

Poverty in American Higher Education: The Relationship Between Housing Insecurity and Academic Attainment

Katharine M. Broton

Departments of Educational Policy & Leadership Studies and Sociology
University of Iowa

Abstract

A substantial share of college students experience housing insecurity and too many students leave higher education before earning a credential. Both of these experiences are more common among students from low-income families who often lack adequate resources. While prior conceptual and qualitative investigations suggest that housing insecurity is associated with poorer student outcomes, this relationship has not been tested due to quantitative data limitations. In this paper, I use data from a statewide longitudinal study of students from low-income families to conduct the first empirical test of the relationship between housing insecurity early in college and later college achievement and attainment. Findings show that housing insecurity is a statistically significant predictor of academic success, net of background factors. Specifically, housing insecurity is associated with an 8 to 12 percentage-point reduction in the probability of later degree attainment or enrollment. In the short-term, housing insecurity is also associated with lower mean grade point average (GPA), a lower probability of obtaining at least a 2.0 GPA, and a higher probability of enrolling part-time rather than full-time, indicating that housing insecurity affects students' college academic experiences in multiple ways. Efforts to promote college attainment should be expanded

* Contact: katharine-broton@uiowa.edu



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to consider students' housing security. There are likely several points in time and multiple ways that higher education institutions, nonprofit agencies, and policymakers can intervene to promote secure housing and college success.

Keywords: academic attainment; college success; poverty; housing insecurity; basic needs

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It is increasingly difficult to attain a middle-class lifestyle without a college education (Zaber & Wenger, 2021). At the same time, the price of earning a college degree has grown substantially (Goldrick-Rab, 2016). The rising net price of college coupled with a weak public social safety net and a paucity of well-paying jobs seem to contribute to the growing number of students who forgo meeting their basic needs while pursuing their higher educational goals (Baker-Smith et al., 2020; Broton & Goldrick-Rab, 2013, 2018; Hallett et al., 2019; Kalleberg, 2011). A recent review article indicates that 45% of college students experience some form of housing insecurity, including problems related to housing unaffordability or instability (Broton, 2020).

The long-term academic implications of housing insecurity during college have not been examined, but human development theory and empirical investigations using ethnographic and interview methods indicate that housing insecurity impedes students' academic success (Bowers & O'Neill, 2019; Crutchfield, 2018; Gupton, 2017; Hallett & Freas 2018; Maslow, 1943). In their book, Hallett and colleagues (2019) explain that housing insecurity may manifest in different ways, but the instability that it creates in students' lives creates distractions, anxiety, and extra logistical burdens that hinder students' ability to perform their best in school. Indeed, survey studies of college students show a bivariate relationship between housing insecurity and lower grades (Baker-Smith et al., 2020; Silva et al., 2017). Moreover, studies of K-12 students show a link between housing challenges and later lower levels of academic achievement and attainment (Cutuli et al., 2013; Darolia & Sullivan, 2021; Miller, 2011a; Obradović et al., 2009).

Despite demonstrated interest from higher education leaders, policymakers, and advocacy groups and implications for resource allocation decisions (e.g., Broton personal communication, January 20, 2019; Broton personal communication, January 26, 2021; MacArthur Foundation, n.d.; U.S. Department of Housing and Urban Development, September 16, 2015; Weissman, 2021),¹ there are no empirical studies documenting

1 Personal communication on January 20, 2019 led to Washington Senate Bill 5738 which cited an earlier working paper version of this manuscript as justification to propose legislation supporting housing insecure college students (see Section 1); subsequently, Bill 5800 was passed by both chambers and signed by the Governor in 2019 and is discussed later in this paper.

the relationship between experiences of housing insecurity during college and later academic attainment. This is largely due to data constraints as the nationally representative studies of college students do not include measures of housing insecurity that can be linked to later academic outcomes. In this paper, I leverage an unusually rich statewide longitudinal dataset that enables me to examine the relationship between experiences of housing insecurity early in college and later academic attainment, persistence, enrollment intensity, and GPA, net of sociodemographic, pre-college financial and academic, and college and community context factors. Across multiple estimation strategies and samples, findings indicate that housing insecurity is associated with an 8 to 12 percentage-point decline in the probability of earning a degree or being enrolled in college four years later. In the short term, housing insecurity is also associated with a lower mean GPA, lower probability of earning at least a 2.0 GPA, and higher probability of being enrolled part-time rather than full-time. The direction and magnitude of these relationships warrants further attention and action to promote college success.

Literature Review

Higher education is a key pathway to breaking the cycle of poverty (Attewell & Lavin, 2009; Zaber & Wenger, 2021). In addition to a higher wage premium and lower unemployment rates, those with a postsecondary credential enjoy better health and are more likely to be civically engaged (Abel & Deitz, 2019; Flanagan & Levine, 2010; Oreopoulos & Petronijevic, 2013; Webber, 2016). Over the past several decades, college access has improved among those historically marginalized and underserved by higher education, including racial/ethnic minority students and those from low-income families. Approximately 40% of first-year undergraduates come from low-income families and three-quarters are “new traditional” students who juggle multiple work and family obligations while attending college (Lumina Foundation, 2015; National Center for Education Statistics, 2015a). However, college attainment rates have not kept pace. Among those born in the early 1980s, 3 in 10 students from families in the lowest income quintile attended college, but fewer than 1 in 10 earned a bachelor’s degree by age 25 (Ziol-Guest & Lee, 2016). Even after accounting for level of academic preparation, students from low-income families are less likely to earn a postsecondary credential than their more affluent peers (National Center for Education Statistics, 2015b).

The price of attending college has grown substantially over the past few decades, and room and board accounts for more than half of the total cost of attendance at four-year institutions and over two-thirds at community colleges (Ross et al., 2015). At the same time, real family incomes for those in the middle and lower classes have been relatively flat with a substantial decline since 2000 (Kochhar & Fry, 2015). Need-based financial aid, including the Pell Grant program, was created to ensure students could pursue college regardless of family economic background, but the “purchasing power” of that aid has declined. In the early 1970s, the Pell Grant covered more than 75% of the cost of attending a public four-year college whereas today it covers just 30% (Goldrick-Rab, 2016). After all grant aid is accounted for, more than half of undergraduates face net

prices greater than 25% of their family income, including 23% whose net price is equal to or exceeds total family income (Kelchen, 2018). Since federal loan limits are capped below the average amount of unmet financial need for students from low- and moderate-income families, students must turn to the private loan market, earn more money, seek charitable assistance, or cut back on expenses to make ends meet (Goldrick-Rab, 2016).

Moreover, inadequate housing policies, including those related to insufficient support for public housing and low-income housing tax credits (Kingsley, 2017; O'Regan, 2017), limited housing supply (Been et al., 2019), and racist housing policies and actions (Faber, 2020; Rosen et al., 2021) have contributed to a lack of adequate and affordable housing options, especially for those from minoritized groups (Airgood-Obrycki et al., 2021; Joint Center for Housing Studies of Harvard University, 2021). Together, these systems leave nearly half of college students housing insecure, or struggling to obtain and maintain fixed, regular, and adequate housing (Broton, 2020; Hallett et al., 2019). Similar to trends in the broader population, students from marginalized backgrounds or underserved groups, including community college students, students of color, and those with low incomes, are especially vulnerable to housing insecurity (Baker-Smith et al., 2020; Broton, 2020; Vasquez et al., 2019; Wood et al., 2016).

Research on college access and attainment tends to focus on the role of students' family income, socioeconomic status, or wealth (e.g., Alon, 2009; Bailey & Dynarski, 2011; Bastedo & Jacquette, 2011; Chetty et al., 2014; National Center for Education Statistics, 2015b; Pfeffer, 2018) rather than students' material well-being, including their housing security status. In contrast, research on K-12 education has long recognized that experiences of poverty and deprivation come with conditions and situations that can compromise children's physical, cognitive, and emotional development, having adverse long-term effects (Duncan & Brooks-Gunn, 2000; Wodtke et al., 2011). Thus, research documents how struggles to get enough to eat or live in adequate shelter independently reduce children's academic achievement, even after accounting for background factors including a lack of family income (e.g., Alaimo, 2005; Miller, 2011a). Moreover, K-12 education policies, such as the McKinney-Vento Homeless Assistance Act, ameliorate conditions of basic needs insecurity and seek to encourage a virtuous cycle of improved academic success and health over the life course (Cutler & Lleras-Muney, 2006; Hallett et al., 2019; Miller, 2011b).

Housing Insecurity among College Students

A growing body of qualitative research gives us insights into the daily lived experiences of housing insecurity among college students. Across studies, students explain the importance of college degree attainment in order to reach their goals of an economically secure future (Bowers & O'Neill, 2019; Crutchfield, 2018; Gupton, 2017; Hallett & Freas, 2018). Yet, housing insecure students also describe a life defined by instability, often hindering their ability to reach their educational goals despite drawing on personal strengths, social networks, and creative pursuits of resilience (Crutchfield, 2018;

Hallett et al., 2019; Hallett & Freas, 2018). These qualitative investigations suggest that housing insecurity affects students' educational success through multiple pathways, including those related to cognition, health, and logistical barriers.

Scholars argue that our brains have limited bandwidth, so concerns about near-term scarcity limit the cognitive capacity available to devote to other tasks or goals. In this case, when students are distracted, stressed, or worried about their ability to secure or retain adequate housing (Bowers & O'Neill, 2019; Hallett et al., 2019), then there is less brain power available to devote to school, which may reduce academic achievement and attainment (Duquenois, 2021; Kaur et al., 2021; Mullainathan & Shafir, 2013). Moreover, these stressors increase hormones that help the body fight or flee. While useful in the short-term, prolonged elevated levels of stress inhibit cognitive functioning, especially hippocampus-controlled tasks including working memory and spatial learning (Lupien et al., 2009).

Housing insecurity also covaries with physical and mental health, including depression, anxiety, and suicidal ideation (Bowers & O'Neill, 2019; Broton et al., in press; Burgard et al., 2012; Eisenberg et al., 2016; Gupton, 2017; Heflin & Iceland, 2009; Sullivan et al., 2008; Tsui et al., 2011). These health problems predict lower achievement and attainment among undergraduates, even after accounting for background characteristics, including current financial situation (Eisenberg et al., 2009). In turn, those with lower levels of educational attainment have poorer health outcomes, on average. Thus, the bidirectional relationship between health and education can create a negative feedback loop (Cutler & Lleras-Muney, 2006).

Finally, students struggling with housing insecurity also face additional logistical challenges that can impede school success (Bowers & O'Neill, 2019; Crutchfield, 2018; Hallett et al., 2019). Direct-assistance programs and services, including housing supports, are often time-limited or require employment, creating additional pressures on students' time (Crutchfield, 2018). As a participant from Hallett and Freas' (2018) study put it, I'm "finding time to get work done between trying to keep myself alive" (p. 731). Additionally, the most affordable housing options are typically located near the outskirts of town, rather than close to campus, increasing travel time. Finally, use of public transportation or unreliable private transportation can be unpredictable, making attending and concentrating in college courses particularly difficult (Hallett et al., 2019; Silva et al., 2017).

Overall, these qualitative investigations indicate that students' housing challenges all too often "negatively impacted their ability to persist" in college (Hallett & Freas, 2018, p. 724). Survey researchers have picked up on this line of inquiry and demonstrated that students who report housing challenges are more likely to report challenges attending class, impaired class performance, and lower grades (Baker-Smith et al., 2020; Silva et al., 2017). Yet, these bivariate associations do not account for correlated background factors. Prior research indicates significant disparities in housing insecurity challenges among those with minoritized and marginalized identities, including those with limit-

ed financial means, students of color, and women (Baker-Smith et al., 2020; Vasquez et al., 2019). Beyond these individual factors, rates of housing insecurity also vary by college and community contexts (Airgood-Obrycki et al., 2021; Baker-Smith et al., 2020). Furthermore, students who experience food insecurity, in addition to housing insecurity, report lower GPAs than those with a single material hardship, indicating that it is important to account for these correlated factors in analyses of the relationship between housing insecurity and academic success (Leung et al., 2021; Wood & Harris, 2020).

Methods

This study seeks to answer the question, what is the relationship between experiences of housing insecurity early in college and later educational success, net of background factors? To better understand potential academic pathways to attainment or persistence, I also assess the relationship between housing insecurity and enrollment intensity and GPA in the short-term.

Wisconsin Scholars Longitudinal Study

The Wisconsin Scholars Longitudinal Study (WSLS) is one of the first studies that allows for such an investigation since it follows a representative cohort of undergraduates over time using survey and administrative records. It includes 3,000 undergraduates from low-income families who enrolled in one of Wisconsin's 42 public colleges and universities full-time for the first-time in fall 2008. Students had to be Wisconsin residents who attended and graduated from a state public high school or earned an equivalency diploma and matriculated within three years. They had to complete the Free Application for Federal Student Aid (FAFSA), qualify for a federal Pell Grant, and still possess at least \$1 of unmet need (excluding loans).

Using administrative records, eligible students were randomly selected for inclusion in the study after enrolling in college (e.g., see also Anderson et al., 2020). This study also includes information from multiple survey questionnaires linked to students' college administrative records, institutional-level data from the Integrated Postsecondary Education Data System (IPEDS), and community-level data from the American Community Survey (ACS). The study tracks students' academic outcomes for four years through colleges' administrative data systems and the National Student Clearinghouse (NSC), which includes degree information from 98% of students in public and private institutions, enabling the study team to track the educational outcomes of students who transfer institutions.

Analytic Sample

In fall 2009, the research team invited a subset of study participants to complete a survey that included questions about students' experiences of housing insecurity during their first year in college. Due to resource limitations, they were not able to invite all

study participants, but selected students based on the eligibility criteria stated above and past survey participation. The analytic sample consists of the 71% of students who responded to that survey and agreed to have their survey data linked to their administrative records ($N = 1,335$). Six in 10 respondents in the analytic sample are female, and 1 in 4 identify as African American, Latino/a, American Indian, or Southeast Asian and are considered targeted racial/ethnic minorities according to University of Wisconsin System policy. Nearly 60% come from families in which a parent has some college experience or higher. Their parents' average annual adjusted gross income is approximately \$27,500 and 35% come from families that are not expected to contribute financially to their students' college costs. Moreover, 1 in 4 students reported that when they were growing up their family struggled to get enough to eat (Table 1).

Compared to the full WSLS study sample, those in the analytic sample come from slightly more advantaged backgrounds, attend more advantaged college institutions, and have higher rates of college success. However, all students in the study are from low-income families and qualified for a Pell Grant, so these differences are relative rather than absolute. For example, students in the analytic sample have slightly higher average family incomes (\$27,500 vs. \$23,200) and a smaller share come from families with a zero-dollar expected family contribution (35% vs. 41%; $p < .001$), but all are likely struggling economically. A smaller share of students in the analytic sample attend two-year colleges (36% vs. 50%; $p < .001$). On average, those in the analytic sample attend institutions with a higher net price (\$9,100 vs. \$7,800) and a smaller share of Pell Grant recipients (24% vs. 26%; $p < .001$; Table A1).

Table 1 on next page.

Table 1: Student background characteristics and outcomes by housing security level

	Analytic Sample	Housing Security Level		
		Housing Secure	Housing Insecure	
<i>Long-term Outcome</i>				
Degree attainment or enrollment four years after initial college entry (%)	66.0	69.6	54.1	***
Degree attainment (%)	17.8	20.6	8.9	
Enrollment (%)	48.2	49.1	45.2	
<i>Short-term Outcomes^a</i>				
Part-time (vs. full-time) enrollment (%)	10.9	8.9	19.5	***
Mean GPA	2.79	2.86	2.49	***
2.0 or higher GPA (%)	88.76	91.41	77.18	***
<i>Background Characteristics</i>				
Childhood Poverty				
Growing up, there was not enough to eat at home (%)	25.7	22.1	37.3	***
College Food Security				
Low Food Security (%)	21.9	17.8	35.0	***
Very Low Food Security (%)	7.9	5.0	17.5	
Pre-College Financial Aid Information				
Average Expected Family Contribution (\$)	1453	1542	1161	**
Zero Expected Family Contribution (%)	35.1	31.0	48.7	***
Financially Independent (%)	5.5	3.4	12.4	***
Simplified Needs Test (%)	58.4	54.5	71.0	***
Pre-College Academics				
ACT college entrance exam record (%)	65.2	66.6	60.5	*
Initial College Context				
Two-year College Sector (%)	35.7	31.9	47.8	***
College Average Net Price (mean \$)	9136.2	9298.0	8610.2	***
Pell Grant Recipients at College (mean %)	23.8	23.1	25.9	***
Community Poverty Rate (mean %)	11.8	11.8	12.0	

Table 1 continued on next page.

Table 1 continued...

Race/Ethnicity				
White, not Hispanic (%)	72.7	75.8	62.4	***
Asian, except Southeast Asian (%)	1.8	2.0	1.3	
Minoritized Race/Ethnicity (%)	25.5	22.2	36.3	***
African American (%)	7.6	6.1	12.7	***
Hispanic (%)	5.8	4.8	8.9	**
Native American (%)	3.8	3.5	4.8	
Southeast Asian (%)	8.3	7.8	9.9	
Demographics				
Female (%)	60.9	59.2	66.6	*
Parents have some college experience or higher (%)	58.2	60.3	51.3	**
Parents Adjusted Gross Income (\$)	27467	28807	23107	***
Immigrant Family (%)	14.8	13.4	19.1	*
N	1335	1021	314	

Notes.

^aEnrollment intensity and GPA are only available for those enrolled in a Wisconsin public college or university in spring 2010, which is the semester following students' material hardship report (N=801). Enrollment intensity is based on the number of credits attempted; GPA is the reported cumulative GPA at the end of the term.

Degree and enrollment outcomes are from the NSC. College housing and food insecurity questions are from a fall 2009 WSLs survey. Pre-college finances come from students' 2008 FAFSA. Pre-college academic information comes from ACT, Inc. and college administrative records. Initial college-level context variables come from IPEDS and the ACS. Demographics come from students' 2008 FAFSA, with the exception of race/ethnicity, parents' education, and immigrant status which come from survey data.

Chi-square test of statistical significance used to test the relationship between housing insecurity and categorical variables. One-way ANOVA used to test the relationship between housing insecurity and continuous variables.

Statistical significance symbols: † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Survey and Administrative Data Measures

There is no national consensus on how to measure housing insecurity (Broton, 2020; Hallett et al., 2019). This study uses survey items from the Census Bureau's Survey of Income and Program Participation (SIPP), which consistently outperforms other national surveys in the measurement of material hardship, including housing insecurity, and uses a 12-month reference period (Czajka & Denmead, 2008; Meyer et al., 2009). Students who indicated that they were unable to pay their rent/mortgage on time or were unable to pay their utilities bill on time are considered housing insecure. Twenty-

four percent of students met this criterion for housing insecurity.² Like the SIPP, the survey did not include information enabling researchers to identify those experiencing the most extreme form of housing insecurity, homelessness.

The primary outcome of interest is later educational success, defined as degree attainment or enrollment four years after matriculating in college. These data come for the National Student Clearinghouse, allowing for the consideration of students who transfer institutions. Additionally, I examine two short-term academic measures, enrollment intensity and GPA, to explore potential academic pathways. Students are considered part-time if they enroll in 1 to 11 college credits and full-time if they enroll in 12 or more. In addition to students' mean cumulative GPA, I also include a binary measure indicating if students' GPA is 2.0 or greater on a four-point scale. This 2.0 cutoff is used in determinations of satisfactory academic progress (SAP), which students must meet in order to remain in good academic standing and eligible for need-based financial aid (Scott-Clayton & Schudde, 2020). These short-term academic outcomes are only available for students enrolled in Wisconsin public colleges and universities and are measured one semester after the report of housing insecurity status.

A key strength of the WSLs database is the extensive information on pre-college financial standing and sociodemographic backgrounds. Information from the FAFSA completed prior to college entry includes parents' adjusted gross income, calculated expected family contribution (EFC), students' financial (in)dependence status, and if students qualify for a simplified needs test due to participation in means-tested public benefits programs or dislocated worker status.³ Responses to survey questions indicate if a student grew up in a home where there was sometimes, often, or always not enough food to eat; their food security status in the prior month, according to the 6-item module developed and validated by the U.S. Department of Agriculture (Bickel et al., 2000); and if either parent has at least some college experience. Students who indicated that they identify as African American, Latino/a, American Indian, or Southeast Asian are considered minoritized according to University of Wisconsin System policy.

- 2 This sample likely includes a smaller share of students who are housing insecure than reported in the review study (Brotton, 2020) because it only includes first-time full-time students who recently graduated from high school and this group tends to be more advantaged than the overall population of college students.
- 3 The EFC is an estimation of a students' or parents' ability to contribute to the financial costs of a college education and is used in determining applicants' eligibility for need-based federal student aid, including the Pell Grant. Students and families often report that they are unable to contribute the estimated EFC. The EFC is minimized at zero, indicating that a family cannot contribute anything to the cost of college. Students can be considered financially independent for several reasons including if they are over age 23, married, or have dependent children. Students qualify for a simplified needs test when calculating the EFC if they reside in a household that receives certain means-tested public benefits (e.g., Supplemental Nutrition Assistance Program [SNAP] or Free and Reduced-Price School Lunch), they satisfy a low-income criterion, or the parent is a dislocated worker.

Background information also includes a measure of sex (male/female) and if students or their parents were born outside of the United States. Together, these measures provide a comprehensive portrait of students' pre-college socioeconomic and demographic backgrounds. I use institutional-level data to capture the context of students' initial college experience including sector of initial enrollment (two- vs. four-year college), average net price of attendance, and the proportion of Pell Grant recipients at the institution. I also include a measure of the county-level community poverty rate in which the college is located (Table 1).

Because the WSLS is a representative sample of low-income college students in the entire Wisconsin public higher education system, only some students took an entrance exam prior to college enrollment. For those students, the study also includes ACT exam scores and self-reported high school GPA, allowing for the consideration of preparatory commitment and pre-college academic achievement. The college entrance exam scores come from students' college transcripts and administrative data from ACT, Inc. and the self-reported high school GPA comes from ACT, Inc. Students who selected to take an entrance exam are not representative of the full study population and may also differ on unobservable characteristics (Table A1). Therefore, I use multiple analytic samples to balance strengths and weaknesses related to internal and external validity.

Analytic Plan

First, I describe how housing insecure students differ from their housing secure peers on observable background measures described above. In these descriptive analyses, I test for statistically significant differences by housing status using a chi-square test for categorical variables and a one-way ANOVA for continuous variables. Then, I predict later educational success, y_i , in a logistic regression model that includes housing insecurity as the predictor of interest and a vector of control variables, X_i , described above and listed in table notes to reduce selection bias:

$$y_i = \alpha + \beta_1(\text{Housing Status}_i) + \gamma X_i + \varepsilon_i \quad (\text{Model 1})$$

To aid in interpretation, I report the logit coefficient and the change in predicted probability. I also employ a semi-parametric propensity score matching (PSM) analysis to estimate the average treatment effect of housing insecurity. This method estimates the alternate potential outcome for each individual by using an average of the outcomes of similar individuals that reported the other housing status and reports the average of the difference between the observed and potential outcomes. Although I am theoretically interested in the causal relationship between housing insecurity and academic success, I use PSM as a robustness check that relies on different assumptions than regression models. For example, regression models rely on certain functional form assumptions and though the procedure to calculate propensity scores is parametric, the propensity score estimation is largely nonparametric and less susceptible to this violation of model assumptions than regression. Also, PSM can account for the distribution overlap between two samples better than regression analyses, which is another potential source

of bias. As shown in Figures A1-A2 descriptions of common support and density and box balance plots, there is sufficient overlap and balance to proceed with the PSM analysis using these data. To the extent that the findings are not sensitive to these different estimation strategies, one may have more confidence in the robustness of the results (Li, 2013).

I employ these estimation strategies in two different samples, each with distinct advantages and drawbacks. The primary analytic sample, described above, includes low-income students attending all of Wisconsin's public colleges and universities, including open-access, comprehensive, and selective institutions, which makes it more generalizable to the target population of interest. But because some of these institutions do not require entrance exams, the only direct measure of students' academic background is an indicator of whether or not they took an entrance exam. So, I also employ a second analytic sample of students who took an entrance exam, allowing me to control for two measures of pre-college academic preparation: ACT entrance exam score and high school GPA. This may improve the internal validity of the model, but necessarily excludes those attending open-access institutions, who are a key population of interest on this topic. The sample of entrance exam takers is nested within the primary analytic sample, and as expected, it is relatively more advantaged than the primary sample (Table A1). Again, I display results from multiple samples as a robustness check, showing the (in)sensitivity of results to these different analytic decisions.

Finally, I explore the relationships between housing insecurity and short-term outcomes, including enrollment intensity and GPA, to identify potential academic pathways. I repeat the regression analysis described above using ordinary least squares regression to predict mean GPA and logistic regression to predict enrollment intensity and SAP GPA. For the logistic regression results, I also report the change in predicted probabilities for ease in interpretation.⁴

Limitations

Scholars, practitioners, and policymakers are interested in the effect of housing insecurity on later educational attainment, but it is simply not possible to randomly assign individuals to experience this material hardship in order to obtain a clean causal estimate for obvious ethical reasons. This methodological limitation does not mean that we should give up and fail to pursue a conceptually-grounded research question of significant scholarly and applied value. This paper uses the best available alternative: good observational data and a variety of estimation strategies to provide a range of plausible associations. While omitted variable bias remains a concern, the WSLs database is an uncommonly rich source of information on students' pre-college financial and academic standing, childhood experiences of poverty, concurrent material hardship challenges, and community and institutional context. The longitudinal nature of the

4 Exploratory interaction analyses provide no statistical evidence that the relationship between housing status and academic success varies across any of the individual- or contextual-level factors described above.

data also ensures that housing insecurity occurred prior to educational achievement and attainment, though it does not allow us to track how housing insecurity changed over time, which may also have important implications for student success.

Results

Housing Insecurity Challenges

In this sample of undergraduates from low-income families in Wisconsin, 24% of students are housing insecure (Table A1). Housing challenges rarely occur in isolation and are often related to other background factors. College students who experience housing insecurity are more likely to have grown up in poverty as evidenced by a lack of food to eat at home. Thirty-seven percent of housing insecure students struggled to get enough to eat growing up compared to 22% of housing secure students ($p < .001$). During college, over half (53%) of housing insecure students reported low or very low levels of food security compared to approximately one-quarter (23%) of housing secure students ($p < .001$; Table 1).

Though all students in the sample are considered low-income because of Pell Grant receipt, housing insecurity challenges during college are still associated with family economic background. Nearly half (49%) of students struggling with housing insecurity come from families that are not expected to financially contribute to their students' college education due to a lack of resources. On average, these families have an adjusted gross income of approximately \$23,000. By comparison, nearly one-third (31%) of housing secure students come from families with a zero-dollar EFC and their average annual income is roughly \$28,000 ($p < .001$). Housing insecure students are also more likely than housing secure students to qualify for a simplified needs test (71% vs. 55%; $p < .001$). Finally, students struggling with housing insecurity are significantly more likely to be financially independent from their parents than their housing secure peers (12% vs. 3%; $p < .001$). Though these differences are statistically significant, they are relative given the challenges that students from low-income families experience during college more broadly (Table 1).

Systemic inequities in U.S. society also contribute to disparities in housing insecurity status by demographic characteristics. Thirty-six percent of housing insecure students identify as a member of a minoritized racial/ethnic group compared to 22% of housing secure students ($p < .001$). While 13% of housing secure students report that they or their parents were born outside of the U.S., 19% of students facing housing insecurity come from an immigrant family ($p < .05$). Females are also significantly more likely to be housing insecure (67% vs. 59%; $p < .05$). Housing insecure students are statistically less likely to have a parent with some college experience or higher; just 51% of housing insecure students have a parent with some college experience or higher compared to 60% of housing secure students ($p < .01$; Table 1).

Later Educational Success

Overall, 18% of students had earned a degree and an additional 48% were still enrolled in college four years after initial entry for a two-thirds success rate. These sample averages, however, mask considerable heterogeneity in later educational outcomes. Twenty-one percent of housing secure students had earned a degree and 49% were still enrolled after four years of college compared to just 9% of housing insecure students who had earned a degree and 45% who were still enrolled. In total, 70% of housing secure students were educationally successful compared to 54% of housing insecure students, a gap of 16 percentage points ($p < .001$; Table 1).

These gaps in educational success could arise from several correlated factors—such as income, prior experiences of poverty, concurrent food insecurity challenges, and discrimination associated with demographic characteristics like race/ethnicity—rather than housing insecurity challenges during college. After adjusting for the covariates described above using regression and matching methods in two analytic samples, housing insecurity remains a statistically significant predictor of later educational success. In the primary analytic sample, covariate adjusted results indicate that a change in housing security status from secure to insecure is associated with a 7.7 percentage point decline in the probability of later educational success ($p < .05$). Findings from the propensity score analysis similarly indicate that housing insecure students are 8.8 percentage points less likely than otherwise observably similar peers to be enrolled or earn a degree four years after starting college ($p < .05$; Table 2). In the sample of entrance exam takers, housing insecurity is associated with a 9.3 percentage point decline in the predicted probability of later educational success, net of background factors ($p < .05$). Similarly, the matching method indicates that housing insecure students are 12.4 percentage points less likely to be educationally successful ($p < .01$; Table 2). Thus, both samples and methods of accounting for background characteristics yielded statistically and substantively similar findings. In sum, housing insecurity is associated with an approximately 10 percentage point lower probability of later educational success, net of family background and college context.

Table 2 on next page.

Table 2: Relationship between housing insecurity and later educational success

	Primary Analytic Sample		Entrance Exam Taker Sample	
<i>Housing Insecure</i>				
Change in Predicted Probability	-0.0765		-0.0925	
Logit Coefficient (SE)	-0.3479 (0.160)	*	-0.4612 (0.232)	*
Average Treatment Effect (SE)	-0.0884 (0.042)	*	-0.1239 (0.039)	**
Controls	Yes		Yes	
N	1335		686	

Notes. The table includes results from propensity score and regression analyses. The primary predictor of interest is housing insecurity status and control variables in the primary analytic sample include female, minoritized race/ethnicity, parental level of education, family income, immigrant status, childhood and college food insecurity, expected family contribution, financially (in)dependent, simplified needs test, took a college entrance exam, institutional sector, average net price, share of Pell Grant recipients, and community poverty rate. The entrance exam taker sample includes all covariates described above plus the inclusion of students' ACT score and overall high school GPA rather than took a college entrance exam. Change in average marginal effects are reported (at means). Change in probability compared to housing secure status.

Statistical significance symbols: † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Enrollment Intensity and GPA in the Short Term

Students report that experiences of housing insecurity inhibit their ability to perform academically, potentially lowering GPA, and one way in which they cope is to enroll in fewer courses, which may reduce students' tuition bill or allow more time for work. Next, I examine if housing insecurity is associated with enrollment intensity or GPA in the semester following students' housing status report.

Results indicate that housing insecurity is associated with part-time enrollment intensity and lower GPA, after accounting for observed background characteristics. Covariate-adjusted models indicate that a change from housing secure to insecure status is associated with a 5.4 percentage point increase in the probability of part-time rather than full-time enrollment ($p < .05$; Table 3). Housing security status is also a statistically significant predictor of mean GPA in the following semester ($p < .001$; Table 1). Adjusting for background characteristics, housing insecurity is associated with a 0.30 point reduction in mean GPA ($p < .001$; Table 3). In addition, housing security status is also associated with the probability of earning a 2.0 or higher GPA in the short-term

($p < .001$; Table 1). The association between housing insecurity and a 2.0 or higher GPA is -11.2 percentage points, net of background factors ($p < .001$; Table 3).

Table 3: Relationship between housing insecurity and academic success in the short-term

	Part-time (vs. Full-time)	Mean GPA	2.0 or Greater GPA
<i>Housing Insecure</i>			
Change in Predicted Probability	0.0541	na	-0.1115
Coefficient	0.6399 *	-0.3049 ***	-1.0679 ***
(SE)	(0.283)	(0.061)	(0.272)
Controls	Yes	Yes	Yes

Notes. The table includes results from propensity score and regression analyses. Short-term academic success measured in the semester following report of housing insecurity. The primary predictor of interest is housing insecurity status and control variables include female, minoritized race/ethnicity, parental level of education, family income, immigrant status, childhood and college food insecurity, expected family contribution, financially (in)dependent, simplified needs test, took a college entrance exam, institutional sector, average net price, share of Pell Grant recipients, and community poverty rate. Students must be in the primary analytic sample ($N=1,335$) to be included in this analysis. Results are reported for the subsample enrolled in Wisconsin public colleges and universities in the following semester, spring 2010 ($N=801$). Change in average marginal effects are reported (at means). Change in probability compared to housing secure status.

Statistical significance symbols: † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion and Implications

Using data from a statewide longitudinal study of undergraduates from low-income families, this paper provides an empirical test of the relationship between experiences of housing insecurity early in college and later educational success. Housing insecurity during students' first year of college is associated with an approximately 10 percentage point reduction in the probability of earning a degree or being enrolled four years later, net of background characteristics. The magnitude of this relationship is considerable and warrants further attention, especially since the relatively more advantaged sample may have resulted in a conservative estimate of the problem. For comparison, a change from growing up in a food secure to insecure home during childhood is associated with a seven-percentage point decrease in the probability of later educational success, after accounting for background factors in this sample. Similarly, the female advantage in college success, well noted by scholars of education, is estimated to be 11 percentage points in this sample, all else equal, indicating that housing insecurity is an issue of similar magnitude and should also be taken seriously.

In the short-term, housing insecurity is associated with lower mean GPA and a lower

probability of earning a 2.0 or higher GPA, which is often necessary to obtain satisfactory academic progress and maintain financial aid eligibility. Moreover, housing insecurity is also associated with part-time, rather than full-time, enrollment, which slows credit accumulation and extends time to degree. Thus, it appears that both reductions in academic achievement and credit attainment contribute to poorer academic outcomes for housing insecure students over the long-term.

A college credential affords a wide range of personal, financial, and other lifelong benefits for individuals. Moreover, higher education is a community good associated with happier and healthier communities. Although college access has expanded, degree attainment rates remain low among students from low-income and otherwise vulnerable families. One of the primary contributors to low attainment rates is the rising net price of college attendance coupled with inadequate family resources. These high net prices, limited support from the public safety net, and a dearth of well-paying jobs and work hours appear to be contributing to the growing share of undergraduates who forgo basic material goods during college. This paper demonstrates that housing insecurity is an independent source of educational disadvantage among students from low-income families.

Changes to policy and practice that include a consideration of students' housing security may improve students' odds of college success. Policymakers and practitioners can either work to address the root causes of housing insecurity among undergraduates or alleviate the experiences directly (Broton & Goldrick-Rab, 2013, 2014, 2016; Hallett et al., 2019; Sackett et al., 2016). Efforts to reduce the total price of college attendance, through state and federal investments in need-based financial aid or new free college approaches, could go a long way to ameliorating students' housing challenges and supporting student success. Investments in housing policies and human services that include college-going adults in a way that aligns education and social policy goals would also be a welcome change. For example, the state of Washington established a pilot program that requires access to short-term housing or housing assistance and/or case management services for students in need (Washington S.B. 5738, 5800). In Florida, the Southern Scholarship Foundation supplies rent-free housing and wrap-around supports to college students from low-income families to help them reach their college goals. Similarly, the College Housing Assistance Program created by the Tacoma Housing Authority and Tacoma Community College leverages public housing supports for college students who are housing insecure or homeless. Both of these interventions are being studied by the Hope Center and affiliates and will soon be providing some of the first experimental outcomes on these types of interventions (Goldrick-Rab et al., 2017). Indeed, prior quasi-experimental work indicates that connecting students with public benefits and other wrap-around supports to address basic needs insecurity improves college success, indicating that the short-term cost pro-

5 Washington Senate Bill 5738 cites a previous working paper version of this article to justify the need for this legislation (see Section 1) and Senate Bill 5800 was passed by both chambers and signed by the Governor in 2019.

motes longer-term gains (Daugherty et al., 2016; Price et al., 2014).

Conclusion

In recent years, the problem of basic needs insecurity on college campuses has gained national exposure in the public discourse (Goldrick-Rab & Broton, 2015; O'Brien & Gandbhir, 2019; Weissman, 2021). Although recent research has contributed to our understanding of the scope and depth of the problem, this paper quantitatively examined long-term academic implications and empirically demonstrated an inverse relationship between housing insecurity and later enrollment or attainment. While some higher education leaders and policymakers are already working to address students' housing challenges, drawing on moral values or their understanding of the public good (Broton et al., 2020), this study also provides quantitative evidence for those interested in the business case for improving retention and attainment. Additional research is needed to better understand the relationship between basic needs insecurity and academic success, but scholars should not be complacent with describing a problem and its implications (Gamoran, 2014, 2021). Research examining programmatic and policy responses to students' basic needs insecurity challenges is crucial to promoting college attainment.

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Appendix A

Table A1: Sample characteristics and tests of external validity

	Full WSLS Study Sample	Primary Analytic Sample	Test Full vs. Primary	Entrance Exam Taker Sample	Test Primary vs. Exam
<i>Housing Security</i>					
Housing Insecure (%)	na	23.52		21.57	†
<i>Long-term Outcome</i>					
Degree attainment or enrollment four years after initial college entry (%)	54.03	65.99	***	71.43	***
<i>Background Characteristics</i>					
Childhood Poverty					
Growing up, there was not enough to eat at home (%)	na	25.69		24.49	
College Food Security					
Low Food Security (%)	na	21.87		22.89	
Very Low Food Security (%)	na	7.94		7.00	
Pre-College Finances					
Unmet Need (\$)	na	na		na	
Zero Expected Family Contribution (%)	40.74	35.13	***	31.20	**
Financially Independent (%)	17.61	5.54	***	4.08	*
Simplified Needs Test (%)	64.25	58.35	***	54.81	**
Pre-College Academics					
ACT college entrance exam record (%)	na	65.17		100.00	***
ACT Composite Score (mean)	na	na		21.41	**
Overall high school GPA	na	na		3.29	
Initial College Context					
Two-year College Sector (%)	50.00	35.66	***	26.68	***
College Average Net Price (mean \$)	7807.37	9136.24	***	9473.59	***
Pell Grant Recipients at College (mean %)	25.71	23.76	***	22.23	***
Community Poverty Rate (mean %)	11.54	11.81	***	11.70	

Table A1 continued on next page

Table A1 continued...

Demographics					
Female (%)	58.69	60.90	*	63.27	†
Minoritized Race/Ethnicity (%)	na	25.54		22.01	**
Parents have some college experience or higher (%)	na	58.20		59.04	
Parents Adjusted Gross Income (\$)	23220.1	27466.75	***	29082.84	**
Immigrant Family (%)	na	14.76		15.16	
N	3000	1335		686	

Notes. Degree and enrollment outcomes are from the NSC. College housing and food insecurity questions are from a fall 2009 WLS survey. Pre-college finances come from students' 2008 FAFSA. Pre-college academic information comes from ACT, Inc. and college administrative records. Initial college-level context variables come from IPEDS and the ACS. Demographics come from students' 2008 FAFSA, with the exception of race/ethnicity, parents' education, and immigrant status which come from survey data.

Statistical significance symbols: † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Figure A1: Overlap and density balance for housing insecurity status

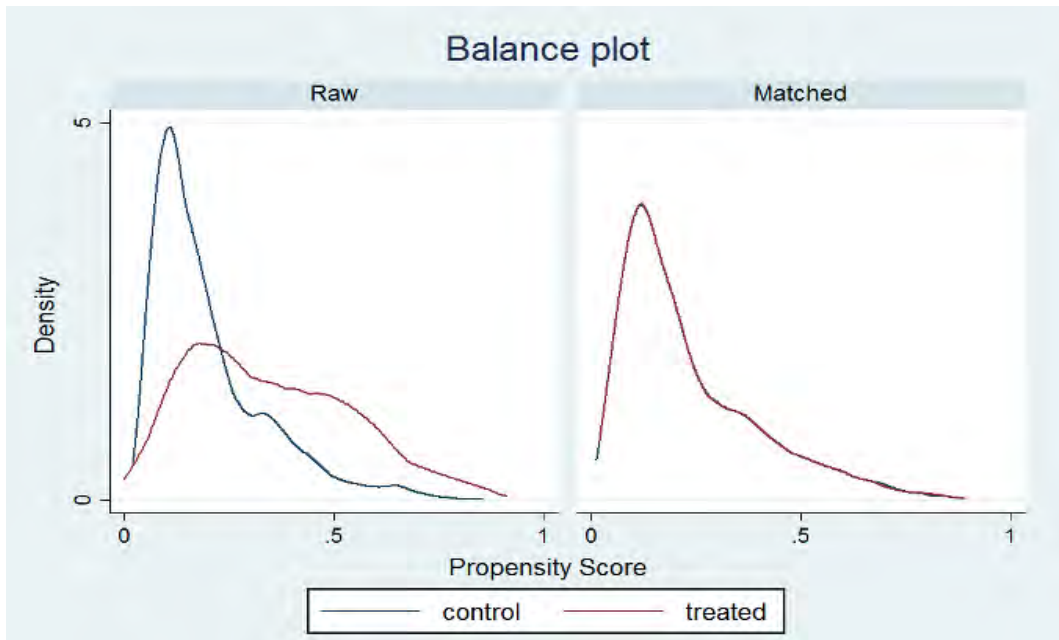


Figure A2. Box balance for housing insecurity status

