Hungry in College: A multi-institutional study of student food insecurity and on-campus food pantries in the United States

Dissertation

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Abstract

Economic insecurity is part of many college students' daily lives. In this dissertation, I investigate food insecurity as a key manifestation of student economic insecurity. I study both individual experiences of food insecurity and institutional responses to student food insecurity through the adoption of on-campus food pantries. I specifically focus on food insecurity because it illuminates both student economic insecurity and the response of colleges to vulnerability on campus. My focus on food insecurity also allows me to develop a theoretical underpinning around institutions' indirect facilitation of students' short term economic security projects, wherein institutions may seek to mitigate students' lack of familial or government safety nets through the provision of security buffer services, such as an on-campus food pantry. In doing so, I speak not only to the issue of individual student food insecurity, but also to institutional responses to this insecurity.

I compiled the data for this dissertation through extensive original data collection combined with existing data, from sources that included college websites, Barron's measures of college selectivity, data from the College Scorecard and Integrated Postsecondary Education Data System (IPEDS), and a survey module on student food insecurity that I administered at 44 public two-year and four-year institutions to random

samples of undergraduate students (n = 15,252 students). I am able to leverage these unique data sources in tandem to build and expand on the prior research on food insecurity among students. These data allow me to investigate institutional responses to food insecurity across the higher education sector, including for-profit institutions and private non-profit institutions, which have not yet been explored in the existing literature. Additionally, I develop estimates of student food insecurity in differing institutional contexts, providing further confirmation of food insecurity as an issue for many students across a diverse range of colleges.

First, I study the provision of on-campus food pantries in seeking to understand how institutions may serve as short term economic security project facilitators for their students. Using an original dataset constructed from IPEDS and data gathered from college websites, I analyze the institutional characteristics associated with the presence of an on-campus food pantry. I investigate the existence of on-campus food pantries in a random sample of higher education institutions in the United States. I find that for-profit institutions in my sample are less likely to have an on-campus food pantry than are non-profit private or public institutions. I also find that institutions in small cities and suburbs are most likely to have an on-campus food pantry and that institutions with more than 10,000 students have much higher odds of having an on-campus food pantry than small institutions. No previous research has examined the existence of food pantries among a random sample of higher education institutions, and thus my contribution to the existing literature here is an essential expansion to include all types of institutional control.

Then, in the next chapter, I investigate how individual student demographic and academic characteristics correlate with experiences of food insecurity. I also examine the relationship between food insecurity and academic achievement, specifically GPA. I find that, on average, and net of many controls, students experiencing food insecurity have lower GPAs than their food secure peers. I also find that student demographic characteristics such as gender, first generation status, and residence location are associated with the likelihood of experiencing food insecurity. This chapter expands on the work of other research by incorporating institution-reported GPA, as well as demographic characteristics such as non-binary gender identities that have not been included in previous research.

Last, I explore the intersection of individual characteristics and institutional contexts to investigate correlations between individual food insecurity and the institutional provision of security buffer services (i.e. food pantries). I seek to understand if student vulnerability to food insecurity may be increased or ameliorated in varied contexts. I find that there may be associations between food insecurity and on-campus food pantries at different types of institutions. This has interesting implications for understanding how levels of individual food insecurity may shape institutional responses to students' experiences. Additionally, it provides nuance to conversations about how institutions may or may not facilitate students' individual short term economic security projects through the provision of social service resources.

I seek to shed light on the overarching question, how does economic insecurity, specifically food insecurity, impact students and their institutions? Overall, this study adds depth and breadth to the literature on food insecurity among college students, deepening researchers' understanding of individual-level food insecurity, while also expanding the scope of research beyond the individual to include institutional research questions.

Dedication

To each person who gave me their time, support, and love in the endeavor called graduate school. Each of you made this dissertation possible, and I am grateful.

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Publications

McDaniel, Anne and **Erica Phillips**. Gender and Education (2018). In B.J. Risman, Froyum, C., & Scarborough, W.J. (Ed.), *Handbook on the Sociology of Gender,* Springer Press.

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Fields of Study

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Chapter 1. Introduction

Economic insecurity occurs when families and individuals experience stress, worry, and hardship around their ability to make ends meet due to financial constraints. The risk of economic insecurity has shifted to the individual, perpetuating an assumption of individual responsibility for one's economic (in)security (Hacker 2006). This great risk shift, to use Hacker's (2006) term, has continued to undermine the social safety net that the United States developed in the wake of the Great Depression and World War II, whether that is through the lesser provision of defined benefit pensions to job insecurity through regular layoffs. Or, in the example of this dissertation, the increasingly individualized risk of pursuing postsecondary education. As students face economic insecurity in college, they may find themselves making challenging decisions about their finances, their quality of life, and their academic priorities.

Higher education has become a primary way through which individuals seek upward social mobility and economic stability in their adult lives. These colleges and universities are anchor institutions at the crossroads of upward and downward economic mobility, and thus, economic security. Higher education institutions serve as mediators of opportunity in U.S. society. Attaining a postsecondary degree, however, is a challenging process for many students. Students face challenges within and outside the academic

realm, often confronting difficult economic situations during their time in college. As more and more Americans experience insecurity in their lives (Cooper 2014; Leicht and Fitzgerald 2014), these experiences are coming with them to college.

One of the ways in which economic insecurity comes with students to college is through their experiences of hunger, or more technically, food insecurity, while they are students. Food insecurity is a harbinger of broader economic insecurities that students may face in college. Food insecurity is defined by the United States Department of Agriculture (USDA) and researchers as "limited or uncertain availability of nutritionally adequate and safe foods or uncertain ability to acquire acceptable foods in socially acceptable ways" (Anderson 1990, p. 1576). Food insecurity captures individuals' and households' inability to purchase food on the market based on their lack of financial resources. It is a potential indicator of economic insecurity. Feeding America, a nationwide network of food banks, estimated in 2014 that 10% of its 46.5 million clients were students pursuing postsecondary education (Resnikoff 2014; Weinfeld et al. 2014).

Colleges and universities are responding to students' inability to meet their basic needs, particularly in terms of food insecurity. Many colleges are offering new services to their insecure students, from on-campus food pantries and homelessness services to legal services and dress for success initiatives. These initiatives seek to support students in precarious situations and to support and encourage students to persist in college, despite sometimes severe socioeconomic barriers such as lack of food. Colleges becoming social service providers is in line with their historical role of *in loco parentis*, or acting in place

of parents. As risk has become more individualized, higher education institutions can be risk mitigators and security project facilitators for their students. Their new role as short term economic security project facilitators is not only a continuation of *in loco parentis,* in which the modern *in loco parentis* steps in to provide resources that parents cannot provide, but it is also *in loco imperii* (in place of government), a concept I develop around colleges' provision of traditional social services for their students as they serve as safety nets where governments and family may not. Colleges are stepping in where the state is not to bridge economic security gaps for their students. As colleges take on this new role, they become security buffers for their students in addition to their traditional roles of hub, incubator, sieve, and temple (Stevens, Armstrong, and Arum 2008). Colleges' entry into the social service realm in this way requires further investigation by researchers to understand its potential impact.

This dissertation investigates one manifestation of economic insecurity on college campuses --- food insecurity in the college setting. I specifically look at food insecurity because it is simultaneously an indicator of students' economic insecurity and institutions' role as security buffers for their students. First, I explore the institutional characteristics that may be associated with responses to student food insecurity. Then, I take a closer look at individuals within institutions to investigate how individual level college students' characteristics correlate with students experiencing food insecurity and how individual food insecurity may be associated with GPA. Last, I simultaneously consider institutional and individual characteristics to explore how food insecurity and

student characteristics are compounded or ameliorated for individuals in varying contexts (namely, does their institution have an on-campus food pantry). In this way, I look at how the institutional provision of social services is associated with student food insecurity. I seek to shed light on the overarching question, how does economic insecurity among students, specifically food insecurity, impact students and their institutions?

1. Economic Insecurity and Higher Education in the United States

1.1 Economic Insecurity in the United States

Economic insecurity and economic inequality are bad for society when the distribution of this inequality and insecurity becomes too skewed. Economic insecurity occurs when families and individuals experience hardship and stress about their ability to make ends meet due to financial constraints. Economic inequality describes the actual income and wealth gaps between groups of people in a society. Economic inequality in the U.S. capitalist system individualizes risk and minimizes the social safety net, to the detriment of middle- and working-class families. The risk of economic insecurity has shifted to the individual, perpetuating an assumption of individual responsibility for one's economic (in)security (Hacker 2006). This great risk shift has continued to undermine the United States' social safety net, whether that is through the removal of defined benefit pensions for workers to regular or normalized layoffs in jobs across the country (Hacker 2006). Or, the increasingly individualized risk of pursuing postsecondary education, which this dissertation explores.

Economic insecurity impacts millions of American families. This insecurity creates challenges not only for families, but for society as a whole as households seek stability, particularly financial stability. Families from different socioeconomic levels are all at risk for insecurity, and may react to insecurity in different ways (Cooper 2014). All families work to have some kind of 'security project' that helps them to understand and make choices around risk management and finances for their families (Cooper 2014). This could be narratives around prioritizing bills to behaviors and attitudes about the types of educational experiences they seek out for their children. One of the ways in which families embark on security projects to try to mitigate economic insecurity is to encourage their children to pursue postsecondary education (Cooper 2014). High income families create security projects centered around robust cultural and educational experiences for children as a means of procuring admission to highly selective colleges, which in turn leads to access to highly selective and highly compensated employment markets (Cooper 2014). This educational focus simultaneously acknowledges and perpetuates economic inequality.

Part of what makes it necessary for families to craft security projects is that workers and families face stagnating incomes (Hacker 2006; Leicht and Fitzgerald 2007; Leicht and Fitzgerald 2014). Stagnating incomes among American families, especially middle income families, mean that families must find other ways to maintain their lifestyles. Families often turn to debt to smooth their consumption patterns (Leicht and Fitzgerald 2007; Sullivan, Warren, and Westbrook 2000). These stagnating incomes and

increasing debts often mean that families and individuals cannot keep up with the rising cost of higher education security projects while continuing to meet their basic needs.

Food is a basic need. Food insecurity is a particularly stark form of economic insecurity, one that impacts millions of people in the United States, including many college students. Research from the United States Census reported that in 2014, 14% of households nationally were considered food insecure and 6% experienced very low food security (Coleman-Jensen, Rabbitt, Gregory, and Singh 2015). Food insecurity captures individuals' inability to purchase food on the market based on their financial resources.

Individuals and families who are experiencing food insecurity may seek out resources to ameliorate their food insecurity, from federal Supplemental Nutrition Assistance Program (SNAP) benefits (food stamps) to privately-run food pantries. SNAP is a federal entitlement program that receives its bipartisan support as part of the U.S. Farm Bill (USDA 2017). The Food Stamp Act of 1964 officially brought food stamps to the forefront of U.S. poverty amelioration policy as part of the War on Poverty (USDA 2017). From the beginning of its existence, food stamps have served a dual purpose in that they help the agricultural sector of the economy and they help low-income households, thus its inclusion as part of the Farm Bill (USDA 2017). In this way, the U.S. government in the 1960s crafted a safety net for low-income households around food access. This safety net, however, has been under negotiation over time, as the implementation of more stringent eligibility criteria in ensuing decades has required participants to demonstrate more extreme need and, for example, to meet work

requirements. Thus, while the SNAP program is essential to many low-income families, the benefits that families receive are often insufficient to meet their monthly food needs.

When individuals and families cannot afford to buy food on the market and do not have any or enough SNAP benefits to fall back on, food pantries may fill the gap. For low-income families, food pantries may be essential components of their security projects. Food pantries are the most recent iteration of emergency food services, building on hundreds of years of soup kitchens and bread lines (Poppendieck 1998). Food pantries and food banks rose to prominence in the food charity landscape in response to the dismantling of social safety net programs under the Reagan administration in the 1980s (Poppendieck 1998). The Clinton administration's welfare reform enactment further cemented U.S. society's need for food pantries (Poppendieck 1998).

Since the 1980s, food pantries have become more widespread and complex, often connected through sophisticated food bank networks. A food bank collects, stores, and distributes large scale food donations from private and corporate providers, as well as surpluses from the federal government, on behalf of its affiliated food pantries (Phillips 2014). Thus, while privately-run non-profit organizations, food banks and food pantries do receive surpluses from federal and sometimes state food systems (Poppendieck 1998). Food pantries vary in size and scope, but are usually small, local, often religiously affiliated non-profit organizations that distribute food to families and individuals experiencing food insecurity (Phillips 2014). While they may also collect, store, and distribute food donations, these donations are usually smaller in scope than those that go

to the local food bank. Food pantries usually want to be member agencies of local food banks because they are able to procure food much less expensively when they get it from a food bank.

College food pantries, however, often face very specific constraints or challenges in becoming a member agency of a food bank. These food pantries must decide if they are going to pursue their own 501(c)3 status, if they are going to use the 501(c)3 status of the university, or if they want non-profit status generally. Without 501(c)3 status, however, accessing food from the local food bank is not possible. Additionally, college food pantries must work with the local food bank to explain the need at their college, as this is still a fairly new area of economic insecurity for food banks to understand.

As food pantries spread to colleges, they exemplify the privatization of the social safety net. Additionally, the complete institutionalization of food pantries as a response, but not a solution, to economic insecurity is evident in their rapid appearance on college campuses in the wake of the Great Recession. Now, college students at public universities have access to private safety nets, to resources available only to them as students and rarely to the broader community in which the college is situated. On-campus food pantries are private safety nets, part of the way that colleges facilitate student security projects, even if they are located on public university campuses. By having an on-campus food pantry, colleges are responding to student needs that cannot or are not being met elsewhere.

Food pantries, however, have limits as successful poverty amelioration interventions. While food pantries have become institutionalized actors in the social service landscape (Poppendieck 1998), their incorporation into university life is an area that requires more exploration since universities have historically provided food to their students, often through meal plans and cafeterias. Food pantries, then, are not the only food-based intervention option for higher education institutions that are seeking to ameliorate food insecurity among their students. Other interventions might include meal swipe donations or campus kitchens. Food pantries, however, seem to be the most prevalent intervention at this time.

As a basic need, food is an indicator of economic security that can help scholars to understand the severity of the economic insecurity that individuals and families are facing on a regular basis. Food insecurity is basic and complex simultaneously. The need is basic, the response complex, complicated by institutional contexts, institutional perceptions, and institutional responses.

1.2 Economic Insecurity and Higher Education

As more and more Americans experience insecurity in their lives (Cooper 2014; Leicht and Fitzgerald 2014), these experiences are coming with them to college. Stevens et al. (2008) articulate that higher education serves many purposes, including sieves that sort, incubators for people and ideas, temples of expertise, and hubs of learning in our communities. As sieves that sort, higher education exacerbates and mitigates economic inequality (Stevens et al. 2008). When considered as sieves, higher education

organizations are noteworthy for their role in the regulation and allocation of positions within the social structure based on institutional prestige and selectivity, and credentials awarded (Stevens et al. 2008). As incubators, colleges and universities bring together social networks, identities, and social and cultural capital to foster long-lasting communities of individuals (Stevens et al. 2008). In serving as incubators that prepare individuals for their long-term place in society, they can have an inclusionary or exclusionary effect. An educational credential is a marker of status in U.S. society, one that powers the view of universities as temples of expertise (Stevens et al. 2008). Higher education legitimates knowledge and creates 'official' knowledge, a sphere that may be highly contested (Stevens et al. 2008). Higher education also plays a vitally important role as a societal hub, one that connects individuals and groups to many institutions, social roles, and social processes (Stevens et al. 2008). For example, it connects to the labor market (through internships and job placement), the family (through assortative mating), philanthropy (through advancement and fundraising), and government (through grants, regulations, and federal student financial aid) (Stevens et al. 2008). Without even one of these hubs, higher education would fail to play the full role that U.S. society expects it to play in our economy, worldview, and class structure.

Food on college campuses may also be considered a mechanism for higher education to take on the role of hub, connecting students over shared meals in campus dining halls. Connecting students to food and meals has always been an important aspect of college in the U.S. for students, though one that has shifted over time. Shared dining

halls were typical at colleges until the early to mid-1800s, when many colleges found the expense of residential and dining upkeep too expensive and many ceased to offer these services on campus (Kreihbel and Meabon 2006). Students, still needing to eat, came together to hire chefs for small groups, or in some cases established eating clubs that served both for social connections and meals (Kreihbel and Meabon 2006). In the early twentieth century, a resurgence in residential and dining requirements occurred, with many offering cafeteria style options (Kreihbel and Meabon 2006).

Throughout the twentieth century, colleges offered meals to their students either through college-operated dining systems or through contracts with third-party vendors to run dining services (Kreihbel and Meabon 2006). With either approach, over time, dining services became an important revenue source for colleges. The rise of complex and varied meal plans with high quality options are expensive in many cases and cater to students most able to afford these plans. Dining services as a revenue source for colleges has important implications for the reasons that institutions may choose to offer food items to food insecure students in a food pantry rather than meals. Some institutions have implemented programs to give food insecure students meals in college cafeterias, while others focus more on providing students with items to make their own meals. Meals may have more significant social significance in allowing students to participate more fully in campus life, depending on the college culture itself. Colleges have historically provided meals for their students, so their transition to providing food pantry items is a new venture for many institutions.

Higher education organizations and the decisions they make deeply influence the social mobility opportunities for individuals, especially individuals with low socioeconomic status backgrounds. The returns to a college degree continue to increase, with large differences in earnings between high school graduates and college graduates (McCall and Percheski 2010). Growing income inequality in the United States, coupled with expanding access to and choices around higher education has led to new roles and responsibilities for colleges and universities across the country.

2. Theoretical Framework of Risk in Higher Education

2.1 Institutional Contexts and Expansion of Higher Education

Higher education has expanded significantly in the past 60 years. Even recently, at all degree levels, between the 2002-2003 and 2012-2013 academic years, the total number of postsecondary degrees awarded increased (Musu-Gillette et al. 2016). Specifically, associate's degrees conferred increased by 59% and bachelor's degree conferred increased by 36% (Musu-Gillette et al. 2016). Institutional variation matters for the kinds of institutional support available to students as they earn more and more degrees.

Higher education's expansion has created a significant breadth and depth of institutional types, specializations, and degrees. Higher education institutions themselves have also expanded significantly in the past eighty years to accommodate increasing

numbers of students. In the recent past, between 2000 and 2014, there has been a 10% increase in the overall number of postsecondary institutions in the United States, from 6,479 to 7,151 institutions, respectively. The expansion of higher education in the past 15 years is noteworthy in terms of where the growth has occurred, primarily among institutions offering sub-baccalaureate credentials and in the for-profit sector (Hudson 2017). Among all institutions across the United States that were eligible for their students to receive federal financial aid in 2014, the breakdown by institutional control was 47% for-profit institutions, 26% private, non-profit institutions, and 27% public institutions. Hudson (2017) found that from 2000 to 2014, the number of institutions offering sub-baccalaureate credentials increased by 20% and that the number of for-profit institutions increased by 37%. Specifically, the growth in sub-baccalaureate programs has been driven primarily by for-profit institutions. Parts of this study include for-profit institutions, as well as students at two-year institutions, students working toward a sub-baccalaureate credential in most cases.

While this expansion of access to higher education is important, all degrees are not created equal. Prestige matters for labor market returns to a degree (Rivera 2011). For-profit education does not always, or often, provide the same quality of education and same co-curricular (outside the classroom) learning opportunities (Cottom 2017; Mettler 2014). And the income returns of an associate's degree are lower than the returns of a bachelor's degree. Exploring how institutional variation may be associated with

economic insecurity can help researchers to understand the role of support services at colleges.

College costs are also not equal, varying along a variety of institutional types, prestige, selectivity, and institutional resources. This variation in college costs may impact student opportunities within their college context. In addition to loans, one of the ways that students fund their college education is through the use of scholarship and grant aid. In the 2014-2015 academic year at four-year institutions, the average grant and scholarship aid that students received at all institutions was $11,300; $7,010 at public institutions, $19,060 at non-profit private institutions, and $5,160 at for-profit private institutions (Snyder and de Brey 2016). At two-year institutions, the average grant and scholarship aid was $4,930 at all institutions; $4,980 at public institutions, $5,730 at non-profit private institutions, and $4,370 at for-profit private institutions (Snyder and de Brey 2016). Scholarship and grant aid is vital in helping students to pay for college, especially when federal loans do not cover the full cost (Goldrick-Rab 2016). Discounts given to students through institutional scholarship and grant aid help to make college more affordable for families. As one can tell from the numbers, however, for-profit institutions give the least aid and have the highest tuition compared to their non-profit and public counterparts. Students with little or no scholarship and grant aid may find themselves facing differing economic insecurities depending on their institution. This study looks carefully at how institutional contexts may be associated with food insecurity among college students and institutional responses to it.

Although I argue that the role of higher education in our society has shifted and expanded toward the provision of social services for students at some colleges, higher education has also expanded rapidly in terms of the number and types of institutions in which students can enroll. This is part of the story needed to understand economic insecurity at a wide variety of institutions. However, it is also important to understand the expansion of higher education from an individual risk perspective as well.

2.2 Individual Risks and Higher Education

Part of the expansion of the higher education sector has also been increased demand for it by students and increasing enrollments. From 2004 to 2014, autumn enrollment in degree-granting institutions rose 17 percent (Snyder and de Brey 2016). This growth in enrollment is particularly noteworthy as enrollments have increased from historically underrepresented groups over the past 30 years, and especially over the past 15 years. Individuals who in the past may not have undertaken postsecondary education are now doing so. For example, students of color are increasingly likely to pursue postsecondary education, as are women, and older students (DiPrete and Buchmann 2013; Snyder and de Brey 2016). It is vital to ensure that underrepresented groups have access to higher education because higher education can mitigate economic insecurity. It is also essential that students have the resources they need to retain and persist to a degree, lest economic insecurity derail degree attainment. Yet, as individuals embark on security projects by seeking higher education credentials, they may take on significant individual risk to do so, particularly in terms of paying for college.

By individualizing the risk of higher education and asking students and families to pay for ever increasing tuition with loans, U.S. society has increasingly individualized the public good of higher education. Again, the risk shift is happening not only within the employment sector, but also within higher education. Student debt is associated with college graduation rates, decisions around marriage and childbearing, wealth attainment prospects, and continued and future access to credit (Andrews 2017; Nau, Dwyer, and Hodson 2015; Houle and Berger 2015; Dwyer, McCloud, and Hodson 2012). Tuition for colleges across the country has continued to increase significantly over the past decades. According to the National Center for Education Statistics (NCES), between 2004-2005 and 2014-2015, the average combined price of undergraduate tuition, fees, room and board for full time students rose 33% at public institutions and 26% at private colleges (adjusted for inflation) (Snyder and de Brey 2016). Rising tuition may impact students' likelihood of experiencing economic insecurity while in college in that it may create an impetus for students to make tradeoffs between the costs of college and other life necessities, such as food.

As families experience increased insecurity in their employment, healthcare, and retirement benefits, they are also experiencing increased risk in financing a college degree. Most college students interact with the financial aid system. The NCES found that 86% of first-time full-time undergraduate students were awarded financial aid of some kind, be that institutional aid or federal aid, in the 2014-2015 academic year (McFarland et al. 2017). Navigating the federal and private financial aid systems requires

significant effort and work, though recent efforts to minimize the burden of the Free Application for Federal Student Aid (FAFSA) are continuing to increase participation. The financial aid system, which is meant to help students meet the costs of the education, is often insufficient when it comes to actually meeting those costs (Goldrick-Rab 2016; Kelly and Goldrick-Rab 2014).

Additionally, financial aid officials set the off-campus cost of living, which is used to calculate the amount of student loans that students may take. Research has shown that these living cost estimates vary widely, even for institutions in the same cities (Kelchen, Goldrick-Rab, and Hosch 2017). Many students will not be able to meet their full need through the federal student loan system (Goldrick-Rab 2016). Recent work has shown that the complexities of the financial aid system may not assist many students in funding and completing their degrees because it is not possible to cover the full costs of education with government-backed loans (Goldrick-Rab 2016). This variation in cost calculations has implications for students' ability to use loan-based financial aid to fully cover the costs of college attendance, and thus their ability to mitigate potential economic insecurity through loans. Without additional family or other resources to fall back on, students find themselves in economically insecure situations.

For many students, then, attending college is a risky endeavor. While a Bachelor's degree may serve as a springboard toward upward mobility, its positive impacts may only begin to be recognized when a student completes their degree. With a national graduation rate of 59% for first-time full-time undergraduates who started college in 2009

(McFarland et al. 2017), the pathway to degree completion is often long and non-linear. Many students transfer, stop out, or drop out in the course of completing a degree. Many students never complete a degree, even after many years of enrollment.

2.3 Institutional Contexts Impact Individual Risks

Institutions though, may impact individual outcomes. For example, graduation rates vary by institution sector and institutional selectivity, with 59% of students at public institutions, 66% of students at private non-profit institutions, and 23% of students at private for-profit institutions graduating within six years generally (McFarland et al. 2017). When selectivity comes into play, 88% of first-time full-time undergraduates completed their degrees in 6 years if the institution had an acceptance rate of less than 25% (McFarland et al. 2017). Higher education institutions' characteristics matter for students' outcomes, from job placements in the long term (Rivera 2011; Stevens et al. 2008), to students' individualized risk in the shorter term.

Higher education institutions that want to serve diverse populations of students in terms of socioeconomic status, race, and gender must prioritize significant resources toward making that happen. In terms of diverse backgrounds, it is critical for colleges and universities to recognize the 'new majority' ---- students age 24 and older, racial and ethnic minority students, and students from low socioeconomic status backgrounds (Greenstein 2017). As Brand and Xie (2013) state, those individuals who are least likely to attend college are those individuals who are most likely to benefit from big economic returns to a college degree. In other words, if completed, college for low socioeconomic

status individuals has big implications for their upward social mobility. Disparate access to educational opportunities may be associated with opportunities for upward social mobility (Alon and Tienda 2007). These students bring varying strengths and opportunities for growth with them to the college setting, strengths and weaknesses that colleges must do more to understand. This new majority of students may face challenges, such as food insecurity, that have not previously been considered when working to understand students' experiences in college settings.

The continued expansion of higher education to serve students who are more at-risk for dropping out and less-resourced has also led to the expansion of programs to serve low-resourced students and to encourage their persistence through college. Food pantries and one-stop shop social service agency connections are two examples of programs that serve low-resourced students. In this dissertation, I expand Stevens et al.'s (2008) roles to include higher education as security buffer. In doing so, I connect the institutional to the individual. As a security buffer, higher education institutions may insulate their students from insecurity. They do this in the long term, as the income returns to a college degree continue to far outweigh the income prospects of individuals without a college degree (McCall and Percheski 2010), and through the accrued value of their institutional selectivity (Rivera 2011). I am specifically interested though, in higher education institutions that serve as security buffers in the short term, through the provision of social services to their students. In providing social services, higher education institutions are stepping into the role of government, the role of social service

providers, and the historical role of parents as they realize the basic needs of their students are not being met by the traditional social safety net and family resources.

3. Food Insecurity in a Higher Education Context

3.1 Colleges as Facilitators of Student Economic Security Projects

Higher education can be a security buffer that connects the social service realm to the educational realm to help low-resourced students to persist in their academic work, now more than ever. Specifically, I develop the concept of colleges and universities acting *in loco imperii*, in place of government, as they bridge the gaps between the social safety net and students' needs. With certain kinds of institutions offering differing resources to their students, be that connections to elite employers or access to a high quality food pantry or social worker, postsecondary institutions are now taking a more active role in students' short term security projects. This could influence students' access to social institutions and their path to upward mobility. Different institutions, though, take on differing roles as security buffers and not all institutions act as security buffers. Colleges becoming social service providers is in line with their historical role of *in loco parentis*. However, their new role in social services is also *in loco imperii* (in place of government), an expansion of their societal role.

Historically, colleges took on the role of *in loco parentis*, or in place of parents, meaning that they did not have to recognize students' rights to due process in disciplining or controlling students' lives (Lee 2011). Beginning in the 1960s, the U.S. courts began

to rule in students' favor regarding their rights to due process and civil rights actions (Lee 2011). Since the 1960s, colleges and universities have moved away from *in loco parentis* (Lee 2011), though they still maintain a *facilitator* role in students' lives. For example, colleges may help students to understand responsible practices for alcohol use, sexual health education, or career development. More recently in this facilitator role, colleges and universities have been establishing on-campus food pantries, student legal services, emergency financial aid programs, and homelessness services. While *in loco parentis* has evolved in a legal sense, in the practical sense of the rules and resources of colleges that impact students' lives in significant ways, *in loco parentis* remains relevant. Additionally, as many more students attend college without family resources to serve as a safety net for them, *in loco parentis* and the facilitator role of colleges in connecting students to resources as they construct their personal security projects remains highly relevant.

In their facilitator role for students, colleges and universities are reacting and responding to students' experiences of economic insecurity by providing traditional social services, such as food pantries, to students. In doing so, colleges and universities are recognizing not only students' shifting needs, but also gaps in the social services available to students through other channels. For example, in many states, students are not eligible for the Supplemental Nutrition Assistance Program (SNAP) unless they meet stringent eligibility criteria (Goldrick-Rab, Broton, and Brunjes Colo 2016; Lower-Basch and Lee 2014). Colleges and universities are implicitly, or explicitly in some cases, recognizing the diminishing social safety net provided by government or family and are

stepping in to bridge the economic security gap for their students. In doing so, they embrace their facilitator role as part of *in loco parentis* and expand it further in that they are acting not only in place of parents, but also in place of government, or *in loco imperii*.

Not all higher education institutions adopt an expanded facilitator role to include *in loco imperii*, and many may not even adopt the basic facilitator role of the modern *in loco parentis*. In particular, for-profit higher education institutions did not historically take on the *in loco parentis* role and they also have not transitioned into a facilitator role for their students. For-profit colleges may undermine individuals' security projects even as they purportedly work to help students attain upward mobility (Cottom 2017). For-profit colleges may hinder security projects in that they often charge higher tuition and fees and their students have more loans than their public and non-profit counterparts (Snyder and de Brey 2016). While for-profit colleges serve many underserved students in the higher education landscape, they often do not serve these students well in helping them to persist in school and complete their degrees (Cottom 2017).

Additionally, for-profit institutions may not provide any security buffer or social services to their students. And yet, research has shown that students at for-profit colleges are likely to view their education as an investment, and to view their high debt loads as part of that investment (Cottom 2017). Moreover, a for-profit institution may be the only option for prospective students in some areas, especially non-urban areas (Cottom 2017).

For-profit colleges matter for work on the relationship between food insecurity, economic insecurity, and degree attainment in that for-profit colleges are less likely to

offer the same style of institutional support that many non-profit and public colleges offer. For-profit colleges also offer fewer services and options for their students in terms of resources available on campus. This matters for students experiencing economic insecurity because their institution type may influence their ability to persist, based solely on the institutional resources available to assist them through a period of struggle, be that short term or long term. While a non-profit or public institution may have a food pantry, social service agency connections, or child care services, a for-profit institution is less likely to offer these services. Thus, students at for-profit colleges may not be able to benefit from these kinds of programs that may help them to remain enrolled.

3.2 College Students' Experiences of Food Insecurity

Food insecurity is a harbinger of broader and wider insecurities that students may face while in college. National awareness of students experiencing hunger is growing. Media accounts highlight the growing challenge college students face to cover the full costs of their education, including food. The New York Times, Washington Post, The Atlantic and the Chronicle of Higher Education have all published stories about the growing problem of food security at colleges recently (Bahrampour 2014; Cady 2016; McKenna 2016; Sharpe 2016). Despite increased media attention, food remains an overlooked component of students' college expenses and it is an important indicator of their economic insecurity.

Food insecurity in college is one aspect of a broader trend toward economic insecurity broadly for many students. Going to college with few and insufficient resources means that many students continue trends from their childhood of being unable to meet their basic needs and experience either chronic or situational poverty (Goldrick-Rab 2016). College students bring economic insecurity with them to postsecondary institutions across the country. This insecurity influences their ability to be successful in college. The measures of food insecurity discussed here do not capture only the 'student surviving on ramen and beer,' but rather demonstrate a deeper level of insecurity that connects food access with the financial means to purchase it.

The research about college students' experiences of food insecurity varies in terms of its focus, numbers of participants and school types, but studies on food insecurity coalesce around an understanding of food insecurity as a significant problem for many college students across a wide range of institutional and demographic characteristics. The literature around food insecurity among college students began in the mid-2000s, with public health and education researchers at diverse colleges across the country and the world beginning to notice and then study food insecurity among their students. Research to date primarily focuses on individual and institutional estimates of food insecurity among students. I discuss in detail the breadth and depth of research around food insecurity among college students to date. First, I outline how the United States Department of Agriculture (USDA) recommends measuring food insecurity. Next, I discuss some of the varying methodologies used in researching food insecurity to date.

Then, I review the existing food insecurity literature organized around topic areas, from food insecurity rates overall to how food insecurity differs by institution type, demographic characteristics, and associations with health and academics.

Measuring Food Insecurity

Before discussing these studies and topic areas in detail, it is important to understand how food insecurity is measured generally. Most studies use a version of the USDA food security module, which exists as an 18-item, 10-item, six-item, or even two-item version. Blumberg, Bialostosky, Hamilton, and Briefel (1999) developed the six-item short form out of the original 18-item U.S. Household Food Security Survey Module, which includes the 10-item U.S. Adult Food Security Survey Module and an additional eight questions about food security among children in the household. The questions on the six-item short form come from a subset of questions on the 18-item U.S. Household Food Security Survey Module that had strong concordance when tested. These researchers found that the six-item short form correctly identified the food security level of 99% of households with no children (Blumberg et al. 1999). Additionally, food insecurity was underestimated by only 0.3 percentage points (Blumberg et al. 1999). The six-item form and 10-item form for adults only is used most often in the studies described below. One study uses a two-item validated version of the USDA modules (Hager et al. 2010; Bruening, Brennhofer, van Woerden, Todd, and Laska 2016). Individuals are given a score of 1 each time their answers fall into an affirmative category (highlighted in bold in Table 3.2 for the six-item form). This creates a food security index that ranges from 0

to 6, 0 to 10, or 0 to 18, respectively. Higher scores on the USDA index indicate greater food insecurity.

The USDA provides directions for combining the module questions into a three category food security index, with categories food secure, low food security, and very low food security. These classifications are used throughout the research literature and are very consistent in their application. While food security and insecurity exist as a continuum for individuals and households, it is useful to classify them into discrete categories for the purpose of analysis. These categories also allow for some general comparisons between surveys that use the USDA modules of varying lengths because all of the USDA food security surveys are broken down into these same categories. Additionally, the USDA also provides instructions for breaking the three categories of food security into two categories of food security – food secure and food insecure. This allows for further comparisons across studies.

Existing Study Methodologies

The research about college students' experiences of food insecurity began with studies of single institutions (Chaparro, Zaghloul, Holck, and Dobbs 2009; Crutchfield, 2016; Freudenberg, Manzo, Jones, Tsui, and Gagnon 2011; Gaines, Robb, Knol, and Sickler 2014; Hanna 2014; Maroto, Snelling, and Linck 2015; Patton-López, López-Cevallos, Cancel-Tirado, and Vazquez 2014), expanding only in the past three years to multi-institutional studies of food insecurity among college students (Dubick, Mathews, and Cady 2016; Goldrick-Rab, Broton, and Eisenberg 2015; Goldrick-Rab, Richardson,

and Hernandez 2017; Goldrick-Rab, Richardson, Schneider, Hernandez, and Cady 2018). These studies use a variety of methods to collect their data, ranging from classroom-based paper forms to email invitations to online surveys sent out to full populations of students. Response rates also vary in these studies from 0.5% to almost 100% (Dubick et al. 2016; Chaparro et al. 2009), depending often on if the survey is administered via an online email invitation, through in-person invitations to the full population in a student union, or in a classroom setting (see Chaparro et al. 2009, Dubick et al. 2016, and Goldrick-Rab et al. 2018 for examples of different administration choices).

From single institution studies that used a variety of measurement instruments, the literature is moving toward multi-institutional and nationally representative studies that use one of the validated USDA food security modules, either the six-item short form or the 10-item adult form in most cases. Additionally, studies are beginning to parse differences in time frames, using either a 30 day, three month, or 12 month time frame for measuring food insecurity. The USDA default time frame is 12 months. Studies are also exploring different time frames for administration during the academic quarter or semester in capturing and validating student food insecurity at different points in the academic term.

Single institution studies have understandable methodological limitations based on their small sample sizes, data collection from a particular sub-group of students, and sometimes a slightly different operationalization of food insecurity. The single institution studies are important for laying the foundation for research in the area of college

students' food insecurity experiences. No nationally representative study of food insecurity among college students currently exists. Particularly as this research area began to develop, single institution studies were useful for developing estimates of food insecurity among students at colleges across the country. Often, they were used for internal assessment purposes and for understanding the issue among students at only that college. They also built up an understanding in the literature that food insecurity was indeed an issue for many college students.

While studies in international contexts such as postsecondary institutions in Australia, South Africa, and Canada can also help to shed light on food insecurity among college students globally, I do not delve into these studies here because these international contexts vary from that of the United States (Hughes, Serebryanikova, Donaldson, and Leveritt 2011; Micevski, Thornton, and Brockington 2014; Munro et al. 2013; Hanbazaza 2016). Specifically, these international studies do not often use the USDA food security modules, so it is sometimes challenging to compare them to the U.S.-based studies. However, these international studies can be helpful in understanding the broader contexts of food insecurity among college students and varying ways to understand and measure that insecurity. For a review that includes international and domestic studies of food insecurity up to 2016, see Bruening, Argo, Payne-Sturges, and Laska (2017). The information below builds on their work by adding more recent studies and focusing more specifically on how each study has built the literature around food insecurity among college students.

Bruening et al.'s (2017) review is also useful in that it distinguishes between peer-reviewed studies and those that are not, but rather are disseminated through research centers and institutional initiatives. I do not distinguish between peer-reviewed and non-peer reviewed studies because the quality across all studies is similar. Overall, the quality of studies of food insecurity among college students is improving as the literature heads toward multi-institutional and nationally representative studies. The majority of multi-institutional studies have yet to be published in peer-reviewed journals, but are nonetheless positively impacting researchers' and institutions' understanding of food insecurity as an issue for many college students. In sum, the literature on food insecurity among college students is growing and improving in quality.

One of the key champions of food insecurity research among college students is Dr. Sara Goldrick-Rab. Goldrick-Rab (2016) became aware of food insecurity among students while conducting research about Pell Grant eligible students' pathways into and through college in the Wisconsin public colleges system, particularly how students paid for college. In interviews with these students over the course of their time in college, she was startled to find that significant percentages of these students were facing serious basic needs insecurity in terms of food and housing. Broton and Goldrick-Rab (2018) highlighted findings from four studies conducted by the Wisconsin HOPE Lab around basic needs insecurity, encompassing food and housing insecurity primarily among students at community colleges across the country. Many of the initial multi-institutional, multi-state studies were coordinated through the Wisconsin HOPE Lab, a higher

education research center based at the University of Wisconsin-Madison founded by Dr. Goldrick-Rab. That work, coupled with the work of many other education and public health researchers, has increased the visibility of food insecurity as an issue on campuses across the United States.

Overall estimates of food insecurity

While 14% of households nationally were estimated to be experiencing food insecurity in the previous 12 months in 2014 (Coleman-Jensen et al. 2014), estimates of food insecurity among college students are significantly higher in many cases. This comparison begins to give researchers and practitioners an idea of the stark economic insecurity many college students are facing. Food insecurity rates among college students vary, though, by a host of student demographic characteristics as well as the type of institution a student attends. In existing studies, overall estimates of food insecurity range from 14% to 59% (Gaines et al. 2014; Patton-López et al. 2014). Across all of the studies described here, the average estimated rate of food insecurity is approximately 35%. In a study of 34 two- and four-year institutions with 3,765 student respondents, researchers found that 48% of students were food insecure, with 22% being categorized as having very low food security (Dubick et al. 2016). In another study Martinez, Maynard, and Ritchie (2016) found that in the University of California public college system, 42% of students were food insecure, with 23% having low food security and 19% of students experiencing very low food security. The most recent comprehensive food insecurity study of students at 31 two-year and 35 four-year colleges found that 36% of college

students were food insecure (Goldrick-Rab et al. 2018). While these results show significant variation in estimates around overall food insecurity in the college student population, they coalesce around an understanding that this issue is affecting many students at colleges across the country.

Food insecurity and institution type

Food insecurity has been studied at both two- and four-year colleges. Research moving forward needs to continue to study public institutions systematically, but also should incorporate measures of institutional selectivity into studies, as well as private non-profit and for-profit institutions. While one study does include private non-profit institutions, it includes only six of these institutions (Goldrick-Rab et al. 2018). No research to date has studied food insecurity among students at for-profit institutions.

Two-year institutions

Overall, existing research suggests that students at two-year institutions are much more likely to experience food insecurity than students at four-year institutions. In the research on two-year institutions, estimates of food insecurity range from 39% to 56%. Maroto et al. (2015) focused on students at two community colleges in Maryland, finding that 56% of students were food insecure. Early multi-institutional research among 4,000 students at 10 community colleges found that 19% of community college students had low food security and 20% had very low food security, for 39% food insecurity overall in the sample (Goldrick-Rab et al. 2015). More recent research with a sample of 33,000 students at 70 community colleges in 24 states found that about 56% of community

college students were food insecure (Goldrick-Rab et al. 2017). This study found significantly higher rates of food insecurity than previous results had suggested, with 23% of these students reporting low food security and 33% reporting very low food security. The most recent research on students at community colleges found that community college students had a 42% food insecurity rate, with 15% having low food security and 27% having very low food security (Goldrick-Rab et al. 2018). While lower than previous estimates, this study also had a smaller sample of two-year college students than previous studies (Goldrick-Rab et al. 2018).

Four-year institutions

Most of the work around four-year institutions to date has been based on single institutions, though a number of recent multi-institutional studies have expanded the literature. Overall, among four-year institutions, estimates of food insecurity range from 14% to 59%. The earliest study of a four-year institution was Chaparro et al.'s (2009) study of the University of Hawai'i at Manoa, which found that 21% of students were food insecure, with 15% experiencing low food security and 6% experiencing very low food security. Gaines et al. (2014) studied a large, public southeastern university and found that 14.1% of students were experiencing food insecurity, with 8.9% experiencing low food security and 5.2% experiencing very low food security. King (2017) found that 35.7% of respondents were food insecure, with 18.1% experiencing low food security and 17.6% experiencing very low food security at a large, public Midwestern university.

A small single institution study focused on a large public mid-Atlantic institution used the 18-item USDA food security module and found that 15% of students in their sample of 237 undergraduates were food insecure (Payne-Sturges, Tjaden, Caldeira, Vincent, and Arria 2018). Forman, Mangini, Dong, Hernandez, and Fingerman (2018) used the six-item USDA food security module among students at University of Texas at Austin Colleges of Liberal Arts and Natural Sciences, finding that 23.5% of students surveyed reported food insecurity. And with the largest estimate of food insecurity on campus, Patton-Lopez et al. (2014) found that 59% of students at a rural mid-size university in Oregon were experiencing food insecurity.

Moving toward more comprehensive multi-institutional studies, Morris, Smith, Davis, and Null (2016) focused on four public universities in Illinois, finding that 35% of respondents were food insecure using the 10-item USDA adult food security survey module. About 16.6% of students experienced low food security and 18.4% were experiencing very low food security (Morris et al. 2016). Another multi-institutional study found that 20% of students at 26 four-year institutions were experiencing very low food security (Dubick et al. 2016).

Crutchfield and Maguire (2018) researched food insecurity at 23 California State University (CSU) colleges using the 10-item USDA household food security module with a previous 30 day time frame. Additionally, the researchers conducted focus groups and interviews with 213 students at 11 CSU campuses who identified as food insecure. This study is the most comprehensive study available of a full four-year college system. Its

mixed-method approach is particularly useful to expanding the nuanced discussion of food insecurity. They found that 41.6% of CSU students were experiencing food insecurity, with 20% experiencing low food security and 21.6% experiencing very low food security.

The most recent multi-institutional study of food security among 35 four-year institution students found that, on average, 14% of four-year university students had low food security and 22% had very low food security (Goldrick-Rab et al. 2018). While food insecurity at four-year institutions seems to be lower than at two-year institutions, additional research is needed to confirm this.

Food insecurity and socio-demographic characteristics

Studies of food insecurity have incorporated a variety of socio-demographic characteristics, from race and ethnicity to gender, class rank, and financial aid status. In 2006, Chaparro et al. (2009) found that native Hawaiians, Pacific Islanders, and Filipinos were more likely to be food insecure than their peers, becoming the first study to suggest that food insecurity rates may be related to socio-demographic characteristics. Multiple studies have found that African American students are more likely to experience food insecurity (Crutchfield and Maguire 2018; Dubick et al. 2016; Freudenberg et al. 2011; Goldrick-Rab et al. 2018; Martinez et al. 2016; Morris et al. 2016; Payne-Sturges et al. 2018; Phillips, McDaniel, and Croft 2018). Forman et al. (2018) found that Hispanic students are more likely to experience food insecurity in their study of undergraduates at University of Texas at Austin. Studies have also shown that first generation students are

more likely to experience food insecurity (Crutchfield and Maguire 2018; Dubick et al. 2016; Forman et al. 2018; Goldrick-Rab et al. 2018; Phillips et al. 2018). Goldrick-Rab et al. (2018), similar to this dissertation, were able to investigate the food insecurity of non-binary gender identity students and found that these students are much more likely to experience food insecurity than their binary gender counterparts.

From a financial perspective, studies have found correlations between food insecurity and Pell Grant eligibility (Broton, Frank, and Goldrick-Rab 2014; Bruening et al. 2018; Crutchfield and Maguire 2018; Dubick et al. 2016; Goldrick-Rab et al. 2018; Martinez et al. 2016; Phillips et al. 2018). Gaines et al. (2014) specifically looked at financial skills and resources and how they correlated with food insecurity, finding that food insecurity was positively associated with receiving financial aid, not actively budgeting, and being financially independent.

Silva, Kleinert, Sheppard, Cantrell, and Freeman-Coppadge (2015) used a unique, non-USDA instrument and focused on graduate and undergraduate students. Including graduate students in these studies is unusual and an important contribution to the literature. The study found that 26.9%-27.4% of students were food insecure, with 6.4% of students experiencing severe food insecurity, defined as often or sometimes not eating for 1-2 days because they did not have enough money for food (Silva et al. 2015). Crutchfield and Maguire's (2018) study also included graduate students and found that they had lower rates of food insecurity than sophomore, junior, and senior students, though 33.8% of graduate students were experiencing food insecurity. Martinez et al.'s

(2016) study of University of California system students also found that graduate students were less likely to experience food insecurity than undergraduates, with 25% of graduate students reporting food insecurity compared to 48% of undergraduates.

In a study that focused on students living in a residence hall, the researchers found that 32% of students reported food insecurity in the past month and 37% in the past three months (Bruening et al. 2016). Thus, the findings of this study are of particular interest since students are living on campus, a situation in which they would most likely have meal plans. My research questions in this dissertation continue to move this area of research forward as well.

Goldrick-Rab et al. (2015) investigated potential variation in food insecurity geographically, finding that students residing in counties with an expensive cost of living were more likely to experience food insecurity. Some geographic differences in terms of urban versus rural campuses also existed for these community college students, with students in rural areas reporting slightly lower food insecurity than students in urban areas. Parts of this dissertation also investigate geographic variation in food insecurity among students.

Food insecurity and government assistance

Occasionally, studies on food insecurity ask respondents about their use of government or social service assistance programs. Overall, use of food assistance programs is associated with greater risk of food insecurity. This can provide additional context about how students are confronting their economic insecurity and constructing

their security projects. An early study of City University New York (CUNY) students found that 7.2% of students reported using a food pantry and 6.4% reported using SNAP benefits (Freudenberg et al. 2011). Of particular importance with this study is that of those students who used SNAP benefits, 63% were food insecure, suggesting that SNAP benefits do not fully mitigate food insecurity (Freudenberg et al. 2011). Another study that asked about participation in food assistance programs (such as SNAP, food pantries, etc.) found that 27% of respondents were using food assistance of some kind (Patton-López et al. 2014). Yet another found that 61% of students reported using an existing social service aid source in the past 12 months, with 25% reporting using SNAP (Dubick et al. 2016). A study of the CSU system found that 4.9% of students were using CalFresh (SNAP) benefits, but also that many students did not realize they potentially qualified for this benefit (Crutchfield and Maguire 2018).

Food insecurity prior to college

On the whole, research that asks students about their pre-college experiences of food insecurity seems to suggest that students experiencing food insecurity have *not* had these experiences before college. Martinez et al. (2016) found that 57% of students experiencing food insecurity had not experienced it prior to college. Forman et al. (2018) further honed the food insecurity literature by adding two questions about food insecurity prior to matriculation at the university, further seeking to determine if food insecurity is starting prior to college or if it is occurring after enrollment. Their results indicated that

food insecurity is happening after enrollment, suggesting that college transitions may create vulnerabilities to food insecurity (Forman et al. 2018).

Food insecurity and mental/physical health

Especially among public health researchers, food insecurity studies have included indicators of mental and physical health. Lin et al. (2013) studied food insecurity among women at a historically black college, finding that food insecurity was significantly associated with lower self-esteem among study participants. This study's focus on African-American females also provides additional nuance to researchers' understanding of food insecurity around a very specific college student population. Food insecurity was also associated with higher rates of depression and anxiety among students, as well as students being less likely to report that they ate breakfast regularly (Bruening et al. 2016; Bruening et al. 2018). Bruening et al. (2018) also found that students were most likely to report experiencing food insecurity at the end of the semester. Other studies have also found that food insecure students were more likely to report depression (Crutchfield and Maguire 2018; Payne-Sturges et al. 2018).

Studies have also found that food insecurity was associated with lower self-reported health (Crutchfield and Maguire 2018; Freudenberg et al. 2011; King 2017; Patton-Lopez et al. 2014). Martinez et al. (2016) found that food insecure students were more likely to prioritize the cost of food over its healthfulness, another indicator of physical health and food security status.

Food insecurity and academic outcomes

Studies have also explored how food insecurity may be correlated with students' academic outcomes. Patton-López et al. (2014) found that students with a grade point average greater than or equal to 3.1 were 60% less likely to have experienced food insecurity in the previous 12 months. A few studies have used a categorical GPA variable and found that food insecurity was associated with lower GPAs (Maroto et al. 2015; Martinez et al. 2016; Morris et al. 2015). Phillips et al. (2018) used institution-reported GPA and found that food insecurity was associated with a lower GPA, controlling for demographic factors.

King (2017) found that as students reported greater levels of academic stress, specifically from getting lower grades than expected, they were more likely to also be experiencing food insecurity. Dubick et al. (2016) also found correlations between negative academic outcomes and food insecurity. Specifically, Dubick et al. (2016) found that among students who reported housing or hunger problems, 32% reported these problems having a negative impact on their education, with 55% not purchasing textbooks, 53% missing classes, and 25% dropping a class due to these basic needs issues.

Institutional responses to food insecurity research

Colleges are responding to the research on food insecurity. In addition to funding the research in the University of California System, system President Janet Napolitano allocated $75,000 per college in 2015 for colleges to support student access to food, either through new initiatives or bolstering existing initiatives. College responses ranged

from hiring full-time staff for on-campus food pantries to making sure students could access CalFresh, the California food stamp system. Some initial research suggests that these resources were being under-utilized by UC students at the time of data collection (Martinez et al. 2016)

Also during 2015, the CSU system was simultaneously working to understand food insecurity among its students. Using a mixed-methods approach by conducting surveys, focus groups, and interviews with staff and students, they explored the resources available to food insecure students within the CSU system (Crutchfield 2016), as well as the prevalence of food and housing insecurity. They found that while many CSU colleges had programs and initiatives in place to assist food insecure students, there were often challenges with access and understanding the issue for students, both among students and staff (Crutchfield 2016).

New voluntary associations, such as the College and University Food Bank Alliance (CUFBA), bring together college food pantries and their administrators from across the United States. CUFBA has seen a massive increase in its numbers of participating institutions, with more than 500 institutions now reporting they have an on-campus food pantry or are in the process of starting one. This organization and the California higher education system are continuing to drive best practices in serving food insecure students. Research around these organizations, however, is limited. Research will need to continue to bring together the institution, the individual, and the intervention (i.e. on-campus food pantries) to understand how these efforts are impacting students.

3.3 The Institution, the Individual, and Food Insecurity

The type of institution a student attends influences the risk of undertaking a college degree (Goldrick-Rab 2016; Cottom 2017; Mettler 2014), as well as their options and opportunities for dealing with potential economic insecurity. Non-profit institutions are more likely to allocate resources to student services that may help mitigate students' experiences of insecurity. Colleges and universities are aware of the risks many of their students take on in pursuing higher education. They also take many intentional steps to support students to persist to degree completion, be this retention programs for first year students, second year engagement programs, or programs to support underrepresented groups on campus, such as racial and ethnic minority students or first generation students. This is particularly the case for non-profit private and public institutions. While these programs may help some students in crucial ways, they do not overcome the structural insecurity that these students face.

As non-profit private and public colleges and universities take intentional steps and implement programs to help students persist to degree completion, they may begin to add services that remind observers of the roles traditionally held by social service providers. These are often services that previously may have been seen as falling beyond a college's purview, but that are now being taken up in an effort to more fully engage students and to serve as a resource for the 'new majority' of students, who often require different resources than students 30 years ago. Colleges are shifting in their facilitator

role for students to help these students in developing their economic security projects using resources available through the college.

Colleges and universities are responding to students' inability to meet their basic needs, particularly in terms of food insecurity and hunger. Many colleges are offering new services to their insecure students, such as food pantries and homelessness services. These initiatives seek to support students in precarious situations and to support and encourage students to persist in college, despite sometimes severe socioeconomic barriers such as lack of food. Research that explores questions like those in this dissertation can help to continue to push research in the direction of understanding how institutions may influence student experiences of food insecurity.

4. Analytic Approach

I approach each of my research questions with unique data sources so as to be able to contribute additional theoretical and empirical evidence to the nascent literature on student food insecurity. Much room for growth exists within the food insecurity research literature. First, researchers need to understand and investigate institutional responses to food insecurity across the higher education sector. We also need to determine estimates of student food insecurity in different institutional contexts, such as for-profit institutions versus non-profit private and public institutions, two-year colleges versus four-year colleges, and selective versus nonselective institutions. Finally, scholars need to understand how food insecurity is correlated with students' academic outcomes.

Using the specific data sources in this dissertation, I am able to push forward the research and understanding of each of these gaps in the literature. From these data, I connect institutional characteristics and the provision of social services to student food insecurity. I am able to bring for-profit colleges into the conversation about student food insecurity. This is particularly important for understanding the changing institutional role some colleges take in providing social services to their students and serving as security project facilitators for their students. I am also able to correlate students' academic outcomes with their food security status, a status not usually included in models of student success. My data are distinctly situated to answer these questions. To my knowledge, no one has specifically investigated broad institutional responses to food insecurity or been able to connect the existence of on-campus social services with estimates of food insecurity. While a few studies do connect some academic outcomes to food security status (Phillips et al. 2018; Dubick et al. 2016), this dissertation is the only the second study to do so with students' institutionally-reported GPA and the first multi-institutional study to use institutionally-reported GPA. Additionally, my chapter on individual-level food insecurity rates is one of the largest multi-institutional studies of food insecurity across two- and four-year public institutions. Its size and standardized questions makes a relevant and useful contribution to the overall literature on food insecurity. My analytic approach uses multiple sources of data to understand food insecurity from both an institutional and individual viewpoint. These data sources coalesce and complement one another, creating an opportunity to explore food insecurity

from both an institutional and individual lens. With these triangulated data sources, I broaden and enhance the literature on student food insecurity, helping researchers to understand more thoroughly one manifestation of economic insecurity on college campuses.

5. Data

The data sources I use include the Integrated Postsecondary Education Data System (IPEDS), College Scorecard data, archival data collected from postsecondary institution websites, the list of on-campus food pantries from the College and University Food Bank Alliance (CUFBA), the Study on Collegiate Financial Wellness (SCFW), and Barron's 2018 college selectivity rankings. As part of the SCFW, I also use the United States Department of Agriculture's (USDA) six-item short form food security module. Each data source adds to my ability to make a previously unexamined contribution to the literature on economic insecurity among college students and to the literature on college student food insecurity more specifically. My data allows me to have an integrated viewpoint institutionally and individually around college student food insecurity across the higher education sector.

The Integrated Postsecondary Education Data System (IPEDS) includes information on all postsecondary institutions that are eligible for their students to receive federal financial aid. This means it is a useful data source for a study such as this one that seeks to understand the breadth and depth of institutional responses to food insecurity.

IPEDS is updated yearly through self-reports by each institution to maintain federal financial aid eligibility. This dissertation uses IPEDS 2015, the most recent year for which full, finalized information was available at the time of analysis. IPEDS includes useful variables on institutional characteristics, such as racial and ethnic composition of the student body and percentage of students receiving varying types of loan, grant, and institutional financial aid. I use IPEDS to create a random sample of 550 two- and four-year, associate's and bachelor's degree-granting institutions in the United States. Second, I use IPEDS and College Scorecard to connect information on institutional characteristics to the individual-level data in the Study on Collegiate Financial Wellness (SCFW). In this way, I triangulate data sources to have a more thorough understanding of food insecurity among college students and institutional responses to it.

Another data source I use is publicly available information about on-campus food pantries from college and university websites. I attach this information to the random sample from IPEDS to understand the breadth of on-campus food pantries at institutions around the United States. I use only publicly available information found on websites so that I am capturing what a student experiencing food insecurity might do in looking for resources to help them. The search terms I use on each college website are food pantry and food bank. I also use the list of member food pantries from the College and University Food Bank Alliance (CUFBA) as an additional check on the data I gathered from publicly available information on college and university websites.

I use Barron's Profile of American Colleges college selectivity information to determine the selectivity of the schools in my random sample and in the SCFW. While all rankings are somewhat contested, Barron's selectivity information provides me with information about the percentage of students admitted each year to the institutions and their average SAT scores as measures of selectivity. When used in combination with IPEDS and the SCFW, it provides further richness to the data. It is also highly relevant information to include since students at selective institutions have significantly higher graduation rates (McFarland et al 2017).

Last, I use the SCFW, a multi-institutional study that examines the financial attitudes, behaviors, and knowledge of students from two- and four-year non-profit private and public colleges and universities across the United States via an online survey. The study was administered in February 2017 to 65 institutions in 25 states. The 2017 institutions included 37 four-year public institutions (56.9% of the SCFW sample), six four-year private institutions (9.2% of the SCFW sample), and 22 two-year institutions (33.8% of the SCFW sample). See Appendix A for more detailed information about the SCFW study administration.

Participating institutions could opt-in to participate in a module on student food security. This module is the basis for this dissertation. Forty-seven institutions participated in the food security module. With 47 of the 65 participating institutions electing to participate in the food security module, this 70.7% participation rate in the module suggests a growing awareness of food insecurity. The breakdown by school type

of these institutions is: 25 four-year public institutions, three four-year private institutions and 19 two-year institutions. At these 47 institutions, 206,835 students were invited to take the survey and 21,773 of these invited students completed at least one question in the larger SCFW survey. For the food security module, 17,811 students answered at least one question in the module, for a response rate of 81.8% on the food security module among students who participated in the larger SCFW. See Table 3.1 in Chapter 3 for detailed information on response rates. This large number of student responses provides robust information for analysis, particularly when used with the SCFW's variety of demographic and education measures. While the response rates may seem somewhat low, they are typical for research in this area. Other multi-institutional research coming out of the Wisconsin HOPE Lab about this topic has lower response rates than those described here. Since these results map on to research in other studies in terms of response rates and results, I feel confident in my data's capacity to understand students' experiences of food insecurity.

For this dissertation, I use the USDA six-question module, described in more detail below. See Table 3.2 for detailed information about the USDA module, including answer options. Individuals were given a score of 1 each time their answers fell into one of the following categories: (a) they answered either sometimes true or often true to Questions 1 or 2; (b) answered yes to Questions 3, 5 or 6; (c) or answered almost every month or some months but not every month to Question 4. This created a food security index that ranged from 0 to 6. Higher scores on the USDA index indicate greater food

insecurity. The USDA provides directions for combining the six questions into a three category food insecurity index, with categories food secure, low food security, and very low food security. I recoded responses into the following three categories based on the students' total score: (a) food secure – raw score 0-1; (b) low food security – raw score 2-4; (c) very low food security – raw score 5-6. These three categories are further condensed into a dichotomous variable for some analyses, with categories of food insecure (including low food security and very low food security respondents) and food secure (including food secure respondents). Dichotomizing the three categories is acceptable per USDA guidelines. See Tables 3.2 and 3.3 in Chapter 3 for more detailed information on the responses to these questions from the data for the module.

5.1 Data Limitations

Any study, including this one, will have limitations. In this study, the limitations include that it is not nationally representative, the potential for non-response bias, and the location of the food security questions at the very end of the survey. Participating institutions self-selected into the study, creating potential selection bias, as it is possible that participating institutions are more likely to have financial wellness and social service programs for their students or a stronger interest in their students' economic lives. Participating institutions also had the resources and staffing to prioritize the administration of this study.

While there may be some concerns about non-response bias among respondents, I am able to account for that somewhat in that I can show the number of students who stopped taking the survey before they got to the food security module and the number of students who skipped these questions. Very few students completely skipped these questions if they saw them. Another potential source of selection bias could be related to the larger survey in that it is possible that students were more likely to respond to the survey invitation if they were experiencing financial precarity. I do not think this is the case, however, based on the number of students who say that they have student loans in the SCFW sample (about 53%), which is lower than student loan taking rates across all institutions (about 67% in 2011-2012, the most recent data available at the time of analysis) (Snyder and de Brey 2016).

Last, it is important to note that the food security module was the final module of the survey. As a result, 3,781 students did not see these questions when they were taking the survey because they stopped taking the survey before getting to these questions. Nonetheless, 17,992 students did see the questions and only 181 respondents saw the questions and chose not to answer them.

The data limitations are outweighed by the opportunities presented by the data. By bringing together these particular data sources, I am able to adeptly explore macro-level institutional characteristics as they relate to food insecurity as well as individual-level characteristics around experiences of food insecurity. I am also able to develop and support the concept of *in loco imperii*, which pushes forward sociologists' theoretical

understanding of the role of colleges in our communities. In doing so, I make a unique contribution to the literature on college food insecurity and push the discussion beyond the examination of food insecurity at an individual level. Below, I discuss my specific plans for exploring each research question.

6. Research Questions

6.1-- Chapter 2: Colleges' Facilitation of Student Security Projects

Chapter 2 discusses which kinds of institutions are most likely to have on-campus food pantries, exploring the intersection of institutional characteristics that may influence the types of services offered to students. This work begins to explore the adoption of social services by colleges across the country, specifically on-campus food pantries. It theorizes about the facilitator role that colleges and universities may play in helping students to craft their individual security projects, often using college resources like a food pantry. In doing so, I expand upon Cooper's (2014) work around household security projects by bringing it to the college realm and expand upon Stevens et al.'s (2008) conception of higher education by considering facilitation as a key component of higher education.

In connecting institutional characteristics to the adoption of social services, I expand the literature on student food insecurity to the organizational realm. Specifically, I work to bring together the concepts of *in loco parentis* and *in loco imperii* to consider a more nuanced approach to the work of higher education institutions as facilitators for

students. Chapter 2 pushes the food insecurity literature in this new direction. By examining a random sample of two- and four-year colleges in the U.S. and whether or not they have a food pantry, it begins to investigate systematically institutional responses to food insecurity. As our understanding of individual food insecurity among college students continues to grow, it will be important to develop a broader understanding of institutional responses to this student challenge. No studies, to my knowledge, have specifically investigated the social services that for-profit institutions may or may not provide through the lens of higher education institutions as facilitators of student security projects. Additionally, no studies have systematically looked at the existence of food pantries generally at postsecondary institutions. This study begins to look more carefully at the social services, specifically food pantries, at the wide variety of institutions across the country, including for-profit institutions.

This chapter adds to the literature by considering food pantries within the full context of higher education institutions in the United States, especially by including for-profit institutions. In the existing literature on student food insecurity, for-profit colleges have been absent. This chapter brings for-profit colleges into the conversation of student food insecurity.

My research question for this chapter is: How do institutional characteristics predict institutional responses to food insecurity at a college or university (through the existence of an on-campus food pantry)?

6.2-- Chapter 3: College Students' Experiences of Food Insecurity

As previously discussed, the research around college students' experiences of food insecurity is growing as more researchers become aware of this problem. Researchers to date have focused primarily on single institution studies, though some studies are beginning to move into the multi-institutional realm. Little research simultaneously investigates students at two- and four-year institutions, so this dissertation helps to fill that gap. This research further pushes the methodological and theoretical discussions around understanding college student food insecurity at an individual level. It particularly adds to the literature in its consideration of the association of food insecurity on academic outcomes. Chapter 3 is multi-institutional, including two- and four-year public colleges. It uses the six-item USDA short form on food security. It builds and improves on previous studies by using institutionally-reported GPA when possible for student respondents. Additionally, it corroborates previous multi-institutional research, further triangulating results around food insecurity among college students.

The study is motivated by the following research questions: What are the college student characteristics/demographics that correlate with students experiencing food insecurity? And how is food insecurity associated with students' academic outcomes?

6.3-- Chapter 4: Intersection of individual and institutional contexts around food insecurity

Colleges' entry into the social service realm through on-campus food pantries requires further investigation by researchers to understand its potential impact on students. I explore the intersection of student status vulnerabilities and institutional

contexts related to food insecurity. In this way, I bring together institutional and individual contexts to offer a more nuanced understanding of food insecurity. Chapter 4 again pushes forward the food insecurity literature by examining the correlation of student food insecurity with institutional responses to it, namely, the existence of an on-campus food pantry. No studies have included institutional characteristics beyond two- and four-year status as part of understanding student food insecurity.

This research is informed by the following research questions: How do student vulnerabilities around food insecurity intersect with institutional contexts? Specifically, how is institutional provision of social services correlated with student food insecurity?

7. Conclusion

Food insecurity is a measure of economic insecurity. This dissertation helps researchers to understand more fully basic needs insecurity on college campuses and their connection to economic insecurity among students more broadly. First, this research pushes the food insecurity literature in a new direction, one focused more on institutional responses to food insecurity. Further, this dissertation begins a discussion about the institutional role that colleges and universities play as security buffers and security project facilitators for their students through their provision of social services, such as food pantries. Researchers need to continue to do more to understand the expanded role in the social service realm that colleges and universities are increasingly participating in on behalf of their students. The incorporation of *in loco imperii* into the traditional *in loco*

parentis facilitator role of colleges has implications for the opportunities and inequities that colleges and universities foster for their students. Second, this dissertation continues to build on previous studies by providing additional estimates of food insecurity rates by specific populations and institution type. Doing so corroborates the work of previous studies. Additionally, by exploring how food insecurity is associated with academic outcomes, it further answers questions about how food insecurity may be having an effect on students' academic pursuits. Third, I connect the institutional and the individual to begin to understand how the existence of an on-campus food pantry may or may not be associated with student food insecurity. Doing so again pushes the food insecurity literature forward into previously unexplored territory. Overall, this dissertation helps to provide nuance and corroboration to the existing literature on food insecurity, while also pushing the literature into the under-studied institutional realm.

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Chapter 2. Colleges' Facilitation of Student Security Projects

Introduction

Economic insecurity occurs when families and individuals experience hardship due to short term or long term financial constraints. In recent years, economic insecurity has re-asserted its presence and become more visible at colleges and universities. As the great risk shift, in terms of work precarity and minimized pension systems, has impacted more individuals and families (Hacker 2006), students have begun to bring their insecurity with them to colleges across the United States. As colleges and universities work to serve more students and provide access to under-represented groups, this insecurity has become more visible. It may also be the case that middle-class college students have also begun to experience more economic insecurity, leading to even more awareness of this issue. There is increasingly individualized risk associated with pursuing postsecondary education, especially for students without a familial safety net.

To mitigate their potential economic insecurity, families and individuals adopt security projects (Cooper 2014). These security projects vary by class background and economic resources, but one key way that parents use security projects to mitigate their economic insecurity is to encourage their children to pursue postsecondary education (Cooper 2014). As the cost of college has risen, this pathway to economic security has

become more challenging for some families to facilitate for their children. Part of what makes families develop security projects is that workers face stagnating incomes (Hacker 2006; Leicht and Fitzgerald 2007; Leicht and Fitzgerald 2014). Stagnating incomes, especially among middle income families, means that families often turn to debt to smooth their consumption patterns (Leicht and Fitzgerald 2007, Sullivan, Warren, and Westbrook 2001). Stagnating incomes and increasing debts mean that families and individuals cannot keep up with the rising cost of higher education security projects while continuing to meet their basic needs.

Typically, researchers consider the impact of education on economic insecurity by discussing how higher education leads to increased earnings over the life course in comparison to high school graduates (Hout 2012; McCall and Percheski 2010; Torche 2011) or how career services offices may mediate access to certain jobs. In this way, education is discussed as a long term, life course security project. In this chapter, I encourage a viewpoint of higher education institutions and education security projects as short term security projects, in addition to their enhancing role over the life course. Some colleges and universities offer services, such as food pantries, to their students that could potentially mitigate students' economic insecurity during their time at the college. In this way, higher education institutions may serve as privatized safety nets and short term security project facilitators for their students. This private safety net characterizes even public colleges because on-campus food pantries usually only serve current students of the institution. As a short term security buffer, colleges and universities facilitate

students' access to resources traditionally provided by social service providers. Thus, colleges are serving as a security buffer for students. They are filling the gap between the social safety net, be that government-based or family based, and students' needs. In doing so, they are short term security project facilitators, at least indirectly, for their students.

As short term security buffers, higher education institutions may take on the role of *in loco parentis* and *in loco imperii*, in place of parent and in place of government, respectively. Colleges and universities are implicitly, or explicitly in some cases, recognizing the diminishing social safety net provided by government and/or family and are stepping in to bridge the economic security gap for their students. In doing so, they embrace their facilitator role as part of *in loco parentis* and expand it further in that they are acting not only in place of parents, but also in place of government, or *in loco imperii*.

Historically, colleges took on the role of *in loco parentis*, meaning that they did not have to recognize students' rights to due process in disciplining or controlling students' lives (Lee 2011). Beginning in the 1960s, the U.S. courts began to rule in students' favor regarding their rights to due process and civil rights actions (Lee 2011). Since the 1960s, colleges and universities have moved away from *in loco parentis*, though they still maintain a facilitator role in students' lives (Lee 2011). For example, colleges may help students to understand responsible practices for alcohol use, sexual health education, or career development. More recently in this facilitator role, colleges and universities have been establishing on-campus food pantries, student legal services, emergency financial aid programs, and homelessness services. While *in loco parentis* has

evolved in a legal sense, in the practical sense of the rules and resources of colleges and universities that may impact students' lives in significant ways, *in loco parentis* remains relevant. Additionally, as many more students attend college without family resources to serve as a safety net for them, *in loco parentis* and the facilitator role of colleges remains highly relevant in connecting students to resources as they construct their personal security projects.

More recently, colleges have also taken the place of some social services, adopting a role *in loco imperii*, or in place of government. With certain kinds of institutions offering differing resources to their students, be that connections to elite employers or access to a high quality food pantry or social worker, postsecondary institutions are now taking a more active role in students' short term security projects. This influences students' access to social institutions and their path to upward mobility. As the U.S. government's social safety net has decreased over time, some colleges and universities have attempted to patch the holes in the safety net for their students. Colleges becoming social service providers is in line with their historical role of *in loco parentis*. However, their new role in social services is also *in loco imperii* (in place of government), an expansion of their societal role. Different institutions, though, take on differing roles as security buffers and not all institutions act as security buffers.

In their facilitator role for students, colleges and universities are reacting and responding to students' experiences of economic insecurity by providing traditional social services, such as food pantries, to students. In doing so, colleges and universities

are recognizing not only students' shifting needs, but also gaps in the social services available to students through other channels. For example, in many states, students are not eligible for the Supplemental Nutrition Assistance Program (SNAP) unless they meet stringent eligibility criteria (Lower-Basch and Lee 2014; Goldrick-Rab, Broton, and Brunjes Colo 2016). While some states, such as California and Massachusetts, are working at the state-level to increase student eligibility for SNAP, most states are not undertaking these kinds of programs (Blumenstyk 2018). As colleges respond to a decreased social safety net, some researchers are beginning to call for a free and reduced-price lunch program at colleges, similar to that provided in a K-12 context (Goldrick-Rab et al. 2016). Particularly among public colleges that offer on-campus food pantries, the adoption of free meal services may be of particular interest practically in terms of community among students and feeding students within existing food systems. But such an endeavor would also be theoretically interesting as an example of *in loco parentis* and *in loco imperii* coming together to extend the social safety net provided to children in the public K-12 school system to the college setting.

In addition to opening food pantries, some colleges are also providing case workers to help students meet eligibility criteria and navigate the bureaucracy to access government resources (Daugherty, Johnston, and Tsai 2016; Goldrick-Rab, Broton, and Frank 2014). In the case of Single Stop, a specific social services connection program, RAND Education researchers found that participation in the program was associated with community college students being three percentage points more likely to persist to their

second year (Daugherty et al. 2016). In this way, colleges can serve as facilitators of students' security projects. Students must still take the initiative to access the resources of an on-campus food pantry or student advocacy services office, for example, but some institutions facilitate these resources for students who seek them out.

Not all colleges, however, offer their students these kinds of resources. For-profit colleges, in particular, may not take on any kind of facilitator role for their students. For-profit colleges, having not developed out of the context of *in loco parentis*, are less likely to facilitate student access to resources outside of student loans, nor to facilitate student access to traditional social services. For-profit colleges may even undermine students' security projects even as they supposedly work to help students toward upward mobility (Cottom 2017). This matters for students experiencing economic insecurity because their institution type may influence their ability to persist, based solely on the institutional resources available to assist them through a period of struggle, be that short term or long term. While a non-profit private or public postsecondary institution may have a food pantry, social service agency connections, and/or child care services, a for-profit institution is less likely to offer these services. Thus, students at for-profit colleges may not be able to benefit from these kinds of programs that may help them to remain enrolled.

As some colleges begin to recognize more of the manifestations of economic insecurity on their campuses, they may work to minimize these insecurities for their students when possible. In this way, some colleges serve as facilitators for students' short

term security projects. One of economic insecurity's manifestations is in students experiencing food insecurity. Colleges may respond to this insecurity by opening an on-campus food pantry.

When individuals and families cannot afford to buy food on the market, food pantries may fill the gap. For low-income families, food pantries may be essential components of their security projects. Food pantries are the most recent iteration of emergency food services, building on hundreds of years of soup kitchens and bread lines (Poppendieck 1998). Since the 1980s, food pantries have become more widespread and complex, often connected through sophisticated food bank networks (Poppendieck 1998). A food bank collects, stores, and distributes large scale food donations on behalf of its affiliated food pantries (Phillips 2014). Food pantries vary in size and scope, but are usually small, local, often religiously affiliated non-profit organizations that distribute food to families and individuals experiencing food insecurity (Poppendieck 1998; Phillips 2014). While food pantries may also collect, store, and distribute food donations, these donations are usually smaller in scope than those that go to the local food bank. Food pantries usually want to be member agencies of local food banks because they are able to procure food much less expensively when they purchase it from other sources, such as grocery stores or wholesalers.

Food pantries and food banks rose to prominence in the food charity landscape in response to the dismantling of social safety net programs under the Reagan administration in the 1980s (Poppendieck 1998). The Clinton administration's welfare

reform enactment further cemented U.S. society's need for food pantries (Poppendieck 1998). At its core, emergency food initiatives are vitally important to serving people in crisis. They have, however, become an institutionalized part of social services that are regularly utilized by clients for whom government safety nets (usually in the form of SNAP benefits or SSI/Disability benefits) are insufficient (Poppendieck 1998).

That food pantries are now prevalent on college campuses exemplifies that privatization of the social safety net and its institutionalization within private providers of social services, of which higher education institutions are an example, including public institutions. On-campus food pantries at public colleges are an example of social services privatization because usually only students from that college are able to access those resources. On-campus food pantries, however, often face very specific constraints or challenges in becoming a member agency of a food bank. On-campus food pantries must decide if they are going to pursue their own 501(c)3 status, if they are going to or be allowed to use the 501(c)3 status of the university, or if they want non-profit status at all. Without 501(c)3 status, however, accessing food from the local food bank is not usually possible. Food banks will sometimes work with colleges to bring a mobile unit of the food bank or pantry to deliver food without the university having to set up any formal structures. These mobile distributions, though, still usually require that students demonstrate that they are an enrolled student, usually through a student identification card. Additionally, many on-campus food pantries must work with the local food bank to explain the need at their institution, as this is still a fairly new area of economic insecurity

for food banks to understand and a new population for them to be intentionally serving. As this issue continues to be more recognized, however, more local food banks and pantries will develop best practices around this topic.

As food pantries spread to colleges, they exemplify the privatization of the social safety net. Now, college students at public universities have access to private safety nets, to resources available only to them as students and rarely to the broader community in which the college is situated. On-campus food pantries on college campuses are private safety nets, part of the way that colleges facilitate student security projects, even if they are located at public universities. Additionally, food pantries, and indeed discussions more broadly of food insecurity among college students, may direct our focus away from the larger problem of inequality by creating a problem (hunger) and a solution (a food pantry), without examining the root causes of the need, which often lies in issues of poverty and inequality (Poppendieck 1998).

Research Questions:

Inequality may look different at different institutions, just as food pantries look different at different institutions. Not all colleges are created equal. I expand the existing literature's understanding of economic insecurity on campus by considering food insecurity as one important aspect of economic insecurity. I question and explore how institutional type and institutional characteristics are correlated with the facilitator role that a college takes on for its students as students craft their own security projects while they are in school. I specifically investigate how institutional type and institutional

selectivity correlate with the existence of an on-campus food pantry. As the first study of its kind, this research explores the adoption of social services at colleges across the country, specifically on-campus food pantries, and helps to answer questions about the overall prevalence of on-campus food pantries. This research is motivated by an interest in understanding the variety of institutions that are, or are not, offering social services to their students in the form of on-campus food pantries. It specifically investigates the types of institutions that are adopting food pantries at their institutions, taking into account for-profit, non-profit, and public status as well as institutional selectivity. It also looks at institution location and size as predictors of having an on-campus food pantry. I bring all of these characteristics together to offer a more nuanced understanding of on-campus food pantries and to seek out any particular characteristics that have a large association with the likelihood of having an on-campus food pantry.

I theorize about the facilitator role that colleges and universities play in helping students to craft their individual security projects, often using institutional resources like a food pantry. In connecting institutional characteristics to the adoption of social services, I expand the literature on student food insecurity to the organizational realm. Prior work on student food insecurity has not intentionally considered institutional variation to a significant degree beyond two-year and four-year school comparisons. No studies, to my knowledge, have specifically investigated the social services that for-profit institutions may or may not provide. I seek to understand these questions in the sections that follow. By beginning to look more carefully at the social services, specifically food pantries, at

the wide variety of institutions across the country, including for-profit institutions, I move the research in this area forward and answer an important question about how institutional characteristics do or do not matter for the existence of an on-campus food pantry.

Data and Method:

Data:

To examine this research question, I first generated a random sample of 550 postsecondary institutions in the United States from the Integrated Postsecondary Education Data System (IPEDS), which has information on all postsecondary schools that are eligible for their students to receive federal financial aid. I created the random sample using Stata software. I used academic year 2015-2016, the most recent year available at the time of my analysis. Using the 2015-2016 academic year also captures a snapshot of higher education at the end of the eight-year Obama administration, prior to any changes to the higher education landscape in the following presidential administration. I generated a random sample of 550 schools so that I would have at least 500 schools for the analyses.

I eliminated from the potential sample seminaries and closed schools, especially ITT Tech campuses, which closed in 2016. In 2015-2016, a number of schools closed across the United States, particularly for-profit schools such as ITT Tech, so I wanted to be sure this did not impact my sample too much. I removed these schools from my

potential sample since they are no longer operational and so would not have a website for me to search. I also removed schools that do not offer at least an associate degree and schools that offer only graduate degrees. I limit the sample to bachelor and associate degrees in this way because I want the sample to reflect primarily students earning these two kinds of degrees rather than short term certifications, such as a cosmetology license. The final number of schools from which I drew the sample of 550 was 3,942 institutions, so my sample represented 14.0% of the institutions available for selection. To my knowledge, no other research in this area uses a random sample of institutions to understand the types of institutions engaging in security buffer services for students.

I confirmed that 500 schools would be enough for analysis using the Raosoft online sample size calculator. For the sample size calculation, I used a 5% margin of error and 95% confidence level. My population size is the 3,942 institutions available for selection into the sample. I conservatively estimated that the response distribution would be 50% of institutions having a food pantry (an overestimation, but it allowed me to maximize potential sample size). This calculation suggested that the recommended sample size was 351 institutions. After completing my data collection on the 550 schools in my sample, I re-confirmed that with a 17.7% response distribution (i.e. the percentage of institutions with a food pantry), my sample size was still sufficient.

From this random sample, I compared each school to the College and University Food Bank Alliance's (CUFBA) list of schools that are members of their association. This provides an additional confirmation of which colleges may have food pantries. I

then visited each school's website to determine if they have publicly available information on their website about an on-campus food pantry.

I removed 31 schools from the original sample of 550 because in my website search I determined they had closed, they had no website, they were the graduate school division of an existing school, and one school that offered only graduate degrees. While I tried to limit the initial sample, because IPEDS data are self-reported by institutions, there are occasionally errors, such as a school that offers only graduate degrees reporting that it offers an associate or bachelor degree. Additionally, I removed another four institutions that did not have data included in the College Scorecard data, since this was ultimately the data I was merging with the schools' pantry information. This means the final random sample used in this chapter includes 515 institutions. See Appendix B for a full list of institutions included in the sample. I compared the institutional control and types of degrees offered of the final random sample to all IPEDS schools that offer associate and bachelor degrees. See Table 2.1 for this comparison. My sample and the distribution in IPEDS matches up closely. All schools in the random sample will be included in a binary variable of whether or not they have information through their website about an on-campus food pantry.

I also returned to the sample size calculator after constructing the information around on-campus food pantry status to confirm that my sample size was large enough. In doing so, I confirmed that with a sample size of 515 institutions, my margin of error was approximately 4%. I also used a logistic regression power analysis in Stata to further

confirm that my sample of 515 institutions, with a predictor variable mean of 0.177 gave me sufficient information for analysis. This power analysis indicated that for a power of 0.8, I needed a sample of at least 487 institutions, which was below the number of institutions in my sample. Thus, I felt confident moving forward with analyses.

I also created an institutional selectivity variable using the 2018 Barron's college selectivity rankings. Barron's categorizes schools into five broad categories: most competitive, highly competitive, very competitive, competitive, less competitive, noncompetitive, and special schools (e.g., military schools and art schools). Any school without a ranking from Barron's I assigned as noncompetitive because their websites made clear that they were open admissions schools. I assigned every school in the random sample into their Barron's category. For schools designated as 'special' by Barron's, I looked up their acceptance rates in the College Scorecard data to add them to the other competitive categories based on that. There are eight special schools in my sample, six art schools and two health schools. For example, The Julliard School is in my sample. Its 6.4% acceptance rate in 2015 (the most recent available) means that it is in the category most competitive.

After creating these variables for institutional selectivity and food pantry status, I then merged them with each institution's respective information in the College Scorecard data. The College Scorecard data is a mixture of IPEDS data, National Student Loan Data System (NSLDS) data, and U.S. Treasury data. While I use IPEDS variables, I use IPEDS variables from the broader College Scorecard data because the data are somewhat

easier to access and work with. Once merged together, I had information about an institution's food pantry and selectivity, as well as information about its location, institution type, and its student body's characteristics, such as race/ethnicity and sex proportions.

Key Measures / Variables:

My dependent variable is a binary variable for whether or not a college has an on-campus food pantry. My independent variables include institutional control (private for-profit, private non-profit, public) institutional type/selectivity (selective four-year school, moderately selective four-year school, nonselective four-year school, nonselective two-year school), location, institution size, average net price, percent of students with federal student loans, percent of students awarded a Pell Grant, racial and ethnic make-up of the institution, percent of female students, and percent of part-time students at the institution.

I created a categorical variable for four-year selective, four-year moderately selective, four-year nonselective schools, and two-year nonselective schools. I created this variable based on Barron's selectivity metrics. Selective schools include those with a Barron's designation of most competitive, highly competitive, or very competitive. Schools with a competitive designation are not included in the selective category because Barron's considers the category a very broad one and it includes schools that admit 50% - 65% of their applicants. Schools with a competitive Barron's designation I include as moderately selective four-year schools. Four-year schools with a designation of less competitive or noncompetitive in Barron's, I call nonselective four-year schools.

To investigate how these schools' locations might be associated with their likelihood of having an on-campus food pantry, I recoded the location type variable from the College Scorecard data. Any schools in a large city or large suburb, defined as a city of 250,000 or more or outside a city, in an urbanized area with a population of 250,000 or more, respectively, were combined into one category of large city/suburb. Mid-size cities and suburbs (with populations of at least 100,000 but less than 250,000) were combined, as were small cities and suburbs (with populations of less than 100,000). Institutions in a town or rural area were also combined into one category. I recode the variable in this way because it brings together larger and smaller metropolitan areas and makes the information more useful for my purposes.

I also recode the continuous institution size variable into a categorical variable. Its categories include institutions that have fewer than 1,000 students, fewer than 5,000 students but more than 1,000 students, fewer than 10,000 students but more than 5,000 students, and more than 10,000 students.

Average net price in my models is the average annual total cost of attendance, including tuition and fees, books and supplies, and living expenses, minus the average grant/scholarship aid. It is calculated for all full-time, first-time, degree/certificate-seeking undergraduates who receive Title IV aid. I did not calculate this variable, it is calculated in IPEDS. I did, however, make this variable a composite variable. In IPEDS, average net price is split into three variables for public schools, private schools, and program-based schools. I added all three of these variables together to create one average

net price variable for all schools in the sample. Additionally, 18 institutions were missing information on this variable. I used mean replacement to account for this missing information in this variable. More specifically, I replaced the means based on institutional control. Thus, a private for-profit institution's mean was replaced with the average net price of other for-profit institutions in the sample and a private non-profit institution's mean was replaced with the average net price of other private non-profit institutions.

Method:

First, I used descriptive statistics, including chi-square tests and t-tests to understand the existence of food pantries at these institutions. Then, I used logistic regression models to explore if and how institutional characteristics are associated with having an on-campus food pantry. I used logistic regression because I have a binary dependent variable, whether or not an institution has an on-campus food pantry. I build three models to test the association of institutional and overall student characteristics and the existence of an on-campus food pantry. These models build off the chi-square tests and t-tests to provide a more complex and nuanced understanding of on-campus food pantries. The first model looks only at institutional characteristics, including institutional control, institutional selectivity, institution location, and institution size. This model explores how institutions' characteristics without student characteristics may be associated with food pantry status. The next model adds student and institutional financial characteristics at the aggregate institutional level, such as the average net price, percentage of students receiving a Pell Grant, and the percentage of students enrolled

part-time. By bringing together student financial characteristics at the institution with institutional characteristics, I add more nuance to the model in understanding the probability of having an on-campus food pantry. The final model adds student gender and racial/ethnic characteristics at an aggregate institutional level. These additional variables explore whether student demographic characteristics may be associated with institutional food pantry status.

Results:

Ninety-one colleges (17.7% of the final sample) in the random sample have on-campus food pantries, as shown in Table 2.2. Table 2.3 shows these food pantries by institutional type (private for-profit, private non-profit, public), as well as two-year versus four-year institutions, and Table 2.4 breaks them down by institutional selectivity. Public institutions are most likely to have a food pantry, with 37.7% of them reporting that they have a pantry. Only one private for-profit institution has information about its on-campus food pantry on its website. Very few private non-profit institutions have an on-campus food pantry (5.2%). In comparing two-year and four-year schools and their likelihood to have a pantry, they are about equally likely to have an on-campus food pantry, with about 17% of each type having online information available about an on-campus food pantry. A chi-square test showed no statistically significant differences between two- and four-year institutions. Similarly, a chi-square test of significance shows that only considering institutional selectivity does not show statistically significant differences between

different levels of selectivity. However, when school type and institutional selectivity are combined into one variable, there are statistically significant differences between school type and food pantry status. For example, 26.4% of selective four-year institutions have a pantry, compared to 11.2% of nonselective four-year institutions. About nineteen percent (18.8%) of nonselective two-year institutions have an on-campus food pantry.

Table 2.5 shows the breakdown of food pantry status by institutional location. Institutions in small cities and suburbs are more likely than any other location to have an on-campus food pantry, with 35.2% of institutions in these areas having one. Table 2.6 shows food pantry status by institution size. Large institutions are most likely to have a food pantry, with 66% of institutions with more than 10,000 students having an on-campus food pantry. A chi-square test shows this is a statistically significant relationship. It is also important to recognize that the majority of schools in the sample have 5,000 students or fewer (408 institutions). Table 2.7 shows results from t-tests for each interval level independent variable in the models. Of particular interest is that food pantry status is correlated with the proportion of students receiving a Pell Grant and the proportion of students enrolled part-time at the institution. Last, Table 2.8 shows the correlations of all the variables in the models.

Next, I created a series of logistic regression models to explore the institutional characteristics that might be correlated with whether a campus has a food pantry. Model 1 includes only institutional characteristics. This allows me to isolate institutional characteristics without aggregate information about the student population the institution

serves to understand how the institution itself may be associated with the probability of having an on-campus food pantry. This helps to answer my research question around the types of institutions that may be more likely to have an on-campus food pantry. Model 2 adds institution and student financial characteristics, including average net price, the proportion of students at the institution with a Pell Grant, and the proportion of students with a federal student loan. I add the aggregate student financial characteristics on their own because it lets me look specifically at how the financial situations of college students in general at an institution may be associated with the existence of an on-campus food pantry. Model 3 includes student characteristics, such as proportion of students who are enrolled part-time, percentage of students who are women, and the racial and ethnic composition of the student body. By taking into account demographic characteristics, I explore if student aggregate demographics at an institution are associated with the existence of an on-campus food pantry. This is relevant since previous studies have suggested the certain demographic groups, such as African-Americans, are more likely to experience food insecurity in college (Crutchfield and Maguire 2018; Morris, Smith, Davis, and Null 2016).

Model 1 includes only institutional characteristics such as non-profit status, institutional selectivity, and two- or four-year status, as well as institution location and institution size. Results from this model suggest that private non-profit institutions and private for-profit institutions are much less likely than public institutions to have a food pantry. This finding remains statistically significant in all three models. Selectivity and

school type, in terms of two-year versus four-year and selective, moderately selective, or nonselective, is not associated with the odds of having a food pantry in this model. Being located in a town or rural location decreases the odds of having an on-campus food pantry by 63%. Additionally, institutions with larger numbers of students are more likely to have an on-campus food pantry.

Model 2 adds student and institutional financial characteristics to the other institutional characteristics included in the model. Specifically, it adds variables for average net price of attendance, percentage of students at the institution receiving a Pell Grant, and the percentage of students at the institutions receiving federal student loans. Adding these institution-level variables about institutional student composition continues to show that private non-profit and for-profit status are associated with decreased odds of having an on-campus food pantry. Additionally, Model 2 also shows that moderately selective four-year institutions are 69% less likely than four-year selective institutions to have an on-campus food pantry, which is statistically significant at the 0.05 level. Being located in a town or rural area is still associated with decreased odds of having an on-campus food pantry. Institutional size continues to be a major predictor of having an on-campus food pantry, with larger institutions being much more likely to have on-campus food pantries.

In Model 3, I added more student-level characteristics about the institutional composition, specifically percentage of part-time students, proportion of female students, and the proportion of students who are white, African American, Hispanic, Asian, or

another race. Model 3 suggests that the odds of private non-profit institutions having an on-campus food pantry are about 93% less than a public institution. At a private for-profit institution, the odds of having an on-campus food pantry are more or less non-existent, since only one for-profit institution in the random sample has a food pantry. Figure 2.1 shows that public institutions are much more likely to have an on-campus food pantry than private non-profit and for-profit institutions. In this model, the likelihood of a public institution having a food pantry is about 30%, holding all other variables at their means. For private non-profit institutions, the odds of having an on-campus food pantry are less than 10%, holding all other variables at their means. Holding all other variables at the mean, selective four-year institutions have more than triple the odds of having an on-campus food pantry compared to other four-year schools and two-year schools (0.18 versus 0.05 for moderately selective four-year schools, 0.05 for nonselective four-year schools, and 0.03 for nonselective two-year schools). See Figure 2.2 for more information. Model 3 also suggests that the odds for four-year moderately selective institutions to have an on-campus food pantry are 76% less than a four-year selective institution. At a nonselective two-year school, the odds of having an on-campus food pantry are 84% less than at a selective four-year school. When institutional control and institutional selectivity are taken into account together, the results suggest that selective, public four-year institutions are the most likely to have an on-campus food pantry. Additionally, among non-profit private institutions, selective four-year institutions are

also the most likely to have an on-campus food pantry. See Figure 2.3 for more information.

Location may also be associated with the odds of having an on-campus food pantry in this sample. Institutions in rural areas have odds of having a food pantry that are 64% less than in a large city or suburb. Figure 2.4 shows that institutions in small cities and suburbs are the most likely to have an on-campus food pantry.

School size is also an important indicator of whether an institution has a food pantry or not. Large institutions with more than 10,000 students have 16.4 times greater odds of having an on-campus food pantry than schools with fewer than 1,000 students. Similarly, though not as extreme, schools with fewer than 5,000 students but more than 1,100 students have 7.6 times greater odds of having an on-campus food pantry than schools with fewer than 1,000 students. And institutions with fewer than 10,000 students but more than 5,000 students are 8.7 times more likely to have a food pantry than smaller schools. On average, the predicted probability that institutions with more than 10,000 students will have an on-campus food pantry is 18%, compared to a probability of 9.3% among institutions with less than 5,000 students but more than 1,000 students. See Figure 2.5 for more information.

When financial and student characteristics are added to the model, these variables are not statistically significant when the other institutional-level variables in the models are taken into account. Overall, these models suggest that institutional characteristics

such as institutional control, selectivity, location, and size are correlated with the existence of an on-campus food pantry.

Discussion:

The results presented in this chapter suggest that institutional characteristics may be associated with the likelihood that an institution has established an on-campus food pantry. The results suggest that institutional control, selectivity, location, and size are all associated with whether or not an institution has established a food pantry. Specifically, in this chapter I add for-profit institutions to the conversation around food insecurity and institutional responses to it. These data show that for-profit institutions do not have on-campus food pantries, with the exception of one for-profit school in the random sample. Thus, at least at this point, the great majority for-profit colleges are not providing this particular social service to their students. It is also important to recognize that the majority of campuses that are establishing food pantries are public institutions, specifically selective public institutions. These public institutions are crafting private safety nets for their students as they seek to bolster and facilitate students' short term security projects while they are in school. As institutions continue to establish food pantries for their students at a rapid pace, researchers must consider the implications for institutionalizing social services within colleges and universities. While unquestionably a vital service for many students, researchers need to understand more about not only why this is a vital service, who it serves, and which kinds of institutions offer it, but also the

potential long term implications of serving as short term security buffers for students. Non-profit private institutions, especially small ones, are not establishing food pantries as much as public institutions, which further complicates the adoption of security buffer services for students and the potential stratifying role that higher education facilitators may be playing in offering these services.

Also of interest is that selective institutions are more likely to have an on-campus food pantry than nonselective institutions. This suggests that there may be benefits to attending a selective institution beyond academic quality and career connections, especially if a student is at risk for experiencing economic insecurity while they are in college. An important caveat, however, is that selectivity here is a broad category that encompasses multiple Barron's categories for selectivity. Additionally, this study finds that approximately 18.8% of two-year schools do have an on-campus food pantry. This suggests that students would do well to research not only their major of interest when choosing a school, be that a selective or nonselective institution, but that they would also do well to research the kinds of resources available to them at their institution of choice in determining whether that school will be able to support their academic endeavors and their potential economic pitfalls.

Last, institution location may also play a role in on-campus food pantry status. Schools in rural areas and towns are significantly less likely to have an on-campus food pantry than large cities in this sample. However, students in rural areas may have constrained higher education opportunities, with only one choice in their proximate

geographic area. Cottom (2017) suggests that in the case of for-profit institutions, this may be associated with students' choices around higher education. Many small schools, which are already less likely to have on on-campus food pantry, are also in rural areas. These same constrained choices may be correlated with students' ability to take advantage of the resources certain colleges offer to their students.

Conclusion:

As economic insecurity becomes more of a norm for college students, some colleges and universities are responding by offering students more services and resources. On-campus food pantries are just one example of an additional resource that institutions are offering to their students more regularly.

For-profit colleges are a significant discussion point for inequality researchers, as research shows that students at for-profit colleges are less likely to finish their degrees, take on more debt, and are more likely to come from low socioeconomic status backgrounds (Gelbgiser 2018; Mettler 2014; Cottom 2017). This research adds another component to the disadvantages of for-profit education by establishing that for-profit schools, on average, do not provide their students with social service-like resources to assist in their degree persistence and completion. While I cannot say that offering these services leads to degree persistence (future research should explore this), the lack of these services at for-profit institutions is indicative that these institutions may behave and react differently than other sectors of the higher education market in serving their students.

For-profit colleges do not serve as a short term security buffer for their students in the same way as a public selective four-year school or public two-year school. Since students at for-profit colleges tend to be particularly disadvantaged (Mettler 2014), this gap is noteworthy.

Additionally, this research brings higher education organizations and their food pantries together for the first time in research that considers the adoption of food pantries within the broader field of higher education more generally, taking into account not only institutional control in terms of non-profit, for-profit, and public status, but also two- and four-year schools and their institutional selectivity. In finding that institutional control, selectivity, and size may significantly influence the adoption of on-campus food pantries, I push forward research in this area and help researchers to understand that while on-campus food pantries are increasing in number, they may be increasing in only a particular segment of the higher education landscape. Without considering the full realm of higher education in the United States, which serves many millions of students, researchers cannot fully understand the role of food pantries in higher education institutions' repertoires of security project facilitation services. This research begins an important conversation around the breadth of food pantries across the higher education sector.

Tables:

Food Pantry Status	
No food pantry (*n* = 424)	82.3%
Yes, food pantry (*n* = 91)	17.7%
Total N = 515	

Table 2.1 Food Pantry Status

Food Pantry Status by Institutional Control		
	Food Pantry Status	
Institutional Control	No food pantry	Yes food pantry
Public (*n*=215)	62.3%	37.7%
Private non-profit (*n*=173)	94.8%	5.2%
Private for-profit (*n*=127)	99.2%	0.8%
Total N = 515	82.3%	17.7%
Chi-square = 0.000		

Table 2.2 Food Pantry Status by Institutional Control

Food Pantry Status by Institution Type		
	Food Pantry Status	
Institution Type	No food pantry	Yes food pantry
4-year school (*n* = 318)	83.0%	17.0%
2-year school (*n*= 197)	81.2%	18.8%
Total (N=515)	82.3%	17.7%
Chi-square = 0.603		

Table 2.3 Food Pantry Status by Institution Type

Food Pantry Status by Selectivity and School Type		
	Food Pantry Status	
School Type	No food pantry	Yes food pantry
Selective 4-year school (*n*= 53)	73.6%	26.4%
Moderately selective 4-year school (*n* = 113)	79.7%	20.4%
Nonselective 4-year school (*n*= 152)	88.8%	11.2%
Nonselective 2-year school (*n*=197)	81.2%	18.8%
Total (N=515)	82.3%	17.7%
Chi-square = 0.048		

Table 2.4 Food Pantry Status by Selectivity and Type

Food Pantry Status by Institutional Selectivity		
	Food Pantry Status	
Institutional Selectivity	No food pantry	Yes food pantry
Selective (*n*=53)	73.6%	26.4%
Moderately selective (*n*=114)	79.7%	20.4%
Not selective (*n* = 349)	84.5%	15.5%
Total (N=515)	82.3%	17.7%
Chi-square = 0.105		

Table 2.5 Food Pantry Status by Institutional Selectivity

Food Pantry Status by Institutional Selectivity (4-year schools only)		
	Food Pantry Status	
Institutional Selectivity	No food pantry	Yes food pantry
Selective (*n* = 53)	73.6%	26.4%
Moderately selective (*n*= 113)	79.7%	20.4%
Not selective (*n* = 152)	88.8%	11.2%
Total (N=318)	83.0%	17.0%
Chi-square = 0.019		

Table 2.6 Food Pantry Status by Selectivity – 4-year only

Food Pantry Status by Institution Location		
	Food Pantry Status	
Location	No food pantry	Yes food pantry
Large city / suburb (*n* = 241)	84.2%	15.8%
Mid-size city / suburb (*n* = 71)	80.3%	19.7%
Small city / suburb (*n* = 54)	64.8%	35.2%
Town / Rural (*n* = 149)	86.6%	13.4%
Total (N=515)	82.3%	17.7%
Chi-square = 0.003		

Table 2.7 Food Pantry Status by Institution Location

Food Pantry Status by Institution Size		
	Food Pantry Status	
Size	No food pantry	Yes food pantry
Fewer than 1,000 students (*n* = 195)	98.5%	1.5%
Fewer than or equal to 5,000 students (and > 1,000) (*n* = 213)	84.0%	16.0%
Fewer than or equal to 10,000 students (and > 5,000) (*n* = 57)	63.2%	36.8%
More than 10,000 students (*n* = 50)	34.0%	66.0%
Total (N=515)	82.3%	17.7%
Chi-square = 0.000		

Table 2.8 Food Pantry Status by Institution Size

Variables of Interest by whether or not campus has a food pantry				
	No food pantry	Yes food pantry		
Variable name	M (S.D)	M (S.D)	t-statistic	Significance
Proportion of students enrolled part-time	0.24 (0.25)	0.34 (0.24)	-3.41	***
Proportion of students receiving a Pell Grant	0.46 (0.21)	0.39 (0.13)	3.19	**
Proportion of students receiving a federal loan	0.54 (0.27)	0.37 (0.22)	5.67	***
Average net price	18,226.70 11,605.59	8,279.38 6,180.29	7.21	***
Proportion of enrolled women students	0.60 (0.17)	0.57 (0.10)	2.19	*
Proportion of enrolled white students	0.52 (0.26)	0.55 (0.23)	-0.89	
Proportion of enrolled African American students	0.18 (0.21)	0.12 (0.17)	2.49	*
Proportion of enrolled Hispanic students	0.13 (0.17)	0.18 (0.16)	-2.49	*
Proportion of enrolled Asian students	0.04 (0.07)	0.05 (0.07)	-1.91	
Proportion of enrolled students of other race	0.05 0.08	0.04 0.03	0.63	
N = 515				

Table 2.9 Food Pantry Status by IPEDS Independent Variables

Correlation of Variables of Interest															
	pantry	control	selectivity	locale	size	% part time	% pell	% federal loan	avg net price	% women	% white	% black	% hispanic	% asian	% other race
pantry	1														
control (non-profit, etc.)	-0.4118	1													
selectivity	-0.0512	0.0442	1												
locale	0.0054	-0.4471	0.0353	1											
size	0.4945	-0.5414	-0.2245	-0.0109	1										
% part time	0.1491	-0.1891	0.402	0.0065	0.123	1									
% pell	-0.1393	0.4413	0.3772	-0.1843	-0.343	0.0872	1								
% federal loan	-0.243	0.5806	-0.2582	-0.2383	-0.3397	-0.3309	0.4781	1							
average net price	-0.3032	0.6299	-0.4086	-0.3652	-0.2948	-0.4083	-0.0136	0.5944	1						
% women	-0.0961	0.2384	0.1226	-0.1428	-0.2379	0.1254	0.3317	0.2132	0.1078	1					
% white	0.0394	-0.233	-0.1949	0.3696	0.0492	-0.1092	-0.3952	-0.002	-0.0131	-0.0765	1				
% black	-0.1093	0.1659	0.1616	-0.1548	-0.1496	0.1311	0.5461	0.2341	-0.0277	0.1791	-0.5298	1			
% hispanic	0.1092	0.083	0.2191	-0.2253	0.0447	0.0883	0.122	-0.1459	-0.0776	0.0115	-0.5174	-0.1921	1		
% asian	0.0841	-0.0078	-0.1633	-0.2183	0.2101	-0.0621	-0.2168	-0.1497	0.1216	-0.0285	-0.2645	-0.1921	0.1189	1	
% other race	-0.0279	-0.0747	0.0783	0.1171	-0.037	0.0589	0.0212	-0.1577	-0.1278	0.0105	-0.1804	-0.1717	0.0235	0.1102	1

Table 2.10 Correlation of IPEDS Independent Variables

Logistic Regression of Institutional Characteristics on Food Pantry Status

Dependent Variable: On-Campus Food Pantry	(1)	(2)	(3)
Institutional Control (ref. Public)			
Private Non-profit	0.082***	0.096***	0.065***
	(0.04)	(0.06)	(0.04)
Private For-profit	0.025***	0.019**	0.008***
	(0.03)	(0.02)	(0.01)
Institutional Type & Selectivity (ref. Selective 4-year school)			
Moderately selective 4-year school	0.410	0.307*	0.234*
	(0.22)	(0.18)	(0.14)
Nonselective 4-year school	0.502	0.366	0.228*
	(0.29)	(0.23)	(0.16)
Nonselective 2-year school	0.381	0.349	0.161*
	(0.21)	(0.24)	(0.13)
Institution Location (ref. Large city/suburb)			
Mid-size city/suburb	1.094	1.052	1.196
	(0.49)	(0.48)	(0.57)
Small city/suburb	1.290	1.418	1.315
	(0.58)	(0.65)	(0.65)
Town/Rural	0.374*	0.366*	0.360*
	(0.15)	(0.15)	(0.16)
Institution Size (ref. school with <=1000 students)			
<=5000 students	5.646**	6.324**	7.554**
	(3.62)	(4.10)	(5.10)
<=10000 students	6.657**	7.962**	8.677**
	(4.67)	(5.71)	(6.51)
>10000 students	14.706***	18.076***	16.432***
	(10.79)	(13.66)	(13.11)
Average net price		1.000	1.000
		(0.00)	(0.00)
Proportion of students receiving Pell Grant		2.784	20.482
		(3.86)	(37.22)

Table 2.11 Logistic Regression of Institutional Characteristics on Food Pantry Status

Continued

Table 2.11 Continued

Proportion of students with a federal student loan		2.854 (3.21)	4.932 (6.04)
Proportion of students enrolled part-time			3.568 (3.90)
Proportion of women students			3.410 (5.91)
Proportion of white students			4.045 (11.62)
Proportion of African American students			0.180 (0.57)
Proportion of Hispanic students			22.881 (69.93)
Proportion of Asian students			11.161 (48.78)
Proportion of students of another race			0.081 (0.33)
Observations	515	515	515
Pseudo R^2	0.36	0.37	0.40

Note 1: Odds ratios and standard errors.
* p<.05, ** p<.01, *** p<.001

Figures

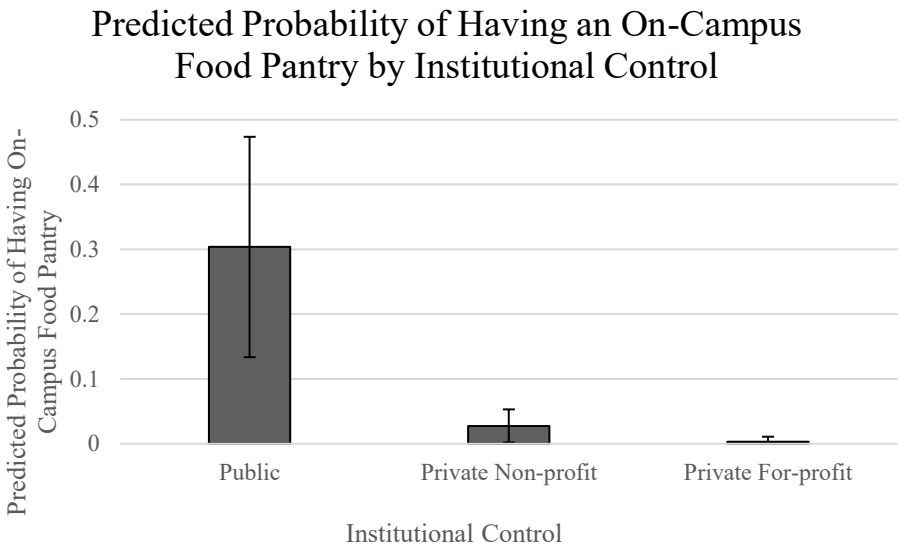

Figure 2.1 Predicted Probability of Having an On-Campus Food Pantry by Institutional Control

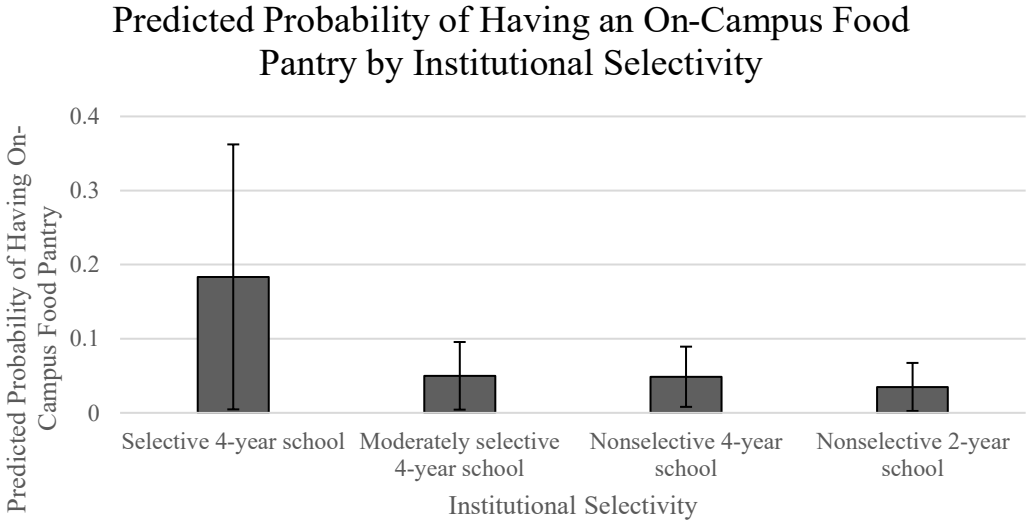

Figure 2.2 Predicted Probability of Having an On-Campus Food Pantry by Institutional Selectivity

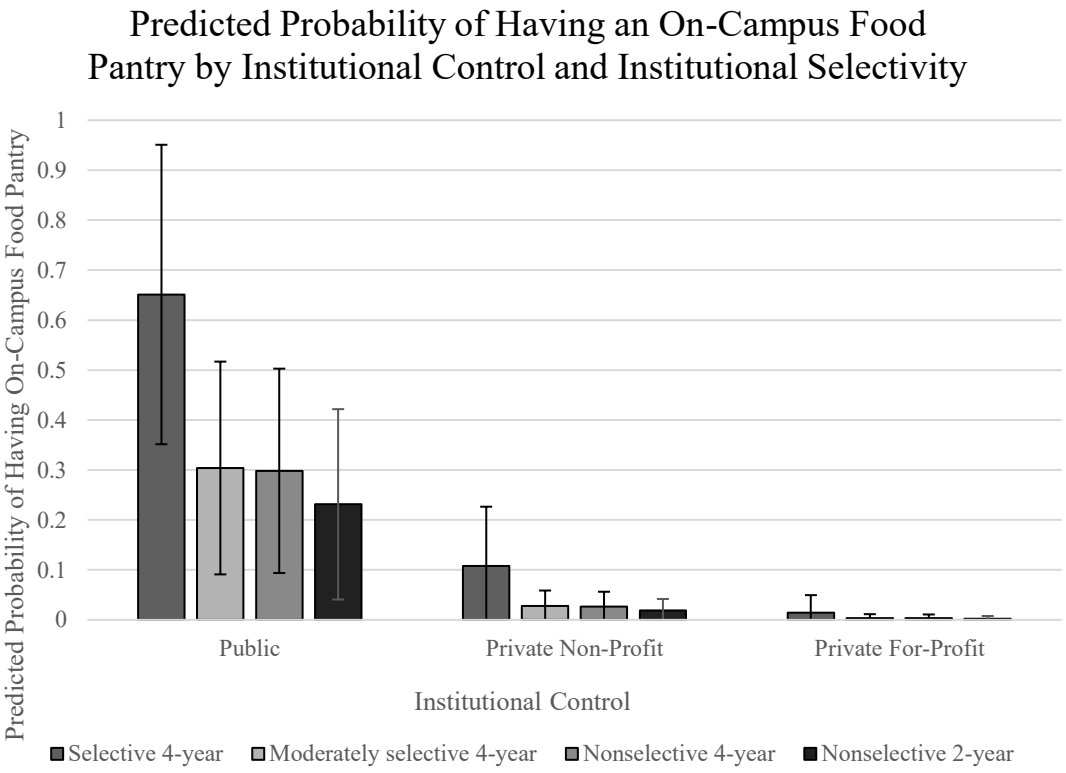

Figure 2.3 Predicted Probability of Having an On-Campus Food Pantry by Institutional Control and Institutional Selectivity

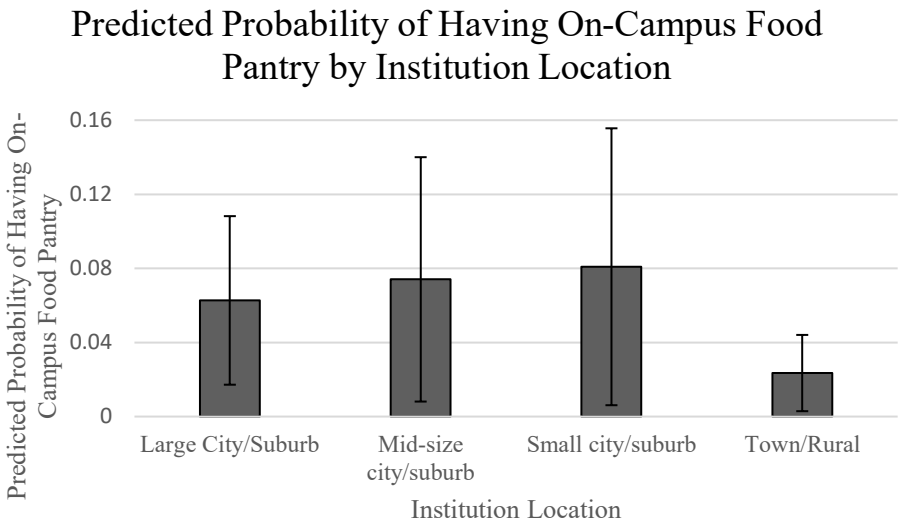

Figure 2.4 Predicted Probability of Having an On-Campus Food Pantry by Institution Location

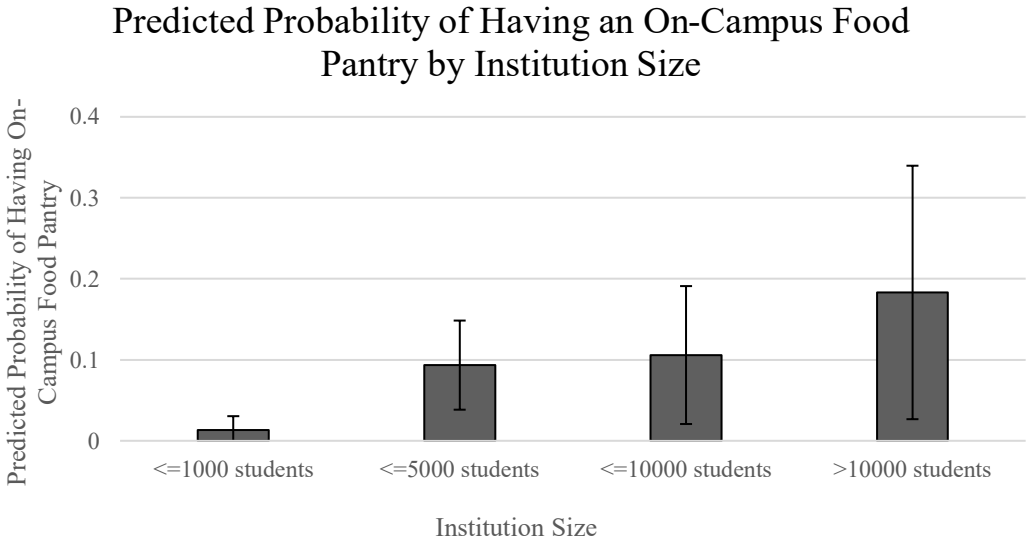

Figure 2.5 Predicted Probability of Having an On-Campus Food Pantry by Institution Size

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Chapter 3. Student Food Insecurity and Academic Outcomes

Introduction

As access to and expansion of higher education in the United States has increased in the past 70 years, the challenges faced by many college students have also expanded. While the previous chapter examined colleges' responses to the challenge of food insecurity that many students are facing, this chapter looks more specifically at individual experiences of food insecurity. Here, I delve into the connections between the expansion of access to higher education, growing economic inequality, and economic insecurity in the college context for individual students. These intersecting social changes have created an environment of significant individual risk in undertaking a college degree, risk that colleges themselves cannot completely mitigate, as the previous chapter suggested. This individual risk, however, may lead to maintained or upward social mobility if a student is successful in attaining their degree. A college degree continues to be a socioeconomic equalizer (Torche 2011), but it is a path fraught with challenges and barriers for many students, especially those with socioeconomic barriers to success.

Economic inequality in the United States is continuing to increase (Piketty and Saez 2006; Atkinson, Piketty, and Saez 2010), leaving a significant gap between those with high wealth and those with no wealth and, often, significant debt. These gaps are

further exacerbated by racial differences in wealth accumulation (Oliver and Shapiro 1995) and educational attainment (McFarland et al. 2017). Moreover, families with differing economic situations craft different types of security projects to help buffer against economic insecurity (Cooper 2014). Again though, these security buffers are individualized risk management systems. Entering the college setting is another aspect of many students' security projects, as they seek to minimize instability in their lives and maximize their future economic stability.

The economic insecurity that many Americans experience in their lives (Cooper 2014; Leicht and Fitzgerald 2014) comes with them to college. One of the ways that this insecurity manifests is through food insecurity among college students. This is not simply surviving on ramen and beer for students, but rather is genuine inability to purchase food from a lack of financial resources. Food insecurity among college students is one manifestation of a broader trend toward economic insecurity generally for many students. Understanding food insecurity among individual college students is vitally important to the conversation of students' broad financial situations and their ability not only to pay for college, but also their ability to be successful in college.

Food insecurity is defined by the United States Department of Agriculture (USDA) and researchers as "limited or uncertain availability of nutritionally adequate and safe foods or uncertain ability to acquire acceptable foods in socially acceptable ways" (Anderson 1990, p. 1576). Food insecurity captures individuals' and households' inability to purchase food from a lack of financial resources. Feeding America, a

nationwide network of food banks, estimated in 2014 that 10% of its 46.5 million clients were students pursuing postsecondary education (Resnikoff 2014; Weinfeld et al. 2014). In understanding more about food insecurity among students, researchers can understand how economic insecurity, individual risk, and the pursuit of upward mobility coalesce in the college experience for many students.

This research is informed by the question, what are the college student characteristics/demographics that correlate with students experiencing food insecurity? And how is food insecurity associated with students' academic outcomes? Previous research has not thoroughly examined these questions in a multi-institutional context. This research also adds depth to the literature by considering students' academic outcomes, measured through institutional GPA, in addition to demographic predictors. As the nascent literature on college food insecurity continues to grow, this chapter will contribute to that growth and researchers' understanding of this issue at colleges across the country.

Individual Risks and Higher Education

Higher education in the United States has become an increasingly individualized pursuit as federal and state policies have shifted it from a public good to an individual consumer good. This means that the risk of higher education, in the form of admission, payment, completion, and transition to the college-educated workforce, is also individualized. In other words, the risk shift, to use Hacker's (2006) term, has come to

higher education in the form of student loans, uncertain chances of completion, and uncertain employment prospects.

Higher education expanded significantly in the late 20th and early 21st centuries as more students sought and were permitted to enroll in college. From 2004 to 2014, autumn enrollment in degree-granting institutions rose 17 percent (Snyder and de Brey 2016). This growth in enrollment is particularly noteworthy as enrollments have increased from historically underrepresented groups over the past 30 years, and especially over the past 15 years. Individuals who in the past may not have undertaken postsecondary education are now doing so. For example, students of color are increasingly likely to pursue postsecondary education, as are women and older students (DiPrete and Buchmann 2013; Snyder and de Brey 2016). It is vital to ensure that underrepresented groups have access to higher education because higher education can mitigate economic insecurity. It is also essential that students have the resources they need to retain and persist to a degree, lest economic insecurity derail degree attainment. Yet, as individuals embark on security projects by seeking higher education credentials, they may take on significant individual risk to do so, particularly in terms of paying for college.

Increased enrollments are in part due to the well-understood benefits of having a college degree in terms of increased earnings (McCall and Percheski 2010), as well as improved health outcomes (Wolfe and Haveman 2002). It is also important to note, however, that despite large increases in enrollment, college completion rates have remained steady and stagnant at around 60% (Bound, Lovenheim, and Turner 2009;

Snyder and deBrey 2016). Additionally, completion rates vary significantly by family income, race/ethnicity, and institution type (Bailey and Dynarski 2011; Snyder and deBrey 2016). With a national graduation rate of 59% for first-time full-time undergraduates who started college in 2009 (McFarland et al. 2017), the pathway to degree completion is often long and non-linear. This means that not everyone who is enrolling in college is experiencing the positive returns to a college degree. And, as this dissertation will investigate, some individuals struggle financially in significant ways during their time in college as well, which may be associated with their likelihood of college completion.

Students struggling financially are more likely to work more hours, take breaks from college, and be unable to purchase textbooks, computers, and other essential college necessities, such as paying the rent and purchasing food (Broton, Frank, and Goldrick-Rab 2014; Bozick 2007; DesJardins, Ahlburg, and McCall 2006; Dubick, Matthews, and Cady 2016; Goldrick-Rab 2016; Terriquez and Gurantz 2015). The cumulative disadvantage of these financial challenges is sometimes too much, leaving students little choice but to stop out or drop out of college. Again, in many cases, these students have taken on individual risk in completing a college degree, and for many low-income and financially-strapped students, the risk does not pay off because they are unable to complete their degrees. By individualizing the risk of higher education and asking students and families to pay for ever increasing tuition with loans, U.S. society has increasingly individualized the public good of higher education.

Many individuals might think that student loans are the answer for these financially-strapped students, but that is not always the case. Most students interact with the financial aid system. The National Center for Education Statistics (NCES) found that 86% of first-time full-time undergraduate students were awarded financial aid of some kind, be that institutional aid or federal aid, in the 2014-2015 academic year (McFarland et al. 2017). Navigating the federal and private financial aid systems requires significant effort and work, though recent efforts to minimize the burden of the Free Application for Federal Student Aid (FAFSA) are continuing to increase participation. The financial aid system, which is meant to help students meet the costs of their education, is often insufficient when it comes to actually meeting those costs (Goldrick-Rab 2016; Kelly and Goldrick-Rab 2014). This means that students who could most benefit from more extensive financial aid often find themselves facing gaps in funding. In their pursuit of the American dream, many of these students find themselves under-resourced and without a safety net.

Additionally, financial aid officials set the off-campus cost of living, which is used to calculate the amount of student loans that students may utilize. Research has shown that these living cost estimates vary widely, even for institutions in the same cities (Kelchen, Goldrick-Rab, and Hosch 2017). Many students will not be able to meet their full need through the federal student loan system (Goldrick-Rab 2016). Recent work has shown that the complexities of the financial aid system fail to assist as many students as the country might hope in funding and completing their degrees because it is not possible

to cover the full costs of education with government-backed loans (Goldrick-Rab 2016). This variation in cost calculations has implications for students' ability to use loan-based financial aid to fully cover the costs of college attendance, and thus their ability to mitigate potential economic insecurity through loans. Without additional family or other resources to fall back on, students find themselves in economically insecure situations. College for many students, then, is a risky, uncertain endeavor.

College Students' Experiences of Food Insecurity

Food insecurity is a harbinger of broader and wider insecurities that students may face while in college. National awareness of students experiencing hunger is growing. Media accounts highlight the growing challenge college students face to cover the full costs of their education, including food (Bahrampour 2014; Cady 2016; McKenna 2016; Sharpe 2016). Despite increased media attention, food remains an overlooked component of students' college expenses and it is an important indicator of their economic insecurity.

To understand food insecurity, researchers can use demographic characteristics as predictors so that practitioners can serve students who may be more at risk to experience food insecurity. Food insecurity research also helps researchers and practitioners to understand an important aspect of economic disadvantage at colleges. Colleges are always going to be concerned about the barriers students face to their academic success. By bringing awareness to food insecurity as an issue among students, it is also important to connect food insecurity to negative academic outcomes. Specifically, considering the association of food insecurity and grade point average (GPA) provides a tangible

connection to student outcomes. Newer research in the literature on college student food insecurity is beginning to build a connection between food insecurity and lower academic achievement in a single institution context (Phillips, McDaniel, and Croft 2018). Moving forward, it will be important to continue to look at academic outcomes and food insecurity in a multi-institutional context, though some initial research has done so (Dubick et al. 2016).

Previous research has started to outline food insecurity in the college setting, but estimates of food insecurity vary. This study provides continued context for understanding food insecurity among college students. Since no nationally representative study on college student food insecurity has been completed as of this writing, researchers continue to rely on a many single institution and a few multi-institutional studies for understanding food insecurity. This dissertation, as a multi-institutional study, adds additional depth and breadth to the conversation around student food insecurity.

Until recently, researchers had not studied food insecurity at the college level. Food insecurity among young people had primarily been studied in the K-12 context (Alaimo, Olson, and Frongillo 2001; Jyoti, Frongillo, and Jones 2005). However, it has become more important to study food insecurity in the college context as more students bring insecurities with them to college. Research in the K-12 literature demonstrates a connection between food insecurity and lower academic achievement (Alaimo et al. 2001). These studies show that food insecurity among children has negative impacts on their schooling. Food insecurity is related to a host of negative consequences related to

health, general wellness, and academics (Alaimo et al. 2001; Cady 2014). In elementary and secondary education, food insecurity has been linked to lower scores on reading and math achievement tests (Jyoti et al. 2005) as well as lower academic and psychosocial outcomes (Alaimo et al. 2001). Cady (2014) suggests a pipeline approach, where food insecurity earlier in life has a negative cumulative association with adult outcomes. Currently, 22% of children under age 18 experience food insecurity (Feeding America). The negative effects of food insecurity observed in earlier educational settings may also extend to the college setting.

Overall estimates of food insecurity among college students

While 14% of households nationally were estimated to be experiencing food insecurity in the previous 12 months in 2014 (Coleman-Jensen et al. 2014), estimates of food insecurity among college students are significantly higher. This comparison begins to give researchers and practitioners an idea of the stark economic insecurity many college students are facing. Food insecurity rates among college students vary though, by a host of demographic characteristics as well as the types of institutions students attend. In existing studies, overall estimates of food insecurity range from 14% to 59% (Gaines, Robb, Knol, and Sickler 2014; Patton-López, López-Cevallos, Cancel-Tirado, and Vazquez 2014). Across all studies discussed in this dissertation, the average estimate of food insecurity is approximately 35%. For a discussion of all studies, please see Chapter 1. The most recent comprehensive study of food insecurity among college students at 31 two- and 35 four-year institutions found that 36% of college students were food insecure

(Goldrick-Rab, Richardson, Schneider, Hernandez, and Cady 2018). While the existing literature shows significant variation in estimates around overall food insecurity in the college student population, they coalesce around an understanding that this issue is affecting many college students across the country. The disparities in the range of food insecurity could be due to different institutions serving different populations as well as differences in how food insecurity is measured, questions that this dissertation begins to explore. This dissertation continues to add to this coalescence of existing research about food insecurity among college students.

Food insecurity and institution type

Food insecurity has been studied at both the two- and four-year college level. Overall, existing research suggests that students at two-year institutions are much more likely to experience food insecurity than students at four-year institutions. The most recent multi-institutional research on students at community colleges found that community college students had a 42% food insecurity rate, with 15% having low food security and 27% having very low food security (Goldrick-Rab et al. 2018). While lower than previous estimates, this study also had a smaller sample of two-year students than previous studies (Goldrick-Rab et al. 2018).

Most of the work around four-year institutions to date has been based on single institutions, though a number of recent multi-institutional studies have expanded the literature (Chaparro, Zaghloul, Holck, and Dobbs 2009; Patton-López et al. 2014; Dubick et al. 2016; Forman, Mangini, Dong, Hernandez, and Fingerman 2018; Goldrick-Rab et

al. 2018; Payne-Sturges, Tjaden, Cladeira, Vincent, and Arria 2018; Phillips et al. 2018). Overall, among four-year institutions, estimates of food insecurity range from 14% to 59% (Gaines et al. 2014; Patton-López et al. 2014). The most recent multi-institutional study of food insecurity among 35 four-year institution students found that, on average, 14% of four-year university students had low food security and 22% had very low food security, for an overall estimate of 46% food insecurity (Goldrick-Rab et al. 2018).

Little research examines food insecurity among students at two- and four-year institutions within the same study, as this dissertation does. Two studies outside of this dissertation explore these institution types within the same study with institutions from around the country, rather than one state higher education system (Dubick et al. 2016; Goldrick-Rab et al. 2018), leaving plenty of room for additional studies to expand on their work in understanding differences in food insecurity by institution type with data collected at the same time. The two existing studies have ties to the Wisconsin HOPE Lab, so my study is the first to independently corroborate the work of researchers affiliated with that research center.

Food insecurity and socio-demographic characteristics

Studies of food insecurity have incorporated a variety of socio-demographic characteristics, from race and ethnicity to gender, class rank, and financial aid status. Chaparro et al. (2009) found that native Hawaiians, Pacific Islanders, and Filipinos were more likely to be food insecure than their peers, becoming the first study to suggest that food insecurity rates may be related to socio-demographic characteristics. Multiple

studies have found that African-American students are more likely to experience food insecurity (Crutchfield and Maguire 2018; Dubick et al. 2016; Freudenberg, Manzo, Jones, Tsui, and Gagnon 2011; Goldrick-Rab et al. 2018; Martinez, Maynard, and Ritchie 2016; Morris, Smith, Davis, and Null 2016; Payne-Sturges et al. 2018; Phillips et al. 2018). Forman et al. (2018) found that Hispanic students are more likely to experience food insecurity in their study of undergraduates at University of Texas Austin. Studies have also shown that first generation students are more likely to experience food insecurity (Crutchfield and Maguire 2018; Dubick et al. 2016; Forman et al. 2018; Goldrick-Rab et al. 2018; Phillips et al. 2018). Goldrick-Rab et al. (2018), similar to this dissertation, were able to investigate the food insecurity of non-binary gender identity students and found that these students are much more likely to experience food insecurity than their binary gender counterparts.

From a financial perspective, studies have found correlations between food insecurity and Pell Grant eligibility (Broton, Frank, and Goldrick-Rab 2014; Crutchfield and Maguire 2018; Dubick et al. 2016; Goldrick-Rab et al. 2018; Martinez et al. 2016; Phillips et al. 2018). Gaines et al. (2014) specifically looked at financial skills and resources and how they correlated with food insecurity, finding that food insecurity was positively associated with receiving financial aid, not actively budgeting, and being financially independent.

In a study that focused on students living in a residence hall, the researchers found that 32% of students reported food insecurity in the past month and 37% in the past three

months (Bruening, Brennhofer, van Woerden, Todd, and Laska 2016). The findings of this study are of particular interest since students are living on campus, a situation in which they would most likely have meal plans. It is important to know that students who live on campus are also at risk to experience food insecurity. Many institutions require students living on campus to purchase meal plans. However, these students may still experience food insecurity if the meal plan they purchase does not provide enough food for the entire semester. Students who choose the smallest meal plan may, for example, run out of food on a weekly basis or later in the semester as their meal plan runs low. Or the meal plan may restrict where and when a student can eat in ways that render food inaccessible, and result in them purchasing food off-campus. Meal plans may also have hidden costs in terms of administrative fees and loss of meals due to strict dining hall requirements (Goldrick-Rab and Kendall 2016). Dubick et al. (2016) report in their study that 43% of students with meal plans at four-year schools experienced food insecurity. While students may be required to have a meal plan, they can still be food insecure if they have no other source of food or the finances to buy food. My research questions in this dissertation continue to move this area of research forward as well by examining the association of students' residence location and their food security.

Food insecurity and academic outcomes

Studies have also explored how food insecurity may be correlated with students' academic outcomes. Patton-López et al. (2014) found that students with a grade point average greater than or equal to 3.1 were 60% less likely to have experienced food

insecurity in the previous 12 months. A few studies have used a categorical GPA variable and found that food insecurity was associated with lower GPAs (Maroto, Snelling, and Linck 2015; Martinez et al. 2016; Morris et al. 2016). Phillips et al. (2018) used institution-reported GPA and found that food insecurity was associated with a lower GPA at a single institution, controlling for demographic factors. This dissertation also uses institution-reported GPA when available, pushing forward the literature as a multi-institutional study that utilizes GPA as an academic outcome.

In this paper, I explore food insecurity's association with student demographic characteristics and student academic outcomes at 44 two- and four-year public institutions across the United States. These data offer useful insights into food insecurity among college students because they permit for an exploration of food insecurity at varied institutions across the country. The data are also uniquely situated to speak to the connection of food insecurity and academic outcomes, an area for growth within the literature on food insecurity in the college setting. Food insecurity is not usually part of the discussion of student success at colleges. This dissertation argues that food insecurity is a useful way to capture broader economic insecurity that moves beyond students' familial socioeconomic status to be more encompassing of their daily lived experiences.

Research Questions:

In this paper, I explore the following research questions and hypotheses around college student food insecurity. I first lay out my overarching research questions and then offer my hypotheses after each question.

1. What is the estimate of food insecurity in this unique sample of students at two- and four-year colleges from around the United States?
    a. The estimate of food insecurity in my SCFW sample of students will confirm other research about food insecurity among college students in other student samples.
2. What are the college student characteristics/demographics that correlate with students experiencing food insecurity?
    a. Students at two-year institutions are more likely to be food insecure.
    b. First generation college students are more likely to experience food insecurity.
    c. Students with non-binary gender identities are more likely to be food insecure.
    d. Students who live outside of walking distance of campus are more likely to experience food insecurity.
3. How is food insecurity associated with students' academic outcomes?
    a. Students experiencing food insecurity will have lower GPAs than food secure students.

Data and Methods

Data:

I use the Study on Collegiate Financial Wellness (SCFW), a multi-institutional study that explores the financial attitudes, behaviors and knowledge of students from two- and four-year non-profit colleges and universities across the United States via an online survey. I helped to administer the study, handling administrative responsibilities that included communicating with partner schools, institutional review board coordination, survey design, data collection, analysis, and reporting. Appendix A describes the study administration in detail. The SCFW team administered the study in February 2017 to 65 institutions in 25 states. The 2017 institutions included 37 four-year public institutions (56.9% of the SCFW sample), six four-year private institutions (9.2% of the SCFW sample), and 22 two-year institutions (33.8% of the SCFW sample).

Participating institutions could also opt-in to participate in a module of student food insecurity. This module is the basis for this dissertation. Forty-seven institutions participated in the food insecurity module. With 47 of the 65 participating institutions electing to participate in the food security module, this 70.7% participation rate in the module suggests a growing awareness of the food insecurity issue among postsecondary institutions. The breakdown by school type of these institutions is: 25 four-year public institutions, three four-year private institutions and 19 two-year public institutions. At these 47 institutions, 206,835 of students were invited to take the survey and 21,773 of these invited students completed at least one question in the larger SCFW survey. For the

food security module, 17,811 students answered at least one question in the module, for a response rate of 81.8% on the food security module among students who participated in the larger SCFW. My response rates are comparable to, and in many cases better than, other multi-institutional studies of food insecurity. See Table 3.1 for detailed information on response rates. This large number of student responses provides robust information for analysis, particularly when used with the SCFW's variety of demographic and education measures.

In these analyses, the three four-year private institutions are excluded. These three institutions are nonselective four-year schools. I chose to exclude these three institutions from the analyses because these schools have very high food insecurity rates among their students and are not fully representative of four-year non-profit private institutions. Thus, I exclude them in order to be able to speak more definitively about food insecurity among public institutions.

The seven question food insecurity module includes the six-item United States Department of Agriculture (USDA) questionnaire on food insecurity, in addition to one question from the 10-item USDA food security form. Blumberg, Bialostosky, Hamilton, and Briefel (1999) developed the six-item short form out of the original 18-item U.S. Household Food Security Survey Module, which includes the 10-item U.S. Adult Food Security Survey Module and an additional eight questions about food security among children in the household. The questions on the six-item short form come from a subset of questions on the 18-item U.S. Household Food Security Survey Module that had

strong concordance when tested. These researchers found that the six-item short form correctly identified the food security level of 99% of households with no children (Blumberg et al. 1999). Additionally, food insecurity was underestimated by only 0.3 percentage points (Blumberg et al. 1999). For this dissertation, I use only the USDA six-item module, described in more detail in Table 3.2. Individuals were given a score of 1 each time their answers fell into an affirmative category (highlighted in bold in Table 3.2). This created a food security index that ranged from 0 to 6. Higher scores on the USDA index indicate greater food insecurity.

The USDA provides directions for combining the six items into a three category food insecurity index, with categories food secure, low food security, and very low food security. While food security and insecurity exist as a continuum for individuals and households, it is useful to classify them into discrete categories for the purpose of analysis. These categories also allow for some general comparisons between surveys that use the USDA modules of varying lengths because all of the USDA food security surveys are broken down into these same categories. This also allows me to compare the results for my sample to the results of other studies, which use the same classifications.

I recoded responses into the following three categories based on the students' total score: (a) food secure – raw score 0-1; (b) low food security – raw score 2-4; (c) very low food security – raw score 5-6. These three categories are then turned into a dichotomous variable for some analyses, with categories of food insecure (including low food security and very low food security respondents) and food secure (including food secure

respondents). Dichotomizing the three categories is acceptable per USDA guidelines. See Tables 3.2 and 3.3 for more detailed information on the responses to these questions from the data for the module.

Method:

First, I use descriptive statistics and chi-square tests to understand the correlations and associations between food insecurity and my demographic and academic outcome variables. Then, I use a series of clustered logistic regression and ordinary least squares (OLS) regression models to explore my research questions. For these models, I first use logistic regression to investigate the association of individual demographic characteristics on food insecurity status. I cluster the models by institution. This allows me to investigate how certain student characteristics may increase or reduce the likelihood of experiencing food insecurity. My dependent variable in this model is food insecurity status. Second, I use ordinary least squares regression to investigate the association of food insecurity and student GPA to understand if food insecurity is correlated with students' academics. My dependent variable in this model is GPA.

Dependent Variables:

The two dependent variables that I utilize in the two regression models are 1) a binary measure of food insecurity in the logistic regression and 2) student GPA in the OLS regression. I created the binary measure of food insecurity, where 1 is food insecure and 0 is food secure, by condensing the categories of low food security and very low food security into the category food insecure. Students with high food security are classified as

a 0. As stated above, this follows USDA guidelines. The student GPA dependent variable uses institutionally-reported student GPA when available as the primary source of student GPA. If not available, I use students' self-reported GPA. For students who were missing GPA information, I use mean replacement. Results with and without mean replacement are not hugely different. I use institution-reported GPA as the primary source of GPA information because it is more official and has less room for self-reported errors. I use GPA as a measure of students' academic success to understand if food insecurity is correlated with academic outcomes.

Independent Variables:

My independent variables for both the logistic regression and ordinary least squares regression models are the same, with the exception of adding food insecurity status to the OLS models as the key independent variable. In the models, I also include independent variables for institution type, first generation student status, gender, Pell Grant status, debt status, and housing location. These variables are part of my theoretical framework in understanding food insecurity among students. Additionally, I control for race/ethnicity, age, international student status, if a student is financially responsible for a child, employment status, and class rank.

Institution type includes selective four-year public institutions, nonselective four-year public institutions, and nonselective two-year institutions. I define institutional selectivity using Barron's 2018 Guide to Colleges selectivity rankings. Selective institutions are those rated by Barron's as most competitive, highly competitive, or very

competitive. Competitiveness is defined based on median entrance examination scores (SAT/ACT) of matriculating classes, matriculating students' high school class rank, as well as admissions selectivity. Institution type is important to include in these models because previous research has shown differences in student food insecurity by institution type (Goldrick-Rab et al. 2018) and I want to explore if institutional selectivity matters for food insecurity.

Gender includes men, women, and another gender identity. Race includes white, Asian, African American, Hispanic/Latinx, and other or multi-racial. Age is a binary variable of traditional age and non-traditional age students. Similarly, first generation student status is also a binary variable. First generation status in this study is defined as any student who reported that their parents or guardians did not complete at least a bachelor's degree. Pell Grant status is a binary variable, as is international student status. Each of these variables is important because they are standard demographic variables that previous studies have shown to be associated with food insecurity, so I want to be sure to include them in my models.

The debt variable encompasses debt from any source that a student might have, so it includes not only student loans, but also credit card debt, car loan debt, etc. The variable for if a student is financially responsible for a child is a binary variable. Employment status includes students who are not employed, employed part-time, or employed full-time. Class rank includes first year through fourth year students, as well as students who have been enrolled for five or more years at the undergraduate level. Last,

housing location includes living on-campus, living off-campus within walking distance, and living off-campus outside of walking distance. These variables provide a larger, more nuanced picture of students' situations as they relate to their economic security and their risk for food insecurity.

Limitations:

As with any study, this examination of food insecurity among students has its limitations. First, while the SCFW data offer many opportunities for unique analyses, they are not nationally representative data. Institutions opted to participate not only in the broader study, but also in the food security module in particular. This could have led to some selection bias in terms of institution participation. Additionally, it is possible that students who were economically insecure were more likely to participate in the SCFW, another source of potential selection bias. However, in the SCFW data, only 53% of students reported using student loans to pay for school compared to about 60% in the general population (McFarland et al. 2017), so I am not overly worried about this potential selection bias.

Low survey response rates are one of the challenges in research of this kind, and this study is no exception. However, while the overall response rate is low, it is comparable to, if not better than, other studies of food insecurity that used an online survey format. Additionally, among students who saw the food security questions in the survey, the vast majority completed them.

Missing data is also sometimes a concern in studies. In this study, there is missing data, but they do not have an outsized impact on the study. I used mean replacement for students who are missing GPA information. I also did multiple imputation to confirm that there were not large differences between imputed and non-imputed data. There were not big differences, so I use the non-imputed data for parsimony and clarity.

Results

Descriptive Information:

To understand how food insecurity among students in my sample compares to food insecurity reported in other research studies on this topic, I first describe descriptive information about food insecurity in these data. This is also important since this is a unique data source that has not previously been utilized to understand food insecurity in the college setting. Chi-square tests indicate statistically significant relationships in all of these findings at the 0.001 level. Across the full sample of two- and four-year students, 20.9% were experiencing very low food security and 19.4% were experiencing low food security, for a total food insecurity estimate of 40.3%. At selective public four-year institutions, 17.6% of students were experiencing low food security and 16.5% were experiencing very low food security, for a total food insecurity rate of 34.1%. At nonselective four-year public institutions, 19.6% of students were experiencing low food security and 20.7% were experiencing very low food security, for a total food insecurity rate of 40.3%. At two-year public institutions, 21.5% of students were classified as

experiencing low food security and 27.4% were experiencing very low food security, for a total food insecurity rate of 48.9%. See Table 3.5 for these full results. These results are similar to the findings of other studies of the difference between two- and four-year institutions (Goldrick-Rab et al. 2018; Maroto et al. 2015; Morris et al. 2016; Crutchfield and Maguire 2018), but this study provides additional information by breaking four-year schools into selective and nonselective groups. These findings confirm Hypothesis 1a, that estimates of food insecurity in my unique sample will confirm the estimates of other research in this area. They also provide initial support for Hypothesis 2a, that students at two-year institutions are more likely to be food insecure.

I confirm the work of other studies in finding that students who reported that they received a Pell Grant were almost twice as likely to report having very low food security than students who did not have a Pell Grant, with 29.0% of Pell Grant recipients having very low food security and 14.7% of non-Pell Grant recipients having very low food security. When low food security is included, 51% of Pell Grant recipients were classified as food insecure, compared to 31.6% of students who did not report receiving a Pell Grant. First generation students are also more likely to be food insecure (48.3%) than non-first generation students (33.3%), providing support for Hypothesis 2b.

Additionally, I am able to include students with a non-binary gender identity in my results. Results suggest that 23.5% of students with a non-binary gender identity have low food security and 38.6% have very low food security, for a total food insecurity rate of 62.1%. This finding suggests preliminary support for Hypothesis 2c. Only one other

research study to date has descriptively investigated students with non-binary gender identities and their rates of food insecurity, finding that 50% of students with a non-binary gender at two-year institutions were food insecure and 46% at four-year institutions were food insecure (Goldrick-Rab et al. 2018). My estimates are higher than the estimates in this initial study.

In the descriptive statistics here, I use GPA as a categorical variable, but in the OLS regression models that follow, I use GPA as a continuous variable. Students with a GPA of 3.00 to 3.99 had a very low food insecurity rate of 18.1% compared to students with a GPA of 2.00 to 2.99 having a very low food insecurity rate of 29.4%. This provides initial support for Hypothesis 3a, that students experiencing food insecurity will have lower GPAs than food secure students.

See Table 3.5 for additional information of food insecurity status by demographic variables. This descriptive information answers my first research question about the estimates of food insecurity in my sample of students. It also provides further confirmation of Hypothesis 1a, that the estimates of food insecurity in this sample are similar to the estimates of food insecurity reported in other studies.

Relationship of Demographics and Food Insecurity Status:

To more thoroughly explore my second research question and Hypotheses 2a, 2b, 2c, and 2d about the college student characteristics and demographics that correlate with students experiencing food insecurity, I investigate the relationship between individual demographic characteristics and food insecurity using a series of clustered logistic

regression models. See Table 3.6 for results from these models. In doing so, I seek to understand if certain groups of students are potentially more at risk for food insecurity in college. My dependent variable is a binary variable for food insecurity. My key independent variables include institution type and selectivity, first generation status, gender, Pell Grant status, debt status, and residence location. These variables allow me to explore my research hypotheses and explore factors in the research literature that are either still under development (e.g., non-binary gender identities) or confirm existing research (e.g., first generation status). I also include demographic characteristics such as race, age, international student status, financially responsible for a child, employment, and class rank. These additional variables are important to include because they could mediate the relationship between my independent variables of interest and my food insecurity dependent variable. For example, while existing research has shown that students of color are more likely to experience food insecurity (Crutchfield and Maguire 2018; Dubick et al. 2016; Freudenberg et al. 2011; Goldrick-Rab et al. 2018; Martinez et al. 2016; Morris et al. 2016; Payne-Sturges et al. 2018; Phillips et al. 2018), including race/ethnicity is also important since it could mediate the relationship between first generation status, Pell Grant status, and food insecurity.

In my first logistic regression model, I explore how institution type may be correlated with student food insecurity. This model includes only institution and selectivity type so that I can understand how institution and selectivity type together may be associated with food insecurity as an initial building block. By including not only two-

and four-year institutions, but also whether four-year institutions are selective institutions or not, I push the literature forward because existing research has not considered the potential role of selectivity in estimates of student food insecurity. This first model indicates that students at nonselective four-year institutions have 1.3 times higher odds of being food insecure than students at selective four-year institutions. Students at two-year institutions have 1.9 higher odds of being food insecure than students at selective four-year institutions. This provides additional confirmation of Hypothesis 2a beyond the descriptive statistics discussed previously. This relationship changes somewhat, however, once student-level characteristics are added to the model, which is discussed in more detail below.

For my second logistic regression model, I look only at student-level demographic characteristics and their relationship with food insecurity. This allows me to look specifically at gender, race, age, first generation status, and Pell Grant status of students and their relationship to food insecurity. For Hypothesis 2b, I find that first generation students have 1.3 times higher odds of experiencing food insecurity than their non-first generation peers in this model. In this model, I find that students with a non-binary gender identity have 2.5 times higher odds of being food insecure than male-identified students. This supports Hypothesis 2c. I also find that students of color, especially African-American and Hispanic students are more likely to be food insecure than their white peers, confirming previous research. Specifically, African-American students have 1.9 times higher odds of experiencing food insecurity than white students and Hispanic

students have 1.4 times higher odds of experiencing food insecurity. Students with a Pell Grant also have 1.9 times higher odds of experiencing food insecurity than students with no Pell Grant. The incorporation of race/ethnicity and Pell Grant status confirms other research with similar findings, adding to the reliability of my data (Goldrick-Rab 2016; Phillips et al. 2018; Gaines et al. 2014; Chaparro et al. 2009).

In the third model, I add in the institutional type variables to the model in combination with student demographic characteristics, a combination of Models 1 and 2. Doing so does not affect the influence of individual characteristics on the likelihood of experiencing food insecurity. It does, however, have an effect on the likelihood of food insecurity among two-year institution students, with two-year institution students having slightly decreased odds (1.4 from 1.8 in Model 1) of being food insecure. Despite the decrease, Model 3 still supports Hypothesis 2a.

In Model 4, the full logistic regression model, I add additional individual student characteristics, including if students are financially responsible for a dependent child, student debt status, employment status, class rank, and living location. These variables apply further nuance to the model and add important student characteristics to more fully flesh out the model and move the literature on food security forward. I apply these additional characteristics in the final model only because they are less traditional demographic characteristics, so provide additional nuance in understanding any potential mediating relationships between, for example, student debt status, institutional type and selectivity, and food insecurity status.

In my full logistic regression model, one of my key findings that supports Hypothesis 2a is that the type of institution a student attends is associated with their food insecurity status. Students at nonselective two-year institutions had 1.4 times higher odds of experiencing food insecurity than their counterparts at selective four-year institutions. However, there is not a statistically significant difference between students at nonselective four-year institutions and selective four-year institutions and their odds of experiencing food insecurity. Figure 3.1 shows the predicted probability of experiencing food insecurity by institution type.

Additionally, I find that first generation students were 1.3 times more likely to experience food insecurity than their non-first generation peers, which offers support for Hypothesis 2b. Figure 3.2 shows the predicted probability of experiencing food insecurity by first generation status. Additionally, in Model 4, women were more likely than men to experience food insecurity, and non-binary gender identified students were 2.6 times more likely to experience food insecurity than male-identified students. Figure 3.3 shows the predicted probability of food insecurity across the three gender identity categories. The finding that students with a non-binary gender identity are particularly at risk for food insecurity serves as an indicator of the many cumulative barriers that non-binary gender students may face. Only one other study on food insecurity has had enough students with non-binary gender identities to begin to understand food insecurity among them (Goldrick-Rab et al. 2018), so my finding of these students' high risk for food insecurity provides an important confirmation of the initial findings of the other study. It

also supports Hypothesis 2c. Also, students living off-campus, either within or beyond walking distance, were more likely to experience food insecurity than students who live on campus. This supports Hypothesis 2d. Figure 3.4 shows the predicted probability of food insecurity by residence location.

In terms of the effect of controls, I find that students with Pell Grants were also more likely to experience food insecurity while in college, having 1.8 times higher odds of having food insecurity experiences. Students with debt from any source were 2.1 times more likely to experience food insecurity than students with no debt. These financially-based variables also confirm the work of previous studies that found that students with financial aid were more likely to experience food insecurity (Gaines et al. 2014).

African-American and Hispanic students were more likely to experience food insecurity than white students (1.9 times more likely and 1.5 times more likely, respectively). This shows a pattern similar to that identified in other studies in which racial and ethnic minority students are more likely to experience food insecurity (Dubick et al. 2016; Morris et al. 2016; Payne-Sturges et al. 2018). Students who work part-time were 1.2 times more likely to experience food insecurity than students who did not work, which also affirms the work of other studies (Dubick et al. 2016). Overall, the logistic regression models suggest that student demographic characteristics are correlated with students' likelihood of experiencing food insecurity.

Relationship of Food Insecurity and GPA:

I next considered food insecurity's association with academic outcomes, specifically GPA, using a series of Ordinary Least Squares (OLS) regression models. See Table 3.7 for the full results. In Model 1, I include only the dependent variable, GPA, and my key independent variable, a binary variable for food insecurity. In these models, GPA is a continuous variable. This initial model suggests support for Hypothesis 3a, that food insecurity will be associated with lower GPAs among students, with food insecurity being associated with a 0.21 point decrease in GPA among food insecure students.

Model 2 expands to include the same demographic variables as Model 2 in the logistic regression models, such as gender, race, age, and international student status. This provides consistency across models, in addition to accounting for similar mediating relationships between these standard demographic variables. In this model, food insecurity continues to be associated with a decrease in GPA, this time by 0.16 points. Model 3 adds more demographic characteristics, such as students' debt status, class rank, and residence location to provide a fuller picture of students' lives and potential mediators of food insecurity status. In this model, the association of food insecurity and GPA continues to be significant at the 0.001 level, but is associated with a lesser GPA penalty, only 0.14 in this model.

In the final OLS regression model, Model 4, I bring together food security status, all of the student demographic characteristics, and institution type and selectivity. I wait until the final model to add institution type because it allows me to see how it is

associated with the demographic characteristics and is also more of a control in this model since my dependent variable is GPA rather than food insecurity status.

In this last model, I find that food insecurity is associated with a 0.13 point penalty to student GPA compared to food secure students. This finding is significant at the 0.001 level and demonstrates support for Hypothesis 3a, that food insecure students will have lower GPAs than food secure students. Moreover, it suggests that food insecurity is correlated with lower GPAs, taking into account other factors that are also often associated with lower GPAs, such as first generation status and Pell Grant status. In Model 4, food secure students had a mean GPA of 3.26 compared to food insecure students having a mean GPA of 3.13, holding all other variables at their means. Figure 3.5 shows this comparison. Figure 3.6 shows that food secure African-American students have a mean GPA of 3.03, holding all other variables constant at their means. Food insecure African-American students have a predicted mean GPA of 2.89, an even greater decrease than the average 0.13 penalty across all students. Overall, African-American, Hispanic, and students identifying as multi-racial were more likely to have lower GPAs than white students. Figure 3.7 shows that across all gender identities, food insecure students had lower GPAs than food secure students. Figure 3.8 describes that students at selective institutions have a mean GPA of 3.36 for food secure students, but food insecure students have a mean GPA of 3.2, a 0.16 decrease in GPA, larger than the average across all students. First generation students and students with Pell Grants also had lower GPAs based on food security status. Figure 3.9 shows predicted mean GPA

based on Pell Grant status, with food insecure students with Pell Grants having lower GPAs. Students with debt from any source or who did not know if they had any debt had a statistically significant lower GPA than students who did not have debt from any source, as shown in Figure 3.10.

Additionally, students employed full-time and students who live off-campus have slightly lower GPAs, on average. Items that were associated with an increase in GPA included being female, being a non-traditional age student, being an international student, and class rank (more advanced students had higher GPAs than first year students). The findings also suggest that students at nonselective two- and four-year schools have lower GPAs that students at selective four-year schools. Future research should examine if the correlation of food insecurity and negative effects on GPA is long term throughout the course of a student's time in college.

Last, I sought to explore how student demographics, especially certain status vulnerabilities, are associated with GPA before taking into account food insecurity status. This allows me to understand if including food insecurity in the models potentially is related to the disproportionate food insecurities different populations with status vulnerabilities may face. To do so, I again use OLS regression with student GPA as the dependent variable. Table 3.8 discusses these findings. First, in Model 1, I created a model that only includes student characteristics to understand how GPA is associated with these characteristics. In this model, African-American and Hispanic students are more likely to have lower GPAs than white students, women have higher GPAs than

men, and students with Pell Grants have lower GPAs than students who do not have Pell Grants. Second, in Model 2, I add the binary food insecurity variable to the model to look specifically at if food insecurity has an effect on increasing or decreasing the vulnerabilities identified among some populations for lower GPAs. I find that adding food insecurity to the model does lead to small decreases in the status vulnerability effects from Model 1, suggesting that the GPA deficits among some groups are potentially partly explained by these groups' disproportionate likelihood of experiencing food insecurity. These decreases, however, are very small. For example, when food insecurity is included in the model, African-American students' decrease in GPA compared to white students is 0.289 compared to 0.311 in the initial model, a decrease of only 0.02. Nonetheless, with GPAs, hundredths of a point matter for students' success in some cases.

Discussion:

First, this study answers my initial research question and Hypothesis 1a with the finding that my estimates of food insecurity in the unique sample of students in the SCFW corroborate the estimates of previous studies. This study, in confirming these findings with different data, makes it clearer that food insecurity is part of a large percentage of students' college experiences and that scholars and practitioners need to be paying attention to this harbinger of social inequality.

This research adds the important element of selectivity to the conversation on food insecurity. While some research has focused on two-year schools and four-year schools separately (Dubick et al. 2016; Goldrick-Rab et al. 2016), little research has examined the two simultaneously (Goldrick-Rab et al. 2018). Additionally, no research, to my knowledge, has considered institutional selectivity in understanding student food insecurity. By bringing selectivity into the conversation, I am able to bolster the conversation around institutional resources to support students in precarious economic positions.

The second research question explored if student characteristics are associated with food insecurity. I find that students at two-year institutions, first generation students, students with non-binary gender identities, and students outside of walking distance from campus are more likely to be food insecure, confirming Hypotheses 2a, 2b, 2c, and 2d, respectively. In connecting risk for food insecurity status to demographic characteristics, I also seek to help colleges and universities understand this phenomenon at their institutions. Specifically, this work can help colleges and universities to understand who may be most likely to be at risk of food insecurity at their institution and to craft programs to support these students. Moreover, it demonstrates that students who may already be at risk for disadvantage in college, from their debt status, Pell Grant status, and parental education status, are cumulatively also more at risk to experience food insecurity.

Last, in investigating Hypothesis 3a about the association of food insecurity with student academic outcomes, I hypothesized correctly that food insecurity would be associated with a lower GPA. These findings suggest that food insecurity is correlated with students' academic success, controlling for a variety of other demographic characteristics. Additionally, this finding contributes to scholars' understanding of food insecurity in the college setting. By connecting food insecurity to an important aspect of college success, GPA, I create a connection for colleges to engage with this issue at their institutions. In connecting student food insecurity to academic outcomes around college success, the imperative to intervene to support students may come to the forefront for colleges and universities. Without the connection to academics, this imperative may be less strong because it is not as directly connected to the institutional mission.

Food insecurity is one manifestation of the economic insecurity that many students may face during their time in college. Importantly, it is a manifestation that has been shown to be ameliorated at the K-12 level through national priorities around food, in the form of the National School Lunch program (NLSP) (Goldrick-Rab, Broton, and Brunjes-Colo 2016). Other recent policy papers have made the argument for a continuation of the national school lunch program at the college level (Goldrick Rab et al. 2016). Researchers should continue to explore this policy option to ameliorate food insecurity at the college level. Particularly for students who participated in the national school lunch program in a K-12 setting, the transition to college and the lack of such a

program is yet another example of the particularly individualized risk of the college setting. Students do not have this safety net program available to them in college.

Economic insecurity is part of the college experience for too many students. This insecurity is correlated with negative academic outcomes, may be part of the cumulative disadvantage some groups of students face, and is intricately connected to the increasingly individualized risk of pursuing higher education. Adding food insecurity to scholars' understanding of economic inequality in higher education adds further nuance to the college experience and definitions of student success. By bringing food insecurity to the forefront, I craft a more nuanced understanding of an important aspect of students' daily, lived experiences in college, their ability to eat a quality and nutritious diet unconstrained by financial barriers.

Tables:

Institution Type	# of institutions	# of invited students to food insecurity questions	# of student respondents in the SCFW	Overall Response Rate	# of students who answered at least 1 food insecurity question	Food Security Module Response Rates
All Institutions	47	206,835	21,773	10.5%	17,811	81.8%
4-year	28	120,689	15,773	13.1%	13,369	84.8%
2-year	19	86,146	6,000	7.0%	4,442	74.0%

Table 3.1 Study on Collegiate Financial Wellness Response Rate Information

Food Security Reponses by Question		
1. The food that I bought just didn't last, and I didn't have money to get more.		
	Freq.	Percent
Never true	10,523	69.2%
Sometimes true	3,244	21.3%
Often true	1,253	8.2%
Don't know/ Prefer not to answer	192	1.3%
Total	15,212	100.0%
2. I couldn't afford to eat balanced meals.		
	Freq.	Percent
Never true	8,800	57.9%
Sometimes true	3,618	23.8%
Often true	2,579	17.0%
Don't know/ Prefer not to answer	212	1.4%
Total	15,209	100.0%
3. In the last 12 months, did you ever cut the size of your meals or skip meals because there wasn't enough money for food?		
	Freq.	Percent
Yes	5,249	34.5%
No	9,355	61.4%
Don't know/Prefer not to answer	632	4.2%
Total	15,236	100.0%
4. How often did this happen?[1]		
	Freq	Percent
Almost every month	1,540	29.4%
Some months but not every month	1,990	38.0%
Only 1 or 2 months	1,338	25.6%
Don't know/ Prefer not to answer	369	7.1%
Total	5,237	100.0%

Table 3.2 Food Security Responses by Question

Continued

Table 3.2 Continued

5. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?		
	Freq.	Percent
Yes	4,903	32.2%
No	9,689	63.7%
Don't know/ Prefer not to answer	624	4.1%
Total	15,216	100.0%

6. In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for food?		
	Freq.	Percent
Yes	3,973	26.1%
No	10,643	69.9%
Don't know/ Prefer not to answer	601	4.0%
Total	15,217	100.0%

Notes:

[1] Only students who answered 'Yes' to Question 3 saw this question.

Not all students answered every question. Students are included in the food security index if they answered at least one question.

Food Security Index Scores			
Score Categories	Score	Freq.	Percent
High food security	0	7,375	48.4%
Marginal food security	1	1,730	11.3%
Low food security	2	1,172	7.7%
Low food security	3	824	5.4%
Low food security	4	958	6.3%
Very low food security	5	1,187	7.8%
Very low food security	6	2,006	13.2%
Total		15,252	100.0%

Table 3.3 Food Security Index Scores

Food Security Index Categories			
Categories	Score	Freq.	Percent
High or marginal food security	0-1	9,105	59.7%
Low food security	2-4	2,954	19.4%
Very low food security	5-6	3,193	20.9%
Total		15,252	100.0%

Table 3.4 Food Security Index Categories

Food Security by Demographic Characteristics

	Food Security Status						
	Secure		Low		Very Low		X^2 test
	%	n	%	n	%	n	
All Students	59.7%	9,105	19.4%	2,954	20.9%	3,193	
Gender							***
Male	62.7%	3,159	18.4%	929	18.9%	951	
Female	58.6%	5,878	19.8%	1,983	21.7%	2,173	
Another gender identity	38.0%	68	23.5%	42	38.6%	69	
Race/Ethnicity							***
White	64.9%	6,066	17.2%	1,610	17.9%	1,673	
Asian or Asian American	60.9%	927	22.7%	346	16.4%	250	
African American or Black	42.7%	366	24.3%	208	33.0%	283	
Hispanic	48.5%	1,249	23.1%	595	28.4%	732	
Other/Multiracial	52.5%	497	20.6%	195	26.9%	255	
Age							***
Traditional (age 18-23)	61.7%	7,399	19.0%	2,251	19.3%	2,283	
Non-traditional (age 24 or older)	52.8%	1,805	20.6%	703	26.6%	910	
Years enrolled in postsecondary education							***
1 year	66.9%	2,495	17.5%	653	15.5%	579	
2 years	59.4%	2,024	19.2%	654	21.4%	727	
3 years	58.2%	1,936	19.9%	663	21.8%	726	
4 years	57.4%	1,480	19.9%	512	22.7%	585	
5 or more years	52.8%	1,170	21.3%	472	26.0%	576	
First-generation status							***
First generation student	51.8%	3,591	20.7%	1,433	27.6%	1,913	
Non-first generation student	66.6%	5,450	18.1%	1,482	15.2%	1,246	
Don't know	46.7%	64	28.5%	39	24.8%	34	

Table 3.5 Food Security by Demographic Characteristics
Continued

Table 3.5 Continued

	Food Security Status						
	Secure		Low		Very low		X^2 test
Pell Grant Recipient							***
Yes	49.0%	3,168	22.0%	1,423	29.0%	1,876	
No	68.3%	5,248	16.9%	1,301	14.7%	1,132	
I don't know	62.4%	689	20.8%	230	16.8%	185	
International Student Status							***
International Student	59.2%	324	26.0%	142	14.8%	81	
Domestic Student	59.7%	8,781	19.1%	2,812	21.2%	3,112	
Employment status							***
Full-time	54.5%	980	18.1%	326	27.4%	493	
Part-time	57.2%	4,466	20.9%	1,631	21.9%	1,710	
Not employed	64.8%	3,659	17.7%	997	17.5%	990	
Current debt of any kind							***
Currently has some form of debt	51.5%	4,314	21.6%	1,812	26.9%	2,253	
Does not currently have any form of debt	71.2%	4,395	15.7%	971	13.1%	811	
Don't know	56.9%	396	24.6%	171	18.5%	129	
Financially responsible for child(ren)							***
Yes	51.8%	741	20.9%	299	27.3%	391	
No	60.5%	8,364	19.2%	2,655	20.3%	2,802	
Residence							***
On-Campus	69.4%	2,967	17.8%	759	12.8%	547	
Off-Campus, within walking distance	57.4%	2,411	20.4%	859	22.2%	933	
Off-Campus, outside of walking distance	55.0%	3,727	19.7%	1,336	25.3%	1,713	
School Type							***
4-year selective public institution	66.0%	3,566	17.6%	950	16.5%	889	
4-year nonselective public institution	59.7%	3,515	19.6%	1,154	20.7%	1,222	
2-year nonselective public institution	51.2%	2,024	21.5%	850	27.4%	1,082	
GPA Categories							***
Less than 2.00	47.8%	274	23.7%	136	28.5%	163	
2.00 - 2.99	49.2%	1,881	21.4%	819	29.4%	1,123	
3.00 - 3.99	63.1%	6,246	18.8%	1,862	18.1%	1,787	
4.00	73.3%	704	14.3%	137	12.5%	120	

Logistic Regression Model of Demographics on Food Insecurity

Dependent variable: **Food Insecurity** (ref. food secure)	(1)	(2)	(3)	(4)
Institution Type (ref. selective 4-year school)				
Nonselective 4-year school	1.311*		1.217*	1.160
	(0.17)		(0.12)	(0.10)
Nonselective 2-year school	1.851***		1.356**	1.444***
	(0.22)		(0.13)	(0.13)
Gender (ref. male)				
Female		1.137***	1.131**	1.103*
		(0.04)	(0.04)	(0.04)
Another gender identity		2.552***	2.547***	2.577***
		(0.42)	(0.42)	(0.42)
Race (ref. white)				
Asian		1.057	1.035	1.130
		(0.08)	(0.07)	(0.08)
African-American		1.921***	1.896***	2.000***
		(0.19)	(0.19)	(0.21)
Hispanic		1.535***	1.433***	1.498***
		(0.08)	(0.09)	(0.09)
Other/Multiracial		1.485***	1.446***	1.500***
		(0.11)	(0.10)	(0.12)
Non-traditional age (ref. traditional age)		1.155*	1.070	0.855*
		(0.08)	(0.07)	(0.06)
First generation student (ref. non-first generation student)				
First Generation student		1.399***	1.347***	1.294***
		(0.06)	(0.06)	(0.06)
Doesn’t know		1.547**	1.440*	1.404*
		(0.24)	(0.22)	(0.19)
Pell Status (ref. doesn’t have Pell Grant)				
Has Pell Grant		1.903***	1.918***	1.760***
		(0.09)	(0.10)	(0.09)
Doesn't know Pell status		1.255**	1.255*	1.260*
		(0.11)	(0.11)	(0.11)

Table 3.6 Logistic Regression Model of Demographics on Food Insecurity

Continued

Table 3.6 Continued

International student (ref. domestic student)		1.526*** (0.14)	1.567*** (0.15)	1.828*** (0.17)
Debt from any source (ref. no debt)				
Has debt				2.070*** (0.09)
Doesn't know if has debt				1.917*** (0.18)
Financially responsible for a child (ref. not responsible)				0.934 (0.05)
Employment Status (ref. not employed				
Employed Part-Time				1.228*** (0.05)
Employed Full-Time				1.068 (0.08)
Class Rank (ref. first year)				
2				1.189** (0.06)
3				1.147* (0.07)
4				1.158** (0.07)
5 or more				1.248** (0.10)
Residence Location (ref. on-campus)				
Off-campus within walking distance				1.523*** (0.09)
Off-campus outside of walking distance				1.279*** (0.08)
Observations	15252	15252	15252	15252
Pseudo R^2	0.010	0.046	0.048	0.076

Note 1: Odds ratios and standard errors. Estimates from Study on Collegiate Financial Wellness (SCFW)
Note 2: Food insecurity variable derived from responses to USDA six-item short form on food security
* p<.05, ** p<.01, *** p<.001

OLS Regression Model of Food Insecurity on GPA

Dependent variable: **Student GPA**	(1)	(2)	(3)	(4)
Food insecure (ref. food secure)	-0.204***	-0.152***	-0.140***	-0.135***
	(0.01)	(0.01)	(0.01)	(0.01)
Gender (ref. male)				
Female		0.093***	0.098***	0.100***
		(0.01)	(0.01)	(0.01)
Another gender identity		0.012	0.016	0.015
		(0.05)	(0.05)	(0.05)
Race (ref. white)				
Asian		0.010	0.001	0.000
		(0.02)	(0.02)	(0.02)
African-American		-0.295***	-0.295***	-0.289***
		(0.02)	(0.02)	(0.02)
Hispanic		-0.198***	-0.191***	-0.175***
		(0.01)	(0.01)	(0.02)
Other/Multiracial		-0.088***	-0.085***	-0.080***
		(0.02)	(0.02)	(0.02)
Non-traditional age (ref. traditional age		-0.001	0.055***	0.072***
		(0.01)	(0.02)	(0.02)
First generation (ref. non-first generation)				
First Generation		-0.114***	-0.096***	-0.085***
		(0.01)	(0.01)	(0.01)
Doesn't know		-0.159**	-0.136*	-0.117*
		(0.05)	(0.05)	(0.05)
Pell Grant status (ref. no Pell)				
Has Pell Grant		-0.048***	-0.046***	-0.047***
		(0.01)	(0.01)	(0.01)
Doesn't know Pell status		-0.098***	-0.091***	-0.091***
		(0.02)	(0.02)	(0.02)
International student (ref. domestic student)		0.092**	0.072*	0.065*
		(0.03)	(0.03)	(0.03)
Any debt (ref. no debt)				
Has debt			-0.085***	-0.085***
			(0.01)	(0.01)
Doesn't know debt			-0.118***	-0.116***
			(0.03)	(0.03)

Table 3.7 OLS Regression Model of Association of Food Insecurity and GPA

Continued

Table 3.7 Continued

Financially responsible for a child (ref. not responsible)			0.031	0.035
			(0.02)	(0.02)
Employment Status (ref. not employed)				
Employed Part-Time			0.007	0.009
			(0.01)	(0.01)
Employed Full-Time			-0.080***	-0.076***
			(0.02)	(0.02)
Class Rank (ref. first year)				
2			0.060***	0.057***
			(0.02)	(0.02)
3			0.080***	0.073***
			(0.02)	(0.02)
4			0.090***	0.078***
			(0.02)	(0.02)
5 or more			0.053**	0.043*
			(0.02)	(0.02)
Residence Location (ref. on-campus)				
Off-campus within walking distance			-0.032*	-0.023
			(0.02)	(0.02)
Off-campus outside of walking distance			-0.076***	-0.045**
			(0.01)	(0.02)
School type (ref. 4-year selective school)				
Four-year nonselective school				-0.101***
				(0.01)
Two-year nonselective school				-0.121***
				(0.02)
Constant	3.292***	3.342***	3.355***	3.399***
	(0.01)	(0.01)	(0.02)	(0.02)
Observations	15252	15252	15252	15252
R^2	0.024	0.068	0.076	0.082

Note 1: Odds ratios and standard errors. Estimates from Study on Collegiate Financial Wellness (SCFW)

Note 2: Food insecurity variable derived from responses to USDA six-item short form on food security

* p<.05, ** p<.01, *** p<.001

Association of Student Food Insecurity and GPA, Part 2

Dependent variable is **student GPA**	(1)	(2)
Gender (ref. male)		
Female	0.097***	0.100***
	(0.01)	(0.01)
Another gender identity	-0.013	0.015
	(0.05)	(0.05)
Race (ref. white)		
Asian	-0.003	0.000
	(0.02)	(0.02)
African-American	-0.311***	-0.289***
	(0.02)	(0.02)
Hispanic	-0.187***	-0.175***
	(0.02)	(0.02)
Other/Multiracial	-0.092***	-0.080***
	(0.02)	(0.02)
Non-traditional age (ref.	0.076***	0.072***
traditional age	(0.02)	(0.02)
First generation (ref. non-first generation)		
First Generation	-0.092***	-0.085***
	(0.01)	(0.01)
Doesn't know	-0.127*	-0.117*
	(0.06)	(0.05)
Pell Grant status (ref. no Pell)		
Has Pell Grant	-0.064***	-0.047***
	(0.01)	(0.01)
Doesn't know Pell status	-0.097***	-0.091***
	(0.02)	(0.02)
International student (ref.	0.047	0.065*
domestic student)	(0.03)	(0.03)
Any debt (ref. no debt)		
Has debt	-0.107***	-0.085***
	(0.01)	(0.01)
Doesn't know debt	-0.134***	-0.116***
	(0.03)	(0.03)
Financially responsible for a	0.036	0.035
child (ref. not responsible)	(0.02)	(0.02)

Table 3.8 OLS Regression Model Association of Food Insecurity and GPA, Part 2

Continued

Table 3.8 Continued

Employment Status (ref. not employed)		
Employed Part-Time	0.003	0.009
	(0.01)	(0.01)
Employed Full-Time	-0.077***	-0.076***
	(0.02)	(0.02)
Class Rank (ref. first year)	0.052***	0.057***
2	(0.02)	(0.02)
	0.069***	0.073***
3	(0.02)	(0.02)
	0.074***	0.078***
4	(0.02)	(0.02)
	0.037	0.043*
5 or more	(0.02)	(0.02)
Residence Location (ref. on-campus)		
Off-campus within walking distance	-0.035*	-0.023
	(0.02)	(0.02)
Off-campus outside of walking distance	-0.052**	-0.045**
	(0.02)	(0.02)
School type (ref. 4-year selective school)		
Four-year nonselective school	-0.105***	-0.101***
	(0.01)	(0.01)
Two-year nonselective school	-0.132***	-0.121***
	(0.02)	(0.02)
Food insecure (ref. food secure)		-0.135***
		(0.01)
Constant	3.392***	3.399***
	(0.02)	(0.02)
Observations	15252	15252
R^2	0.073	0.082

Figures:

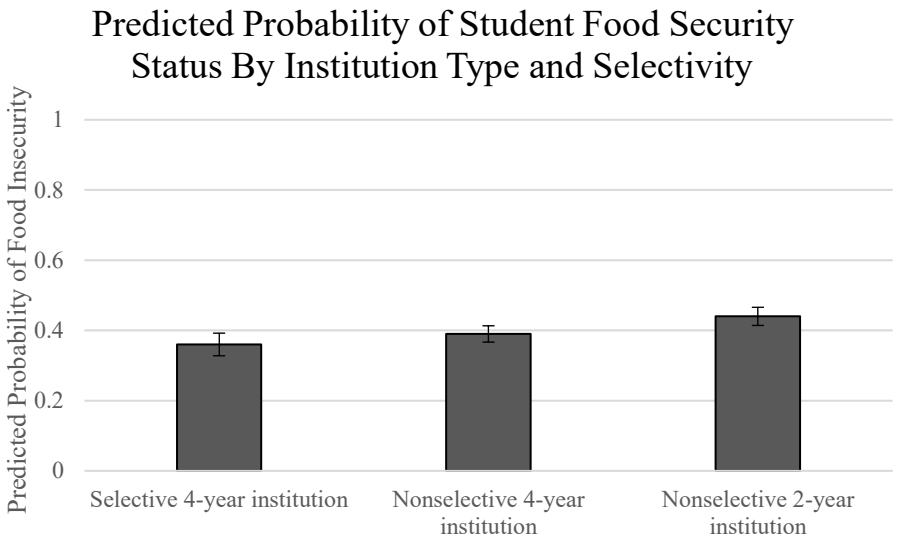

Figure 3.1 Predicted Probability of Food Insecurity by Institution Type and Selectivity

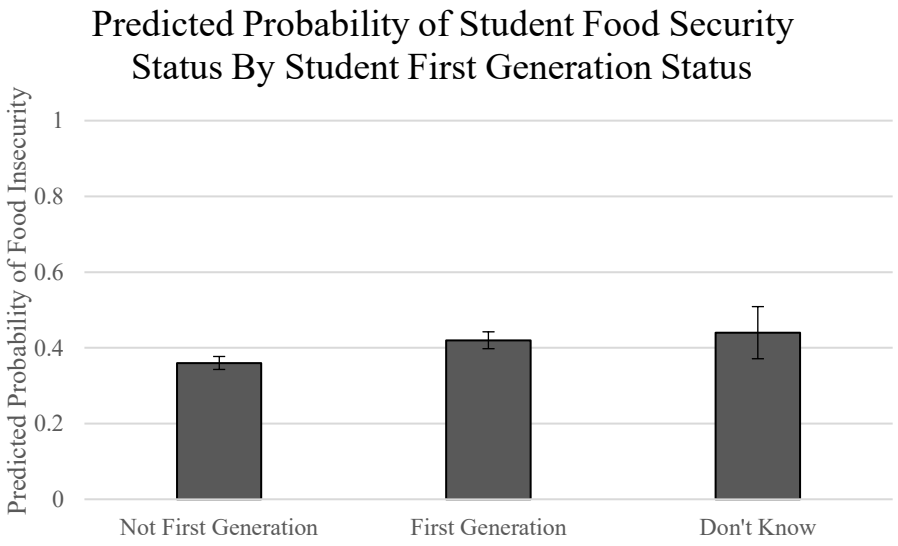

Figure 3.2 Predicted Probability of Food Insecurity by First Generation Status

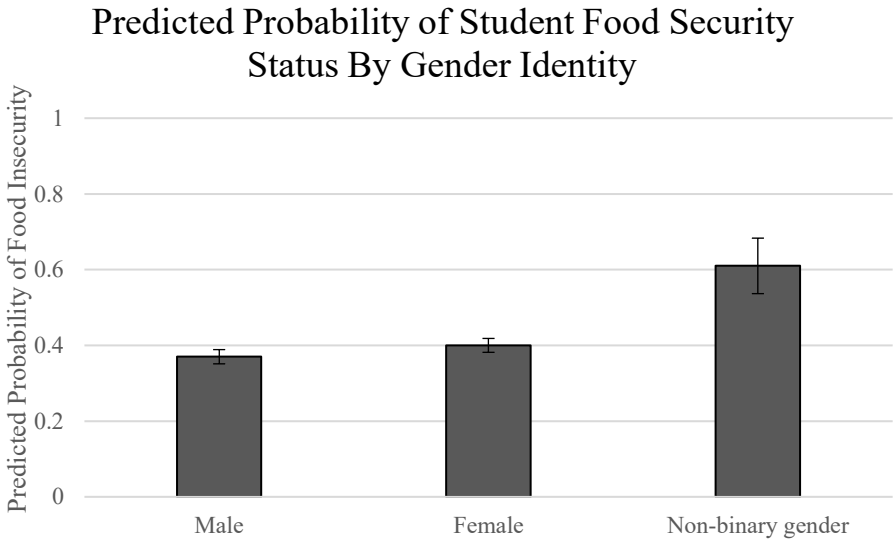

Figure 3.3 Predicted Probability of Food Insecurity by Gender Identity

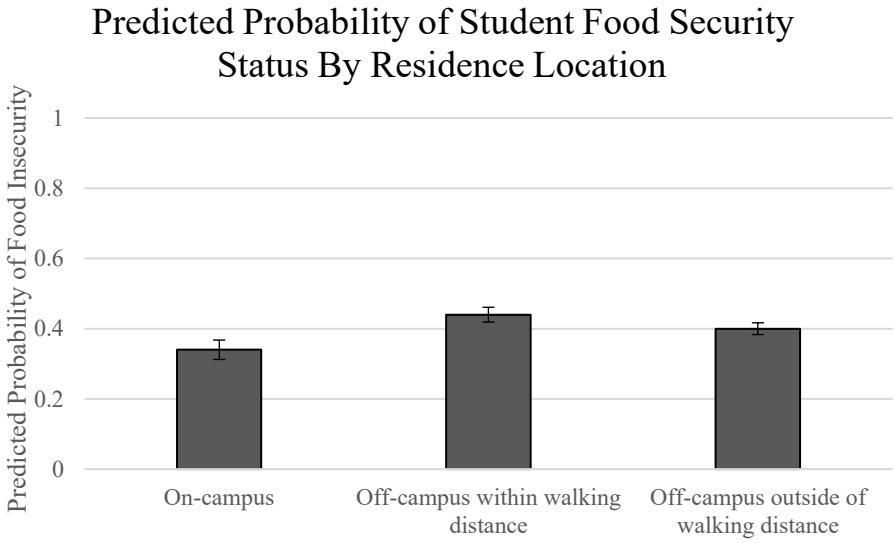

Figure 3.4 Predicted Probability of Food Insecurity by Residence Location

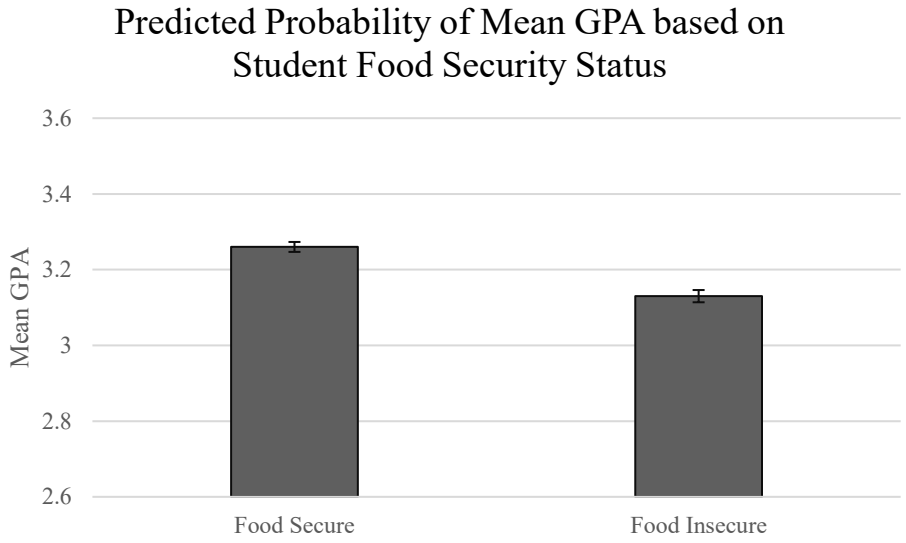

Figure 3.5 Predicted Probability of Mean GPA by Food Security Status

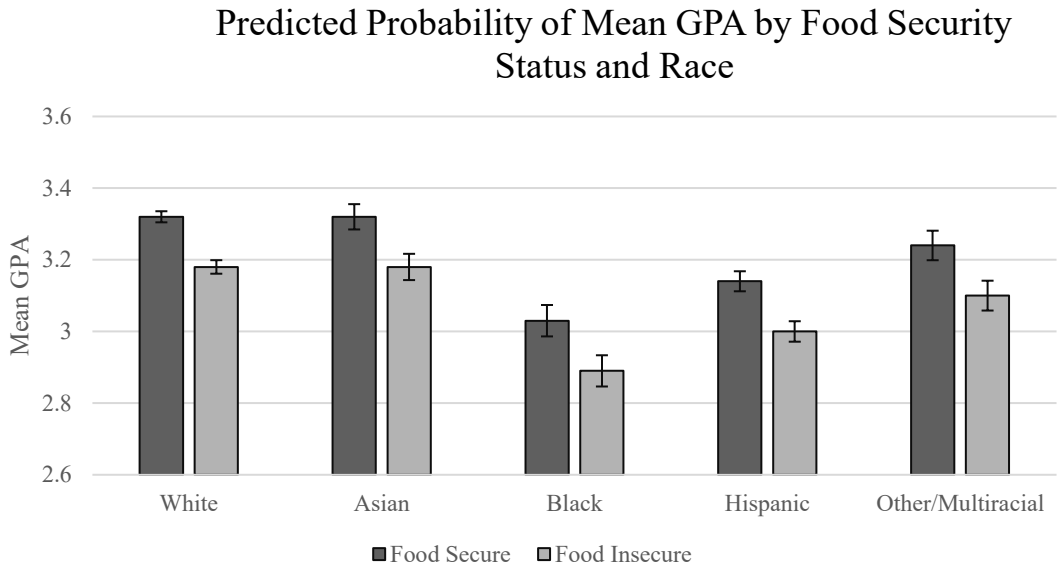

Figure 3.6 Predicted Probability of Mean GPA by Food Security Status and Race

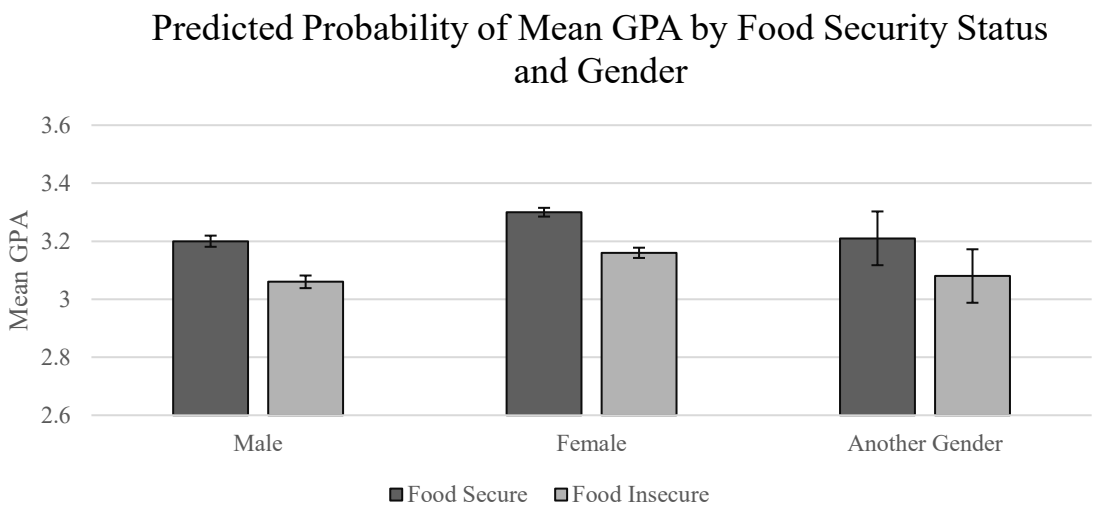

Figure 3.7 Predicted Probability of Mean GPA by Food Security Status and Gender

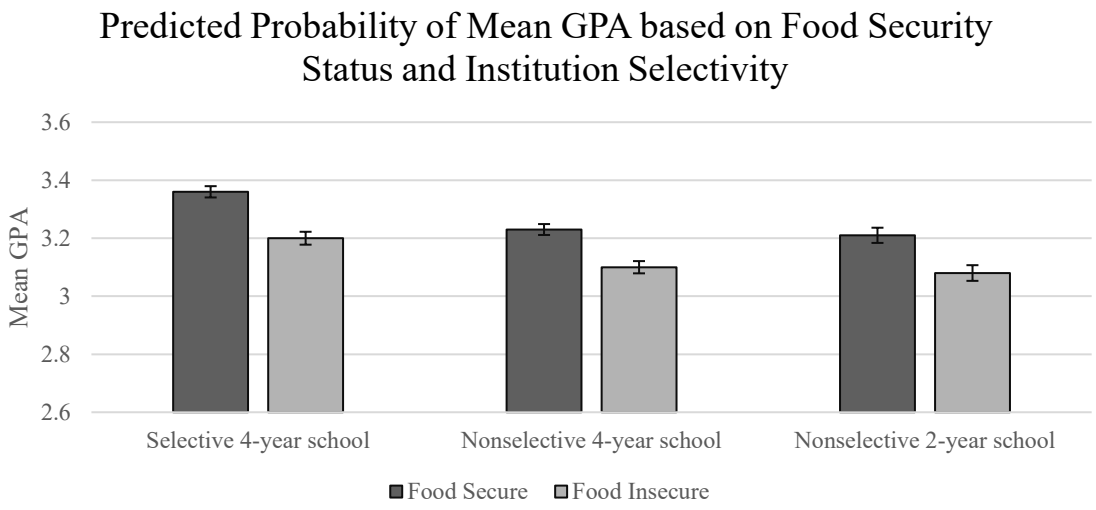

Figure 3.8 Predicted Probability of Mean GPA by Food Security Status and Institution Selectivity

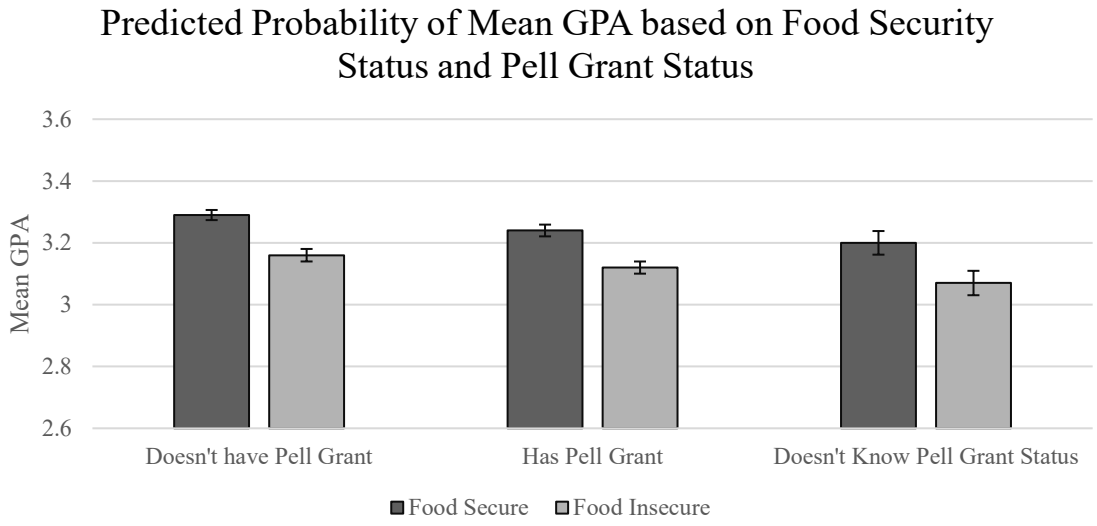

Figure 3.9 Predicted Probability of Mean GPA by Food Security Status and Pell Grant Status

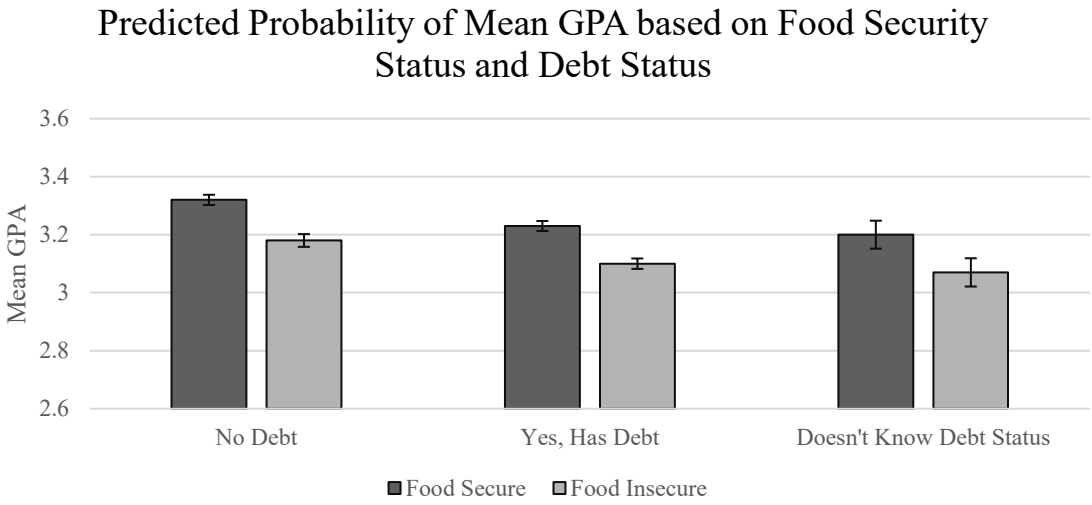

Figure 3.10 Predicted Probability of Mean GPA based on Food Security Status and Debt Status

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Chapter 4. Intersection of individual and institutional contexts around food insecurity

Introduction

Economic insecurity is part of the college experience for many students. Higher education is a social institution that influences individual students, not only through its provision of learning and social mobility opportunities, but also through the availability of institutional resources, such as food pantries, that might not be available elsewhere to students. This chapter explores how higher education institutions may or may not have an influence on students through their provision of social services. Specifically, it investigates how higher education institutions may support individual students' economic security projects, focusing on the existence of on-campus food pantries and how these institutional initiatives are related to individual students' experiences of food insecurity while in college.

The risk of undertaking a college degree is influenced by the type of institution a student attends (Goldrick-Rab 2016; Cottom 2017; Mettler 2014), as well as their opportunities for dealing with their economic insecurity. Cottom (2017) and Mettler (2014) articulate the precarity of undertaking a degree at many for-profit colleges, finding that students at for-profit colleges are at great risk not only for non-completion of degrees, but also for the accrual of higher amounts of debt than their counterparts in the

non-profit private and public higher education sector. Goldrick-Rab (2016) has explored the risk of undertaking a college degree through a focus on Pell Grant recipients in the Wisconsin public college system and found significant economic insecurity among students, often dependent on the status of their personal safety net and their institutional aid packages.

Most other research considers how colleges and universities influence their students' life course in the long term. While research may focus on the college experience, such as the party pathway and its impact on students (Armstrong and Hamilton 2013) or the impacts of elite educational credentials and extracurricular activities (Rivera 2011), it often focuses on associations with career outcomes, income outcomes, and even marital outcomes from these college experiences (Stevens, Armstrong, and Arum 2008). These life course perspectives are very useful, but there is space for more attention to the experiences of college students in the short term and the ways in which institutions may be influencing students' short term experiences through the facilitation of student economic security projects via the use of institutional resources. Research has shown that college is an equalizing force in terms of social mobility, but that this equalizing force is shifting over time from a focus on bachelor's degrees to more advanced degrees (Torche 2011). As practitioners within higher education work to maintain college at the bachelor's degree level as an equalizing social mobility force, they are implementing new security buffer services to assist students experiencing

economic precarity. In doing so, they are expanding their societal role and having a potentially shifting influence on students in the short term as well as the long term.

Colleges and universities, especially those in the non-profit private and public sector, are working to understand the risks many of their students take on in pursuing postsecondary education. They also intentionally support students to degree completion when possible, be this through retention programs for first year students, second year engagement programs, or programs to support underrepresented groups on campus, such as racial minorities and first generation students. On-campus food pantries are another example of a program that could and/or does support students in their college endeavors. While these programs can help some students in vital ways, they do not always overcome the structural insecurity that these students may face during their time in college (Goldrick-Rab 2016). These programs, though, can be resource-intensive in terms of the staff needed to run them and the costs for actual programming for students.

As non-profit private and public colleges and universities take intentional steps and implement programs to help students persist to degree completion, they may begin to add services that remind observers of the roles traditionally held by social service providers. These are often services that previously may have been seen as falling beyond a college's purview, but that are now being taken up in an effort to engage students more fully and to serve as a resource for the 'new majority' of students, who often require different resources than students 30 years ago (Greenstein 2017). Colleges are shifting in

their facilitator role to help these students in developing their economic security projects using available college resources.

Colleges and universities are responding to students' inability to meet their basic needs, particularly in terms of food insecurity and hunger. Many colleges are now offering services to their insecure students, such as food pantries and case work social services. Since the Great Recession in 2008, over 500 campus food pantries have joined the College and University Food Bank Alliance (CUFBA), most of them new initiatives at their institutions. Some colleges are also offering case work social services to students, helping students to apply for traditional social services such as Temporary Assistance for Needy Families (TANF), the Supplemental Nutrition Assistance Program (SNAP), as well as subsidized childcare and other programs. One of the programs that provides these benefit application services at colleges, Single Stop USA, has shown that participation in their program among community college students may increase retention to the second year of college by as much as three percentage points (Daugherty, Johnston, and Tsai 2016). These initiatives seek to support students in precarious situations and to support and encourage students to persist in college, despite sometimes severe socioeconomic barriers such as lack of food.

This chapter builds on the previous two chapters by bringing together the institutional level characteristics described in Chapter 2 with the individual level characteristics described in Chapter 3. I include institutional level characteristics that were relevant to the likelihood of having an on-campus food pantry in Chapter 2, such as

institution type and selectivity, as well as institution size. From Chapter 3, I include individual level characteristics that were associated with individual food insecurity, such as first generation status, gender, and residence location. By investigating the interplay of these institutional and individual characteristics, I aim to arrive at a greater understanding of status vulnerabilities that may be associated with having an on-campus food pantry. Additionally, by adding on-campus food pantry status as my key independent variable, I expand on the work in Chapter 3 and consider how food pantry status may or may not be associated with student food insecurity at that institution. This work is informed by the following research questions:

- How are institutional characteristics associated with student experiences of food insecurity?
    - Specifically, is institutional provision of social services (i.e. an on-campus food pantry) correlated with student food insecurity?

My hypotheses are:

1. Four-year institutions in the SCFW data will be more likely to have a food pantry than two-year institutions.
2. Students at institutions with on-campus food pantries will have higher estimates of food insecurity than students at institutions without food pantries.

Data and Methods

To explore the association between individual students and institutional characteristics through the establishment of an on-campus food pantry, I needed to create a data set that combined individual and institutional level information. To do so, I combined the individual level data from the Study on Collegiate Financial Wellness (SCFW) with College Scorecard and Integrated Postsecondary Education Data System (IPEDS) institutional information. This permitted me to investigate more deeply the ways in which institutional characteristics may or may not be associated with students' experiences of food insecurity as I work to understand the role of institutions in students' economic security projects.

To understand these roles, I intentionally structure this chapter in such a way that it brings together the theoretical and operational viewpoints of the previous chapters to a joint culmination in this chapter. More specifically, I utilize the some of the same variables from Chapter 2 and Chapter 3 in this chapter, building them into a joint model that brings together institutional and individual characteristics in exploring food insecurity within the SCFW sample.

Key Measures / Variables:

My dependent variable is an individual level binary variable of food insecurity, where 1 means a student is food insecure and 0 means a student is food secure. This variable is calculated from the six-item USDA short form food security module that was a module in the SCFW. Individuals with a raw score of 0-1 were classified as food

secure, raw scores of 2-4 were classed as having low food security, and raw scores of 5-6 were classified as having very low food security. Students who answered two or more of the six questions in the affirmative were classified as food insecure. This follows USDA guidelines for classifying individuals as food insecure. See Table 3.2 in Chapter 3 for more detailed information. The institutional level independent variables I include are: existence of an institutional food pantry, institutional sector/type/selectivity, institutional location, institution size, percent of students with federal student loans, and percent of students awarded a Pell Grant.

I created a variable for the existence of an on-campus food pantry by visiting each institution's website and using the search terms food pantry and food bank to determine if the institution had publicly available information about an on-campus food pantry on its website. I used this information to create a binary indicator variable where 1 meant an institution had an on-campus food pantry and 0 meant that it did not have one. I then added this information to the SCFW data. I also created the institutional sector/type/selectivity variable by using an institution's IPEDS designation as a two-year or four-year public school and combining it with a measure of selectivity derived from Barron's 2018 college selectivity rankings. Selective institutions are defined as those with a Barron's selectivity ranking of very competitive, highly competitive, or most competitive. Institutions with a competitive rating from Barron's are part of the nonselective four-year institution category because these institutions have lower

admissions requirements, admitting 50%-65% of their applicants, and it is a very broad category.

Variables for institution location, institution size, percent of students with federal student loans, and percent of students awarded a Pell Grant are derived from IPEDS and College Scorecard. For institutional location, I recoded IPEDS' categories into four categories for large cities and suburbs, medium cities and suburbs, small cities and suburbs, and town/rural locations. Other variables were used as reported in College Scorecard and IPEDS.

I do not include variables for average net price, percent of racial and ethnic minority students, and percent part time students, as I did in Chapter 2, because these variables are highly correlated in this data with one another, as well as institutional type/selectivity and percent with federal student loans. As such, it is better to exclude these variables, particularly since Chapter 2 demonstrated that they are not significantly correlated with the likelihood of having an on-campus food pantry. I also include the individual level variables from the SCFW that are used in Chapter 3. These include gender, race/ethnicity, age, first generation status, individual Pell Grant status, citizenship status, debt status, financially responsible for a child, employment status, years enrolled, and residence location. The goal in including both institutional and individual level variables is to understand the interplay between the two, if any, and to explore my research question about whether an on-campus food pantry is associated with higher estimates of food insecurity among students.

Method:

First, I used descriptive information to investigate the relationships between institutional level variables and the existence of an on-campus food pantry. I calculated average food insecurity rates across each institution to capture institutional level food insecurity and to understand any trends across institution types. This information is reported in more detail below. Since most research on food insecurity among college students is not multi-institutional, the SCFW provides a unique opportunity to understand descriptively food insecurity among students within institutions from around the United States. While not nationally representative, this field is still developing and so this data can provide researchers with useful insights into food insecurity. Looking at food insecurity institutionally is one example of leveraging the SCFW's strengths to push forward the study of food insecurity at colleges around the United States. This descriptive information helps me to explore Hypothesis 1.

Second, I use a series of mixed effects logistic regression models for nonselective four-year institutions and nonselective two-year institutions, respectively, to explore the interplay between institutional and individual characteristics and their correlation with individual food insecurity. Since part of the focus of my research question is to explore institutional associations with individual student food insecurity, this allows me to have random effects estimates that account for the different institutions within which individuals are nested in the SCFW data. I am not able to estimate models for selective

four-year institutions because 10 out of 11 of these institutions in the SCFW sample have an on-campus food pantry.

Since I am interested in institutional contexts as they relate to individual food insecurity, using a mixed effects logistic regression model is more appropriate than using a clustered logistic regression model (Huang 2014). Specifically, Huang (2014) discusses that other clustered modeling techniques may be appropriate for Level 1 (individual level) research questions (such as those in Chapter 3), but that for research questions that are interested in Level 2 effects (i.e. institutional effects), using a multi-level model is appropriate. Especially given that my institution clusters have varying group sizes and since I specifically want to investigate the institution level variables, a multi-level model is a useful modeling approach. Last, since I am interested in understanding the potential association of an intervention at Level 2 (i.e. an on-campus food pantry) while measuring food insecurity at the first level, a multi-level modeling approach is appropriate (Huang 2014).

For both four-year and two-year nonselective institutions, I use the same modeling approach. I do not use mixed effect logistic regression models for four-year selective institutions because only one institution in the sample does not have a food pantry. For Model 1, I use only institutional characteristics, including food pantry status, institution location, and institution size. For Model 2, I add student financial characteristics at an institutional level, including percentage of students receiving Pell Grants and percentage of students receiving a federal student loan. Model 3 adds

individual level characteristics reported in the SCFW, including gender, race/ethnicity, age, first generation status, Pell Grant status, citizenship status, debt status, financially responsible for a child, employment status, years enrolled, and residence location.

Results

Of the 44 public two- and four-year institutions that participated in the SCFW, 34 (77%) have an on-campus food pantry and 10 (23%) do not have one (see Figure 4.1). Looking at institution type, 10 of the 11 selective four-year institutions in the sample have an on-campus food pantry, as well as 11 of 14 nonselective four-year institutions, and 13 of 19 nonselective two-year institutions (Figure 4.2). If aggregated to four-year schools, 21 of 25 four-year institutions have an on-campus food pantry. Overall, 84% of four-year institutions that participated in the SCFW food security module had an on-campus food pantry compared to 68% of two-year institutions. These initial figures suggest that different types of institutions may have different likelihoods of having an on-campus food pantry.

Food insecurity also varied by institution type, with 35.3% of students experiencing food insecurity at selective four-year schools, on average, (18.2% low food security and 17.1% very low food security), 40.5% experiencing food insecurity at nonselective four-year schools (19.7% low food security and 20.8% very low food security), and 47.6% of students at nonselective two-year institutions experiencing food

insecurity (20.7% low food security and 26.9% very low food security). See Figure 4.4 for this breakdown by institution type.

Institutions with no on-campus food pantry had an average of 37.1% of students experiencing food insecurity (17.2% with low food security and 19.9% experiencing very low food security) compared to 44.1% of students experiencing food insecurity at institutions with an on-campus food pantry (20.8% with low food security and 23.3% with very low food security). See Figure 4.5 for a chart describing this finding. Figure 4.6 describes institutions' food security status averages by their institutional type and whether or not they have an on-campus food pantry. In general, in the SCFW sample, institutions with on-campus food pantries have a higher average food insecurity rate than institutions with no on-campus food pantry. This finding provides initial support for Hypotheses 1 and 2. This finding may also suggest that institutions with higher food insecurity among their students may be recognizing this and reacting, but this is not the only possible reason for establishing an on-campus food pantry, and these initial descriptive results are not conclusive.

For the mixed effects logistic regressions, I first explored the association of food insecurity with institutional food pantry status for nonselective four-year institutions. These results are detailed in Table 4.1. I built three models that add different institutional and individual characteristics to explore relationships between institutional characteristics and individual characteristics in discussions of food insecurity among students. Model 1 is a basic model of four-year nonselective institutions that included as independent

variables only institutional characteristics related to the institution itself, including the existence of an on-campus food pantry, institution type/selectivity, institution location, and institution size. My dependent variable is a binary variable for if a student was food insecure or not, which was derived from the USDA short form module on food security. These models are clustered by institution. In this basic model of four-year nonselective institutions, these institutional characteristics are not associated with student food insecurity. In Model 2, I added aggregated student financial characteristics, specifically the proportion of students with Pell Grants at the institution and the proportion students with a federal student loan. With these financial variables included, the results suggest that students at four-year nonselective institutions in mid-size cities and suburbs have 1.6 times higher odds of experiencing food insecurity than students in a large city. Additionally, students at institutions with 20,000 or more students have 1.7 times higher odds of experiencing food insecurity than students at schools with fewer than 1,000 students. In Model 3, institutions located in mid-size cities or suburbs continue to have a statistically significant association with students experiencing food insecurity and the results for institution size are also the same as Model 2. Figure 4.7 shows the non-statistically significant predicted probability of experiencing food insecurity at four-year nonselective institutions in the SCFW sample. This suggests that the probability of a student experiencing food insecurity at the four-year nonselective institutions in the SCFW is not predicted by whether or not an institution has an on-campus food pantry. By focusing only on four-year nonselective institutions in this model, I am able to focus on

students at these institutions without focusing on differences between students at two-year and four-year institutions. Figure 4.8 shows a predicted probability of food insecurity based on food pantry status and institution size. It suggests that students on campuses with more than 20,000 students may have very different food insecurity experiences, with a predicted probability of 39.9% of students at four-year nonselective institutions *with* food pantries experiencing food insecurity compared to a predicted probability of 47.0% of students at four-year nonselective institutions *without* an on-campus food pantry experiencing food insecurity. Figure 4.9 shows the predicted probability of experiencing food insecurity at four-year nonselective institutions by their food pantry status and their institution location. It suggests that the predicted probability of experiencing food insecurity on a mid-size campus *without* a food pantry is 50.0%, compared to 42% for institutions *with* a food pantry.

Similar to Chapter 3, individual characteristics such as gender, first generation status, Pell Grant status, and residence location continue to be significantly associated with students' likelihood of experiencing food insecurity. In all three models, among nonselective four-year institutions, I find that whether or not an institution has a food pantry is not significantly associated with students' likelihood of being food insecure. This suggests that, among nonselective four-year institutions with potentially similar populations in this SCFW sample, food pantries are not correlated with individual food security.

Next, I use the same modeling series to explore the association of on-campus food pantries with food insecurity at nonselective two-year institutions. Model 1, the basic model with only institutional characteristics, suggests that students at an institution with an on-campus food pantry have 1.4 times higher odds of experiencing food insecurity than their peers at institutions with no on-campus food pantries. This model also suggests that students at nonselective two-year institutions in mid-size cities and suburbs have 22% lower odds of experiencing food insecurity. Model 2 finds a similar pattern, even when adding in aggregated student financial characteristics. In Model 3, I add individual characteristics, similar to Chapter 3. In this model, students at two-year nonselective institutions with an on-campus food pantry have 1.4 times higher odds of experiencing food insecurity than students at institutions with no on-campus food pantry. This provides support for Hypothesis 2. Figure 4.14 shows the predicted probability of experiencing food insecurity at a two-year nonselective institution. There is a predicted probability that 41.7% of students at two-year nonselective institutions are experiencing food insecurity, compared to 50.2% of students at institutions *with* an on-campus food pantry. Figure 4.15 shows the predicted probability of experiencing food insecurity based on food pantry status and institution size. It suggests that the predicted probability of experiencing food insecurity at a nonselective two-year institution *without* an on-campus food pantry is 42.1%, compared to 50.5% at institutions *with* a food pantry on campus. Figure 4.16 shows the predicted probability of experiencing food insecurity at nonselective two-year institutions based on food pantry status and institution location. Here, the probability of

experiencing food insecurity at institutions in mid-size cities and suburb *without* a food pantry is 39.0%, compared to 47.3% at institutions *with* an on-campus food pantry. Interestingly, this is a reversed relationships of what the models for nonselective four-year institutions suggested, which was that students at institutions with an on-campus food pantry had less food insecurity than students at institutions without an on-campus food pantry.

I next explored the predicted probabilities of experiencing food insecurity by food insecurity and a few status vulnerabilities, including race/ethnicity, gender, Pell Grant status, and first generation student status at both two-year and four-year nonselective institutions. First, among two-year nonselective institutions, I find that food insecurity among African American students at institutions without an on-campus food pantry is 51%, compared to 59% at institutions with an on-campus food pantry. Similarly, Hispanic students had a 43% likelihood of experiencing food insecurity at an institution with no on-campus food pantry compared to 52% at institutions with an on-campus food pantry. See Figure 4.17 for more information. Among nonselective four-year institutions, I find that African Americans have a 56% probability of experiencing food insecurity at institutions with no food pantry compared to a 49% probability of experiencing food insecurity at institutions with an on-campus food pantry. Additionally, Hispanic students have a 52% likelihood of experiencing food insecurity at institutions with no on-campus food pantry compared to 46% at institutions with an on-campus food pantry. See Figures 4.10 and 4.17 for four-year and two-year institutions, respectively**.**

These inverse relationships of food pantry status and food insecurity across different populations of students at two-year and four-year nonselective institutions continue to be salient with gender, Pell Grant status, and first generation student status. Among students who identified as a non-binary gender identity at four-year nonselective institutions, their likelihood of experiencing food insecurity was 76% at institutions with no on-campus food pantry and 71% at institutions with an on-campus food pantry. See Figure 4.11 for more information. At two-year nonselective institutions, students with a non-binary gender identity had a 58% likelihood of experiencing food insecurity if their institution did not have an on-campus food pantry compared to 66% if their institution had an on-campus food pantry (see Figure 4.18). Students with Pell Grants at four-year nonselective institutions with no on-campus food pantry had a 51% predicted probability of experiencing food insecurity compared to 43% at institutions with an on-campus food pantry. See figure 4.12 for more information. At two-year institutions, this relationship is again reversed, with students on campuses *without* an on-campus food pantry having a higher predicted probability of experiencing food insecurity (see Figure 4.19). Last, for first generation status students, students at two-year nonselective institutions without an on-campus food pantry had a predicted probability of experiencing food insecurity of 43% compared to 52% of students at two-year nonselective institutions with an on-campus food pantry (see Figure 4.20). First generation students at four-year nonselective institutions *without* an on-campus food pantry had a predicted probability of experiencing

food insecurity of 48%, compared to 41% at institutions with an on-campus food pantry. See Figure 4.13 for more information.

Taken together, the results from nonselective four-year institutions and nonselective two-year institutions may begin to suggest that different student populations may be associated with the likelihood of establishing an on-campus food pantry and with the likelihood of experiencing food insecurity more generally. Students who attend two-year institutions may be more likely to experience food insecurity in general, which might help to explain these differing and inconsistent results. Additionally, these results could have some selection bias in terms of institutions that participated in the study more generally, as these institutions, especially four-year institutions, may have been more likely to have an on-campus food pantry. These results also affirm the results of Chapter 2 and 3 that students at different types of institutions have different likelihoods of experiencing food insecurity. Overall, students at selective institutions are the least likely to experience food insecurity and students at nonselective two-year institutions are most likely to experience food insecurity. This is of particular interest since, in the SCFW sample, students at selective institutions are the most likely to have access to an on-campus food pantry and students at a two-year institutions are the least likely to attend an institution with an on-campus food pantry. Additionally, student status vulnerabilities continue to be salient for understanding food insecurity.

As mentioned previously, I am unable to use mixed effects logistic regression modeling for the selective four-year institutions in my sample because only one

institution did not have an on-campus food pantry. Just knowing this, however, can help researchers in exploring food insecurity at institutions with varying selectivity profiles.

There are limitations to my modeling approach as a means of understanding how institutional characteristics may or may not matter for students' experiences of food insecurity. The SCFW is not a nationally representative sample of students, nor is it always representative of students at each institution. Additionally, I was not able to include measures of the overall student body racial and ethnic composition in my models because average net price, percentage of Pell Grant recipients, and percentage of students with a federal loan were all highly correlated with racial and ethnic minority composition, so I made the decision not to include racial and ethnic institutional composition in these models. I was also unable to do regression modeling with selective four-year institutions because only one of these institutions in my sample did not have an on-campus food pantry, so complex comparisons were not possible. However, the descriptive information and these models do some preliminary work in understanding the relationship, or non-relationship, between food insecurity and institutional characteristics.

Discussion

In this research, I seek to understand the interplay between institutional and individual characteristics and their association with the existence of an on-campus food pantry within the SCFW sample. It is of interest that, in this sample, student food insecurity is not significantly associated with the existence of an on-campus food pantry

among nonselective four-year institutions, but this association does exist among nonselective two-year institutions in my sample. This may suggest not only differences in the likelihood of having an on-campus food pantry by institution type, but also different risk profiles for food insecurity among students at these different types of institutions with different potential status vulnerabilities. Further, it is interesting that the majority of selective institutions (10 out of 11) in the sample have an on-campus food pantry. This suggests that institution type, particularly selective public four-year institutions, may be associated with the likelihood of having an on-campus food pantry, further confirmation of the findings in Chapter 2. Further, these results capture some of the differences between four-year selective institutions, four-year nonselective institutions, and two-year nonselective institutions and the average food insecurity by institution type. While food insecurity exists across the spectrum of institutions, it is particularly pronounced among two-year institutions in this sample and least pronounced among selective four-year public institutions. Even more specifically, this research suggests that at two-year nonselective institutions, having an on-campus food pantry is associated with higher food insecurity among students, suggesting that institutions may be responding to student needs by establishing food pantries. This knowledge may inform institutions' responses to student food insecurity. These results also suggest that food insecurity exists across the spectrum of institution types and selectivity represented in the SCFW, though with varying severity and varying responses to it.

It is also important to recognize that the SCFW sample includes a small number of institutions, all of which opted into the model on food insecurity for their students. This is particularly useful to recognize in light of the large proportion of institutions that have an on-campus food pantry, particularly when compared to the percentage of institutions with an on-campus food pantry in Chapter 2. I can, however, still develop useful conclusions for the food insecurity literature from the SCFW sample in that it allows me to explore individual characteristics in varied institutional contexts to understand their association with the existence of an on-campus food pantry. To my knowledge, no other research has considered this interplay with the depth presented here. The SCFW data are uniquely suited to such an effort.

Further, these findings add more nuance to my theoretical underpinning around higher education institutions as facilitators of student security projects in that selective institutions are the most likely to have on-campus food pantries in the sample. This is an example of the resources that may be available to under-resourced students in a resource-rich environment, as many selective schools are. As indirect facilitators of students' individual economic security projects, higher education institutions' use of on-campus food pantries as a response to student food insecurity is in line with their role in supporting students, though it is a new way in which they are doing so. Overall, then, this chapter sheds further light on how institutional and individual characteristics are or are not associated with the existence of an on-campus food pantry and estimates of food insecurity at different institutions.

Future research should continue to explore more specifically differences in the likelihood of different institution types to establish on-campus food pantries. Additionally, research in this vein should investigate the reasons that institutions establish on-campus food pantries for their students, particularly since this research suggests that many selective four-year public institutions have an on-campus food pantry, but they also have the highest average food security. A qualitative study that interviews administrators from the three institution types outlined here would be a valuable addition to this literature. More research is also needed to understand the interplay of individual food insecurity and food pantries, and/or social service resources in general, at for-profit institutions because no research currently exists in this vein. Last, it would be useful to explore longitudinally the adoption of on-campus food pantries across the United States and their utilization rates by students. Food insecurity and food pantries look different across the spectrum of not only institution types, but also in the food pantries themselves and the services offered to students. Continued research in this area can push forward the baseline information outlined in this chapter and provide useful information not only to education and sociology researchers, but also to practitioners and administrators seeking to serve their students thoughtfully.

Tables:

Mixed Effects Logistic Regression Models of Relationship of Demographic and Institutional Characteristics on Food Insecurity – **Four-Year Nonselective Institutions**

Dependent variable: **Food Insecurity** (ref. food secure)	(1)	(2)	(3)
Campus has a food pantry (ref. no on-campus food pantry)	1.030 (0.22)	0.716 (0.14)	0.747 (0.12)
Institution Location (ref. large city/suburb)			
Mid-size city/suburb	1.274 (0.28)	1.564* (0.28)	1.500** (0.23)
Small city/suburb	1.047 (0.21)	1.281 (0.21)	1.231 (0.18)
Town/Rural	0.928 (0.28)	1.011 (0.24)	1.090 (0.23)
Institution Size (ref. < 5,000)			
5,000 – 9,999 (not included because no institutions of this size in four-year nonselective sample)			
10,000 - 19,999	1.093 (0.23)	1.472 (0.31)	1.394 (0.24)
20,000 and above	1.199 (0.33)	1.732* (0.46)	1.644* (0.37)
Proportion of student population with a Pell Grant		1.025** (0.01)	1.017* (0.01)
Proportion of student population with a federal student loan		0.997 (0.01)	0.994 (0.01)
Gender (ref. male)			
Female			1.110 (0.07)
Another Gender Identity			4.362*** (1.33)

Table 4.1 Mixed Effects Logistic Regression of Demographic and Institutional Characteristics on Individual Food Insecurity Among Four-Year Nonselective Institutions

Continued

Table 4.1 Continued

Race / Ethnicity (ref. white)	
Asian	0.856
	(0.13)
African-American	1.721***
	(0.20)
Hispanic	1.524***
	(0.15)
Other/Multiracial	1.308*
	(0.16)
Non-traditional Age (>23) (ref. traditional age <=23)	0.703***
	(0.07)
First Generation Status (ref. not first generation)	
First Generation	1.244***
	(0.07)
Doesn't Know	1.814
	(0.87)
Pell Grant status (ref. no Pell)	
Has Pell Grant	1.573***
	(0.10)
Doesn't know Pell status	1.193
	(0.14)
International Student Status (ref. not international student)	2.003***
	(0.39)
Debt Status (ref. no debt)	
Has debt	2.194***
	(0.14)
Doesn't know debt	1.926***
	(0.26)
Financially responsible for a child (ref. not responsible for child)	0.770*
	(0.10)
Employment Status (ref. not employed)	
Employed Part-Time	1.184**
	(0.07)
Employed Full-Time	1.021
	(0.12)

Continued

Table 4.1 Continued

Years enrolled (ref. 1 year)			
2			1.120
			(0.10)
3			1.132
			(0.11)
4			1.183
			(0.12)
5 or more			1.372**
			(0.17)
Residence Location (ref. on-campus)			
Off-campus within walking			1.475***
distance			(0.12)
Off-campus outside of walking			1.201*
distance			(0.10)
Observations	5891	5891	5891

Note 1: Odds ratios and standard errors. Estimates from Study on Collegiate Financial Wellness (SCFW)
Note 2: Food index categories derived from responses to USDA short form on food security
* p<.05, ** p<.01, *** p<.001

Mixed Effects Logistic Regression Models of Relationship of Demographic and Institutional Characteristics on Food Insecurity – **Two-Year Nonselective Institutions**

Dependent variable: **Food Insecurity** (ref. food secure)	(1)	(2)	(3)
Campus has a food pantry (ref. no on-campus food pantry)	1.388**	1.404*	1.406**
	(0.17)	(0.19)	(0.18)
Institution Location (ref. large city/suburb)			
Mid-size city/suburb	0.781*	0.769*	0.867
	(0.08)	(0.09)	(0.09)
Small city/suburb	1.069	1.062	1.055
	(0.17)	(0.17)	(0.16)
Town/Rural	1.151	1.161	1.188
	(0.40)	(0.40)	(0.41)
Institution Size (ref. < 5,000)			
5,000 - 9,999	1.019	1.051	1.049
	(0.37)	(0.39)	(0.39)
10,000 - 19,999	1.055	1.068	1.076
	(0.46)	(0.47)	(0.47)
20,000 and above	1.123	1.132	1.106
	(0.48)	(0.48)	(0.47)
Proportion of student population with a Pell Grant		0.996	0.992
		(0.01)	(0.01)
Proportion of student population with a federal student loan		1.001	1.001
		(0.01)	(0.01)
Gender (ref. male)			
Female			1.075
			(0.08)
Other			2.067*
			(0.63)
Race / Ethnicity (ref. white)			
Asian			1.060
			(0.12)
African-American			1.759***
			(0.29)
Hispanic			1.276**
			(0.11)
Other/Multiracial			1.636***
			(0.22)

Table 4.2 Mixed Effects Logistic Regression of Demographics and Institutional Characteristics on Food Insecurity among Two-Year Nonselective Institutions

Continued

Table 4.2 Continued

Non-traditional Age (>23) (ref. traditional age <=23)	0.955 (0.08)
First Generation Status (ref. not first generation)	
First Generation	1.258** (0.10)
Doesn't Know	1.287 (0.30)
Pell Grant status (ref. no Pell)	
Has Pell Grant	1.749*** (0.13)
Doesn't know Pell status	1.365* (0.18)
International Student Status (ref. not international student)	2.003*** (0.39)
Debt Status (ref. no debt)	
Has debt	2.289*** (0.17)
Doesn't know debt	2.054*** (0.38)
Financially responsible for a child (ref. not responsible for child)	1.024 (0.09)
Employment Status (ref. not employed)	
Employed Part-Time	1.086 (0.09)
Employed Full-Time	0.925 (0.09)
Years enrolled (ref. 1 year)	
2	1.001 (0.09)
3	1.141 (0.12)
4	0.946 (0.12)
5 or more	1.019 (0.11)

Continued

Table 4.2 Continued

Residence Location (ref. on-campus)			
Off-campus within walking			0.595
distance			(0.22)
Off-campus outside of walking			0.556
distance			(0.20)
Observations	3956	3956	3956

Note 1: Odds ratios and standard errors. Estimates from Study on Collegiate Financial Wellness (SCFW)
Note 2: Food index categories derived from responses to USDA short form on food security
* p<.05, ** p<.01, *** p<.001

Figures:

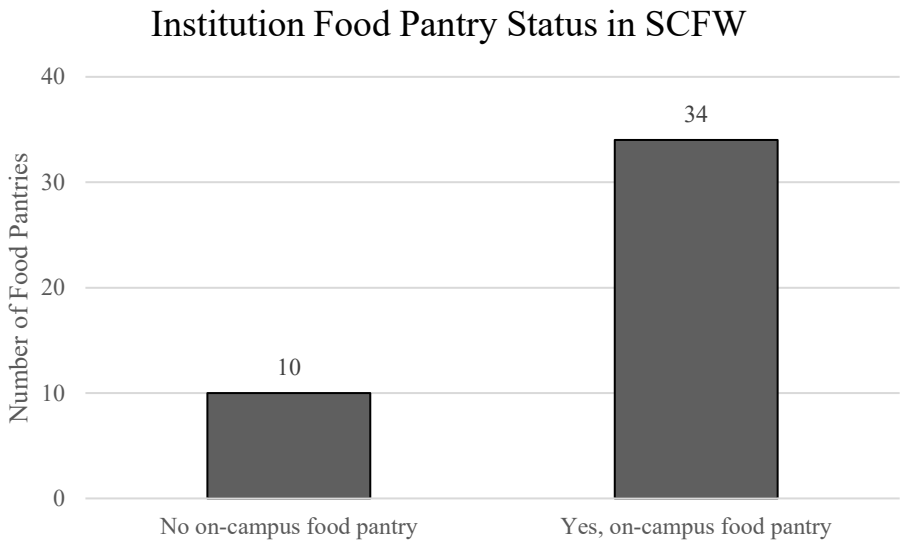

Figure 4.1 Institution Food Pantry Status in the SCFW

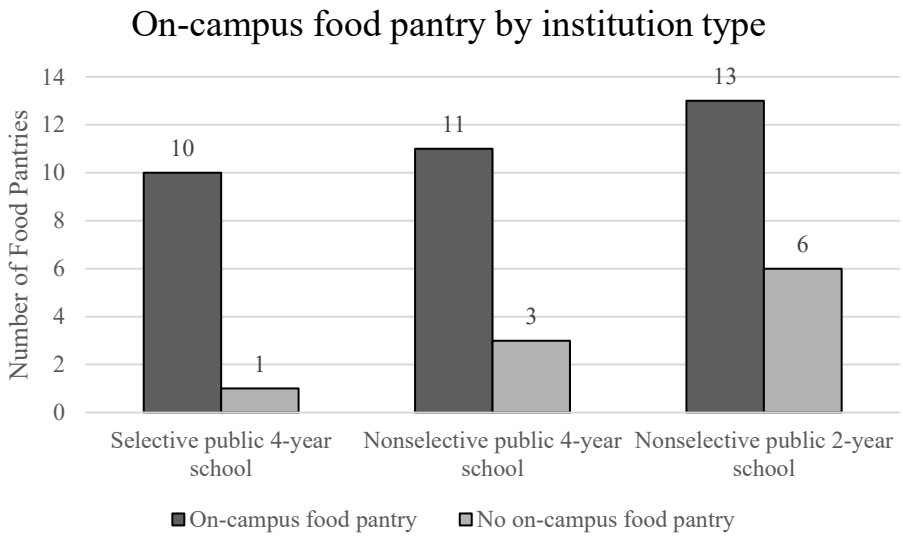

Figure 4.2 On-campus food pantry by institution type (selectivity)

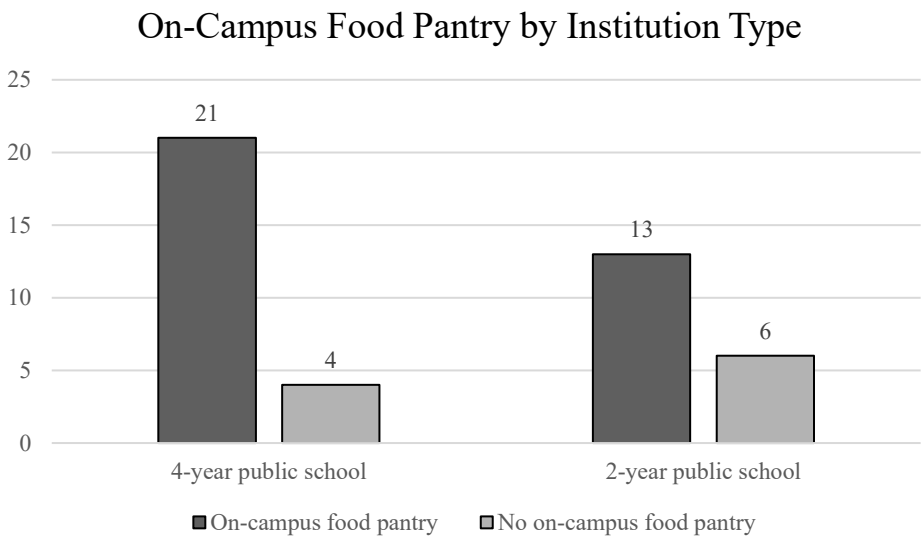

Figure 4.3 On-campus food pantry by institution type (2- vs. 4-year)

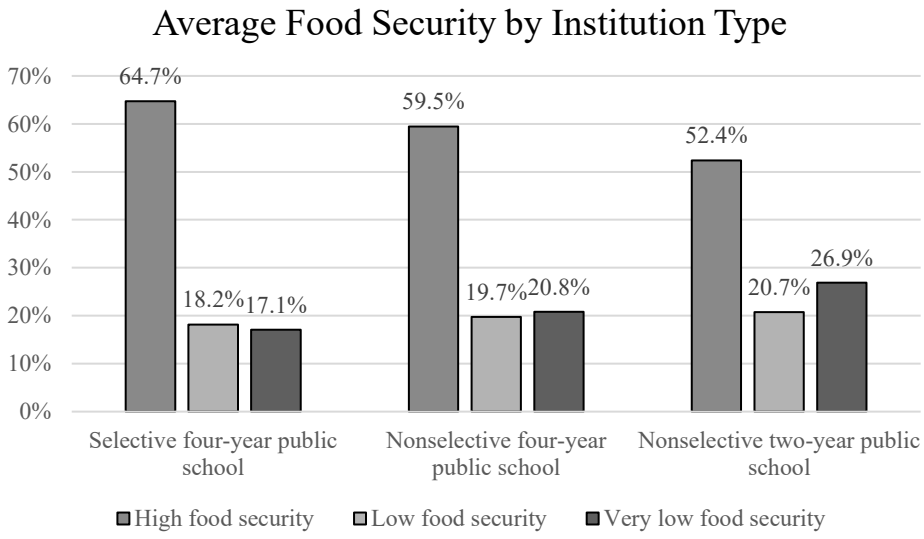

Figure 4.4 Average Food Security by Institution Type (selectivity)

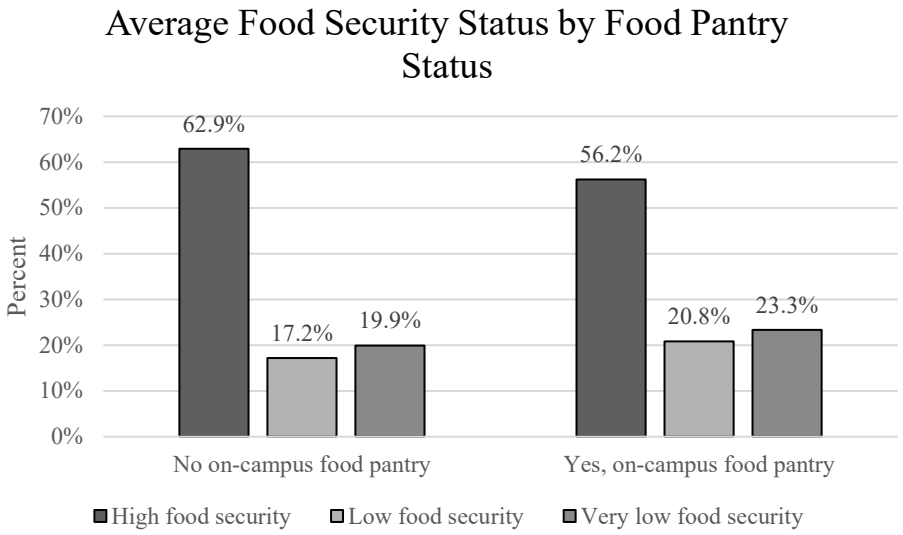

Figure 4.5 Average Food Security Status by Food Pantry Status

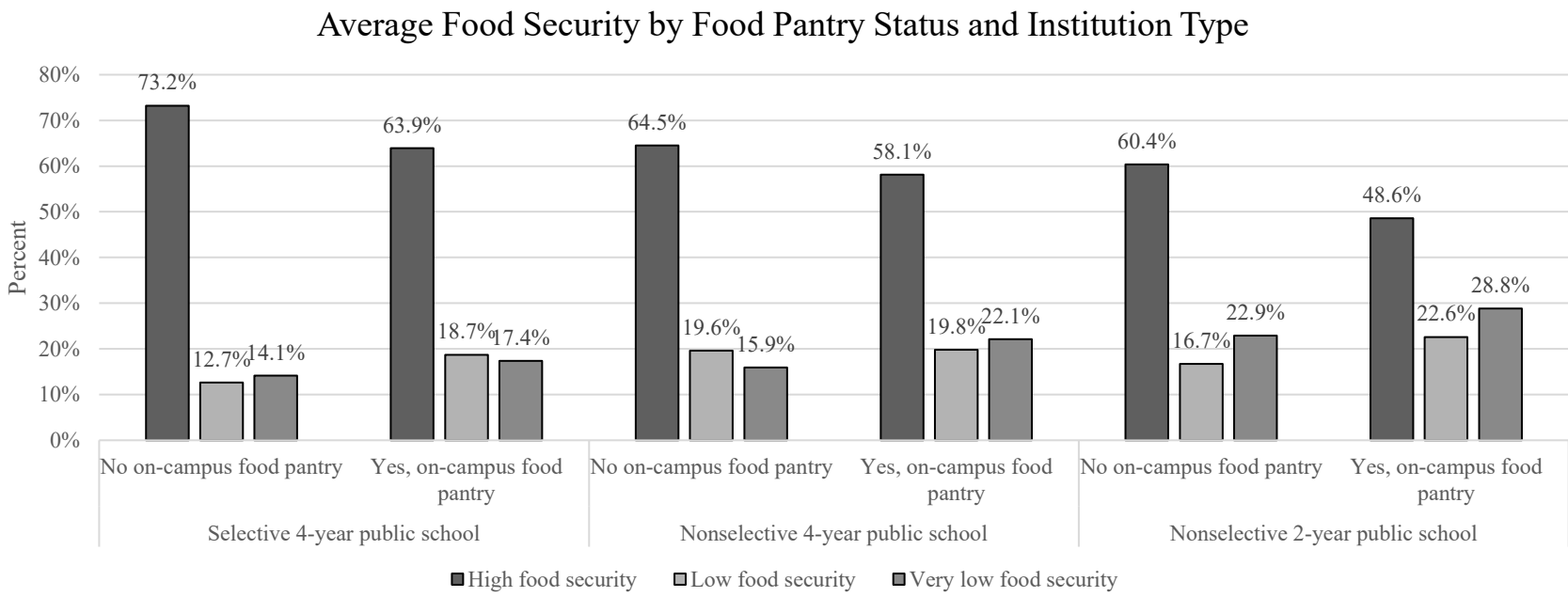

Figure 4.6 Average Food Security by Food Pantry Status and Institution Type

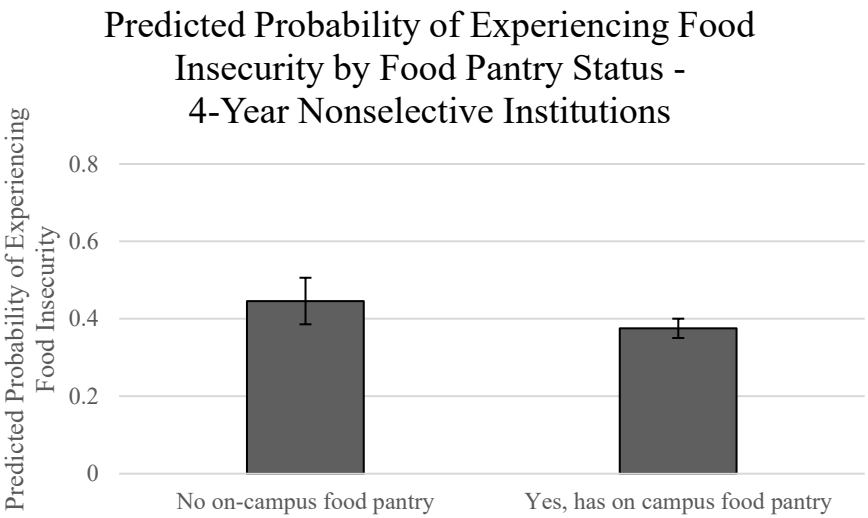

Figure 4.7 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status - 4-Year Nonselective Institutions

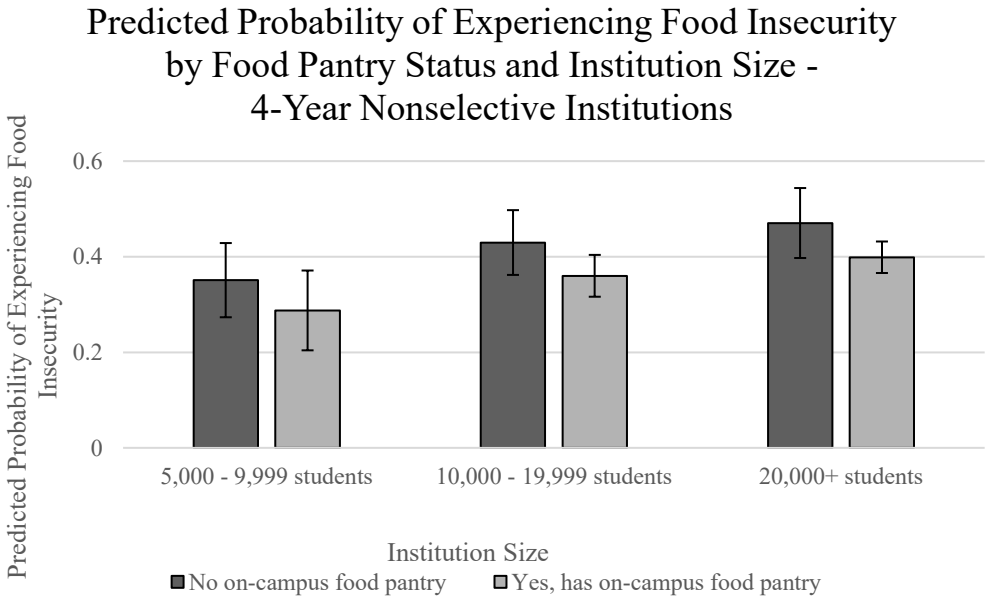

Figure 4.8 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status and Institution Size - 4-Year Nonselective Institutions

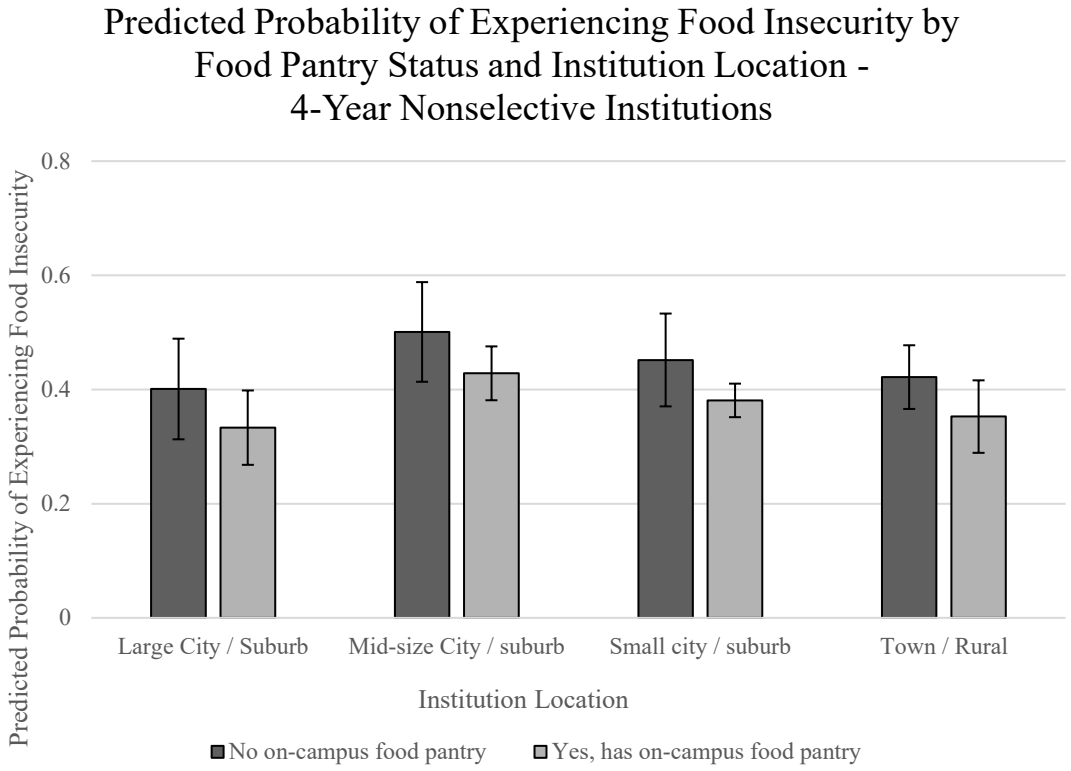

Figure 4.9 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status and Institution Location - 4-Year Nonselective Institutions

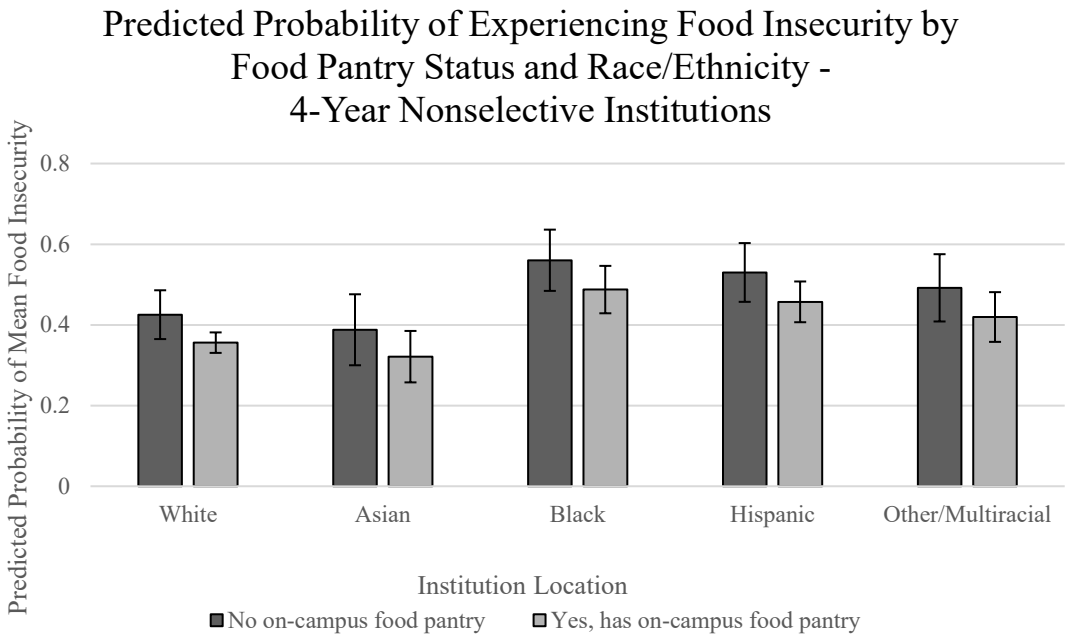

Figure 4.10 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status and Race/Ethnicity - 4-Year Nonselective Institutions

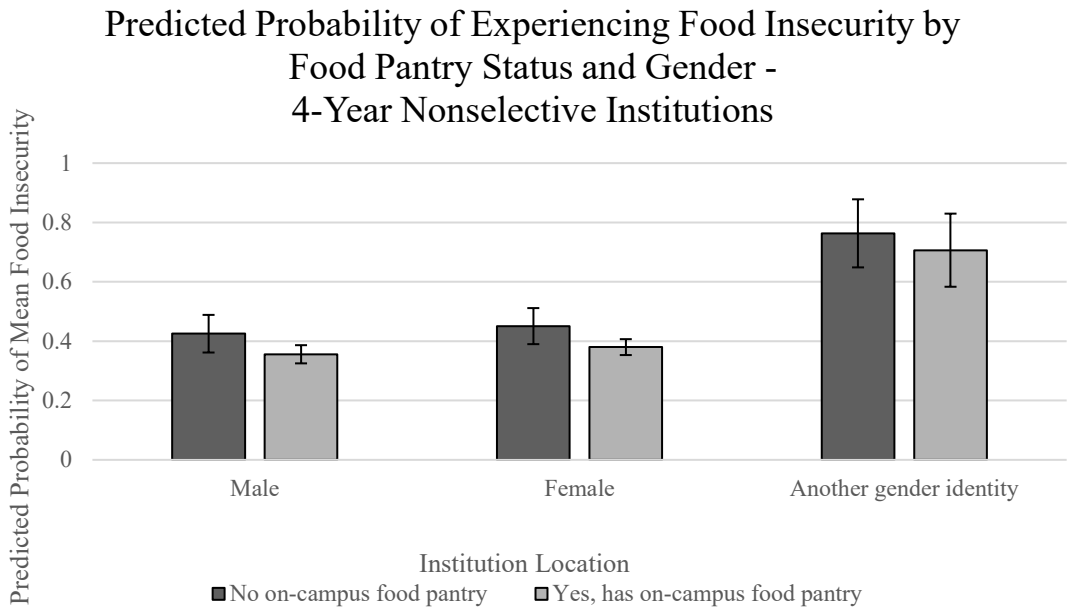

Figure 4.11 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status and Gender - 4-Year Nonselective Institutions

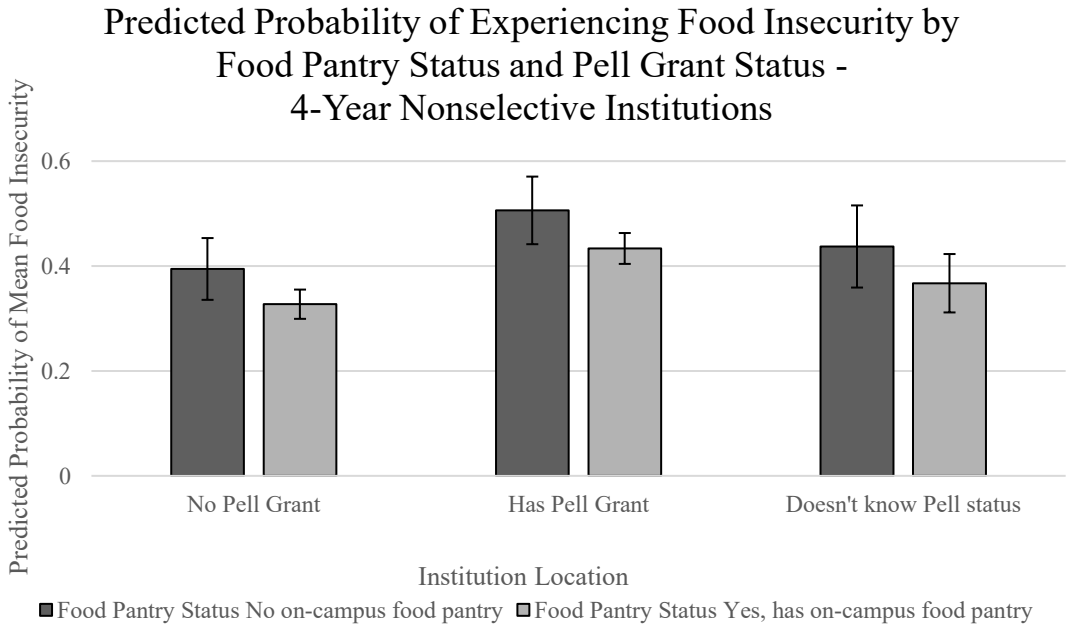

Figure 4.12 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status and Pell Grant Status - 4-Year Nonselective Institutions

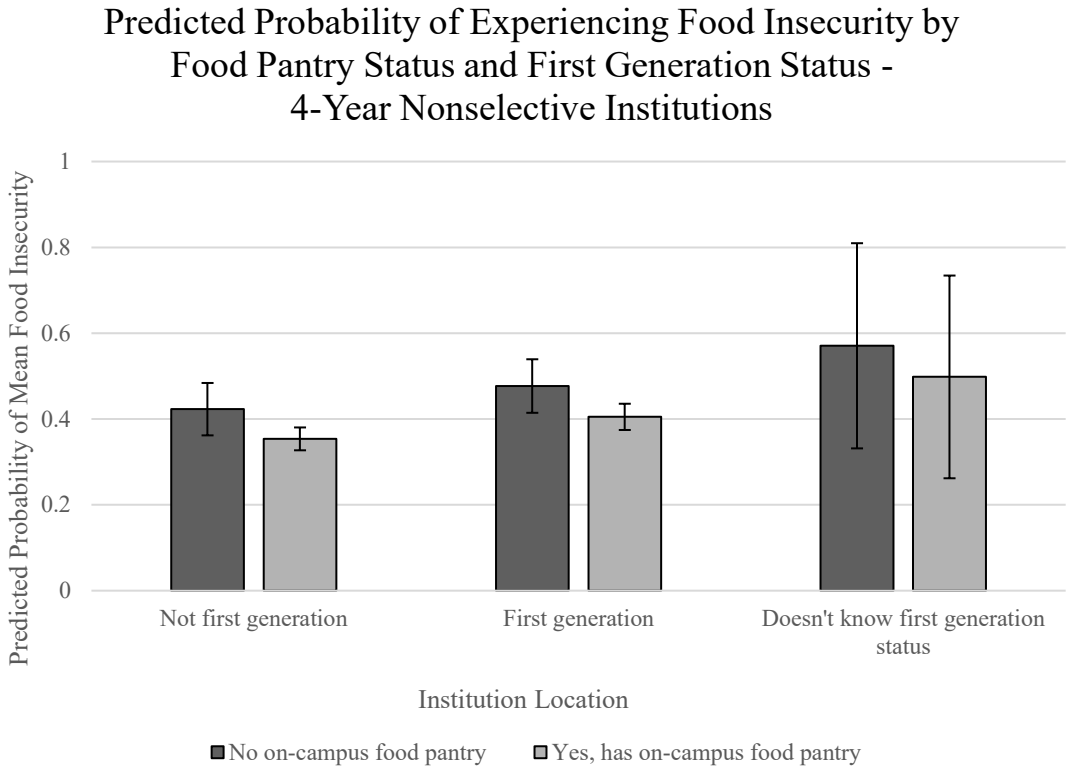

Figure 4.13 Predicted Probability of Food Insecurity by Food Pantry Status and First Generation Status - 4-Year Nonselective Institutions

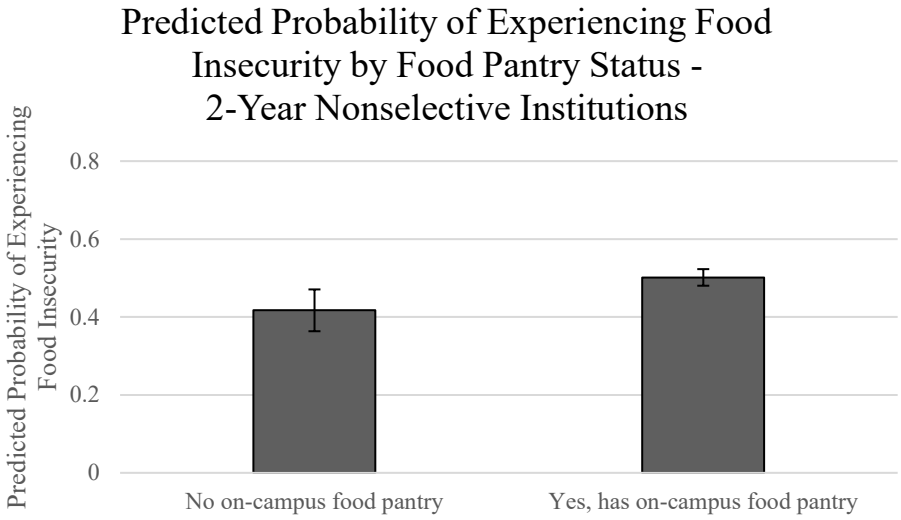

Figure 4.14 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status - 2-Year Nonselective Institutions

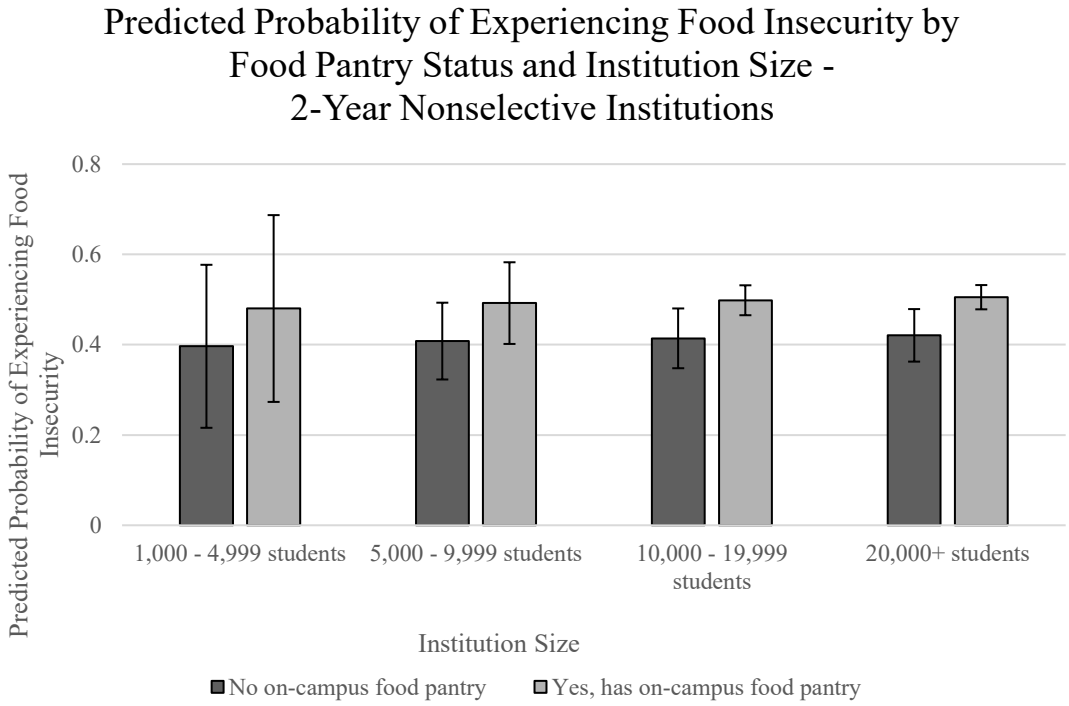

Figure 4.15 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status and Institution Size - 2-Year Nonselective Institutions

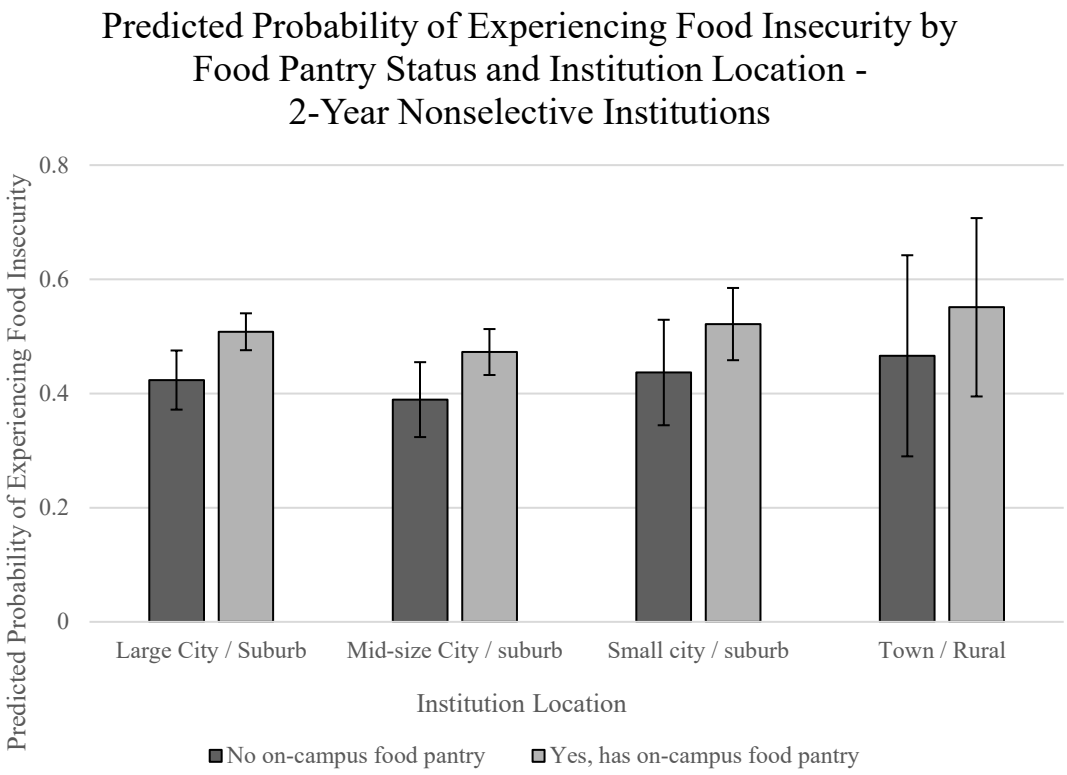

Figure 4.16 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status and Institution Location - 2-Year Nonselective Institutions

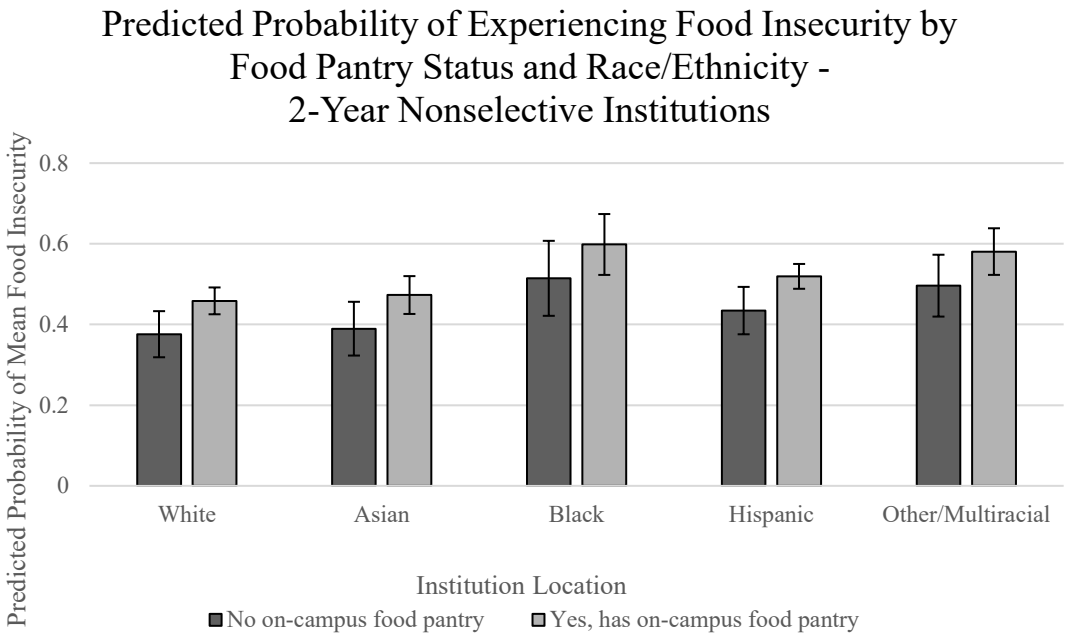

Figure 4.17 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status and Race/Ethnicity - 2-Year Nonselective Institutions

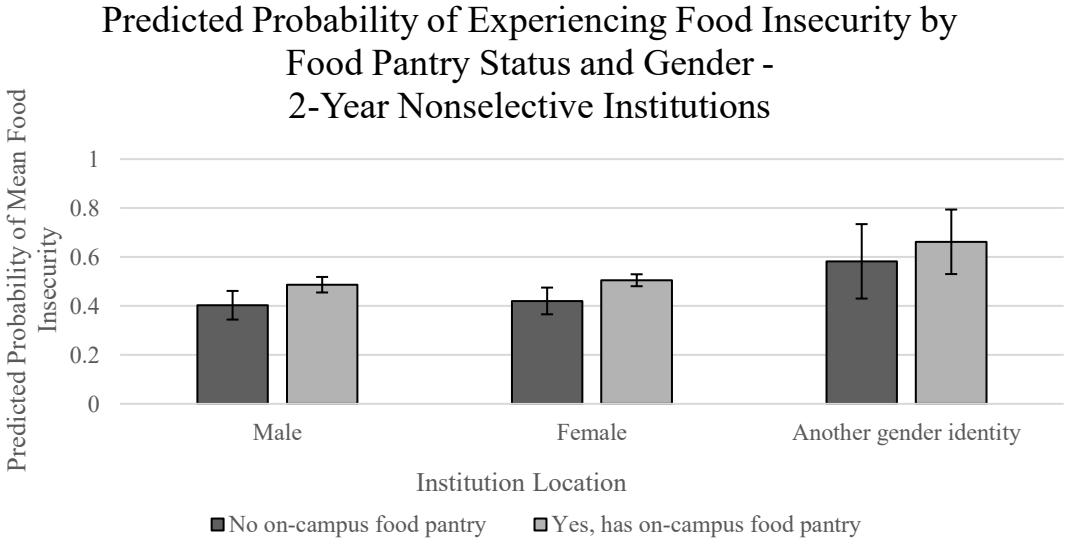

Figure 4.18 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status and Gender - 2-Year Nonselective Institutions

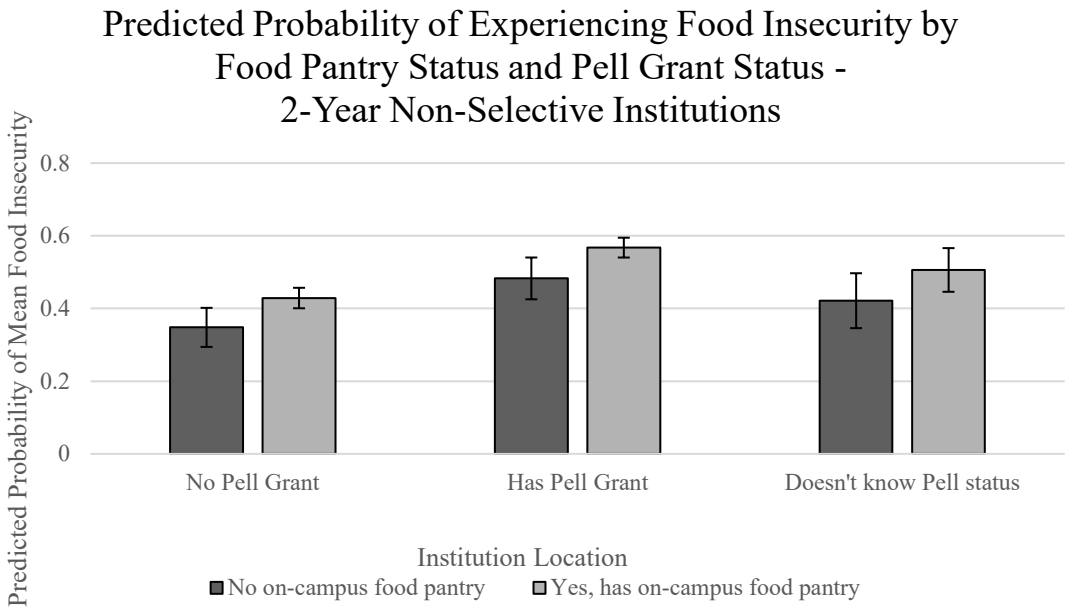

Figure 4.19 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status and Pell Grant Status - 2-Year Nonselective Institutions

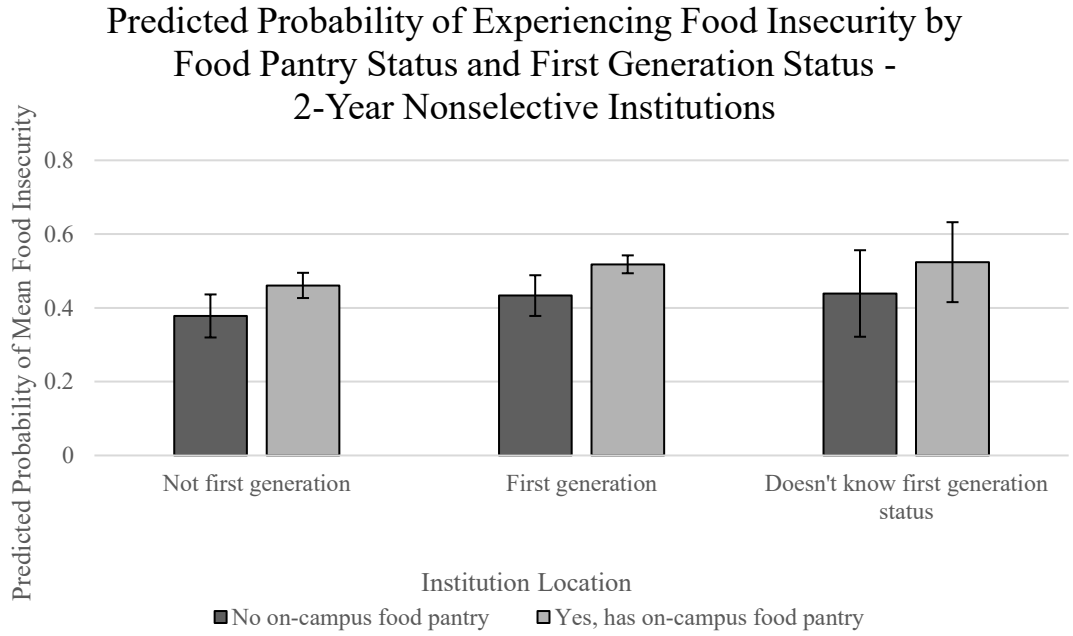

Figure 4.20 Predicted Probability of Experiencing Food Insecurity by Food Pantry Status and First Generation Status - 2-Year Nonselective Institutions

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Chapter 5. Conclusion

Economic insecurity is part of the fabric of many Americans' lives, including many college students (Goldrick-Rab 2016; Leicht and Fitzgerald 2014; Sullivan, Warren, and Westbrook 2000). As college administrators and faculty become more aware of economic insecurity among their students, they are working to ameliorate this issue at their institutions, particularly when other resources for confronting economic insecurity among their students are lacking. As postsecondary institutions begin to adopt and offer social services programs to their students, such as on-campus food pantries, they are beginning to shift from their role of *in loco parentis* into a role that is also *in loco imperii*, or in place of government. Higher education institutions, at least, as this dissertation suggests, non-profit private and public postsecondary institutions, are adopting a new role as they indirectly help students to facilitate their individual, short term economic security projects. Higher education institutions have a long history of helping to facilitate students' long term security projects in terms of careers, for example, but have only recently been actively engaging in students' individual short term security projects on an institution-wide scale. These short term security project facilitations may have very real implications for students' long term success, giving even more weight to colleges as hubs that connect students to resources and as institutions at the crossroads of upward social

mobility (Stevens, Armstrong, and Arum 2008). For, if a student finds themselves at an institution with no social services resources, which they need to remain enrolled, suddenly a student at an institution *with* those resources may have a distinct advantage. While my dissertation cannot specifically speak to that phenomenon, it can speak to these individual experiences and institutional responses to economic insecurity, and future research should continue to push beyond the findings of this dissertation to explore even deeper implications. Considering and understanding this shift in the role of higher education institutions in their students' lives is important for higher education researchers and sociologists interested in inequality. This dissertation begins to examine the shifted facilitator role of higher education institutions, specifically through the lens of food insecurity.

This dissertation explores economic insecurity among college students, with a focus on food insecurity, and considers the expanded role of colleges in providing for students' basic needs when students' other resources fall short. It examines food insecurity from both an individual and institutional lens. Specifically, it investigates the existence of on-campus food pantries as a response to student food insecurity by colleges and universities, as well as food insecurity among individual college students. Using multiple unique sources of data, I am able to investigate food insecurity from the individual and institutional perspective. I leverage data from the Integrated Postsecondary Data System (IPEDS), College Scorecard, Barron's selectivity rankings, institutional websites, the College and University Food Bank Alliance (CUFBA), and the Study on

Collegiate Financial Wellness (SCFW) to develop unique insights about food insecurity among college students.

This dissertation contributes to the growing body of literature available about college students' experiences of food insecurity and colleges' responses to that food insecurity. Specifically, it confirms and expands on the existing literature by using a multi-institutional design to explore college student food insecurity. Additionally, it corroborates the work of other studies in its estimates of the percentage of students who may be experiencing food insecurity. Only one other research center has engaged in multi-institutional research around food insecurity with a similar number of responses, so this work is an important addition to that work. Second, this work begins the process of considering the institutional side of food insecurity, investigating the existence of on-campus food pantries and institutional patterns that might predict adoption of these services for students.

The main findings of this dissertation are 1) that non-profit private and public institutions are more likely to have an on-campus food pantry than for-profit institutions; 2) individual student food insecurity is associated with demographic characteristics, including gender, first generation status, and residence location; 3) food insecurity has a negative association with student GPA; 4) different types of public institutions (by selectivity) have different likelihoods of having an on-campus food pantry; and 5) having an on-campus food pantry is not clearly associated with individual estimates of food insecurity at institutions. As a whole, these findings fit within my theoretical framework

of increased economic insecurity among college students and an expanded role for higher education institutions as facilitators of students' short term security projects. The following sections review the results of each empirical chapter in this dissertation and discuss the implications of these findings.

Summary of Results

Chapter 2 explores institutional responses to student food insecurity through the adoption of on-campus food pantries. It shifts the focus within the broader literature from individuals to institutional responses, extending the college-based food insecurity literature in a new direction. No other studies, to my knowledge, have looked at the existence of on-campus food pantries among a random sample of postsecondary institutions. In this chapter, I find that non-profit private and public institutions are more likely to have an on-campus food pantry than for-profit institutions. This is important in that it provides additional support to discussions around the minimal services available to students at a for-profit institution compared to a non-profit institution and extends that support to basic needs and social services. Chapter 2 also finds that large institutions are more likely to have an on-campus food pantry.

Chapter 3 then shifts the focus to individual-level data and the relationship of food insecurity with socio-demographic characteristics and academic outcomes, specifically GPA. I find that students at two-year institutions, student with non-binary gender identities, first generation students, and students who live off-campus are more likely to experience food insecurity. I also find that students classified as food insecure

have a 0.13 points lower GPA than their food secure peers, on average. Chapter 3 adds to the literature on food insecurity by shifting the conversation from existence to correlation with academic outcomes. In doing so, it makes conversations about food insecurity at colleges a conversation about student success, and potentially even student retention. Without a connection to academics, food insecurity is isolated in economic insecurity and may be seen as beyond the purview of academic institutions. Connecting food insecurity to academic outcomes creates a tie to support students as they seek these services.

Chapter 4 then brings together the individual and the institutional lens to explore if the existence of an on-campus food pantry is correlated with estimates of individual food insecurity. I find that different types of public institutions (by selectivity) have different likelihoods of having an on-campus food pantry and that there are some differences between institution types in the existence of on-campus food pantries and their association with student food insecurity rates. These results, however, are mixed and not fully conclusive. However, this preliminary research extends the field of food insecurity to consider the institutional role in understanding and responding to food insecurity among an institution's students.

Implications of Findings

Overall, these findings suggest that food insecurity is a challenge for students at many colleges. Moreover, it suggests that food insecurity exists across all types of institutions, from non-profit private schools to public schools, two-year schools and four-year schools, as well as schools across the selectivity spectrum. Economic insecurity

among college students and minimized social safety nets are not going to be repaired in the near future, so institutions are left sewing up the safety net when possible. In lieu of changes in students' individual resource structures in terms of financial aid, family resources, or government resources, institutions are stepping up to share their resources with students to help bridge security gaps and to help students as they craft individual security projects. By serving as a short term security buffer in addition to facilitators of students' long term security projects, non-profit private and public higher education institutions are serving as facilitators of their students' success. For-profit institutions, within the scope of this study at least, are not serving as short term security project facilitators for their students. It is important that researchers understand these influences and consider the shifting role of higher education institutions in many students' lives. It is also important that higher education institutions understand the changing needs of their students, and assistance in accessing food is just one example of the adjustments underway to serve students experiencing economic insecurity.

These findings also have implications for policy and institutional action. Within the current socioeconomic environment of stagnant wages and increasing costs, higher education institutions can consider the findings outlined here to understand more fully the precarity many of their students are facing. The findings can also help institutions to consider their response, if any, to economic insecurity among their students and to consider their options in providing social services to students. From a policy perspective, this research adds another piece of evidence to the overall research literature that suggests

that for-profit colleges and universities are not serving their students as fully as public and non-profit private institutions. This research makes clear that there is more space to assist young people as they transition to adulthood, particularly as many young people lack familial support in their shift. While student loans may help many students, research such as this dissertation makes clear that student loans are often insufficient in helping students to maintain their economic security while in college. A dismantling of the myth of students surviving on ramen and beer as a rite of passage would help students experiencing precarity and food insecurity in college to come forward and to seek support. It would also help policy makers, administrators, and faculty to continue to act on the severity on this issue at institutions across the country.

Future Directions

The literature on economic insecurity among college students should continue to be expanded, examining multiple arenas in which higher education institutions are serving (or not serving) as security project facilitators for their students. The shift to helping students to meet their basic needs through social services programs based within postsecondary institutions is important to continue to examine and to continue to support universities as they support students dealing with a frayed social safety net. Food pantries are one example of how institutions are supporting their students. Even within the realm of food insecurity, other programs, such as campus kitchens and meal swipe donations, are also part of the conversation, though less so than food pantries. Thus, food pantries are not the only intervention option available to higher education institutions.

Specifically, as the literature on student food insecurity continues to grow, researchers will need to continue to focus on expanding the field's understanding of food insecurity in a nuanced and intentional manner. The topic of food insecurity attracts researchers from many disciplines, including sociology, public health, nutrition, and education. This creates a unique opportunity for interdisciplinary collaborations that can build the quality and impact of the field. Building this area of research will require not only carefully designed multi-institutional research, but also nationally representative research that can continue to push the literature forward and consider food insecurity in a wide variety of college environments. Specifically, more research on non-profit private institutions, as well as for-profit institutions, must be done to speak more fully to food insecurity in higher education generally. Right now, the research, including this dissertation, exists as cross-sectional snapshots of certain institutions, primarily public institutions.

Future research should also consider the adoption of a longitudinal design to more thoroughly understand the relationship between experiences of food insecurity in college with career and educational outcomes. A longitudinal design could provide rich insights into students' experiences of economic insecurity generally and food insecurity specifically.

As this research continues to move forward, it will be vital to get the most updated information into the hands of practitioners and faculty who regularly work with students. Making sure that these stakeholders know how to direct and support students experiencing food insecurity is essential to ameliorating this problem at colleges as much

as possible. It will be important for researchers not to lose sight of the daily, individual implications of this work for supporting students in their security projects as they work toward degree completion.

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Appendix A. The Study on Collegiate Financial Wellness

The data for this study are part of the Study on Collegiate Financial Wellness (SCFW), a multi-institutional study that explores the financial attitudes, behaviors and knowledge of students from two- and four-year non-profit and public colleges and universities across the United States via an online survey. For the 2017 study administration, the research team specifically explored the themes of students' financial self-efficacy, financial socialization, financial stress and strain, financial knowledge, and positive and negative financial behaviors. Participation in the SCFW is free for partner institutions. This allows partners from all types of institutions and with any institutional resource level to participate in the study. We currently keep the study free for institution participants because it allows for as broad of participation as possible.

The SCFW was first administered by the Center for the Study of Student Life (CSSL) and an Ohio State University faculty member, Catherine P. Montalto, in 1999 and throughout the early 2000s on Ohio State's Columbus campus. In 2010, the study was expanded to include multiple institutions and was administered at 19 Ohio colleges and universities. This first iteration of the multi-institutional study, call the Ohio Student Financial Wellness Survey (OSFWS), asked students at two-year public, four-year

public, and four-year private institutions about their financial resources, attitudes, and behaviors.

In the fall of 2014, the study was conducted with 50 institutions from around the United States and one Canadian institution. This version of the study was heavily revised from the 2010 version and included a variety of questions that explored the ways in which students handled their financial matters.

For the 2017 administration of the study, staff in CSSL again significantly revised the study instrument to incorporate stronger measures of financial management, financial socialization, and financial self-efficacy. Additional questions about students' credit card use, specifically their use of credit cards to pay for their college tuition, were also added to the study. Participating institutions also had the option in 2017 to participate in the module on food security. Forty-seven institutions chose to participate in the food security module, which forms the basis for this dissertation.

I joined the CSSL staff in August 2016, in time to take on primary responsibility for the study administration. The study was administered in February 2017 to 65 institutions, encompassing 90 campuses in 25 states. An example that illustrates the differentiation between institutions and campuses is that Ohio State University is an institution and its six campuses (Columbus, Newark, Marion, Mansfield, Lima, and Agricultural Technical Institute) are all combined to form one institution. The study had a 78% increase in the number of participating institutions between 2014 and 2017. The 2017 institutions included 37 four-year public institutions (56.9% of the SCFW sample),

six four-year private institutions (9.2% of the SCFW sample), and 22 two-year institutions (33.8% of the SCFW sample).

The SCFW provides important contributions to researchers' understanding of students' holistic financial experiences in college. While this includes students' experiences with student loans, it also includes information about financial education they receive before and during college, their attitudes about their financial situation, and their view of their financial futures. The study also asks students about their experiences with financial counselors, including personal financial advisors, financial aid counselors, and peer financial counselors. The SCFW is unique in that it asks students about these broader financial experiences and financial attitudes. Moreover, the study also asks about loan aversion among students, an understudied topic, but a vital one in understanding the interplay between college access, student loans, and financial attitudes around debt among students.

Additionally, the SCFW has measures that can help to operationalize economic precarity, asking students if they would be able to come up with $400 in cash in the case of a financial emergency during the semester and asking students the extent to which they agree or disagree that they struggle to pay their monthly expenses. For a subset of 47 institutions, the SCFW also measures economic precarity through the lens of food insecurity. These measures are particularly useful in broadening researchers' understanding of precarity and in connecting precarity to other measures of financial wellness, such as attitudes, financial behaviors, and stress. A dataset that combines

experiences of precarity with attitudinal measures about students' financial situations allows the data to be understood sociologically through the exploration of the interplay between economic precarity and attitudes about students' financial and academic situations.

My role in the SCFW

As a sociologist interested in students' experiences of economic insecurity while in college, I was very excited to have the opportunity to work on the SCFW. I am responsible for the coordination of the SCFW. This coordination can be broken down into the following categories of responsibilities: 1) institution recruitment, 2) institutional coordination prior to survey administration, 3) institutional review board management 4) survey administration, 5) data cleaning, preparation, and analysis, 6) reporting, 7) dissemination, and 8) preparation and reflection for next survey administration. The sections below discuss the details of each of these responsibilities.

Institution Recruitment

When I started at CSSL, the recruitment of institutions to participate in the SCFW was already underway, but incomplete. I worked to continue and complete the institution recruitment process. I organized the many emails in the SCFW email account and created a protocol for what to do when an institution signed up to participate for the study. This included sending them a welcome email that confirmed their registration for the study and outlined the next steps and timeline for the next few months. It also created a space for institutions to ask questions and to receive personalized, timely answers.

I also tracked registrations for the study. This spreadsheet included the institution's contact person(s), projected sample size based on institutional enrollment, institutional type (4-year, 2-year, public, private), and Institutional Review Board status. The spreadsheet had multiple worksheets that showed which institutions signed up, which institutions declined to participate, and which institutions dropped out of the study after signing up. This spreadsheet was very useful throughout the course of the study, and additional items were added to include information about the invitation email for each campus, the use of incentives, which consent institutions wanted to use, and if/when institutions submitted their random sample of students. By organizing this document carefully, I created an excellent tool for tracking each institution throughout the study, from recruitment onward.

Institutions voluntarily signed up to participate in the SCFW through an online form and then I worked with each institution to administer the study to their students. The staff members we work with at our partner institutions have a variety of roles within their universities, from professors and financial wellness coordinators to vice presidents of student affairs or financial aid and institutional research directors. All of these partners have varying levels of research experience and expertise. I had to work carefully with partners to ensure that they understood the processes and approvals necessary for their institution to participate in the study. Through email and phone conversations, I guided partner institutions through the processes of institutional review board approval, incentive decisions, gathering a random sample of students, and general study protocols and

processes. Through these guiding conversations with partners, I worked to make the implementation of the study at their institution as easy as possible. While these conversations were most prevalent during the recruitment phase of the study implementation, many of these conversations occurred at each step of the implementation process with partner institutions.

Institutional Coordination Prior to Survey Administration

Prior to administering the survey, I worked with institutions on their study approval documentation, their institution's specific details for the study, and general check-ins about timelines and deadlines.

Institutional Review Board Approval or Letter of Support

After institution recruitment was complete, I worked with each partner institution to procure documentation from their institution that approved the SCFW occurring at their institution. Each institution could provide documentation either from their institution's IRB or a Letter of Support from a senior staff member at their university. For institutions who received IRB approval from their institution, they received an anonymized raw data file of their SCFW results. Institutions that submitted a Letter of Support received their institution's report(s), but did not receive the anonymized data file. I walked institutions through the process of deciding if they should complete an IRB application or obtain a Letter of Support. Institutions who did not intend to do further analyses or additional projects with their data did not need IRB approval. It is often less complex for partners to obtain a Letter of Support from their institution. In helping

institutions to think about their longer term plan for the project, I could help them to determine the best kind of approval for their specific case. For institutions that did obtain IRB approval, I helped them through the process at their institution any time they had questions. I communicated with institutions not only about the process, but checked in with them regularly about the timeline and deadline for the study team to receive their approval documentation.

Next Steps Survey and Information

Each participating institution customized their survey administration in terms of the incentives that they offered and 'who' the email invitation for the survey came from. I created a Next Steps Survey for each institution to complete that asked them to share their school's incentives and email invitation details, as well as gave them an opportunity to opt-in to the food security module.

In addition to gathering this information, the next steps information that I shared with participating schools included instructions for the random sample and information to share with their IT personnel to 'whitelist' the email invitations do not go to spam folders.

Prior to survey administration, I also continued to check in regularly with non-responsive institutions about missed deadlines. At this time, we experienced some attrition from the study as institutions stopped responding to emails or shared that staff transitions had changed their ability to participate.

IRB Management

As part of this project, I served as the main contact point with the Ohio State IRB. I worked to update the IRB application for the 2017 study administration. I was responsible for submitting amendments to update our participating institutions and to upload their approval documentation. I crafted new documentation for the IRB showing how many institutions participated in the study in 2014 and 2017, as well as the total number of participants covered by the Ohio State IRB. In the spring, I also handled creating our Continuing Review for the Ohio State IRB.

Survey Administration

For the survey administration, I handled all preparation work, actual administration, and concluding aspects of the survey.

Preparation Work

Through coordination of this study, I learned the Qualtrics survey software. A significant portion of the survey preparation work involved using Qualtrics to check the survey itself. I confirmed the survey questions by comparing them to the IRB-approved survey. I also checked the survey logic, both for individual questions and for entire blocks of the survey. I set up a survey checking protocol that tested the survey logic, with CSSL staff being assigned certain profiles to test the survey and make sure the questions displayed as expected.

Of particular importance in the preparation work was adding more variables to the contacts spreadsheet. These additional variables, or embedded data, allowed me to have

the pertinent information about each student contact actually loaded into the Qualtrics platform as part of the survey itself so that when I downloaded the data from Qualtrics, all that extra, non-sensitive, but very useful, information would also be there, already associated with a student's response to the survey.

All institutions had to securely submit their random sample of undergraduate students for the survey. I set up folders for each institution and then sent each partner a personalized link for them to submit their random sample. I then added all of the necessary institutional information from the Next Steps Survey and from the institution tracking spreadsheet, such as school type, to each sample. After receiving all the samples and adding the pertinent information to them, I created one massive spreadsheet with all of the emails (approximately 235,000) in it to upload to Qualtrics. Once the contact list was in Qualtrics, I split it into two samples, one for institutions with incentives and one for institutions with no incentives. I split the list in this way because students received slightly different emails depending on if their institution offered incentives.

For each sample, I created an invitation message in the Qualtrics survey platform. This invitation message used the embedded data from the contact list to automatically fill the students' first name and the specific 'from' information provided by the institution, including a specialized signature line and a specialized 'from' name, that the email would appear to be from. I also sent up reminder messages in the Qualtrics platform, again using embedded data so that the reminders would automatically send on the specified days. The

sheer scale of the email invitations I was sending also required me to get special permission from Qualtrics to send up to 700,000 emails in one week.

Actual Administration

On the morning when the survey went out to students, I checked it regularly to identify and troubleshoot any issues that came up. As part of troubleshooting, I also communicated with partner schools about any issues that arose during administration, such as emails ending up in spam folders or a name mix-up. One school had issues with spam filters, so I worked with their IT personnel to get the surveys to students' inboxes.

To track responses from each school during the administration period, I created a spreadsheet that tracked the number of emails sent per institution, the number of emails actually sent once bounced and failed emails were accounted for, and the number of responses. This allowed me always to have the most accurate response rate available per school. This also allowed me to tell schools how many emails bounced back when I tried to send the survey invitation.

During the three week survey administration, I downloaded the responses from Qualtrics on a weekly basis to calculate response rates in the tracking spreadsheet. I calculated response rates in Stata. Each week, I emailed partners using mail merge in Microsoft Word to send them their updated response rates.

Concluding Aspects

I closed the survey on Qualtrics when the survey administration period had ended and downloaded the data in SPSS format. I then began to prepare for the data cleaning and preparation.

Data cleaning, preparation, and analysis

Data cleaning and preparation

I downloaded the data from the Qualtrics survey platform in SPSS format. I wrote SPSS syntax to merge the data together from multiple SCFW Qualtrics surveys (i.e. those created from troubleshooting issues). Once I had a complete and merged data file, I began cleaning it. Cleaning the data included determining a cut-off point of survey completion for inclusion in the final dataset. This inclusion point was that respondents answered at least one question past the initial demographics. I removed thousands of responses that did not meet this cut-off criteria.

To continue to data cleaning, I renamed all variables, recoded some variables, and created new variables. For example, I recoded the continuous age variable into a categorical variable and created a new categorical variable for first generation students based on parental education. I also created variables for school type (4-year public, 4-year private, 2-year public), financial knowledge scores, and food security categories, to name a few.

For schools that had IRB approval, I also created anonymized data files to share with them. Just over one-third of schools with IRB approval also asked students to

consent to share their education records as part of their consent to participate in the SCFW survey. For these schools, I uploaded a list of their respondents' names and emails to individual, secure folders. The partners downloaded this list, attached whatever education information they were interested in connecting to their students' SCFW responses, and then re-uploaded the list with the education information. The information that partners usually included was cumulative GPA, number of credits completed, any flags for military veteran status, honors program status, etc. I sent regular reminder emails to schools for them to submit this information.

Once I had received all the education records from schools, I merged the education records with their students' SCFW responses to create even richer datasets for these partner institutions. I anonymized these datasets before sending them to partner institutions.

In order to have more information about institutional context, I added information from the Integrated Postsecondary Education Data System (IPEDS) about institutions' demographic make-up, their provision of institutional aid, students' average loan balance, and cohort graduation rates. This allowed me to further enrich the SCFW with more nuanced and thorough information about the participating institutions. The IPEDS is ideal for this because its data are self-reported from the institutions themselves to the National Center for Education Statistics (NCES), which administers IPEDS.

Data analysis

Data analysis for this project remains ongoing, but I have undertaken some initial analyses to include as part of the reporting for our partner institutions.

First, I did initial exploratory analyses to understand the data, running descriptive statistics and doing some preliminary cross-tabulations by institution type and student characteristics, such as gender and first generation status, among others.

Then, I helped to craft an exploratory factor analysis from the study's attitudinal, socialization, behavior, and knowledge questions. This factor analysis identified themes around financial attitudes and behaviors. These factors included: financial self-efficacy, financial socialization, financial stress and strain, financial knowledge, and positive and negative financial behaviors. I also confirmed that the correlations between these variables for the factor analysis were distinct. Based on this factor analysis, I then calculated mean scores for the partner institution reports across these six factors. To calculate the mean scores, I only included students who had answered all questions for each scale.

Data analysis remains ongoing and the study team has multiple manuscripts and presentations in progress with the SCFW 2017 data.

Reporting

To report on the SCFW 2017 results, I created descriptive reports for each partner institution, a descriptive report for all institutions, and talking points for any media

inquiries. I also partnered with a co-worker to create the key findings report, a report that offers the important highlights from the whole study.

To create the descriptive reports for each partner institution, I first created a template report in Microsoft Excel with all of the questions in the survey using the SCFW brand colors and fonts identified by Ohio State Student Life Marketing. To more easily create all of the reports, I created custom tables in SPSS, in combination with seed and receiver files in Excel. Custom tables in SPSS allowed me to create full descriptive reports by institution code all at one time and to create reports by school type for each report. After downloading these custom tables into Excel, I was able to copy and paste from the custom tables into the correct cells in the report template, pasting it as a link to the custom tables Excel sheet. This link creates the seed (custom tables) file and the receiver (template) file. By connecting these two files via pasted links, any update to the seed file also changes the receiver file. This made the report creation much faster for each institution. To then create each report, I would change the information in the seed file and save the receiver file of the report template as a PDF document.

All reports had to be checked for consistency and correctness. I created a report-checking protocol and assigned CSSL staff to check batches of reports. I myself checked the numbers on many of these reports as well.

Dissemination

To disseminate the results of the study, I emailed individual reports, the national descriptive report, and the anonymized data file (if applicable) to each partner institution.

I also communicated the timeline for reporting and sharing to partner schools, as we had to delay dissemination by about two weeks. I also handled all updates to the SCFW website, adding new reports and analyses. I developed talking points for any media inquiries as well.

Preparation and Reflection for 2020 Survey Administration

Throughout the study administration, I took notes to prepare for the 2020 survey administration. In doing so, I regularly reflected on how to alter and change the study in future iterations. For example, in the future, I will upload two contact lists to the Qualtrics survey platform, split by incentive status, rather than split the samples within Qualtrics. Additionally, I will do even more checking of the survey samples when they come in from partner institutions to prevent avoidable mistakes such as incomplete email addresses.

Limitations

Any study, including this one, will have limitations. The limitations of this study include that it is not nationally representative, the potential for non-response bias, and the location of the food security questions at the very end of the survey.

The SCFW is not nationally representative data. Institutions that participated signed up voluntarily and we accepted all interested institutions. As a result, this study does not proportionally represent the higher education landscape in the United States. Participating institutions range from highly selective to open enrollment institutions. The institutions represented in this data come from 25 states across the country, not all 50

states. Participating institutions self-select into the study, creating potential selection bias as it is possible that participating institutions are more likely to have financial wellness programs for their students or a stronger interest in their students' financial lives. Participating institutions also have the resources and staffing to prioritize the administration of this study on their campus. Nonetheless, it is particularly useful for helping us to understand broad trends among students since it includes students at two-year and four-year institutions.

Conclusion

The SCFW provides a unique view into the financial situations, attitudes, behavior, and knowledge of college students from campuses across the United States. It provides a holistic view of students' financial wellness, as well as sociologically useful measures of economic insecurity. For this dissertation, it provides complementary data and insights on students' experiences of food insecurity while in college. These insights and findings will inform the conversation around students' experiences of economic insecurity while in college.

Appendix B. Full List of Chapter 2 Institutions and Food Pantry Status

Institution Name	Pantry Status (1 = yes)
ASA College	0
Adams State University	1
Adelphi University	0
Adventist University of Health Sciences	1
Albertus Magnus College	0
Albright College	0
Alderson Broaddus University	0
Alexandria Technical & Community College	0
Allegany College of Maryland	0
Allen College	0
Alverno College	0
American Career College-Anaheim	0
American College for Medical Careers	0
American International College	0
American National University	0
Andrew College	0
Angeles College	0
Antioch University-Seattle	0
Aquinas College	0
Argosy University-Phoenix	0
Argosy University-The Art Institute of California-Inland Empire	0
Argosy University-The Art Institute of California-Orange County	0
Arkansas Baptist College	0
Arkansas Northeastern College	0
Arkansas State University Mid-South	0
Art Center College of Design	0
Aspen University	0
Atlanta Metropolitan State College	1
Atlantic Cape Community College	0
Auburn University	1
Avila University	0
Baltimore City Community College	1
Barnard College	0
Barton College	0

Barton County Community College	0
Bates College	0
Bates Technical College	0
Bay Mills Community College	0
Becker College	0
Beckfield College-Tri-County	0
Bennington College	0
Berea College	0
Bergen Community College	1
Bergin University of Canine Studies	0
Bethel University	0
Beulah Heights University	0
Big Bend Community College	1
Black Hills State University	0
Blue Mountain Community College	0
Bon Secours Memorial College of Nursing	0
Boston Baptist College	0
Bowie State University	0
Brewton-Parker College	0
Brigham Young University-Provo	0
Brightwood College-Bakersfield	0
Brightwood College-Baltimore	0
Brightwood College-San Antonio-Ingram	0
Brightwood College-San Diego	0
Broadview University-Boise	0
Brookline College-Phoenix	0
Brown Mackie College-Indianapolis	0
Brown Mackie College-Louisville	0
Bryan University	0
Bryan University	0
Bryant & Stratton College-Amherst	0
Bryant & Stratton College-Milwaukee	0
Buena Vista University	0
CUNY Bronx Community College	1
California Institute of Technology	0
California Institute of the Arts	0
California Miramar University	0

California State University-Sacramento	1
California State University-San Marcos	1
Cambridge College	0
Cambridge Junior College-Yuba City	0
Carleton College	0
Carrington College-Phoenix	0
Carrington College-Sacramento	0
Carrington College-Stockton	0
Carrington College-Westside	0
Casa Loma College-Van Nuys	0
Cascadia College	0
Central College	0
Central Maine Community College	0
Central Michigan University	0
Central New Mexico Community College	0
Chadron State College	0
Chamberlain College of Nursing-Florida	0
Chandler-Gilbert Community College	0
Charter College-Canyon Country	0
Chatham University	0
Chattahoochee Valley Community College	0
Chattanooga State Community College	0
Cheyney University of Pennsylvania	0
Chicago State University	0
Christopher Newport University	0
Clark State Community College	0
Clatsop Community College	0
Cleary University	0
Clinton Community College	0
College of Central Florida	1
College of Saint Elizabeth	0
College of St Joseph	0
College of Staten Island CUNY	1
College of the Redwoods	1
Colorado Heights University	0
Colorado School of Mines	0
Columbia College-Chicago	0

Concorde Career Institute-Tampa	0
Concordia University-Irvine	0
Connors State College	0
Copper Mountain Community College	0
Cossatot Community College of the University of Arkansas	1
Cuyamaca College	1
D'Youville College	0
Dallas Nursing Institute	0
Daytona State College	1
De Anza College	1
DeVry University-Florida	0
DeVry University-New Jersey	0
DeVry University-Ohio	0
DeVry University-Oklahoma	0
DeVry University-Wisconsin	0
Denmark Technical College	0
Dickinson State University	0
Digital Media Arts College	0
Doane University-Arts & Sciences	0
Drexel University	0
Eagle Gate College-Layton	0
East Arkansas Community College	0
East Central Community College	0
East Central University	0
East San Gabriel Valley Regional Occupational Program	0
Eastern Illinois University	0
Eastern West Virginia Community and Technical College	0
Eastern Wyoming College	0
Elmhurst College	0
Enterprise State Community College	0
Evangel University	0
Expression College for Digital Arts	0
Fashion Institute of Design & Merchandising-San Diego	0
Fayetteville State University	0
Feather River Community College District	1
Ferris State University	1
Fisher College	0

Fitchburg State University	0
Flint Hills Technical College	0
Florida College of Natural Health-Pompano Beach	0
Florida Memorial University	0
Florida SouthWestern State College	0
Fordham University	0
Fort Valley State University	1
Fortis College-Cutler Bay	0
Fortis College-Cuyahoga Falls	0
Fortis College-Norfolk	0
Fortis College-Salt Lake City	0
Franklin W Olin College of Engineering	0
Galen College of Nursing-Cincinnati	0
Galen College of Nursing-Tampa Bay	0
GateWay Community College	1
Golf Academy of America-Carlsbad	0
Green River College	0
Greensboro College	0
Hampton University	0
Hawaii Community College	0
Herzing University-Kenner	0
Herzing University-Kenosha	0
Herzing University-Toledo	0
Hickey College	0
Highland Community College	0
Hiram College	0
Hobart William Smith Colleges	1
Hopkinsville Community College	0
Houghton College	0
Humphreys College-Stockton and Modesto Campuses	0
Huntingdon College	0
Huntington University	0
Huntsville Bible College	0
Huston-Tillotson University	0
IBMC College	0
Immaculata University	0
Indian River State College	0

Indiana Institute of Technology	0
Indiana University-Kokomo	1
Indiana University-South Bend	1
Interactive College of Technology	0
Interactive College of Technology-Morrow	0
Interactive College of Technology-Newport	0
International Business College-El Paso	0
Iona College	0
Iowa State University	1
Irvine Valley College	0
Itawamba Community College	0
Jackson State Community College	1
Jackson State University	0
James Madison University	1
Jefferson College	0
Jefferson Community and Technical College	0
Johns Hopkins University	0
Joliet Junior College	0
Jose Maria Vargas University	0
Kansas City Kansas Community College	1
Kaplan University-Cedar Falls Campus	0
Key College	0
Kilgore College	0
LIM College	0
LIU Post	0
Laboure College	0
Lake Forest College	0
Lake Region State College	0
Lander University	0
Lane Community College	1
Las Positas College	0
Le Cordon Bleu College of Culinary Arts-Atlanta	0
Le Cordon Bleu College of Culinary Arts-Chicago	0
Le Cordon Bleu College of Culinary Arts-Pasadena	0
Le Cordon Bleu College of Culinary Arts-Scottsdale	0
Lebanon Valley College	0
Lincoln College of Technology-Denver	0

Lipscomb University	0
Lock Haven University	0
Long Beach City College	0
Louisburg College	0
Louisiana Delta Community College	0
Louisiana State University-Shreveport	0
Lubbock Christian University	1
Luther College	0
MCPHS University	0
Manchester University	0
Manhattan Christian College	0
Manhattanville College	0
Marymount California University	0
Maryville College	0
Mayland Community College	0
Meredith College	0
Meridian Community College	0
Merrimack College	0
Mesalands Community College	0
Messenger College	0
Messiah College	0
Methodist College	1
Metropolitan College of New York	0
Metropolitan State University of Denver	1
Miami-Jacobs Career College-Springboro	0
MidAmerica Nazarene University	0
Middlesex Community College	1
Midland University	0
Miller-Motte Technical College-Augusta	0
Miller-Motte Technical College-Macon	0
Miller-Motte Technical College-Roanoke	0
Milligan College	0
Milwaukee Area Technical College	1
Minneapolis College of Art and Design	0
Minneapolis Media Institute	0
Minot State University	1
Misericordia University	0

Mississippi College	0
Mississippi State University	0
Mississippi University for Women	0
Missouri University of Science and Technology	0
Monroe College	0
Moody Bible Institute	0
Morehead State University	1
Mountain State College	0
Mt Hood Community College	1
National American University-Austin	0
National American University-Burnsville	0
National American University-Ellsworth AFB Extension	0
National American University-Georgetown	0
National American University-Overland Park	0
National American University-Roseville	0
National American University-Sioux Falls	0
National American University-Zona Rosa	0
Nebraska College of Technical Agriculture	0
Nebraska Methodist College of Nursing & Allied Health	0
Neumann University	0
New England College	0
New Mexico Highlands University	1
New Mexico Junior College	0
New Mexico State University-Alamogordo	1
New Mexico State University-Dona Ana	0
New Mexico State University-Grants	0
New River Community College	0
Newberry College	0
North American University	0
North Central Missouri College	0
Northampton County Area Community College	1
Northeast Catholic College	0
Northern Kentucky University	1
Northern New Mexico College	0
Northland College	0
Northshore Technical Community College	0
Northwest Iowa Community College	0

Northwest Missouri State University	1
Northwestern College-Chicago Campus	0
Norwalk Community College	1
Nossi College of Art	0
Oglethorpe University	0
Ohio Christian University	0
Ohio State University Agricultural Technical Institute	0
Ohio Technical College	0
Ohio University-Lancaster Campus	0
Ohio Wesleyan University	1
Oklahoma State University Institute of Technology	0
Oklahoma State University-Oklahoma City	1
Oregon Institute of Technology	0
Orleans Technical Institute	0
Otis College of Art and Design	0
Ottawa University-Ottawa	0
Otterbein University	1
Ozarka College	0
Pacific Union College	0
Palmer College of Chiropractic	0
Pasadena City College	1
Pennsylvania College of Art and Design	0
Pennsylvania State University-Penn State DuBois	0
Pennsylvania State University-Penn State Schuylkill	0
Pennsylvania State University-World Campus	0
Pensacola State College	0
Phillips Beth Israel School of Nursing	0
Phoenix College	1
Piedmont College	0
Pierce College-Puyallup	1
Pima Medical Institute-Albuquerque	0
Pima Medical Institute-Denver	0
Pinnacle Career Institute-North Kansas City	0
Pioneer Pacific College	0
Pittsburgh Institute of Aeronautics	0
Platt College-Aurora	0
Plymouth State University	1

Polytechnic University of Puerto Rico-Orlando	0
Porterville College	1
Presentation College	0
Professional Golfers Career College	0
Providence College	0
Pueblo Community College	1
Quinnipiac University	0
Radford University	0
Ramapo College of New Jersey	0
Rappahannock Community College	0
Remington College-Dallas Campus	0
Remington College-Heathrow Campus	0
Remington College-Lafayette Campus	0
Remington College-Little Rock Campus	0
Remington College-North Houston Campus	0
Remington College-Shreveport Campus	0
Rend Lake College	1
Richland College	0
Rider University	0
Ringling College of Art and Design	0
Riverland Community College	0
Rochester Institute of Technology	1
Rockhurst University	0
Roger Williams University	0
Rogue Community College	0
Rollins College	0
Roosevelt University	1
Rowan College at Burlington County	0
Rowan-Cabarrus Community College	1
SAE Institute of Technology-Atlanta	0
SUNY Buffalo State	1
SUNY College of Environmental Science and Forestry	1
SUNY Maritime College	0
SUNY at Purchase College	0
Saint Cloud State University	0
Saint Luke's College of Health Sciences	0
Saint Norbert College	0

Saint Vincent College	0
Samuel Merritt University	1
San Antonio College	1
San Diego State University	1
San Francisco Conservatory of Music	0
San Jose State University	1
Santa Ana College	0
Santa Barbara City College	1
Savannah Technical College	0
Scripps College	0
Seattle University	0
Seminole State College	0
Shawnee Community College	0
Shawnee State University	1
Sierra College	1
Sitting Bull College	0
South Georgia State College	0
South Louisiana Community College	0
South Piedmont Community College	0
South University-Tampa	0
South University - Virginia Beach	0
Southeastern Baptist College	0
Southeastern College-Jacksonville	0
Southeastern College-West Palm Beach	0
Southeastern Community College	0
Southeastern Louisiana University	1
Southeastern University	0
Southern California University of Health Sciences	0
Southern Nazarene University	0
Southern Technical College	0
Southside Regional Medical Center Professional Schools	0
Southwest Collegiate Institute for the Deaf	0
Southwest Minnesota State University	0
Southwest Tennessee Community College	0
Southwest University of Visual Arts-Tucson	0
Spencerian College-Lexington	0
Spencerian College-Louisville	0

Spokane Falls Community College	0
Springfield Technical Community College	1
St Cloud Technical and Community College	0
St Lawrence University	0
St Louis College of Health Careers-Fenton	0
St Olaf College	0
Stanbridge College	0
State College of Florida-Manatee-Sarasota	1
Stonehill College	0
Stony Brook University	1
Stratford University	0
Strayer University-North Carolina	0
Strayer University-Tennessee	0
Strayer University-West Virginia	0
Sussex County Community College	1
Taft College	0
Talmudic College of Florida	0
Tarrant County College District	1
Taylor College	0
Taylor University	0
Texas A & M University-College Station	1
Texas A & M University-Corpus Christi	1
The Art Institute of Indianapolis	0
The Art Institute of Pittsburgh	0
The Art Institute of Portland	0
The Art Institute of Seattle	0
The College of Idaho	0
The Creative Center	0
The Juilliard School	0
The University of Texas of the Permian Basin	0
The University of the Arts	0
Tillamook Bay Community College	0
Toccoa Falls College	0
Towson University	1
Trevecca Nazarene University	0
Tri-County Technical College	0
Triangle Tech Inc-Sunbury	0

Trinity College of Florida	0
Tulsa Welding School-Tulsa	0
Tusculum College	0
Tuskegee University	0
Union County College	0
Universal College of Healing Arts	0
Universal Technical Institute of Arizona Inc	1
University of Arkansas Community College-Morrilton	0
University of Central Missouri	1
University of Chicago	0
University of Hawaii at Hilo	0
University of Hawaii at Manoa	0
University of Illinois at Chicago	1
University of Louisiana at Monroe	0
University of Maine at Machias	0
University of Mary	0
University of Memphis	1
University of Michigan-Ann Arbor	1
University of Minnesota-Duluth	0
University of Mount Olive	0
University of New Orleans	0
University of North Carolina at Charlotte	1
University of North Florida	1
University of Notre Dame	0
University of Phoenix-Virginia	0
University of Pittsburgh-Bradford	0
University of Pittsburgh-Greensburg	0
University of Redlands	0
University of Richmond	0
University of Rochester	0
University of Science and Arts of Oklahoma	0
University of Southern Indiana	1
University of Valley Forge	0
University of Wisconsin Colleges	0
University of Wisconsin-La Crosse	1
University of Wisconsin-Oshkosh	1
Utica College	0

Utica School of Commerce	0
Valley City State University	0
Vance-Granville Community College	0
Vatterott College-Spring Valley	0
Vet Tech Institute	0
Vincennes University	0
Virginia College-Birmingham	0
Virginia College-Greenville	0
Virginia Highlands Community College	0
Virginia Union University	0
Virginia Western Community College	1
Vista College	0
Wagner College	0
Walden University	0
Walla Walla University	0
Washburn University	1
Washington Adventist University	0
Washington College	0
Washington State Community College	0
Wayne County Community College District	1
Wayne State University	1
Wells College	0
Wentworth Military Academy and College	0
West Georgia Technical College	1
West Liberty University	0
West Tennessee Business College	0
West Virginia University at Parkersburg	1
Western State Colorado University	0
Western Technical College	0
Wheeling Jesuit University	0
White Mountains Community College	0
William Moore College of Technology	0
Windward Community College	0
Wittenberg University	0
Wood Tobe-Coburn School	0
Yakima Valley Community College	1
Yale University	0