

**Improving Work and Equity for Lower-Income Students:
Examining the Effects and Underlying Mechanisms of Federal Work-Study**

by

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Abstract

The federal work-study program is one of the earliest forms of federal financial aid for higher education in the United States and has come under close scrutiny for its debatable impact on low-income students' college success and persistence. However, federal work-study surprisingly remains one of the least-studied financial aid programs. This has been largely due to the unavailability of detailed institutional data and information about how institutions allocate work-study funds to students and the difficulty of identifying plausibly exogenous factors that determine students' participation in the program.

The goal of this study was thus to overcome these limitations and contribute to accumulating robust evidence on the impact of federal work-study on lower-income students. I seek to inform stakeholders about whether the program is a valuable financial aid choice to be prolonged and in what ways, it could remain as one. With unprecedented access to six years of administrative student records, information about financial aid packaging processes, and a student survey from a large, highly selective public four-year institution in the Midwest, I took a deep dive to answer fundamental questions about the effects and underlying mechanisms of federal work-study among lower-income first-year students.

I began by examining the demographic and behavioral landscapes of work-study students. I find that compared to work-study-offer decliners, work-study students demonstrate greater financial needs and have higher percentages of underrepresented minorities and first-generation students. On campus, work-study students also exhibit more intense part-time working behavior than non-work-study student employees, working significantly more hours

with a greater share of students working more than one job. Intriguingly, work-study-offered students mostly engage in research-type work while those without work-study offers largely work labor/service jobs.

Exploiting the case institution's rigid rule for work-study aid eligibility, the expected family contribution cutoff, I then used a fuzzy regression discontinuity design to estimate the causal effects of work-study employment on students' first-year outcomes. I discover that work-study employment has null effects on students' first-year GPA and persistence to sophomore year. Meanwhile, work-study employment significantly increases students' weekly hours worked on campus. Importantly, work-study has heterogeneous effects, inducing male students and underrepresented minority students to work more hours on campus than their counterparts.

To better understand the low take-up of work-study, I further investigated the mechanisms of students' work-study decisions through a survey. The findings reveal diverse informational and structural barriers that hinder students from making informed decisions about their work-study offers. Students experience cognitive overload, wrestling with gathering and digesting a great amount of information about federal work-study. Hiring processes are also an obstacle to matching students with available positions. First-year students highlight their need for time to transition to college prior to accepting any part-time work. Overall, lower-income first-year students advocate for timely delivery of accurate information about the federal work-study program, a well-structured, guided process of work-study employment, and access to meaningful work opportunities.

Chapter 1 Introduction

Long and Riley (2007) described financial aid in the United States as “a broken bridge” (p. 39) to college access and persistence as they witness the growth in students’ unmet financial need, especially among low-income students. They documented that the focus of financial aid policy has been gradually shifting toward making college education more affordable for middle- and upper-income families by defraying the costs (e.g., higher education tax credits, college saving plans) rather than increasing college access for low-income students.¹ At higher education institutions, a shifting emphasis in enrollment management strategies from need-based to merit-based aid, particularly during the 1990s, has further detrimentally impacted college opportunities for low-income students (Davis, 2003; Long & Riley, 2007).² Until recently, scholars have continued to denote concerns about the persistent underrepresentation of low-income students at four-year higher education institutions, with an even more pronounced indication at selective institutions (Bastedo & Bowman, 2017; Bastedo & Jaquette, 2011; Chetty et al., 2017; Dynarski et al., 2018; Hoxby & Avery, 2012; Joseph & Lips, 2011; Redd, 2004).

The federal work-study program is one of the earliest forms of federal financial aid for higher education in the United States and it lately has come under close scrutiny for its debatable impact on college access and success for low-income students (e.g., Baum, 2019; Scott-Clayton

¹ Studies showed that families with income over \$50,000 benefitted the most from the higher education tax credits (Long, 2004) and that 90% of families enrolled in a college savings plan had at least one family member who earned a college degree (Dynarski, 2004).

² Institutions rapidly adopted merit aid programs during the 1990s (McPherson & Shapiro, 1998). Davis (2003) also found that between 1995 and 1999, the new trend toward merit-based aid led low-income students “to bear a greater share of typical marginal increase in tuition and fee charges” (p. 17).

& Minaya, 2016; Soliz & Long, 2016; The White House, 2019). Preceding Pell Grants and Stafford Loans, the program was introduced in 1964 as part of the Economic Opportunity Act (Scott-Clayton, 2017) that aimed at reducing national poverty by extending educational and occupational opportunities for the public (42 U.S.C. §§ 2701-2981, n.d.). A year later, it was transferred to the Higher Education Act of 1965 with a precise goal to promote college access and persistence for low-income students by creating educationally relevant employment opportunities and subsidizing student wages (Baum, 2010; Scott-Clayton, 2011a, 2017). At that time, the notion of “working [one’s] way through college” (p. 506) was popular and it strongly encouraged and supported the enactment of the program (Scott-Clayton, 2011a).³

In 2020-21, a total of about \$1.2 billion federal aid was allocated to students through the federal work-study program (Ma & Pender, 2021). It has been serving about 700,000 students every year, or about 10% of full-time, first-year undergraduate students (Scott-Clayton & Minaya, 2016). Despite the program’s extensive reach and history, it was significantly criticized in Congress during the 2019 reauthorization of the Higher Education Act. It uniquely gained bipartisan consensus on the need for change (Baum, 2019) due to its many inherent policy design features that exacerbate economic inequities between low- and high-income students.⁴ After adjusting for inflation, the amount of federal funding allocated for work-study has decreased by approximately 25% since 2000 (Ma & Pender, 2021).⁵ The decline in federal support for the program is likely attributable to the fact that there is a dearth of empirical evidence on its impact, especially for low-income college students (Scott-Clayton & Zhou, 2017).

³ Scott-Clayton (2011a) elaborated that a working college student would be described as a “Horatio Alger protagonist, overcoming obstacles to achieve the American dream through hard work and determination” (p. 506).

⁴ The 2017 Promoting Real Opportunity, Success, and Prosperity Through Education Reform Act (PROSPER Act) by the House Education Committee Republicans and the 2018 Aim Higher Act by the Democrats.

⁵ Between 1990-91 and 2020-21, total federal work-study aid for undergraduate and graduate students decreased by 1% in inflation-adjusted dollars whereas the 30-year percentage changes were 166% for Pell Grants, 736% for veteran’s benefits, 513% for Parent PLUS loans (Ma & Pender, 2021).

Key Policy Issues

Federal Work-Study and College Access

One of the most debated attributes of the program is the federal allocation formula for work-study funds that has hardly changed since the 1960s. Currently, it prioritizes the longest-participating institutions with high sticker prices. They are mostly non-profit private four-year institutions and they receive more work-study funds than any other types of institution (Smole, 2005). Thus, high-income students at private, high-cost institutions have been receiving more work-study aid than low-income students with greater unmet need at public four-year institutions (O’Sullivan & Setzer, 2014). New York University annually receives more funds than all 24 institutions of the City University of New York combined (Scott-Clayton, 2017). Columbia University receives more than three times the level of work-study funds than Florida State University, an institution with nearly four times as many total undergraduate students and more Pell Grant recipients (O’Sullivan & Setzer, 2014). The current allocation formula for federal work-study is yet likely to remain “inequitable because growing schools cannot increase their funding and other institutions’ funding levels are largely protected” (Baum, 2010, p. 11) regardless of the share of students with need (Kelchen, 2017).

Amended student eligibility for federal work-study has further aggravated low-income students’ access to the program (Scott-Clayton, 2017) and therefore, access to higher education. When the program first started in 1964, it required work-study recipients to be low-income. This was later revised to merely prioritize low-income students, and today, any student who submits the Free Application for Federal Student Aid (FAFSA) and has some financial need is eligible for work-study (Scott-Clayton, 2017). While low-income students are to be given priority for the aid, decisions are ultimately determined by institutions who directly receive the funds and have

much discretion about how they distribute the funds to students (Soliz & Long, 2016). Hence, such change in aid eligibility reinforces inequity in college access by allowing students at high-cost institutions to be eligible even if they may be from higher income families than those at lower-cost institutions (Scott-Clayton & Zhou, 2017; Smole, 2005). This could indeed create a critical barrier to college access for lower-income and students of color who already confront a considerable amount of unmet need (Long & Riley, 2007), especially when financial aid plays a significant role in “getting students in the door” (DesJardins et al., 2002, p. 654).

Federal Work-Study and College Success

Scholars are also increasingly raising questions about the effectiveness of the federal work-study program in promoting low-income students’ college success and persistence. College financial aid is assumed “to help students by allowing them to work less than they would otherwise” (DesJardins et al., 2002, p. 654) largely because working while in school often competes for time for studying or doing assignments (Perna et al., 2007; Ziskin et al., 2010). Federal work-study is yet an employment subsidy that requires students to earn their work-study awards in a form of wage through work (i.e., a financial aid exchanged for labor). It is thus fundamentally distinct from other types of aid (Perna, 2010), which are intended to improve college success and persistence by lowering the reliance on self-help financial aid (DesJardins et al., 2002). While the intent of the federal work-study program is to make college education more affordable for low-income students (Kalenkoski & Pabilonia, 2010), the design of the program still does not eliminate students’ financial need to work. Increases in work could not only reduce the likelihood of college persistence and degree completion, but also limit positive life chances postsecondary education offers students when they make decisions to “trade labor for wages to subsidize [college] attendance” (Pusser, 2010, p. 141).

Another controversy related to the federal work-study's impact is that the program does not ensure academically or career-relevant work opportunities for low-income students, despite the program's original intent. The program required work-study jobs to be educationally relevant at its inception, but it is no longer the case (Scott-Clayton, 2017). Today, it is merely emphasized that federal work-study jobs be relevant to students' academic programs or career goals "to the maximum extent practicable" (20 U.S.C. § 1087-53, n.d.) or "whenever possible" (U.S. Department of Education, n.d.). The main concern is that "working while enrolled is not without costs" (Perna, 2010, p. 285) and that it is crucial for work-study jobs to ensure "valuable labor market experience or [jobs] that are related to the student's academic pursuits" (Baum, 2010, p. 18), since such opportunities are often only available to high-income students who could afford to take high-quality, unpaid internships via family networks or backgrounds (Kenefick, 2015; Scott-Clayton, 2017). Many scholars argue that meaningful work opportunities can benefit low-income students and furthermore, student employment during college will have the potential to "reduce economic and social stratification and inequality" (Perna, 2010, p. 287).

Empirically, the most recent and the only available national survey of federal work-study (Troppe, 2000) found that more than 50% of work-study students had jobs not related to their academic or career interests, although a large majority of students responded that they wanted institutions to offer more academically and career-relevant positions. Kenefick (2015) explained that "the administrative burden associated with federal work-study placements is the most-cited reason for lack of career-related and/or off-campus placements" (p. 3). Unfortunately, according to the survey by the National Association of Student Financial Aid Administrators (NASFAA) (2016), most institutions are unable to verify if students replaced in educationally relevant work-study jobs. Institutions have no data to determine how many students with work-study offers

actually earn them, why they accept or decline work-study offers, what the connection is between work-study and student outcomes, or how students' work-study goals are well-matched with what employers are offering. NASFAA (2016) concluded that institutions lacked both communication and use of data indispensable for improving the program.

The federal work-study program overall presents manifold policy questions regarding its impact on lower-income students' college access and success. As Baum (2010) bluntly wrote, ultimately, "a work-study award is not really financial aid [but it] is a job that requires the same effort as any other job" (p. 18) for students whereas a grant would reduce and a loan could defer the timing of paying college costs. It is thus a fair question to ask, "what precisely is the added value of [federal work-study]?" (Scott-Clayton, 2017, p. 2). As noted earlier, many researchers concur that the program can substantially benefit students if it ensures more academically compatible and career-relevant employment on campus (Baum, 2010, 2019; Kalenkoski & Pabilonia, 2010; Kenefick, 2015; NASFAA, 2016; Scott-Clayton, 2017; Soliz & Long, 2016) compared to non-work-study jobs that are mostly off campus and more likely to be in sales, service, or labor (Scott-Clayton & Minaya, 2016). Given that especially high expectations are placed on today's entry-level workforce to have relevant work experience and skills (Baum, 2019), an improved federal work-study program can "level the playing field of access" (Scott-Clayton, 2017, p. 3) to meaningful work experiences particularly for lower-income students (O'Sullivan & Setzer, 2014) who face higher barriers to such opportunities.

Main Limitations of Prior Literature

To date, federal work-study remains one of the least-studied financial aid programs and its effectiveness has never been rigorously investigated (Scott-Clayton et al., 2020). Scholars also refer to the existing evidence on how employment affects student outcomes as having "no

consensus” (Stinebrickner & Stinebrickner, 2003, p. 473) and “puzzling” (Pusser, 2010, p. 141). A few studies attempt to estimate causal effects of federal work-study on student outcomes using quasi-experimental methods, however, they show mixed findings and contain major limitations. For instance, earlier studies are limited to atypical and less representative samples of students at institutions where all students are required to work (e.g., Stinebrickner & Stinebrickner, 2003) or use samples from a small state (e.g., Scott-Clayton, 2011a). Later research (e.g., Scott-Clayton & Minaya, 2016; Soliz & Long, 2016) attempt to improve on the prior literature by studying much larger and more nationally representative samples of students from nation-wide surveys such as High School and Beyond. Their findings were still restricted to those who went to college many years ago (e.g., 1980s), offering limited suggestions for present stakeholders.

More fundamentally, one of the most critical limitations of the existing research on the impact of federal work-study on student outcomes is “the difficulty of identifying plausibly exogenous variation in work decisions” (Scott-Clayton, 2011a, p. 507). In other words, it is vital to find an exogenous factor that approximates students’ random assignment to a work-study offer or program participation but is not related to student outcomes to be able to obtain rigorous (“causal”) evidence of the program’s impact on student outcomes (e.g., GPA, persistence) (Scott-Clayton, 2017; Soliz & Long, 2016). There has also been a significant deficiency in contextual information regarding the complex decision mechanisms through which institutions allocate federal work-study funds or how they decide to offer the amounts they do. Studies continue to document empirical limitations related to having no indicator of federal work-study offer or aid amounts (e.g., Scott-Clayton, 2011a) and no knowledge about what determines work-study aid eligibility (e.g., Soliz & Long, 2016), heavily relying on approximations to identify work-study eligible students.

Finding an exogenous factor that explains the variations in a student's work-study offer or participation is thus methodologically important when studying the impacts of the program. This could essentially mitigate the issues associated with students' self-selection into work-study participation, which could potentially lead to an endogeneity problem and in so doing produce inaccurate or unreliable results (Angrist & Pischke, 2015; DesJardins et al., 2002).⁶ Nevertheless, existing literature pays little attention to information regarding students' work-study decisions including reasons to participate, choice of type of job, or how students decide how many hours to work during school (NASFAA, 2016). Understanding students' work-study behaviors and experiences is, nonetheless, indispensable for bringing about tangible improvements to the program. That is, identifying the sources of variation in students' work-study decisions (e.g., informational and structural barriers) might help guide policy interventions to maximize the benefits of the program for students. As a whole, current policy recommendations for federal work-study are based on a few key pieces of empirical research (e.g., Baum, 2010; Scott-Clayton, 2011a; Scott-Clayton & Minaya, 2016; Soliz & Long, 2016) and responses from college administrators (NASFAA, 2016) rather than students and their actual experiences.

Purpose of the Study

The existing literature is quite explicit about the potential impact of the federal work-study program on students and their rationale is well-established. If students are obliged to work to afford the costs of modern higher education, work-study employment has certain advantages over non-work-study employment by offering jobs that are closer to campus, more flexible with

⁶ Due to a potential endogeneity problem, researchers have not utilized the actual program participation (i.e., receipt of work-study) data to estimate the effects of the federal work-study program. As Scott-Clayton (2017) explained, students' pre-existing characteristics such as ability or motivation can both impact their decisions to participate in work-study as well as student outcomes (e.g., academic performance, graduation).

students' academic responsibilities, and more likely to be educationally relevant (Baum, 2019; Scott-Clayton, 2017; Soliz & Long, 2016). Unfortunately, "the full promise of the program has not been fully realized" (Kenefick, 2015, p. 8) due to insufficient and inconclusive evidence that demonstrates any positive impacts on students, which could buttress support for the program. It is therefore evident that more empirical research is needed to build insights into how the program works and how it affects student outcomes.

As discussed, earlier studies have major limitations related to data and information constraints, especially about the detailed mechanisms of institutional allocation of work-study funds to students, students' motivation to participate in work-study, and students' decision-making processes of choosing a work-study job. The main purpose of this study is to overcome these limitations and provide more applicable, robust evidence on the effects of the program. I seek to inform stakeholders to determine if federal work-study can play a role in today's higher education as a worthwhile financial aid policy choice. Another key objective of this study is to further investigate the underlying mechanisms of the federal work-study program's impact by studying both institutions' and students' decision-making processes, focusing on the role of informational and structural barriers in work-study decisions. Overall, I achieved these goals by using unprecedented access to extensive datasets and by drawing upon theories and concepts from multiple disciplines including education, behavioral economics, sociology, and psychology.

Specifically, in this study, I employ multiple datasets including student-level institutional data (i.e., demographics, financial aid, academic records, employment, and payroll), student survey data gleaned from student focus group and administrative staff interviews. These datasets contain quantitative and qualitative data. In the first part of the study, to describe the key features of the federal work-study program, I conduct an in-depth quantitative analysis of detailed

student-unit records representing six recent cohorts of first-time, full-time freshmen enrolled at the case study institution (pseudonym: Lake University) between 2013-14 and 2018-19. I depict the demographic and behavioral landscape of work-study students and how their characteristics differ from those who were offered but decided not to use work-study and those who were not offered work-study at all. In addition, I descriptively explore the various features of work-study employment (e.g., job type, hours) and then compare them to non-work-study jobs on campus held by both work-study decliners and students who were not offered work-study. My goal is to extend our knowledge about not only work-study participants, but also students who make different work choices to finance their college experience.

The second part of the study uses the same administrative student-level data to estimate the causal impacts of federal work-study program participation on students' first-year academic and employment outcomes (i.e., first-year GPA, persistence to the sophomore year at the same institution).⁷ I also estimate the effects of federal work-study participation on hours worked on campus and earnings obtained through on-campus employment. Precise information regarding the case institution's work-study offer decisions (i.e., eligibility criteria) was available for this study, allowing the potential to make more rigorous causal inferences of program effects than earlier research that relied on the federal-level allocation of work-study funds to institutions to predict the probability of students' work-study offer (e.g., Scott-Clayton, 2011a; Soliz & Long, 2016).⁸ I also emphasized on first-year college outcomes, given mounting evidence that many students are working "at the expense of academic pursuits" (Thibodeaux et al., 2017, p. 6), which can be more alarming for first-year, low-income students. First-year grades "are probably the

⁷ According to the National Student Clearinghouse Research Center (2015), persistence to the sophomore year at the same institution is referred to as retention, which is defined as "continued enrollment (or degree completion) within the same institution for the fall semesters of a student's first and second year" (p. 1).

⁸ These studies are discussed in detail in the Literature Review section.

single most revealing indicator of [...] successful adjustment to the intellectual demands of a particular college's course of study" (Pascarella & Terenzini, 1991, p. 388 as cited in Pike & Saupe, 2002). College persistence is also vital for students' degree completion, which also has become a key measure of institutional effectiveness (DesJardins et al., 2002).

Another goal of this study is to initiate a new set of scholarly inquiries on the impact of federal work-study from students' perspectives. That is, how do students assess the costs and benefits of work-study and make decisions? Are students making informed decisions about their work-study offers? What are the barriers confining their ability to make informed work-study decisions? I answer these questions by doing a thorough investigation into the mechanisms of students' work-study decisions based on both quantitative and qualitative data from a student survey. Following Scott-Clayton (2011b),⁹ I begin by elucidating the decision context for federal work-study (i.e., determining what to do, planning how to do it, following through, available resources), in which students navigate the program, starting from when they file the FAFSA to when they choose a (work-study) job (or choose not to work a part-time job).¹⁰ I then examine the main factors students considered and the types of obstacles to making work-study decisions. Finally, I examine the kinds of work and financing decisions made by students who declined work-study aid after being offered. Above all, the goal of this chapter is to identify the various kinds of informational and structural barriers that lead students to making uninformed, less-than-optimal decisions, and to deeply ponder upon how the program can truly improve college access and success for low- and limited-income students.

⁹ In her study, she provided a description of the decision context that community college students experience, that is, "What do they have to do in order to successfully navigate to completion?" (Scott-Clayton, 2011b, p. 3).

¹⁰ Students may choose not to participate in work-study and get a non-work-study job on or off campus, or not work a job at all. I was only able to focus on students with on-campus employment data, excluding those who did not work at all or those who worked off campus (i.e., no on-campus employment records).

Significance of the Study

To the best of my knowledge, this is the first study to use a set of detailed student-level employment and payroll information in addition to demographics, financial aid, and academic records to examine the effects of the federal work-study program. Moreover, this study initiates scholarly inquiry about the little-known, complex mechanisms of students' work-study behaviors and decisions by conducting a new student survey on these topics. Given the depth and scope of both quantitative and qualitative data, I am able to answer vital questions about federal work-study with findings that have significant implications for research, policy, and practice.

First and foremost, this study contributes to the understanding of the impacts of the federal work-study program and the underlying mechanisms, both empirically and theoretically. Empirically, the access to detailed institutional-level information about a federal work-study offer eligibility considerably improves the empirical strategies to assess causal effects of the program, which has not been available for any earlier research and has remained a key limitation. The use of on-campus student employment data in this study also allows me to distinguish work-study positions and non-work-study positions, meaning that I obtain findings specific to student employment operated via work-study. This indeed has been a critical limitation of the majority of the past studies, which had to conflate the effects of federal work-study employment with the effects of non-work-study employment (e.g., Dadgar, 2012; Darolia, 2014; Stinebrickner & Stinebrickner, 2003).

The findings also greatly expand the current conceptual understanding of the mechanisms of the federal work-study program. While earlier work-study research is confined to elucidating the relationship between working and studying more broadly, I extend the scope of knowledge about work-study by investigating the process of students' work-study decision making. To

depict how students navigate the federal work-study program, I collect both quantitative and qualitative data beginning from the time when students indicated their interests in work-study in the FAFSA to when they finally chose a job. I identify the decisions students make regarding work-study and the motivations behind each decision. Hence, this study contributes to building theoretical and conceptual foundations for future studies that explore students' behavioral patterns associated with federal work-study, and furthermore, how these patterns may mediate the relationship between work-study and student outcomes.

This research also contributes by adding more empirical evidence that could inform policymakers and higher education practitioners wanting to improve current work-study funds allocation and targeting strategies. Specifically, better understanding students' work-study behaviors could alleviate the issues of underutilized funds for both the federal government and institutions that result when students decline work-study offers. These funds are returned to the Department of Education for reallocation (20 U.S.C. § 1087-52, n.d.), failing to be given to students with financial need. In addition, institutions who return more than 10% of their original allocations are penalized with reduced allocation of work-study funds in the next fiscal year (20 U.S.C. § 1087-52, n.d.). As a result, institutions not only encounter disadvantages when work-study funds are underutilized, but also, they miss an opportunity to extend the reach of the funds to low-income students with need. In a survey of 1,885 university and college staff, NASFAA (2016) found that about 20% of the respondents had a record of returning unspent work-study funds.¹¹ Among institutions who returned more than 10% of their original allocation, nearly 75% received a reduced amount of work-study allocation. In this regard, this research has important implications for policymakers and higher education institutions seeking to improve allocation

¹¹ The survey participants responded about work-study allocations concerning the past five years (NASFAA, 2016).

and targeting strategies to better serve low- and limited-income students and maximize the benefits of the program.

Findings from the student survey can inform institutional practices regarding student experience with federal work-study. Recently, researchers have been calling for an implementation of a work-study student survey to gather newer data about today's students (NASFAA, 2016; Scott-Clayton et al., 2020) and to "bring the program into the 21st century" (O'Sullivan & Setzer, 2014, p. 14). Due to the scarcity of information on work-study students' actual experiences, the existing policy recommendations have been relying on administrators' assumptions about student experiences (NASFAA, 2016). This is also attributable to the fact that institutions rarely attend to learning about whether students are making well-informed work-study decisions or getting educationally-relevant work-study jobs, largely because the administrative priority is to simply distribute the funds to students. I verify to the extent to which work-study students have jobs related to students' academics and the kinds of informational and structural hurdles lower-income students confront when seeking work-study employment. Thus, this study thus informs institutions about the means to improve administrative assistance for students with federal work-study offers and to redistribute high-quality work opportunities and experiences on campus among students from diverse socio-economic backgrounds.

Research Scope and Questions

To achieve the goals of this study, I specifically address the following main research questions and sub-questions:

- (1) What are the key characteristics of the federal work-study program?¹²

¹² Questions about students who worked off campus or who did not work at all (on or off campus) were answered based on the analysis of student survey data to supplement the analysis of administrative student records that did not include off-campus employment records.

- a. Do students characteristics (i.e., demographics, pre-college factors, academic characteristics, and college costs) vary by federal work-study status? If yes, how are they different?
 - b. Do job characteristics (i.e., job type, hourly wages, weekly hours worked, and weekly total earnings) vary by federal work-study status? If yes, how are they different?
- (2) What are the causal impacts of the federal work-study program on student outcomes?
- a. What are the causal effects of federal work-study on students' first-year GPA, persistence to the 2nd year, weekly hours worked on campus, and weekly total earnings from on-campus employment during their first-year?
- (3) What are the mechanisms through which students make work-study decisions?
- a. What is the motivation behind students' various federal work-study decisions?
 - b. What are the informational and structural factors that hinder students' ability to make informed decisions about federal work-study?

While answering these questions, I pay special attention to low- and limited-income students who are offered work-study to attend a highly selective institution for vital reasons.¹³ To elaborate, the literature documents a growing gap in college access and success between low- and high-income students (Hill & Winston, 2006; Long & Riley, 2007; Melguizo & Chung, 2012). This gap is wider at selective institutions (Bastedo & Jaquette, 2011; Chetty et al., 2017) despite the evidence that low-income students are more likely to benefit from attending selective institutions (e.g., costs, degree attainment, future employment) (Andrews et al., 2016; Cohodes & Goodman, 2014; Dale & Krueger, 2002; Hoxby & Avery, 2012; Zimmerman, 2014). In fact, scholars have been especially concerned with the findings that the majority of low-income, high-achieving students do not even attempt to apply to selective institutions to begin with (Dillon & Smith, 2017; Hoxby & Avery, 2012).

¹³ At the case institution, one of the key work-study eligibility criteria is an expected family contribution of \$20,000 or lower. These work-study eligible students are described as low- and limited-income (or lower-income) students in this study.

I thus pay greater attention to what occurs once low- and limited-income, high-achieving students (with work-study offers) enroll at selective institutions, which have “more students from the top one percent of the income distribution than from the entire bottom half” (Dynarski et al., 2018, p. 3). Since these students have lower expected family contributions (EFCs), this results in greater financial unmet need calculated as well as in a higher probability of receiving a federal work-study offer. Work-study then induces lower-income students to work their way through college, “constantly [reminding them] of the costs of their education because they are paying for it by working as long as they receive that aid” (Cappelli & Won, 2016, p. 9). At the same time, having to work at a place (i.e., selective institution) where working for pay may not be a norm for a large majority of enrolled students from higher income families can be greatly challenging for lower income students. Being a working student can characterize them as ‘token’ students, possibly leading them to feel a sense of isolation or a high pressure to perform better in various aspects of college life.¹⁴ Low- and limited-income, working students at selective institutions therefore need scholarly attention to a greater extent.

¹⁴ Kanter (1977) introduced a concept of “tokens” in her study of workplace experiences of women. Members of a token group refers to those who have low numerical representation (less than 15%) in an organization and thus, are likely to be viewed as different from the majority of the group (i.e., dominants).

Chapter 2 Literature Review and Conceptual Framework

The literature review for this study is primarily guided by the following three questions: What are the effects of the federal work-study program participation on students' academic performance and persistence? What are the underlying mechanisms of this impact? Why and how do students decide to participate in federal work-study? Given a lack of empirical studies specifically on the federal work-study program, I broadly review literature on college student employment. I begin by discussing the conceptual approaches taken in prior research to study the effects of working while in college on students' academic outcomes and persistence.¹⁵ I then review existing empirical evidence on the relationship between working and student outcomes. Drawing upon literature from multiple disciplines, I also review conceptual approaches and empirical findings about students' work and work-study decisions, although prior studies are quantitatively limited. In addition, I conduct an inter-disciplinary literature review about human limitations and the role of information and structure in decision making to construct a more comprehensive conceptual framework for studying students' work-study decisions.

College Student Employment and Academic Performance

Conceptual Approaches

Accrued literature on student employment and its consequences on academic (school) performance (i.e., GPA) is generally composed of two areas of research: Student employment

¹⁵ I do not include empirical literature on students enrolled at two-year community colleges or for-profit institutions, in which a large majority of students are part-time, working, or nontraditional students (e.g., adult learners).

during high school (e.g., Dustmann & Soest, 2007; Eckstein & Wolpin, 1999; Lillydahl, 1990; Oettinger, 1999; Quirk et al., 2001; Rothstein, 2007; Schill et al., 1985; Schoenhals et al., 1998; Singh, 1998; Warren et al., 2000) and working while in college (e.g., Dadgar, 2012; Darolia, 2012; DeSimone, 2008; Ehrenberg & Sherman, 1987; Gleason, 1993; Hood et al., 1992; Kalenkoski & Pabilonia, 2010; Paul, 1982). Although student employment at the college level has received relatively less attention than working while in high school (DeSimone, 2008), researchers strongly concur that understanding the impacts of working on college students is vital for public policy. Specifically, knowing the consequences of paid employment on students' academic performance can inform various policies concerning the overall labor supply, students' and families' ability to pay for college education, and the quality of educational experiences students receive (DeSimone, 2008; Perna et al., 2007; Stinebrickner & Stinebrickner, 2003). Existing theories, however, suggest contradicting hypotheses about the relationship between employment while in college and academic performance.

In the conceptual approaches to understanding the relationship between employment and college students' academic outcomes, the notion of "time" appears to be central. Particularly in the economics literature, working while in school is theorized to be harmful and detrimental to students' academics since it simply competes for time spent studying. Within the framework of the utility maximization model (Ehrenberg & Sherman, 1987), time is a fixed resource (Darolia, 2014) and students have to decide how they want to use it to obtain the highest satisfaction from that decision (Rachlin et al., 1981). Thus, academic achievement would be a positive function of time students spend on studying (Kalenkoski & Pabilonia, 2010). In this regard, if a student decides to spend time in the labor market, it will substitute for time spent on educational activities such as taking more classes, doing homework, or going to the library (e.g., Choy &

Berker, 2003; King & Bannon, 2002). It may also compete with time to engage with academic communities that can foster greater commitment to one's schooling. It is then "not difficult to hypothesize why student employment in general may harm academic outcomes" (Scott-Clayton, 2011a, p. 507). Literature grounded in this view attend to studying the effects of employment intensity typically measured by the number of hours worked (e.g., Darolia, 2014; DeSimone, 2008; Ehrenberg & Sherman, 1987; Kalenkoski & Pabilonia, 2010; Paul, 1982; Stinebrickner & Stinebrickner, 2003). These theoretical approaches yet overlook an important possibility that students may substitute time spent working with time spent on non-academic activities while preserving time for studying.

There are several other explanations as to why working while in college may have an inverse relationship with students' academic performance, although not prevalent in the existing literature. For instance, working a part-time job may reduce time for studying not simply because work hours replace study hours, but possibly if a student is physically fatigued after work, takes additional time to commute to a workplace, or spends more time doing other activities after work such as even taking a shower (Stinebrickner & Stinebrickner, 2003). These situations including physical tire or time needed before and after work for certain activities thus can further diminish students' time investment into studying, leading to unsatisfactory academic outcomes. Bradley (2006) described such cognitive (e.g., decreased concentration) and health (e.g., fatigue) states stemming from working an increased number of hours as having spill-over effects on academics.

Overall, the conceptual approaches that posit a negative association between employment and academic performance highlights students' use of time, which is fixed in quantity. It is yet important to note that these views essentially compare students who work with those who do not work at all (i.e., non-workers) (Gleason, 1993). Namely, student employment would result in

negative returns in academic outcomes only relative to students who do not participate in the labor market at all and commit more time and energy to academics. Bradley (2006) noted that students who are induced to work may essentially have lower level of academic motivation than non-working students who tend to prioritize academic success. This again denotes a potential endogenous relationship between students' work decisions and academic outcomes.

On the contrary, some scholars propose that working in while school can have a positive association with academic outcomes for college students (e.g., Ben-Porath, 1967; Dadgar, 2012; Pascarella & Terenzini, 2005; Paul, 1982). More specifically, employment may not negatively impact students' academic performance if time spent on working substitutes, for instance, time spent on non-educational activities such as leisure, socializing, or extracurriculars (Darolia, 2014). An important assumption is that students in school allocate their time between school, work, and leisure (Kim et al., 2015) rather than simply between school and work. One possible mechanism of the positive relationship between work and academic outcomes is that when an individual has a positive attitude toward one's job because it is personally rewarding, a student would have "less need for leisure time" (Paul, 1982, p. 51). One would then reduce time spent for leisure and preserve time for studying, which would lead to a positive relationship between work and academics. In other words, "paid work interferes with studies only when work is experienced with stressful, dissatisfying, non-discretionary, and/or incongruent with the student's life goals and values" (Bradley, 2006, p. 484).

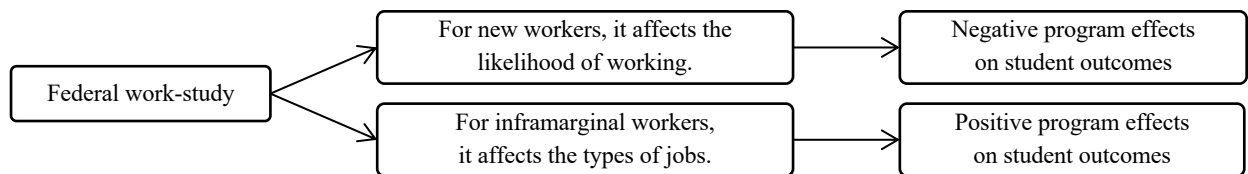
Based on empirical evidence on adolescents, Bradley (2006) further theorized that below a certain threshold (e.g., 15-20 hours worked/week), working college students may be capable of making necessary adjustments to other parts of their life so that their work does not negatively affect their studies. These theories can also be buttressed by the idea of diminishing marginal

returns of studying. Ben-Porath (1967) asserted that a student's academic performance would not always be proportionate to an increase in time spent for studying. If a student spends sufficient time on academics to a point where an additional hour of studying does not increase one's academic outcomes, working may not essentially harm their academic performance.

Another perspective on the positive relationship between college student employment and academic performance is suggested by scholars who highlight the potential benefits of working on campus (e.g., Dadgar, 2012; Scott-Clayton, 2016; Tinto, 1993). Conditional on working, there may be a positive association between work and academic outcomes for students working on-campus jobs compared to students in other labor markets such as off-campus. Dadgar (2012) hypothesized that on-campus employment might even help students to produce better academic performance. Scholars who support these propositions strongly believe that on-campus jobs have features that promote student learning. For instance, on-campus positions introduce students to “educated adults who can serve as mentors or role models, inspiring the students and helping them navigate college” (p. 3) and to lower-intensity work than off-campus workplaces (Dadgar, 2012). On-campus work can also offer students opportunities to get involved with the academic community (e.g., research opportunities with faculty), which may lead to greater academic commitments (Darolia, 2014; Tinto, 1993). Moreover, certain jobs “can complement academic lessons by providing applied context” (Darolia, 2014, p. 39) and “provide students with opportunities to develop values and skills that are transferable to current study” (Bradley, 2006, p. 484). In brief, if a student is obliged to work, scholars state that on-campus employment aligned with students' academics may help students to obtain higher academic outcomes than working other jobs off-campus.

As a whole, the conceptual approaches to studying the impacts of student employment on academic outcomes propose both positive and negative relationships, conditional on employment status (i.e., working vs. not working) and job characteristics (i.e., on campus vs. off campus). Scott-Clayton and Minaya (2016) presented a conceptual framework that illustrated these aspects of student employment. In an attempt to hypothesize how the federal work-study program affects student outcomes based on wage-subsidy literature, they proposed that federal work-study might have heterogeneous effects on student outcomes via two distinct mechanisms.¹⁶ First, federal work-study will affect students' likelihood of working by inducing students to employment. These students are considered as new workers for whom the program negatively impacts their academic outcomes since they would have not worked without a work-study offer. Another mechanism is that the program may influence the kind of jobs students hold. For students who would have worked anyway (i.e., inframarginal workers), the effect of federal work-study may be positive by nudging students to replace off-campus jobs with on-campus jobs that may improve both wage and non-wage aspects (e.g., hours worked, job activity). Having to commute shorter distances or a cap on work hours placed by federal work-study could thus be advantageous to students' academic outcomes, conditional on working. Figure 1 illustrates the conceptual framework introduced by Scott-Clayton and Minaya (2016).

Figure 1. *Differential Effects of the Federal Work-Study Program on Student Outcomes*



Note: This illustration is based on my interpretations of Scott-Clayton and Minaya's (2016) framework.

¹⁶ Based on the wage-subsidy literature, the authors added that a student employment subsidy program, for example, the federal work-study program, could be justified if it is effective in resolving the issues originating from market imperfections such as information or structural constraints to valuable work experiences, or if it improves the extent that institutional employers are likely to hire students via work-study who would have worked anyway.

Empirical Findings

Empirical evidence on college student employment has been limited by available data (DeSimone, 2008) and the findings on how the federal work-study program affects students' academic performance are not well known. Most of the earlier literature examined the correlation between intensity of work, which was typically measured by the number of hours worked, and academic outcomes (e.g., Paul, 1982; Ehrenberg & Sherman, 1987). Gleason (1993), on the other hand, utilized a simple indicator of ever employed for pay during school. Overall, earlier findings indicated that working while in college had either null or negative and small effects on students' academic outcomes such as course exams (Paul, 1982), first-year GPA (Ehrenberg & Sherman, 1987), and term-level average GPA during college (Gleason, 1993).

Yet, these earlier studies were limited in various aspects. For instance, work measures (e.g., hours) used in these studies were self-reported and subject to survey measurement errors. Work was also considered mostly only in terms of its quantity (i.e., amount of work) and the timing of the work (i.e., when students worked while in school) was often disregarded. Earlier literature was also restricted to considerably narrow samples of students such as those in business majors (e.g., Paul, 1982) or male students (e.g., Ehrenberg & Sherman, 1987) who attended college during the 1970s and 1980s. Most importantly, their key limitations are that they not causal estimates (Dadgar, 2012; Soliz & Long, 2016), often failing to control for vital individual characteristics such as race and ethnicity (e.g., Ehrenberg & Sherman, 1987) that may be related to students' work decisions (Paul, 1982) and student outcomes (Soliz & Long, 2016).

Later studies by DeSimone (2008) and Kalenkoski and Pabilonia (2010) found plausibly causal impacts of college student employment on academic outcomes by using an instrumental variable that might address the variations in students' work decisions. As in earlier studies, they

consistently found that work negatively affected students' academic outcomes. In DeSimone's (2008) study, he analyzed a nationally representative sample of full-time, four-year college students who participated in the Harvard College Alcohol Survey between 1993 and 2001. He utilized an indicator for being Jewish and father's education level as an instrument for estimating student's hours worked. Citing Botticini and Eckstein's (2005) discussion of "a religious norm requiring Jewish fathers to educate their sons" (DeSimone, 2008, p. 6), he argued that "students raised Jewish will spend fewer hours working for pay in response to greater financial support from their fathers, who have better means of providing such support and also emphasize schooling and the eventual attainment of skilled jobs" (p. 6-7) and that the same logic would apply to the relationship between student employment and paternal education level.

DeSimone (2008) found that work had negative effects on students' grades, although the impact was generally small. However, scholars concern that his study maybe subject to potential internal validity because "[his] instrument may violate the assumption that it only affects student outcomes through its effect on whether or not a student works" (Soliz & Long, 2016, p. 4). That is, having parents whose religious norms emphasize education may be associated with students' academic motivation or habits that could directly impact student outcomes (Dadgar, 2012).

Using the National Longitudinal Survey of Youth 1997 (NLSY97) data, Kalenkoski and Pabilonia (2010) also studied a nationally representative sample of students who finished the first term in college. The authors also highlighted the importance of identifying what determines the heterogeneity in students' decisions to participate in the labor market and criticized that the prior literature pays insufficient attention to questions about why students work. In order to predict the variations in students' work decisions, they used parental transfer (of financial support) as an instrument. They explained that although college financial aid expects parents to contribute to

their child's education, parents are not forced to actually pay for any college expenses. Thus, a low parental transfer may result in financial motives for students to work for pay.

Kalenkoski and Pabilonia's (2010) research yet may also have limited internal validity. Dadgar (2012) argued that students with parents who are invested in their children's education are more likely to achieve greater academic outcomes and that parental transfer would be a weak instrument to estimate causal relationships between working and student achievements. Flaster (2018) also discovered that parental transfer (plan to pay for their children's college) is deeply shaped by their socioeconomic status (SES). The high-SES parents were "more likely than low-SES parents to view paying for college to be a parental responsibility" (Flaster, 2018, p. 1000). This shows that the level of parental transfer reflects students' SES that has important association with their academic achievements, supporting Dadgar's (2012). Moreover, Kalenkoski and Pabilonia's (2010) study potentially has measurement errors from using self-reported measures of hours worked. Their focus on the first term of college outcomes is also limited to understand the effects of work-study on students' GPA since students can begin their work-study employment during any time of the school year.

Darolia (2014) used the NLSY97 data as well to estimate the causal impacts of working off campus on students' college GPA. Similar to the studies using instrumental variables (e.g., DeSimone, 2008; Kalenkoski & Pabilonia, 2010), he stressed the need to "control for potentially endogenous relationships among working and academic performance" (p. 38). To address these issues, he first used student-level fixed effects to account for any unobservable factors associated with the variations in students' hours worked. He then employed the generalized methods-of-moments (GMM) estimator that could model the relationship between hours worked and student outcomes that may vary over time. That is, students may work more hours during certain periods

of time when academic workload is low. Yet, they may also work less in times, during which financial need is less. He also instrumented for work hours using two plausibly exogenous factors, housing prices and credit quality (i.e., scores) in the area in which a student's family resides. He argued that these factors could not be controlled by individuals, and they influenced students' financial need to work without directly affecting their academic performance.

Contrary to previous literature, Darolia (2014) found no evidence that students' work intensity (i.e., hours worked) negatively affected their GPA, suggesting that "increased working time may not be crowding out study time" (p. 47). Although he remarkably improved estimation strategies to address hypothetically endogenous relationship between employment and academic performance, he acknowledged that using NLSY97 data might possibly result in measurement errors. In NLSY97 data, key variables such as GPA, credits, and work hours are all self-reported. Also, for his measure of hours worked, he averaged hours worked data only from two reference weeks (i.e., second weeks of February and October) in each academic year, which would be a limited time points to reflect students' work behaviors throughout the entire academic year.

Until recently, scholars agree that Stinebrickner and Stinebrickner's (2003) study offers the most rigorous evidence specifically on the causal effects of on-campus student employment on academic performance (e.g., Dadgar, 2012; Scott-Clayton, 2011a; Scott-Clayton & Minaya, 2016; Soliz & Long, 2016). The authors studied a unique setting where the case study institution required all attending students to work, implying no self-selection into decisions about working while in college. Their study was done at Berea College, a small liberal arts college in Kentucky. All students attending Berea received full-tuition scholarships, and the cost of attendance was partially defrayed by a required work on campus at least for 10 hours per week. As regards, their financial aid packages included a \$2,800 labor grant and students received additional \$2 per hour

for their jobs while some earned up to \$4. Most importantly, institutions randomly assigned jobs to students in their first semester, and the jobs were all service-type positions. The authors utilized this random job assignment to instrument for students' hours worked, which might vary if students chose to work more hours. They underlined the credibility of their instrumental variable that could "explain a reasonable portion of the variation in work hours and [is] unrelated to an individual's academic performance except through their effect on hours worked" (p. 474).

Using student-level administrative records, Stinebrickner and Stinebrickner (2003) found that working an additional hour had a statistically significant and negative effects on students' semester GPAs with about 0.162 points decrease. Notwithstanding the rigor of their results, the authors themselves and other researchers (e.g., Dadgar, 2012; Soliz & Long, 2016) cautioned about the generalizability of the findings, given that Berea College was a considerably unique context. Their study also did not distinguish work-study and non-work-study positions, although some portion of students' on-campus employment was probably subsidized through the federal work-study program (Scott-Clayton & Minaya, 2016).

The aforementioned literature is largely inadequate to provide insights into the impacts of the federal work-study program on students' academic performance. Many studies examine college student employment without distinguishing the different types of employment (i.e., work-study, non-work-study on-campus positions, and non-work-study off-campus positions). With specific regard to the federal work-study program, there are three studies that estimate the causal effects of the program on student' college GPA. Scott-Clayton (2011a) was the first to provide quasi-experimental estimates of work-study effects. She analyzed data from the West Virginia Higher Education Policy Commission (WVHEPC), a state agency, to study first-time college students who enrolled at two- or four-year public West Virginia institutions between

2002 and 2004. To instrument for work-study employment, she utilized institutional work-study allocations (i.e., available funds per eligible students) at federal level. She used a difference-in-differences (DID) strategy to compare work-study eligible and ineligible students at institutions with higher allocations and those at schools with lower amounts of funds.

Scott-Clayton's (2011a) findings showed that the level of work-study funds available at institutions had significant effects on the probability of students' work-study participation. With regard to students' first-year GPA, she found that work-study employment had no statistically significant effects. However, there were heterogeneous impacts of work-study by gender. The negative impacts were stronger for female students while more positive effects were found for male students. She explained that the types of work or the counterfactual use of time may differ by gender, which were not observed in her data. Scott-Clayton's (2011a) study is valuable as it provides the first direct evidence on the effects of the federal work-study program. However, the author cautioned the interpretations of her findings due to the fact that "West Virginia is itself a small and nationally unrepresentative state" (Scott-Clayton, 2011a, p. 524).

In Scott-Clayton and Minaya's (2016) research, the authors estimated the causal effects of work-study on students' first-year GPA using a more nationally representative sample as well as a different identification strategy. They analyzed two waves of the Beginning Postsecondary Student longitudinal survey of students who began college in 1995-96 or 2003-04. The authors then used a propensity-score matching strategy to test a theoretical framework they proposed about two different mechanisms of work-study impact on student outcomes. This methodological approach estimates "not only the overall impact of participating in work-study, but also the impact under two highly distinct conditional counterfactuals; what would have happened if the participant had worked at an alternative, non-work-study job, and what would have happened if

the participant had not worked at all” (Scott-Clayton & Minaya, 2016, p. 2). For the first time, they also accounted for data on students’ work experiences such as job types (e.g., clerical, labor, service) based on their hypothesis that conditional on working, work-study occupations would be more likely to have positive effects on students than off-campus positions.

Their findings showed that work-study participants worked on campus at a much higher rate (80%) than non-work-study workers (8%). Work-study also had a statistically significant and positive effect on the likelihood of working on campus with a 52 percentage-point (pp) increase. A larger proportion of work-study students moreover had jobs in clerical occupations rather than sales, labor, or service positions, however, they earned lower hourly wages. The researchers thus summarized that work-study jobs were greatly different from non-work-study positions in their characteristics. Then, for students who were new workers, namely, who would have not worked but were induced to work due to work-study, the program had negative effects on students’ first-year GPA. Nevertheless, when compared with students who worked non-work-study jobs (i.e., students who would have worked anyway regardless of work-study), work-study employment had a null effect on first-year GPA. This study evidently provided an important insight into the counterfactual scenarios. Yet, “the estimates are only causal if the observable characteristics that the authors are able to control for completely determine whether or not a student participates in the [work-study] program” (Soliz & Long, 2016, p. 5). In addition, as highlighted in other studies using students’ self-reported data (e.g., hours worked), Scott-Clayton and Minaya’s (2016) study may be also subject to possible measurement errors.

The most recent empirical study on the federal work-study program was done by Soliz and Long (2016). Following Scott-Clayton’s (2011a), they also used DID identification strategy and a two-stage least squares (2SLS) instrumental variables model, utilizing the variations in

work-study funds allocated to institutions. They used institutions' work-study allocations to first estimate the amount of work-study aid received by students and then to estimate students' first-year GPA. The authors emphasized that they studied a more representative sample of first-time, full-time students from the Ohio public university system than the prior studies (i.e., Kentucky or West Virginia). Their sample also referred to more recent cohorts of students who started college in the fall of 2007 and 2008. Compared to the 2007 national averages of student characteristics, their sample was less diverse in terms of race and ethnicity and had more students who were financially dependent of their parents, although they had comparable family income.

Soliz and Long's (2016) first-stage estimates indicated that being eligible for work-study at an institution with higher work-study allocations had a significant and positive effect on the amount of work-study aid students received. Overall, they found statistically significant and negative impacts of work-study employment on students' first and second semester GPAs, especially when they excluded Ohio State University. The effects were, nonetheless, small. Their sub-group analyses also found no heterogeneous effects of work-study by gender, contradicting Scott-Clayton (2011a)'s findings. They also find no differential effects by race and ethnicity. The authors concluded that the literature overall suggests "minimal negative effects" (p. 28) of work-study on GPA, and this may be far outweighed by the program's other potential outcomes (e.g., non-academic, work-relevant skills). Despite their contributions by studying a more nationally representative sample of students, the authors highlighted a lack of important data and having to approximate key variables such as a cutoff for work-study eligibility or hours worked.

Accumulated literature on the federal work-study program's effects on college GPA generally suggests that work-study employment has either null or small negative effects on students' academic performance. Nonetheless, the findings remain inconclusive with each study

examining unique sample of students. The results represent students from institutions in largely distinct regions (e.g., West Virginia vs. Ohio) or those who attended colleges many years ago. Additionally, Scott-Clayton and Minaya's (2016) study was the only study that was able to control for job characteristics to some extent. The variations in work measurement, for instance, by the number of hours worked or by location only (i.e., on campus vs. off campus) also limit the understanding of the effects of employment on student outcomes (Nuñez & Sansone, 2016), and a more comprehensive information on job characteristics is crucial. Above all, it is essential to distinguish the effects of work-study from non-work-study employment and to identify a more reliable exogenous variable that could approximate students' random assignment to work-study and explain the variations in students' work decisions. I draw upon this review and Scott-Clayton and Minaya's (2016) conceptual framework to suggest the following:

Proposition 1: Student employment through the federal work-study program will have differential effects on college GPA depending on whether time spent on working replaces time spent on academic activities or non-academic activities.

Proposition 2: Student employment through the federal work-study program will have differential effects on college GPA depending on whether or not they would work in the absence of their work-study offers.

Proposition 3: Student employment through the federal work-study program will have differential effects on college GPA depending on job characteristics, conditional on working.

Scott-Clayton and Minaya's (2016) conceptual framework well illustrated the potential effects of federal work-study accounting for an individual's likelihood of working and the types of jobs. Yet, "a logical next question is whether there are differential effects of participating in work-study for students working more or fewer hours" (Soliz & Long, 2016, p. 28). Although Scott-Clayton and Minaya's (2016) framework assumed that work-study employment does not lead to excessive hours of working (i.e., a cap on hours worked), they still did not explain how

the relationship between work and academic outcomes might be moderated by different numbers of work hours. Above discussed literature in general merely assumes that academic outcomes are proportional to the number of hours worked and do not examine whether adverse effects of work on GPA are not observed within certain number of hours (i.e., below a particular threshold). As regards, there are some empirical evidence of this relationship for other academic outcomes. In the analysis of the 1999-2000 National Postsecondary Student Aid Study (NPSAS: 2000), Choy and Berker (2003) found that students who worked 1-15 hours per week completed a degree at a higher rate than those who did not work at all as well as those who worked more than 15 hours per week. Some studies also indicated that working more than 15 hours a week had a negative impact on academic and social integration into campus community (e.g., Pascarella & Terenzini, 1991; Perna et al., 2007). Nevertheless, with regard to college GPA, most findings continue to report a linear relationship between work hours and GPA (e.g., Choy & Berker, 2003; Perna et al., 2007). These findings are mostly, yet, dated and descriptive, requiring further investigation using more recent data and rigorous estimation methods.

College Student Employment and Persistence

Conceptual Approaches

Conceptual approaches to understanding of the relationship between student employment and college persistence is comparable to the discussion about how work impacts students' academic outcomes. Broadly, scholars have described the relationship focusing on the idea of utility maximization, intensity of work (e.g., hours worked), and types of jobs. Ehrenberg and Sherman (1987) were one of the earliest scholars to conceptualize how employment while in college impact student persistence based on the utility maximization model, which depicts how an individual makes an economic decision. They hypothesized that persistence was a function of

their academic performance so far in college (e.g., GPA) and their expected earnings through future employment if they persist in college. This means that students' decision to stay in college or not is based on their evaluation of the utility obtained under two scenarios: (a) If one remains in college versus (b) leaving school, conditional on their current GPA, which is largely affected by the hours of employment while in college.

Regarding the relationship between work intensity and persistence, a general consensus is that it would be adverse. That is, "if the burden of simultaneous involvement in college and the labor market is too great, student workers may fail out, transfer to easier schools, or drop out" (Gleason, 1993, p. 6). Nevertheless, a larger body of the literature on student employment and college persistence highlights the importance of job characteristics (e.g., location) rather than the effects of work intensity. Heavily citing Tinto's (1975, 1993) view on the mechanisms of student persistence, many scholars posit that persistence is positively correlated with students' level of integration into academic and social communities on campus (e.g., Dadgar, 2012; DesJardins et al., 2002; Scott-Clayton, 2011a; Soliz & Long, 2016). In this regard, scholars hypothesize that working on campus (either through work-study program or not) is likely to positively relate to students' persistence. Especially, an employment through work-study is perceived to positively impact student persistence not only by offering opportunities to work on campus where students may strengthen attachment to their institutions through interacting with faculty and peers, but also by limiting students' work hours through a cap on work-study award (Astin, 1975; Darolia, 2014; DesJardins et al., 2002; Scott-Clayton, 2011a, 2016).

Empirical Findings

Empirical evidence on the effects of broadly defined student employment on persistence is even more scarce than findings about academic performance. Ehrenberg and Sherman (1987)

used the National Longitudinal Survey of the high school class of 1972 data to provide one of the earliest findings on how hours worked affected college persistence. They found that compared to students who did not participate in the labor market, students who worked 20 hours per week in their freshmen year had an increased probability of not returning for second year in college. Yet, their study focused on male students and accounted for work hours in October only. Central student characteristics such as race and ethnicity were also not included in the analysis, leading to less reliable results. Gleason (1993) also did a non-causal study of student employment and college dropout, using a nationally representative sample of students from the High School and Beyond survey of 10th and 12th graders in 1980. Based on students' self-reports, Gleason (1993) found that working while in college was positively related to college dropout. A considerable portion of respondents reported that dropout decisions were affected by having to work for pay.

In education literature, some of the earlier empirical studies directly examined how work-study as a form of financial aid affected student retention or persistence. Astin (1975) conducted a non-causal study using the Cooperative Institutional Research Program survey data of students who started college in 1968. He found that participating in work-study during the first year in college resulted in a small, but statistically significant increase in college persistence (not 2nd year retention). Furthermore, positive relationship between work-study and persistence was mostly concentrated among female students, black students, and students from middle-income families. The positive impact was no longer significant especially among low-income students, however, if grants and loans were accounted for. The author yet stressed a possible endogeneity between student motivations for college choice, work decisions, and persistence, which was not controlled for in his study and might have led to biased estimates of work-study impact.

DesJardins et al. (2002) later delivered more robust evidence on the effects of work-study on college persistence in their study of how differential financial aid packaging impacts student departure from college. They analyzed students who enrolled at the University of Minnesota in the fall of 1986. Their data included detailed financial aid information and earnings from non-work-study on-campus employment, and this was particularly central to understanding how financial factors altogether affected student departure. Making a distinction among different types of employment is crucial since work-study is need-based administered through financial aid while other types of employment is not (Alon, 2005; DesJardins et al., 2002). They found that scholarships had the largest effect on student persistence among different types of financial aid, and this was followed by work-study. The authors underscored that their findings supported Tinto's (1975) theory about work-study promoting students' integration into their institutions. Yet, the authors cautioned that the generalizability of their findings was limited to similar institutions only (i.e., non-profit, large public universities). More importantly, they acknowledged the limitations from not being able to verify students' self-selection into federal work-study program, which again emphasizes the importance of controlling for any unobserved characteristics among students who make different work decisions.

Two more studies discussed earlier estimated the causal effects of work-study on student retention. In addition to studying work-study impact on students' first-year GPA, Soliz and Long (2016) as well as Scott-Clayton and Minaya (2016) further examined the relationship between work-study and students' continued enrollment in their sophomore years. From the analyses of students who enrolled at public institutions in Ohio, Soliz and Long (2016) found no statistically significant effects of work-study participation on retention. Such results were, in fact, similar in Scott-Clayton and Minaya's (2016) study. The authors did find that work-study employment had

small, but positive impact on retention, a 1.1 pp increase in the probability. Yet, when they used the matching strategy to compare students to counterfactuals (i.e., work-study students vs. working students or work-study students vs. who do not work at all), they found null effects of work-study on persistence in both comparisons.

Overall, the existing studies hypothesize that work-study employment would increase the probability of college persistence based on a theory that work-study jobs could promote students' integration into their institutions. In other words, the benefits of work are mediated by the level of student engagement with the communities in their institutions (Perna, 2010) and work-study has a greater potential to enhance student engagement than off-campus or non-work-study jobs. Most literature, however, lacked information regarding employment features that could verify if the positive outcomes of work-study employment on campus were through an increased level of student engagement. Based upon this literature review, I propose the following:

Proposition 4: Student employment through the federal work-study program will have differential effects on college persistence depending on job characteristics that promote (or not) academic and social integration into the campus.

Students' Work (Study) Decisions

Conceptual Approaches

Understanding the factors related to students' participation in the labor market while in college has grown in its importance. Regarding higher education policy and practice, knowing why students work while enrolled can guide institutional decision makers to respond to student needs more appropriately (Perna et al., 2007) such as the types of work experiences students are interested in. Understanding students' work behaviors can also inform financial aid practice and other institutional practices that could improve student outcomes (DesJardins et al., 2006). Especially from a financial aid perspective, it is imperative to know if students are making

informed financial decisions (e.g., employment, work-study participation, loans) in ways that do not hinder attaining the educational benefits of college experience. Both education scholars and economists have yet to propose a conceptual framework that comprehensively explains why college students participate in the federal work-study program. Still, there have been some approaches across various disciplines to conceptualize why students decide to participate in the labor market more broadly while in college (Perna et al., 2007).

Public Policy Perspective. Most commonly established reasons for students to work is concerned with the changes in federal financial aid programs. When there is a decrease in federal support for higher education, it also burdens institution and limits their ability to allocate a larger amount of granted aid such as scholarships. This ultimately affects financial aid packages to put heavier weights on loans and on-campus employment, further influencing students' enrollment and part-time employment decisions (Ehrenberg & Sherman, 1987). Working while in college thus becomes a means to pay for the cost of college attendance (Perna et al., 2007). Furthermore, "as the price of college increases more rapidly than incomes, more students are certain to find work as a necessity than a choice" (Baum, 2010, p. 3). Especially for students from low-income families, a reliance on employment and loans is inevitable to afford college costs (King, 2002). Martinez et al., (2012) added that low-income, first-generation students were much likely to depend on either on-campus or off-campus employment to meet the costs.

When students demonstrate unmet need to pay for college costs, students are also likely to be offered federal work-study aid as a part of their financial aid packages. In this instance, students may be induced to employment while in college (Perna et al., 2007; Scott-Clayton & Minaya, 2016). Scott-Clayton and Minaya (2016) referred to this group of students as 'new workers,' implying that they are induced to employment solely due to work-study aid offer in

their financial aid packages and that they would have not worked in the absence of the offer. In sum, as Ehrenberg and Sherman (1987) described, institutions are generally not able to offer grant-type of aids to fully cover the costs of tuition and fees, and they will offer work-study aid to students, encouraging them to consider part-time employment while in college.

Economic Perspective. Literature in economics also provide explanations for why college students may simultaneously participate in the labor market and higher education. Human capital theory (Becker, 1962, 1993) proposes that individuals consider the total expected returns on their investments in higher education when making education decisions. Although students choose to invest in college education based on their expected short- and long-term benefits and costs, there will be opportunity costs of attending college. For example, foregone earnings are “the earnings that the student would realize if they were not attending college” (Perna et al., 2007, p. 13). In this concern, students may decide to work for pay while in college to reduce the costs of foregone earnings in addition to an attempt to pay the direct costs of college education (Becker, 1993; Perna et al., 2007). In behavioral economics, the theory of loss aversion does assume that individuals “feel a loss more strongly than an equal-sized gain” (Dynarski et al., 2018, p. 6), and this has greater influence on preferences (decisions) than future gains or advantages (Tversky & Kahneman, 1991).

In Dynarski et al.’s (2018) study, the authors drew upon various behavioral economics theories to understand students’ educational decision-making that could also explain students’ motivations to work during school year. Students may work as they “overemphasize short-term costs and benefits” (Dynarski et al., 2018, p. 6), often in ways irrelevant to future goals (Ainslie, 1975; Laibson, 1997) since college-going aged students are “particularly susceptible to present bias” (Dynarski et al., 2018, p. 6) according to Chapman et al. (2012) and Bettinger and Slonim

(2007). For instance, instead of devoting their time and efforts to academics to attain the long-term benefits of higher education, students may be triggered to part-time employment for more immediate spending money (Baum, 2010) or for a maintenance of certain lifestyles (Perna et al., 2007) such as owning a car (e.g., King, 2002). In education literature, such reasons to work for pay is viewed as a sociocultural reason (Perna et al., 2007) rather than an economic decision. Furthermore, there may be other instances where short-term benefits of working are emphasized among college students, particularly who are low-income. There is growing evidence that low-income students are sacrificing access to food and safe housing (Broton et al., 2014; Goldrick-Rab, 2016) to afford for college costs. These students may be induced to working longer hours to overcome economic and material hardships while enrolled.

The concept of debt aversion can provide another explanation to students' participation in the labor market during college. Referred as willingness to borrow in education literature, debt aversion is a behavioral phenomenon that describes individuals' unwillingness to take out loans (i.e., borrow) to finance college education (Dynarski et al., 2018; Perna et al., 2007). Among already enrolled students, those with a fear of borrowing may choose to work, even more than 20 hours per week during school (Burdman, 2005). On the contrary, socioeconomic perspectives highlight that a student may decide to work even in the absence of debt aversion behavior. For instance, students will work if they have borrowing constraints possibly due to loan maximums, high interest rates, low spending limits, or credit card debt (Kalenkoski & Pabilonia, 2010; Long & Riley, 2007). Students will also work if their parents are not willing to help with the costs of attending college, even though financial aid awards assume some level of parental contribution (Kalenkoski & Pabilonia, 2010; Perna et al., 2007). Low parental transfer can be foreseen

especially because “there is no mechanism to force reluctant parents to pay” (p. 471) and this gives students with sufficient motivations to work (Kalenkoski & Pabilonia, 2010).

Sociological Perspective. Sociological views on student motives for employment entails the ideas of identity, habitus, and capital. Social identity is seen as particularly important when making decisions as people are likely to behave in ways “consistent with their social identity and the norms of their social groups” (Benjamin et al., 2010 as cited in Dynarski et al., 2018, p. 6). Hence, if students identify themselves as workers because they also worked in high school, they may be more likely to work while in college. Similarly, if they come from a family background where many of the family members worked while attending college, working a part-time job during school may be a decision that aligns with their identity. In sociology, one would view these work decisions as students’ habitus (Bourdieu, 1986) playing a key role, which is “an internal set of dispositions and beliefs that an individual brings to bear on his or her choices” (Nuñez & Sansone, 2016, p. 96).

Table 1. *Summary of the Reasons to Work While in College*

| Perspectives | Reasons for part-time employment while in college |
|---------------|--|
| Public policy | <ul style="list-style-type: none"> • Decrease in federal support for higher education and subsequent limitation on institutions’ ability to provide grant aid, leading to heavier weight on loans and part-time employment for students • Greater demonstrated need leading to increased probability of work-study aid offer that could induce students to part-time employment |
| Economics | <ul style="list-style-type: none"> • Desire to reduce foregone earnings by attending college (i.e., loss aversion) • Overemphasis on short-term benefits of working (e.g., increased spending money, lifestyle maintenance) • Debt aversion • Other financial reasons in the absence of debt aversion behavior (e.g., loan maximums, high interest rates, credit card debt, low parental contributions to college costs) |
| Sociology | <ul style="list-style-type: none"> • Social identity • Norms of students’ social group (e.g., having family members or close friends who worked while in college) • Habitus |

Empirical Findings

Despite the importance of understanding students' work behaviors, empirical evidence is considerably limited. Scholars mostly have attempted to determine the reasons for part-time employment as an approach to identify exogenous variables that causes variations in students' work behaviors, which can be utilized to estimate causal effects of employment or work-study on student outcomes. For instance, low parental contribution (Kalенkoski & Pabilonia, 2010) or housing prices or credit scores (Darolia, 2014) have been found to increase the probability of students' part-time work while in college. With specific regards to work-study, availability of work-study funds at institutions (Scott-Clayton, 2011a; Soliz & Long, 2016) and work-study aid offers significantly increased the probability of work-study employment.

To date, Troppe's (2000) nation-wide survey of work-study students is the single direct study of students' motivations behind work-study participation. Troppe (2000) surveyed both the federal work-study program administrators at higher education institutions during the 1997-98 award year as well as students who participated in work-study during the same year. The survey did not examine the reasons to participate in work-study, however, the results showed that 70% of students who were offered work-study accepted the award and had work-study employment. Students also reported that they were not averse to employment during school year in order to pay the costs of college attendance. Correspondingly, 80% of work-study participants responded that they would have worked anyway regardless of work-study.

Troppe (2000) also examined how students made decisions about work-study jobs. A large majority of work-study students (72%) chose jobs on their own while others were assigned a job by work-study administrators. The most-reported reason (30%) for their work-study job choice was that the work hours accommodated their schedule. About 25% of the students mainly

chose their work-study jobs as it was related to their academic or career interests, although most institutions were not able to verify if work-study students were in jobs reflecting their academic or career interests. Then, nearly 13% of students selected their jobs because of the job's location. Hourly wage or low-pressure work activities were less commonly reported reasons for students' work-study job choice. Moreover, students who did not have their first-choice jobs indicated that they would have preferred a job that was more aligned with their academic or career interests.

The survey findings also showed students' preferences for the types of work activities. Nearly 40% of work-study students had clerical or office assistant positions, and a larger proportion of female students (44%) had these jobs than male students (27%). Students were then similarly in lab or research assistant jobs (15%) and resident or student life assistant positions (12%). About 10% of work-study jobs were at university libraries. Less common jobs students had via work-study program were teaching assistants or tutoring, community services, maintenance worker, food services, or cashier. In Scott-Clayton and Minaya's (2016) analysis of a national survey data of college entering students in 1995 and 2003, they also found that the largest majority of work-study participants were in clerical positions. Contrary to Troppe's (2000) survey, Scott-Clayton and Minaya's (2016) results showed that the next majority of work-study students (18.3%) were in service occupations. With this review, I propose the following:

Proposition 5: Students will be induced to work-study employment if they have work-study offers in their financial aid packages.

Proposition 6: Students will be induced to work-study employment if they are under financial constraints to afford college costs (e.g., pay direct costs of college education, borrowing constraints, low parental transfer).

Proposition 7: Students will be induced to work-study employment if they are present biased and overvalue the short-term benefits of working (e.g., increased spending money, income to maintain certain lifestyles).

Proposition 8: Students will be induced to work-study employment if they are averse to loss (e.g., foregone earnings) or debt (i.e., loans).

Proposition 9: Students will be induced to work-study employment if working is one of their salient social identities or norms of their social communities.

Conceptualizing Other Potential Mechanisms of Work-Study Decision

The Decision Context: Navigating the Federal Work-Study Program

With almost unanimity, the prior literature essentially approaches work-study as a form of employment, a means to make earnings. Federal work-study is yet also a form of financial aid, which is “complex and difficult for many families to decipher and navigate” (Long & Riley, 2007, p. 41). Deciding to participate in work-study or choosing a work-study job truly entails a complex set of decisions stemming from having to navigate administrative bureaucracy surrounding financial aid and student employment. Following Scott-Clayton’s (2011b) study that outlines how community college students navigate college and the constraints on making optimal educational decisions, I make an initial attempt at depicting the decision context facing first-year college students with a work-study offer in their financial aid packages. That is, what do they have to do so as to successfully navigate the federal work-study program? Given the decision context for federal work-study I describe, I moreover examine how the notion of “universal human limitations” (p. 9) (i.e., bounded rationality, bounded self-control) (Scott-Clayton, 2011b) can be applied to conceptualize other potential mechanisms, through which students make work-study decisions. The roles of information and structure in decision-making are finally discussed to complement the conceptualization of work-study decision-making processes.

Human Limitations in Work-Study Decisions

Participating in the federal work-study program entails a number of decisions and choices in many different steps. While classical theories in economics describe more choices or diverse

options as positive, serving individual preferences, literature in psychology, marketing, and behavioral economics contrastingly suggest that it may not always be a good thing (Scott-Clayton, 2011b), especially when the decision-making process involves informational or choice overload (Dynarski et al., 2018). Also referred as ‘cognitive overload’ in the theory of bounded rationality (Simon, 1972), it can explain work-study decision context, in which students may struggle to gather and digest an intensive amount of information to make a series of choices. In these situations, “individuals may struggle to determine which factors are most important [...] and to appropriately weight the costs and benefits of these factors in a final calculation” (Scott-Clayton, 2011b, p. 10). As a result, students may decide to stick to the status quo (Dynarski et al., 2018) or to use heuristics and mental shortcuts (Kahneman, 2003). This may be taking no action at all (i.e., not participate in work-study) or searching for a similar job they previously had in high school, even though it may not be the best choice for them.

Even when individuals have perfect information and know what the optimal choice is (e.g., a work-study job well-matching with academic or career interests), one can still struggle to take necessary actions toward that decision due to bounded self-control (Scott-Clayton, 2011b). According to Tversky and Simonson (1993), individuals have unstable preferences and they do not always have “a complete preference order of all options” (p. 1179). Students thus may not always make the best use of given information (Scott-Clayton, 2012), and make biased work-study decisions. Students may also delay or avoid making work-study decisions because they believe that it will be easier in the future, also known as hyperbolic discounting (Laibson, 1997). For instance, for a smaller reward within a shorter time frame (e.g., less cognitive overload), students may think that navigating work-study will get easier next year than in the first year. Another feature of bounded self-control is regret aversion (O’Donoghue & Rabin, 2001), a

phenomenon where someone act in ways one can avoid possible regrets about not choosing alternatives. That is, a student would decide not to do work-study if there are potential regrets about alternate options (e.g., off-campus position with higher pay). Lastly, there can be also hassle factors (Bertrand et al., 2004) diverting students from participating in work-study. For example, an extensive effort to gather information on work-study, complex bureaucratic processes, or lack of student services/supports can all play a role as hassle factors in students' decision-making processes. Based upon this review of economic theories of bounded rationality and bounded self-control, I suggest the following:

Proposition 10: Students will not be induced to work-study employment if navigating the federal work-study program involves information overload (e.g., college costs, financial aid, employment) or choice overload (e.g., various types of jobs).

Proposition 11: Students will not be induced to work-study employment if they fail to practice self-control due to changing preferences, immediate smaller reward, desire to avoid regrets, or hassle factors.

The Roles of Information and Structure in Work-Study Decisions

Overall, there are numerous economic, sociological, behavioral, as well as psychological factors that can explain how students make work-study decisions. The decision-making process can, in fact, be exacerbated with lack of quality information, although perfect information cannot improve human biases in decision making (Scott-Clayton, 2012). Thus, the role of information can be substantial throughout students' decision-making processes regarding work-study. It can impact students' decision to express interest in work-study in the FAFSA, accepting work-study award when offered, or attaining a work-study job that can maximize the program benefits. As Dynarski and Scott-Clayton (2006) wrote, students cannot respond to a price subsidy (e.g., work-study offer in financial aid) "if they do not know it exists" (p. 320). Students will see work-study in their aid offers and yet, if they do not know what work-study is, they cannot make informed

decisions about the program. Moreover, “if informational barriers are particularly acute among the disadvantaged, the effectiveness of financial aid policy can be undermined substantially” (Scott-Clayton, 2012, p. 3). However, in the prior literature, the role of information barriers has only been explored regarding the FAFSA application, college choice, or effectiveness of grants or loans (e.g., Bettinger et al., 2012; Chapman, 2006; Dynarski & Scott-Clayton, 2006; Dynarski & Wiederspan, 2012; Horn et al., 2003), and not with regard to effectiveness of work-study.

Furthermore, work-study programs at most institutions lack structure to guide students’ work-study decisions. As discussed earlier, there exist scant reasons to motivate institutions to inspect operative aspects of the program once work-study funds are distributed to students via financial aid awards. Scott-Clayton (2012), nonetheless, stressed that the lack of structure can intensify inequality, especially when decisions are complex and when students “may be least equipped to navigate this complexity” (p. 13). This is largely because the significance of social know-hows or college knowledge escalates with the lack of organized structure (Deil-Amen & Rosenbaum, 2003). In the context of work-study, students who are offered work-study are often low-income, first-generation students without many resources to rely on throughout financial aid application processes. The absence of organized structure may, for example, virtually turn work-study-offered students to off-campus work that may be least relevant to their education or career while students from higher socioeconomic backgrounds secure more valuable on-campus work opportunities (e.g., research assistantship). Scott-Clayton (2012) hence called for attention to the fact that the lack of structure is not a coincidence. Some institutions will have philosophical objections to intervene in students’ decisions, arguing that “it is the student’s job to be engaged and proactive in their education” (Scott-Clayton, 2012, p. 14). Regardless, it is vital for more

research to examine the roles of informational and structural barriers in students' work-study decisions and experiences so that the federal investment in higher education is worthwhile.

Proposition 12: Lack of quality information about federal work-study will play a role in students' work-study decisions.

Proposition 13: Lack of organized structure regarding federal work-study will play a role in students' work-study decisions.

In brief, the prior literature based on multiple disciplinary perspectives suggest diverse potential mechanisms of students' work-study decisions and behaviors. As a financial aid and a part-time employment, there is an administrative, bureaucratic structure students must navigate to understand what federal work-study entails and how the program runs. During this process, there may be a number of informational and structural factors that play a role in students' work-study decisions, which may be additionally impacted by their own cognitive limitations or limited self-control about their preferences. In the following chapter, I begin elaborating on the methodological strategies to identify the causal impact of the program on student outcomes.

Chapter 3 Methodology

Research Setting and Institutional Context¹⁷

The research setting for this study is Lake University, a large, not-for-profit, highly selective public four-year institution in the Midwest. According to the Office of Financial Aid at Lake University, the university is committed to meeting the full demonstrated needs of resident students in particular, and this primarily determines how they award federal work-study aid and other types of financial aid to its students. This institutional decision regarding financial aid packaging would be, however, unique to Lake University because higher education institutions have different institutional priorities and distinctive financial aid allocation formulas. This also implies that the level of unmet need after gift aid (e.g., grant, scholarship), especially for in-state resident students, may be much lower at Lake University compared to those at other institutions, which may lead students at Lake University to make different work-study decisions as well as part-time employment or college financing decisions in general.

To put Lake University into context and better understand its financial aid decisions and behaviors compared to other comparable institutions, I employed six years of data—2013-14 to 2018-19—from the Integrated Postsecondary Education Data System (IPEDS), which represent the academic years analyzed. This data also represents full-time, first-time, degree/certificate-seeking undergraduates only.¹⁸ More specifically, I compared Lake University with 81 other

¹⁷ Unless specifically cited, all information provided in this section is based on the interviews of the staff members in the Office of Enrollment Management (including the Office of Financial Aid) at Lake University.

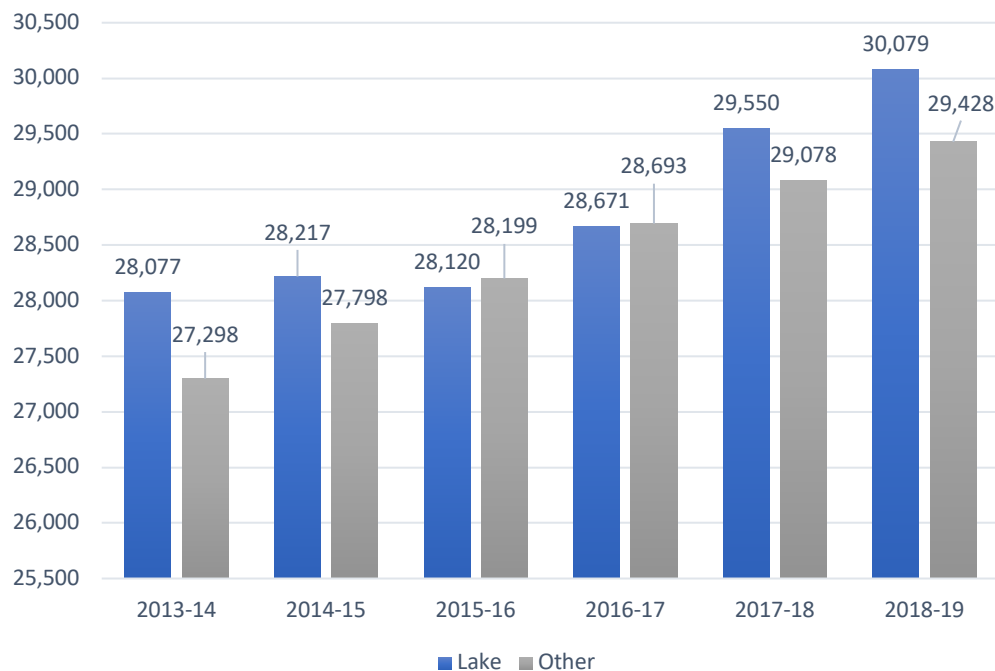
¹⁸ In IPEDS, full-time undergraduate students are defined as being enrolled for 12 or more credits per semester (cf. 12-18 credits at Lake University), which is equal to 12 or more quarter credits, or 24 or more clock hours each term.

universities that were also (a) Title IV participating, (b) not-for-profit, (c) public four-year, (d) degree-granting (baccalaureate or above), (e) doctoral universities with very high research activity as categorized by the Carnegie Classifications, and (f) enroll more than 20,000 students with regards to the following:

- Fall enrollment size (full-time equivalent) and trends
- Total cost of attendance (COA) by residency
- Average amount of each grant aid and student loans (excludes loans to parents)
- Percentage of the total COA covered by each aid type

Figure 2 shows that Lake University annually enrolled a slightly more or similar number of students compared to the average of 81 comparable institutions during the 2013-14 and 2018-19 period. Throughout these years, Lake University annually enrolled an average of 370 more students than the average of 81 similar institutions, indicating a comparable enrollment trend.

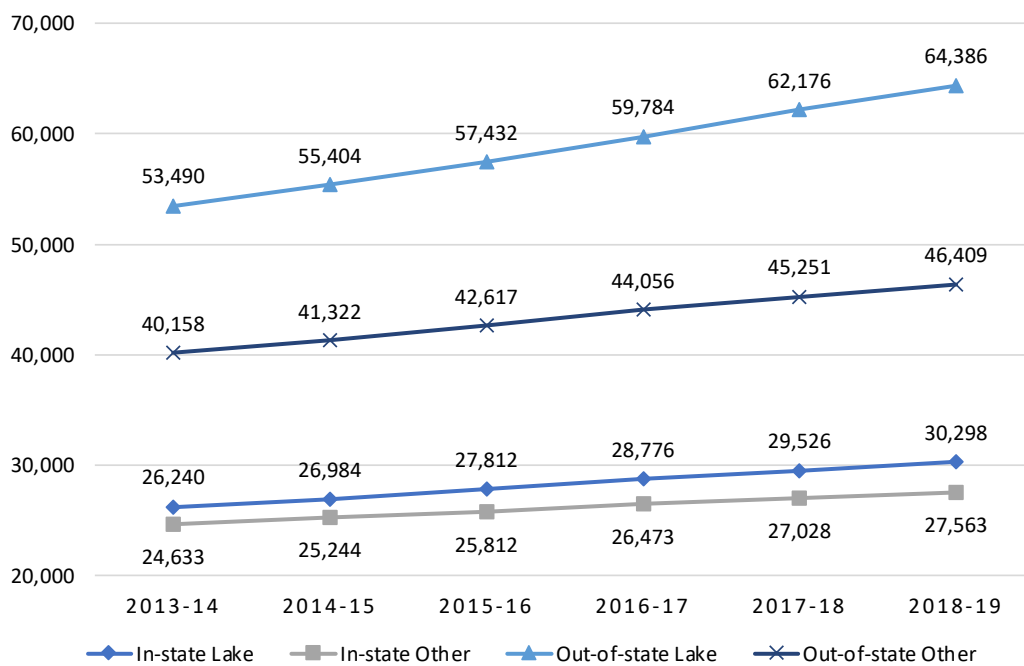
Figure 2. *Fall Enrollment Size and Trends Over the Years*



I also examined the total cost of attendance (COA) by residency for undergraduates at Lake University and other similar institutions over the corresponding years (see Figure 3). For

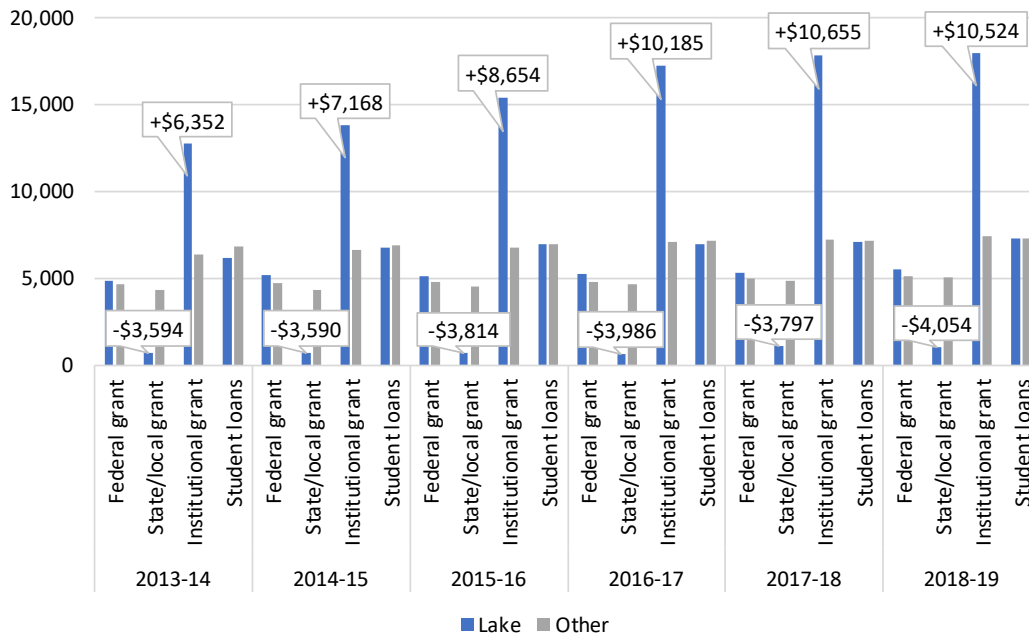
both resident and non-resident full time, first-time, degree/certificate-seeking undergraduate students at all institutions, the total COA has been slightly increasing over the years. However, the total COA for non-resident undergraduate students enrolled at Lake University has not only been consistently the most expensive, but also risen the most with about 20% increase between 2013-14 and 2018-19. The six-year average total out-of-state COA of Lake University was about 39% higher than that of other 81 institutions. It was then 134% higher than the six-year average in-state COA of the 81 institutions and about 113% higher than the six-year average in-state COA of Lake University.

Figure 3. *Total Cost of Attendance (\$) by Residency for Undergraduates Over the Years*



Lake University has been awarding more institutional grant aid to undergraduates than the 81 institutions as shown in Figure 4. On average, Lake University has awarded about \$11,000 more institutional grant aid to undergraduates in recent years than comparable institutions. On the other hand, Lake University undergraduates have been awarded about \$4,000 less state/local grant aid than students at similar institutions.

Figure 4. Average Amount of Aid (\$) Awarded to Undergraduates Over the Years



I further examine to what extent these awards cover the total COA for students, given the differences in COA across institutions. Figure 5 details the percentages of each type of aid’s coverage of the total COA for full-time, first-time, degree/certificate-seeking undergraduates.¹⁹ At Lake University, between 32% and 38% of the total COA has been covered by institutional grant aid while this was about 20% for comparable institutions during the same period. In the meantime, student loans were a smaller proportion of the total COA—about 4% to 6% less—for students at Lake University than at other institutions. Federal grant aid amount and percentage coverage have been quite similar across all institutions, although there has been a significant difference in the level of in-state/local grant aid between Lake and other institutions. Lake University students have received approximately \$4,000 less state/local grant aid than those at other comparable institutions, and it took up only about 2% of the total COA; state/local grant aid covered about 13% of the total COA at other institutions.

¹⁹ For this analysis, I use the average of the total COAs for resident and non-resident students.

Figure 5. Percentages of the Total COA Covered by Aid Over the Years

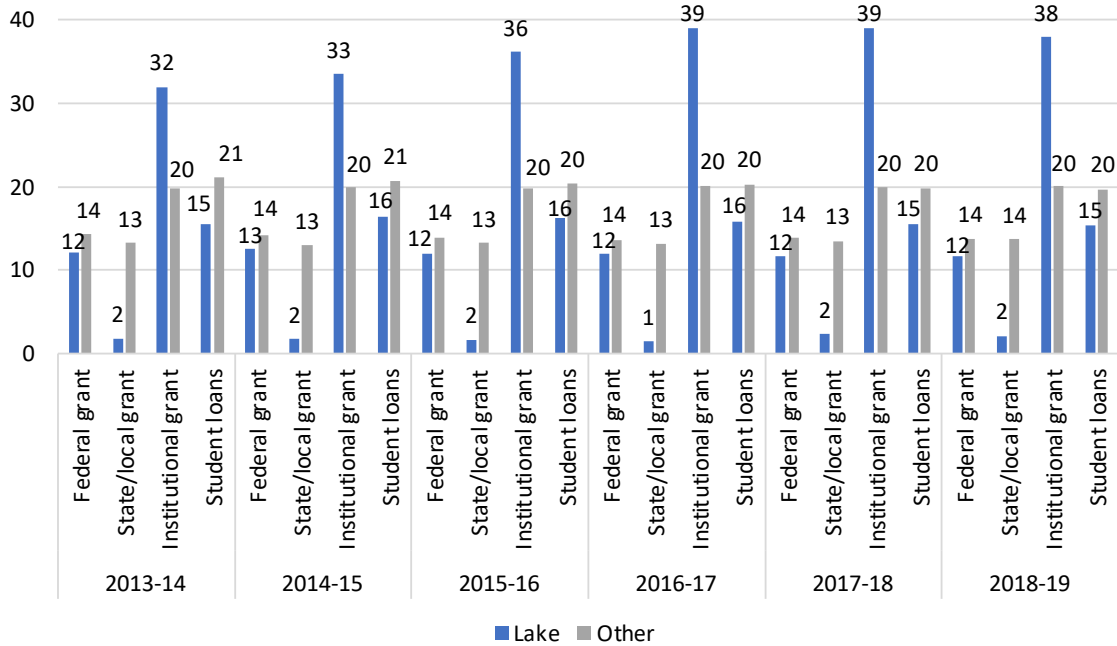


Table 2 summarizes the percentage of the total COA that was not covered by the federal grant, state/local grant, institutional grant, and student loans. For Lake University, the total COA after grant aid and loans has slightly decreased over the years from 39% in 2013-14 to 33% in 2018-19, being about the same with other similar institutions. Meanwhile, this rate has remained steady for other institutions with an average of between 32% and 33% over the same period.

Table 2. Percentage of the Total COA Not Covered by Grant Aid and Student Loans

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
|-------|---------|---------|---------|---------|---------|---------|
| Lake | 39% | 36% | 34% | 32% | 32% | 33% |
| Other | 32% | 32% | 33% | 33% | 33% | 32% |

Note: The percentages were calculated using the following equation: % not covered = 100(%) – federal grant aid (%) – state/local grant aid (%) – institutional grant aid (%) – student loans (%).

With regards to the remaining COA after accounting for grant aids and student loans, it is highly likely that federal work-study would not significantly change the unmet need of students given that work-study offer amounts do not vary across institutions to a large extent. This is because, according to the Office of Financial Aid at Lake University, most institutions cap work-

study hours at 20 hours (or less) per week, which then affects the aid offer amount. The U.S. Department of Education (n.d.) also indicates that the amount one can earn through federal work-study cannot exceed the amount of work-study funds awarded to students. Specifically, the *National Postsecondary Student Aid Study, Administrative Collection (NPSAS:18-AC): First Look at Student Financial Aid Estimates for 2017-18* (Burns et al., 2022) indicated that students enrolled at not-for-profit, doctoral degree-granting, public four-year institutions were awarded an average of \$2,400 work-study aid. During this period, freshmen undergraduates enrolled at Lake University with work-study offers were awarded about \$2,821 on average, which was higher than the average offer amount at not-for-profit, public four-year institutions.

In summary, according to IPEDS, there were 81 higher education institutions that were comparable to Lake University in terms of key institutional characteristics (e.g., sector, size, control, degree offerings). Over the academic years 2013-14 and 2018-19, Lake University has annually enrolled a marginally larger student body with about 370 more full-time, first-time, degree/certificate-seeking undergraduates than the average of similar institutions. The total COA for resident and non-resident students was also higher at Lake University compared to other institutions. While federal work-study award is presumed to make no significant difference in its share of the total COA at Lake and other universities, students at Lake University have been receiving institutional grants that covered a greater share of COA compared to other institutions, and then student loans that covered a smaller proportion of COA. Ultimately, the remaining proportion of COA that was not covered by any grants or student loans were about the same for Lake and other comparable institutions. Nevertheless, as the average COA has been higher at Lake University, particularly for non-resident students, students at Lake University might have had rather greater unmet need after grant aid and student loans than those at similar institutions.

Financial Aid Packaging: “Meeting the Full Demonstrated Need of Residents”

As briefly mentioned earlier, Lake University is committed to meet the full demonstrated need of its resident students and this *dictates* how the institution awards federal work-study aid along with other types of funding. The Office of Financial Aid at Lake University added that the university may be unique in how they award financial aid at least in the public four-year sector and that all institutions have somewhat different philosophies and priorities regarding financial aid packaging. For example, other institutions may not offer work-study aid to a student with any grant aid while Lake University would package financial aid award utilizing all types of aid until the full demonstrated need is met, particularly for resident students. Also, the different campuses of Lake University would even adopt different allocation formulas to offer federal work-study award to their students whose needs are dissimilar from that of the main campus.

With a given institutional philosophy about financial aid, Lake University begins the aid packaging process by determining the total COA for each academic year, which is also the first step to estimate the demonstrated need for students. COA is determined annually by a planning group that consists of institutional leadership and financial aid professionals:

- Vice Provost for Academic and Budgetary Affairs
- Vice Provost for Enrollment Management
- Associate Vice Provost for Academic and Budgetary Affairs
- Director of Financial Aid
- Senior Associate Director of Financial Aid

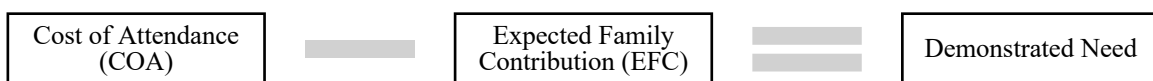
The group predominantly decides the amount of institutional grant aid to be awarded to students and its parameters based on the institution’s annual spending model and COA that accounts for:

- Tuition and standard fees
- Books and supplies
- Housing and meals
- Loan fees (if a student is borrowing)
- Personal & miscellaneous expenses

The personal and miscellaneous item is estimated to be about \$60 per week and to include items such as shampoo, deodorant, a trip or two to home, replacement of underwear and socks.²⁰

Once COA is defined, Lake University calculates the demonstrated need for all students based on a simple formula by subtracting EFC from COA as shown in Figure 6. In fact, there are two types of EFC Lake University uses to award financial aid: (a) EFC based on the FAFSA, which is primarily used to award federal financial aid including work-study, and then (b) EFC based on CSS profile to award institutional aid (and to calculate COA). In detail, the FAFSA and CSS Profile assess family wealth differently, often resulting in federal EFC based on the FAFSA being higher than EFC based on CSS Profile. For example, a family who reported an income of \$20,000 by writing off \$40,000 because they owned a business and a family who had an income of \$20,000 through labor imply different levels of wealth. Lake University emphasized that using these two types of EFC allows the institution to level the playing field for families by using the higher EFC among the two when awarding institutional aid. Importantly, any form of aid can never exceed the amount of demonstrated need for any student.

Figure 6. *Demonstrated Need Calculation*



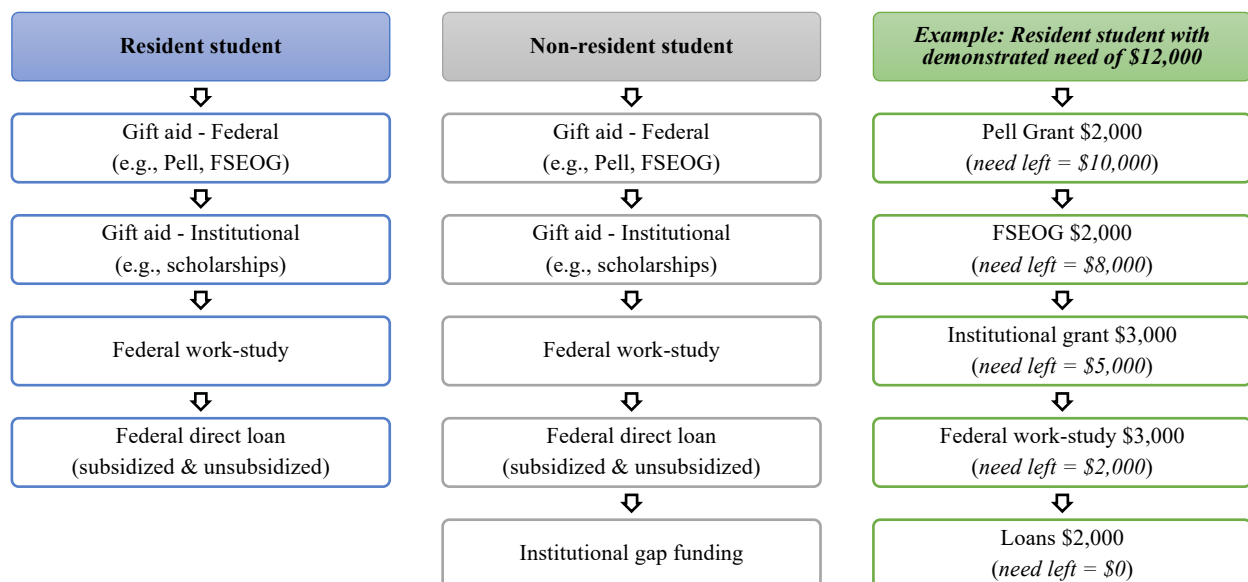
Based on the demonstrated need, the financial aid package is constructed by applying aid types in the following order as shown in Figure 7. Students are first awarded need-based federal grants such as Pell Grant and Federal Supplement Educational Opportunity Grant (FSEOG). Pell grant is first awarded as a requirement and then FSEOG if a student qualifies for the grant. The sum of EFC, Pell, and FSEOG is then subtracted from COA, which then determines how much institutional gift aid (e.g., grants, scholarships) a student is eligible to receive. As described

²⁰ \$60 is based on the time of the staff interview (fall 2019) and the amount could have slightly changed later.

earlier, the aid planning group sets the parameter for the maximum amount of institutional grant aid that can be awarded to students each academic year, and this impacts how much institutional grant aid a student receives. The maximum amount for institutional grants is typically higher for non-resident than resident students at Lake University.

After all gift aid (federal and institutional grants), federal work-study is awarded.²¹ The maximum award amount for work-study does not fluctuate annually, although it may vary by residency. The remaining need after work-study is filled with federal direct loans (subsidized and unsubsidized), and this is the overall aid awarding process at Lake University. According to Lake University, loans are not considered until work-study is awarded as the institution also has a commitment to keep student loans and borrowing down. Apart from this process, there are two institutional grant aid programs for students in the very low-SES group. These programs aim to fill in the remaining gap after student loans. One of these programs is designated to non-residents with an institutional goal to ensure that these students are also fully funded to the extent possible.

Figure 7. *Financial Aid Awarding Process*



²¹ Federal work-study allocation processes are further described in the next section.

Work-Study Funds Allocations to Students

The amount of federal work-study funds that Lake University can award to students is determined annually. Every year, Lake University submits the Fiscal Operations Report and Application to Participate (FISAP) as a part of the federal work-study allocation requirements.²² In FISAP, the university reports the allocation for the past academic year and the amount of underutilized funds that were returned to the U.S. Department of Education, all of which are considered in the allocation formula for the next fiscal year's work-study funds. Lake University receives notification of its federal work-study allocation in early December of any given year for the upcoming academic year. Federal allocation is finalized in the next two or three months as the federal government continues to work through FISAP corrections.

Federal work-study funds are allocated to an institution as a single allocation, and Lake University divides the allocations across its multiple campuses before allocating the funds to students. The university utilizes its own formula that considers factors such as COA, student count, the number of aid eligible students, and student needs to split the allocations across campuses, who then independently award work-study funds to their students with need. The allocations will thus vary across time and campuses. As indicated earlier, universities and colleges receiving federal work-study allocations have the ability and flexibility about how they disburse the funds to students. Lake University uses federal work-study as one of the financial aid programs to meet eligible students' unmet financial need after all gift aid, based on a primary goal to meet the full demonstrated need of resident students.

More specifically, Lake University has three main criteria that students have to meet to be eligible for federal work-study aid. First, a student must submit the FAFSA on time (i.e.,

²² The formula for federal allocation of work-study funds to institutions is described in depth in Smole (2005). Here, I focus on explaining institution-level allocations of federal work-study funds to students.

March 31st of a given year) to be considered for federal work-study aid. For those who submit the FAFSA, for example, in April, May, or later, eligible students will be offered federal work-study aid as long as the funds are still available.²³ A student then has to have unmet financial need after all gift aid (i.e., grants and scholarships) are put into financial aid package. Lastly, Lake University requires students to have EFC of \$20,000 or lower based on the FAFSA as it is a federal aid, and not the EFC value from the CSS profile the institution uses for its institutional grants. In sum, to be considered for federal work-study aid at Lake University, a student must:

- submit the FAFSA (on time);
- has unmet financial need after all gift aid;
- has EFC of \$20,000 or lower to be eligible for federal work-study.

It is important to note that many institutions require students to indicate their interest in federal work-study on the FAFSA to be considered for the funds.²⁴ However, Lake University disregards this information for first-year students with an assumption that first-year college students and their families may have limited knowledge about federal work-study and that their response to this question may not be fully informed. Beginning in the students' second year, they will be considered for federal work-study only if they demonstrate their interest on the FAFSA.

Once a student is determined to be eligible for federal work-study, Lake University will offer work-study aid of up to \$3,000 at maximum for both resident and non-resident students (as of the 2018-19 academic year) based on their unmet need after all gift aids. The maximum award amount for federal work-study does not change every year, yet the rates can be subject to a minor change if there are crucial changes in financial aid programs. For instance, the Federal Perkins Loan program expired in the fall of 2017, and this affected Lake University's decision for the

²³ Federal work-study funds are typically still available after March 31st deadline according to the university.

²⁴ In the FAFSA, there is a question that asks, "Are you interested in being considered for work-study?" Students can answer either "Yes," "No," or "Don't know."

2019-20 academic year to increase the maximum work-study offer amount for non-resident students from \$3,000 to \$3,100.²⁵

A student with a work-study offer receives the award in a form of wages earned through part-time employment. Importantly, this means that the offer amount could differ from actually disbursed amount as students will only receive the amount they have earned through work. A senior financial officer at Lake University thus highlighted that there exists much confusion among students, assuming that they will receive work-study money as an up-front aid. When a student acquires a work-study position, federal work-study covers 60% of the student wages, while the employer covers the remaining 40%. One exception is the America Reads program, which is covered fully by federal work-study. In addition, as the award is for the academic year, a student can participate in work-study any time throughout the year (i.e., two semester period), meaning much flexibility in terms of when a student can acquire and start a work-study position.

With regards to federal work-study, there is a clear distinction between offer amount and disbursed amount, and this relates to the fact that students earn the award in a form of wage. To be more specific, students make a series of decisions after federal work-study award is offered in their financial aid packages and this impacts how much work-study aid is actually disbursed to them. Once federal work-study aid is offered as part of the financial aid award, a student will first either accept or decline the award. If a student declines federal work-study aid, the actual disbursed funds would equal to zero dollars. When students accept work-study, they have to independently find a part-time employment that accepts work-study students. Depending on, for example, the job and its hourly wages as well as hours worked, the actual disbursed amount will then vary across work-study students, especially given the cap on work hours. If a student also

²⁵ The 2019-20 academic year is not part of the analysis in this study. Any changes during the periods included in this study is further discussed in the 'Data analysis' section.

does not earn all of the offered federal work-study aid amount, this would also lead to varying disbursed amounts among students.

Students' decisions to either accept or decline federal work-study aid is also referred to as the utilization rate, that is, to what extent do students with work-study offers actually accept them. A senior financial aid staff member at Lake University indicated that the utilization rate has been between 18% and 30% over the years. As a response to the low work-study utilization rate, the university has been over-matching (or over-offering). For example, if the institution knows that the actual allocation of the funds would be around \$3 million, the university will offer about \$10 million in federal work-study to students, knowing that the utilization is going to be around 30%. The institution makes this allocation decision based on their professional judgment and experiences and determine the safe range of allocations. Most importantly, senior financial aid officers at Lake University acknowledged that the institution has limited information about the sources of low work-study utilization rate or student characteristics that are associated with students' work-study decision behaviors, and there are only anecdotes about why student accept or decline their work-study offers.

Overall Research Design

To best answer the research questions posed in this study, I took multiple methodological approaches. The first set of research questions aims to comprehensively understand the key traits of the federal work-study program such as take-up rate, participant and decliner characteristics, and the types of work-study positions on campus. With a focus on elucidating the patterns and trends associated with work-study at the institution-level, I used student-level administrative records to conduct a series of quantitative descriptive analyses. I then supplemented the analysis of administrative data with an additional set of descriptive analysis of student survey data. I did

this because administrative records had limited information to address other potential mechanisms of students' work-study decisions such as the level of familiarity or knowledge about the program while filing the FAFSA and/or work experiences during high school.

The second part of the study focuses on estimating the causal effects of federal work-study participation on various student outcomes, using administrative student data. I employed a fuzzy regression discontinuity (RD) design, a quasi-experimental method, for which I was able to take advantage of the \$20,000 EFC cutoff threshold for work-study eligibility used at the case institution. A rigid eligibility rule such as an EFC cutoff creates a condition where the probability of receiving a treatment (i.e., a work-study offer) is discontinuous at the cutoff, which has the potential of generating the local randomization of subjects around the cutoff, producing conditions akin to an experiment (Angrist & Pischke, 2015). I also assessed the validity of the application of the RD design in this study. Overall, I examine the causal effects of the federal work-study program on academic outcomes including first-year GPA, persistence to the 2nd year in addition to part-time on-campus employment outcomes such as hours worked and earnings.

In the third phase of this study, I examine the overall experience of work-study-offered students regarding their decisions to participate in the program. To be more specific, it was essential to understand the factors that attributed to students' low participation rate in federal work-study to extend the reach of the program benefits to students in need and improve student experiences. Hence, I administered a student survey to students who were offered federal work-study aid in their first year and investigated various potential mechanisms of students' decision-making processes related to work-study. The survey collected responses on a range of closed- and open-ended questions in different time periods, including filing the FAFSA while in high school, receiving a financial aid award, and seeking part-time employment either through work-

study or not. I mainly conducted descriptive analysis of the quantitative data from closed-ended responses and performed thematic analysis of the qualitative data from open-ended responses. Based on my analyses of the quantitative and qualitative data, I hope to develop a comprehensive understanding of how students navigate and make work (study) decisions while in college.

Data

Over the course of a year, I collected contextual information and data for analysis from multiple sources at Lake University including (a) informal administrative staff interviews, (b) administrative units that hold and manage student-level records, and (c) a student survey. Appendix A summarizes the data collection timeline for this study. As shown in Appendix A, I obtained two institutional review board (IRB) approvals for conducting the student survey (IRB exempt approved) and for using the institution's administrative student records for this research.

Contextual Information

At the earliest stages of the data collection for this study, I began with in-person meetings and email exchanges with university leadership and senior administrative staff members in the Office of Enrollment Management, Office of Financial Aid, and Student Employment Office at Lake University. During a three-month period, I conducted several informal meetings with the:

- Vice Provost for Enrollment Management, Office of Enrollment Management;
- Assistant Vice Provost of Enrollment Management and Executive Director of Financial Aid, Office of Enrollment Management
- Director of Data, Analytics, and Research, Office of Enrollment Management;
- Senior Associate Director, Office of Financial Aid;
- Associate Director of Strategic Initiatives and Partnerships, Office of Financial Aid;
- Assistant Director, Student Employment Office

The primary goal of these informal interviews was to collect in-depth contextual data about the institutional decisions related to financial aid packaging and to gain insights about the purpose, goal, and institutional philosophy that guided the allocation processes of various types of funds

to students including federal work-study. I also obtained historical information for the analysis period about all the changes in policies and rules associated with the federal and institutional aid allocation formula, namely, changes in the maximum award amount (see Table 3).

Table 3. *Work-Study Eligibility and Maximum Award Amount Over Time*

| Academic year | EFC eligibility for work-study | | Maximum work-study offer | |
|---------------|--------------------------------|--------------|--------------------------|--------------|
| | Resident | Non-resident | Resident | Non-resident |
| 2013-14 | \$20,000 | \$20,000 | \$3,000 | \$2,500 |
| 2014-15 | \$20,000 | \$20,000 | \$3,000 | \$2,500 |
| 2015-16 | \$20,000 | \$20,000 | \$3,000 | \$2,500 |
| 2016-17 | \$25,000 | \$20,000 | \$3,000 | \$3,000 |
| 2017-18 | \$25,000 | \$20,000 | \$3,000 | \$3,000 |
| 2018-19 | \$25,000 | \$20,000 | \$3,000 | \$3,000 |

To the best of my knowledge, this study is the first research on the federal work-study program to have a detailed institution-level information about allocation methods for financial aid awards, including a precise eligibility criterion for federal work-study offers. The information about the eligibility cutoff played a key role in the adoption of a RD design, which can help to estimate the causal effects of the program. The availability of the historical information about the policy changes in financial aid awarding practices over time, and accounting for these variations, may also significantly improved robustness of the estimates of this study.

Administrative Student Records

Following IRB approvals and the memorandum of understanding (MOU) with the Office of Enrollment Management at Lake University regarding access to and use of student records, I received student records from the Office of Enrollment Management and the Human Resource Records and Information Services Office. The administrative data from the Office of Enrollment Management mainly consisted of student demographics, high school information, entrance exam scores, financial aid award details, and academic records for the first year in college. The data

from the Human Resource Records and Information Services Office then included student-level records about on-campus employment and payroll information including position title, affiliations, employment period and hours, hourly wages, and earnings. A more comprehensive summary of student records is presented in Appendix B.

I obtained first-year student records for six cohorts of first-time, full-time domestic (non-international; U.S. citizen) undergraduate students who enrolled at Lake University in each fall semesters from 2013 through 2018. For fall 2013 cohort, the financial aid year reflects the period covering the fall semester of 2013 through the summer semester of 2014. Importantly, the data did not include non-citizens, transfer students, and summer starters as they were unique groups of students. For instance, according to the financial aid staff at Lake University, summer starters may be eligible for summer financial aid before they enroll in the fall. They may start working a job before starting their fall semesters as well, which could result in different amount of work during the fall and winter semesters compared to non-summer starters. For non-citizen students, their financial aid eligibility is generally incomparable to domestic students, especially such as federal aid including federal work-study. Transfer students who are non-first-time college enrollees may be also eligible for special financial aid if they transfer from community colleges.

In summary, I acquired a total of 37,336 unique student records for demographics, financial aid, academic records from the Office of Enrollment Management. The number of first-time, full-time first-year students for each cohort is shown in Table 4. For the same population, I received student records about on-campus employment and payroll from the Human Resources Records and Information Services Office. There were a total of 12,384 unique records for on-campus employment during fall 2013 through fall 2018 period for first-time, full-time first-year domestic students who were also non-transfer students and non-summer starters. Some students

had multiple records if, for example, they had multiple positions or worked the same position during different time periods. There were ultimately on-campus employment records for a total of 9,181 students when accounting for multiple records for some students. All student records were merged into one dataset for analysis, following the transformation of student employment and payroll data from long to wide format. Appendix C provides details about the data cleaning processes, and the analytic sample for this study is further elaborated in the following section.

Table 4. *Number of First-Year Students in Each Cohort*

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
|------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Number of students (%) | 5,951 (16%) | 6,249 (17%) | 5,827 (16%) | 6,369 (17%) | 6,537 (18%) | 6,403 (17%) |

Student Survey

To better understand students' decision-making mechanisms regarding federal work study and part-time employment while in school, I collected data through a survey of students in the fall 2019 cohort who were offered federal work study in their financial aid package. The fall 2019 cohort was, in fact, not included in the analysis of administrative student record data and yet, still chosen as the survey population to collect responses from students who had the most recent experience with making work-study decisions. That is, fall 2019 cohort was the most recent entering cohort at the time of data collection.

I initiated the survey data collection process, following the essential steps to a survey instrument development. Specifically, Groves et al. (2009) highlighted five different methods to systematically evaluate survey questions and enhance the quality of measurement: (a) expert reviews, (b) focus groups, (c) cognitive interviews, (d) field pretests, and (e) randomized or split-ballot experiments. For this study, I used steps (a) through (d) to evaluate the survey questions before the survey was fully developed and administered (see Appendix A for details).

Expert Reviews. First, I drafted survey questions based on the literature review as well as the questions I intended to ask about work-study decisions and experiences so that I could prepare for an expert review, during which an expert of the subject (i.e., college financial aid, federal work-study) “review[s] the questions to assess whether their content is appropriate for measuring the intended concepts” (Groves et al., 2009, p. 260).²⁶ The first draft of survey questions was reviewed by multiple experts including faculty members whose research focus was on college financial aid as well as senior financial aid professionals at Lake University. Faculty expert reviews were focused on identifying additional questions that have not been investigated in prior research and the questions that administrative student record data could not answer such as alternative decisions after declining a work-study offer (e.g., take out loans, engage in off-campus employment) or part-time job application behaviors (e.g., priorities in job selection, timing of applications). Meanwhile, expert reviews by financial aid professionals centered on reviewing technical terms in financial aid and the order of questions to parallel the process of students’ receipt of financial aid award and decision-making.

Focus Groups. Following the expert reviews, I developed a focus group protocol along with a revised draft of survey questions because “a draft survey instrument constitutes a good protocol for a focus group discussion” (Fowler, 1995, p. 108). In the early stages of survey development, focus group interviews can help researchers to “learn about how members of the target population understand the concepts in the questionnaire, what terminology they used in discussing them, what common perspectives are taken by the population on key issues, and so on” (Groves et al., 2009, p. 262). The purpose of the focus group interviews were primarily to understand to what extent the potential respondents understood the federal work-study program,

²⁶ In addition to subject matter experts, Groves et al. (2009) noted that questionnaire design experts could also review the draft questions.

what issues and topics would rise as they discussed the program and their relevant experiences, and how they think about the areas of improvement for the program. The results from the focus groups was also used to construct a set of response options that was inclusive for the survey.

Recruitment for focus groups began with a random sampling of potential participants. Because I had to use the same student population to sample for the focus groups, cognitive interview, pretest, and actual survey, I needed to be intentional about to whom I would send invitations for each phase of the instrument evaluation process. For student focus groups, I randomly selected 15 students from the population of students who accepted work-study and then, another group of 15 students from the population of work-study decliners. A recruitment email was sent to these 30 students (see Appendix D for details). I recruited 12 students for four separate focus groups, and the participant information is provided in Table 5. Although student participants came from different colleges and departments, they were predominantly White. All students signed a consent form to participate in focus groups.

Table 5. *Focus Group Interview Participants*

| Group | Work-study status | Number of participants | Sex | Race/ ethnicity | Academic careers |
|--------------|--------------------------|-------------------------------|----------------------|------------------------|---|
| A | Accepted | 3 | 2 males; 1 female | 3 White | Music; Kinesiology; Undeclared |
| B | Accepted | 2 | 1 male; 1 female | 1 White; 1 Asian | Engineering; Astronomy and Astrophysics |
| C | Declined | 4 | 1 male; 3 females | 4 White | Economics; Climate and Space Sciences and Engineering; Computer Science; Pre-medicine |
| D | Declined | 3 | 1 male; 2 females | 2 White; 1 Asian | Business; Neuroscience; International Studies |

Each student focus group lasted for 60-75 minutes and the participants discussed their knowledge and experiences with federal work-study at various time points in the decision-making process when they filed the FAFSA while applying for college, after receiving a financial aid award, and during the process of deciding whether to accept a work-study offer.

The focus group interview protocol is provided in Appendix E. Each participant received a \$20 gift card for their participation. All focus group interviews were recorded with participants' consent. Recordings were transcribed verbatim using an online transcription tool, *Temi*, and then completely disposed of once the transcriptions were received.

Pretest and Cognitive Interviews. In survey development, “cognitive interviews are complementary to focus groups” (Fowler, 1995, p. 113). The main aim of cognitive interviews is to “learn how the respondents understand the questions [and] how they formulate their answers” (Groves et al., 2009, p. 260). Cognitive interviews therefore help researchers learn whether prospective respondents understand the question. The information gleaned from the cognitive interviews can then be used to improve the survey questions by providing definitions and/or images or paraphrasing questions to clarify the question or to help in recalling processes. My primary goal in conducting the cognitive interviews was to determine if respondents had difficulties recalling choices made at different points in their decision-making process or whether there were any questions that were too complex to comprehend.

There are three common ways to conduct cognitive interviews (Forsyth & Lessler, 1991), although there is no single means that is superior or preferred (Groves et al., 2009). In this study, I adopted a procedure of “going through the questions twice, first having respondents answer them in the usual way, then returning to the questions and having a discussion with respondents about the response task” (Fowler, 1995, p. 112). I asked the interview participants to take the survey and then spend about 30-40 minutes to provide feedback about the survey questions, thinking about the following questions, for example: “Are questions easy to understand? Are questions easy to answer? Are there all possible response options? Are there any words or phrases that can be improved?” Given that the purpose of this step was to further evaluate survey

questions, I considered the first part of this task as a field pretest, which has been a common practice using use small samples before the actual survey.

To recruit participants for survey pretest and cognitive interviews, I followed the same sampling method used for the focus groups. With the goal being to recruit 30 participants, I first randomly selected 90 students from the population of first-year students who were offered work-study in their financial awards in fall of 2019, excluding the focus group interview participants. I sent an email invitation for these students to participate online as shown in Appendix F. Once participation was confirmed, I sent instructions and links to the survey to them. Participants received survey questions that were relevant to their work-study status (accepted vs. declined) (see Appendix G). That is, because the final survey incorporated many skip patterns depending on students' work-study acceptance status and part-time employment, the participants were only asked to review the questions that were relevant to them. All 30 participants who completed all requirements received a \$25 gift card as a compensation for their participation and time.

From the pretest, I was able to achieve a few goals before the actual survey was finalized. I identified the average time taken by the respondents to complete the survey, which I clarified later in the invitation to survey. I also detected and fixed minor technical issues of the *Qualtrics*, the survey administration software, related to skip patterns. The cognitive interview findings moreover helped me understand the kinds of images (e.g., a partial image of the university's financial award notice), definitions, and examples that were helpful to respondents to recall their memory and to clearly understand the topic of each question. The results also improved the response options to certain questions to be more inclusive of other choices (e.g., part-time job sector, types of guardians other than biological parents).

Administration. Based on the pretest and cognitive interviews, I finalized the survey instrument and administered it via *Qualtrics*. Appendix H presents the survey flow and the complete survey instrument. An invitation to an online survey on the federal work-study program was sent during the last week of August 2020, when students were returning to campus. All students in the population list excluding participants in the focus groups, cognitive interviews, and pretest received an invitation to participate (see Appendix I for details). Within six hours of the invitation being sent out, over 600 students began to take the survey and I had to discontinue the data collection due to the limited funding I had for participant compensation. In the end, the survey was completed with a total of 514 eligible, complete responses who each received a \$10 gift card as compensation. There were no missing data in 514 students' responses.

Analytic Sample

Administrative Data

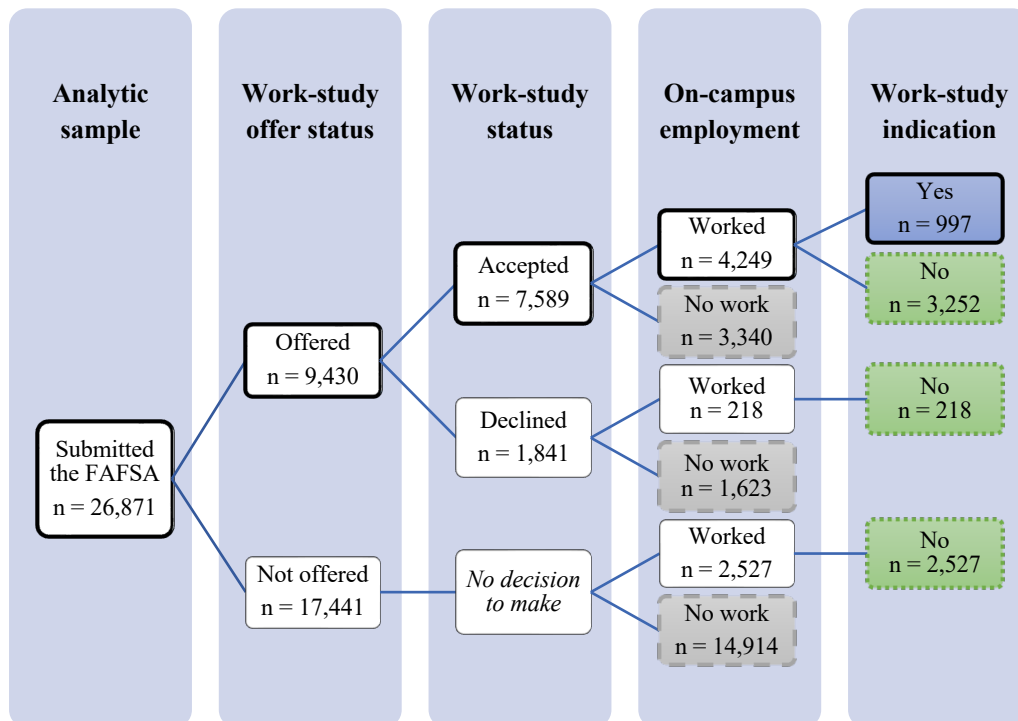
Administrative data originally included a total of 37,336 unique student records. Among these students, 26,871 students submitted the FAFSA and were eligible for federal financial aid. The remaining 10,465 students did not submit the FAFSA and thus, were ineligible for any type of federal aid including Pell Grant or work-study. For those who did not submit the FAFSA, administrative records were accordingly incomplete with completely missing EFC information (along with all other FAFSA information) as well as nearly 70% missing for any aid information. For the purpose of this study, the central focus of the analysis was the students who submitted the FAFSA ($n = 26,871$) and thus, who would be considered for federal financial aid including federal work-study. I merged these 26,871 federal aid eligible student records with on-campus employment and payroll data. About 26% of them ($n = 6,994$) had on-campus employment

records (997 work-study and 5,997 non-work-study) during their first year in college while the other 74% (n = 19,887) had no on-campus employment records.

Figure 8 summarizes the analytic sample and its sub-groups by employment status and work-study indication. Black-outlined boxes indicate students (n = 997) who were offered federal work-study in their financial aid award, accepted their work-study offers, and ultimately, participated in work-study. In summary, I distinguished and categorized the sample into five categories based on whether they were offered federal work-study, whether they worked on campus, and whether they had a work-study position if they worked:

- Was offered work-study and had a work-study job (n = 997); blue
- Was offered work-study and had a non-work-study job (n = 3,470); green
- Was offered work-study and did not have a job on campus (n = 4,963); gray
- Was not offered work-study and had a non-work-study job (n = 2,527); green
- Was not offered work-study and did not have a job on campus (n = 14,914); gray

Figure 8. *Analytic Sample Classification*



Regarding this sample classification procedure, it is important to note that there were students who had more than one employment record. For instance, a student could have two employment records including a work-study and a non-work-study job on campus. In fact, 803 students out of 997 (about 81%) had one employment record that was work-study. However, the remaining 194 students (about 19%) had more than one employment record and at least one of them was a work-study employment. Multiple employment records could happen when a student earned all work-study aid amount that was offered and thus, secured a new position (additional employment record that is non-work-study) or continued the same job without using work-study (additional employment record that is non-work-study). I categorized both cases as a work-study student group (i.e., was offered work-study and had a work-study job; blue), given the specific goal of this study to identify who participated in work-study when it was offered to them. Accordingly, the second type of group (colored in green in Figure 8) is solely inclusive of students who had one or more non-work-study employment records. The last group in color gray then consisted of students with no on-campus employment at all. Again, it is important to note that administrative data did not capture any off-campus employment.

Descriptive statistics of the analytic sample ($n = 26,871$) is shown in Tables 6-7. Table 6 presents the demographic characteristics of the sample students including sex, race and ethnicity, underrepresented minority (URM) status, first-generation status, and pre-college academics. The analytic sample had slightly more females (51.96%) than males (48.04%). By race and ethnicity, the largest majority of students were White (60.44%), followed by Asian students (16.81%). About 7% of the students were Hispanic and close to 6% were Black. Less than one percent were Native students (American Indian, Alaskan Native, Native Hawaiian, other Pacific Islanders). The remaining students included those who reported to be multiracial (4.8%) and who did not

report their race and ethnicity (4.77%). Students in the analytic sample were also mostly non-first-generation students (84.30%). Pre-college academic achievements showed that the average high school GPA of the students in the analytic sample were 3.85. Students' average ACT composite score was 30.52. Regarding the number of AP scores that was submitted to the university only, students submitted 6.2 test scores on average, and their average score was 3.79.

Table 6. *Descriptive Statistics: Demographics*

| Variables | All students (n = 26,871) | |
|--|---------------------------|-----------|
| | n | % |
| Sex | | |
| Female | 13,961 | 51.96 |
| Male | 12,910 | 48.04 |
| Race/ethnicity | | |
| White | 16,240 | 60.44 |
| Black | 1,532 | 5.70 |
| Hispanic | 1,953 | 7.27 |
| Asian | 4,518 | 16.81 |
| Native | 55 | 0.20 |
| Multiracial | 1,291 | 4.80 |
| Unknown | 1,282 | 4.77 |
| Underrepresented minority (URM) | | |
| Non-URM | 22,697 | 84.47 |
| URM | 4,174 | 15.53 |
| First-generation | | |
| Non-first-generation | 22,579 | 84.30 |
| First-generation | 4,205 | 15.70 |
| | Mean | SD |
| High school GPA | 3.85 | 0.17 |
| ACT composite score | 30.52 | 3.24 |
| Number of AP scores submitted | 6.2 | 3.11 |
| Average AP scores | 3.79 | 0.80 |

Note: (1) 'Sex' and 'Race/ethnicity' categories are defined by the case institution for administrative purposes. (2) URM description is provided in Appendix C. (3) First-generation status data was missing for 87 students, which was about 0.3% of the sample. (4) AP test data was missing for 5,101 students, which was about 19% of the sample.

Table 7 illustrates student characteristics associated with their enrollment and financial aid. In the analytic sample, there was a larger share of residents (63.03%) than non-residents

(36.97%). Students were mostly enrolled in the College of Literature, Science, and the Arts (64.36%), followed by the College of Engineering (22.44%), colleges in Art & Design, Music, and Dance (5.53%), College of Nursing (2.74%), College of Kinesiology (2.59%), College of Business Administration (2.07%), and College of Architecture (0.28%). The average COA was about \$40,000 for students in the analytic sample. The average EFC was slightly higher than the average COA with \$45,270. On average, the students in the analytic sample received an average of \$15,050 in gift aid, \$4,670 in student loans, and \$2,680 in work-study offer. In addition, according to the FAFSA, about 63% of students indicated interest in work-study, nearly 14% of students showed no interest, and the other about 24% responded “Don’t Know”.

Table 7. *Descriptive Statistics: College Enrollment and Financial Aid*

| Variables | All students (n = 26,871) | |
|---|---------------------------|-----------|
| | n | % |
| Residency | | |
| Non-resident | 9,933 | 36.97 |
| Resident | 16,938 | 63.03 |
| College | | |
| Literature, Science, & the Arts | 17,295 | 64.36 |
| Engineering | 6,031 | 22.44 |
| Business Administration | 556 | 2.07 |
| Art & Design, Music & Dance | 1,485 | 5.53 |
| Architecture | 74 | 0.28 |
| Kinesiology | 695 | 2.59 |
| Nursing | 735 | 2.74 |
| Work-study interest (FAFSA) | | |
| Yes | 16,806 | 62.54 |
| No | 3,710 | 13.81 |
| Don’t know | 6,355 | 23.65 |
| <i>Unit (\$1,000)</i> | Mean | SD |
| Cost of attendance (COA) | 40.08 | 15.20 |
| Expected family contribution (EFC) | 45.27 | 75.86 |
| Gift aid amount | 15.05 | 18.95 |
| Loan amount | 4.67 | 9.81 |
| Work-study offer amount | 2.68 | 0.48 |

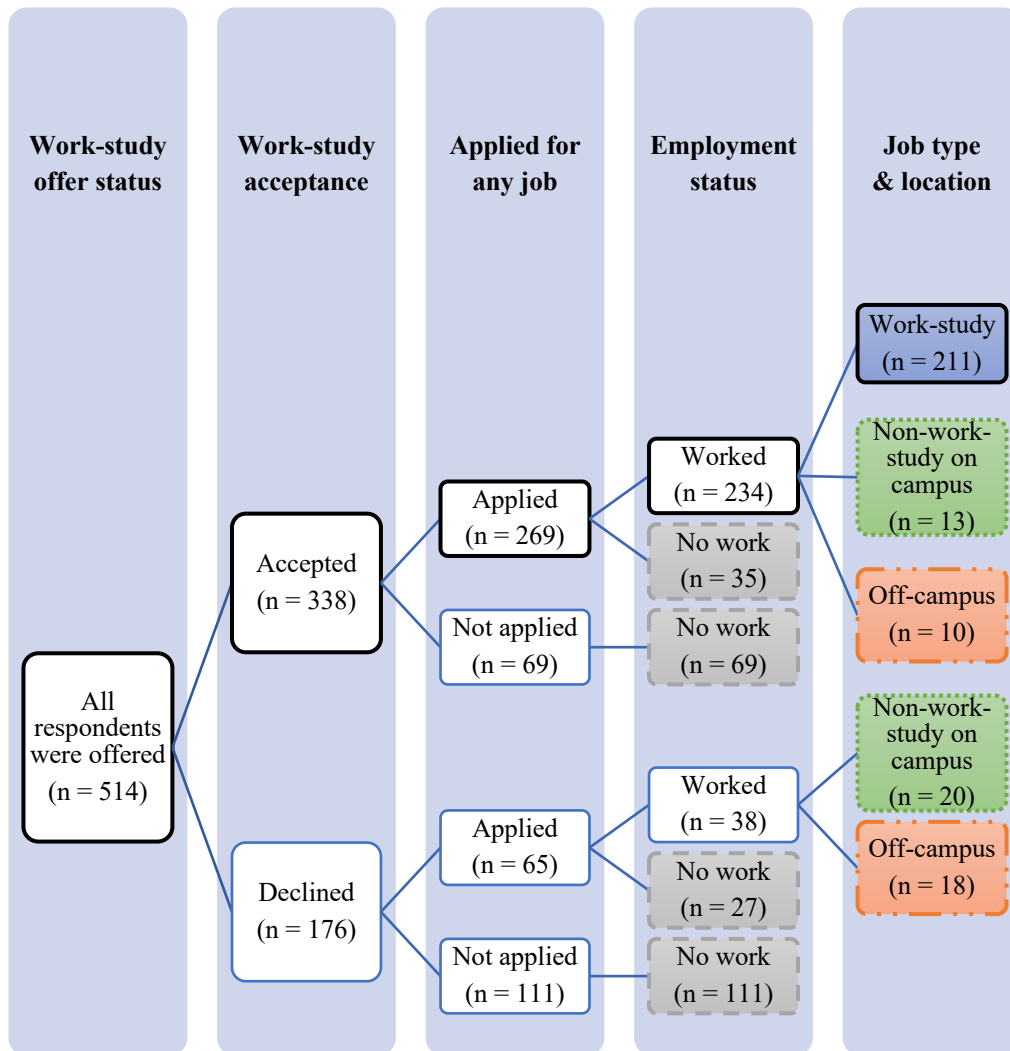
Survey Data

The target population of the survey study was the first-year students *with* work-study offers who entered Lake University in the fall 2019 (n = 2,226). This cohort was considered as a group who would have the most recent memory about their work-study decisions for the 2019-20 academic year. Specifically, the survey included a total of 514 complete responses from first-year students who received a federal work-study offer for the 2019-20 academic year. This data was merged with administrative data to add demographic information (sex, race/ethnicity, URM status, first-generation status, estimated gross family income, and high school GPA). This additional information was however not complete. One particular student had missing data for all variables. There were 10 other students without first-generation status (2%), seven students without high school GPA (1%), and 80 students missing estimated gross family income (16%).

For the purpose of the survey study, I analyzed all 514 survey responses despite some respondents with missing demographic data. This is because not only I used the longitudinal administrative data to examine the landscape of student demographics associated with work-study behaviors, but more importantly, the essential focus of the survey study was to elucidate students' motivations for work-study behaviors that could not be examined using administrative data. As shown in Figure 9, I was able to illustrate the multiple stages of work (study) decision-making processes using the survey data.²⁷ The survey respondents (n = 514) were classified into different sub-groups based on their work-study offer acceptance status, any job application status including federal work-study, employment status, and job type and location. These classification criteria resulted in nine unique groups of students according to their work (study) decisions with the black-outlined students (n = 211) being the final work-study participants (see Figure 9).

²⁷ In the next chapter, complex work (study) decision-making processes in Figure 9 are discussed in greater depth.

Figure 9. *Survey Sample Classification*



As discussed in the description of administrative student records data, the categories in Figure 8 were also mutually exclusive. If a student had at least one work-study employment, one would be classified as a work-study student (n = 211). As a result, the ‘Non-work-study job on campus’ category would consist of students who had one or more non-work-study jobs on campus, but no work-study (n = 33). It would be possible that these students would have one non-work-study position on campus and one off-campus job, but no work-study. Lastly, the ‘Off-campus’ category included students who had one or more off-campus jobs only, excluding both work-study and non-work-study jobs on campus (n = 28).

Table 8 presents the descriptive statistics of the survey sample of students who were offered work-study. I compared their demographic characteristics with that of the work-study-offered students in the administrative data (n = 9,430) to examine how similar they were. Both groups were students who were offered federal work-study in their financial aid awards for their freshmen year, which was 2019-20 for survey respondents and then between 2013-14 and 2018-19 for the students in the administrative data.

The findings indicated that the proportion of female students was larger for the survey sample (60.43% vs. 54.16%). In terms of race and ethnicity, there were smaller percentages of White, Black, and Native students and larger percentages of Hispanic, Asian, and Multiracial students in the survey data than the analytic sample from the administrative data. The difference in the proportions for White (10.45%) and Asian (14.03%) students were particularly larger than other race and ethnic groups. Overall, however, the rate of non-URM, that is, Black, Hispanic, Native, and URM students were approximately the same between the survey sample and the administrative data sample, with non-URM students taking up about 80% of the sample. While students' first-generation status had some missing values (about 2% of the survey data), there was no substantial difference in the proportion of non-first-generation students between the two samples (74.16% vs. 72.31%).

The average high school GPA was, however, slightly lower for the survey respondents (3.63) than students in the administrative data (3.85). According to Lake University, a 3.63-point GPA is between A- and B+ range while a 3.85-point GPA is between A and A- range. Moreover, descriptive statistics showed that about 45% of the survey respondents had an estimated gross family income that was less than \$50,000 per year. Given that 38.10% of the respondents had an estimated gross family income between \$50,000 and \$99,999, approximately 83% of the survey

respondents had an estimated gross family income that was less than \$100,000 per year. This demographic information was yet not available for the administrative data sample, which instead had EFC information.

Table 8. *Descriptive Statistics: Survey Respondents vs. Administrative Data Sample*

| Variables | Survey respondents (n = 514) | | Administrative data sample (n = 9,430) | |
|--|---------------------------------|-----------|---|-----------|
| | n | % | n | % |
| Sex | | | | |
| Female | 310 | 60.43 | 5,107 | 54.16 |
| Male | 203 | 39.57 | 4,323 | 45.84 |
| Race/ethnicity | | | | |
| White | 236 | 46.00 | 5,323 | 56.45 |
| Black | 30 | 5.85 | 757 | 8.03 |
| Hispanic | 48 | 9.36 | 801 | 8.49 |
| Asian | 163 | 31.77 | 1,673 | 17.74 |
| Native | 0 | 0.00 | 19 | 0.20 |
| Multiracial | 34 | 6.63 | 473 | 5.02 |
| Unknown | 0 | 0.00 | 384 | 4.07 |
| Underrepresented minority (URM) | | | | |
| Non-URM | 413 | 80.50 | 7,570 | 80.28 |
| URM | 100 | 19.49 | 1,860 | 19.72 |
| First-generation | | | | |
| Non-first-generation | 373 | 74.16 | 6,802 | 72.31 |
| First-generation | 130 | 25.84 | 2,605 | 27.69 |
| Estimated gross family income | | | | |
| Less than \$50,000 | 196 | 45.27 | <i>Not available</i> | |
| \$50,000 - \$99,999 | 165 | 38.10 | | |
| \$100,000 - \$149,999 | 56 | 12.93 | | |
| \$150,000 - \$199,999+ | 16 | 3.70 | | |
| | Mean | SD | Mean | SD |
| High school GPA | 3.63 | 1.00 | 3.85 | 0.17 |

Note: (1) For survey respondents, the sum of observations vary due to missing data. The sample size ‘n’ represents the number of respondents. (2) Estimated gross family income is not equivalent to EFC.

Empirical Strategies

In this study, I examined three primary research questions about: (a) examining the characteristics of the federal work-study program including its participants and job features, (b) identifying the causal effects of the federal work-study program on student outcomes, and (c) unpacking the mechanisms by which students make work-study decisions. The goal of these research questions was to address under-examined effects of the federal work-study program as well as mixed findings about its impact. I attempted to achieve this goal by employing data from multiple sources that could investigate different aspects of the program and analyzing them with several empirical strategies that would best answer these questions. In brief, I used quantitative descriptive analysis, a fuzzy RD design, and thematic analysis to improve the current knowledge about the program effectiveness and related mechanisms.

Quantitative Descriptive Analysis

One of the key questions of this study called for robust evidence on the causal effects of the federal work-study program to improve and maximize its benefits for students with financial need. However, an important precursor to understanding cause is description, which is an overall illustration of existing patterns among a population of interest (Loeb et al., 2017). That is, while causal inference methods can produce robust evidence on a policy or program, “[in] order to know what types of interventions might be useful—what problems need to be solved—we must understand the landscape of needs and opportunities [and] large-scale descriptive research provides this landscape” (Loeb et al., 2017, p. 1). The authors thus highlighted that combining causal and descriptive analysis is essential. A well-designed causal analysis will be a strong tool to examine the effects of an intervention and yet, “effective descriptive work can identify the

characteristics of the population, the features of implementation, and the nature of the setting that is most relevant to interpret the findings” (Loeb et al., 2017, p. 1).²⁸

In this regard, I conducted a set of descriptive analysis using both a longitudinal large-scale administrative data and survey data to answer key research questions. I aimed to explain the demographic and behavioral landscapes of work-study students and the job characteristics of on-campus employment and compare them to students who made alternative choices. In other words, the motivations for the descriptive analysis was to identify the probable explanations and mechanisms of the federal work-study program’s causal effects by examining students’ demographic characteristics, job features, or the success of work-study program implementation. The findings of the descriptive analysis were anticipated to contribute to the discussion of targeting strategies of work-study funds, the results from a causal inference study, and potential sources of the low-dosage of the intervention (i.e., low take-up of work-study), by answering questions about “who, what, where, when, and to what extent” (Loeb et al., 2017, p. v) of the federal work-study program.

Fuzzy RD Design

I examined the causal effects of the federal work-study program participation on student outcomes including first-year GPA, persistence to the 2nd year, total number of hours worked, and total earnings from on-campus employment during an 8-month period from fall to winter semesters. To estimate the causal effects of federal work-study on student outcomes, I used a RD design that has become popular among researchers to “expand upon correlational evidence with causal results” (McCall & Bielby, 2012, p. 252) of various policies important for the field of

²⁸ Loeb et al. (2017) emphasized that descriptive analysis is not analogous to data summaries, and the difference is mainly in their motivations. Descriptive summary aims to report the summary of a collected data while descriptive analysis intends to depict an important phenomenon of interest and discovering socially important patterns.

higher education. In this part of the chapter, I review the key concepts of a RD design, discuss a fuzzy RD design used in this study, check whether its underlying assumptions are met in this study, and then describe the empirical strategies for obtaining causal estimates of the treatment effects using the RD method.

Key Concepts of RD. A RD design is a quasi-experimental method that “mimic[s] the desirable properties of randomized experiments” (McCall & Bielby, 2012, p. 250). It is mainly “characterized by a treatment assignment that is based on whether [a subject] falls above or below a cut point on a rating variable, generating a discontinuity in the probability of treatment receipt at that point” (Jacob et al., 2012, p. 4). Specifically, every subject is given a score based on a rating variable, which is also known as a running variable, such as income, test score, GPA, or age. Then, there is a rigid rule (i.e., a cutoff score) that assigns subjects to a treatment group on one side of the cutoff and assigns other subjects to a control group on the other side of the cutoff. A treatment status is hence entirely determined by the eligibility rule and “switches cleanly off or on as the running variable passes a cutoff” (Angrist & Pischke, 2015, p. 151).

The rigid rule is viewed as creating a research design as valuable as experiments (Angrist & Pischke, 2015) by generating local randomization of subjects around the cutoff. That is, the premise of the RD approach is that any “differences between candidates who just miss and just make a threshold are random” (Jacob et al., 2012, p. 6). Subjects near the cutoff are thus equal in expectation (e.g., in their average characteristics) and the differences in outcomes observed at the cutoff are caused by the treatment (Murnane & Willett, 2011). Accordingly, to have a valid RD design, it is central for researchers “to have knowledge of the process by which individuals are assigned to treatment (or not) in order to ascertain whether individuals are able to manipulate this placement” (McCall & Bielby, 2012, p. 257).

In this study, an EFC eligibility cutoff for a federal work-study aid offer is the rigid rule that determines the treatment status of students, and assigns them to a treatment group (i.e., receive a work-study offer if EFC is \$20,000 or below) or a control group (i.e., do not receive a work-study offer if EFC is greater than \$20,000). The EFC cutoff creates the randomness at the cutoff, and students around the cutoff (just below or above the cutoff) are expected to be similar in their average characteristics with the only exception being their treatment status (i.e., work-study offer). For example, when an EFC cutoff for work-study is \$20,000, a student whose EFC was \$19,900 and was offered work-study and a student whose EFC was \$20,100 and was not offered work-study are expected to be alike in their average characteristics (e.g., demographics, high school GPA), except for a work-study offer. In the following parts of the chapter, I examine the validity of a RD design for this study by checking for any possibilities of manipulation of the running variable (i.e., EFC) and the distribution of student characteristics around the cutoff.

Fuzzy RD. There are two RD designs, a sharp RD design and a fuzzy RD design. The key difference between the two designs is the extent to which subjects comply to a rigid rule that determines treatment status (Flaster & DesJardins, 2014; Lesik, 2008). In a sharp RD design, a treatment status is a deterministic function of the eligibility threshold (Angrist & Pischke, 2015). Every subject with a score above the cutoff (in a treatment group) receives the treatment and every subject with a score below the cutoff (in a control group) does not receive the treatment, implying a perfect compliance with the assignment rule. Correspondingly, the probability of treatment equals one for subjects in the treatment group whereas the probability to treatment is zero for subjects in the control group. The difference in the probabilities of treatment between treatment and control groups thus equals one, with the probability of treatment status changing neatly from zero to one at the cutoff (Angrist & Pischke, 2015; McCall & Bielby, 2012).

When there is an imperfect compliance with the treatment assignment, a fuzzy RD design is often employed (Hahn et al., 2001; Lee & Lemieux, 2010; Trochim, 1984) and the cutoff score no longer solely determines the treatment status. In a randomized experiment, it would be similar to “having no-shows (treatment group members who do not receive the treatment) and/or crossovers (control group members who do receive the treatment)” (Jacob et al., 2012, p. 6). For example, a student assigned to a remedial course (treatment) based on a test score “may opt out of treatment receipt, thereby placing themselves in the control group” (Flaster & DesJardins, 2014, p. 8), while a student not assigned to a remedial course may be induced to the treatment by choosing to take the course. With imperfect compliance, the probability of treatment changes at the cutoff, but not necessarily from zero to one and there will be a smaller jump at the cutoff than under the sharp RD condition. In a fuzzy RD design, subjects assigned to a treatment group are hence viewed as being “exposed to a more intense treatment” (Angrist & Pischke, 2015, p. 169) with the share of subjects with a treatment receipt suddenly changing around the cutoff.²⁹

I adopted a fuzzy RD design for this study because of the imperfect compliance of federal work-study, the treatment. To elaborate, some students who were below the EFC cutoff did not receive a federal work-study offer as they already received sufficient gift aid that covered the total cost of attendance. In other instances, some students who received work-study offers by being below the cutoff declined their offers and did not participate in the program. Conversely, there were students who were above the EFC eligibility threshold but were offered work-study. According to the office of financial aid, the sources of non-compliers above the cutoff generally include manual errors in aid packaging, professional judgments, student appeals to a special review committee in the office, or combinations of these. In the analytic sample ($n = 26,871$),

²⁹ Refer to the following for graphical representations of the probability of treatment in sharp and fuzzy RD designs: Angrist and Pischke (2015), Lee and Lemieux (2010), or McCall and Bielby (2012).

there were about 120 students (less than 0.5% of the sample; about 20 students every year) who were ineligible for federal work-study according but was still offered.

Figures 10 and 11 graphically illustrates strong evidence to employ a fuzzy RD design in this study ($n = 26,871$). Specifically, the x-coordinates in both figures indicate EFC categories (bins) relative to work-study eligibility cutoff. Here, EFC, which was the running variable (a rigid rule), was re-centered on zero for each student to reflect the changes in the EFC cutoff over time and differences by residency status.³⁰ To recenter, I subtracted a constant value of either 20,000 or 25,000 (depending on the cohort) from each student's EFC value to generate a new EFC value predictor relative to the EFC cutoff. For example, the x-coordinate '-10' indicates an EFC value that was \$10,000 dollars lower than the EFC cutoff, which would be either \$20,000 or \$25,000 depending on students' residency and cohort year.

The y-axis displays the share of students who were offered work-study (i.e., assigned to the treatment) (Figure 10) or the share of work-study participants (i.e., received the treatment) (Figure 11). Figure 10 shows that the shares of students with work-study offers ranged from 60% and 80% for those below the EFC cutoff, whereas the proportions of students with offers were between 0% and 10% for those in EFC categories above the cutoff. Figure 11 illustrates that the proportions of work-study participants were higher below the EFC cutoff than above the cutoff. Overall, the shares of students who received federal work-study offers (Figure 10) and the shares of work-study participants (Figure 11) were higher below the EFC cutoff than above the cutoff. In the following sections, I formally test the gaps at the cutoff in Figures 10 and 11 to examine their statistical significances and also, describe how I use these two variables to estimate casual effects of participating in the federal work-study program on student outcomes.

³⁰ There were two different EFC thresholds for work-study eligibility (\$20,000 and \$25,000) over time depending on the academic year and in-state residency. Refer to Table 3 for the history of eligibility changes.

Figure 10. *Fuzzy RD Plot: Treatment Assignment (Work-Study Offer)*

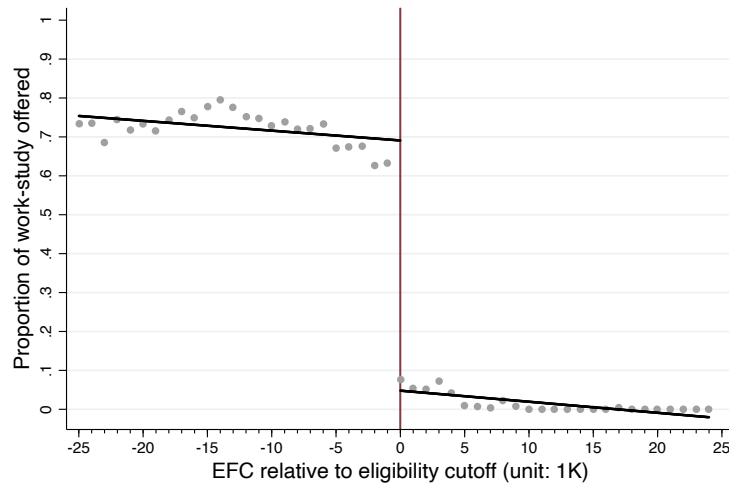
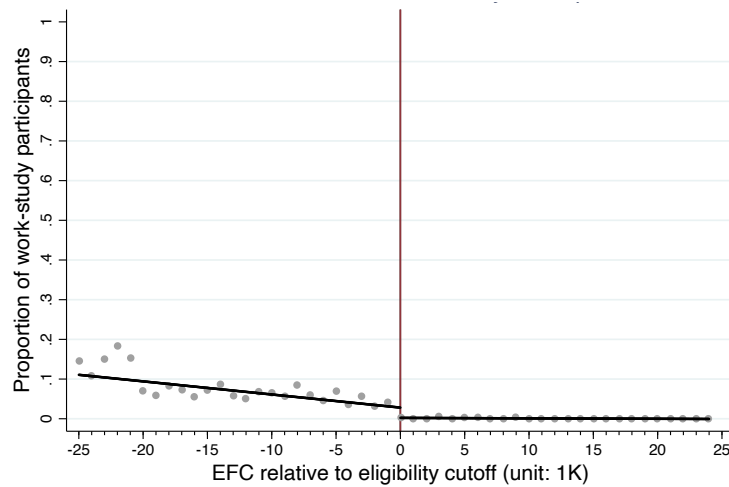


Figure 11. *Fuzzy RD Plot: Treatment Receipt (Work-Study Participation)*



Robustness Checks. I assessed the validity of a RD design in several ways. First, I did a formal test of the statistical significance of the discontinuity at the cutoff for the probabilities of treatment assignment and treatment receipt. For each, I regressed the outcome on three variables: (a) a dummy variable that indicated whether a student was below the EFC cutoff for work-study offer, (b) the running variable, EFC, and (c) an interaction term of (a) and (b) that allowed the slopes to vary below and above the cutoff to account for the possibility that the relationship between the running variable and the outcome may be different on the two sides of the cutoff

(Flaster & DesJardins, 2014). In this model, I estimated a linear relationship between the running variable, EFC, and the probability of the outcomes.

Moreover, I estimated a model that assumed the running variable, EFC, had a quadratic effect on the outcomes, a federal work-study offer and work-study participation. In this second model, I included a quadratic term of the running variable and it was interacted with an indicator for being below the cutoff. Lastly, I estimated a model where the running variable was expected to have a cubic polynomial effect on the outcomes. Following McCall and Bielby (2012), I conducted likelihood-ratio tests after estimation to assess whether including additional quadratic and cubic terms improved the model fit to the data and reported Chi-squared test statistics.

Table 9 shows the estimated discontinuity in the level of treatment assignment, a federal work-study offer, and Figures 12, 13, and 14 illustrate the linear, quadratic, cubic relationships between the running variable and the outcome, respectively. The linear model indicated that the probability of treatment assignment (i.e., work-study offer) was, on average, about 68 percentage points (pp's) higher for students below the cutoff ($p < 0.001$) than those above the cutoff (Figure 12). In the quadratic model, the treatment assignment probability was, on average, about 62 pp's higher for those below the cutoff than their non-treated peers ($p < 0.001$; Figure 13). Finally, the cubic model showed that the probability of treatment assignment was about 58 pp's higher for students below the cutoff than those above the cutoff ($p < 0.001$) on average (Figure 14).

Overall, I find that there was a statistically significant relationship between EFC and the probability of treatment assignment, a federal work-study offer. This means that the gap in the probability of being offered a federal work-study offer at the cutoff was statistically significant. Yet, the results were sensitive to model specifications. With a higher-order polynomial model, the probability of being offered a federal work-study offer decreased. Importantly, the quadratic

model fit the data better than the linear model, and the cubic model provided a better fit than the quadratic model. These findings suggested that the estimates from the cubic model are preferred to the other two model specifications, indicating that being below the EFC cutoff increased the probability of receiving a federal work-study offer by about 58 pp's. Importantly, the statistical significance of the gap at the cutoff provides evidence that supports the validity of RD design.

Table 9. *Estimated Discontinuity in the Level of Treatment Assignment*

| Variable | Linear | Quadratic | Cubic |
|---------------------------------|---------------------|---------------------|---------------------|
| <i>Below</i> (=1) | 0.681*** (0.009) | 0.616*** (0.014) | 0.576*** (0.013) |
| EFC | Yes | Yes | Yes |
| EFC x <i>Below</i> | Yes | Yes | Yes |
| EFC ² | No | Yes | Yes |
| EFC ² x <i>Below</i> | No | Yes | Yes |
| EFC ³ | No | No | Yes |
| EFC ³ x <i>Below</i> | No | No | Yes |
| Cohort fixed effects | Yes | Yes | Yes |
| Observations | 26,871 | 26,871 | 26,871 |
| n below the cutoff | 12,781 | 12,781 | 12,781 |
| R-squared | 0.569 | 0.570 | 0.571 |
| Chi-squared test | - | 79.17*** | 22.01*** |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: (a) *Below* is the dummy indicator for being below the cutoff. (b) Robust standard errors in parentheses.

Figure 12. *Fuzzy RD Plot: Treatment Assignment (Linear Relationship)*

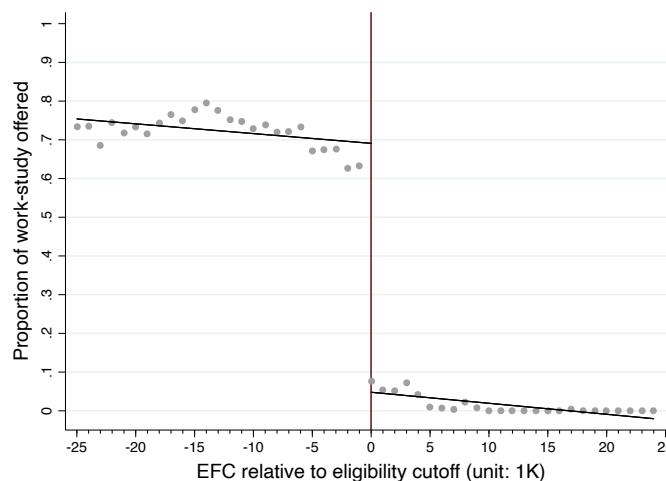


Figure 13. *Fuzzy RD Plot: Treatment Assignment (Quadratic Relationship)*

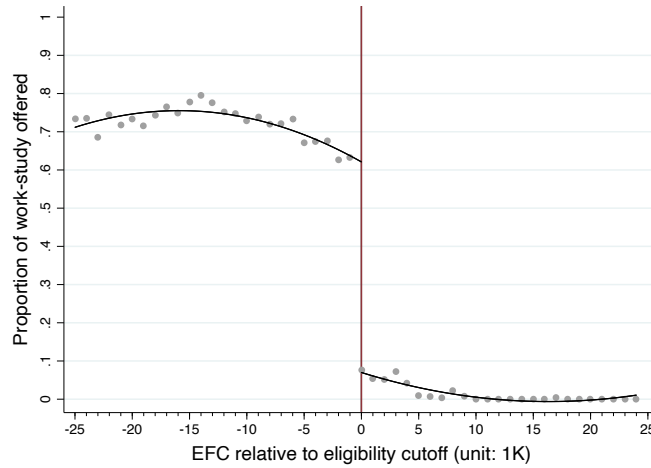
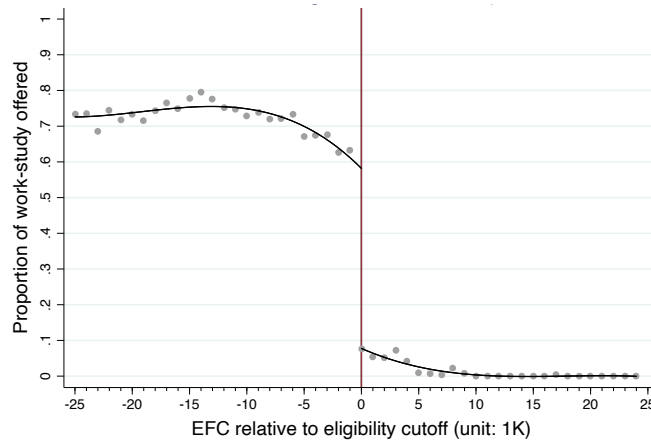


Figure 14. *Fuzzy RD Plot: Treatment Assignment (Cubic Relationship)*



Following the same procedures, I also examined the statistical significance of the gap in the probability of treatment receipt at the cutoff. Table 10 presents the estimated discontinuity in the level of treatment receipt, actual participation in the federal work-study program. Figures 15, 16, and 17 corresponds to the results in Table 10. When looking at the relationship between EFC, the running variable, and the probability of treatment receipt, the linear model indicated that the probability of treatment receipt was, on average, 4 pp's higher for students below the cutoff than those above the cutoff ($p < 0.001$) (Figure 15). The quadratic model showed that the probability of treatment receipt was 5 pp's higher for those below the cutoff than their peers above the cutoff

on average ($p < 0.001$) (Figure 16). In the cubic model, the estimates showed that the average probability of treatment receipt was 3.3 pp's higher for students below the cutoff than those above the cutoff ($p < 0.001$) (Figure 17).

In summary, the probability of treatment receipt (i.e., participating in federal work-study) was meaningfully associated with EFC, meaning that the gap in the probability of doing work-study at the cutoff was statistically significant. Nevertheless, the results were again sensitive to model specifications. The probability of actually participating in federal work-study decreased with a higher-order polynomial model. The quadratic model fit the data better than the linear model, and the cubic model presented a better fit to data than the quadratic model. The results thus showed that the cubic model estimates were preferred to the other model specifications, indicating a 3.3 pp's higher average probability of federal work-study participation among students below the EFC cutoff compared to students above the cutoff. From the statistically significant results about the estimated discontinuity at the cutoff, I find evidence to support the validity of a RD design for this sample.

Table 10. *Estimated Discontinuity in the Level of Treatment Receipt*

| Variable | Linear | Quadratic | Cubic |
|---------------------------------|---------------------|---------------------|---------------------|
| <i>Below</i> (=1) | 0.040*** (0.005) | 0.050*** (0.006) | 0.033*** (0.008) |
| EFC | Yes | Yes | Yes |
| EFC x <i>Below</i> | Yes | Yes | Yes |
| EFC ² | No | Yes | Yes |
| EFC ² x <i>Below</i> | No | Yes | Yes |
| EFC ³ | No | No | Yes |
| EFC ³ x <i>Below</i> | No | No | Yes |
| Cohort fixed effects | Yes | Yes | Yes |
| Observations | 26,871 | 26,871 | 26,871 |
| n below the cutoff | 12,781 | 12,781 | 12,781 |
| R-squared | 0.141 | 0.141 | 0.142 |
| Chi-squared test | - | 10.22** | 12.00*** |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: (a) *Below* is the dummy indicator for being below the cutoff. (b) Robust standard errors in parentheses.

Figure 15. Fuzzy RD Plot: Treatment Receipt (Linear Relationship)

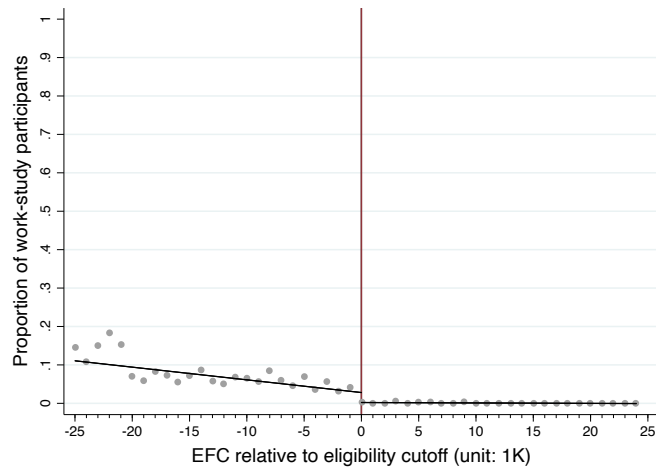


Figure 16. Fuzzy RD Plot: Treatment Receipt (Quadratic Relationship)

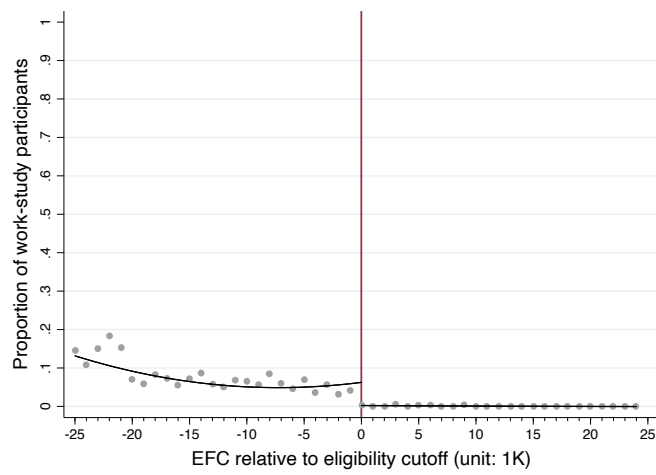
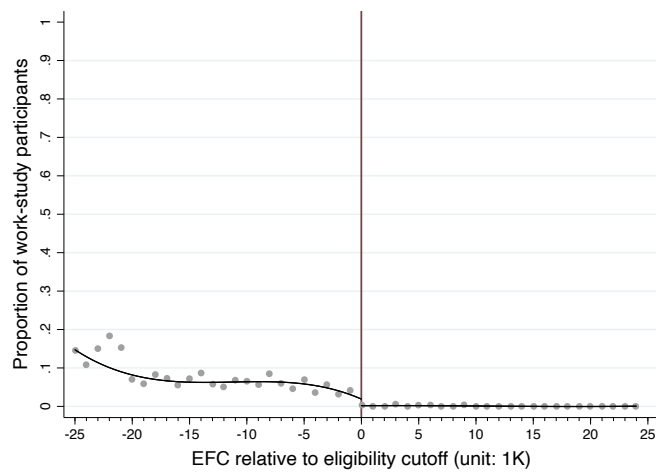


Figure 17. Fuzzy RD Plot: Treatment Receipt (Cubic Relationship)



A statistically significant discontinuity at the cutoff, however, does not solely assure the validity of a RD design. As highlighted earlier, it is vital to “ascertain whether individuals are able to manipulate [their] placement [into a treatment group]” (McCall & Bielby, 2012, p. 257). If subjects are able to manipulate their values of a running variable (e.g., EFC) that determine their treatment status (e.g., work-study offer), this would violate a critical assumption of a RD design that the cutoff score generates local randomization of subjects around a threshold and that subjects around the cutoff are equal in expectation in their average characteristics. Any differences in the outcome would potentially not be due to the treatment, but possibly because of an endogenous factor that led to different outcomes.

For example, there may be a college scholarship (i.e., treatment) that is given to students who have a high school GPA (i.e., running variable) of 3.8 or above (i.e., cutoff). If this GPA threshold is publicly announced and students know about it, some students who are strongly motivated to go to college may choose to take easy classes to obtain a higher GPA and receive the scholarship. In this scenario where students manipulate their GPAs, the assumption about a local randomization of subjects near the cutoff no longer holds. Students’ latent characteristics such as their college aspirations now play a role in their treatment status. Consequently, any differences in outcomes (that happened after the treatment) such as first-year college GPA between students who are below the cutoff and those who are above the cutoff can no longer be assumed to be due to the treatment, the scholarship. It could be rather because of students’ level of aspirations and motivations related to college.

Therefore, I took several steps recommended by scholars (e.g., Imbens & Lemieux, 2008; McCall & Bielby, 2012) to closely examine for threats to the internal validity of a RD design in this sample. First, I checked whether or not the internal validity of the results could have been

threatened by subjects manipulating “their placement on the forcing variable” (Murnane & Willett, 2011, p. 198). If the EFC eligibility cutoff for federal work-study was publicly known, students or parents could have manipulated their income or other factors used in determining need to lower their EFCs below the eligibility threshold for work-study aid. I confirmed with Lake University that the EFC cutoff information for work-study has never been publicized and the threshold has changed on an annual basis when adjustments were needed based on the total cost of attendance. Thus, it appears manipulation of selection into treatment is unlikely.

A RD design may also fail if the EFC cutoff for a federal work-study offer (\$20,000) was used for other types of financial aid offered at Lake University. If so, it would not be identifiable which type of financial aid led to the differences in student outcomes for students near the cutoff. I verified with the Office of Financial Aid at Lake University that no other aid programs used the same EFC eligibility criteria as work-study to allocate the funds.

Nonetheless, I formally tested for manipulation using a *Stata* command `rddensity` (Cattaneo et al., 2018), which uses a local linear density estimation technique. This test was conducted on the whole sample as well as for its various subgroups. Table 11 includes the robust bias-correction statistics which is “the default and recommended option for implementing a manipulation test” (Cattaneo et al., 2018, p. 251). For all samples including the full sample and subsamples, I found no statistical evidence of systematic manipulation of the cutoff ($p > 0.05$). Furthermore, I examined the distribution of the students below and above the EFC cutoff and found visual evidence that confirmed no bunching around the EFC cutoff (i.e., no manipulation of the running variable) for all samples tested in Table 11. Figure 18 shows the results for the full sample and Figure 19 illustrates the findings for 20 subsamples.³¹

³¹ For a close, local examination for the manipulation near the cutoff, the x-axis in these plots were restricted to an EFC+/-8K range.

Table 11. *Manipulation Test Results*

| Test sample | Observations | Test-statistics | <i>p</i> -value |
|---|--------------|-----------------|-----------------|
| Full sample | 26,871 | -1.67 | 0.10 |
| Male | 12,910 | 0.41 | 0.69 |
| Female | 13,961 | -1.70 | 0.09 |
| URM | 4,174 | -0.95 | 0.34 |
| Non-URM | 22,697 | -1.38 | 0.17 |
| First-generation | 4,205 | 0.35 | 0.73 |
| Non-first-generation | 22,579 | -1.84 | 0.07 |
| Resident | 16,938 | -1.24 | 0.22 |
| Non-resident | 9,933 | 0.14 | 0.89 |
| Cohort: 2013 | 4,310 | -0.42 | 0.68 |
| Cohort: 2014 | 4,269 | -0.78 | 0.43 |
| Cohort: 2015 | 4,131 | -1.75 | 0.08 |
| Cohort: 2016 | 4,548 | -1.44 | 0.15 |
| Cohort: 2017 | 4,721 | 0.33 | 0.74 |
| Cohort: 2018 | 4,892 | 1.42 | 0.16 |
| College: Literature, Science & the Arts | 17,295 | -0.88 | 0.38 |
| College: Engineering | 6,031 | 0.26 | 0.80 |
| College: Business Administration | 556 | 0.44 | 0.66 |
| College: Art & Design, Music & Dance | 1,485 | -0.20 | 0.84 |
| College: Architecture | 74 | 0.79 | 0.43 |
| College: Kinesiology | 695 | 0.60 | 0.55 |
| College: Nursing | 735 | 0.21 | 0.84 |

Figure 18. Manipulation Check: Full Sample

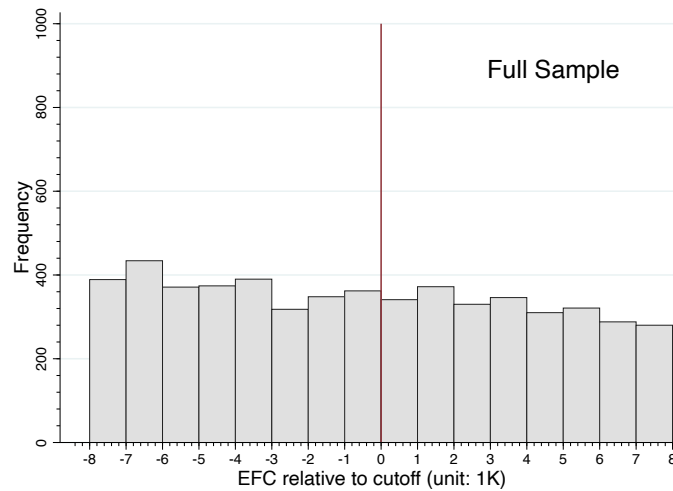
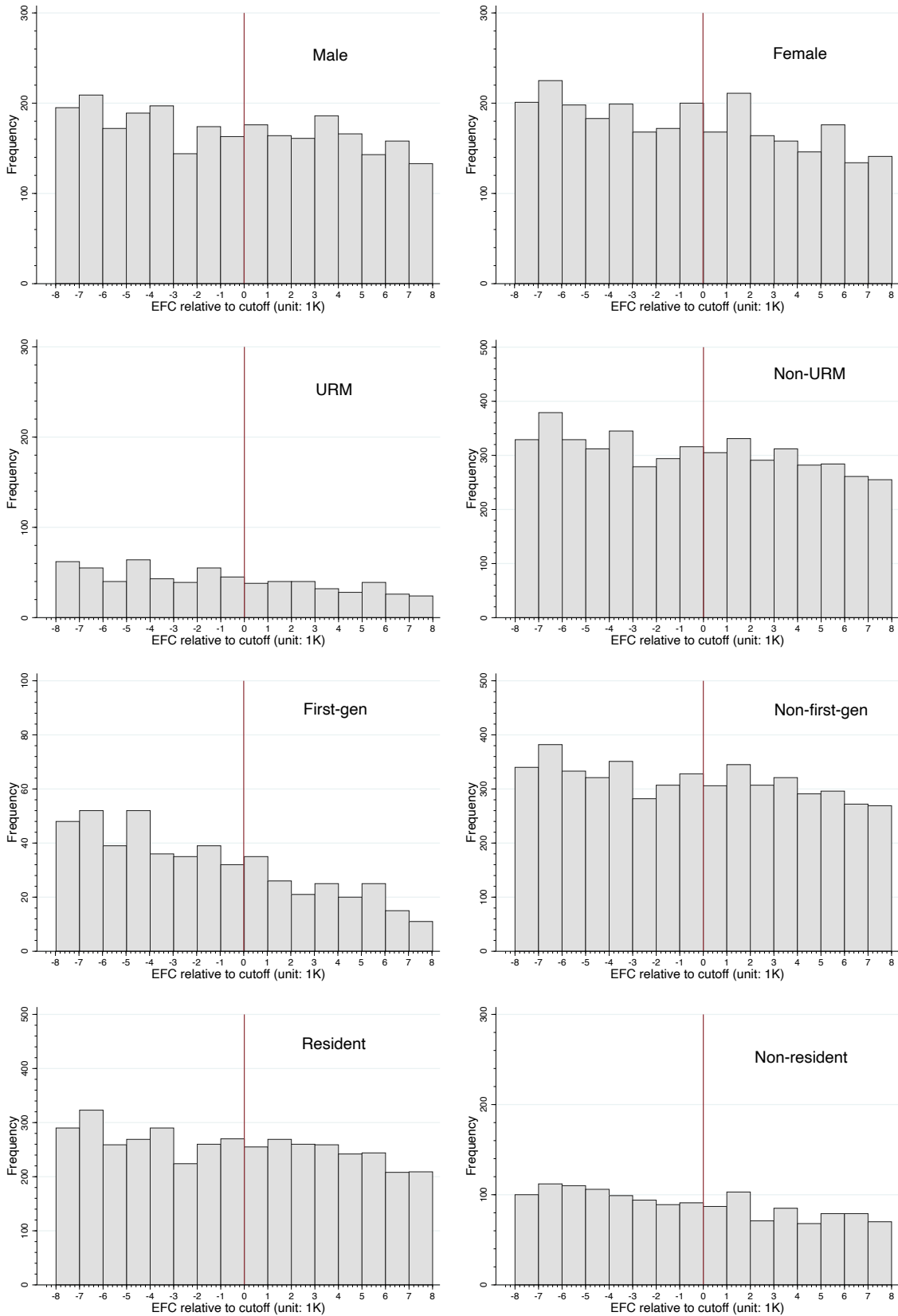
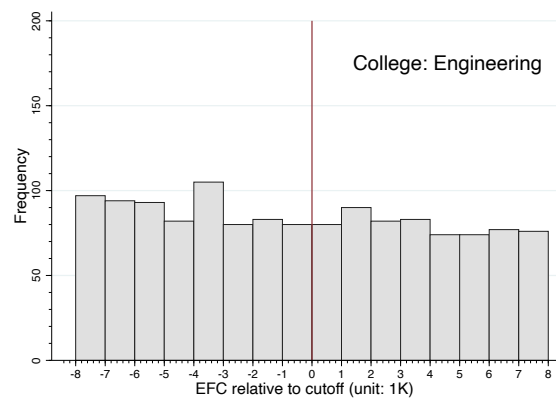
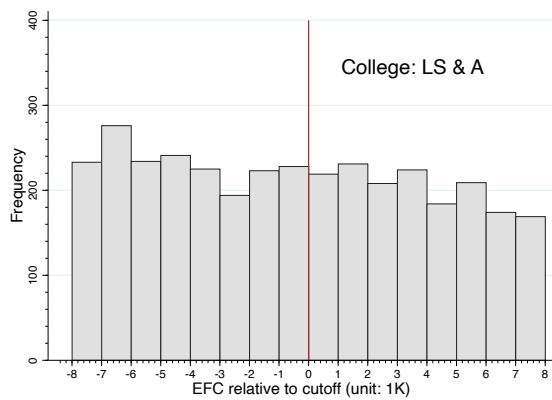
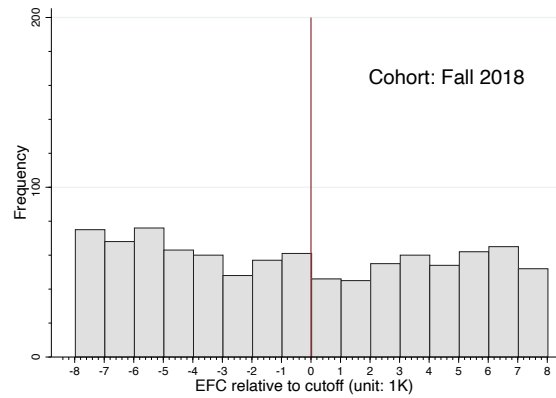
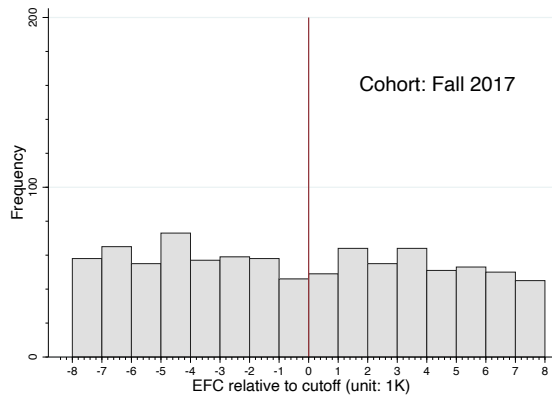
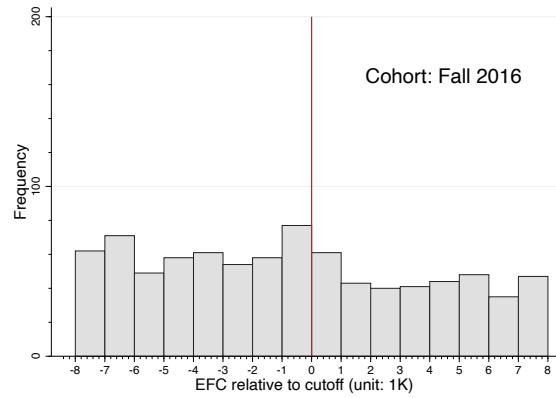
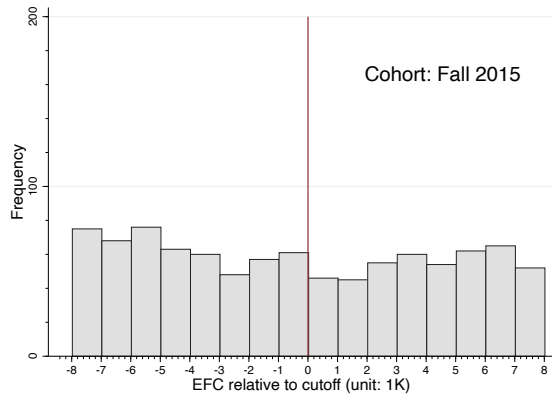
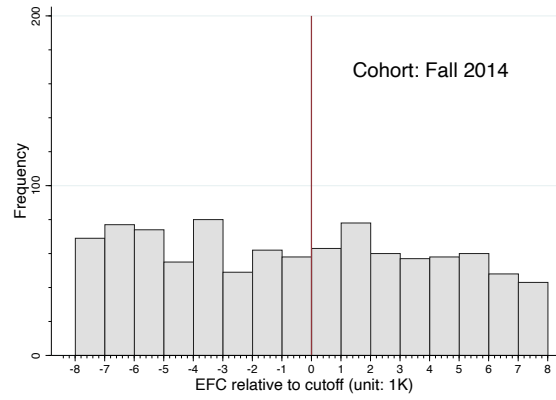
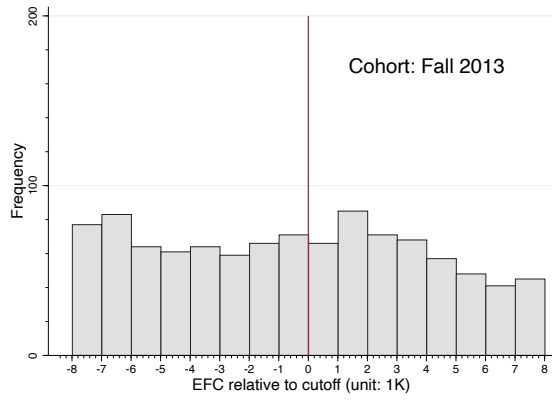
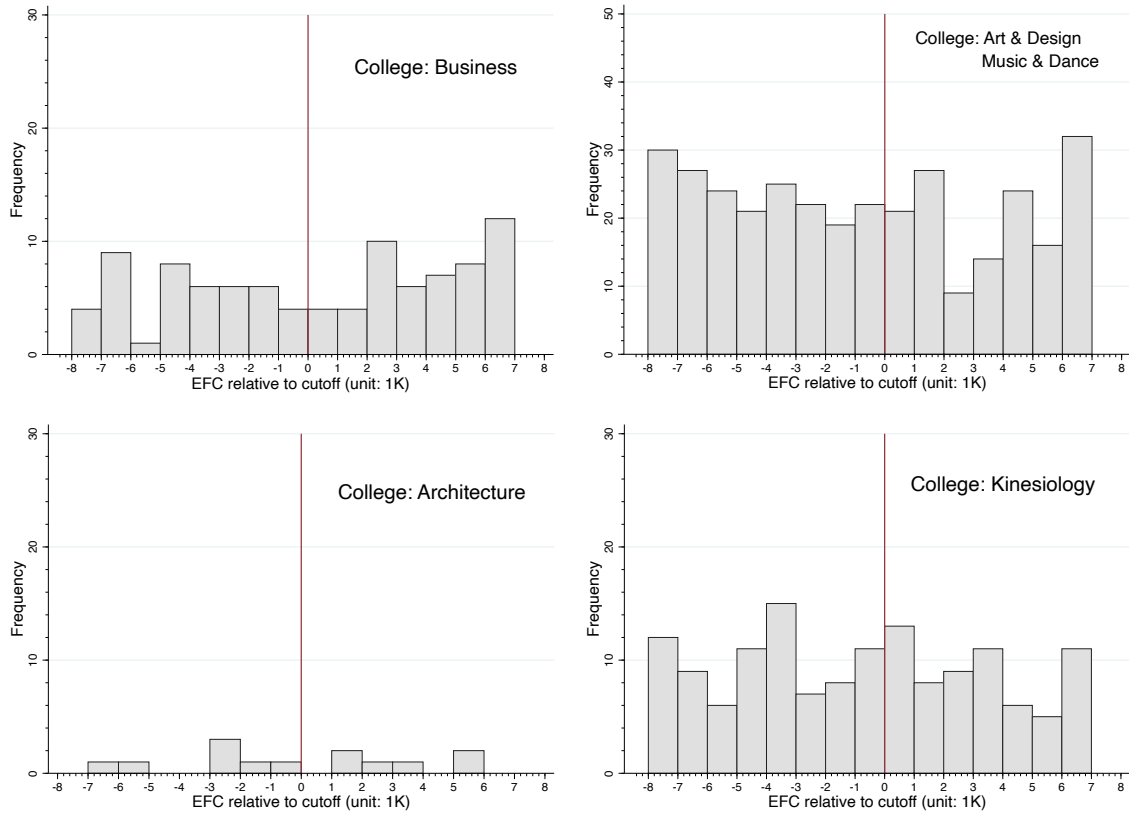


Figure 19. Manipulation Check: Subgroups

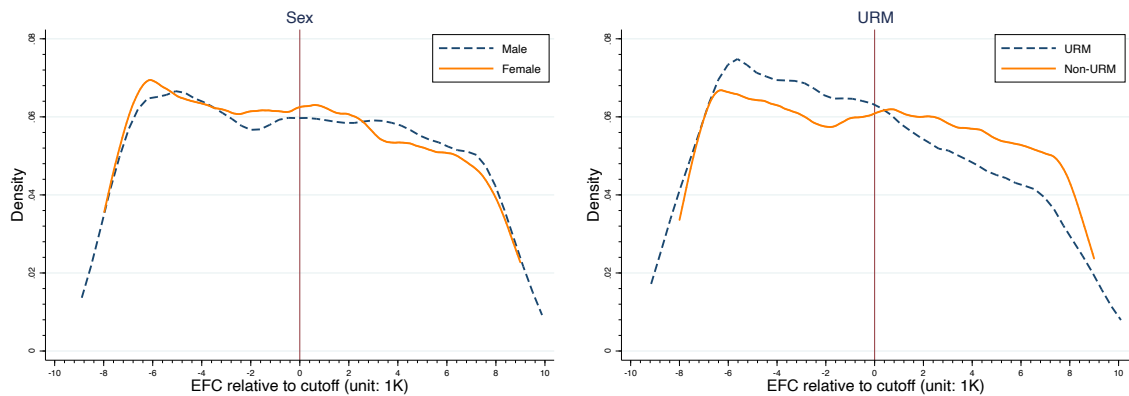


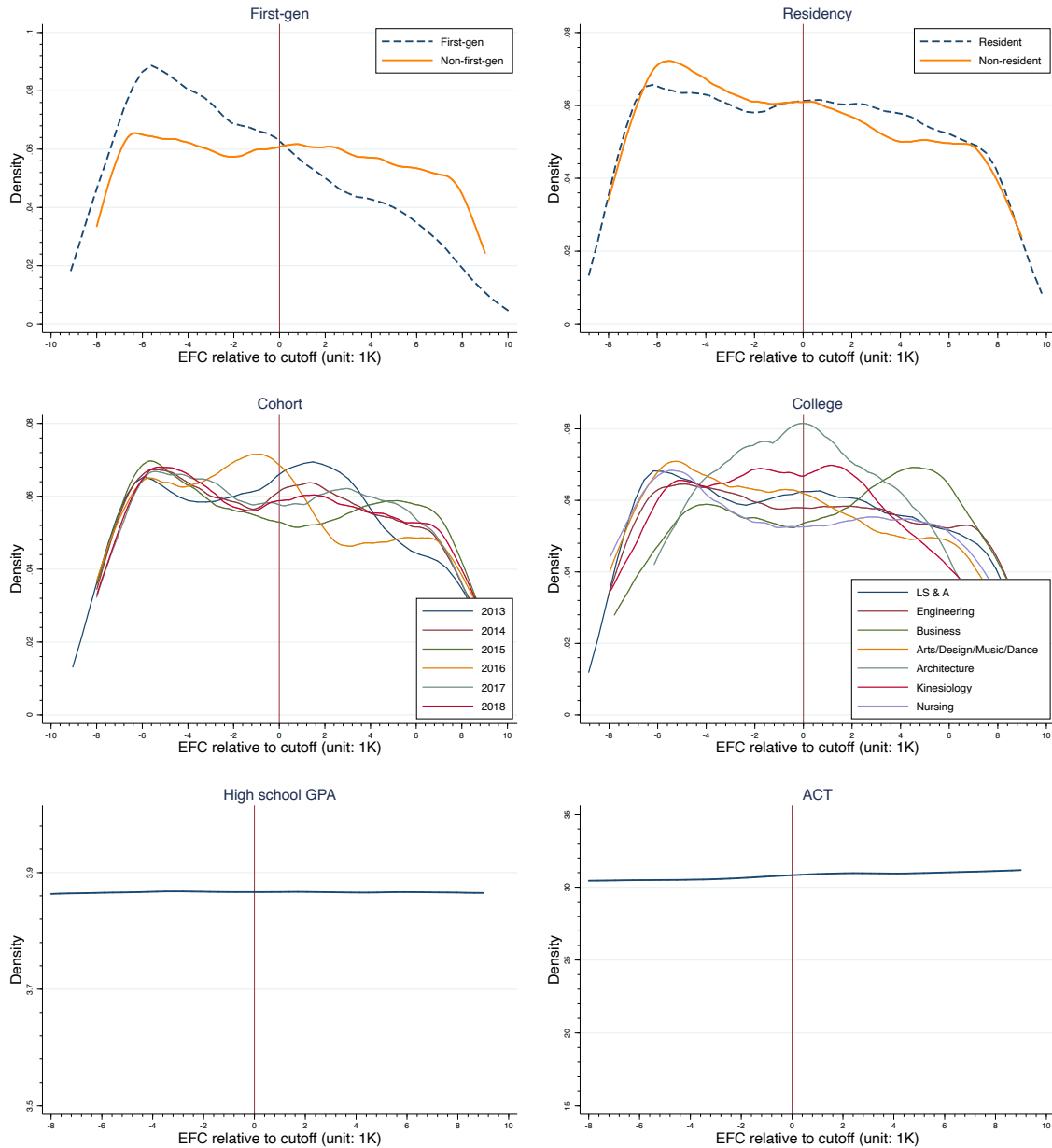




In addition, I also used the kernel density plot to test whether there was manipulation (bunching) around the cutoff. Density plots in Figure 20 illustrate smooth relationships across the threshold for key covariates including demographics, college enrollment characteristics, and high school academic achievements. The overall results show that only the treatment variable should cause a jump in the outcomes, but not these covariates.

Figure 20. *Smooth Density Estimates of Covariates Around the Cutoff*





Next, I conducted a formal test of covariate balance around the EFC cutoff, which is “similar to checking whether the randomization was done correct in an [randomized controlled trial]” (McCall & Bielby, 2012, p. 261). This test allows me to examine whether the assumption of equality in expectation near the cutoff was met (Dee & Sievertsen, 2015; Murnane & Willett, 2011). Here, as McCall and Bielby (2012) pointed out, defining what “near” or “around” the

cutoff means could be challenging. I followed the authors' recommendations to use different bandwidths and examined how sensitive the results were to the different intervals used.

I checked the covariate balance at the cutoff by regressing each baseline characteristic on the indicator for being below the cutoff as in Equation (1), controlling for the running variable RV_i that was re-centered on the cutoff. \widehat{Cov}_i is a covariate being examined. $Below_i$ is a dummy indicator for being below the cutoff. e_i is an error term. I then estimated this regression model using different bandwidths.

$$\widehat{Cov}_i = \beta_0 + \beta_1(Below_i) + \beta_2(RV_i) + e_i \quad (1)$$

In Table 12, each row provides estimates from Equation (1) for each covariate, reporting the coefficient on $Below_i$, standard error, and the statistical significance of the test statistic. I present the results for different bandwidths that I applied to check whether the covariate balance would be sensitive to the bandwidth. For all bandwidths, I found no evidence of imbalance for all covariates ($p > 0.05$), except for the average ACT scores when using the bandwidth of $\pm 6K$ ($p < 0.05$) and $\pm 10K$ ($p < 0.05$). In both cases, the results indicated that students below or at the cutoff, on average, had less than 0.5 points lower on ACT than students above the cutoff, which was a slight difference. Intriguingly, the difference was insignificant when bandwidth of $\pm 8K$ was applied. The inconsistency may be possibly due to the fact that a large majority of the ACT score data had missing values and were imputed with a transformation of SAT scores (for those who submitted SAT). In any case, I estimated an additional RD model including the baseline covariates to account for the unbalance of the ACT variable.

The overall results still supported an argument that any discontinuities in the outcome at the cutoff would be due to the treatment, not by any other baseline characteristics (except for the ACT scores) between the treatment and control groups.

Table 12. *Covariate Balance Check*

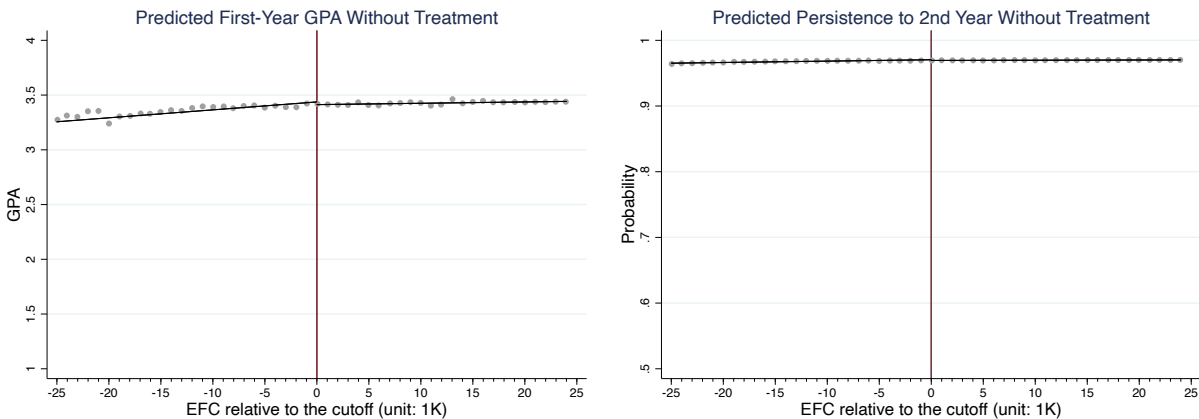
| Outcome | Bandwidth ±2K | Bandwidth ±4K | Bandwidth ±6K | Bandwidth ±8K | Bandwidth ±10K |
|------------------|------------------|------------------|----------------------|------------------|----------------------|
| | Coef. (SE) | Coef. (SE) | Coef. (SE) | Coef. (SE) | Coef. (SE) |
| Male | -0.08 (0.05) | -0.02 (0.04) | -0.02 (0.03) | -0.02 (0.03) | -0.02 (0.02) |
| URM | <0.01 (0.03) | 0.02 (0.02) | 0.02 (0.02) | 0.01 (0.02) | 0.01 (0.02) |
| First-generation | -0.03 (0.03) | <0.01 (0.02) | 0.01 (0.02) | 0.01 (0.02) | 0.01 (0.01) |
| Resident | -0.01 (0.05) | 0.01 (0.03) | 0.01 (0.03) | -0.02 (0.02) | -0.03 (0.02) |
| High school GPA | >-0.01 (0.02) | 0.01 (0.01) | 0.005 (0.01) | 0.01 (0.01) | 0.01 (0.01) |
| ACT score | -0.37 (0.31) | -0.37 (0.22) | -0.41* (0.18) | -0.30 (0.16) | -0.33* (0.14) |
| Observations | 1,423 | 2,807 | 4,183 | 5,574 | 6,870 |

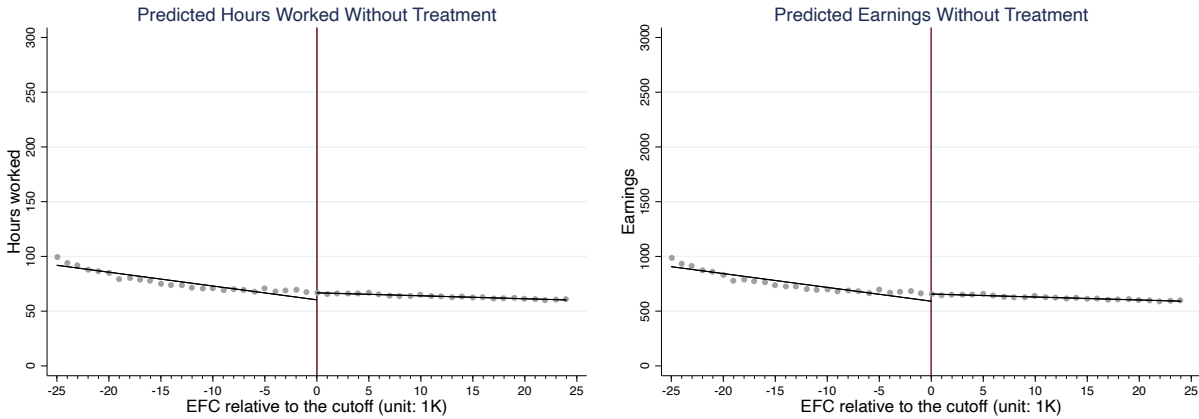
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: First-generation status and high school GPA had some missing values, and the observations were smaller.

Finally, I checked whether there would be discontinuities in the predicted student outcomes at the EFC cutoff in the absence of treatment (i.e., federal work-study). For each of the four outcomes, I regressed the outcome on a set of covariates that I used for the covariate balance check as well as cohort and college variables. I excluded the running variable, EFC, in the model because it is assumed to affect the outcomes by assigning students to treatment. As presented in Figure 21, I found that the predicted outcome was smooth through the EFC cutoff for all four outcomes in the absence of treatment.

Figure 21. *Predicted Outcomes in the Absence of Treatment*





Estimating Treatment Effects. In a sharp RD design, the treatment effect is the parameter related to the binary variable that indicates whether a subject’s score (on the running variable) is below or above the eligibility threshold (Flaster & DesJardins, 2014). This parameter of interest is known as the *local* average treatment effect (LATE; Angrist & Pischke, 2015) as it only uses data near the cutoff to estimate treatment effects for subjects “*at the margin of receiving the intervention*” (Flaster & DesJardins, 2014, p. 16). However, in a fuzzy RD design where there are non-compliers, this parameter does not capture the treatment effect, but only captures the effect of treatment assignment, or the “intent to treat” (Lee & Lemieux, 2010, p. 300). For example, a work-study offer would be an intent to treat when there are non-compliers, not an actual treatment. Accordingly, the parameter of the dichotomous indicator (for being below or above the cutoff) captures the effect of being offered work-study (i.e., treatment assignment), not the effect of doing work-study (i.e., treatment receipt).

In a fuzzy RD setting, there are several ways to estimate the treatment effect (e.g., the effect of doing work-study). One approach is to remove all non-compliers in the data, which is “appropriate if [they] constitute a small proportion of the sample—typically 5% or less—or are confined to a narrow range of the running variable immediately around the cut-point” (Flaster &

DesJardins, 2014, p. 17).³² I did not to use this approach because the rate of non-compliance was greater than 5% of the analytic sample. Instead, I estimated the treatment effect using two-stage least squares (TSLS) as suggested by Hahn et al. (2001), which is widely used in a fuzzy RD setting (Lee & Lemieux, 2010). With TSLS, the treatment effect is estimated in an instrumental variable framework. Specifically, the parameter associated with the binary indicator for being below (or above) the cutoff serves as an instrument for the actual receipt of the treatment, and the treatment effect is estimated in two stages. In the first stage, the effect of being assigned to the treatment on actually receiving the treatment is estimated; for example, the effect of receiving a work-study offer (as a function of the EFC cutoff rule) on actually doing work-study. In the second stage, the predicted probability of treatment receipt from the first stage is used to estimate the treatment effect on the outcome of interest; for instance, the effect of the predicted probability of doing work-study on first-year GPA. Importantly, the estimated treatment effect using TSLS is only relevant to the subjects affected by the instrument, that is, the *compliers* who were assigned to the treatment group by satisfying the cutoff rule and who received the treatment (Lee & Lemieux, 2010). In this study, the treatment effect is thus applicable to the subpopulation of students who received a federal work-study offer by being below the EFC cutoff and actually participated in work-study.

As highlighted by Lee & Lemieux (2010), it is essential to validate the use of instruments when employing TSLS. Hence, prior to estimating treatment effects, I examined whether the probability of doing work-study is discontinuous at the EFC cutoff (see Table 10). I then fitted the data using a TSLS estimator to estimate the causal effects of participating in the federal work-study program on the outcomes of interest. In Equation (2), I present a reduced form for a

³² See Shadish et al. (2002) or Trochim (1984) for more details as cited by Flaster and DesJardins (2014).

TOLS setup. This naïve model shows the direct effects of the instrument, the binary indicator for being below the EFC cutoff, on the outcomes: $Below_i$ is a dummy variable that indicates students who qualified for work-study by being below the EFC cutoff; EFC_i is the running variable that determines work-study eligibility; $EFC * Below_i$ is an interaction term that allows “the population slopes of the relationship [between EFC and the outcome] to differ on opposite sides of the discontinuity” (Murnane & Willett, 2011, p. 189); e_{0i} is the error term; and α_0 , ρ , β_0 , and δ_0 are the parameters to be estimated.

$$Y_i = \alpha_0 + \rho(Below_i) + \beta_0(EFC_i) + \delta_0(EFC * Below_i) + e_{0i} \quad (2)$$

The estimate of ρ in Equation (2) is the direct association between being below the EFC cutoff for federal work-study and the outcome. This parameter is yet an endogenous treatment assignment correlated to the error term because of the unobserved confounding factors that are related to subject’s treatment receipt and outcomes (Flaster & DesJardins, 2014). That is, as discussed earlier, some students were offered work-study even when they had EFCs above the cutoff (e.g., professional judgments in financial aid packaging) and some students who were offered work-study also did not participate in the program for unobserved, unmeasured reasons (e.g., motivations). As a result, this makes causal interpretations of the relationship between the instrument and the outcome difficult, which leads to using a TOLS estimator that remedies the endogeneity issues.

Equation (3) is a corresponding first-stage equation in the TOLS setup. In the first stage, I estimated the probability of treatment (i.e., doing work-study) using the instrument (i.e., being below the EFC cutoff): \hat{X}_i is the predicted probability of work-study participation, the outcome; ϕ captures the jump in the probability of treatment between students below and above the cutoff, that is, it is the difference in the probability of doing work-study induced by the eligibility cutoff;

EFC_i is the running variable indicating if a student qualifies for the treatment; δ_1 is the parameter associated with the interaction term, which allows the slopes to vary on each side of the cutoff; and e_{1i} is an error term “defined as the residual from the population regression of [the outcome, \widehat{X}_i ,] on [the covariates] and the instrument” (Angrist & Lavy, 1999, p. 549).

$$\widehat{X}_i = \alpha_1 + \phi(Below_i) + \beta_1(EFC_i) + \delta_1(EFC * Below_i) + e_{1i} \quad (3)$$

The second-stage estimation shown in Equation (4) captures the local average treatment effect of work-study participation on the outcomes: λ captures the causal effects of work-study participation on the outcomes where \widehat{X}_i is the first-stage fitted value from Equation (3); and e_{2i} is an error term. As noted by Angrist and Pischke (2015), the second stage consists of the same covariates as the first stage with the exception of the dummy variable, $Below_i$, that serves as an instrument.

$$Y_i = \alpha_2 + \lambda\widehat{X}_i + \beta_2(EFC_i) + \delta_2(EFC * Below_i) + e_{2i} \quad (4)$$

In summary, I used a TSLS model to estimate the causal effects of doing work-study on student outcomes for those who were at the margin of receiving a federal work-study offer near the cutoff. Equations (3) and (4) demonstrate that the EFC threshold is serving as an instrument for the treatment of interest (i.e., work-study participation), assuming that the EFC eligibility for a federal work-study offer does not *directly* affect student outcomes, but it affects the outcomes only through their participation in the federal work-study program. I employed the TSLS estimator to estimate the treatment effects of work-study on all student outcomes examined.

Following McCall and Bielby (2012), I conducted a set of additional analyses to check whether the underlying assumptions of the model were met. First, the TSLS estimator assumes that the running variable, EFC, has a linear relationship to the outcomes. I tested this assumption by using different polynomial functions of the running variable. I began with a linear regression

model and then I estimated two other models that assumed that the running variable had a quadratic and a cubic polynomial effect, respectively, on the outcomes.

For each of the three models, I also estimated them with additional covariates. As McCall and Bielby (2012) stressed, “if the data are randomized around the cutoff point, then including additional control variables (e.g., gender and parental education) should not have an appreciable effect on the treatment estimate when compared to a model without these control variables” (p. 268). When I formally tested the covariate balance near the cutoff (see Table 12), the results indicated that any discontinuities in the outcome at the cutoff were not due to students’ baseline characteristics, with inconsistent findings for ACT score. I estimated the models including sex, URM status, first-generation status, residency, high school GPA, and ACT score to check the assumption of randomization around the cutoff, and included cohort (i.e., year) fixed effects to account for any policy changes in financial aid or other policies at the institution over the years that might confound the results. Across all models, I tested the joint null hypothesis that the coefficients related to the quadratic and cubic terms, were zero, following McCall and Bielby (2012). I reported the Chi-squared test statistics and their p values.

McCall and Bielby (2012) finally suggested to “check the sensitivity of the results to the assumption of random assignment around the cutoff point ... by narrowing the width of the interval around the cutoff point which determines whether or not an observation is included in the sample” (p. 270). I started with an optimal bandwidth selected by `rdbwselect`, a *Stata* software command to choose an optimal bandwidth when employing local polynomial RD estimators (Calonico et al., 2014; Calonico et al., 2018; Calonico et al., 2019; Calonico et al., 2020); the optimal bandwidths were slightly different for different outcomes. Then, I estimated the models using various bandwidths to check the sensitivity of the results. In general, a wider

bandwidth increases the statistical power as the sample size increases, however, it threatens the internal validity of the comparison between the treatment and control groups as the assumption of equality in expectation across these groups is less plausible (Murnane & Willett, 2011).

Thematic Analysis

In the third research question, I seek to unpack the mechanisms by which students make work-study decisions. I examined students' open-ended responses in the survey to questions about their motivations behind various decisions they have made regarding their work-study offers. For instance, I explored the reasons for accepting or declining their work-study offers, deciding to work a non-work-study job on campus or an off-campus job after declining work-study offers, or choosing to not work a part-time job at all. Also, to identify the informational and structural barriers to making informed work-study decisions, I examined student responses to questions about their pre-existing knowledge about the federal work-study program at the time of filing FAFSA, the questions and confusion they had about work-study when it was offered in their financial aid award, and overall, how experience with the federal work-study program could be improved. Specifically, I focused on the following questions from the survey:

- *When you received your financial aid award notice for the 2019-2020 academic year (a sample image below), what were some of the immediate questions or confusions you had about the “federal work-study”?*
- *What were your main reasons to accept your work-study offer for the 2019-2020 academic year?*
- *What were your main reasons to decline your work-study offer for the 2019-2020 academic year?*
- *What were your main reasons not to apply for/work any part-time jobs?*
- *What were your main reasons not to work any part-time jobs?*

- *In what ways, can Lake University improve the financial aid award notice and related practices/services to better assist students to make informed decisions about their work-study offer (accept vs. decline)?*
- *In what ways, can Lake University (e.g., offices, staff, employers) do better to improve student experience with navigating work-study jobs and making related decisions?*
- *Please share your remaining comments or feedback about how Lake University can improve students' access to information, services, and assistance related to work-study.*

Using students' open-ended responses, I conducted a thematic analysis, which "assumes that the recorded messages themselves (i.e., the texts) are the data, and codes are developed by the investigator during close examination of the texts as salient theme emerge inductively from the texts" (Neuendorf, 2019, p. 212). I thus treated each open-ended response as a single data and open coded each response. Once this process was complete, I then conducted a pattern coding that is appropriate for the second phase of coding to develop and identify central themes from the data (Miles & Huberman, 1994; Saldaña, 2013). In this step, I searched for "saturated themes" (Neuendorf, 2019, p. 212) in student responses to reach "qualitative, inductive, conclusions about [those] themes" (Neuendorf, 2019, p. 219). Lastly, I complemented the findings from the thematic analysis of students' open-ended responses with the results from relevant closed-ended questions (e.g., *How satisfied were you with the assistance you received from the Office of Financial Aid regarding your inquiries about work-study?*).

Limitations

There are a few limitations to this study related to above data and analysis. First, the administrative student records did not capture any off-campus student employment. If a student declined a federal work-study offer and worked a job off campus, this information was not available. Therefore, any part-time employment data analyzed in this study was restricted to

understanding students' on-campus employment behaviors. One of the outcomes I examined, for example, was the total hours worked during the fall and winter semesters over an 8-month period. I was able to determine how participating in work-study impacted the hours worked on campus, however, the results would not reflect the hours students worked from all types of employment if a student had both on and off campus jobs. Still, I collected information about students' off-campus part-time work and analyzed the data to supplement the findings from the analysis of administrative student records data.

As discussed earlier, the internal validity of this study can be also threatened if there are other factors that play a role in students' work-study behaviors such as other financial aid offers. I indicated that I confirmed with the university that no other financial aid programs uses the same eligibility criteria as federal work-study at Lake University, however, I still had limited ability to determine how close the thresholds were regarding a few financial programs. Specifically, there were two financial aid programs that were introduced at Lake University within the window of my analysis; one program began in 2015 and the other program began in 2018. Both programs are designed for low- and limited-income in-state resident students, and one program is designed for low-income, high-achieving students in particular. The income threshold for one aid program was \$65,000 and assets less than \$50,000. The other program identified low-income students using the federal subsidized-lunch program data, and the income threshold was between \$33,000 and \$46,000 for a family of four in 2018.³³ As these programs employ income thresholds while work-study uses EFC to establish aid eligibility, I could not compare the two different types of aid eligibility information and determine how these thresholds could have interacted. To examine any potential threats, I descriptively confirmed that work-study take-up rates did not change in

³³ Income threshold numbers are rounded up to the nearest thousands.

the years when these new aid programs were introduced. As noted earlier, I also included cohort (year) fixed effects in the estimation models to account for any policy changes in financial aid or other policies at Lake University over the years that could confound the results.

A survey of students' who were offered work-study made valuable contributions to this study and moreover, our current knowledge about how students make work (study) decisions in general. However, it should be noted that the survey data had several limitations. First, the focus group interviews, which was one of the steps of the survey instrument development, included White and Asian participants only. All participation was voluntary, however, I did not have any Black, Hispanic, or Native participants who accepted my invitations to the interviews. Although Lake University is predominantly White with the second largest population being Asian, the lack of representation of non-White, non-Asian students could have impacted my survey instrument development (e.g., not including response options that reflect their experiences).

It was also highly likely that the survey data had measurement error, which is “a departure from the true value of the measurement as applied to a sample unit and the value provided” (Groves et al., 2009, p. 52). Measurement error generally originates from various sources such as respondents' misreporting to sensitive questions (e.g., underreporting drug use) or misunderstanding of wording or phrases in a question, especially when the responses are all self-reported. I took several steps to reduce any potential measurement error in the student survey. As noted earlier, I adopted multiple methods to evaluate the survey items including cognitive interviews and field pretests, revising the questionnaire based on the participants' feedback, questions, and confusions. There were a few response options that were added as a result of this process, however, no concerns were identified regarding the sensitivity of topics in the survey or question wording.

Surveys also consist of other types of error such as coverage or sampling errors that result in having a study sample that is not representative of the target population. In this study, I did not have any coverage error, which occurs when the population, from which a sample is drawn, does not cover the actual population (Groves et al., 2009). For example, a researcher may conduct a survey using a randomly generated landline phone number. However, there would be a coverage error if not every potential respondent has a landline phone. In this study, the sample was drawn from a whole population list of students who were offered work-study in the academic year of interest. Yet, the survey data for this study was still had sampling error, which was “deliberately introduced into sample survey statistics [because] of cost or logistical infeasibility [that led to] not all persons in the sampling frame are measured” (Groves et al., 2009, p. 56).

Specifically, the survey invitation was sent to all students in the population list who were offered work-study for 2019-20 academic year ($n = 2,226$), excluding those who participated in focus groups, cognitive interviews, and pretests ($n = 42$). Due to the limited funding available for participant compensation, however, I had a limited ability to allow all interested students to take the survey. As a result, not everyone in the sampling frame had an equal chance of selection. I however did not apply any survey weights to my survey data to correct for relevant errors for an important reason. In the survey data, there were both quantitative and qualitative responses I analyzed. If I weighted the quantitative responses, the findings from quantitative analysis would then represent a different student population than the findings from qualitative responses, for which sampling weights were inapplicable. Therefore, I decided not to apply any weights to survey data, but to take caution in the interpretations of the survey findings.

Lastly, the findings of this study are not generalizable as it focused on a single institution. This has been a consistent limitation of the majority of the prior research on work-study because

the program, in nature, operates differently across institutions, given their discretions as to how they allocate work-study funds or offer work-study positions on campus. Hence, the approach to understanding the impact of the federal work-study program has been a collective effort by aggregating the findings from various studies, accounting for the institution-level variations. As in previous literature, I also note that interpretations of the findings from this study should be limited to similar contexts. Still, this study makes important contributions to research, policy, and practice related to federal work-study based on unprecedented administrative datasets and a supplementary student survey of recent college students. The administrative data for this study was not only able to distinguish different types of on-campus employment (work-study vs. non-work-study), but also the survey data updated our existing knowledge of student experiences that was lastly surveyed about two decades ago (e.g., Troppe, 2000). In addition, based on the precise and detailed information about the institutions' work-study fund allocation processes, I achieved to conduct a rigorous causal inference study on federal work-study and offer robust evidence on the causal program effects on lower income college students.

Chapter 4 The Landscape of the Federal Work-Study Program

One of the important goals of this study is to elucidate the landscape of the federal work-study program and identify “the characteristics of the population, the features of implementation, and the nature of the setting” (Loeb et al., 2017, p. 1) to better understand the implications of the program. Therefore, this chapter focuses on answering the first research question, “What are the key characteristics of the federal work-study program?” by examining students’ demographic and behavioral characteristics associated with the program in three parts.

First, I begin by examining the distributions of a federal work-study offer and student decisions about on-campus employment including federal work-study. There are primarily five different subgroups defined by students’ work-study offer receipt and on-campus employment statuses (i.e., work-study, non-work-study, and no work) based on the administrative data. Using the survey of students who were all offered work-study, I introduce two additional subgroups of work-study decliners who made decisions that were not captured in the administrative data (i.e., regarding off-campus work and no work at all).

I then perform a series of comparative analyses of student characteristics including demographics, pre-college factors (e.g., level of familiarity with federal work-study while filing FAFSA), college enrollment and financial aid details, and first-year college outcomes across the different subgroups of students according to work-study offer receipt status and their work-study decisions (e.g., decline the offer and work a non-work-study job). I examine both administrative and survey data to comprehensively describe the variations in student characteristics across the student subgroups.

Lastly, I illuminate the features of students' part-time employment including federal work-study positions, non-work-study jobs on campus, and off-campus work, focusing on the subgroups of students who had a part-time job during their first-year in college. I first analyze the administrative data about on-campus employment and examined the number of jobs students had, types of job they worked, average hourly wages of those jobs, total hours worked, and total earnings across three unique subgroups of students. With regard to off-campus workers, I rely on the student survey data to explore the number of jobs they worked, types of job, and average hourly wages. I conclude the chapter with a discussion of the findings about the characteristics of federal work-study program participants as well as their work-study positions in comparison to students who have made alternative choices about part-time employment.

The Distribution of Work-Study Offers and Student Decisions

Between the 2013-14 and 2018-19 academic years, about 35% of the first-year students (n = 9,430) who submitted the FAFSA were offered federal work-study, and the remaining 65% of the sample (n = 17,441) did not receive work-study offers (see Table 13).

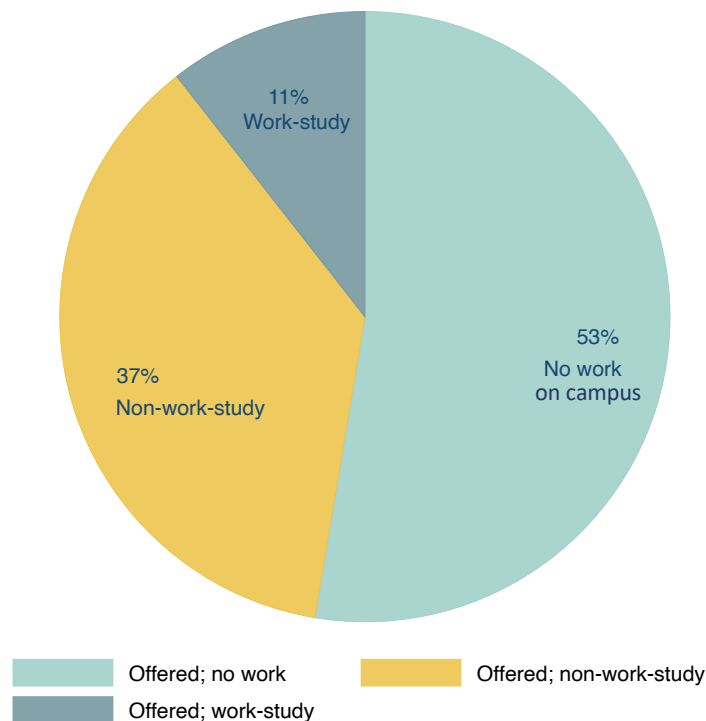
Table 13. *Work-Study Offers and Student Decisions*

| | Groups | n | % |
|--------------------|------------------------------|----------|----------|
| Offered | Work-study | 997 | 3.7 |
| | Non-work-study job on campus | 3,470 | 12.9 |
| | No work on campus | 4,963 | 18.5 |
| | <i>Subgroup total</i> | 9,430 | 35.1 |
| Not offered | Non-work-study job on campus | 2,527 | 9.4 |
| | No work on campus | 14,914 | 55.5 |
| | <i>Subgroup total</i> | 17,441 | 64.9 |
| | Total | 26,871 | 100.0 |

Note: The percentages may not add up to 100 due to rounding.

Students who received work-study offers made one of the three types of decisions: (a) accepted work-study offer and had a work-study job, (b) declined work-study offer and had a non-work-study job on campus, or (c) declined work-study offer and had no on-campus employment.³⁴ More specifically, 997 students ultimately had federal work-study employment, which made up about 11% of the students who received work-study offers (see Table 13; Figure 22).³⁵ Hence, the remaining students were work-study decliners, among which 3,470 students worked a non-work-study job on campus and 4,963 students had no on-campus employment. These students were approximately 37% and 53% of the students with work-study offers, respectively. Overall, the work-study take-up rate was close to 11% among six cohorts of first-year students at Lake University, that is, almost 89% of those who were offered work-study declined their offers.

Figure 22. *Work Decisions Among Students With Work-Study Offers (n=9,430)*



³⁴ The administrative data is not able to identify students who might have had off-campus employment or those who did not work at all either on or off campus among work-study decliners.

³⁵ In Figure 20, the percentages do not add up to 100 due to rounding.

There were 17,441 students who were not offered work-study and made up about 65% of the entire sample (see Table 12). These students either (a) had an on-campus employment (non-work-study; n = 2,527) or (b) did not work on campus at all (n = 14,914). The students who had a non-work-study on-campus employment were merely about 14% among the students who were not offered work-study (see Figure 23). The other 86% of the students without work-study offers then had no on-campus employment.

Figure 23. Work Decisions Among Students Not Offered Work-Study (n=14,914)

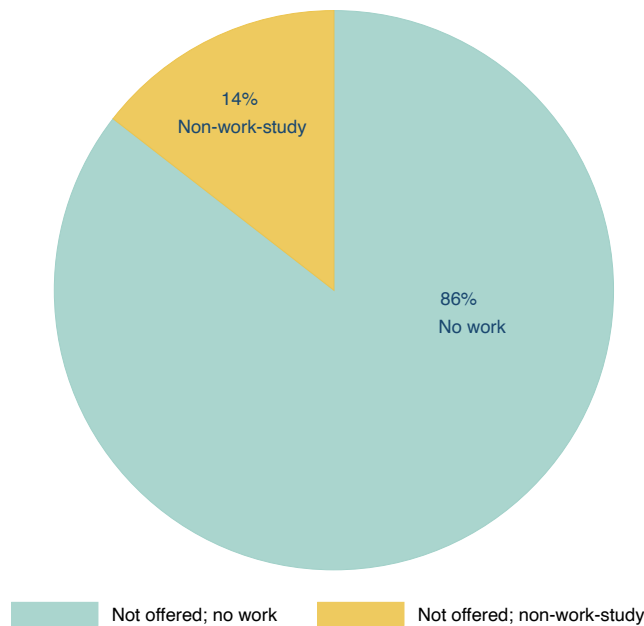
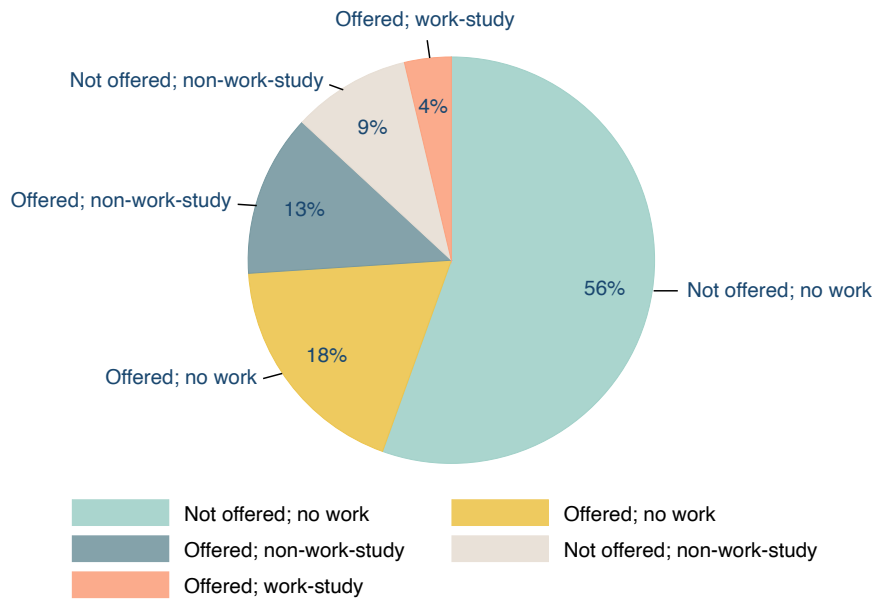


Figure 24 illustrates the breakdown of five student subgroups divided according to their work-study offer receipt and on-campus employment statuses for the whole sample (n = 26,871). In sum, approximately 74% of the sample had no on-campus employment history during their first-year at Lake University whether they were offered work-study or not. About 22% of the sample had non-work-study employment on campus, including work-study decliners (13%) and those who were not offered work-study (9%). Finally, only 4% of the first-year students participated in the federal work-study program among fall 2013 through fall 2018 cohorts.

Figure 24. *The Distribution of Work-Study Offers and Student Decisions (n=26,871)*



The administrative data, however, does not collect information about students’ off-campus employment and I could not determine what other decisions work-study decliners might have made if they did not work on campus. Thus, I examined the survey data of students who were all offered work-study (n = 514). Table 14 shows that about 41% of the respondents were work-study participants and the rest (59%) were work-study decliners. Among work-study decliners, there were students who (a) worked a non-work-study job on campus, (b) worked off campus, and (c) worked no part-time job at all.

Table 14. *Work Decisions Among Students With Work-Study Offers – Survey (n=514)*

| Groups | n | % |
|------------------------------|------------|--------------|
| Work-study | 211 | 41.1 |
| Non-work-study job on campus | 33 | 6.4 |
| Off-campus job | 28 | 5.5 |
| No work at all | 242 | 47.1 |
| Total | 514 | 100.1 |

Note: The percentages do not add up to 100 due to rounding.

In summary, I examined the distributions of work-study offers and student decisions among six cohorts of first-time, full-time first-year students who enrolled at Lake University. Based on the administrative data, approximately 35% of the students were offered federal work-study aid as a part of their financial aid awards after submitting the FAFSA. Among students who were offered work-study, the take-up rate was only about 11%, resulting in less than 5% of the students in the analytic sample having participated in the federal work-study program.

Federal work-study offer decliners made several different choices. Some students had a non-work-study position on campus after declining their work-study offers, which was nearly 37% of the students who were offered work-study. Meanwhile, the rest of the decliners had no record of on-campus employment and made up a slightly more than 50% of the students who were offered work-study. Based on a student survey of work-study-offered students, I discovered that some of these students without on-campus employment records (after declining work-study) had an off-campus part-time job while some chose not to work at all during their first-year in college. The extent of the exact proportions of off-campus workers and non-workers were not able to be verified using the administrative student record data as it does not collect off-campus employment data. The findings from the survey still suggested that in large part, work-study decliners with no on-campus employment records were likely to not work off campus either.

As indicated earlier, about 65% of the students in the administrative data sample were not offered federal work-study aid. The results showed that while 14% of these students had a part-time job on campus, the others had no on-campus employment records at all. Like work-study decliners, these students without on-campus employment records could have worked off-campus jobs or not worked any part-time job. Nevertheless, in this study, I cannot determine whether these students without work-study offers worked off campus or had no part-time job at all.

Student Characteristics by Work-Study Status

So far, the findings indicate that students make various decisions about their work-study offers and more broadly, about having part-time employment during the first year in college. As a next step, I conducted an in-depth descriptive analysis of student characteristics and examined whether they were meaningfully different among students who have made distinctive decisions through several stages. First, I compared student characteristics between students who were offered federal work-study and those who were not, using the administrative student record data. Student characteristics included (a) demographics, (b) college enrollment and financial aid, and (c) first-year college outcomes.

The following set of analyses specifically focused on federal work-study-offered students and how student characteristics varied across its three subgroups of students who made different work-study decisions: (a) take-up work-study, (b) decline work-study and work a non-work-study job on campus, or (c) decline work-study and not work on campus. Using the survey data, I further explored whether and if so, how certain pre-college factors (e.g., level of familiarity with work-study while filing the FAFSA) were related to students' work-study decisions. As shown in Table 14, the survey data identified four different types of decision groups among work-study-offered students and thus, the pre-college factors were compared across these student subgroups: (a) take-up work-study, (b) decline work-study and work a non-work-study job on campus, (c) decline work-study and work an off-campus job, or (d) decline work-study and not work.

Student Characteristics by Work-Study Offer Status

In Tables 15-17, I present the results from a comparative analysis of the differences in student characteristics between students who received work-study offers and those who did not. I examine students' demographics, college enrollment and financial aid, and first-year outcomes.

Demographics. Students who received a federal work-study offer ($n = 9,430$) and those without offers ($n = 17,441$) were meaningfully distinguishable in terms of sex, race and ethnicity, URM status, and first-generation status. The subgroup of work-study-offered students included larger proportions of females (54.2% vs. 50.8%), non-White students (i.e., Black, Hispanic, Asian, multiracial) (about 44% vs. 37%), URM students (19.7% vs. 13.3%), and first-generation students (27.7% vs. 9.2%). These differences were all statistically significant ($p < 0.001$). In particular, there were noticeably more Black and Hispanic students and less White students among those who were offered work-study than the group of students without work-study offers.

Students' pre-college academic achievements were comparable between the two groups of students with and without federal work-study offers. The average high school GPAs were the same (about 3.9), and the difference was not statistically significant. The average ACT scores of the two student groups were comparable with a marginal, but statistically significant difference of one point. Students who were offered work-study, on average, had one-point lower ACT scores than those who were not offered work-study. Regarding AP scores, both the number of scores submitted to the university as well as the average score of the submitted AP scores were statistically different between the two groups. On average, work-study-offered students submitted less than six AP test scores while students who were not offered work-study submitted more than six AP test scores. The difference in the average AP test scores was 0.3 with work-study-offered students scoring lower than those without work-study offers.

Overall, the findings indicated that work-study-offered students and those without offers were statistically significantly different in all demographic characteristics examined ($p < 0.001$). One exception was the average high school GPA, which was not surprising given that students' high school GPAs do not vary much at Lake University in general.

Table 15. *Student Demographics by Work-Study Offer Status*

| Variables | Offered work-study <i>n</i> = 9,430 | | Not offered work-study <i>n</i> = 17,441 | | <i>p</i> |
|--|--|-----------|---|-----------|-----------------|
| | <i>n</i> | % | <i>n</i> | % | |
| Sex | | | | | |
| Female | 5,107 | 54.2 | 8,854 | 50.8 | |
| Male | 4,323 | 45.8 | 8,587 | 49.2 | *** |
| Race/ethnicity | | | | | |
| White | 5,323 | 56.5 | 10,917 | 62.6 | |
| Black | 757 | 8.0 | 775 | 4.4 | |
| Hispanic | 801 | 8.5 | 1,152 | 6.6 | |
| Asian | 1,673 | 17.7 | 2,845 | 16.3 | |
| Native | 19 | 0.2 | 36 | 0.2 | |
| Multiracial | 473 | 5.0 | 818 | 4.7 | |
| Unknown | 384 | 4.1 | 898 | 5.2 | *** |
| Underrepresented minority (URM) | | | | | |
| Non-URM | 7,570 | 80.3 | 15,127 | 86.7 | |
| URM | 1,860 | 19.7 | 2,314 | 13.3 | *** |
| First-generation | | | | | |
| Non-first-generation | 6,802 | 72.3 | 15,777 | 90.8 | |
| First-generation | 2,605 | 27.7 | 1,600 | 9.2 | *** |
| | Mean | SD | Mean | SD | <i>p</i> |
| High school GPA | 3.9 | 0.172 | 3.9 | 0.168 | . |
| ACT composite score | 30.0 | 3.350 | 31.0 | 3.093 | *** |
| Number of AP scores submitted | 5.8 | 3.086 | 6.4 | 3.105 | *** |
| Average AP scores | 3.6 | 0.843 | 3.9 | 0.769 | *** |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: (1) The percentages may not add up to 100 due to rounding. (2) ' p ' shows the statistical significance of the Pearson's Chi-squared statistics for categorical variables or t-test statistics for continuous variables.

College Enrollment and Financial Aid. Table 16 shows student characteristics related to enrollment and financial aid award information. In the subsample of students with work-study offers, there was a higher percentage of resident students (68.4% vs. 60.1%) compared to the group of students who did not receive work-study offers ($p < 0.001$). Students' enrolled colleges

also had a statistically significant relationship with work-study offer status. Among students who were offered work-study, there were lower percentages of students in the College of Engineering (20.6% vs. 23.4%) and in the College of Business Administration (1.6% vs. 2.3%), and then larger proportions of students in the colleges of Literature, Science, and the Arts, Art and Design, Music and Dance, Kinesiology, and Nursing among work-study-offered students.

The results also indicated that the average COA was about \$2,100 lower for work-study-offered students than students who were not offered work-study ($p < 0.001$). Meanwhile, there was a substantial difference in students' EFCs between the two groups. Work-study-offered students' average EFC was about \$7,400 whereas students who were not offered work-study had EFCs of about \$65,800 on average, and there was about \$58,400 gap in EFCs ($p < 0.001$). This further implies that work-study-offered students would have had greater demonstrated need (i.e., COA-EFC). Accordingly, students with work-study offers received about \$19,000 more gift aid on average than students who were not offered work-study ($p < 0.001$). Students who had work-study offers also had \$1,300 more loans on average than those without work-study offers ($p < 0.001$). Although this difference in loans might appear not substantial, for work-study-offered students, the average loan amount of \$5,500 equaled nearly 74% of their EFCs.

In addition, FAFSA information indicated that a much larger proportion of students with work-study offers (about 71% vs. 58%) have expressed interest in work-study in the FAFSA than those who were not offered ($p < 0.001$). Work-study-offered students also had a lower ratio of students who answered "No" (8.8% vs. 16.5%) than those who were not offered. For those who were offered work-study aid, the offer amount was, on average, about \$2,700.

In brief, students who received federal work-study offers and those who did not were significantly different in their enrollment and financial aid characters. Work-study-offered

students had larger shares of resident students and smaller shares of students in engineering and business administration. Notably, students with work-study offers had significantly lower EFCs and accordingly, greater financial need than students who were not offered, resulting in larger gift aid and loans as well as work-study offers. Work-study-offered students also had much more students who indicated interest in federal work-study in the FAFSA.

Table 16. *College Enrollment and Financial Aid by Work-Study Offer Status*

| Variables | Offered work-study <i>n</i> = 9,430 | | Not offered work-study <i>n</i> = 17,441 | | <i>p</i> |
|------------------------------------|--|-----------|---|-----------|-----------------|
| | n | % | n | % | |
| Residency | | | | | |
| Non-resident | 2,976 | 31.6 | 6,957 | 39.9 | |
| Resident | 6,454 | 68.4 | 10,484 | 60.1 | *** |
| College | | | | | |
| Literature, Science, & the Arts | 6,211 | 65.9 | 11,084 | 63.6 | |
| Engineering | 1,942 | 20.6 | 4,089 | 23.4 | |
| Business Administration | 155 | 1.6 | 401 | 2.3 | |
| Art & Design, Music & Dance | 581 | 6.2 | 904 | 5.2 | |
| Architecture | 27 | 0.3 | 47 | 0.3 | |
| Kinesiology | 251 | 2.7 | 444 | 2.6 | |
| Nursing | 263 | 2.8 | 472 | 2.7 | *** |
| Work-study interest (FAFSA) | | | | | |
| Yes | 6,669 | 70.7 | 10,137 | 58.1 | |
| No | 828 | 8.8 | 2,882 | 16.5 | |
| Don't know | 1,933 | 20.5 | 4,422 | 25.4 | *** |
| (Unit: \$1,000) | Mean | SD | Mean | SD | <i>p</i> |
| Cost of attendance (COA) | 38.7 | 14.774 | 40.8 | 15.368 | *** |
| Expected family contribution (EFC) | 7.4 | 8.618 | 65.8 | 87.345 | *** |
| Gift aid amount | 27.4 | 18.775 | 8.4 | 15.344 | *** |
| Loan amount | 5.5 | 7.956 | 4.2 | 10.655 | *** |
| Work-study offer amount | 2.7 | 0.478 | - | - | |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: (1) The percentages may not add up to 100 due to rounding. (2) ' p ' shows the statistical significance of the Pearson's Chi-squared statistics for categorical variables or t-test statistics for continuous variables.

First-Year College Outcomes. I also explored the relationships between students' work-study offer status and three first-year college outcomes (see Table 17). With regard to college persistence, I examined dropouts at two different time points: after the 1st semester, after the 1st year. First, I discovered that the students who were offered work-study had a marginally lower percentage of students who dropped out after their 1st semester in college (0.7% vs. 1.1%) than students who were not offered work-study ($p < 0.01$). However, the difference in the proportion of students who dropped out after their first-year (i.e., dropped out after two semesters; did not persist to 2nd year) between the two groups were statistically insignificant (3.0% vs. 3.2%). In both groups of students, the overall dropout rate after the 1st year was about 3%.

In terms of a cumulative first-year GPA, the average GPA of work-study-offered students was statistically significantly lower (3.3 vs. 3.4) than the average GPA of students who were not offered work-study ($p < 0.001$). At Lake University, a 3.3 GPA is equivalent to a letter grade of B+ while a 3.4 GPA is between A- and B+, making the 0.1-point gap practically meaningful.

Table 17. *First-Year Outcomes by Work-Study Offer Status*

| Variables | Offered work-study <i>n</i> = 9,430 | | Not offered work-study <i>n</i> = 17,441 | | <i>p</i> |
|--|--|-----------|---|-----------|-----------------|
| | n | % | n | % | |
| Dropped out after 1st semester | | | | | |
| Dropped out | 65 | 0.7 | 191 | 1.1 | |
| Stayed | 9,365 | 99.3 | 17,250 | 98.9 | ** |
| Dropped out after 1st year | | | | | |
| Dropped out | 286 | 3.0 | 554 | 3.2 | |
| Stayed | 9,144 | 97.0 | 16,887 | 96.8 | . |
| | Mean | SD | Mean | SD | <i>p</i> |
| First-year GPA | 3.3 | 0.492 | 3.4 | 0.472 | *** |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: (1) The percentages may not add up to 100 due to rounding. (2) ' p ' shows the statistical significance of the Pearson's Chi-squared statistics for categorical variables or t-test statistics for continuous variables.

Student Characteristics by Work-Study Decision

In Tables 18-21, I show student characteristics specifically among students who were offered federal work-study but made varying decisions about their offers. To elaborate, work-study-offered students made three different types of decisions: (a) accepted the offer and had a work-study position, (b) declined the offer but still worked a non-work-study job on campus, or (c) declined the offer and had no on-campus employment. Across these three subgroups of students, I investigated whether student characteristics were significantly different. Using the administrative data, I analyzed student demographics, college enrollment and financial aid, and first-year outcomes. I then examined the relationship between several pre-college factors and students' work-study decisions using the survey data.

Demographics. Table 18 displays the association between student demographics and their work-study decisions. The results indicated that that all demographic characteristics I examined were statistically significantly different across the three decision groups. First, among work-study participants, the proportion of female students was the largest (61.8%), followed by work-study decliners who worked a non-work-study job on campus (59.4%) and then the other group of decliners who did not work on campus (49.0%) ($p < 0.001$). More broadly, in the first two subgroups of students who had an on-campus job either work-study or non-work-study, more than half of the students were female students while there were more male students in the group of students with no work on campus.

Both students' URM and first-generation statuses also statistically significantly varied across the three work-study decision subgroups ($p < 0.001$). Overall, in all three groups, there were more non-URM students (between 74% and 84%) and more non-first-generation students (between 66% and 74%) than URM or first-generation students. Across the subgroups, there

were significantly higher proportions of URM (26.5%) and first-generation students (33.5%) among work-study students than the subgroup of decliners with non-work-study jobs (23.2% URM; 28.6% first-generation) as well as the subgroup of decliners with no work on campus (15.9% URM; 25.9% first-generation).

The relationships between students' work-study decision status and each of the four types of academic characteristics were statistically significant as well. The average high school GPA was the highest for the group of work-study participants across the three decision groups, that is, higher than work-study decliners ($p < 0.001$). I additionally conducted the Bonferroni multiple-comparison test using the three groups and confirmed that the average high school GPA was not significantly different between the two subgroups of work-study decliners.

The ACT scores were also related to students' work-study decisions ($p < 0.001$), and the students who had no work on campus had the highest ACT score (29.8) than the other two groups of students who worked either work-study or non-work-study positions. However, the Bonferroni multiple-comparison test results showed that the only meaningful difference was between the two group of work-study decliners including students who had a non-work-study job on campus (29.5) and those with no work on campus (29.8) with a 0.3-point gap.

On average, work-study participants submitted the greatest number of AP scores to the university with more than six scores compared to work-study decliners who submitted less than six scores ($p < 0.001$). It was followed by the students with no work on campus (5.8) and then those who had a non-work-study position on campus after declining work-study (5.7). The 0.1-point difference between the two subgroups of work-study decliners were statistically different according to the Bonferroni multiple-comparison test results. The average AP score moreover statistically significantly varied across the three groups ($p < 0.05$). The decliners with a non-

work-study employment on campus had the lowest average AP score with 3.6 while the other two groups had an average score of 3.7. Yet, the Bonferroni multiple-comparison test indicated that while the 0.1-point difference between non-work-study students and those who did not work was statistically different ($p < 0.05$), the same 0.1-point gap was not statistically meaningful between work-study and non-work-study workers.

Table 18. *Student Demographics by Work-Study Decision*

| Variables | Offered work-study | | | | | | <i>p</i> |
|-------------------------------|--------------------|-----------|------------------------------|-----------|-------------------|-----------|-----------------|
| | Work-study | | Non-work-study job on campus | | No work on campus | | |
| | <i>n</i> = 997 | | <i>n</i> = 3,470 | | <i>n</i> = 4,963 | | |
| | n | % | n | % | n | % | |
| Sex | | | | | | | |
| Female | 616 | 61.8 | 2,061 | 59.4 | 2,430 | 49.0 | |
| Male | 381 | 38.2 | 1,409 | 40.6 | 2,533 | 51.0 | *** |
| URM | | | | | | | |
| Non-URM | 733 | 73.5 | 2,665 | 76.8 | 4,172 | 84.1 | |
| URM | 264 | 26.5 | 805 | 23.2 | 791 | 15.9 | *** |
| First-generation | | | | | | | |
| Non-first-generation | 658 | 66.2 | 2,472 | 71.4 | 3,672 | 74.2 | |
| First-generation | 336 | 33.8 | 989 | 28.6 | 1,280 | 25.9 | *** |
| | Mean | SD | Mean | SD | Mean | SD | <i>p</i> |
| High school GPA | 3.9 | 0.131 | 3.8 | 0.170 | 3.8 | 0.181 | *** |
| ACT composite score | 29.7 | 3.465 | 29.5 | 3.413 | 29.8 | 3.275 | *** |
| Number of AP scores submitted | 6.2 | 3.184 | 5.7 | 3.020 | 5.8 | 3.103 | *** |
| Average AP scores | 3.7 | 0.833 | 3.6 | 0.871 | 3.7 | 0.824 | * |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: (1) The percentages may not add up to 100 due to rounding. (2) ' p ' shows the statistical significance of the Pearson's Chi-squared statistics for categorical variables or one-way analysis-of-variance (ANOVA) test statistics for continuous variables.

Overall, the results revealed that all examined student demographics were meaningfully associated with students' work-study decisions among those who were offered.

College Enrollment and Financial Aid. All college enrollment and financial aid award variables examined in Table 19 had statistically significant relationships with students' work-study decisions. In all three subgroups of work-study-offered students, there was a higher share of resident students. The subgroup of work-study students then had the smallest proportion of resident students (64.3%) than the group of decliners with non-work-study positions on campus (72.5%) and the other group of decliners with no work on campus (66.5%).

The overall trend of students' affiliated colleges were similar across all three subgroups of students. Most students were in the College of Literature, Science, and the Arts (between 63% and 70%), followed by the College of Engineering and the College of Architecture (between 18% and 23%), and then the College of Art and Design as well as the College of Music and Dance (between 6% and 7%). Compared to the two decliner subgroups, work-study students had a significantly smaller proportion of those studying literature, science, and the arts, engineering, and architecture, but larger proportions of students in other colleges ($p < 0.001$).

Furthermore, students' financial aid related factors meaningfully varied by students' work-study decision status. Among students who were offered work-study, work-study students' average COA was the highest with \$43,000. It was followed by the subgroup of decliners who had no work on campus (\$39,300) and then the subgroup of decliners who had non-work-study jobs on campus (\$36,600). The results from the Bonferroni multiple-comparison test showed that all between-subgroup differences were statistically significant ($p < 0.001$).

EFC also had a statistically significant relationship with students' work-study decisions ($p < 0.05$). While all work-study-offered students' EFCs were in the \$7,000 range, students who had no work on campus had the highest EFC among the three decision groups with an average of \$7,600. Their average EFC appeared to be statistically significantly higher than the average EFC

of work-study decliners who had a non-work-study job on campus (\$7,100). However, there was no statistically meaningful gap in the average EFCs between work-study students (\$7,300) and the decliners who had no work on campus (\$7,600).

Work-study-offered students received gift aid amounts that were, on average, higher than work-study decliners. In particular, the Bonferroni multiple-comparison test indicated that the \$2,600 difference in the average gift aid amount between work-study students and the decliners with no work on campus was statistically significant (\$29,100 vs \$26,500). The average gift aid amount was also significantly lower for the subgroup of work-study decliners with no work on campus than the decliners who had a non-work-study job on campus (\$26,500 vs \$ 28,100).

While work-study students received the highest average amount of gift aid, they had the lowest average loan amounts compared to the two groups of work-study decliners, and the loan amount was statistically significantly related to students' work-study decisions ($p < 0.05$). In general, all work-study-offered students had loans amounts in the \$5,000 range. Work-study students had an average of \$5,100 in loans whereas the decliners with a non-work-study job on campus had a significantly higher average loan amount with \$5,800. Work-study decliners who did not work on campus had an average loan amount of \$5,500, yet the Bonferroni multiple-comparison test statistics showed that it was not meaningfully different from that of work-study students (\$5,100) or that of work-study decliners with non-work-study jobs on campus (\$5,800).

The average work-study offer amounts statistically significantly varied across all three decision groups ($p < 0.001$). On average, work-study participants received \$200 more than the decliners who worked non-work-study jobs on campus and then \$100 more than the decliners who did not work on campus. These differences were all statistically significant between groups according to the Bonferroni multiple-comparison test. Work-study participants, yet, had a lower

share of students who expressed interest in work-study in FAFSA (75.8%) than the subgroup of work-study decliners with non-work-study jobs on campus (80.1%). Both groups of students who worked (work-study and non-work-study) though had a higher proportion of students who had interest in work-study than the decliners who had no work on campus (63.2%).

Table 19. *College Enrollment and Financial Aid by Work-Study Decision*

| Variables | Offered work-study | | | | | | <i>p</i> |
|------------------------------------|------------------------------|-----------|---|-----------|--|-----------|-----------------|
| | Work-study <i>n</i> = 997 | | Non-work-study job on campus <i>n</i> = 3,470 | | No work on campus <i>n</i> = 4,963 | | |
| | n | % | n | % | n | % | |
| Residency | | | | | | | |
| Non-resident | 356 | 35.7 | 955 | 27.5 | 1,665 | 33.6 | |
| Resident | 641 | 64.3 | 2,515 | 72.5 | 3,298 | 66.5 | *** |
| College | | | | | | | |
| Literature, Science, & the Arts | 663 | 66.5 | 2,438 | 70.1 | 3,110 | 62.7 | |
| Engineering, Architecture | 177 | 17.8 | 636 | 18.3 | 1,156 | 23.3 | |
| Business Administration | 26 | 2.6 | 20 | 0.6 | 109 | 2.2 | |
| Art & Design, Music & Dance | 72 | 7.2 | 205 | 5.9 | 304 | 6.1 | |
| Kinesiology | 33 | 3.3 | 88 | 2.5 | 130 | 2.6 | |
| Nursing | 26 | 2.6 | 83 | 2.4 | 154 | 3.1 | *** |
| Work-study interest (FAFSA) | | | | | | | |
| Yes | 756 | 75.8 | 2,779 | 80.1 | 3,134 | 63.2 | |
| No | 46 | 4.6 | 185 | 5.3 | 597 | 12.0 | |
| Don't know | 195 | 19.6 | 506 | 14.6 | 1,232 | 24.8 | *** |
| (Unit: \$1,000) | Mean | SD | Mean | SD | Mean | SD | <i>p</i> |
| Cost of attendance (COA) | 43.0 | 16.231 | 36.6 | 13.610 | 39.3 | 15.008 | *** |
| Expected family contribution (EFC) | 7.3 | 16.752 | 7.1 | 6.849 | 7.6 | 7.202 | ** |
| Gift aid amount | 29.1 | 18.980 | 28.1 | 18.399 | 26.5 | 18.953 | *** |
| Loan amount | 5.1 | 6.617 | 5.8 | 7.990 | 5.5 | 8.170 | * |
| Work-study offer amount | 2.8 | 0.449 | 2.6 | 0.505 | 2.7 | 0.457 | *** |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: (1) The percentages may not add up to 100 due to rounding. (2) ' p ' shows the statistical significance of the Pearson's Chi-squared statistics for categorical variables or one-way analysis-of-variance (ANOVA) test statistics for continuous variables. (3) 'Engineering' and 'Architecture' were grouped together due to a zero-cell issue.

First-Year College Outcomes. As shown in Table 20, I examined three types of first-year outcomes and their relationship to students' work-study decisions. The dropout rate after the first semester in college remained lower than 1% across all three subgroups of students but appeared to be statistically different by students' work-study decisions ($p < 0.05$). Among the subgroups, the group of work-study decliners who had no work on campus had the largest share of students who dropped out after their first semester in college (0.9%), and it was followed by work-study students (0.7%) and then work-study decliners who had non-work-study positions on campus (0.4%). When looking at the rate of persistence to the 2nd year, the group of work-study decliners who had no work on campus had the largest proportion of students who dropped out after their first year in college (3.6%). This was followed by the group of decliners with non-work-study jobs on campus (2.6%) and work-study group had the lowest percentage of students (2.0%) who dropped out after first year in college (i.e., did not persist to 2nd year). The overall persistence to the 2nd rate remained high across the three subgroups with higher than 96%.

Regarding first-year GPA, it had a statistically significant relationship with students' work-study decisions. In general, students in all three subgroups had an average first-year GPA of 3.3 or 3.4. Work-study participants had the highest average first-year GPA with 3.4 which was 0.1-point higher than both groups of work-study decliners. This 0.1-point gap was statistically significant according to the Bonferroni multiple-comparison test. Again, at Lake University, a 3.3 GPA is equal to a letter grade of B+. A 3.4 GPA is then between A- and B+, making the 0.1-point difference meaningful.

In sum, work-study-offered students' first-year outcomes were statistically significantly associated with their work-study decisions. I found that on average, work-study students had the highest persistence to the 2nd year rate as well as the first-year cumulative GPA.

Table 20. *First-Year Outcomes by Work-Study Decision*

| Variables | Offered work-study | | | | | | <i>p</i> |
|--|--------------------|-----------|------------------------------|-----------|-------------------|-----------|-----------------|
| | Work-study | | Non-work-study job on campus | | No work on campus | | |
| | <i>n</i> = 997 | | <i>n</i> = 3,470 | | <i>n</i> = 4,963 | | |
| | n | % | n | % | n | % | |
| Dropped out after 1st semester | | | | | | | |
| Dropped out | 7 | 0.7 | 14 | 0.4 | 44 | 0.9 | |
| Stayed | 990 | 99.3 | 3,456 | 99.6 | 4,919 | 99.1 | * |
| Dropped out after 1st year | | | | | | | |
| Dropped out | 20 | 2.0 | 90 | 2.6 | 176 | 3.6 | |
| Stayed | 977 | 98.0 | 3,380 | 97.4 | 4,787 | 96.5 | ** |
| | Mean | SD | Mean | SD | Mean | SD | <i>p</i> |
| First-year GPA | 3.4 | 0.467 | 3.3 | 0.474 | 3.3 | 0.508 | *** |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: (1) The percentages may not add up to 100 due to rounding. (2) ‘*p*’ shows the statistical significance of the Pearson’s Chi-squared statistics for categorical variables or one-way analysis-of-variance (ANOVA) test statistics for continuous variables.

Pre-College Factors. The survey of work-study-offered students collected information about some of the factors that were relevant to the time when students were in high school and filing FAFSA. As presented in Table 21, I analyzed the student survey data to examine five pre-college factors and their relationships to students’ work-study decisions.

First, I surveyed students’ main source of help with filing FAFSA and their perceived satisfaction or quality of that help, of which both had statistically insignificant association with students’ work-study decisions. Across all four subgroups of students, between 50 to 58% of students received help with FAFSA primarily from their parents or guardians. The next main source of help with FAFSA filing was students themselves and their own research across all decision groups with an only exception of work-study decliners who worked non-work-study jobs on campus who instead received assistance from sibling(s) who attends or attended college.

The group of decliners who worked off campus jobs moreover had the largest share of students who rated the help with FAFSA as average or below (36%) compared to the other two groups. It was followed by the group of decliners who worked non-work-study jobs on campus (30%), and work-study student group had the smallest share of those who rated their main help with FAFSA as average or below (21%).

Students' indication of interest in work-study in FAFSA continued to have a statistically significant relationship with their work-study decisions according to the survey results ($p < 0.001$). The group of work-study participants had the highest percentage of students who expressed interest in federal work-study in FAFSA than all other subgroups of work-study decliners. Moreover, their level of familiarity with federal work-study at the time of filing FAFSA had a statistically significant relationship with students' work-study decisions ($p < 0.1$). The findings showed that work-study participant group had the highest percentage of students who reported to have been moderately, very, or extremely familiar with work-study (about 56%) at the time of filing FAFSA among all subgroups of work-study decliners. In the subgroups of decliners who had non-work-study jobs on campus and decliners who did not work at all, most of the students in these groups reported that they were slightly familiar or not at all familiar with federal work-study at the time of filing FAFSA (63.6% and 62.5, respectively).

Experience with work for pay while in high school was not statistically associated with students' work-study decisions when offered. Overall, more than half of students in all decision groups ever worked for pay in high school. Among the four groups, work-study decliners who worked an off-campus job had the highest percentage of students who ever worked for pay in high school (82.1%), which was followed by work-study students (70.1%). The other two groups of decliners similarly had between 64% and 66% of students with paid-work experience.

Table 21. *Pre-College Factors by Work-Study Decision*

| Variables | Offered work-study | | | | | | | | <i>p</i> |
|---|--------------------|------|------------------------------|------|----------------|------|----------------|-------|----------|
| | Work-study | | Non-work-study job on campus | | Off-campus job | | No work at all | | |
| | <i>n</i> = 211 | | <i>n</i> = 33 | | <i>n</i> = 28 | | <i>n</i> = 242 | | |
| | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % | |
| Main source of help with FAFSA | | | | | | | | | |
| My own search (e.g., web searching) | 45 | 21.3 | 3 | 9.1 | 8 | 28.6 | 55 | 22.7 | |
| Parents(s)/guardians | 113 | 53.6 | 19 | 57.6 | 14 | 50.0 | 136 | 56.2 | |
| Sibling(s) who attends/attended college | 18 | 8.5 | 7 | 21.2 | 1 | 3.6 | 16 | 6.6 | |
| Other | 35 | 16.6 | 4 | 12.1 | 5 | 17.9 | 35 | 14.5 | . |
| Rating of the help received | | | | | | | | | |
| Excellent | 65 | 30.8 | 12 | 36.4 | 8 | 28.6 | 64 | 26.5 | |
| Good | 102 | 48.3 | 11 | 33.3 | 10 | 35.7 | 118 | 48.76 | |
| Average or below | 44 | 20.9 | 10 | 30.3 | 10 | 35.7 | 60 | 24.8 | . |
| Work-study interest (FAFSA) | | | | | | | | | |
| Yes | 206 | 97.6 | 27 | 81.8 | 24 | 85.7 | 194 | 80.2 | |
| No/Don't know | 5 | 2.4 | 33 | 18.2 | 28 | 14.3 | 242 | 19.8 | *** |
| Familiarity with work-study | | | | | | | | | |
| Extremely familiar | 7 | 3.3 | 1 | 3.0 | 1 | 3.6 | 2 | 0.8 | |
| Very familiar | 21 | 10.0 | 1 | 3.0 | 3 | 10.7 | 19 | 7.9 | |
| Moderately familiar | 89 | 42.2 | 10 | 30.3 | 9 | 32.1 | 70 | 28.9 | |
| Slightly familiar | 59 | 28.0 | 14 | 42.4 | 9 | 32.1 | 87 | 36.0 | |
| Not familiar at all | 35 | 16.6 | 7 | 21.2 | 6 | 21.4 | 64 | 26.5 | + |
| Work experience in high school | | | | | | | | | |
| Ever worked for pay | 148 | 70.1 | 21 | 63.6 | 23 | 82.1 | 159 | 65.7 | |
| Never worked for pay | 63 | 29.9 | 12 | 36.4 | 5 | 17.9 | 83 | 34.3 | . |

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: (1) Table 20 displays the unweighted descriptive statistics of the student survey data. (2) The percentages may not add up to 100 due to rounding. (3) '*p*' shows the statistical significance of the Pearson's Chi-squared statistics for categorical variables. (4) For 'Main source of help with FAFSA' variable, five categories were grouped as 'Other' due to zero cells: 'Sibling(s) who attends/attended Lake University,' 'Sibling(s) who attends/attended college other than Lake University,' 'Other family member(s) (e.g., cousin),' 'Friend(s) who attends/attended college,' 'High school counselor/teacher,' 'Hired financial aid consultant/professional,' and 'Other.' (5) For 'Rating of the help received' variable, 'Average,' 'Poor,' and 'Terrible' categories were grouped as 'Average or below' due to zero cells. (6) For 'Work-study interest (FAFSA)' variable, 'No' and 'Don't know' response options were grouped together due to zero cells.

Part-Time Job Characteristics by Work-Study Status

In this part of the chapter, I present the findings from an in-depth descriptive analysis of the various features of part-time jobs students had on campus and how the characteristics of their jobs and work behaviors varied across the three different work-study status groups. Primarily, I examined the employment characteristics of students, including the number of jobs they had, types of job they worked, and average hourly wages of those jobs and moreover, the employment outcomes such as total hours worked and total earnings. I examined these characteristics across three subgroups of students: (a) work-study participants, (b) work-study decliners who had non-work-study jobs on campus, and (c) students who were not offered work-study and had non-work-study jobs on campus.

Employment Characteristics

Number of Jobs.³⁶ As provided in Table 22, the number of part-time jobs students had on campus was statistically significantly related to work-study status ($p < 0.001$). In general, more than 80% of students in all groups worked one part-time job during their first year in college. Work-study students, yet, had a larger proportion of students who had more than one job (16.9%) than those who declined work-study and had non-work-study jobs on campus (13.4%) and those who were not offered work-study and had non-work-study jobs on campus (11.5%).

Job Type.³⁷ The types of part-time job on campus were statistically significantly different across the three groups of students. Broadly, the type of students' part-time job were distinctive between work-study-offered and not offered students. More specifically, the largest proportion of work-study-offered students (work-study participants and decliners with non-work-

³⁶ The number of jobs indicate the number of different positions or jobs students had during their first year in college and do not imply that they worked these jobs at the same time.

³⁷ In Appendix J, the specific list of job titles or descriptions are provided for each job type.

study jobs) had research-relevant positions (about 31-32%); it was only about 8% for students who were not offered work-study and had non-work-study jobs on campus. The second largest share of these students who were offered work-study had labor or service type of jobs; work-study decliners who had non-work-study positions had a higher percentage of those working in labor or service type of jobs (25.5%) than work-study participants (21.2%). Third, work-study-offered students had clerical type of jobs; work-study students had a larger share of workers in these jobs (19.6%) than work-study decliners who had non-work-study jobs on campus (14.5%).

On the other hand, close to 40% of students who were not offered work-study and had non-work-study jobs on campus had labor or service type jobs, which was considerably more than work-study participants (21.2%) and work-study decliners who had non-work-study jobs on campus (25.5%). The second largest proportion of students who were not offered work-study had administrative type of jobs (20.3%), which was about twice as much work-study-offered students did (10.1%). Then, the third highest percentage of students who were not offered work-study had professional positions on campus as their part-time jobs (10.6%).

Overall, the lowest share of students in all groups had teaching-related part-time jobs. Still, work-study students had the largest proportion of those working this type of jobs (5.7%) than work-study decliners with non-work-study position on campus (3.3%) and those who were not offered work-study and had non-work-study position on campus (2.2%).

Average Hourly Wage. The average hourly wage of the part-time jobs was statistically significantly associated with students' work-study status ($p < 0.001$). Though by a marginal gap of less than one-dollar, work-study participants had positions with the highest average hourly wage of \$10.20 compared to work-study decliners with non-work-study jobs (\$9.5), and students who were not offered work-study but worked on campus (\$9.9).

Employment Outcomes

Total Hours Worked. The number of total hours worked was statistically significantly related to students' work-study status ($p < 0.001$). Among the three groups, work-study students worked the most hours in the 8-month period (i.e., fall and winter semesters) during their first year in college, working an average of 310 hours. Meanwhile, work-study decliners who had non-work-study positions on campus worked an average of 270 hours during the same period. Students who were not offered work-study and worked on campus worked the least among the three groups with an average of 248 hours. The Bonferroni multiple-comparison test using the three groups and confirmed that all between-group differences were statistically meaningful.

Total Earnings. Students' total earnings from on-campus employment during the above 8-month period was statistically significantly associated with their work-study status. As work-study students worked the most hours, they also earned the most during the same period (\$3,200), which was statistically significantly more than the other two groups of students. Work-study decliners who had non-work-study jobs on campus then had an average of \$2,600 total earnings, and students who were not offered work-study and had non-work-study jobs on campus had total earnings of \$2,500 on average. The \$100 difference in the total earnings of these two groups was, however, statistically insignificant.

In brief, all job characteristics and employment outcomes examined in this chapter had statistically significant relationship with students work-study status (i.e., participate in work-study, decline work-study and do non-work-study job on campus, or not have a work-study offer and work a non-work-study position on campus). Work-study students in general worked mostly in research-related positions with the highest average hourly rate than the other two groups of students. They also worked most hours and earned the most from on-campus employment.

Table 22. *Part-Time Job Characteristics by Work-Study Status*

| Variables | Offered work-study | | | | Not offered work-study | | <i>p</i> |
|--------------------------------|--------------------|-----------|------------------------------|-----------|------------------------------|-----------|-----------------|
| | Work-study | | Non-work-study job on campus | | Non-work-study job on campus | | |
| | <i>n</i> = 997 | | <i>n</i> = 3,470 | | <i>n</i> = 2,527 | | |
| | n | % | n | % | n | % | |
| Number of jobs | | | | | | | |
| One job | 828 | 83.1 | 3,003 | 86.5 | 2,235 | 88.4 | |
| Two jobs | 147 | 14.7 | 428 | 12.3 | 280 | 11.1 | |
| Three jobs | 20 | 2.0 | 34 | 1.0 | 11 | 0.4 | |
| Four jobs | 2 | 0.2 | 5 | 0.1 | 1 | 0.0 | *** |
| Job type | | | | | | | |
| Administrative | 122 | 10.1 | 404 | 10.1 | 576 | 20.3 | |
| Professional | 61 | 5.0 | 178 | 4.5 | 299 | 10.6 | |
| Research | 372 | 30.7 | 1,275 | 32.0 | 223 | 7.9 | |
| Teaching | 69 | 5.7 | 131 | 3.3 | 62 | 2.2 | |
| Clerical | 237 | 19.6 | 576 | 14.5 | 273 | 9.6 | |
| Technical | 93 | 7.7 | 401 | 10.1 | 318 | 11.2 | |
| Labor/service | 257 | 21.2 | 1,016 | 25.5 | 1,081 | 38.2 | *** |
| <i>Total for job type</i> | 1,211 | 100.0 | 3,981 | 100.0 | 2,832 | 100.0 | |
| | Mean | SD | Mean | SD | Mean | SD | <i>p</i> |
| Average hourly wage (\$) | 10.2 | 0.895 | 9.5 | 1.262 | 9.9 | 1.647 | *** |
| Total hours worked | 310 | 351.361 | 270 | 257.646 | 248 | 313.342 | *** |
| Total earnings (unit: \$1,000) | 3.2 | 3.882 | 2.6 | 2.539 | 2.5 | 3.248 | *** |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: (1) The percentages may not add up to 100 due to rounding. (2) ‘*p*’ shows the statistical significance of the Pearson’s Chi-squared statistics for categorical variables or one-way analysis-of-variance (ANOVA) test statistics for continuous variables. (3) The total observation for job type exceeds the sample size for each student subgroup because some students had more than one job. For work-study participants, 45 out of 1,211 jobs (3.7%) were non-work-study jobs on campus they had in addition to work-study jobs. (5) The total hours worked was rounded up to the nearest integer.

Part-Time Job Off Campus

I further analyzed the student survey data to understand the characteristics of off-campus part-time jobs work-study decliners worked, which was not captured in the administrative data.

As presented in Table 23, the student survey (n = 28) identified off-campus workers' number of jobs they had, job type, and hourly wage. First, most students (73.5%) worked one off-campus job. Moreover, the largest majority of students (about 56%) had labor or service types of part-time jobs. All respondents who worked in labor or service jobs specifically reported that they worked in food services (e.g., restaurants, coffee shops). The next largest share of students had clerical positions off campus (14.7%), all reporting to work as a cashier or a clerk. There were four students who had professional type of jobs off campus (11.8%) such as health services (e.g., emergency medical technician). However, there was no off-campus job that was related to a research type of work. In addition, the average hourly wage for off-campus positions were \$12.40 per hour, which appeared to be higher than on-campus positions (refer to Table 22).

Table 23. *Part-Time Job Characteristics for Off-Campus Employment*

| Variables | Off-campus job (work-study decliner) <i>n</i> = 28 | |
|------------------------------------|---|-----------|
| | n | % |
| Number of jobs | | |
| One job | 25 | 73.5 |
| Two jobs | 3 | 17.6 |
| Three jobs | 1 | 8.8 |
| Job type | | |
| Administrative | 2 | 5.9 |
| Professional | 4 | 11.8 |
| Research | 0 | 0.0 |
| Teaching (non-university students) | 3 | 8.8 |
| Clerical | 5 | 14.7 |
| Technical | 1 | 2.9 |
| Labor/service | 19 | 55.9 |
| <i>Total for job type</i> | 34 | 100.0 |
| | Mean | SD |
| Average hourly wage (\$) | 12.4 | 3.699 |

Note: The percentages may not add up to 100 due to rounding.

Summary of the Findings

In accordance with the first research question, I delved deeply into the overall landscape of the federal work-study program in this chapter. I sought to understand the demographic and behavioral characteristics of the work-study participants by identifying (a) who were offered work-study, (b) who accepted their offers and participated in the federal work-study program, and (c) what features federal work-study employment had. To achieve this goal, I conducted an in-depth descriptive analysis of the case institution's administrative student record data including demographics, financial aid award, academic records, in addition to on-campus employment and payroll. I supplemented the findings with the analysis of a survey of students who received a federal work-study offer.

Among six cohorts of first-year students who enrolled at Lake University between 2013-14 and 2018-19 academic years, about 35% of them received work-study offers. I find that work-study-offered students are demographically different from students who do not receive work-study aid offers. Among students with work-study offers, there are larger proportions of females, URM students, and first-generation students. Work-study-offered students are also more likely to be in-state students, conveying Lake University's institutional goal to meet the full demonstrated need of resident students. Importantly, work-study-offered students exhibit greater financial need with lower EFCs than students without work-study offers. In terms of academic achievements during high school, work-study-offered students generally have marginally lower ACT scores and AP test scores than students without work-study offers.

I find that not all students with work-study offers end up participating in the federal work-study program. At Lake University, the take-up rate is fairly low, for example, it was only about 11% among the six cohorts of first-year students between 2013-14 and 2018-19. Work-

study decliners work a non-work-study job on campus, work off campus, or not work a part-time job at all. Demographically, work-study students include higher percentages of females, URM students, and first-generation students than work-study decliners. Work-study students are also more likely to be out-of-state students than work-study decliners and thus, they demonstrate that a slightly higher cost of attendance to afford than work-study decliners. Work-study students' financial aid awards therefore include higher amounts of gift aid, higher work-study aid offers, but smaller loans than that of work-study decliners. Most intriguingly, work-study students demonstrate having higher level of familiarity with the federal work-study program at the time of filing the FAFSA than work-study decliners.

The next set of findings I discover center on the differences in part-time employment characteristics among first-year students by their work-study status. In terms of job types, I find great similarities among students who are offered work-study despite their work-study status. That is, work-study participants and work-study decliners with non-work-study, on-campus jobs both mostly work in research positions. On the other hand, students who do not receive work-study offers (and thus, work on campus without work-study or work off campus) mostly work in labor or service jobs. The findings thus indicate that work-study positions are not necessarily always uniquely different from non-work-study positions on campus. Rather, a work-study offer may induce students to certain on-campus positions or work-study-offered students may have unobserved characteristics that are different from students without work-study offers to choose certain jobs on campus. Moreover, students working off campus earn higher average hourly wage than students working on campus. Still, among on campus student employees, work-study students' average hourly wage is higher than that of non-work-study students. As work-study

students also work more hours than non-work-study student employees, their total earnings are also much higher.

In the following chapters, I estimate the causal effects of work-study employment on several student outcomes and furthermore, examine student responses about their motivations behind multiple decisions they have made about working part-time jobs during their first year in college. I engage the descriptive findings from this chapter to interpret the results in the later chapters and to better understand the complex mechanisms of how and to what extent work-study employment affects students.

Chapter 5 The Federal Work-Study Program Effects on Student Outcomes

In this chapter, I present and discuss the findings about the causal effects of the federal work-study program on four student outcomes: First-year GPA, persistence to the 2nd year at the same university, weekly hours worked on campus during the fall and winter semesters (an 8-month period), and weekly earnings from that on-campus employment. I exploit the institution's rigid rule for federal work-study aid eligibility, the EFC cutoff, to employ a fuzzy RD design and estimate the causal program effects on the outcomes of interest. The estimate results are local average treatment effects (LATE) and thus only apply to the subpopulation of students near the EFC cutoff whose work-study participation was determined by the cutoff rule (i.e., compliers). Specifically, the estimated program effects for work-study participants is relative to students who just passed the EFC cutoff with marginally higher EFC than the cutoff and, accordingly, neither received federal work-study offers nor participated in the program.

There are three main parts in this chapter. First, I present the estimated treatment effects of federal work-study on the four student outcomes using three different model specifications. Each model assumes that the running variable, EFC, has a linear, quadratic, and cubic effect on the outcomes, respectively. Next, I examine the robustness of the estimated effects by estimating the models using different bandwidths around the EFC cutoff. I focus on analyzing results from the most fitting model specification suggested by the test statistics, which was the linear model.³⁸ Finally, I demonstrate heterogeneous treatment effects of the federal work-study program on

³⁸ As elaborated in Chapter 3, across all models, I tested the joint null hypothesis that the coefficients related to the quadratic and cubic terms, were zero, following McCall and Bielby (2012).

student outcomes. As highlighted by McCall and Bielby (2012), “the impact of the treatment may be different for different subgroups of individuals who are close [to] the cut-off value” (p. 280). I follow the authors’ estimation strategies and estimate a fuzzy RD linear model for subgroups of students based on their sex, URM status (defined by Lake University; non-White, non-Asian, non-multiracial), and first-generation status.

Estimated Causal Impact of the Federal Work-Study Program

I estimated the causal treatment effects of the federal work-study program on four types of first-year college outcomes as shown in Table 24: First-year GPA, persistence to the 2nd year, weekly hours worked on campus through fall and winter semesters, and weekly earnings from on-campus employment during the same period. For each outcome, I employed different optimal bandwidths for estimation (see Table 24 note; refer to Chapter 3 for more details). I estimated a linear, quadratic, and cubic models, and examined the statistical significance of the model specifications between the linear and quadratic and then between the quadratic and cubic. The test statistics and their *p*-values are reported in the bottom panel of the table.

For each of the linear, quadratic, and cubic models, I first estimated a base model with the base set of covariates (i.e., a binary indicator for being below the EFC eligibility cutoff, a running variable, and an interaction term of these two variables) with an assumption being local randomization near the cutoff. I then estimated a model that I referred to as the full model, in which I controlled for additional variables. If the assumption about local randomization was met, inclusion of these variables “should not have an appreciable effect on the treatment estimate when compared to a model without these control variables” (McCall & Beilby, 2012, p. 268). This approach allowed me to evaluate to what extent the estimates changed when I included additional covariates, which generally also improves the precision of the estimates.

Table 24. *Treatment Effects of Federal Work-Study: Linear, Quadratic, and Cubic Models*

| Outcome (optimal bandwidth) | Linear | | Quadratic | | Cubic | |
|---|-----------------------|----------------------|----------------------|----------------------|---------------------------------|--------------------|
| | Base | Full | Base | Full | Base | Full |
| First-year GPA (\pm \$9,874) | 0.453 (0.614) | 0.646 (0.612) | 0.658 (0.925) | 0.934 (0.900) | 0.886 (0.929) | 0.857 (0.832) |
| Persistence to the 2 nd year (\pm \$14,394) | 0.017 (0.170) | 0.005 (0.177) | 0.204 (0.311) | 0.243 (0.323) | 0.699 (0.443) | 0.653 (0.442) |
| Weekly hours worked (\pm \$11,720) | 20.27** (5.836) | 19.90** (5.963) | 22.69* (10.070) | 21.76* (10.395) | 15.90 ⁺ (9.077) | 13.97 (8.724) |
| Weekly earnings (\$) (\pm \$12,223) | 185.98*** (52.558) | 183.46** (54.131) | 244.77* (108.414) | 228.71* (110.910) | 142.83 ⁺ (86.224) | 122.49 (83.348) |
| <i>Chi-squared test statistics (p-values)</i> | | | | | | |
| First-year GPA | - | - | 0.550 (0.761) | 0.390 (0.822) | 1.170 (0.761) | 1.720 (0.632) |
| Persistence to the 2 nd year | - | - | 2.690 (0.261) | 3.200 (0.202) | 5.830 (0.120) | 5.35 (0.148) |
| Weekly hours worked | - | - | 0.930 (0.627) | 0.680 (0.711) | 1.670 (0.645) | 1.250 (0.742) |
| Weekly earnings (\$) | - | - | 1.280 (0.528) | 0.780 (0.676) | 2.000 (0.572) | 1.440 (0.696) |

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: (1) Different optimal bandwidths were chosen for each outcomes by `rdbwselect`. (2) Full model included an additional set of control variables: Sex, URM status, first-generation status, residency, high school GPA, and ACT score. (3) For estimated treatment effects, robust standard errors are reported in parentheses. (4) Estimates for hours worked and earnings are rounded up to the nearest hundredths. (5) For each model that included a quadratic or a cubic term of the running variable, a joint null hypothesis that coefficients related to them were zero was conducted, and corresponding Chi-squared test statistics and their p -values are reported. (6) For sample size, refer to the bottom panel of Table 25 for 'Optimal Bandwidth' columns.

As presented in the first row of Table 24, overall, the effect of participating in the federal work-study program had a statistically insignificant effect on students' first-year GPA regardless of the model specification. The estimates from the linear model indicated that participating in work-study slightly increased students' first-year GPA by about 0.453 points and yet, this impact was not statistically significant. Including additional control variables increased the magnitude of the estimated effects to 0.646 points, which was still statistically insignificant. I found that the linear regression model best fit the data as I discovered no strong evidence that the higher-order polynomial models (i.e., quadratic, cubic) fit the data better than the linear specification when estimating federal work-study effects on first-year GPA.

Similarly, undertaking work-study had no statistically significant effects on students' persistence to the 2nd year across all model specifications. The linear model estimates indicated that participating in work-study increased the persistence rate marginally by 1.17 pp's, however, the effect was statistically insignificant. Inclusion of additional covariates in the model decreased the magnitude of the estimated work-study effects to about 0.5 pp's, although the estimated effects remained to be statistically insignificant. Again, I discovered no evidence that the higher-order polynomial models fit the data better than the linear model when estimating work-study effects on the persistence to the 2nd year.

On the other hand, participating in work-study had a statistically significant and positive effect on both on-campus employment outcomes. Based on the linear specification, engaging in federal work-study increased students' weekly hours worked on campus by about 20 hours ($p < 0.01$), and increased weekly earnings from on-campus employment by approximately \$186 ($p < 0.001$).³⁹ With additional covariates, the estimated effects slightly changed in the full model, but

³⁹ To recall, about 86% of the nonparticipants who were not offered work-study had no on-campus employment.

only marginally. In the quadratic model, the estimated effects of work-study on both outcomes continued to be statistically significant and positive ($p < 0.05$) with slightly higher estimates than the linear model. Yet, I discovered no statistical evidence that the quadratic model fit the data better than the linear model. The estimated effects then changed drastically in the cubic model, showing smaller differences in weekly hours worked on campus and weekly earnings from on-campus employment between federal work-study participants and nonparticipants. The estimates were yet no longer statistically significant at 0.05 level, and I again found no evidence that the cubic model fit the data better than the quadratic model.

In summary, I found that the fuzzy RD estimates using a linear regression model to fit the data better than the higher-order polynomial model specifications in estimating work-study effects on student outcomes, providing evidence that the running variable, EFC, had a linear relationship with student outcomes. Based on the linear model specification results, participating in work-study had no significant impact on students' first-year GPA nor persistence to the 2nd year. Conversely, the linear model estimates indicated that participating in work-study had statistically a significant and positive effects on on-campus employment outcomes. Taking up work-study increased students' number of weekly hours worked on campus by about 20 hours, and weekly earnings from on-campus employment by \$186. Even after controlling for additional covariates, the estimated effects only marginally changed in magnitude, and remained robust.

Estimated Causal Impact Using Different Bandwidths

I further examined the effects of federal work-study on student outcomes using different analytic windows (i.e., bandwidths). The goal was to inspect whether the estimated effects change when using different bandwidths compared to the optimal bandwidth method used above. The new bandwidths included two that were narrower than the optimal bandwidth used above,

and two that were wider than the optimal bandwidth. For all analysis, I estimated a linear model (base and full models), assuming that the running variable, EFC, had a linear effect on student outcomes; this decision was after estimating higher-order polynomial models for all models estimated in Table 25 and conducting a joint null hypothesis that coefficients related to them were zero, which indicated that the linear model specification fit the data better than all other models. Overall, an increased bandwidth is expected to increase both the statistical power and precision of the estimates (smaller standard errors) as the sample size increases. However, it may also increase threats to the internal validity of the estimates because the assumption about the equality in expectation among subjects just below and above becomes less plausible (Murnane & Willett, 2011). Thus, in this analysis, I examined whether I could be confident about the internal validity of the estimated results.

Table 25 shows that the trend of the estimated treatment effects of work-study on all outcomes was consistent across the models using different bandwidths. First, the effects of engaging in work-study on first-year GPA was positive, but not statistically significant in all models. With wider bandwidths, the estimated effects decreased in magnitude, but the precision increased (i.e., smaller standard errors). The overall trend of no work-study effects on first-year GPA remained the same. The estimated work-study effects on the persistence to the 2nd year was also not statistically significant across the models using different bandwidths. Yet, while the estimated effects of work-study on persistence was positive when using the optimal bandwidth (i.e., higher rate for work-study participants), the effects were negative when not using the optimal bandwidth. The estimates from all models were still close to zero and not statistically significant, implying no meaningful work-study effect on persistence to the 2nd year.

Table 25. *Treatment Effects of Federal Work-Study Using Different Bandwidths*

| Outcome | ± \$2,000 narrower | | ± \$1,000 narrower | | Optimal bandwidth | | ± \$1,000 wider | | ± \$2,000 wider | |
|---|----------------------|----------------------|----------------------|----------------------|-----------------------|----------------------|-----------------------|-----------------------|----------------------|----------------------|
| | Base | Full | Base | Full | Base | Full | Base | Full | Base | Full |
| First-year GPA | 0.498 (0.779) | 0.779 (0.783) | 0.397 (0.655) | 0.640 (0.654) | 0.453 (0.614) | 0.646 (0.612) | 0.169 (0.570) | 0.369 (0.561) | 0.176 (0.503) | 0.402 (0.495) |
| Persistence to the 2 nd year | -0.036 (0.183) | -0.038 (0.189) | -0.005 (0.178) | -0.007 (0.186) | 0.017 (0.170) | 0.005 (0.177) | -0.053 (0.163) | -0.068 (0.169) | -0.044 (0.157) | -0.075 (0.163) |
| Weekly hours worked | 24.06** (7.232) | 23.89** (7.571) | 22.21** (6.754) | 21.98** (7.011) | 20.27** (5.836) | 19.90** (5.963) | 21.26*** (5.495) | 21.38*** (5.731) | 19.49*** (5.316) | 19.67*** (5.606) |
| Weekly earnings (\$) | 216.96** (65.544) | 208.88** (66.942) | 195.52** (62.526) | 191.09** (64.606) | 185.98*** (52.558) | 183.46** (54.131) | 206.84*** (52.776) | 207.20*** (55.211) | 172.27** (49.532) | 170.33** (51.650) |
| <i>Sample size</i> | | | | | | | | | | |
| First-year GPA | 5,422 | 5,373 | 6,066 | 6,010 | 6,717 | 6,658 | 7,345 | 7,280 | 8,045 | 7,973 |
| Persistence to the 2 nd year | 8,480 | 8,402 | 9,161 | 9,076 | 9,822 | 9,727 | 10,530 | 10,430 | 11,189 | 11,075 |
| Weekly hours worked | 6,681 | 6,621 | 7,325 | 7,258 | 8,027 | 7,954 | 8,701 | 8,622 | 9,386 | 9,299 |
| Weekly earnings (\$) | 7,011 | 6,947 | 7,688 | 7,620 | 8,360 | 8,238 | 9,042 | 8,958 | 9,706 | 9,614 |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: (a) Linear model is estimated for all outcomes. (b) In general, the full model had a smaller sample size than the base model as additional variables had missing values.

Across all models using different bandwidths, the positive and statistically significant effects of participating in work-study on weekly hours worked on campus and weekly earnings from on-campus employment remained robust relative to the optimal bandwidth results (see Table 25). Generally, with smaller bandwidths (i.e., smaller sample size), the estimated effects increased in magnitude while losing precision to some extent (i.e., larger standard errors). Specifically, the model using the optimal bandwidth ($\pm \$11,720$; $n = 8,027$) demonstrated that participating in work-study increased students' weekly hours worked on campus by 20 hours ($p < 0.01$). Meanwhile, when using the narrowest analytic window ($\pm \$9,720$; $n = 6,681$), participating in federal work-study increased the weekly hours worked on campus by about 24 hours ($p < 0.01$), which was 4 hours more than the estimates from the model using the optimal bandwidth method.

When I applied wider bandwidths than the optimal bandwidth to estimate the effects of work-study on weekly hours worked, the estimated effects marginally changed in magnitude in an inconsistent direction, although all estimates remained positive and statistically significant. In a model using a $\pm \$1,000$ wider EFC bandwidth ($\pm \$12,720$; $n = 8,701$) than the optimal bandwidth, participating in work-study increased the weekly hours worked on campus by about 21 hours ($p < 0.001$) vs. 20 hours when using the optimal bandwidth. When the bandwidth used was $\pm \$2,000$ wider ($\pm \$13,720$; $n = 9,386$) than the optimal bandwidth, federal work-study employment increased students' weekly hours worked on campus by about 19 hours ($p < 0.001$), which was only marginally different from the estimates obtained using the optimal bandwidth (i.e., 20 hours). Overall, the findings illustrated that the estimated positive effects of federal work-study on students' number of weekly hours worked on campus (i.e., increasing the hours by about 20 hours) remained robust when different bandwidths were applied.

Work-study effects on weekly earnings from on-campus employment that were positive and statistically significant using the optimal bandwidth method remained robust across all models using different bandwidths (see Table 25). Using the optimal bandwidth (\pm \$12,223; $n = 8,360$), work-study increased students' weekly earnings from on-campus employment by about \$186 ($p < 0.001$; base model estimates). Applying narrower bandwidths, the estimated effects of work-study grew in magnitude, but with less precision (i.e., larger standard errors). When using the narrowest bandwidth (\pm \$10,223; $n = 7,011$), work-study increased the weekly earnings from on-campus employment to \$217, which was \$31 more than the estimated effect when using the optimal bandwidth. When using wider bandwidths, the estimated effects decreased in magnitude, but the standard errors were smaller. For instance, using the widest bandwidth window (\pm \$14,223; $n = 9,706$), the results indicated that work-study increased students' weekly earnings from on-campus employment by approximately \$172. The results demonstrated that regardless of the bandwidths employed, the positive effect of work-study on students' weekly earnings from on-campus employment was consistently statistically significant.

In brief, this analysis aimed to evaluate whether the estimated effects of participating in the federal work-study program on student outcomes were consistent when different bandwidths were applied. Wider bandwidths would generally challenge the internal validity of the estimates as the assumption of local randomization near the cutoff becomes harder to meet. Nevertheless, the findings presented in Table 25 provide strong evidence of the robustness of the results to different bandwidth choices. Participating in the federal work-study program had no meaningful impact on students' first-year GPA nor persistence to the 2nd year. This aid type did, however, significantly increase students' weekly hours worked on campus as well as their earnings from on-campus employment compared to students who did not receive work-study aid.

Heterogeneous Treatment Effects

In studies using a RD design, testing for heterogeneous treatment effects is common and important, particularly because the average treatment effect estimates are local near the cutoff, around which there may be a dense group of subjects with similar characteristics (McCall & Bielby, 2012). It thus becomes vital to examine for the heterogeneity of treatment effects across different subgroups of subjects, especially when informing policy. Therefore, I estimated the treatment effects of participating in federal work-study on student outcomes for subgroups of students by sex, URM status, and first-generation status. As found in the previous chapter, these three characteristics appeared to be statistically significantly different not only between students who were offered work-study and those not offered work-study, but also across the subgroups of students who made varying decisions about their work-study offers (e.g., do work-study, take a non-work-study job, or not work). I focused on estimating treatment effects using a linear regression model including additional covariates and the optimal bandwidth, after confirming that the linear model specification fit the data better than higher-order polynomial models.

Table 26 presents the findings from heterogeneity tests for six subgroups of students: (a) males, (b) females, (c) URM students, (d) non-URM students, (e) first-generation students, and (f) non-first-generation students. First, the results showed that the impact of doing federal work-study on both first-year GPA and persistence to the 2nd year was not different between student subgroups by their sex, URM status, and first-generation status. This was not surprising given the earlier findings (see Table 24-25) that there were no statistically significant effects of work-study on these outcomes. On the other hand, the effects of federal work-study participation on the two on-campus employment outcomes were heterogeneous across different subgroups of students based on their demographic characteristics.

Table 26. *Heterogeneous Treatment Effects of the Federal Work-Study Program*

| Outcome | Sex | | URM | | First-generation | |
|---|---------------------|---------------------|----------------------|----------------------|---------------------|----------------------|
| | Male | Female | Yes | No | Yes | No |
| First-year GPA | 0.406 (0.877) | 0.838 (0.810) | 1.731 (1.541) | 0.410 (0.666) | 0.709 (1.342) | 0.587 (0.672) |
| Persistence to the 2 nd year | -0.035 (0.243) | 0.062 (0.250) | -0.170 (0.393) | 0.052 (0.194) | 0.557 (0.680) | -0.055 (0.184) |
| Weekly hours worked | 21.58* (8.739) | 17.82* (7.814) | 26.43* (10.982) | 18.77** (6.875) | 26.34 (17.022) | 18.81** (6.352) |
| Weekly earnings (\$) | 201.91* (78.948) | 159.69* (71.322) | 276.24* (113.080) | 166.64** (61.296) | 246.28 (154.999) | 172.48** (57.518) |
| <i>Sample size</i> | | | | | | |
| First-year GPA | 3,248 | 3,410 | 798 | 5,860 | 613 | 6,045 |
| Persistence to the 2 nd year | 4,739 | 4,988 | 1,233 | 8,494 | 1,036 | 8,691 |
| Weekly hours worked | 3,856 | 4,098 | 962 | 6,992 | 766 | 7,188 |
| Weekly earnings (\$) | 4,032 | 4,251 | 1,016 | 7,267 | 810 | 7,473 |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Linear model that includes additional control variables (i.e., full model) is estimated for all outcomes, using optimal bandwidth selected by `rdbwselect`.

Specifically, the effects of federal work-study on the students' weekly hours worked on campus was positive and statistically significant for both males and females, but the impact was larger for male students. Participating in federal work-study increased male students' weekly hours worked on campus by about 22 hours ($p < 0.05$) while the hours were increased by about 18 hours for female students ($p < 0.05$). Looking at URM status, participating in work-study had significantly positive effects on weekly hours worked on campus for both URM and non-URM students. For URM students, taking up work-study had a larger effect on their weekly hours worked on campus than for non-URM students. Federal work-study employment increased URM students' weekly work hours on campus by about 26 hours ($p < 0.05$) and non-URM students' weekly hours worked by about 19 hours ($p < 0.01$). The effect of federal work-study was also significantly different for students by their first-generation status. For first-generation students, the effect of engaging in work-study on their weekly hours worked on campus was positive, however, it was not statistically significant. Meanwhile, federal work-study had a positive and statistically significant effect on non-first-generation students' weekly hours worked on campus ($p < 0.01$), increasing their hours worked by about 19 hours.

As indicated in Table 26, there were also demographic differences in the effect of work-study on students' weekly earnings from on-campus employment. Participation in the federal work-study program had positive and statistically significant effects on both male and female students' weekly earnings from on-campus jobs. Yet, the program impact was much greater for male students, for whom doing work-study increased their weekly earnings from on-campus employment by \$202 ($p < 0.05$). For female students, federal work-study increased their weekly earnings from on-campus employment by \$160 ($p < 0.05$). Work-study impact also varied by students' URM status. While work-study statistically significantly increased students' weekly

earnings from on-campus employment for both URM and non-URM students, the impact was significantly greater for URM students whose earnings increased by \$276 ($p < 0.05$) compared to \$167 ($p < 0.01$) for non-URM students. Lastly, work-study impact also differed for students by first-generation status with regard to their weekly earnings from on-campus work. Both first-generation and non-first-generation students were positively affected by undertaking work-study in terms of weekly earnings from on-campus employment. However, as it was with weekly hours worked, the effect of work-study had no statistically significant effect on first-generation students' weekly earnings. On the other hand, participating in the federal work-study program statistically significantly increased non-first-generation students' weekly earnings from on-campus employment by about \$172 ($p < 0.01$).

In sum, I found that participating in the federal work-study program had no statistically significant impact on students' first-year GPA and persistence to the 2nd year. Even when different analytic windows were used, the impact of work-study on these outcomes were not statistically meaningful. As anticipated, I also observed no significant impact of work-study on academic outcomes for various subgroups of students by sex, URM status, and first-generation status. The overall findings suggested that work-study significantly increased students' number of weekly hours worked on campus and their weekly earnings from on-campus employment relative to those not participating in the program. The results from different models using various bandwidths, in particular, provided some evidence about the robustness the findings on the impact of work-study on students' on-campus employment outcomes. Importantly, I discovered heterogeneous effects of work-study participation on on-campus employment outcomes. Federal work-study differentially affected these outcomes with larger impacts for males (vs. females), URM students (vs. non-URM), and non-first-generation students (vs. first-generation).

Summary of the Findings

In this chapter, I identified the causal impact of participating in the federal work-study program on four outcomes for first-year college students: First-year GPA, persistence to the 2nd year (at the same institution), number of weekly hours worked on campus, weekly earnings from on-campus employment. I employed a fuzzy RD design, in which I used the EFC eligibility cutoff rule for federal work-study aid offer as an instrument for predicting the probability of participating in work-study. By using various bandwidths around the EFC cutoff, testing for different model specifications (i.e., linear, quadratic, and cubic), and controlling for additional covariates, I examined the robustness of the estimated effects of the federal work-study program.

Overall, I find that at Lake University, participating in the federal work-study program has no statistically significant impact on both students' first-year GPA and persistence to the 2nd year. The null effect of the program suggests that working on campus through work-study does not have an inverse relationship (i.e., no negative effect) with first-year students' academic performance. Work-study employment also has no impact on first-year students' persistence to the 2nd year, denoting no negative effect of federal work-study.

Meanwhile, having work-study employment statistically significantly increases first-year students' weekly hours worked on campus as well as their weekly earnings from on-campus employment. Students who have work-study positions, on average, spend about 20 more hours working on campus than students without work-study employment (as they are ineligible for the aid). Federal work-study students accordingly also weekly earn about \$186 more from on-campus employment between September through April the next year.

Intriguingly, participating in the federal work-study program has differential effects on on-campus employment outcomes by student demographics including sex, URM status, and

first-generation status. Work-study leads to more weekly hours worked and higher on-campus employment earnings for male students (than for females) and for URM students (than for non-URM students). In terms of first-generation status, work-study effect on on-campus employment outcomes only appears statistically significant and positive for non-first-generation students. I overall find strong evidence for the robustness of the estimated effects of federal work-study.

In the next chapter, I rely on a student survey to examine various factors that are latent but may be related to students' work (study) decisions and behaviors. These factors, for example, include students' motivations to participate in federal work-study, different priorities they find in part-time employment, which may impact their work-related decisions, and various types of informational and structural obstacles students face while navigating work-study. As I explore these topics to better understand students' work decisions, any heterogeneity in these factors by students' sex, URM status, or first-generation status may be able to shed light on the different extent of student decisions to work more hours on campus through federal work-study.

Chapter 6 The Mechanisms of Students' Federal Work-Study Decisions

In previous chapters, I employed administrative student record data to descriptively explore the landscape of the characteristics of work-study students and their jobs and to obtain rigorous evidence on the effects of participating in the federal work-study program on student outcomes. The questions answered so far are limited in explaining the mechanisms of student behaviors associated with navigating the program and making relevant decisions. Therefore, in this chapter, I conduct an in-depth analysis of survey data collected from first-year students who received a work-study offer as a part of their financial aid package for the 2019-20 academic year ($n = 514$).⁴⁰ I primarily investigate the motivations behind students' work-study decisions and the types of informational and structural barriers that play a role in those decisions. Closed-ended responses are analyzed using descriptive statistics and then I conduct a thematic analysis of the open-ended responses.

The findings of this chapter are organized into three parts. I begin by discussing student experiences navigating the federal work-study program. I examine students' immediate questions and confusion they have about work-study when it is offered in their financial award notices, and to what extent they reach out the Office of Financial Aid to resolve their questions. In the second part of the chapter, I explore the reasons why students accept or decline their work-study offers and why some students who once accepted work-study ultimately do not apply for jobs or choose to work at all. Regarding these students, I review their alternatives in terms of financing college

⁴⁰ To reiterate, I surveyed the most recent cohort of first-year students at Lake University at the time of conducting this study (i.e., fall 2019 cohort) to collect data from students who have most recently made work-study decisions.

given their choice not to participate in work-study. Lastly, I discuss student responses about the ways the university can improve their work-study related practices and services to understand student needs and better assist them to make informed work-study decisions.

Navigating the Federal Work-Study Program

Most students indicated that they first encountered the federal work-study program when filing the FAFSA. The FAFSA has a question about work-study, asking “Are you interested in being considered for work-study?” No further questions are asked about work-study at this point and students only have to indicate their interest in work-study. The survey findings showed that most students answered the work-study question in the FAFSA, although they did not have the best knowledge of what work-study was. As presented in Chapter 4, about 83% of the survey respondents said that they answered “Yes” to this question, however, 89% of the respondents indicated that they were not very (or extremely) familiar with federal work-study. Students who responded “Yes” generally indicated that their response to this question was attributable to their intention to seek every possible financial aid opportunity available at the time of filing FAFSA.

When federal work-study is offered to a student in a financial aid package (Figure 25), students have to inform the university whether they intend to accept or decline their work-study offers. According to the survey, many students began exploring the program more in depth when a federal work-study offer appeared in their financial aid award notices. Not surprisingly, I discovered that almost all work-study-offered students confronted a range of questions about the program as they had to make decisions about their offers. In the following section, I present the three main types of questions students had about work-study (i.e., What is it? How does it work? Why should I do it?) and their experiences of interacting with the Office of Financial Aid to resolve their inquiries about the aid.

Figure 25. *Lake University's Financial Aid Award Notice (2018-19 Sample)*⁴¹

| TERMS: | Fall 2018 | Winter 2019 | TOTAL |
|--|-----------------|-----------------|-----------------|
| Estimated cost to attend <input type="text" value="Lake University"/> | | | |
| (www. <input type="text" value="Web address"/>): | | | |
| • Tuition & Fees based upon: <input type="text" value="[State] resident"/> | \$7,413 | \$7,413 | \$14,826 |
| • Housing & Meals (either on-campus or off-campus) | \$5,599 | \$5,599 | \$11,198 |
| • Other Costs (books, supplies, personal expenses) | \$1,751 | \$1,751 | \$3,502 |
| TOTAL COST | \$14,763 | \$14,763 | \$29,526 |
| Financial Aid Offer | | | |
| Gift Aid (DOES NOT require repayment): | | | |
| • <input type="text" value="Institutional grant I"/> | \$3,850 | \$3,851 | \$7,701 |
| • <input type="text" value="Institutional grant II"/> | \$5,378 | \$5,378 | \$10,756 |
| • * FED PELL GRANT | \$2,035 | \$2,035 | \$4,070 |
| YOUR COST TO ATTEND LESS GIFT AID | \$3,500 | \$3,499 | \$6,999 |
| Work-Study (earned wages, not applied to student billing account): | | | |
| • * FEDERAL WORK STUDY | \$1,500 | \$1,500 | \$3,000 |
| Loans (must be repaid): | | | |
| • * FED SUBSIDIZED DIRECT LOAN | \$1,164 | \$1,163 | \$2,327 |
| • * FED UNSUB DIRECT LOAN | \$836 | \$836 | \$1,672 |
| YOUR ESTIMATED COST IF USING ALL AID OFFERED | \$0 | \$ 0 | \$0 |

Questions About Federal Work-Study

In the survey, students were asked to share immediate questions or confusion they had about federal work-study when it was offered in their financial aid awards. I found that students posed questions about assorted aspects of work-study, reflecting the complexity of the cognitive processes students undergo before accepting or declining their offers. The main questions were: (1) What is it? (2) How does it work? and (3) Why should I do it? (see Table 27 for examples).

What is “Federal Work-Study”? A number of students shared that one immediate question they had about federal work-study when they saw it in their financial aid award notices

⁴¹ Figure 25 is a partial image of the financial aid award notice that captures the costs and aid amounts. Institution-identifying terms are de-identified. Figure 25 was also included in the survey as a reference for students.

was, *what it was*. Some students also mentioned that they wanted to know who received work-study aid (i.e., work-study eligibility and qualifications), trying to understand why they received it. Many students specifically stated that they questioned the term “federal” as it was confusing for them to understand why work-study was described as federal. This led students to question about the source of work-study as one student asked, “Is [work-study aid] from the school, or the government?” They also questioned what it meant that work-study was a federal aid and how it could impact them by being a federal aid. For instance, one respondent shared that the term, federal, gave him the impression that he was going to be forced into a government job.

Students further questioned about the *nature* of federal work-study aid. The award notice conveyed a great level of confusion as to whether work-study aid was a grant or some type of loan that they owed, primarily because of the way work-study amounts were presented in the award notice. Specifically, there are mainly two parts in the award notice (Figure 25): the estimated cost to attend Lake University and the financial aid offer, which consists of gift aid, work-study, and loans. At the bottom of the notice, all aid amounts including work-study are subtracted from the estimated total cost of attendance. This organization of financial aid offers resulted in questions from numerous students about whether work-study money has already been granted to them and applied to the tuition bill as a discount, or if they owed the aid amount to the university like a loan, because it was shown to be subtracted from the costs when they have not earned or paid it yet. In most cases, their confusion stemmed from an incorrect assumption that work-study aid has already been applied to tuition bills in some form due to the way the financial aid offers were presented in the award notice.

Importantly, first-year students who had limited knowledge about the program inquired about what it meant to have work-study in their financial aid awards. Students were concerned

about how a work-study offer already might have affected their current other financial aid such as scholarships, and how choosing to receive work-study would impact other aids. For example, they asked, “Did I get less in other parts of my financial aid because of the work-study?” “Would I have gotten more aid if I declined work-study?” Another student also shared, “I was unsure of how [work-study] would affect my other scholarship. I wasn’t sure if I accepted work-study, if the money received from the [scholarship name] would decrease.”⁴²

Table 27. *Federal Work-Study Questions - “What is it?”*

| Topic | Example questions and statements |
|---------------------------------------|--|
| <i>What is it?</i> | <p>“What is this?”</p> <p>“What is this for?”</p> <p>“The first thing I wondered was ‘what is work-study?’”</p> <p>“How did work-study happen [in my aid package]?”</p> <p>“What have I received?”</p> <p>“Why did I get it?”</p> <p>“I was confused for the purpose of the [work-study] aid given to me.”</p> <p>“Who gets this [work-study] aid?”</p> |
| <i>What does “federal” mean here?</i> | <p>“Why is it federal?”</p> <p>“What makes it federal?”</p> <p>“I was unsure about what about it was ‘federal’ vs. what school work-study would be.”</p> <p>“I was confused by the federal part and didn’t understand why it wasn’t just called work-study.”</p> <p>“Is federal work-study the same as work-study?”</p> <p>“I didn’t know what ‘federal’ meant. [The] question [was] ‘who is paying for this?’</p> <p>“How does the university and the federal funding source split the bill?”</p> <p>“What does federal work-study mean and how much is paid by the government?”</p> <p>“Is [work-study aid] from the school or the government?”</p> <p>“It [looked] like I was going to be forced into a government job or something.”</p> |
| <i>What kind of aid is it?</i> | <p>“Does work-study count as a scholarship?”</p> <p>“I was confused. I thought it was an award, that it was going to go towards my tuition and then, so I didn’t really look towards doing more about it. I was just confused.”</p> <p>“I was like, ‘what is that?’ ... I was also wondering, ‘do I have to pay that money back?’”</p> <p>“I did not know if I was just going to get money if I accepted. Honestly, I was not even sure if it was just a loan or not...”</p> <p>“I thought work-study was a sum [aid] released to your student account to pay for tuition.”</p> <p>“I initially thought it was a scholarship.”</p> <p>“... [work-study] felt as if it was a reimbursement program.”</p> |

⁴² In the discussion chapter, I explain the mechanisms how receiving work-study could impact students’ eligibility for other types of aid.

| | |
|--|--|
| <i>What does it mean for my financial aid?</i> | <p>“Do I have to [do] work-study to get the rest of my financial aid?”</p> <p>“Is work-study going to take away from my financial aid?”</p> <p>“I was unsure of how it would affect my other scholarships as I have the [scholarship name], and I wasn’t sure if I accepted work-study, if the money received from the [scholarship name] would decrease.”</p> <p>“Did I get less in other parts of my financial aid because of the work-study?”</p> <p>“How will it directly affect how much financial aid I receive?”</p> <p>“Would I have gotten more aid if I declined work-study?”</p> <p>“Why can’t I just get another grant [instead of work-study]?”</p> |
|--|--|

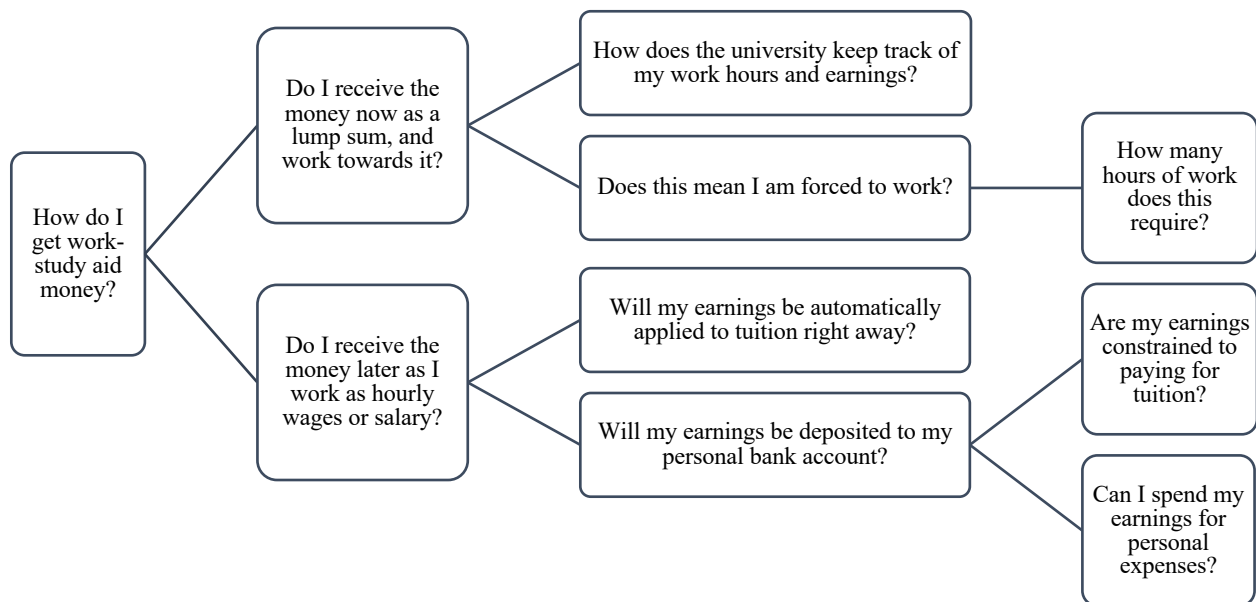
How Does Federal Work-Study Work? Almost all students indicated that when they received a work-study offer in their financial aid awards, they had insufficient information about how the federal work-study program worked. One student explained, “My primary question was, ‘how does this money even work?’ I understood loans and grants, but work-study was unknown to me.” Accordingly, many students added that they were uncertain about the kinds of action they were supposed to take next with regard to federal work-study, asking “What exactly was I supposed to do if I got [work-study]?”

Specifically, students’ questions about how the program works were mainly twofold, the money aspect of the program and the work feature. About the financial parts of work-study, the questions were about (a) how they could receive work-study money, (b) how the funds could be used, (c) what the terms and conditions of work-study funds were (see Table 28 for examples). First, in asking these questions, there were two groups of students: students who did not assume they had to work and those who did. The group of students who were not aware of the fact that work-study aid money had to be earned in a form of a wage broadly reported not knowing how work-study funds would be distributed to them. Some of them assumed that receiving work-study aid meant, for example, having to do extra paperwork or setting up a bank account.

As for those who discerned that work-study entailed working and earning wages, they asked a more thorough set of questions about the allocation mechanisms of work-study funds.

Figure 26 illustrates the sequence of questions these students asked. I found that one fundamental confusion was related to the timing of receiving work-study money and working, that is, whether the money was given to them right away as a lump sum and they had to work towards earning the amount offered to them or they would receive the money as they worked. “Would the money be applied to my tuition before I started working? Would my checks go straight to my tuition or would I have to pay my account invoices myself? Would I have to come up with the money to start classes and then get paid back later?” The aid award notice suggested to some students that work-study funds had already been applied to the cost of attendance, generating an abstruse idea about how work-study aid could be received. One student explained, “It only showed up like a scholarship towards my tuition. So, I didn't know if it was already being deducted and then I would have to work or if I had to work to be able to earn the money.”

Figure 26. *Work-Study Money Questions*



Students who supposed that work-study money would be given as a lump sum aid were then anxious and uncertain about how the paying-back-via-work arrangement would operate and to what extent the program required students to work. They had a misunderstanding that work

was compulsory and asked, “Will I be forced to work during my time on campus?” “How much would I have to work to be paid out?” In this line of inquiries, students further probed how the university would then keep track of students’ hours worked and earnings.

As for the students whose assumption was that they would be potentially earning work-study money as a wage, their questions were focused on how their future earnings from work-study could be used or spent. A large majority of these students asked whether their earnings would automatically be applied toward tuition and other costs on the bill or if the earnings would be deposited to their personal bank accounts. In case of the latter, they were still unsure about whether there were restrictions to how they could spend work-study earnings. “I didn’t know if [work-study] money went directly to tuition or if it came in the form of a check that I was free to spend on what I wanted,” “Does the money from work-study have to go towards my tuition? Do they track how it is spent? Can I use any of the money for personal needs?”

Following these questions, there were a set of commonly asked questions about the terms and conditions of work-study. Most frequently, students asked questions about the amount of the offer. For example, if a student was offered a total of \$3,000 work-study, it seemed ambiguous to students whether or not they could earn only up to \$3,000 and also, what would happen if they earned more or less than the offer amount.⁴³ Students were particularly worried about situations, in which they did not earn the full amount of their work-study offers, for example, due to failing to secure a job or not working enough hours. The concern was about being penalized in ways that would affect their financials, for example, “If I say yes [to my work-study offer] but can't find a work study job, will I be penalized with a lower work-study next year?” “I wasn't sure if I

⁴³ Work-study offer amount indicates the maximum amount of earnings students can make through work-study employment. There are no penalties for earning less than the offer amount. If students wish to earn more than the offer amount after already earning all offered amount, students must secure the employment without work-study.

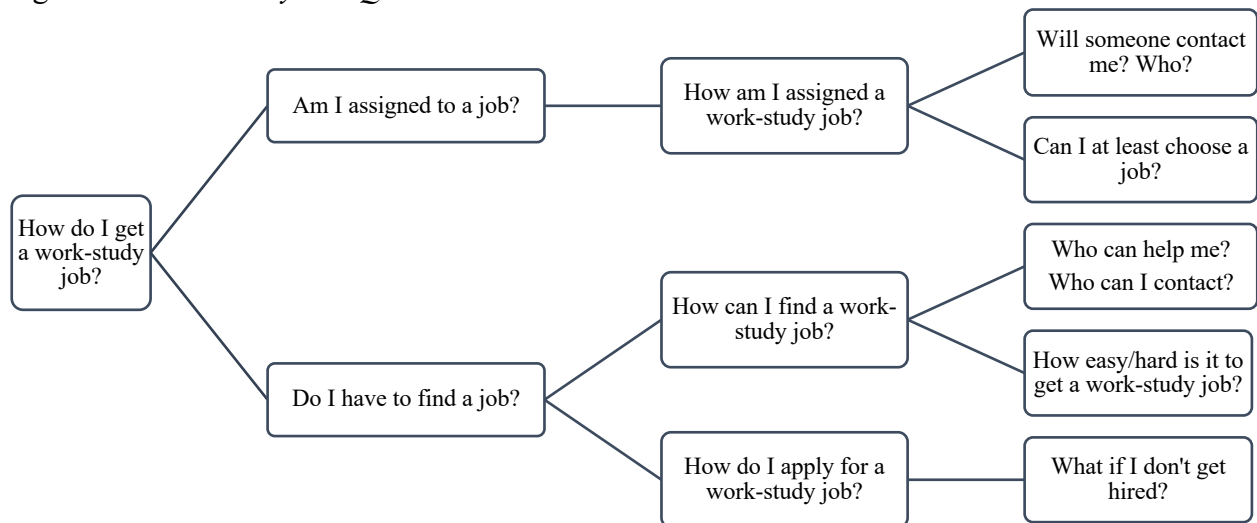
would have the pay the difference of what I didn't earn (ex. I make \$2000/\$3000). Will that \$1000 be added to my loans?" I noticed similar concerns among students who were curious about what would happen if they declined their work-study offers. Students asked if the work-study money they declined had to be returned to the university out of pocket and how this would impact their next year's financial aid. They questioned, for instance, "If I decline, do I have to make up for it out of pocket?" "Will I not be offered work-study next year if I reject this year?"

Table 28. *Federal Work-Study Questions - "How Does it Work? (Money)"*

| Topic | Example questions and statements |
|---|---|
| <i>How do I get work-study money?</i> | "I wondered how I would get this money." "I didn't know how to actually get it." "How do I start to get the money from my work-study?" "How will I receive this money? I don't even have a bank account yet?" |
| <i>* no work assumed</i> | "I wasn't sure exactly what you had to do to actually get the money." "Mostly what I had to do to get the money. Like, did I have to do extra paperwork?" |
| <i>How do I get work-study money?</i> | "How was it going to be distributed (lump sum or hourly wages)?" "Does the award mean I will receive a maximum of \$ (work study amount listed) for this job?" "I wasn't sure how the work-study worked. Did I get that money right away and then work it off? Did it go in later? Did I have to work on campus for the money to cover my expenses?" |
| <i>* work assumed</i> | "Do I get the money first and then, work my hours after? Or do I get paid weekly and cap the total on what I was given?" |
| <i>How can I use work-study money?</i> | "Is the money I make from work-study constrained to only being used towards tuition expenses?" "I was confused if [work-study] money was solely for academic expenses or if I was free to do whatever with the money." "Will I get [work-study] money to spend or will it all go towards tuition?" "Is [work-study money] only towards tuition or can I use it for personal expenses?" "Did the money have to go towards my tuition, or could I keep it for myself?" |
| <i>What are the terms and conditions?</i> | "I guess I wondered what would happen if I didn't work enough hours to earn the full amount of money I was offered. Or, conversely, what would happen if I worked *more* hours than needed - would they continue paying me if I reached the amount of money offered, or would they not let me work anymore?" "Will I still be allowed to work after I've reached the [offer amount]?" "Will I have to pay [work-study offer amounts] back if I don't end up getting a job?" "Do I have to pay back money for federal work-study if I don't make all the money?" "Will I lose work-study for the next year if I don't use it this year?" "I was concerned that I would be able to work up until I reached the amount of money to my labor hours, but after that it was free work and I didn't get compensated for what I earned over the work-study dollar amount." |

About how the program works, another major question students had about federal work-study was job-related: (a) how they could get a work-study job, (b) what work-study jobs would be, and (c) what the terms and conditions of work-study jobs were (see Table 29 for examples). Figure 27 shows that students' questions varied first by how they assumed work-study jobs could be obtained. One group of students assumed that work-study jobs would be assigned to them. I found that these students, to some degree, understood the aid offer as a job offer. In this case, they questioned what the job assignment process would look like or who might be contacting them about it. Intriguingly, I discovered that these students misconstrued that they might not have a choice in the kind of work they would be doing via work-study. For example, one student asked, "Will they just offer it to me? Do I get to pick?"

Figure 27. *Work-Study Job Questions*



The other group of students supposed that they personally had to find a work-study job. For them, the questions were more centered around how they could search and apply for work-study jobs. These questions were followed by inquiries about to whom they could seek assistance with finding work-study jobs. For instance, "Where do I need to look or who do I need to contact in order to find a job for the work-study?" "What kind of help will I be offered when looking for

a job?” “What resources do you follow to find [work-study] jobs?” Some students additionally probed, overall, how difficult the process of finding a work-study job would be and also, what would happen when they were not able to find a job or get hired. For instance, “What happens with my work-study [when] I can’t find a job? Do I just get nothing?”

In most cases, students furthermore had questions about the features of work-study jobs. Their questions included how available the jobs were, whether work-study positions were only available on campus, what types of work or jobs they could do, how work-study jobs differ from non-work-study jobs (or regular jobs as students referred to), how much work-study jobs paid, how flexible work-study employment was in terms of breaks and work schedules, and whether they could have more jobs other than work-study. Noticeably, many students also questioned, if they had a work-study job, whether they had to report income through work-study jobs for tax purposes and in the next year’s FAFSA. They asked, “Does [work-study] money get taxed or get counted as income that I need to report for next year’s FAFSA?” “Will I have to pay federal income tax on what I earn?” “Do I have to file taxes for work-study? I was unsure how the work-study wages will affect my financial aid in subsequent years.”

Table 29. *Federal Work-Study Questions - "How Does it Work? (Job)"*

| Topic | Example questions and statements |
|---------------------------------------|---|
| <i>How do I get a work-study job?</i> | <p>“How would I get a job that qualifies for work-study? Will I be contacted about this?”</p> <p>“Will I need to search for a job myself, or will someone else take care of that for me?”</p> <p>“How do I even find a work study job? Will they just offer it to me? Do I get to pick? How is work study different from getting a non-work study job?”</p> <p>“Would I have to find a work study job myself or am I assigned to one by the university? What are some examples of work study jobs?”</p> <p>“How do I get a job on campus that goes hand in hand with work study?”</p> <p>“How was I supposed to find a work-study job? How would I know which jobs were considered work-study jobs?”</p> <p>“I also was unsure if I would need to find the job myself or if I would be placed.”</p> |

*What are
work-study
jobs?*

- “What are some examples of work-study jobs?”
- “What are most of the [work-study] jobs offered like? Is it only jobs where I’m working for the university (dining hall, cafes, etc.)?”
- “What kind of work will I be doing?”
- “Are there other jobs than working in a dining hall?”
- “What kind of work is entailed if I accept work-study?”
- “How flexible are the hours for work-study jobs?”
- “What is the difference between work-study and just getting paid for a regular job?”
- “Do I make more money [with work-study] than a regular, non-work-study job?”
- “I was confused about if it was any different than just having a job on campus.”
- “How strict is the work-study schedule? Am I able to alter my hours week-by-week? Am I able to get time off? Do I have to work over breaks?”
- “How is a work-study job different from an off-campus job?”
- “I didn’t understand the difference between work-study and getting a regular job.”
- “I was unsure if [work-study earnings] counted as aid or income.”
- “Does the money I earn from work-study count as my income when I file FAFSA next year?”
-

Why Should I Do Federal Work-Study? As students began to wonder about how work-study jobs were distinguishable from non-work-study jobs, they became curious about what the benefits and costs of federal work-study were and sought to understand why they should consider doing work-study (see Table 30 for examples). First, the questions students asked reflected their concerns about the potential harm of work-study on their academics. For instance, “How much time does work-study take? Can I handle taking classes and work-study?” “Will [work-study] fit into my schedule? Will it cause me to be behind in classes?” I overall discovered that students’ anxiety about the costs of work-study derived from not yet knowing what their schedules would look like and not having the ability to guess the degree of time commitment for working.

Then, many students more straightforwardly questioned about the benefits and value of federal work-study, often in comparison to working non-work-study jobs. “Is it worth it? Am I being paid more than I can possibly earn somewhere else to help me pay off tuition?” “What advantage is there to work-study vs. traditional part-time employment?” “What is the benefit of work study rather than just finding a job to make my own money?” In this regard, there were some students who shared that they ultimately could not determine the worth of participating in

the federal work-study program, stating “I didn’t see the benefit of this over a regular job,” or “[in the end] work-study didn’t really mean anything [to me].”

Table 30. *Federal Work-Study Questions - "Why should I do it?"*

| Topic | Example questions and statements |
|---|---|
| <i>How will work-study affect my study?</i> | “How much do I really have to work? Will it interfere with my studies?” |
| | “Will I be able to maintain my grades with a work-study job?” |
| | “I thought it might conflict with classes and bring down my GPA if it took up too much time.” |
| | “How will it affect my studies and benefit me?” |
| | “How would I manage to fit it into my full schedule with other responsibilities?” |
| <i>What is the value of work-study?</i> | “Will I still be able to manage class schedules along with work schedules?” |
| | “What’s the point of work-study?” |
| | “What is the benefit to accepting work-study?” |
| | “How does work-study benefit me and what does it entail?” |
| | “How does [work-study] actually help me financially?” |
| | “I was unsure if [work-study] is a better alternative to finding a job.” |
| | “What was advantageous about a work-study position as opposed to a regular job?” |
| | “Why should I choose work-study over a job I get paid actually money for?” |

Resolving Federal Work-Study Questions

Through the survey, I hoped to learn about to what extent students were reaching out to the Office of Financial Aid to resolve their inquiries about work-study prior to deciding to accept or decline their offers. Only 22% of the respondents (n = 114) reported that they reached out to the Office of Financial Aid to clarify their questions and confusion about work-study. The results showed that the majority of these students (72%) were content with the help they received from the Office of Financial Aid about their work-study questions. Nevertheless, the survey findings revealed that for most of the respondents, their parents/guardians were the main source of help with learning and deciding about their work-study offers.

Making Decisions about Federal Work-Study

In the survey of 514 students, about 41% of them (n = 211) accepted and participated in the federal work-study program. Close to 25% of the respondents (n = 127) originally accepted

their work-study offers but did not do work-study in the end. Lastly, around 34% of the survey participants (n = 176) were students who declined their work-study offers. Students reported that when deciding about their work-study offers, they primarily relied on their parent(s)/guardian(s) (38%), which was followed by their own research (e.g., *Google*) (32%). The results showed that the Office of Financial Aid at Lake University was the third most cited source of help to inform students' work-study decisions, yet it represented only about 9% of the respondents.

In this part of the chapter, I first examine why students accepted and participated in the federal work-study program and compare their responses to why some students declined their work-study offers. I overall assume that students' work-study decisions were mostly impacted by their parents/guardians and themselves. I moreover review the reasons why some students did not work even though they originally pursued doing federal work-study. I separately examine students who did not apply to any jobs to begin with and then, those who applied for positions but still ended up with no part-time employment. Finally, I examine the kinds of alternative choices students made to finance any remaining college costs (if any) when they decided to not work any part-time jobs.

Reasons for Accepting and Participating in Federal Work-Study

The findings suggested that there were three main reasons for accepting and doing federal work-study among first-year college students: Money, work, and employers (see Table 31). One of the most cited reasons was that they needed extra income/money to help with the costs related to attending college. The expenses students mentioned included tuition, housing, transportation, daily expenses including food, and books. Moreover, some students shared that the extra income was also needed for personal spendings. For instance, now they were in college, they wanted to “start paying for their own stuff” and “have money for personal use” without “having to ask

parents for a personal allowance.” Some respondents indicated that the extra income was not necessarily for expenses during the current school year, but for future expenditures (e.g., next year’s tuition, paying off student loans). Students highlighted that doing work-study for extra income was important for them to “help relieve the financial burden from their family.” A few students then wanted to reduce their own financial burden that they might have to face in the summer. For example, “[Work-study] helps lessen how much I have to work in the summer to pay for college, so it seems pretty obvious to take advantage of it.”

Students moreover accepted their work-study offers due to reasons related to work opportunities and experiences. Many students misinterpreted participating in work-study as working on campus. Students believed that accepting work-study would give them an eligibility or guaranteed opportunity to work on campus or that it would be the only way to get a job on campus. As students wanted to gain some work experience during college, they considered accepting work-study as a logical next step. In other instances, students shared believing that work-study positions would mean “more preferable” and “better” work opportunities on campus. For example, several students specifically mentioned that the reason for accepting work-study was to have more desirable work options on campus “outside dining hall.”

More importantly, I found that a large majority of (work-study-offered) students who wanted work experience on campus were specifically interested in research-type work, and this was the primary reason for accepting work-study. It was not necessarily that federal work-study positions on campus were research related. Rather, work-study was extra income that followed research of work students already pursued. Specifically, at Lake University, there are programs that offer undergraduate students with opportunities to participate in research. There is also a program that is explicitly designed for first-year students. Students reported that they already had

been accepted to these research programs and then learned that they could get paid for the work (instead of credits) if they had a work-study offer in their financial aid package. This was why they accepted their work-study offers. Students explained, “I had been accepted into [*research program name*] and knew from the program that I could use my work-study to earn money from a research position,” “I knew that since I was in [*research program name*], being work-study would help me get paid for it.” I found that there were very few students who knew that these research programs could be counted as work-study before they applied for them. For them, as one student described, such programs were “the perfect choice” because they needed to work to pay for college costs while they were pursuing research experience in college.

The third most frequently mentioned reason for accepting work-study was associated with employers at the university. Students mentioned that there were employers who either requested or suggested using work-study if students had it in their financial aid package. I also found that for some students who seemed to have some level of knowledge about federal work-study (that work-study lessens employers’ contributions to student wages), they found that work-study would make them more “appealing” and “desirable” employees compared to other students without work-study and overall, make the job searching process easier for them. As explained earlier, this is because work-study funds reduces the financial burden of the employers related to student wages; work-study funds generally covers 60% of student wages at Lake University.

Finally, although not common, other responses included students who accepted and participated in work-study because they thought they had to. Misinformed students believed that accepting work-study was the way not to owe any money (i.e., work-study offer amount) to the university. A small number of students also mentioned that work-study jobs offered them most flexible hours compared to other positions they considered.

Table 31. *Reasons for Accepting Work-Study*

| Topic | Example questions and statements |
|---------------------------------|---|
| <i>Financial reasons</i> | <p>“I needed extra income to help with college costs because both of my parents are deceased and can't help.”</p> <p>“I wanted extra income to help with college costs. I don't want to have a lot of student debt when I graduate, so anything helps!”</p> <p>“I needed money to help support me through college. I didn't receive a lot of aid, to begin with, so I wanted to take advantage of the aid that was given to me.”</p> <p>“I needed extra money for food. As someone who has a special diet... the university dorms didn't really offer that many option... As such, I accepted work-study so I can order halal food to eat when I'm hungry.”</p> <p>“I needed the extra income to help with college costs. FAFSA believes that my parents make a lot of money for our contribution to be over \$1,000 but that's not the case. I had to get a job in high school to pay for the majority of my expenses in high school.”</p> |
| <i>Work-related reasons</i> | <p>“I am relying on myself to put myself through college and get an education, so [work-study] was necessary to gain some job experience.”</p> <p>“I wanted to participate in [research program name], but also had to have a job to support myself. Since the [program name] offered work-study, it was the perfect choice.”</p> <p>“I was enrolled in [research program name] and wanted to be paid rather than get credits.”</p> <p>“I think that working while in school is a valuable skill that would help me in the long run. Having work-study gave me a greater incentive to do so.”</p> <p>“I wanted to ... gain work experience in a new environment, and I was thankful enough to work at the [school name] where I study.”</p> |
| <i>Employer-related reasons</i> | <p>“I figured work-study would make me more desirable as an employee.”</p> <p>“[Work-study] appeals to employers.”</p> <p>“I had a job that requires work-study.”</p> <p>“... I knew that many professors are always looking for work-study research assistants (since the money doesn't come from their grants).”</p> |

Reasons for Declining Federal Work-Study

The survey findings demonstrated that there existed three predominant reasons as to why students declined their work-study offers: (a) students did not want to work, (b) they could not figure out how work-study worked, and (c) they did not think work-study was financially needed (see Table 32). The most salient reason for students to decline their work-study offers was that they did not want to work, especially during their *first year* in college.⁴⁴ Instead of partaking in part-time employment, students sought to spend their time focusing on school, transitioning to

⁴⁴ Indeed, 78% of the survey respondents who declined work-study reported that they did not work at all.

college, or a combination of them. Students explained, for example, “I thought since it was the first year of college that I should not accept work-study so that I could focus on my academics” or “My main reason for [declining work-study] was because I did not want to get a job right at the start of my college career. The transition to college, in my opinion, was already stressful enough and I didn't find the idea of working, on top of that, very appealing.”

For students wanting to focus on studying and transitioning to college, having to work implied being under time constraints and psychological pressure. They felt that there would be “no time” for work if they were to focus on adjusting to new academic responsibilities. For instance, “I thought I wouldn't have enough time to do well in school and work a minimum wage job. I worked 30 hours a week a minimum wage job in high school my last two years and it was exhausting. I barely got sleep. I decided I didn't want to go through that stress anymore especially in an environment completely new to me.” In particular, students who identified themselves as student-athletes highlighted that they had no availability at all for any type of part-time work. Although rarely, I also discovered that students hoped to secure some extra time they might have on other activities rather than work, for example, extracurricular or social activities. One student said, “I wanted to have more free time to meet new people and become involved in other activities because it was my freshman year.”

As noted earlier, students further elaborated on various psychological and mental stress they experienced while thinking about working during their first year in college. A large majority of the respondents expressed that they were already “overwhelmed” with starting college or it was “overwhelming” to consider balancing working and studying. Student responses included, for example, “I did not want to start off college with a job, especially because I never had one before. I did not want to be too overwhelmed with a job AND school. I wanted to slowly ease

into everything before even thinking about getting a job,” “I was completely overwhelmed going into college and everything was extremely chaotic for me because I had little help getting prepared for college,” and “I believed I would be too overwhelmed with working a job on top of my studies. I was really nervous my grades would suffer because of a job.” In this concern, students commonly described working and studying as “too much to handle,” “too much to juggle,” “too much on [one’s] plate,” or “biting off more than [one] can chew,” and that the idea of working during their first year in college felt “uncomfortable” and “too stressful.”

Among first-year students, the second most cited reason for declining work-study was that they could not figure out how the program worked. Students viewed work-study as having too many hassle factors to deal with (e.g., figuring out the process, finding a work-study job) for a first-year student. Hence, students responded that they simply decided not to try to make sense of it and declined their offers. For example, students said, “I didn’t understand how to use [work-study], so I didn’t,” “I wasn’t sure where the money for the work-study would go, so I figured I wouldn’t do it.” Some students added they were not comfortable with committing to something that they lacked knowledge of. One student stated, “I was still unsure about the specifics of the program, and I didn’t want to sign myself up for something that I didn’t understand, especially for my first semester.” Others mentioned that it was also questionable whether spending time on figuring out work-study was worthy. One student explained, “I didn’t know exactly what [work-study] would entail and if it would be more worthwhile to find part-time work elsewhere. It didn’t seem worth it to try to figure that out along with everything else.”

Lastly, students declined their work-study offers as they perceived it as financially not necessary. These students generally viewed that they already had a sufficient amount of financial aid, excluding work-study, and that declining work-study would not financially harm them. For

instance, students responded, “I just didn't really need the work-study considering that between my scholarships and financial aid, I had all of my expenses covered such as room and board and tuition,” “I decided to decline my work-study offer since I had other financial aid offers and was fortunate enough to have an education fund. So, I ended up not needing the [work-study] money anymore.” In other instances, students considered the amount of work-study aid, which have been usually around \$3,000 or less, was financially manageable through other means (e.g., family contribution, small loan, savings). For example, one student explained, “There wasn't really a need for me to take out bank loans or take up a work-study offer. My siblings said they would help me pay for college and then I would pay back what I owed after I got my degree.”

Overall, mainly three reasons motivated students to decline work-study. Students did not want to work a part-time job either with or without work-study, they did not want to deal with figuring out the specifics of the program (e.g., how to proceed with their work-study offers), and they did not view their financial circumstances to be needing work-study. Some other reasons indicated that students already had or were seeking non-work-study jobs. Students explained that it was primarily because they pursued a job that had “no limit” to the number of hours they could work and also, a job with “higher income.” I found that the maximum work-study offer amount concerned students as to how much income they could make.

In fact, I asked an additional question to work-study decliners in the survey. The question was how likely they would have accepted work-study if they have been provided with perfectly clear and complete information about federal work-study. On a scale of 1 to 6 (extremely likely to extremely unlikely), 72% of work-study decliners responded that they would have been more likely (i.e., extremely, moderately, and slightly likely) to accept work-study if they had access to full information about the program, whereas the other 28% of work-study decliners responded

that they still would have not accepted work-study. The findings suggested that more students presumably would have accepted work-study if more detailed information about the program have been available and presented to them, prior to making decisions about work-study offers.

Table 32. *Reasons for Declining Work-Study*

| Topic | Example questions and statements |
|--|---|
| <i>Did not want to work</i> | <p>“Even though I needed the money, I knew I wanted to fully focus on school for my first year of college.”</p> <p>“I wanted to focus on my academics my freshman year so that I could start off with a good GPA and have a chance to be admitted to the Dean’s List and Engineering Honors”</p> <p>“I decided that it was not in my best interest to take on a job on top of the difficult classes that I was taking. In other words, I needed to take my time when it came to transitioning to college.”</p> <p>“I ultimately decided that I would need to focus on learning and getting my bearings in a college environment my freshman year, leaving no room for work-study.”</p> <p>“I was worried about starting college and having a full schedule, so my parents and I agreed [that] work-study didn’t make sense as it would be too stressful.”</p> <p>“I originally wanted to do work-study. But with the transition to college and the workload that the [department name] had quickly overwhelmed me, so I needed to step back from a few things.”</p> <p>“... I was not sure how capable I would have been with work and school as I was transitioning from a public school with no college prep.”</p> <p>“I was accepted to [undergraduate research program], but upperclassmen told me that it was a lot of work and dedication. I was taking [course names] as a freshman and was told that it was a lot of work. I wanted to spend maximum effort on my core classes.”</p> <p>“I wasn’t quite prepared to work for freshman year while also getting used to college.”</p> <p>“The transition to college is an intimidating and uncertain experience, and I ultimately declined my work-study offer because of that uncertainty about how my first semester would play out.”</p> |
| <i>Could not figure out work-study</i> | <p>“It was difficult to figure out work-study, and I figured I would find a job elsewhere.”</p> <p>“I didn’t know what [work-study] was, so I wasn’t sure if I should accept it.”</p> <p>“It was difficult trying to figure out the application and working process of work-study...”</p> <p>“I couldn’t figure [work-study] out and had other things to worry about - moving from out of state, adjusting, etc.”</p> <p>“I was uncertain about how to set [work-study] up.”</p> |
| <i>Did not need work-study</i> | <p>“It seemed like the money that my parents had was apparently enough to be used for my tuition that there would be no reason to get a job.”</p> <p>“... I had enough money saved up from working during the summer to not need to work during the school year.”</p> <p>“I had scholarships and I decided it would be better to focus on getting adjusted to college life than getting a job.”</p> <p>“... my aid packet gave me a good amount to cover my tuition and fees that I declined to do work-study.”</p> <p>“I had sufficient aid to afford school without [work-study].”</p> <p>“I was able to pay for my education that year without work-study.”</p> |

Reasons for Not Working

As discussed earlier, a majority of work-study decliners did not want to engage in part-time employment at all particularly during their first year in college. They were more concerned about focusing on their academics and making smooth transition to college. Aside from work-study decliners who did not work, there were also students who ended up not working even though they originally accepted work-study. Some students did not even apply for part-time positions. There were some students who applied for jobs, but ultimately also did not get a part-time employment. To these students, I asked them follow-up questions in the survey about why they chose not to apply for jobs and/or why they did not work, even after applying for jobs.

Students who did not apply for any positions to begin with shared two main motivations for their decisions. Similar to work-study decliners, they ultimately decided that they preferred focusing on studying and transitioning to college over working. Students explained that they were surprised by the amount of work and time that had to be invested in academics and thus, they felt “overwhelmed” with the coursework load. Although their motivations were alike to that of work-study decliners, these students were distinctive in a way that most of them highlighted that their decisions were despite the financial circumstances they had to face. Students said that they declined work-study “despite the financial issues [they] had to face as a result.”

The second most cited reason for not applying for jobs was related to the job searching process. For many students, they were either not able to find a job they were interested in or they did not qualify for jobs of interest. Student responses again indicated that there were students who viewed positions in the dining halls as not appealing. One student shared, “I looked for jobs several times but I never ended up applying for anything. Honestly, I was just being too prissy due to not wanting to work in the dining halls. That job was essentially guaranteed but I didn’t

want to do it.” Students also reported that they did not apply for jobs as they were underqualified for the jobs that were interested in. They explained that they either did not have a résumé to submit (they never had one written before) that was required for most jobs or they did not have relevant work experience that was expected. I found that my interview with the assistant director of the Student Employment Office supported these student responses. She indicated that there were many jobs that favored upper-class students, which then led many students to consider off-campus jobs. She explained that it was because “Upper-classman undergraduate students already have more experience. They are going to be eligible for some of the more exciting or more [academically] relevant positions... [It’s] generally upperclassmen who gets [those jobs].”

Then there were students who applied for work-study positions after accepting the offer, but still ended up without a job. While I found that wanting to focus on studying was one of the main reasons why students ultimately chose not to participate in federal work-study, in most cases, students unwillingly did not get a job. That is, students were not accepted to the positions they have applied to. Importantly, I discovered that more than half of these students simply never received any types of response from the employers after submitting applications. Students shared, for example, “I applied for 5 work-study jobs, and 4 directly through the school, but never heard back from any of them. I was very frustrated because as a freshman there were little to no opportunities for work-study jobs since most go to upperclassmen” “I applied to many job listings that were on the work-study site, but I believe they were failed because I never got any response.” In such cases, students added that they would already have spent weeks waiting to hear back, and they eventually decided that they should discontinue the job searching process.

In a follow-up question to work-study offered students, but who did not work, I asked them about the primary financial decision they made to help financing college costs instead of

working a part-time job. Nearly half of the students relied on their existing financial aid offers, about 20% of them took out student loans, and close to 19% of them received financial help from their parents. I discovered that only a small percentage of students attempted to reduced college-related expenses or applied to additional scholarships.

Understanding Student Needs

Via student survey, I aimed to learn about their experiences with navigating work-study and their related decision-making processes. I also intended to identify the key informational and structural barriers that hinder first-year students from making informed work-study decisions by hearing directly from them about how institutional practices and services can be improved. Thus, I specifically asked in what ways, the university could improve the financial aid award notice and related practices/services, student experiences with navigating work-study jobs, and the overall access to information and student assistance regarding work-study. I found three key issues raised among students: Availability and accessibility of information, federal work-study employment process, and proactive student advising.

Information

More Information. Students evidently reported that more detailed, quality information was indispensable for them to make informed decisions about their federal work-study offers. They sought information about the questions and confusion about work-study they have shared in the survey. That is, students wanted precise information about what the federal work-study program is, how it works (i.e., how the money is distributed; how they can find work-study jobs), what policies or rules the program entails (e.g., what happens when students earn less than the offer?), and above all, what the benefits and costs of work-study are. Students specifically emphasized that they wanted to be informed about the “benefits,” “advantages,” and “purpose”

of partaking in federal work-study, which would help them determine why they should consider doing work-study. At the same time, students indicated that they wanted to be knowledgeable of the “disadvantages” and “costs” of work-study, and “why someone might decline work-study.” Notably, first-generation students stressed the need for more accessible information specifically for first-generation students, given their lack of resources. For example, “I really want to emphasize the need for information about work-study because a lot of first-generation [students] who come from low resourced school do not have background knowledge on this subject.”

Accurate Information. Importantly, students underscored the need for more “accurate,” “transparent,” and “clearer” information about federal work-study in the financial aid award notice. The results demonstrated that many students viewed the work-study information on the aid award notice as “misleading,” giving them “a false sense of security.” As discussed earlier, the fact that work-study award amounts (along with loans) were subtracted from the total cost of attendance confused students to a great extent as to how much students exactly have to pay for tuition as well as whether work-study was a type of gift aid in nature. One student described, “The fact that [work-study] appears on financial aid as an amount deducted from our costs is a total misnomer. In reality, it facilitates finding fairly low wage work and is roughly equivalent to just having a job during the school year.” In this concern, students suggested that the university “should not include [work-study] money inside of the money taken off of [the total cost of attendance] because it isn’t directly applied [to the costs] and is giving a false sense of security if you do not have parents assisting payment” and “[should] organize the award notice so that the things that you’re actually getting charged for by the school are clear, so then you can see how much of your financial aid can go toward that... [and] being more transparent up front will encourage a lot more students in the future.”

Hence, many students concluded that the financial aid award notice ought to be more transparent about the nature of the federal work-study aid that it is not a scholarship or grant that would automatically reduce their cost of attendance and that it is rather a job opportunity. In the end, I found that many students were left with a question of, “how is the federal work-study aid a financial aid?” Students commented, “Don't even use work-study as a term unless it's applied to the bill. I made \$9.50 the first semester and \$9.75 the second semester. It seems to just be a job. I still have no idea how it helps my financial aid,” “I suggest letting students know it's more of a job opportunity with less taxes taken out. It isn't really a scholarship,” “So, I'm basically getting paid to do a job. So, I am not really sure how [work-study] is financial aid really because I feel like it's just working.”

Timely Information. Students furthermore a shared consensus that federal work-study information should be provided to students in a timely manner. Specifically, students stressed that the information needed to be offered “as early as possible” and most preferably when the financial aid award notice is distributed because that is when students have to decide to accept or decline work-study. Therefore, a large number of students proposed that all essential information about federal work-study should be provided with the aid award notice as much as possible and that first-year students should not be “left to search for information.”

Information Delivery. The survey results also revealed a variety of methods, through which students preferred to receive information about federal work-study. As mentioned earlier, students predominantly wanted to have access to information on the financial aid award notice, or at least a “direct” link to a space or a person with information (e.g., dedicated staff or website for work-study). Diverse examples of communication means also included short videos, one-pagers, flyers, pamphlets, information packet, targeted emails to students who received work-

study offers, FAQ website, live chat, or making it a part of the student orientation. Overall, I found that students were mainly looking for a readily available information they could easily access as they begin to navigate the federal work-study program. Students wished for sufficient amount of correct information about work-study as well as knowledge of what the next steps should be if they accept work-study.⁴⁵

Work-Study Employment Process

More Structured Process. The findings revealed that students significantly struggled with the process of finding and applying for work-study positions. As discussed earlier, first, it took a significant amount of time for students to realize that they would not be assigned a work-study job along with the aid offer, but they would have to independently search for work. Therefore, students underscored that directing them to this “next step” following the offer was essential. A large number of students actually indicated that they would like to be “assigned,” “connected,” or “matched” to work-study jobs based on, for example, their academic background to make the whole process of job search easier.

If students had to individually go through the job search process, students advocated for a “simpler,” “organized,” and “more systematic” structure for work-study job searching. That is, students expressed that it was a “stressful and overwhelming” process to explore a considerable number of jobs posted on the student employment website, especially when much information was not up to date and many employers were non-responsive. For example, the website would list jobs that were hiring years ago as still available, misleading students to apply. In other many instances, students simply never heard back from employers after submitting their applications,

⁴⁵ At the time of collecting data for this study (between September 2019 and August 2020), I was not able to locate any information about federal work-study provided by the university, except for a shared online document created by students. In the spring of 2022, I noticed that the university now has created brief documents and few webpages (FAQs) that explain the federal work-study program.

which led them to spend weeks to wait for the result of their applications. Students strongly appealed that the university should inform the applicants about the application process (e.g., “whether the employer even looked at their application at all”) and “encourage employers to respond” to actually help them to get hired and use work-study.

In this line of suggestions, one of the most frequently mentioned proposals was to improve the student employment website, specifically by adding more filtering/sorting options for a job search, to ease the navigation structure. Students explained that the current online system was technically extremely demanding for them to look for available work-study positions as they could not filter for jobs that accepted work-study, jobs that were currently hiring, and jobs that accepted first-year students or that did not require previous work experience, which first-year students often did not possess. One student suggested to “maintain an active, dynamic online database that students can access and tailor their application towards (and even apply) online for [work-study] positions,” adding that “students like [himself] felt overwhelmed coming into college and navigating work-study without appropriate resources and systems made making informed decisions much harder.” Overall, students’ general impression of the work-study job searching experience was exhausting and draining. As a result, many students also advocated for a “dedicated” on-and off-line space and staff to assist them with searching for work-study jobs.

Accessibility of Opportunities. Students repeatedly stressed that more job opportunities should be accessible for first-year students to participate in the federal work-study program. First-year students often found themselves as underqualified to apply for on-campus positions because of the lack of previous work experience, which added another layer of barrier to their search for an opportunity of interest. Students similarly shared, “As a freshman, I have to say that I found it very hard to get a good job because many of the jobs listed require a lot of

experience, which I did not have as a freshman,” “While searching for an on-campus [work-study] job, I often felt that there were many prerequisites that could not be expected of a first year or someone new to the workforce. Offering workshops to inform students on how to use and be familiar with specialized programs that bar inexperienced workers from entering the workforce would be extremely helpful.”

Relevant Work Experience. The survey results indicated that first-year students with work-study offers pursued work experiences that were related to their academics (e.g., major) or career interests and that the university should create more relevant opportunities if needed. One student also emphasized that the academic and career-relevance of work-study jobs should be more inclusive of different majors. Intriguingly though, from another question in the survey about the three most important factor in choosing part-time jobs in general, I found that students’ top priorities did not necessarily include the relevance of work. Students reported that more relevant work opportunities would be beneficial, however, the most important factor for students was the flexible hours of the job to accommodate their schedules, which was followed by hourly rate and then proximity to where students lived. For students who did not work in their first year, career relevance was the fourth important factor to look for in their part-time work experience. On the other hand, for students who worked (including work-study and non-work-study jobs), a low-intensity, low-pressure work environment were the fourth important factor.

Proactive Student Advising

A great deal of first-year students expressed that there was a lack of guidance, support, and advising for students regarding federal work-study (e.g., navigating the program, finding a job). For instance, students shared, “I just felt like I had to do it on my own. I’m not sure if I missed the email from someone offering to help me navigate work-study, but it just felt like yet

another stressor to figure out,” “It would be extremely beneficial to have someone to talk with specifically about navigating and finding a good work-study job... rather than be expected to do it all completely on your own with little to no guidance.” Hence, students entreated the university to be “more proactive” in reaching out to students with work-study offers to help them. They wanted to receive guidance and advising to make informed decisions about their offers and jobs. Students were especially looking for personal-level support, mentioning “one-on-one meetings,” “in-person conversations,” “[speaking] with students directly,” and “individual attention.” In the end, with guidance and support, students aspired to make work-study decisions that would be “suitable for them” (e.g., fit with a job), beneficial and useful to their future goals (e.g., career goals), and fulfilling their needs (e.g., experience).

Table 33. *Student Needs: Information, More Structure, and Guidance*

| Topic | Example questions and statements |
|-----------------------------------|---|
| <i>Information</i> | <p>“Specifically target first-generation students because we’re the ones who have the hardest time with these situations.”</p> <p>“Help students understand what all is entailed in the work-study and what it means.”</p> <p>“I don’t believe that the ‘Work-Study’ amount should be included in ‘Total Cost of Attending’ and it should be made clear that this is merely money you can raise if you go out and have the time to get a job during the school year.”</p> |
| <i>Student employment process</i> | <p>“On the student employment website, there are countless job postings where employers are not even looking for new people anymore. If they are not looking to hire anymore, I would want [the university] to update the student employment website, so I can really see WHO is hiring, not who is “maybe” hiring. [The university] should delete job postings on the student employment website that are not even looking anymore. It would simplify my job search so much more, instead of having to look at 300+ job postings where half of them are not even looking for a new person to work for them.”</p> <p>“I tried to search for work-study through student employment, but it was impossible to filter to jobs I would be able to apply for.”</p> <p>“There needs to be more opportunities for work-study for freshman students. Even if you’re granted work-study, it’s next to impossible to actually get a job because most, if not all, go to upperclassmen.”</p> <p>“Make it easier for work-study students to do something related to their careers.”</p> <p>“Guide students on how to find work-study options related to major.”</p> <p>“[The university] should look for more ways for departments to add more work-study. There should be a variety of work-study that relates to different majors. These part-time jobs should be helpful for students’ careers as well.”</p> |

*Student
advising*

“School can be a lot more proactive in reaching out to students, specifically about different options for work-study jobs on and off campus, the process of getting a work-study job.”

“Speak with students directly. Actively reach out if a student has accepted work-study and has not followed through. Individual attention for students to cater to that student’s needs, not just a mass email or a poorly compiled list of limited resources.”

“Have staff reach out to work-study students to check up on them and see if they have found a position yet and help them out if they don't know where to start.”

“Meet one-on-one with students about [the work-study] option. Create an advisory job for discussing this with students.”

“Actively reach out to students with work-study and help them. Better if it’s a one-on-one type of thing.”

Summary of the Findings

In this chapter, I first examined how students navigate the federal work-study program and make relevant decisions and then, explored the informational and structural barriers that play a role in their decisions. I analyzed data from an institution-wide survey of first-year students who were offered work-study. The goal was not only to inform institutions and policymakers about the potential means to improve work-study funds allocation strategies, but also to improve student experiences with the program as both a financial aid and a work experience, based on an updated knowledge about current college students since Troppe’s (2000) survey.

First-year, lower-income students who are offered federal work-study at Lake University generally have scarce knowledge and information about the program when they file the FAFSA. They mostly tend to express their interest in federal work-study though, hoping to be eligible for as much financial aid as possible. As students receive the federal work-study aid as a part of their financial aid awards, they begin to navigate the program more in-depth. They are confronted with wide-ranging questions and confusion about federal work-study. Primarily, their inquiries include what the federal work-study program is, how the program works in terms of receiving the aid money and work-study jobs, and what the benefits of participating in the program are for them to consider. Most students lack both basic information about work-study as well as

essential features of the program such as having to earn work-study money in a form of wage through part-time work. Surprisingly, I find that many students do not actively seek assistance from the Office of Financial Aid to resolve their inquiries about federal work-study.

First-year students instead heavily rely on their parents (or guardians) and themselves throughout the process of navigating federal work-study and making decisions whether to accept or decline their work-study offers. Students accept and do federal work-study largely due to their financial needs to earn extra income for both college and living costs, work-related reasons, and requests from employers. Importantly, I find that students frequently accept work-study based on incorrect knowledge about it. Many students, for example, misunderstand that accepting work-study means working on campus or that work-study implies an eligibility to work on campus. I moreover find that students who participate in research programs designed for undergraduate students actually secure those opportunities without considering work-study. However, after being employed, they find out about the possibility of being paid for their work via work-study, about which they view as an unexpected, added benefit.

On the other hand, for most work-study decliners, they are not interested in work-study as they do not wish to participate in any type of work for pay during their first-year in college. They have strong intentions to focus on academically and socially transitioning to college without any concerns about time spent on work potentially harming their academic achievements and goals. First-year students generally describe that working and studying at the same time lead to a sense of worry and anxiety, overwhelming pressure, and stress. Quite a few students indicate that they prefer to take out a small amount of loan over working at least for their first year. Students also decline their work-study offers because they cannot figure out how federal work-study operates as a financial aid and an employment. The program presents too many hassle factors for students

to resolve when they are starting college as a freshman. Importantly, I find that a large majority of work-study decliners actually may accept work-study if they were given better information about it. Lastly, students also decline work-study because they simply do not feel the need for it as their current financial aid without work-study seems adequate. I indeed find that in general, work-study decliners rely on existing financial aid offers, take out student loans, or receive help from their parents as an alternative option to doing work-study.

Students overall highlight three main factors to be improved for them to make more informed decisions about federal work-study. First and foremost, students stress the need for access to more information, accurate information, and timely information using all possible means of communication. In particular, numerous students maintain that the current financial aid award notice and how it presents the federal work-study aid are greatly misleading. Students find the institutional practice of subtracting work-study aid money from the total cost of attendance to demonstrate an estimate of total cost to attend significantly obscure as to how work-study aid is financially lessening the burden of their actual tuition bills. Students are thus often left with a question how the federal work-study program functions as a financial aid when it appears to be equivalent to partaking in a regular, non-work-study job for income.

More structurally, students strongly advocate for an easier process of student employment hiring for work-study students. Without any dedicated space for work-study students to look for work opportunities in addition to no specific guidance about the steps to secure a work-study job after accepting work-study, students are confronted with a number of unknown, opaque steps to getting hired. Merely a few students refer to themselves as “very lucky” to have a sibling with work-study experience to teach them “how the system worked.” However, for the majority of students, no standard procedure to secure work-study positions, unorganized student employment

website with hundreds of job listings to navigate (for many of which first-year students do not qualify), and limited guidance and assistance for students all play a role as obstacles for lower-income, first-year students to make informed decisions about work-study. Hence, students call for more proactive efforts by the university to increase students' knowledge about federal work-study and to help them make "educated decisions" about work-study.

In the next chapter, I provide the summary of all findings from this study and discuss its implications. I conclude with future directions for more research the federal work-study program.

Chapter 7 Discussion and Implications

The federal work-study program is one of the earliest federal financial aid programs for higher education “that remain the foundation of U.S. student aid” (Dynarski et al., 2022, p. 1). The program is almost 60 years old and it continues to serve one tenth of full-time undergraduate students (Dynarski et al., 2022) with the same goal since its founding to support college access and persistence for low-income students (Scott-Clayton, 2017). Despite its long-standing role in college financial aid, there exists limited robust evidence on the program’s impact on students. There are four representative quasi-experimental studies specifically about federal work-study by Stinebrickner and Stinebrickner (2003), Scott-Clayton (2011a), Scott-Clayton and Minaya (2016), and Soliz and Long (2016), and currently, there is one study (Scott-Clayton et al., 2020) that employs a randomized-control trial (RCT) to examine the effectiveness of the program.⁴⁶ Today, due to inadequate and inconclusive evidence that establish strong support for work-study, Kenefick (2015) wrote, “the full promise of the program has not been fully realized” (p. 8).

The primary goal of this study was thus to contribute to accumulating robust evidence on the impact of the federal work-study program on low- and limited-income college students. I sought to inform various stakeholders about whether work-study is a valuable financial aid choice to be prolonged and in what ways, it could remain as one. In this study, I achieved this aim with unprecedented access to detailed institutional data from the case institution (a highly selective, large public four-year institution) as well as a survey of students, which I used to

⁴⁶ Scott-Clayton et al.’s (2020) study description is at <https://ies.ed.gov/funding/grantsearch/details.asp?ID=4500>. The findings of the earlier four studies are discussed later in this chapter.

estimate causal effects of the program on student outcomes and to unveil the mechanisms of this impact by understanding students' work-study behaviors. Specifically, I answered the following research questions: (a) what are the characteristics of federal work-study students and their employment? (b) what are the causal effects of the program on first-year student outcomes? and (c) what are the mechanisms of federal work-study students' behaviors that could explain the effectiveness of the program? In this chapter, I summarize and discuss the findings of this study in depth and conclude with the implications for research, policy, and practice.

Summary and Discussion of the Findings

I summarize the findings of this study mainly in two parts. I first review the descriptive findings about the characteristics of federal work-study students and work-study employment and then, discuss the effects of the program on student outcomes. Throughout, I supplement the discussion with the findings from the student survey for a deeper understanding of the context and mechanisms of the federal work-study program.

The Landscape of the Federal Work-Study Program

Who Are Offered Federal Work-Study? Higher education institutions have great discretion about how they allocate federal work-study funds to students (Soliz & Long, 2016). At Lake University, I find that the financial aid awarding process developed based on institutional philosophy manifest in who receives federal work-study offers. Specifically, one of the key determinants of the work-study offer for students who submitted the FAFSA is that they must have unmet need. Students should demonstrate financial need to afford the cost of attendance after accounting for their EFCs and all gift aid (e.g., grants, scholarships). Lake University then has an important priority to fully meet the financial needs of in-state resident students.

As a result, between 2013-14 and 2018-19, work-study-offered first-year students had about 8 pp's higher share of resident students than the group of students without work-study offers. The average EFC of work-study-offered students (\$7,400) was also significantly lower than that of the students who were not offered work-study (\$65,800). Given that the difference in the average cost of attendance for the two groups was only about \$2,000, the gap in their average EFCs implied considerably greater financial need for students who were offered work-study. The university's goal of meeting the full need of resident students was further reflected in the average amount of gift aid offered to students who were offered work-study. They received \$19,000 more gift aid on average than those who were not offered work-study, covering much of their unmet need. They were then offered an average of \$2,700 in work-study prior to receiving loan offers.

Based on this aid awarding process, about 35% of the first-year students (n = 9,430) in the sample were offered federal work-study. These work-study-offered students who were more likely to be in-state residents and have greater financial need were moreover distinctive from students without offers in other demographic characteristics. Compared to the group of students without work-study offers, there were higher percentages of females, racially or ethnically underrepresented minorities, and first-generation students among work-study-offered students. The two groups of students were also marginally, but statistically significantly different in their performance on college entrance exams, although their average high school GPAs were the same. Work-study-offered students, on average, scored 1-point lower on ACT and submitted lower number of AP test scores (less than 1-test difference). The average AP test score was also 0.3 point lower than students who did not receive work-study offers. These differences were not surprising as income gap is generally associated with performance on standardized tests (Bastedo et al., 2018; Michelmore & Dynarski, 2017).

Who Are Federal Work-Study Students? Not all work-study-offered students participate in the federal work-study program. They make different decisions not only about their work-study offers, but also more generally about participating in the part-time labor market while in school for various reasons. Informational and structural constraints may play a role in students' work-study decisions (Dynarski & Scott-Clayton, 2006; Scott-Clayton, 2012). It may also be individuals' bounded rationality or bounded self-control (e.g., changing preferences) (Scott-Clayton, 2011b) that lead students to make less-than-optimal decisions. Some scholars have also suggested that students have different financial needs and preferences (e.g., debt aversion) or varying social norms they follow when financing college costs (Dynarski et al., 2018). In this study, I examined the different types of and motivations behind the decisions students make when they are offered federal work-study and also, to what extent students are different in their characteristics across the various decision groups.

The findings suggest that there are four different decisions groups among students who are offered work-study. There are work-study participants, work-study decliners with non-work-study jobs on campus, work-study decliners with off-campus jobs, and work-study decliners who did not work. At Lake University, work-study participants made up about 11% of the students who were offered work-study, and the remaining 89% were work-study offer decliners between 2013-14 and 2018-19. About 14% of the decliners had non-work-study jobs on campus. The rest of the decliners had no record of working on campus, and the survey revealed that some of them had part-time jobs off campus. However, the survey findings suggest that it is highly likely that most of the work-study decliners who do not work on campus also do not work off campus.

I find that work-study participants are largely different from work-study offer decliners in terms of their demographic characteristics. Above all, work-study students have greater financial

needs than work-study offer decliners. They appear to have a higher cost of attendance to pay than the decliners, probably because the share of nonresident students are greater among work-study students than the decliners. Even after taking gift aid and EFCs into account, work-study students still exhibit greater unmet need than the decliners, which may explain why work-study students' receive a slightly more work-study aid (between \$100 and \$200) and smaller loans (between \$400 and \$700) than work-study decliners. To some extent, these results propose that work-study participants is more likely to perceive work-study as a favorable option that would help them to meet the remaining needs with relatively smaller loans than work-study decliners.

Moreover, work-study participants are more likely to be females (61.8%) than work-study decliners with non-work-study jobs on campus (59.4%) or decliners without on-campus employment (49%). They also have higher shares of URM students (26.5% vs. 19.6%) as well as first-generation students (33.8% vs. 27.3%) than the decliners, although there are overall more non-URM and non-first-generation students among work-study participants.⁴⁷ In addition, work-study students demonstrate statistically significant, but marginally higher academic achievements during high school than the decliners (e.g., 0.1-point difference in high school GPA, less than 0.1-point difference in the average AP scores). Descriptively, a similar trend is observed in students' first-year outcomes. Work-study students achieve marginally, but statistically significantly higher first-year GPA than work-study offer decliners, and they also have a higher proportion of students who persisted to 2nd year than work-study offer decliners.⁴⁸

The findings from the survey also suggest that students' pre-existing knowledge about federal work-study at the time of filing FASFA is meaningfully related to their work-study

⁴⁷ The percentage for work-study decliners is the average of the decliners with non-work-study jobs on campus and the decliners with no on-campus employment.

⁴⁸ This is a descriptive finding and does not imply causal effects of work-study on GPA.

decisions. The greater familiarity with the program early on, the higher the likelihood of work-study-offered students to participate in work-study, highlighting the important roles information and knowledge play in students' decisions. This is particularly intriguing as work-study students do not necessarily have the most interest in federal work-study at the time of filing FAFSA. For instance, work-study students have a smaller share of students who indicated interest in work-study in the FAFSA than the decliners who work non-work-study jobs on campus. Hence, the results propose that students' level of familiarity with the federal work-study program has a stronger relationship than their overall interest in work-study with their work-study decisions.

In brief, the overall federal work-study aid take-up rate is about 11%, and I discover limited evidence that a work-study offer induces students to take up work-study employment. That is, the empirical findings do not strongly support the proposition that students would be induced to work-study employment if it is offered as a part of their financial aid awards. Nevertheless, given that nearly half of the work-study-offered students had part-time jobs on campus, I would argue that a work-study offer could prompt students to work on campus rather than off campus. This is especially because the student survey results show that about 80% of work-study decliners who do not work on campus do not work at all during their first year in college and that the share of decliners who work an off-campus job is considerably small.

The findings also support the proposition that students are more likely to be induced to work-study employment if they are under financial constraints. Work-study students have greater demonstrated unmet financial need than work-study decliners to pay the direct costs of college attendance. Besides, several students' demographic identities (i.e., female, URM, and first-generation) are related to their work-study decisions, however, I argue that working may not be one of the students' salient identities that induce students to work-study employment at least

among work-study-offered students. The survey findings show that work-study students and decliners have a comparable level of paid-work experience while in high school, denoting that working is not necessarily a conspicuous social identity of either group. Lastly, I find some evidence that information matters in work-study decisions, given the significant relationship between the level of familiarity with the program and student decisions.

Why Do Students Accept or Decline Their Federal Work-Study Offers? Given the low take-up of work-study among first-year students at Lake University, I investigated further about the reasons and motivations behind students' work-study decisions through a survey of work-study-offered students. I find that the survey results strongly support the descriptive findings discussed above. Descriptive analysis of the administrative data indicate that federal work-study participants generally demonstrate statistically significantly greater financial unmet needs than work-study decliners. Similarly, the student survey shows that students primarily participate in federal work-study for financial reasons. Student responses reveal that they “need extra money” to directly support college costs such as tuition, housing, food, and transportation. However, I find that there are students among work-study participants who can be viewed as being “susceptible to present bias” (Dynarski et al., 2018, p. 6), overvaluing short-term benefits of working such as immediate spending money (Baum, 2010) or lifestyle maintenance (Perna et al., 2007). Although it is less common, some work-study students report that the extra money is for accruing spending money (without having to ask parents) or to take care of a pet.

It is important to note that the findings of this study do not find evidence for other kinds of financial motivations for participating in federal work-study such as debt aversion (Burdman, 2005; Dynarski et al., 2018; Perna et al., 2007) or loss aversion (Tversky & Kahneman, 1991), and borrowing constraints (e.g., loan maximums, high interest rates, existing credit card debt)

(Kalenkoski & Pabilonia, 2010). I also do not discover any evidence that low parental transfer (Kalenkoski & Pabilonia, 2010) is the reason for students to participate in work-study.⁴⁹ Students rather indicate that they partake in work-study to possibly lower their parents' financial burdens, but not necessarily because they have parents who are unwilling to contribute to their college costs. Lastly, from both administrative data and student survey, I discover no empirical evidence for the argument that students are induced to work-study if working a job is one of their salient social identities. As descriptive findings show, work-study-offered students generally have similar levels of work experience during high school and also, I do not find any relevant responses from the survey.

Another common reason why students participate in work-study is associated with their interest in gaining work experiences. Intriguingly, it is not necessarily work-study positions on campus or its certain characteristics prompt students to decide to participate in work-study. Some students are completely misguided that work-study employment means working on campus and that is why they accept their offers and have work-study employment. Other work-study students, mostly in research-type position, secure their jobs without initially thinking about participating in federal work-study. Specifically, these students get accepted to undergraduate research programs (without even thinking about work-study) based on their interest and then, learn about the possibility of making income from that work via work-study instead of earning academic credits. I find that these students commonly think that they “might as well get paid” for a job they already have.⁵⁰ In a related context, the third most cited reason for participating in work-study is that their employers (for a job they got hired already) recommend students to use work-study funds, which works as a wage subsidy for the employers.

⁴⁹ These behavioral economics theories and concepts are explained in-depth in the literature review chapter.

⁵⁰ I discuss these findings further in relation to work-study job characteristics in the following section of this chapter.

As highlighted above, almost 90% of the work-study-offered first-year students declined their offers at Lake University. Only about 14% of them still worked on campus, but the findings of this study generally suggest that work-study decliners are most likely to not work at all either on or off campus. Based on the survey results, I identified two predominant reasons for declining work-study. First, work-study decliners primarily have no interest in working during their first year in college as they prioritize their academic responsibilities as well as adjusting to college, and their responses evidently show loss-aversion behaviors (Kahneman & Tversky, 1979). In this context, this means that “even if the potential future gain is high” (Dynarski et al., 2018, p. 6), students may feel a loss of time for studying more strongly than the probable benefits of work-study. For example, many students specifically explain that they do not want to risk their GPAs or making a smooth transition to college by spending their time working. They view the idea of working as “overwhelming,” “not making sense,” or “stressful,” making them feel much worried about not being academically successful in their first year in college.

Students also decline their work-study offers because the federal work-study program is hard to understand as to what it is and how it works. From the survey, I find that most work-study decliners experience cognitive overload (Simon, 1972), wrestling with collecting and digesting a great amount of information about work-study. As Scott-Clayton (2011b) highlights, this can lead students to be incapable of “appropriately [weighting] the costs and benefits of [important] factors in a final calculation” (p. 10). Work-study decliners indeed ultimately get confused about what the benefits of work-study are, why they should consider work-study over a non-work-study job, or whether there is even a value in making efforts to understand how the program operates. In the end, throughout the process of attempting to learn about and work through the program, there are too many hassle factors (Bertrand et al., 2004) (e.g., findings

resources to get help with work-study, navigating student hiring processes, interaction with non-responsive employers) that play an unconstructive role in students' decisions.

The findings of this study suggest that most work-study decliners end up not working during their first year in college. Although less frequent, some work-study decliners also have non-work-study jobs on or off campus. As Dynarski et al. (2018) describes, these behaviors are likely to be the results of the complicated decision-making process, and students are deciding to “resort to heuristics or mental shortcuts to simplify the decision” (p. 7), quoting Kahneman (2003). That is, students default to their current financial aid award without earning work-study or get other jobs that are easier to find or apply for because the federal work-study program entails too much complexity. To add, among few work-study decliners, I also find hyperbolic discounting behavior (Laibson, 1997), which is to delay or avoid decision making because of a belief that it will become easier in the future. The survey results reveal instances where students wanting to wait (about work-study) until how their “first semester would play out” or deciding to “wait until the next year” to do work-study after spending their first-year adjusting to college.

Overall, the findings suggest that work-study students and decliners focus on different aspects of the program when deciding about their offers. Work-study participants are largely motivated by the financial aspects of the program whether work-study earnings are essential to alleviate their financial constraints or work-study income is an extra that comes with a job they already have (although they do not need it). On the other hand, for work-study decliners, they are discouraged by the potential loss of a successful transition to college, both academically and socially. Work-study decliners' decisions moreover demonstrate various behaviors associated with cognitive overload, complexities and uncertainties work-study entails, and numerous hassle factors they find it hard to navigate throughout deciding about their work-study offers.

What Are the Characteristics of Federal Work-Study Employment? I comparatively analyzed in what ways and to what extent students' part-time employment characteristics varied between (a) work-study participants, (b) work-study decliners with a non-work-study job on campus, (c) work-study decliners with an off-campus job, and (d) on-campus student employees who were not offered work-study. Largely, there were three findings. Work-study students work to a greater extent than non-work-study employees on campus. Moreover, a work-study offer, not work-study participation, induces students to different types of jobs on campus. Finally, work-study decliners who work off-campus prioritize wage benefits the most.

At Lake University, work-study students work noticeably more hours than non-work-study student employees on campus. Work-study students worked an average of 310 hours (9.7 hours/week) during an 8-month period (i.e., fall through winter semesters). Work-study decliners with non-work-study jobs on campus worked a total of 270 hours (8.4 hours/week). On-campus student employees who were not offered work-study worked 248 hours in total (7.8 hours/week). In addition, work-study students exhibit a more intense part-time working behavior with a larger share of students working more than one job (17%) than non-work-study on-campus student employees (between 12% and 13%). It is plausible that work-study students have more employment records because of a cap on work hours through work-study. Work-study aid offer is a fixed amount and they must find a new part-time job if they are willing to work more. Still, considering both the total number of hours worked and the number of jobs students worked, the findings suggest that work-study students demonstrate higher-intensity part-time work behavior. To some extent, these findings contract the general assumption about federal work-study in the literature that relative to non-work-study employment, work-study would not lead to excessive hours of working given a cap on hours worked (Scott-Clayton & Minaya, 2016).

While work-study students show more intense participation in the part-time working than non-work-study student employees on campus, I still argue that it is not to an extent that would result in detrimental effects on student outcomes. That is, while some studies suggested that hours worked had a linear relationship with students' academic performance (Choy & Berker, 2003; Perna et al., 2007), a number of studies also offered evidence that as long as students worked less than 15 hours per week, which is the case for work-study students, it would not negatively impact students (Choy & Berker, 2003; Pascarella & Terenzini, 1991; Perna et al., 2007). Though I discuss in-depth later in this chapter, I find no negative causal effect of work-study on students' academic outcomes. It may be attributable to the fact that the largest majority of work-study students work educationally-relevant jobs on campus (i.e., research).

As work-study participants worked the most hours among on-campus student employees, they also earned the most during an 8-month period. They had an average income of \$3,200, which was about \$600 to \$700 more than the average of non-work-study student employees on campus. In fact, work-study students' work hours were combined with the highest average hourly wage to result in the highest income through on-campus employment. The average hourly wage for work-study students' jobs was \$10.20 and it was marginally but significantly higher than the average hourly wage for non-work-study jobs on campus, which was between \$9.50 and \$9.90. Intriguingly, work-study decliners who worked off campus had the highest hourly wage with an average of \$12.40, offering partial evidence that they may be primarily driven by wage benefits when they choose part-time jobs. In fact, they also had a larger share of students who had more than one job (26%) than on-campus student employees (14%). It is likely that they experience more frequent changes or turnovers in their employment because off-campus employment generally offers less flexibility with students' academic obligations or commute.

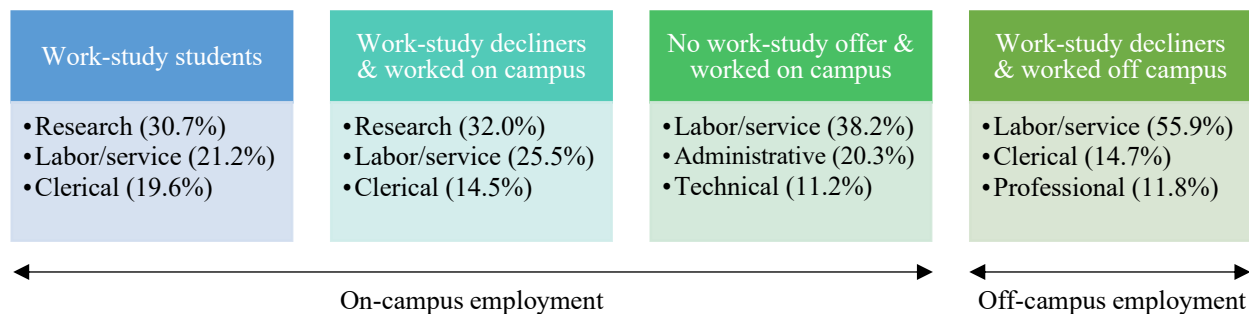
I however remain cautious about comparing work-study students and work-study offer decliners who work off campus, who make up a fairly small proportion of the decliners in the data. I also do not have accurate information on the total hours worked for students who work off campus and thus, I cannot provide concrete evidence that work-study students also work more intensively than work-study decliners with off-campus jobs.

Another major focus of this study was to examine the types of jobs work-study and non-work-study students had. In existing research, the types of part-time jobs received important attention due to their relationship to students' academic performance. Scholars have claimed that on-campus employment entails more benefits than off-campus employment (e.g., integration into academic community; mentors who can help students to navigate college; lower-intensity work; building skillsets relevant to current area of study) (Bradley, 2006; Dadgar, 2012; Darolia, 2014; Scott-Clayton, 2016; Tinto, 1993). With an emphasis on federal work-study, Scott-Clayton and Minaya (2016) further posited that for students who would have worked anyway, work-study would affect the types of jobs they work by prompting them to replace off-campus jobs with on-campus jobs, improving both wage and non-wage aspects.

The discoveries in this study, however, suggest that actual work-study participation may not be the key determinant of the types of jobs students work. Figure 28 illustrates the top three types of jobs Lake University's first-year students had by their work-study status and the location of the job. Focusing on on-campus student employees, I find that an important difference in job type exist between students who are offered work-study and those who are not offered, but not between work-study and non-work-study student employees. The first two groups in the figure are work-study-offered students, and their top three types of jobs include research, labor or service, and clerical jobs. On the other hand, on-campus student employees who are not offered

work-study mostly work labor or service, administrative, and technical jobs. Hence, for students who work on campus, a federal work-study offer, not the actual participation, appear to induce students to different types of jobs to a meaningful degree.

Figure 28. *Main Types of Jobs by Employment Type*



In search for the explanations attributable to unique work behaviors and choices between students who are offered work-study and those who are not, I refer back to the differences in their demographic characteristics. Work-study-offered students are much more likely to be female students than students without offers. They are overall more likely to be non-URM (i.e., not Black, Hispanic, American Indian, Alaskan Native, Native Hawaiian, other Pacific Islanders) and non-first-generation students, however, work-study-offered students have statistically significantly higher shares of URM students and first-generation students than students who are not offered work-study. Compared to those who are not offered work-study, students with work-study offers also come from lower-income families with considerably lower EFCs. I argue that these demographic characteristics are likely to be strongly related to students' decisions about the types of jobs they choose to work.

For example, students with different demographic characteristics may have different preferences for certain job activities. As mentioned above, work-study-offered students are more likely to be female students than students without offers, and female students may prefer non-labor-intensive types of work than male students. It is also feasible that students with distinctive

demographic characteristics consider the benefits and costs of working differently than each other and hence, prioritize different types of jobs to work. For instance, work-study-offered students who are who are lower-income may pursue part-time work experiences that will result in long-term benefits (e.g., high-impact work experience) rather than short-term benefits (e.g., extra spending money), compared to their higher-income counterparts without work-study offers. It could be more imperative for lower-income students with work-study offers to have jobs in ways that will help them persist and succeed in college.

From the survey, I do find some evidence to explain why work-study-offered students mostly engage in research-type work while students without work-study offers largely have labor/service type of jobs. The results suggest that work-study students have deep interests in academically-relevant work experiences such as research, even before they consider using work-study for those opportunities. As for work-study decliners with non-work-study jobs on campus, it is likely that they also share a similar aspiration for work experiences that are academically beneficial to them in a long term. In fact, despite their similar aspirations, the only difference between these two groups of students could be the financial factors. As presented earlier, among work-study-offered students, work-study participants have greater unmet need than work-study decliners. Thus, I suppose that work-study students may have chosen to receive financial compensations for their research work whereas work-study decliners (with non-work-study jobs on campus) choose to receive academic credits for their research-related employment.

Following Deci and Ryan's (1985, 2000) self-determination theory of motivation, I can also interpret work-study-offered students' job choices as being more intrinsically motivated than higher-income peers who are not offered work-study. The theory explains that "behavior is based on the need to maintain a sense of personal independence and competence to successfully

meet challenges and to feel a sense of belonging” (Próspero & Vohra-Gupta, 2007, p. 965). As in Próspero and Vohra-Gupta’s (2007) examples about going to college, a student who has stronger intrinsic motivation may say, “I am going to college because I like learning new things” (p. 965) whereas someone who is more extrinsically motivated may say, “I go to college because I need a college degree to get a better-paying job” (p. 965). Likewise, it is plausible that lower-income work-study-offered students have stronger intrinsic motivations to choose a certain type of part-time jobs (e.g., academically relevant jobs such as research) than their higher-income peers who are not offered work-study.

To summarize, the findings suggest that on campus, work-study students are engaged in part-time employment with higher intensity than non-work-study students. At a significant level, they work more hours, choose jobs that pay more per hour, and have a higher share of students who work more than one job compared to non-work-study student employees on campus. Yet, work-study offer decliners who work off campus demonstrate even higher-intensity working behavior than work-study students with a higher share of students working more than one job and with higher paying jobs. Regarding the type of jobs, work-study employment does not distinguish students from other types of student employees on campus. Rather, the type of jobs appear different among students based on whether students are offered work-study or not. The largest majority of students who are lower-income and hence offered work-study have research-type jobs while the vast majority of their higher-income counterparts without work-study offers work labor/service jobs. The overall results imply that work-study students have both strong intrinsic and extrinsic motivations and pursue work opportunities that would advance both wage and non-wage benefits.

The Effects of Federal Work-Study on Student Outcomes

I find that federal work-study participants and nonparticipants are markedly different in the number of weekly hours worked on campus. First-year students who were federal work-study participants, on average, worked about 20 hours more per week on campus than those who did not have work-study employment (i.e., nonparticipants) through the fall and winter semesters (September through April the next year), earning about \$186 more per week from on-campus employment. This is, in fact, highly likely when considering the fact that the vast majority of the nonparticipant students have no on-campus employment.⁵¹ As revealed in the earlier chapter, almost 86% of the students with no work-study offers had no record of working on campus (i.e., zero hours for on-campus work). However, we cannot conclude that work-study students in general work more or less hours than nonparticipants, or earn more, as the administrative data that does not contain information about off-campus employment.

An intriguing finding is that although working on campus 20 more hours per week than nonparticipants, the federal work-study program has no negative effect on participants' first-year GPA. The null effect of federal work-study contrast with previous findings that work-study has minimal, but statistically significant and negative effects on students' first-year GPAs (e.g., Scott-Clayton, 2011a; Scott-Clayton & Minaya, 2016; Soliz & Long, 2016; Stinebrickner & Stinebrickner, 2003). However, as highlighted by Scott-Clayton and Minaya (2016), some of the earlier findings (e.g., Scott-Clayton, 2011a; Stinebrickner & Stinebrickner, 2003) were relevant to "largely rural contexts where students may have limited other employment opportunities" (p. 17). Students are thus more likely to engage in work that are less relevant to their academics or career interests. Scott-Clayton and Minaya (2016) also discovered significant and negative effects of work-study on GPA when they limited their sample to rural students. Similarly, Soliz

⁵¹ In my fuzzy RD design, work-study nonparticipants are students without work-study offers above the EFC cutoff, but near the cutoff (i.e., within the optimal bandwidth for analysis).

and Long (2016) revealed that receiving work-study aid had marginally negative and significant effects on first-year GPA for students attending public four-year institutions in the state of Ohio.

In this respect, Lake University is a unique setting relative to the regions and institutions explored in earlier studies. Lake University is not located in a rural area, possibly offering more part-time employment opportunities off campus. On campus, as a doctoral university with a very high research activity, it may also offer students different types of work-study positions (e.g., undergraduate student research) than institutions in rural areas that may be less research intensive.⁵² Students who enroll at Lake University moreover have high incoming high school GPAs and standardized test scores (i.e., academically highly motivated) as described in previous chapters. All of such unique characteristics of the institution and students could have resulted in non-negative impact of doing federal work-study on students' first-year GPA at Lake University rather than small negative effects that were found in other studies.

To be more specific, one possible explanation for the null effect of the program on first-year GPA for students is that for work-study students, time spent on working may not compete with time spent on educational activities (e.g., studying, doing on homework). This is plausible when students manage their time well, making important adjustments to other parts of their lives so that part-time working does not negatively influence their study (Bradley, 2006). Especially when students preserve sufficient time for studying, any additional time would not negatively impact their academic performance, which might not always be proportionate to an increased time for studying (Ben-Porath, 1967). Given that Lake University students are academically highly motivated, it is likely that work-study students endeavor to adjust how they spend time on work and studying so that part-time work does not negatively impact their academic outcomes.

⁵² This description about the institution is based on the Carnegie Classification of Institutions of Higher Education.

In fact, Lake University students' high-achieving behaviors were evidently shown in the data with not much variation in their academic achievements (e.g., first-year GPA). It is statistically plausible that the lack of variation in student achievements led to the null effects of work-study.

Moreover, hours worked may not be a substitute for time allocated to studying if students replace time spent on work with time for non-educational activities (e.g., leisure, socializing), which is feasible when students have positive attitudes toward their work and feel less desire for leisure (Bradley, 2006; Paul, 1982). That is, working has negative effects on students' academic performance only if the nature of the work experiences are negative and unsatisfactory. I argue that at Lake University, work-study students' work experiences are not "stressful, dissatisfying, non-discretionary, and/or incongruent with the student's life goals and values" (Bradley, 2006, p. 484) to the degree of having adverse effects on academic outcomes. The findings in the previous chapter showed that a large majority of work-study students had a research-related job on campus, which leads to a higher probability of work-study students being content with their work experiences, viewing work-study jobs as relevant to their goals and values, and not replacing time for studying with time spent on work-study. The survey again offers strong support for this argument as work-study participants indicated that they have already secured research positions based on their interests, before they learned they could use work-study for those opportunities.

I also find that work-study employment on campus has no statistically significant impact on students' persistence to the 2nd year, which is consistent with the findings from the studies done by Scott-Clayton and Minaya (2016) and Soliz and Long (2016). When they employed causal estimation strategies (e.g., differences-in-differences instrumental variable model, propensity score matching), they discovered that doing work-study had no statistically significant

influence on students' persistence to the sophomore year.⁵³ These findings about the federal work-study program are inconsistent with the general hypothesis that working while in school has an adverse effect on college persistence (Ehrenberg & Sherman, 1987; Gleason, 1993). My findings are however consistent with the hypotheses about the positive impact of working on campus on students' persistence in college (e.g., Astin, 1975; Dadgar, 2012; DesJardins et al., 2002; Scott-Clayton, 2011a; Soliz & Long, 2016) by establishing strong integration into campus communities for students (Tinto, 1975).

More specifically, and noted earlier, I am not able to identify whether federal work-study nonparticipants with no on-campus employment records work off campus or whether they work more hours than work-study students. However, I have evidence that work-study students do spend more time on campus than their counterparts based on the findings that the federal work-study program increases students' hours worked on campus. These findings suggest that federal work-study may entail the benefits from on-campus work such as stronger academic and social integration into their institutions that leads to greater academic commitments (Darolia, 2014; DesJardins et al., 2002; Tinto, 1993), meeting educated role models and mentors on campus (Dadgar, 2012), or work opportunities that promote student learning by creating spaces for them to apply textbook knowledge in applied settings (Bradley, 2006; Darolia, 2014), which altogether do not negatively affect students' college persistence. In fact, the benefits of working on campus via work-study could explain why work-study has no negative impact on students' GPA despite the fact that the program increases students hours worked on campus.

I furthermore discover that the federal work-study program has heterogenous effects on students' on-campus employment outcomes (i.e., hours worked and earnings per week) by their

⁵³ Soliz and Long's (2016) findings I discuss here are relevant to the analysis that included public four-year universities (e.g., Ohio State University, University of Cincinnati, University of Toledo).

sex, URM status, and first-generation status. First, work-study employment increases weekly hours worked on campus to a greater degree for male students (approximately four more hours than females). Although it could be less common among traditional students (e.g., non-adult students), it may be related to the “many identities, roles, and responsibilities [that] a substantial number of today’s undergraduates [have]” (Perna, 2010, p. 284) such as caring for family. The survey results indicate that there are students whose reason for accepting work-study was to financially support their family. For example, a student shared, “[I accepted work-study for] another source of income and more money... to help support my family back home.” Although I am not able to draw any conclusions from two respondents, only male students provided these responses and it may be that they tend to feel a greater sense of financial responsibility than female students to assist or share the financial burden of their family.

Participating in work-study also has stronger effects for URM students than non-URM students. It affects URM students to work about eight to nine more hours per week. Perna (2010) explained that the fact that students from disadvantaged backgrounds relatively work at a higher rate is an indication of how “employment during college reinforces stratification and inequality” (p. 287) based on Ziskin et al.’s (2010) argument that “the norms and structures of educational institutions, including the institution of higher education research, channel students toward class- and race-defined roles that reflect their current positions” (p. 88). Thus, URM students may be working more hours because it is reflective of their socioeconomic backgrounds (e.g., lower-income, working family members), and then various norms and structures of the institution (e.g., working lower-income students, even work-study offers to lower-income students in financial aid) are leading students to make work decisions that are consistent with those backgrounds. Although the survey results do not identify these reasons to be one of the key reasons to

participate in work-study or work more, it may be because of “an internal set of dispositions and beliefs that an individual brings to bear on his or her choices” (Nuñez & Sansone, 2016, p. 96).

Heterogeneous effects of work-study are also found by students’ first-generation status. First-generation students work about 7 hours more per week on campus than non-first-generation students. The social reproduction perspectives discussed above (Nuñez & Sansone, 2016; Perna, 2010; Ziskin et al., 2010) may as well explain why first-generation students exhibit relatively more intense working behaviors than non-first-generation students. First-generation students are also more likely to have the financial need to work than their higher-income peers. However, work-study effects are no longer statistically significant for first-generation students while it remains robust for non-first-generation students. I assume that it is potentially because there is a much lower number of first-generation students’ counterparts who are above the EFC cutoff for work-study, that is, who are higher income than work-study participants below the cutoff.⁵⁴

The heterogeneous effects of federal work-study I find in this study overall show that the program induces male students and students who come from disadvantaged backgrounds to work more hours on campus than non-work-study student employees on campus. Nevertheless, the findings also indicate that work-study students are more likely to be working in academically-relevant positions such as research and their participation in federal work-study is not harming their academic achievements. In this regard, the findings from Lake University may not concern policymakers or institutional decision makers. However, as some of the earlier studies indicated (e.g., Scott-Clayton, 2011a; Stinebrickner & Stinebrickner, 2003), if students, particularly those from socioeconomically-disadvantaged backgrounds, attend institutions that do not offer much academically-relevant work experiences and if they were to work significantly more hours via

⁵⁴ I find that it is likely due to the fact that in the subgroup analysis, there are significantly lower number of first-generation students above the EFC cutoff (i.e., ineligible for work-study; n = 225) than below the cutoff (n = 541).

work-study than non-work-study students, federal work-study may have detrimental effects on students' academic achievements. Thus, the heterogeneous effects of work-study on students' work intensity (measured by hours worked) found in this study calls for important attention to institutions where students are more likely to come from lower-income backgrounds or first to attend college in their families.

In sum, I estimated the causal effects of participating in the federal work-study program on students' academic outcomes and on-campus employment outcomes. By examining different model specifications and employing various analytic bandwidths, I also obtained strong evidence for the robustness of the findings of this study. Participating in the federal work-study program has null effects on students' first-year GPA and persistence to the 2nd year at the same institution, aligning with earlier findings that federal work-study employment had either null or statistically significant, but minimal negative effects on academic achievements. Work-study, however, significantly increases first-year students' hours worked on campus and earnings from on-campus employment, particularly for male and URM students. In general, I find that work-study students' involvement in educationally-relevant work such as research could explain why it has no detrimental effects on students, despite the longer hours of work (on campus) than their counterparts.⁵⁵ It is also likely that Lake University students' high level of academic motivations in general result in the null effects of work-study on their academic performance. Importantly, work-study students' strong intrinsic and extrinsic motivations to succeed and persist in college may also be playing essential roles in their academic achievements in spite of their intensive participation in part-time employment through the federal work-study program.

⁵⁵ To recall, work-study students' counterparts are those who just passed the EFC cutoff with marginally higher EFC than the cutoff and, accordingly, neither received work-study offers nor participated in the program.

Contributions and Implications

Research

This study makes important methodological contributions to the literature on the federal work-study program and its impact on college students. This is the first study to use a RD design to examine the effects of participating in work-study on student outcomes. Access to detailed information about the case institution's financial aid packaging processes and work-study fund allocation mechanisms allowed me to employ a RD design, using an EFC eligibility cutoff, and obtain robust causal estimates of the program effects. Identification of an exogenous variable that generates students' random assignment to federal work-study has been one of the key limitations of the prior literature (Scott-Clayton, 2011a), and I overcome these limitations in this study, and improve the methodological approaches to mitigate the potential endogeneity problem related to students' self-selection into work-study. In addition, examining different model specifications (e.g., higher-order polynomial models) and applying varying analytic bandwidths to analyses using a RD design contributed to improving the robustness of the empirical evidence.

I also make theoretical contributions to the federal work-study literature by adopting theories and concepts from multiple disciplines including education, behavioral economics, psychology, and sociology. I find that the literature on student employment in general is limited in explaining the impact and mechanisms of federal work-study and that it is vital to view federal work-study as a financial aid program to take student behaviors into account (e.g., why certain students self-select into work-study) in understanding its effects. That is, work-study is not solely about students working part-time jobs while in college, but it is a complex, less-commonly-known, federal financial aid program that students and parents must navigate and digest. Therefore, I examine, for example, how the "universal human limitations" (p. 9) (e.g., bounded

rationality, bounded self-control) in decision-making processes (Scott-Clayton, 2011b) or students' salient social identities (Dynarski et al., 2018; Nuñez & Sansone, 2016; Perna, 2010; Ziskin et al., 2010) is associated with access to and success of the federal work-study program.

Empirically, the extensive institutional data (e.g., demographics, academic records, employment and payroll information) analyzed in this study identified important details about the federal work-study program that have not been explored in previous literature. For instance, I unveil how much work-study funds are allocated to who, how much work-study money is actually disbursed to students, and who earns work-study money. I also elucidate the specifics of student employment on campus including hourly wages, earnings, hours worked, and types of jobs for both work-study and non-work-study positions. These details contribute to a better understanding of the effects of federal work-study on students found in this study. Most importantly, a successful application of a valid RD design is a result of linking the administrative data with contextual information collected from administrative staff interviews.

I moreover complement the deep administrative student record data with a student survey that delves into understanding the underlying mechanisms of the federal work-study program, which made valuable contributions to this study. To the best of my knowledge, this is the first survey of work-study students since Troppe (2000). Above all, I was able to investigate the role of informational and structural barriers to students' work-study experience. As I noted earlier, the role of information is substantial in the context of college financial aid (Dynarski & Scott-Clayton, 2006), and particularly for disadvantaged students. Unresolved informational barriers can undermine the impact of financial aid programs (Scott-Clayton, 2012), which I also discover in this study. A large majority of work-study-offered students decline their work-study offers because they cannot untangle the informational complexities associated with the program and

often, they are not adequately motivated to do so, not finding the effort worth their time to be spent on transitioning to college. Dynarski and Scott-Clayton (2006) stressed that in the absence of information, students cannot respond to a price subsidy, and I conclude that the dearth of information about work-study at hand at the time of receiving a financial aid award notice (this is also when students have to decide whether they want to accept or decline work-study) limits students' ability to respond to their work-study offers.

The survey also identifies critical structural barriers to students' access to federal work-study program. The findings suggest that there exists a lack of organized structure for work-study-offered students to navigate the program, search and apply for work-study positions, or acquire assistance throughout the process. It was highlighted earlier that most institutions lack the motivation to monitor the operative aspects of the program once the funds are allocated to students, especially when they believe that it is students' responsibility to proactively navigate and participate in the program. However, the lack of structure can exacerbate inequality among students (Scott-Clayton, 2012), particularly for those with no background college knowledge and limited resources to figure out the complexities during the decision-making processes. Another salient structural barrier I find is the lack of work opportunities that students pursue. Both students and the university staff acknowledge that the "more exciting and relevant" opportunities are offered to upper-class students (i.e., juniors and seniors). Employers often require work experiences that first-year students are not equipped with, limiting access to those experiences from first-year work-study-offered students with the same level of aspirations.

Policy and Practice

Allocation and Targeting Strategies for Federal Work-Study Funds. The average work-study take-up rate among first-year students has been about 11% at Lake University, the

case institution, during the six-year period between 2013-14 and 2018-19. Students' low participation rate in the federal work-study program is not limited to Lake University. As introduced earlier, a survey of almost 1,900 financial aid administrative staff at universities and colleges (NASFAA, 2016) indicated that about 20% of them had returned underutilized funds to the federal government, which resulted in a penalty of reduced allocation for nearly 75% of them. At Lake University, the institution has adopted an over-matching strategy to offer, for example, three times the amount of federal work-study funds to be actually disbursed to students, knowing that only about 30% of the offered students will accept it. Administratively, as long as all federal allocations are distributed to students, it is most likely that institutions find no issue with how federal work-study operates. However, it is essential to understand the reasons underlying low take-up rates to improve institutions' targeting strategies to extend the reach of work-study funds to all students in need.

Institutions can increase the utilization of federal work-study funds by not front-loading the funds to first-year students' financial aid awards, but rather allocating more funds to non-first-year students. The findings of this study highlight that the majority of work-study decliners who are in their first year prioritize transitioning to college. They stress their needs for spending the first year to focus on adjusting to the new kinds of academic expectations and requirements. Regardless of their unmet financial needs or a chance of taking out student loans, students are still willing to secure their first year to focus on school instead of allocating that time for part-time work including work-study. Nevertheless, work-study decliners indicate that they are more likely to accept work-study if it were to be offered in the following academic year (i.e., second year in college), once they are more accustomed to college. Students also signal that they need some degree of time to explore the kinds of work opportunities and experiences available on

campus in order to make informed work-study decisions. Therefore, I argue that increasing the weight of work-study fund allocation to non-first-year students could substantially improve the take up of federal work-study.

Still, targeting more work-study funds to non-first-year students rather than first-year students requires institutions to assure that the financial needs of lower-income first-year students are met, most likely using institutional grants (not loans) to promote student success. Increasing institutional gift aid, however, may not be a viable options for institutions with limited resources for financial aid. At lower-resourced institutions, one potential means to increase the utilization of work-study funds to provide clear information about the program to students. More specifically, students can, technically, accept work-study funds when they are offered, but start a job anytime during the academic year. Students can thus spend their first semesters in college on adjusting and attempt to find a work-study position for the second semesters. A delivery of clear information about the timeline students can utilize work-study could prevent many students from declining work-study out of anxiety about not knowing what college will be like at the beginning of their first year. This could certainly be a more feasible option for lower-resourced institutions.

Rethinking Federal Work-Study as Financial Aid and Student Employment. The findings of this study raise more fundamental questions about how we think about the idea of work in relation to financial aid. I find numerous students raising the question, “how is federal work-study financial aid?” and for many of them, it is tough to recognize federal work-study as a financial assistance to college costs if it has to be earned through work. How could students think differently about work-study from a regular part-time job? Also, why does the university present federal work-study as if it is reducing the burden of the costs of attending college? These are questions that scholars have persistently asked over the years, claiming that federal work-study

misguides the actual unmet financial need of students and that it is, in essence, a subsidy to employers, not students (Baum, 2010). From the students' perspective, "a work-study award is not really financial aid [but it] is a job that requires the same effort as any other job" (Baum, 2010, p. 18), and it does not lessen students' financial need to work.⁵⁶

Then, what improvements can be made to ensure that the federal work-study program has benefits that far outweigh the costs of student employment? Scholars consent unanimously that federal work-study has to guarantee educationally relevant work opportunities for lower-income students (Baum, 2010; O'Sullivan & Setzer, 2014; Scott-Clayton, 2017). Although I find that a large proportion of federal work-study students engage in research work opportunities at Lake University, undergraduate student research programs may not be common at other institutions such as less research-intensive institutions or community colleges, where a larger population of low-income students are more likely to be enrolled. Students also report that such opportunities offer limited access in terms of both quantity and required qualifications, which is hypothetically why about 21% of work-study students did have labor or service jobs. Hence, it is imperative for institutions to proactively create work opportunities that are relevant to students by engaging faculty and other employers on campus (Ziskin et al., 2010). As students reported in this study, the idea of a relevant job also implies more work opportunities within their departments. It does not always mean doing research. I presume that students will find opportunities to engage with their affiliated academic programs through, for example, administrative positions, as relevant to them and meaningful. Such opportunities could socially integrate students into their academic communities, promoting a greater sense of belonging. In general, these opportunities should be

⁵⁶ Baum (2010) argues that while grants subsidize students' total cost of attendance and loans delay payment for education, work-study requires students to work to meet relatively more daily financial needs.

accompanied by quantitative expansion. Institutions can also consider prioritizing work-study students for on-campus jobs “to put [them] on more equal footing” (Baum, 2010, p. 18).

Lowering Informational and Structural Barriers. I argue that the quality of work-study experiences or work-study jobs can be also realized by improving students’ knowledge about the program. Most importantly, for students and parents to be truly able to make informed work-study decisions, they should be knowledgeable about the benefits and costs of work-study employment so that they can find “the appropriate balance” (Perna, 2010, p. 293) between work, financial aid, and college attendance. The findings of this study reveal that most work-study-offered students do ask about how work-study can be beneficial to them and what resources are available for them to help them make “educated” decisions about work-study.

For example, one important caveat about federal work-study is that earnings from work-study are taxable incomes just as earnings from a regular part-time job, which has to be reported in the next year’s FAFSA. However, work-study earnings will not reduce students’ future federal aid because it is not included in the calculation of total income.⁵⁷ Thus, if a work-study-offered student declines work-study and obtains a non-work-study job that could actually utilize work-study (e.g., library), it may have an impact on student’s future federal aid, even if it would have been the same job. If a student has a job of interest that, for example, aligns with one’s career interests (e.g., law office clerk off campus) but does not accept work-study, using work-study may not become a priority. Overall, only when students make informed decisions about work-study can the federal work-study program result in quality educational work (study) experiences.

Therefore, intentional outreach and early interventions should be designed to (a) deliver work-study information and to (b) simplify and assist socioeconomically disadvantaged students

⁵⁷ More details can be found at the federal student aid website of the U.S. Department of Education.

with federal work-study processes and securing work-study positions that match students' goals. As the findings of this study showed earlier, students will benefit from dedicated spaces (online and physical) and committed advisors for work-study-offered students. First-generation students who indicate having no other reliable resources other than the university staff will particularly benefit from the proactive outreach from institutions. Most importantly, I suggest institutions attend to the needs of students and their experiences with the federal work-study program. Institutions should gather data and information about student experiences and their needs with concerted effort among financial aid staff, faculty, and employers.

Directions for Future Research

The findings of this study suggest several important topics and issues to be examined in future research. The literature on federal work-study will benefit from future research at various types of higher education institutions in different settings (e.g., region, urbanicity). This will first contribute to better understanding through what mechanisms institutions allocate federal work-study funds to students. As discussed earlier, higher education institutions have great discretion as to how they utilize work-study funds, resulting in different allocation methods. Institutional philosophy and priorities in financial aid awarding practices influence which students receive work-study offers and how much they receive. For instance, in Stinebrickner and Stinebrickner's (2003) study, the institution fully subsidized tuition and required all admitted students to work 10 hours per week. At Lake University, the institution had an EFC eligibility cutoff for work-study with an institutional priority to meet the demonstrated needs of resident students. According to the financial aid professionals, how students can utilize work-study earnings also vary across institutions. Hence, future research at different types of higher education institutions (e.g., private, large public, community colleges) will help researchers to map the varying institutional

practices and priorities that determine students' access to work-study funds as well as to what extent their practices entail informational and structural obstacles hindering students to make informed decisions about work-study.

I particularly stress the need for federal work-study research at institutions that serve larger populations of students lower-income students, racially and ethnically underrepresented minorities, and first-generation students. Because of their financial needs, these students are more likely to have conflicting priorities between work and study and also, they may be urged to start a part-time employment as soon as they start college without being able to spend sufficient amount of time to consider to what extent their part-time employment will be relevant to their academics or career goals. Their institutions may also offer limited work opportunities that are educationally relevant despite the federal work-study program's original intention. Thus, in order to identify appropriate interventions that help lower-income, first-year college students to make optimal, educationally-relevant work (study) decisions, future research could focus on colleges and universities serving mostly underprivileged students. I emphasize the importance of illuminating the differential effects of work-study on students and the distinctive work (study) behaviors and decisions in various higher education contexts for a more holistic understanding of the federal work-study program.

It would be also valuable to examine how the federal work-study program operates (e.g., institutional allocations to students, students' work-study behaviors, work-study effects) beyond students' first year in college. Existing literature and this study primarily focus on the effects of work-study on first-year student outcomes, and there exists limited research that longitudinally investigates work-study over time. However, students are likely to show different work-study decisions and behaviors after their first year in college as they have made necessary adjustments

to college. Undergraduates who are juniors and seniors also may display distinctive work (study) decisions as they reach degree completion and prepare to enter the labor market. Thus, future research can benefit from longitudinally examining federal work-study and inform stakeholders about students' changing behaviors and needs over time throughout college. The findings will improve the program by guiding policies to better utilize the funds to ensure meaningful work experiences for students from lower-income backgrounds at different stages in college.

In this study, I find that work-study decliners also decide to engage in off-campus jobs, most likely due to wage benefits. However, I obtained limited data about these students and the self-reported information in the survey about their jobs resulted in inadequate conclusions about, for example, what factors drove them to off-campus employment and how much they worked off campus or how much they earned. Future research can employ data that captures students' off-campus employment (e.g., quarterly earnings data) to understand what impact off-campus employment has on students relative to participating in the federal work-study program and better determine the benefits and costs of work-study. To add, examining students' decisions to choose off-campus employment could also inform institutions about the kinds of needs students have regarding part-time employment (e.g., specific types of work activities, hourly wages, location, commute). The findings will inform policies that could redistribute quality work experiences among college students, especially for those from lower-income backgrounds, and promote their access to and success in higher education.

I also focused on exploring how information and structure play a role in students' ability to navigate the federal work-study program and make optimal work (study) decisions for their successful first-year in college. The findings of this study suggest that there are opportunities for future research to conduct a randomized controlled trial, using informational interventions or

structural changes. For instance, informational intervention studies can explore how the different information delivery methods (e.g., websites, one-pagers attached to financial aid award notice, short videos, student testimonials) at which time points (e.g., when filing the FAFSA, when receiving aid award notice, during the first week of school) effectively increases students' work-study take up or changes students' choices in job types. Structural change examples can include the ways through which students search and apply for part-time employment on campus. Future research can explore whether job assignments or recommendations along with work-study offer meaningfully changes students' work-study behaviors or their satisfaction with the federal work-study program. As I highlighted above, discovering means to design effective outreach and interventions will improve students' access to work opportunities that align with their goals.

Conclusion

Notwithstanding the history of the federal work-study program, it has relied on little empirical evidence to inform policy and practice. Limited access to deep institutional data has been a major challenge for researchers, and higher education institutions' scant regard to student experiences has added another layer of uncertainty about how the program impacts students' college access and success. Hence, the goal of this study was to obtain robust evidence of the effects of federal work-study on lower-income students' college outcomes and identify the underlying mechanisms. I took a deep dive into answering fundamental questions about the program and initiating scholarly inquiries about the little-known, complex mechanisms of institutions' financial aid awarding practices related to federal work-study as well as students' work-study behaviors, using an extensive institutional dataset of student demographics, academic records, and student employment.

The key findings of this study are consistent with existing evidence and indicate that the federal work-study program has null effects on students' first-year GPA and persistence to the 2nd year at currently enrolled institution. Intriguingly, the program significantly increases work-study students' weekly hours worked on campus (and related income) relative to students who did not receive work-study offers due to marginally higher expected family contributions. In particular, work-study employment has heterogeneous effects on students, inducing male students and racially and ethnically underrepresented students to work more hours per week on campus than their counterparts. I find that student decisions about work and their motivations behind that work all come into play to determine the quality and outcomes of the federal work-study program.

Most importantly, I reiterate that the full potential of the federal work-study program is yet to be realized. Not all students, especially students from disadvantaged backgrounds, have been making well-informed, prudent decisions about work-study. This is attributable to many informational and structural barriers associated with the program. It is essential for policymakers and institutions to recognize that federal work-study is not simply about student employment. It is more fundamentally a financial aid program that most underprivileged students have limited knowledge about and that entails substantial amount of complexities and hassle factors. Thus, proactive interventions to improve students' and parents' knowledge about work-study and to simplify the associated administrative processes are indispensable. The benefits of the program can be also maximized by targeting more funds to non-first-year students or by creating educational work opportunities for all students including the first-year students.

The literature on the federal work-study program is an imperfect puzzle. I endeavored to fit in more puzzle pieces through this study and yet, the whole picture is still unknown. Due to

the extensive institutional discretion about how federal work-study funds are allocated and how the program operates, existing studies have offered findings that may not be generalizable to a broader body of varying institutions, serving different types of student body. I thus call for more research with emphasis on institutions where more socioeconomically disadvantaged students are enrolled at. These students have the most financial need to work to afford college education and therefore, they are the students who could potentially utilize an enhanced federal work-study program as their access to work experiences that will build a bridge to an upward socioeconomic mobility through higher education. For policymakers and institutions, recognizing the weight of student employment on students' college access and success will lead them to taking one step forward to fulfilling their responsibilities as important stakeholders of higher education.

Appendices

Appendix A. Data Collection Timeline

Table A. *Data Collection Timeline*

| Data | Phase | Details | 2019 | | | | 2020 | | | | | | | | | |
|------------------------------------|--------|---|------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | | |
| Student survey | I-1 | Focus group protocol draft and question revisions (including expert reviews) | | | | | | | | | | | | | | |
| | I-2 | IRB application, revisions, and approval | | | | | | | | | | | | | | |
| | I-3 | Additional IRB pending for administrative data analysis (refer to III-1 through III-5) | | | | | | | | | | | | | | |
| | I-4 | Recruitment for focus group participants (3rd week of FEB) | | | | | | | | | | | | | | |
| | I-5 | Focus group interviews completed (4th week of FEB) | | | | | | | | | | | | | | |
| | I-6 | Focus group interview transcriptions and analysis | | | | | | | | | | | | | | |
| | I-7 | Survey questionnaire drafted based on focus group interviews | | | | | | | | | | | | | | |
| | I-8 | Pilot survey and cognitive interviews (1st-2nd weeks of AUG) | | | | | | | | | | | | | | |
| | I-9 | Survey instrument revisions and online survey preparation using Qualtrics (3rd week of AUG) | | | | | | | | | | | | | | |
| | I-10 | Survey administration (4th week of AUG) | | | | | | | | | | | | | | |
| Contextual information | II-1 | Informal administrative staff interviews | | | | | | | | | | | | | | |
| | II-2 | Back and forth cross checking of information gathered | | | | | | | | | | | | | | |
| Administrative student record data | III-1 | MOU with the Office of Enrollment Management (OEM) | | | | | | | | | | | | | | |
| | III-2 | IRB application and revisions | | | | | | | | | | | | | | |
| | III-3 | IRB approval | | | | | | | | | | | | | | |
| | III-4 | Formal data request for administrative data to the Office of Enrollment Management (OEM) | | | | | | | | | | | | | | |
| | III-5 | [Survey] Receipt of student contact information for focus group participant recruitment | | | | | | | | | | | | | | |
| | III-6 | Meetings with university leadership regarding data request and details | | | | | | | | | | | | | | |
| | III-7 | Mock data submitted as requested by OEM | | | | | | | | | | | | | | |
| | III-8 | Formal data request to the Office of Human Resources Records & Information Services (UHR) | | | | | | | | | | | | | | |
| | III-9 | Receipt of UHR data | | | | | | | | | | | | | | |
| | III-10 | Receipt of OEM data | | | | | | | | | | | | | | |

Appendix B. Administrative Student Record Data Details

Table B. *Administrative Student Record Data Variables*

| Demographics | Financial Aid | Academic Career | Employment and Payroll |
|---------------------------------|--|---|--------------------------------|
| - Sex | - Total tuition & fees (\$) | - Enrollment (cohort) year | - Job description |
| - Race/ethnicity | - Total gift aid amounts (\$) | - Affiliated college/department | - Affiliated department/office |
| - Unrepresented minority status | - Total loan amounts (\$) | - Academic major | - Work-study job indicator |
| - First-generation status | - Work-study interest indicator in the FAFSA | - Fall: Enrollment indicator | - First payment date |
| - Residency status | - Work-study offer indicator for each term | - Fall: Total number of credits taken | - Last payment date |
| - Marital status | - Work-study offer amount (\$) | - Fall: Total number of courses taken | - Total amount earned (\$) |
| - Number of dependents | - Work-study earned amount (\$) | - Winter: Enrollment indicator | - Total number of hours worked |
| - Expected family contribution | - Work-study earned amount (\$) for the year | - Winter: Total number of credits taken | - Hourly rate |
| - High school GPA | | - Winter: Total number of courses taken | |
| - High school name | | - Spring: Enrollment indicator | |
| - High school state | | - Spring: Total number of credits taken | |
| - High school zip code | | - Spring: Total number of courses taken | |
| - Number of AP scores sent | | - Summer: Enrollment indicator | |
| - Average AP score | | - Summer: Total number of credits taken | |
| - SAT composite score | | - Summer: Total number of courses taken | |
| - ACT composite score | | - First-year GPA | |
| | | - Persistence to the sophomore year | |

Appendix C. Notes on Data Cleaning

- **Underrepresented minority (URM)**

At Lake University, students who were Black, Hispanic, American Indian/Alaskan Native, and Native Hawaiian /other Pacific Islanders were identified as underrepresented minorities.

- **College/department**

Students' affiliated colleges and departments were originally categorized into seven different colleges. For analysis, students who were in 'Art and Design' and 'Music, Theatre, and Dance' schools in addition to joint degree programs with interarts performance major were merged into one category to deal with small cell issues.

- **SAT and ACT scores**

There were 22,876 missing data for SAT scores and 7,719 missing data for ACT. Among 7,719 students with no ACT scores, 7,715 of them had SAT scores, which I used to replace missing ACT scores based on ACT/SAT concordance table available online. I converted SAT to ACT scores because the conversion could happen between a score to a score, while converting ACT to SAT scores would give you a range of SAT scores, not an exact score.

- **AP scores**

AP scores in the data only consisted of scores that were submitted to the university.

- **Financial data – General**

All financial data—financial aid and payroll—represent funds and earnings for an 8-month period—from fall to winter semesters, and not for spring and/or summer semesters.

- **Cost of attendance (COA)**

85 students (about 0.2% of the data), had missing values for COA for unidentified reasons as confirmed by the Director of Data, Analytics, and Research, OEM. The director suggested the missing values to be replaced with newly calculated values using student information including residency, academic career, cohort year, and tuition and fees. For example, a resident student who enrolled at College of Literature, Science, and the Arts (LSA), Lake University in the fall of 2013 had a missing value for COA. For students with the same residency status, academic career, cohort year, and tuition and fees, COA ranged

from \$20,542.38 to \$34,288.13 with the mode value of \$26,240.38. Namely, 93.4% of the students' COA was \$26,240.38. This mode value was used to replace the missing COA. The same process was repeated individually for 85 students.

- **Expected family contribution (EFC)**

EFC information in the data is the federal EFC calculated based on the FAFSA. There were 10,465 students with missing data for EFC. According to the Director of data, analytics, and research, Office of Enrollment Management, there would be no information on EFC if a student (a) did not submit the FAFSA in the first place or (b) submitted the FAFSA, selected for review and resubmit, but did not resubmit it. These students would ultimately be ineligible for any federal financial aid including federal work-study. Therefore, the missingness of EFC also identified students' eligibility status for federal work-study.

- **Gift aid and loans**

There were 267 students (about 0.7% of the data) who had missing values for both gift aid and loans, although they submitted the FAFSA. No confirmation on the exact reason for missing data was available from the university and thus, I replaced the missing values with \$0 aid amount, which was most likely according to the Director of data, analytics, and research, Office of Enrollment Management. That is, there are instances when originally allocated gift aid or loans are cancelled as, for example, students receive external scholarships that exceed COA, which possibly led to a missing value for these aids.

- **Federal work-study interest in the FAFSA**

Among students who submitted the FAFSA, 336 students had missing data on Question 31 that asked about interest in federal work-study. For analytic purposes, these values were recoded as "Don't know." Among students who did not submit the FAFSA and who would have not had any FAFSA information on their records, 94 students had data on Question 31. The data for these students were recorded as missing in accordance with the status of the FAFSA submission.

- **Federal work-study offer indicator record from financial aid data**

10 students who did not submit the FAFSA and were ineligible for any federal aid was indicated as being offered work-study in their financial aid records, however, with no data on offer amount. After further cross-examinations with HR data, I confirmed that these students did not have any work-study employment and recoded the offer indicator as not offered.

- **Persistence**

Students were coded as "persisted to the 2nd year" if they enrolled for fall and winter semesters in their freshmen year and then, enrolled for the fall semester in sophomore year. If a student did not come back the next fall after finishing the winter semester in the first year, it would mean that a student did not persist to the 2nd year.

- **First-year GPA**

In the data, there were 223 students (about 0.6%) who had zero GPA values for fall-winter as they took classes during the spring and summer. This administratively recorded GPA for fall through winter semesters as zero. For these students, I used the max term GPAs, which was a cumulative GPA for a 12-month period from fall through summer in the following year.

- **On-campus employment records for fall through winter semesters**

Students' employment records spanned one calendar year, for example, from September 2013 to August 2014 for a student who was enrolled during 2013-14 academic year. In this study, I examined first-year outcomes that was reflective of fall through winter semesters only, excluding spring and summer semesters. Therefore, it was necessary to only account for employment and payroll records between September and April (of the next year) only so that I could exclude any part-time work during spring or summer semesters.

I utilized pay begin and end dates to recalibrate employment and payroll data—hours worked and earnings—and limited all data to employment during the 8-month period. Specifically, according to the university staff, pay end date implies that a student worked until at least two weeks before that pay end date due to a bi-weekly payroll plan at the university. Thus, if a pay end date was around mid-May, this would mean that a student worked until the end of April or very early May, which would be included in the analysis. However, any on-campus employment in the spring/summer semesters (May through August) was excluded.

The university payroll office distinguished students' job type mainly in four categories: (a) professional or administrative, (b) clerical, (c) technical, and (d) labor or service. I further divided the jobs in professional or administrative category into four different job types to separate research or teaching related positions from general administrative and professional positions in the same category.

- **Off-campus employment records for fall through winter semesters**

Student survey collected partial information about work-study decliners' off-campus jobs including job description, job title, job type, and hourly wage. There were 28 off-campus workers with 34 employment records, among which six students did not report average hourly wages for these jobs. The six missing hourly wage data was replaced with the average value of the jobs in the same job type category.

- **Federal work-study offer, offer amount, and offer acceptance (additional from HR)**

Federal work-study related data had much inconsistency throughout because financial aid offers are subject to change after being offered and the administrative data do not always capture the latest information, particularly for federal work-study. For example, there could be a student who was originally offered federal work-study aid but later received an external scholarship after the receipt of the first financial aid award. Federal work-study is then highly likely to be cancelled because the new scholarship, which is a gift aid, comes into the aid

packaging equation before work-study. According to the staff at Lake University, this type of change is not always up to date in the administrative data.

Hence, I relied on the employment and payroll information to verify the student records on the federal work-study offer and receipt provided by the Office of Enrollment Management. This resulted in data correction for 35 students who had work-study employment, but their financial records indicated that they were neither offered work-study nor accepted the aid. These student records were recoded as to having received and accepted the offer. Still, the accurate amount of work-study offer amount was not available for these students, and the actually earned amount was not an exact representation of the original offer amount. As it was for almost all work-study-offered students, I replaced the offer amounts for 35 students with the maximum offer amount that corresponded to their aid award year and residency.

Appendix D. Invitation to Focus Groups

- **Recruitment email for work-study participants**

Subject: [Sign-up + \$20 gift card] Participate in a focus group interview about work-study!

Hello,

My name is Sooji Kim, and I am a PhD student in the higher education program at the University of Michigan. I am writing to invite you to participate in my dissertation study that focuses on the federal work-study program that is being supported by the Office of Enrollment Management at [case institution name].

I am particularly interested in learning about **how you figured out work-study when it was offered to you in your financial aid package for the 2019-2020 academic year (freshman year), how you made your final decision to participate in the program, and how you navigated the work-study job searching process.** The findings will not only help my research, but also inform current financial aid practices associated with work-study at [case institution name].

Your participation in this study would involve a one-time, **60-75-minute-long focus group interview.** Your involvement in the study is completely voluntary, and you may choose not to participate or to leave the interview at any time. Should you choose to participate, you will receive a **\$20 gift card** (a prepaid Mastercard) as a small token of my appreciation of your time.

I plan to arrange focus group interviews during the **week of February 24 (next week).** If you are interested in participating in the study, please complete this short [google form](#).

You can reach me by [email address] or by [phone number] if you have any questions.

Thank you for your time and consideration.

Best regards,
Sooji Kim

Ph.D. Candidate
Center for the Study of Higher and Postsecondary Education
University of Michigan, School of Education

FAQs

Q. How was I selected?

A. With the support from the Office of Enrollment Management at [case institution name], I am reaching out to students who were offered work-study and decided to accept the offer for the 2019-2020 academic year. Within the fall 2019 cohort, 15 students have been *randomly selected* to participate in this study.

Q. Has this study been approved by IRB (Institutional Review Board)?

A. Yes, this study has been approved by the [case institution name] Institutional Review Board (IRB).

- **Recruitment email for work-study decliners**

Subject: [Sign-up + \$20 gift card] Participate in a focus group interview about work-study!

Hello,

My name is Sooji Kim, and I am a PhD student in the higher education program at the University of Michigan. I am writing to invite you to participate in my dissertation study that focuses on the federal work-study program that is being supported by the Office of Enrollment Management at [case institution name].

I am particularly interested in learning about **how you navigated work-study when it was offered to you in your financial aid package for the 2018-2019 academic year (freshman year), and how you made your final decision to NOT participate in the program.** The findings will not only help my research, but also inform current financial aid practices associated with work-study at [case institution name].

Your participation in this study would involve a one-time, **60-75-minute-long focus group interview.** Your involvement in the study is completely voluntary, and you may choose not to participate or to leave the interview at any time. Should you choose to participate, you will receive a **\$20 gift card** (a prepaid Mastercard) as a small token of my appreciation of your time.

I plan to arrange focus group interviews during the **week of February 24 (next week).** If you are interested in participating in the study, please complete this short [google form](#).

You can reach me by [email address] or by [phone number] if you have any questions.

Thank you for your time and consideration.

Best regards,
Sooji Kim

Ph.D. Candidate
Center for the Study of Higher and Postsecondary Education
University of Michigan, School of Education

FAQs [same as above in the invitation to work-study participants]

Appendix E. Focus Groups Protocol

Before discussion starts:

- (1) Moderator will have participants fill out a pseudonym name badge.*
- (2) Moderator will build personal rapport.*

Welcome & Introduction [0:00 - 0:05]

Good afternoon and thank you for joining me today to talk about work-study. My name is Sooji Kim, and I am a graduate student at the University of Michigan, studying higher education. As you have already been informed, this research is for my dissertation. But I am also receiving various types of support from the Office of Enrollment Management at [case institution name] for this research, with whom I will be sharing the summary of the findings.

Today, I want to learn about your overall decision-making process regarding work-study and your experiences with work-study. For example, I want to know about how you first learned about work-study, how did you know if you wanted to participate in the program, or what processes you went through to find a work-study job. To gather information on these questions, I am having focus group interviews like this with several groups of current students at [case institution name].

The findings of today's discussion will be used to develop a comprehensive survey questionnaire that will be sent out to current students at the university in the near future. A brief summary of the findings will also be shared with the Office of Enrollment management so that they can learn about student experiences with work-study and improve any associated student services.

And you were invited because you have demonstrated interest in work-study in the FAFSA and also have been offered work-study in your financial aid package when you enrolled.

Now, I will review some guidelines and inform you about confidentiality. [Review IRB]

Ground rules [0:05 - 0:10]

I am going to go over some ground rules before we begin.

First, this is a discussion and therefore, there are no wrong answers. As this group is intended to reflect diverse and broad student experiences as much as possible, your unique and different thoughts, experiences, and comments will be very helpful. Please feel free to share them.

Second, you may be assured of complete confidentiality. We will be on a pseudonym first-name basis today, and no potential documents or reports will identify you by any means. I will also ask you to respect each other's privacy and not repeat anything that was said here today.

Third, I am audio recording our discussion today to ensure that I have an accurate record of what you have to say. You will provide me with very helpful information, and I would not want to miss any of your comments. [get participant consent]

Last, you may eat and drink during the discussion, but smoking is not allowed in this room. Restrooms are available outside the room.

Before I move on, does anybody have any questions? Well, let's begin.

Opening questions [0:10 - 0:15]

I have placed name cards on the table in front of you to help us remember each other's names. Let's find out some more about each other by going around the table. Tell us your name and what you are studying.

The moderator and participants go around the table for a brief introduction.

Key questions [0:15-1:15]

1. Filing the FAFSA

I would like to begin by asking you about filing the FAFSA. Could you tell me if you have worked on it by yourself or with someone?

Probe: *[If a participant worked on FAFSA with someone else]* Who assisted you in filing the FAFSA?

2. Submitting the FAFSA

If you remember, what is your best estimate of the date that you submitted the FAFSA? If this is too difficult, you can tell me your best guess of which week of which month, for example, the first week of March.

[Note: Participants will be asked to check this information before coming to the focus group.]

3. Response to work-study question in the FAFSA; demonstrating interest in work-study in the FAFSA *[Distribute a copy of the FAFSA page with work-study question.]*

What I just handed out to you is a copy of the 2019-2020 FAFSA that you probably submitted, and I highlighted the question #31 that asks, "Are you interested in being considered for work-study?" And it asks you to answer either "Yes" or "No", or "Don't know".

31. Are you interested in being considered for work-study? Yes 1 No 2 Don't know 3

How many of you actually remember (answering) this question from the FAFSA?

Now, I want you to take a minute and use your fondest memory to reflect on the moment you were answering this question that asks you to demonstrate your interest in work-study. I am interested in hearing about how you figured out how you want to answer this question. This is a list of questions that can guide you to think about the kinds of thoughts and questions you had while answering this question on work-study. For example,

The moderator will share a memo of the guiding questions and read them to the participants.

- How did you figure out if you are interested in being considered for work-study or not?
- How much prior knowledge did you have about work-study when answering this question?
- If you had any knowledge about work-study, what did you know about it and how did you know about it? How did that help you answer this question?
- If you did not know what work-study was, how were you able to answer this question?
- What was your response to this question? What were the factors that led to your response among “Yes”, “No”, or “Don’t know”?
- How did your existing knowledge or no knowledge about work-study affected you to choose your response to this question?

Please take a minute to think about it.

4. Comment on work-study question in the FAFSA

If it is possible, how would you improve this question about work-study in the FAFSA? For example, you could rewrite the question, divide the question into multiple questions, provide more response options, or offer some notes to the question for reference.

Probe: *[If a participant suggests changes]* What makes you to want to suggest those changes?

5. Understanding of the work-study offer in financial aid package

Now, as mentioned earlier, you were invited today because you were all offered work-study award in your financial aid package. This time, I want you to focus on the time you received your financial aid package and learned that you were offered work-study.

Could you tell me about the process of how you navigated your financial aid package?

What were your immediate thoughts, questions, or reactions about work-study when you saw it in your financial aid package?

Probe: Were your questions or confusions resolved? How? What were the resources that helped you?

Compared with the time you were filing the FAFSA, would you say that you had a better or more knowledge about work-study when you knew you offered the award?

Probe: [*If yes*] What were the things you knew more about work-study? How did you get to know better about the program?

Probe: [*If no*] What would be the reasons why you were not able to gain more information about work-study since filing the FAFSA?

6. More thoughts, reflections about work-study

I am very interested in hearing more about your thoughts and reflections on work-study.

When did you exactly learn that work-study award was not a grant aid, but it had to be earned? How did you learn about how work-study operates?

Probe: What are your thoughts about what work-study is and how it works? (or)
What do you think about work-study as a financial aid?

What do you think about the offer amount? Does the offer amount feel sufficient for you, why or why not?

Probe: Thinking about the offer amount, were there any thoughts that you might want to work a second job?

If possible, what suggestions would you make to the office of financial aid officers about work-study award? Your suggestions can relate to financial aid package itself, related student services, or anything else you would like to comment on.

7. Work-study job questions for those still navigating

Now, I would like to switch some gears and start talking about your plans regarding work-study.

If you are still deciding whether or not to participate in work-study, could you tell me in detail about what kinds of thoughts or questions you are having during the process?

If you know that you ultimately want to participate in work-study, could you tell me about the reasons why you have not started working? What kinds of factors do you think are delaying this process?

Now, let's think about the types of work or activities for work-study job.

What would be an ideal work-study job for you? What kinds of characteristics or activities would describe your ideal or first-choice work-study job?

Probe: What are the resources and information you have been using to look for this ideal job?

Probe: What are some of the difficulties or challenges you are experiencing while finding your ideal job?

Probe: Considering what we just talked about, what would be your second choice job?

Overall, how important is the level of relevance of work-study job to your academic major?

How important is the level of relevance of work-study job to your career interests?

Work-study actually has a limit to how much you can work since there is a maximum amount of wages you can earn throughout one academic year. In this regard,

In this regard, how much does the working hours matter for you? For example, somebody would want to evenly earn the award amount throughout the year, while someone else might want to work as much as possible within a shorter time.

Overall, what are the things the school can do to improve student experiences of navigating work-study? What would be your suggestions?

8. Work-study job questions for those who found a job

I am interested in hearing about your work-study job navigating process.

Could you tell me about when and how you started searching for a work-study job? For example, what motivated and helped you to find a job soon after you enrolled?

Probe: What are the resources or information you used throughout the process?
Which were helpful and which were not?

Closing questions

Closing

I want to thank you so much for taking the time to give us your thoughts and opinions. I have your incentive, and after receiving it, please be sure to sign a receipt.

The moderator will be giving the participants the incentive and have them sign a receipt.

Appendix F. Invitation to Cognitive Interview

Subject: [\$25 gift card for all participants] Review my survey questionnaires!

Hello, my name is Sooji Kim, and I am a PhD student in the higher education program at the University of Michigan. I am inviting you to help me with my dissertation research that focuses on the federal work-study program. **A survey instrument has been developed to ask students about work-study relevant decisions, and the questionnaires need feedback.**

For example: Are questions easy to understand? Are questions easy to answer? Are there all possible response options? Are there any words or phrases that can be improved?

Your participation will be a one-time, fully online participation. Specifically, it involves:

- (a) 15~20 minutes of taking the survey yourself and
- (b) 30~40 minutes of providing feedback on the survey questionnaires (on a Google doc).
 - Your involvement in the study is **completely voluntary**, and you may choose not to participate or to quit at any time.
 - Should you choose to participate, you will receive a **\$25 Amazon e-gift card** as a small token of my appreciation of your time.

There are **only 30 spots available**. So, if you are interested in participating, **please quickly complete this short google form**, which has a few screening questions to check your eligibility to participate.

You can reach me by [email address] or by [phone number] if you have any questions.

Thank you for your time and consideration!

Best regards,
Sooji Kim

Ph.D. Candidate
Center for the Study of Higher and Postsecondary Education
University of Michigan, School of Education

FAQs [same as above in the invitation]

Appendix G. Instructions for Cognitive Interview

- **Information sheet**

Researcher

Sooji Kim, Doctoral Candidate
Center for the Study of Higher and Postsecondary Education
University of Michigan, School of Education
Contact information: [email address] | [cell number]

Purpose of the Study

This study mainly investigates students' decision-making processes related to work-study offered in their financial aid packages. I am particularly interested in (a) how students generally navigate work-study and decide to either accept or decline the offer, (b) how students make work-related decisions and other alternative options (other than work) to finance college expenses, and (c) what kinds of challenges students face throughout these processes that can be improved at the university level.

Description of Involvement

This stage of the survey research is called “cognitive interview”, during which a drafted survey is taken by a small sample of respondents who will afterwards provide comments and suggestions to improve the survey before it is administered. Therefore, your participation will be a one-time, fully online involvement including TWO tasks: (a) Taking the survey (about 15 minutes) and (b) offering feedback on the survey (about 30-40 minutes) (see ‘Instructions’ for examples). Please note that your involvement in this study is completely voluntary, and you may choose not to participate or quit at any time.

Incentives for Participation

Participation in this study will involve no cost to you. Should you choose to participate, you will receive a \$25 Amazon e-gift card as a small token of my appreciation for your time. Once you send back the survey with your comments and suggestions, the gift card will be electronically sent to you to your university email account.

- **Instructions**

Please read this document carefully.

1. First, take the survey using the following link and the password. The survey is **web-friendly**, and it is NOT recommended that you take the survey on your mobile one. Also, I kindly ask you to answer the questions using **your best knowledge and memory**.

- Link to survey: [link]
- Password: [password]
- Note: You will NOT be answering all the questions in the survey. There are skip patterns throughout the survey, and you will ONLY ANSWER questions that are relevant to you.

2. After completing the survey, open the word document (survey draft) attached to this email. By using “Review” – “Comment” functions, please **provide honest and thoughtful comments or suggestions for each question that you responded to**.

- Note: You ONLY COMMENT on the questions you responded to, and you DO NOT comment on any other questions that are not relevant to you (that you did not respond to/did not experience).

A list of things you can think about:

- Are questions easy to understand? Can it be rephrased or simplified?
- Are there any words, phrases, or concepts that are too difficult to understand?
- Does the order of questions feel natural while answering the questions?
- Are any questions too sensitive? How can it be better asked?
- Do questions offer all possible response options? If not, what should be added?
- Are there any questions that are repetitive?

Please remember that these are only a few examples to provide you with some guidelines. You are also welcome to comment if questions were well written or easy to understand 😊

3. Save the word document with your comments and **e-mail it back to Sooji Kim (me)** [email address].

4. Once I confirm the receipt of your comments (document) and your survey responses (online), I will be sending you \$25 Amazon e-gift card within a day or two. The e-gift card will be sent to your university email.

5. Please e-mail or call me if you have any inquiries.

Appendix H. Survey Flow and Questions

Table C. *Survey Flow*

| Questions | Topics |
|-----------|--|
| Q. 1-6 | <p>Eligibility questions and contact information</p> <p><i>Notes: Students are eligible to take the survey only if they enrolled at Lake University as the fall 2019 cohort and if they were offered work-study to accept or decline. If work-study was cancelled, this means that they were ultimately not offered work-study and not eligible to take the survey.</i></p> |
| Q. 7-15 | <p><u>Reference period: Filing the FAFSA</u></p> <ul style="list-style-type: none"> - Source of help with the FAFSA - Rate the source of help and explain - Response to work-study interest question - Level of familiarity with work-study - Things one knew about work-study - Work experience in high school and type |
| Q. 16-25 | <p><u>Reference period: Receiving financial aid</u></p> <ul style="list-style-type: none"> - Immediate questions about work-study when first noticed on financial aid award notice - Experience with assistance from Office of Financial Aid regarding work-study inquiries - Work-study decision (accept vs. decline) and why - Possibility of alternative work-study decision - Source of help with work-study decision - Comments on ways to improve financial aid practice |
| Q. 26-47 | <p><u>Reference period: Searching and deciding a job</u></p> <ul style="list-style-type: none"> - Part-time job application information (including work-study): When, how many, and types - Source of help with job searching process and rating - If not applied for a part-time job, why. - Comments on ways to improve financial aid practice - Part-time job experience (including work-study): How many, job description for each job - If did not work a part-time job, why. - Working multiple jobs and the reason - Priorities when choosing a part-time job while in school - Preferred minimum hourly rate for a part-time job while in school - Alternative financial decisions if ultimately did not work a part-time job - Overall satisfaction with the university student services regarding work-study - Comments on ways to improve financial aid practice <p><i>Notes: There are lots of skip patterns depending on whether students accepted vs. declined work-study offer; whether or not they applied for a job (including work-study); and whether or not they finally worked a part-time job (including work-study).</i></p> |

- **Survey Questions**

Q1 Thank you for choosing to take this survey! The first three questions will check your eligibility to participate.

Okay! (1)

Q2 Did you enroll at Lake University as the **fall 2019 entering cohort (i.e., freshman in the 2019-2020 academic year)?**

Yes (1)

No (2)

Skip To: End of Survey If Q2 = 2

Q3 Were you offered work-study in your financial aid package for the **2019-2020 academic year?**

Yes (1)

No (2)

Skip To: End of Survey If Q3 = 2

Q4 Which ONE of the following correctly describes your work-study status for the **2019-2020 academic year?**

I was offered work-study and I accepted it. (1)

I was offered work-study and I declined it. (2)

I was offered work-study, but it was later canceled (e.g., due to scholarships). (3)

Skip To: End of Survey If Q4 = 3

Q5 Great! You are eligible to take this survey. Please use your best knowledge and memory to answer the following questions.

Please provide your **FULL NAME**. This information will ONLY be used as a recipient information for your gift card.

Q6 Please provide your **UNIVERSITY EMAIL address. Your gift card will be sent to this address.**

Q7 Part I is about your experience with filing the FAFSA to apply for financial aid for your freshman year. Please refer to the time you were filing the 2019-2020 FAFSA, that is, between October 2018 and June 2019.

Okay! (1)

Q8 Which ONE of the following was your MAIN source of information, advice, or assistance that helped you fill out the 2019-2020 FAFSA? Select one.

My own research (e.g., web searching) (1)

Parent(s)/Guardian(s) (2)

Sibling(s) who attends/attended Lake University (3)

Sibling(s) who attends/attended college other than Lake University (4)

Other family member(s) (e.g., cousin) (5)

Friend(s) who attends/attended college (6)

High school counselor/teacher (7)

Hired financial aid consultant/professional (8)

Other (Please specify) (9) _____

Q9 How would you **rate your main source of help to fill out the 2019-2020 FAFSA?**

Excellent (1)

Good (2)

Average (3)

Poor (4)

Terrible (5)

Skip To: Q11 If Q9 = 1

Skip To: Q11 If Q9 = 2

Q10 Please briefly explain **why you gave this rating to your main source of help with the 2019-2020 FAFSA.**

Q11 In the 2019-2020 FAFSA, **Question 31** asked you if you were interested in being considered for work-study as shown below. Which ONE of the following was **your response** to this question?

31. Are you interested in being considered for work-study? Yes 1 No 2 Don't know 3

- "Yes" (1)
- "No" (2)
- "Don't know" (3)

Q12 How **familiar** were you with work-study (e.g., what it is, how it works) **AT THAT TIME** when you were responding to Question 31 in the FAFSA?

31. Are you interested in being considered for work-study? Yes 1 No 2 Don't know 3

- Extremely familiar (1)
- Very familiar (2)
- Moderately familiar (3)
- Slightly familiar (4)
- Not familiar at all (5)

Skip To: Q14 If Q12 = 5

Q13 What were the **things you knew** about work-study **AT THAT TIME** when filing the 2019-2020 FAFSA?

**** Please be as specific as possible.**

Q14 If any, which type(s) of **work experience** did you have while in **high school**? Select all that apply.

- Paid part-time job (1)
- Paid internship (2)
- Unpaid internship (3)
- Volunteering (4)
- Other (Please specify) (5) _____
- No work experience (6)

Skip To: Q16 If Q14 = 6

Q15 In which of the following categories, did you have work experience while in **high school**? Select all that apply.

- Education (e.g., tutoring, lessons) (1)
- Sports, fitness, & recreation (2)
- Healthcare (3)
- Social services & non-profit (4)
- Administration & office (5)
- Cleaning & facilities (6)
- Customer service (7)
- Personal care & services (8)
- Art, fashion, & design (9)
- Computer & IT (10)
- Entertainment & travel (11)
- Protective services (12)
- Restaurant & hospitality (13)
- Transportation & logistics (14)
- Other (Please specify) (15) _____

Q16 **Part II is about your experience with navigating work-study when it was offered to you in your financial aid package.** Please refer to the time you received your financial aid package for the 2019-2020 academic year from Lake University.

Okay! (1)

Q17 When you received your financial aid award notice for the 2019-2020 academic year (a sample image below), what were some of the immediate questions or confusions you had about the “federal work-study”?

For example: How is work-study aid going to be distributed? Is this going towards my tuition? Will I be assigned a work-study job?

| Financial Aid Offer | | | |
|---|----------------|----------------|----------------|
| Gift Aid (DOES NOT require repayment): | | | |
| • Institutional grant name | \$0,000 | \$0,000 | \$1,000 |
| • Institutional grant name | \$0,000 | \$0,000 | \$10,000 |
| • * FED PELL GRANT | \$2,000 | \$2,000 | \$7,000 |
| YOUR COST TO ATTEND LESS GIFT AID | \$3,500 | \$3,499 | \$6,999 |
| Work-Study (earned wages, not applied to student billing account): | | | |
| • * FEDERAL WORK STUDY | \$1,500 | \$1,500 | \$3,000 |
| Loans (must be repaid): | | | |
| • * FED SUBSIDIZED DIRECT LOAN | \$1,000 | \$1,000 | \$1,000 |
| • * FED UNSUB DIRECT LOAN | \$0 | \$0 | \$1,000 |
| YOUR ESTIMATED COST IF USING ALL AID OFFERED | \$0 | \$ 0 | \$0 |

** Please be as specific as possible to inform financial aid practice at Lake University.

Q18 Did you reach out to the **Office of Financial Aid** to resolve your questions or confusions about work-study offered to you?

Yes (1)

No (2)

Skip To: Q20 If Q18 = 2

Q19 How **satisfied** were you with the **assistance you received** from the Office of Financial Aid regarding your inquiries about work-study?

- Extremely satisfied (1)
- Moderately satisfied (2)
- Slightly satisfied (3)
- Slightly dissatisfied (4)
- Moderately dissatisfied (5)
- Extremely dissatisfied (6)

Q20 For the **2019-2020 academic year**, did you **accept or decline** work-study offered to you?

- I accepted. (1)
- I declined. (2)

Skip To: Q22 If Q20 = 2

Q21 What were your **main reasons to accept** your work-study offer for the **2019-2020 academic year**?

For example: I needed work-study for a job I wanted; I needed extra income to help with college costs.

*** Please be as specific as possible to inform financial aid practice at Lake University.*

Skip To: Q24 If Condition: What were your main reasons... Is Not Empty. Skip To: Overall, which ONE ...

Q22 What were your **main reasons to decline** your work-study offer for the **2019-2020 academic year**?

For example: It was overwhelming to transition to college and work at the same time; It was difficult to figure out work-study.

*** Please be as specific as possible to inform financial aid practice at Lake University.*

Q23 If you were to have been provided with **perfectly clear and complete information** about work-study, **how likely** would you have accepted work-study for the **2019-2020 academic year**?

- Extremely likely (1)
- Moderately likely (2)
- Slightly likely (3)
- Slightly unlikely (4)
- Moderately unlikely (5)
- Extremely unlikely (6)

Q24 Overall, which ONE of the following was your **MAIN source** of help when you had to **make a decision about your work-study offer** (accept vs. decline) for the **2019-2020 academic year**? Select one.

- Office of Financial Aid (1)
- Student Employment Office (2)
- Other administrative office (Please specify) (3) _____
- University staff (e.g., advisor, employer) (Please specify) (4) _____
- My own research (e.g., web searching) (5)
- Parent(s)/Guardian(s) (6)
- Sibling(s) who attends/attended Lake University (7)
- Sibling(s) who attends/attended college other than Lake University (8)
- Other family member(s) (e.g., cousin) (9)
- Peers at Lake University (10)
- Friend(s) who attends/attended college other than Lake University (11)
- High school counselor/teacher (12)
- Hired financial aid consultant/professional (13)
- Other (Please specify) (14) _____

Q25 In what ways, can Lake University improve the **financial aid award notice and related practices/services** to better assist students to **make informed decisions** about their work-study offer (accept vs. decline)?

*** Please be as specific as possible to inform financial aid practice at Lake University.*

Q26 Part III is about your part-time job searching process and decisions. Please refer to the 2019-2020 academic year only, that is, between September 2019 and April 2020.

- Okay! (1)

Q27 Did you apply for any part-time jobs to work while in school during the 2019-2020 academic year?

**** Please consider all jobs including work-study and non-work-study positions on- and off-campus.**

- Yes (1)
- No (2)

Skip To: Q29 If Q27 = 1

Q28 What were your main reasons not to apply for any part-time jobs?

**** Please be as specific as possible to inform financial aid practice at Lake University.**

Skip To: Q43 If Condition: What were your main re... Is Not Empty. Skip To: Which ONE of the following actions...

Q29 During which month, did you start applying for part-time jobs?

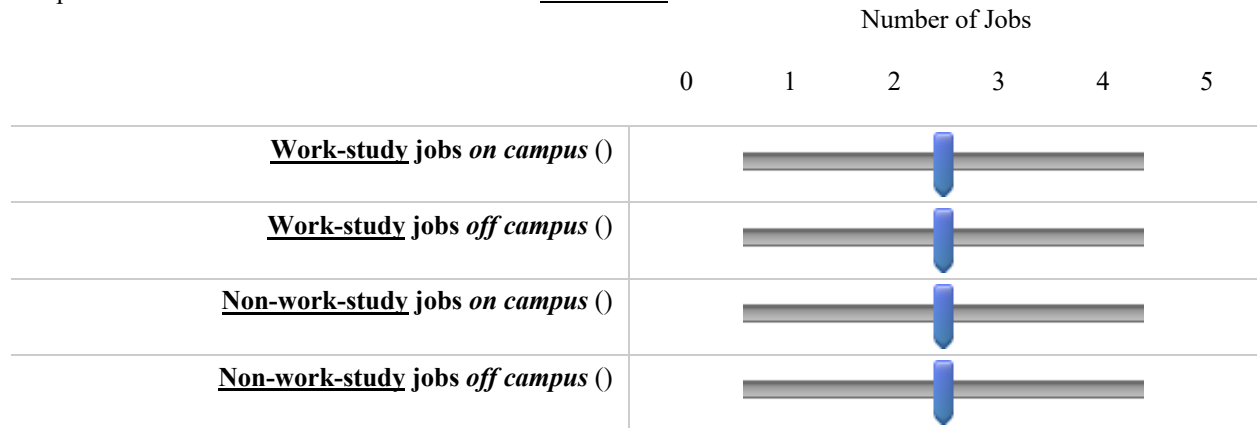
- Before August 2019 (1)
- August 2019 (2)
- September 2019 (3)
- October 2019 (4)
- November 2019 (5)
- December 2019 (6)
- During or after January 2020 (7)

Q30 In total, how many part-time jobs did you apply for?

**** Please consider each job application as one job.**

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 or more (5)

Q31 How many of **each of the following types** of part-times jobs did you apply for? For each type, drag the slider to a point on the scale. **** Please consider "5" as "5 or more"**.



Display This Question:

If Q31 [1] >= 1

Or Q31 [2] >= 1

Q32 While **searching and applying for work-study jobs**, which ONE of the following was the **MOST INFORMATIVE** source that helped you with the overall process? Select one.

- Student Employment Office (1)
- Office of Financial Aid (2)
- Other administrative office (Please specify) (3) _____
- University staff (e.g., advisor, employer) (Please specify) (4) _____
- My own research (e.g., web searching) (5)
- Peers at Lake University (6)
- Friend(s) who attends/attended college other than Lake University (7)
- Parent(s)/Guardian(s) (8)
- Sibling(s) who attends/attended Lake University (9)
- Sibling(s) who attends/attended college other than Lake University (10)
- Other (Please specify) (11) _____

Display This Question:

If Q31 [1] > 0

Or Q31 [2] > 0

Q33 How would you **rate** your main source of help with work-study job navigating process?

- Excellent (1)
- Good (2)
- Average (3)
- Poor (4)
- Terrible (5)

Q34 In what ways, can Lake University (e.g., offices, staff, employers) do better to improve student experience with **navigating work-study jobs** and making related decisions?

*** Please be as specific as possible to inform student employment services at Lake University.*

Q35 During the **2019-2020 academic year**, did you ultimately work any part-time job **while in school**?

- Yes (1)
- No (2)

Skip To: Q37 If Q35 = 1

Q36 What were your **main reasons not to work** any part-time jobs?

*** Please be as specific as possible to inform financial aid practice at Lake University.*

Skip To: Q43 If Condition: What were your main re... Is Not Empty. Skip To: Which ONE of the following actions....

Q37 **In total**, how many part-time jobs did you have **while in school** during the **2019-2020 academic year**?

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 or more (5)

Skip To: Q40 If Q37 = 1

Q37 During the **2019-2020 academic year**, were there times you worked **multiple** part-time jobs **at the same time** (e.g., working two jobs during the same period)?

- Yes (1)
- No (2)

Display This Question: If Q37 = 1

Q38 Which ONE of the following was your **MAIN reason** to work multiple part-time jobs at the same time? Select one.

- To earn more money (1)
- To gain work experience (2)
- Enjoyed the second job (or other additional jobs) (3)
- Other (Please specify) (4) _____

Q40 **UP TO THREE** part-time jobs **in the order of you worked** during the **2019-2020 academic year**, please describe them about the following: Organization / job title / job description / hourly rate / work-study status.

(For example: University Recreational Sports Department / lifeguard / oversee swimmers / 14 / Yes)

| | Organization (1) | Job Title (2) | Job Description (3) | Hourly Rate (4) | Work-Study (Yes/No) (5) |
|----------------|------------------|---------------|---------------------|-----------------|-------------------------|
| First job (1) | | | | | |
| Second job (2) | | | | | |
| Third job (3) | | | | | |

Q41 How would you **best describe** your part-time job(s) you had during the **2019-2020 academic year**? Select all that apply.

- Clerical/office/administrative assistant (1)
- Lab/research assistant (2)
- Teaching assistant/tutoring (3)
- Resident/student life assistant (4)
- Library (5)
- Retail/clerk/sales (6)
- Service/maintenance (e.g., facilities) (7)
- Technical (e.g., Computer, IT) (8)
- Allied health (9)
- Community service (10)
- Other (Please specify) (11) _____

Q42 Overall, when you were **deciding on a part-time job** to work **while in school**, which THREE of the following were MOST important to you? Select three.

- Hourly rate (1)
- Proximity to campus (2)
- Proximity to where I live (3)
- Flexible hours (4)
- Academic relevance (e.g., major) (5)
- Career relevance (6)
- Familiarity with the job due to past experience (7)
- Familiarity with the job due to information I gathered from others (e.g., peers) (8)
- Hard skills development (e.g., knowledge, language, programming) (9)
- Soft skills development (e.g., communication, leadership, teamwork, time management) (10)
- Low-intensity, low-pressure work environment/activities (11)
- Jobs that keeps me on my feet rather than desk jobs (12)
- Desk jobs rather than being on my feet (13)
- Other (Please specify) (14) _____

Display This Question: If Q27 = 2 Or Q35 = 2

Q43 Which ONE of the following actions did you **primarily** take to help financing college costs **instead of working** a part-time job? Select one.

- Took out student loans (1)
- Reduced expenses (2)
- Applied to scholarships (3)
- Received help from parents (4)
- Relied on my existing financial aid (5)
- Other (Please specify) (6) _____

Display This Question: If Q27 = 2 Or Q35 = 2

Q44 In general, if you were to **decide on a part-time job** to work **while in school**, which THREE of the following would be MOST important to you? Select three.

- Hourly rate (1)
- Proximity to campus (2)
- Proximity to where I live (3)
- Flexible hours (4)
- Academic relevance (e.g., major) (5)
- Career relevance (6)
- Familiarity with the job due to past experience (7)
- Familiarity with the job due to information I gathered from others (e.g., peers) (8)
- Hard skills development (e.g., knowledge, language, programming) (9)
- Soft skills development (e.g., communication, leadership, teamwork, time management) (10)
- Low-intensity, low-pressure work environment/activities (11)
- Jobs that keeps me on my feet rather than desk jobs (12)
- Desk jobs rather than jobs keeping me on my feet (13)
- Other (Please specify) (14) _____

Q45 In general, what is the **minimum hourly rate** you would take for a part-time job **while in school**?

- Between State minimum wage (\$9.45) and \$10.99 an hour (1)
- Between \$11 and \$11.99 an hour (2)
- Between \$12 and \$12.99 an hour (3)
- Between \$13 and \$13.99 an hour (4)
- Between \$14 and \$14.99 an hour (5)
- \$15 an hour or higher (6)

Q46 Overall, how **satisfied** were you with each of the following at Lake University?

| | Extremely satisfied (1) | Moderately satisfied (2) | Slightly satisfied (3) | Slightly dissatisfied (4) | Moderately dissatisfied (5) | Extremely dissatisfied (6) | Not applicable (7) |
|--|----------------------------|-----------------------------|---------------------------|------------------------------|--------------------------------|-------------------------------|-----------------------|
| Amount of work-study information made available to students (1) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Amount of assistance made available for students to find a work-study job (2) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Different types of work-study jobs made available to students (3) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Accessibility of staff to assist students throughout work-study job experience (4) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q47 Lastly, please share your remaining comments or feedback about how Lake University can improve students' **access to information, services, and assistance** related to **work-study**.

**** Please be as specific as possible.**

Appendix I. Invitation to Survey

Subject: [\$10 Amazon gift card for all participants] 15-min Survey on Work-Study

Hello, my name is Sooji Kim, and I am a PhD student in the higher education program at the University of Michigan. I am inviting you to take a brief survey about your experience with navigating work-study that was offered to you in your 2019-20 financial aid package (your freshmen year).

This survey is an important part of my dissertation research, but also the results will be shared with the Office of Financial Aid so that we could improve the university's financial aid practices and services to better assist students who are offered work-study.

For example: Are questions easy to understand? Are questions easy to answer? Are there all possible response options? Are there any words or phrases that can be improved?

Specifically,

- Your participation will be a *one-time, fully online* participation.
- On average, the survey should take *about 15 minutes*.
- Should you choose to participate, you will receive a *\$10 Amazon e-gift card* as a small token of my appreciation of your time. The e-gift card will be sent to your university email on August 31, 2020.
- **Survey link:** [Work-Study Survey 19-20](#)

Participation is limited to a fixed number of respondents as I plan to compensate all respondents. I highly encourage you to take it soon!

Thank you in advance for your time and valuable opinion. You can reach me by [email address] or by [phone number] if you have any questions.

Thank you,
Sooji Kim

Ph.D. Candidate
Center for the Study of Higher and Postsecondary Education
University of Michigan, School of Education

FAQs [same as above in the invitation]

Appendix J. Job Type Categories and List of Jobs

Table D. *Job Type Categories and List of Jobs*

| Job Type | List of Jobs |
|----------------|--|
| Administrative | Activity area staff, camp associate, administrative assistant, grader, food service assistant, driverless shuttle conductor, patient services assistant, program assistant/lead/staff, supervisor roles, student services assistant, student coordinator, student fundraiser, student housing assistant |
| Professional | Computer consultant, engineer, musician, programmer analyst, web site designer, marketing and media assistant, writer, lifeguard, sports officials/referees, personal trainer, programmer, allied health professional |
| Research | Research associate, research assistant |
| Teaching | Program instructor, exercise instructor, tutor, instructional aide, teachers assistant, simulated patient instructor |
| Clerical | Clerk, salesclerk, accountant clerk, coder, data entry specialist, editorial assistant, entrance monitor, library assistant, membership services assistant, secretary, word processing operator, (exam) monitor |
| Technical | Building crew, computer operator, draftsman, equipment staff, engineering/electronics technician, figure drawing model, graphic artist, laboratory assistant, media assistant, nursing assistant, museum assistant/technician, photographer, production assistant, recreational assistant, scanner, stagehand, allied health technicians |
| Labor/service | General laborer, food/dining service worker, tipped worker, waiter or waitress, housing service worker, groundskeeper, laboratory attendant, kitchen cleaner, laundry worker, maintenance mechanic, messenger, motor vehicle operator, mover, stockkeeper, transit coach operator |

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