



# HHS Public Access

Author manuscript

*Am J Agric Econ.* Author manuscript; available in PMC 2025 July 08.

Published in final edited form as:

*Am J Agric Econ.* 2025 August ; 107(4): 1016–1040. doi:10.1111/ajae.12537.

## Net Worth Poverty and Food Insecurity

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### Abstract

Food insecurity is a widespread problem faced by American families, particularly those with children. It is clear that poverty contributes to food insecurity, but extant research focuses almost exclusively on income poverty (IP). We move beyond income-centric conceptions of poverty to propose that net worth poverty (NWP) is an important, but overlooked, measure of marginalization and financial hardship that puts families at risk of food insecurity. A family is NWP if they have insufficient net worth to meet basic needs for three months, and NWP has increased in recent decades even while IP declined. This paper explores how NWP and its two subcomponents—asset and debt poverty—relate to food insecurity using data from the 2015–2021 Panel Study of Income Dynamics on 5,762 households with at least one resident child under 18. Net worth poor households were 11.3% more likely than households that were neither net worth nor income poor to be food insecure. Although asset poverty and debt poverty were associated with increased risks, asset poverty more than doubled the risk of food insecurity relative to debt poverty. Black and Hispanic child households were more likely to be NWP and food insecure than White households, but associations between poverty and food insecurity did not vary by racial and ethnic subgroup. Findings demonstrate how low wealth, including financial assets and debts, affect risks of food insecurity.

### Keywords

inequality; income; wealth; net worth; poverty; race; ethnicity; food insecurity

### JEL codes:

D; I; J

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Food insecurity is a pervasive and chronic issue faced by millions of American families, particularly families with children. Food insecurity refers to having sufficient, safe, nutritious food that allows all members of a family to live healthy, active lives (World Bank 2023). In 2021, nearly 13% of households with at least one resident child under age

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18 (child households) were food insecure, meaning that the household had insufficient food for all of its members to live healthy, active lives (Coleman-Jensen et al. 2021a). Parents and other caregivers often sacrifice their own food to ensure that their children have meals that are as adequate and healthy as possible; as a result, in about half of food-insecure households, only adults are food insecure (Coleman-Jensen et al. 2021a). However, in nearly 8% of U.S. child households, children went without sufficient food; and in nearly 1% of child households, food was so scarce that children were hungry, skipped meals, or did not eat for entire days because of food scarcity (Coleman-Jensen et al. 2021a). Food insecurity is associated with poorer physical and mental health for children and adults; it also reduces cognition and increases behavioral problems for children, particularly those younger than age five (Denney, Brewer, and Kimbro 2020, Johnson and Markowitz 2018b, Hobbs and King 2018, King 2018). Food insecurity also reduces parents' physical and mental health and increases conflict between parents, leading to negative spillover effects on children in both the short- and long-terms (Johnson and Markowitz 2018b).

Poverty is clearly a risk factor for food insecurity. However, most previous research focuses on income deprivation – or income poverty (IP) – which provides only a partial explanation of the association between resource deprivation and food insecurity. This research shows, for example, that not all families who are income poor are food insecure; and not all food insecure families are income poor (Brewer 2020, Coleman-Jensen et al. 2021a, Gundersen, Kreider, and Pepper 2011). Roughly 36% of households below the federal income poverty threshold are food insecure, relative to 63% of those who are not poor; of child households, 42% of households below the poverty line are food insecure, compared with 57% who are not poor (Rabbitt et al. 2023). Thus, food insecurity may arise for reasons beyond inadequate income. Gundersen and Gruber (2001), for instance, find that permanent income as measured by the average of household income across a two-year period is a better predictor of household food insecurity than current annual income.

We propose that net worth poverty (NWP) is an important, but overlooked, measure of financial hardship that—together with income poverty—puts families at risk of food insecurity. A family is net worth poor if their wealth (assets less debts) is less than one fourth of the federal poverty line (\$7,420 for a family of four in 2022) (Gibson-Davis, Keister, and Gennetian 2021, Haveman and Wolff 2005). Approximately one-third of US households were net worth poor in 2019, and NWP has been rising even while IP declined in recent decades (Gibson-Davis et al. 2022). Families who are NWP may have too few assets to meet their basic needs, particularly when income is interrupted or stops entirely. The majority of net worth poor households are not income poor (Gibson-Davis, Keister, and Gennetian 2021), suggesting that net worth poor households are a separate group that are overlooked in income-based assessments of economically fragile populations. The risk of food insecurity from low wealth may be a marker of inequality that is not fully captured in research focused on low-income households.

Two financial states can push families below the NWP threshold. First, a family might be asset poor; that is, their level of assets is insufficient to bring them above the NWP threshold. Second, they might be debt poor; that is, their assets exceed the NWP threshold, but their level of debts puts them below the threshold. Asset-poor families may be at

greater risk of food insecurity because they have insufficient financial resources to purchase food when necessary; these families may also be unable to access credit markets (that is, take on debt). Debt-poor families, though facing constraints on cash flow, may be able to leverage their debts to obtain food and/or may be more able to readily convert their existing assets into cash for food. Previous work suggests that *either* assets *or* debt can increase vulnerability to food insecurity (Brewer 2020, Chang, Chatterjee, and Kim 2014), but previous research has not compared the relative states of having an insufficient level of assets versus a relatively high level of debt.

Net worth poverty in the US is highly racialized: Black and Hispanic children are more than twice as likely as White children to be net worth poor (Gibson-Davis, Keister, and Gennetian 2021). Racial and ethnic differences in net worth poverty reflect long-standing patterns of systematic exclusion and structural inequalities faced by non-white families in accumulating wealth. Notably, only one-third of Black and Hispanic children who are net worth poor are also income poor, signifying that most children of color who experience net worth poverty are not measured in studies that focus on income poverty. If net worth poverty is a risk factor for food insecurity, then its disproportionately high rates among Black and Hispanic children suggest that it could explain additional variance in the prevalence of food insecurity.

In this study, we examine the association between NWP and food insecurity for households with resident children (child households). We pay particular attention to whether NWP is associated with food insecurity beyond the effect of IP, and we disentangle the association between asset- and debt-driven NWP on food insecurity. Data come from the 2015–2021 Panel Study of Income Dynamics (PSID) on 5,762 child households. The PSID is the only data set suited for this study as it contains contemporary information on food insecurity as well as net worth, income, and other control variables (e.g., individual and household demographics). In addition, the PSID is longitudinal, allowing us to model the association between NWP/IP and food insecurity on the same households over time. We use mixed effects logistic regression models which allow us to control for both between- and within-household fixed effects, an advantage over traditional regression models that may be biased by unobserved time invariant factors.

In our first analysis, we classify children into one of four mutually exclusive categories that allow us to compare net worth poverty and income poverty: (1) neither net worth nor income poor, (2) net worth but not income poor, (3) income but not net worth poor, and (4) both net worth and income poor. Our second analysis considers the components of net worth poverty status, classifying children into one of three mutually exclusive categories: (1) not net worth poor, (2) asset poor, or (3) debt poor. Recognizing that institutional racism and other structural factors have led to an unequal distribution of both net worth poverty and food insecurity by race, we stratify our estimates by race and ethnicity.

Our study makes several contributions to the literature. First, we explore whether net worth poverty is a risk factor for food insecurity beyond the association between income poverty and food insecurity. By considering both types of poverty simultaneously, we seek to expand the current focus on income deprivation alone. Second, we explore the relative importance of assets and debts in driving the association between NWP and food insecurity. Third, we

explore the prevalence of food insecurity for some of the more economically marginalized groups by focusing on households with children and further among household with children across different racial and ethnic groups.

Our analyses indicate that net worth poverty is associated with greater food insecurity, even when income poverty is held constant. We find that the size of the association between three poverty states – net worth poor only, income poor only, both net worth and income poor – and food insecurity is equally strong and statistically significant. However, we find sizable differences between two types of net worth poverty and food insecurity: households who are net asset-poor are significantly more likely than households who are debt-poor to be food insecure. Our results confirm findings from prior research that shows that Black and Hispanic families are more likely than White families to experience NWP, IP, or both types of poverty. However, the association between NWP/IP status is equivalent across households regardless of race and ethnicity. Our findings suggest that households that are NWP are at increased risk of food insecurity and that ignoring wealth deprivation overlooks a large group of households that are at risk of food insecurity and its consequences.

## BACKGROUND

### The Problem of Food Insecurity

Food insecurity occurs when a household has inadequate food to meet the dietary needs and preferences of its members, preventing them from living full, health, and active lives. There are four components of food insecurity: availability, access, utilization, and stability (World Bank 2023). *Availability* refers to the supply of food available to a household and reflects aggregate levels of production, stocks, and a myriad of associated trade issues. *Access* to food indicates that households have the economic and physical means to secure the food that they need; and *utilization* summarizes the large number of physical processes necessary for the body to derive and use the nutrients found in the food that is available. Together, access and utilization shape the nutritional status of individuals. Finally, stability refers to the consistency of the other three dimensions. If food availability, access, and utilization are sporadic, uncertain, or even periodically interrupted, households may suffer from food insecurity and its associated deleterious effects. Food insecurity does, indeed, have a host of wide-ranging, negative implications for both children and their caregivers. For children, food insecurity is associated with higher rates of birth defects, hospitalization, asthma, anemia, vitamin deficiencies and other nutritional deficits; it is also associated with lower general and oral health (Thomas, Miller, and Morrissey 2019, Schmeer and Piperata 2017, Jackson and Testa 2021). Food insecurity increases behavioral problems, psychological distress (e.g., depression, suicidal ideation), and cognitive deficits in children (Gundersen and Ziliak 2014, Johnson and Markowitz 2018a, Denney, Brewer, and Kimbro 2020, Jyoti, Frongillo, and Jones 2005). These problems appear for children of all ages, but the effects are particularly severe for those who experience food insecurity before they turn 5 years old (Denney, Brewer, and Kimbro 2020, Johnson and Markowitz 2018b, Ziliak 2015).

Adults also suffer when they have inadequate food, of course; but it is perhaps most notable that adults who have children are particularly likely to experience food insecurity and, as such, are especially prone to the negative effects of food insecurity. For example, food

insecurity is associated with lower self-rated health, high blood pressure, and heart disease for adults (Seligman, Laraia, and Kushel 2010, Vozoris and Tarasuk 2003). Pregnant women in food insecure households have increased odds of experiencing iron and other vitamin deficiencies which can create complications with their pregnancies and can have lasting negative health and developmental effects on their unborn children (Park and Eicher-Miller 2014). The negative association between food insecurity and physical health is especially pronounced for parents (Stuff et al. 2004, Vozoris and Tarasuk 2003). Food insecure parents have comparatively high rates of mental health issues and psychological distress compared to food secure parents (Whitaker, Phillips, and Orzol 2006, Jessiman-Perreault and McIntyre 2017). Finally, food insecurity is associated with an increased use of parent-to-child psychological and physical aggression (Helton et al. 2019) that can exacerbate other health problems in both children and their parents.

### Net Worth Poverty and Food insecurity

Net worth poverty is a measure of financial insecurity that extends the traditional income-centric poverty definition to include household assets and debts (Haveman and Wolff 2005, 2004, Brandolini, Magri, and Smeeding 2010). This broader conceptualization of financial precarity recognizes that financial stability and well-being hinge not only of the flow of resources into a household (i.e., cash or cash equivalent income) but also on the stock of financial resources owned by a household at any point in time. Definitions of poverty that focus exclusively on flows do not adequately capture how households achieve financial security and are an inadequate representation of the resources that families have in times of economic crisis (Haveman and Wolff 2004). Wealth also more fully captures the intent of characterizing poverty vis-à-vis household spending since income and wealth both shape budget constraints (Brandolini, Magri, and Smeeding 2010). Importantly, NWP is more than an indicator of low wealth. Rather, NWP signals that a household's financial resources put it in a particularly vulnerable, and often persistent, state of deprivation that is likely to lead to both short- and long-term challenges.

Net worth poverty is likely to be associated with higher food insecurity beyond the effects of income poverty. Income poverty is a robust, but imperfect, predictor of food insecurity (Gunderson, Kreider, and Pepper, 2011). Only 5% of households with children whose income-to-needs ratio was greater than 1.85 were food insecure in 2020; of those whose income-to-needs ratio was less than one (e.g., the income poor), 35% were food insecure (Coleman-Jensen et al. 2021b). The mismatch between income poverty and food insecurity reflects the reality that income is only one of two economic resources that contribute to economic well-being. Families also rely on wealth to maintain financial health.

Net worth poverty may account for part of this previously-unexplained variance, operating through each of the four dimensions of food insecurity. A complete exploration of the mechanisms linking NWP with food insecurity is beyond the scope of this paper given the complexity of these relationships; however, a discussion of the potential mechanisms is useful for understanding our expectations and associated empirical findings. First, NWP may affect where a household lives, shaping whether food is *available*. For example, NWP households may be more likely than other households to live in food deserts where safe,

healthy food is in short supply; and NWP households have insufficient financial resources—including owning vehicles and having funds to pay for public transportation—making it difficult for them to travel to areas where food is more plentiful. Second, even if food is available, a NWP household may not have *access* to it because its financial resources are limited and earmarked for other expenses. NWP places strict limits on household spending and directs income to other necessities such as paying rent and utilities. Families who are NWP are likely at particular risk of food insecurity in the event of a lost income, a medical emergency, a natural disaster, or other financial shock because their store of financial resources is inadequate to withstand unanticipated budgetary changes.

Third, NWP is likely to be associated with food insecurity through utilization. Because NWP is associated with lower levels of education, household members may be unable to make health decisions regarding food choices, preparation of healthy meals, and other nutrition-related issues. Similarly, NWP is associated with a host of other health problems, utilization of food's nutrients might also be compromised. Finally, households may move into and out of NWP over time if their resource constraints reflect financial shocks such as occasional unforeseen medical and other expenses. These dynamics might erode food stability. Given that NWP is likely to follow from—and exacerbate—income poverty, we propose that NWP is likely to be positively associated with food insecurity, even when IP is held constant.

A large group of families is *simultaneously* income *and* net worth poor. In a study of net worth poverty that classified families into one of four mutually exclusive poverty categories (net worth poor, income poor, *both* net worth *and* income poor, not poor), the share of households that were income poor (3%) was substantially smaller than the share that were net worth poor (26%) or both income and net worth poor (9%) (Gibson-Davis, Keister, and Gennetian 2021). Families who have neither an adequate store of cash resources or a stock of assets to draw upon are likely to be economically unstable and may be unable to meet their household's basic food needs. These families are unique in being doubly-disadvantaged. Thus, we anticipate that there is a strong, positive association between simultaneously being in *both* NWP *and* IP and food insecurity.

### Asset Versus Debt Poverty

Importantly, net worth poverty may represent either the absence of assets (asset-poor NWP) or the presence of debts (debt-poor NWP). To illustrate the difference, consider two net worth poor families of four, each with wealth levels of \$6,000. Family A has assets of \$6,000, meaning that regardless of their level of debt, their assets are insufficient to bring them above the net worth poverty line (they are “asset poor”). Family B has assets of \$20,000 and debts of \$14,000. Family B's assets place them above the poverty line; however, their debts bring them below the poverty line (they are “debt poor”).

Both asset-driven and debt-driven NWP are likely to be associated with increases in food insecurity, given that assets reduce food security and debt increases it. However, the financial situations of these two types of households are substantively different, and this experience may inform levels of food insecurity. Specifically, we anticipate that asset-poor families are likely to be at higher risk of food insecurity than debt-poor families. Cash

savings—such as savings and checking accounts—and other liquid assets are particularly important for meeting short-term consumption needs when households are faced with unexpected shocks. Assets can also be used to access credit markets – that is, to assume debt – which further improves their ability to spend and secure necessary resources (Ribar and Hamrick 2003, Chang, Chatterjee, and Kim 2014). High levels of debt can be detrimental, of course, as families with debt are committed to making payments on loans or may face financial consequences, and this may limit their ability to purchase food (Brewer 2020; Chang, Chatterjee, and Kim 2014; Fitzpatrick and Coleman-Jensen 2014). Debt may be a particularly salient concern for families with limited resources, who may face unfavorable debt conditions through predatory loans or other types of usury. Despite the potential negative repercussions of debt, we anticipate that the inability of asset poor families to smooth consumption or to acquire additional resources through credit markets will lead to higher levels of food insecurity.

Previous research has focused on the association between *either* assets *or* debts and food insecurity (Chang, Chatterjee, and Kim 2014, Brewer 2020). This work provides some evidence that wealth does, indeed, matter. For example, food insecurity declines in elderly households who are able to draw down home equity through mortgage borrowing to purchase food (Loibl et al. 2022, Ziliak, Haist, and Gundersen 2008). Similarly, financial asset deficits (e.g., deficits in non-pension money assets) (Chang, Chatterjee, and Kim 2014) and high debt, particularly medical debt (Brewer 2020) are both associated with increased risk of food insecurity. These studies provide an important starting point for our empirical work; we extend this work to look more holistically at net worth deprivation, and we evaluate the relative importance of the two net worth poverty substates—asset- and debt-driven—on food insecurity. We anticipate that NWP is positively associated with food insecurity, even when IP is held constant. We further predict a strong, positive association between simultaneously being in *both* NWP *and* IP and food insecurity. Finally, we propose that both asset-driven NWP and debt-driven NWP will be associated with food insecurity, with larger effects for asset poverty.

### **Racial Differences in Food Insecurity and Net Worth Poverty**

Black and Hispanic households are more likely than White households to be food insecure. Indeed, in 2022, 19% of Black, 16% of Hispanic, and 7% of White households were food insecure (Rabbitt et al. 2023). Higher rates of food insecurity for Black and Hispanic individuals can partially be accounted for by differences in socioeconomic status: Black and Hispanic households are more likely to exhibit characteristics, such as lower levels of education or employment, that are correlated with food insecurity (Rabbitt et al. 2023). In addition, Black and Hispanic households are more likely than White households to live in food deserts—areas with relatively few grocery stores (Rhone et al. 2017)—which may further exacerbate their food insecurity.

Finally, public policies and institutional forces have contributed to low wealth accumulation for Black and Hispanic families and may contribute to both race/ethnic differences in poverty (both NWP and IP) and food insecurity. These policies—in tandem with the historical legacies of Jim Crow—have created racism-related barriers to credit markets and

asset acquisition that cumulate over time and over generations to lead to low levels of asset ownership for Black and Hispanic families relative to White families (Oliver and Shapiro 1995, Massey 2015). In particular, these policies may have contributed to vast contemporary differences in homeownership (Killewald and Bryan 2018), the primary asset of households with children (Percheski and Gibson-Davis 2020). Black families are less likely to own a home, and those that do receive lower returns on homeownership (Killewald 2013, Killewald and Bryan 2016). Discrimination in housing markets has been compounded by the growth of fees in the criminal justice system and the explosion of student debt, both of which have been disproportionately borne by non-White households (Addo, Houle, and Simon 2016). When combined with an American labor market in which many Black and Hispanic adults occupy jobs offering lower wages and fewer benefits (Bahn and Cumming 2020), these policies may contribute to low rates of wealth accumulation among non-White households.

Consistent with these differences in wealth accumulation, racial and ethnic differences in net worth poverty are quite large. In 2019, 22% of White child households were net worth poor (either alone or in combination with income poverty), compared to 58% of Black and 50% of Hispanic households. Black and Hispanic child households are also more than three times as likely as White child households to be *both* net worth *and* income poor (16%, 14%, and 5%, respectively) (Gibson-Davis, Keister, and Gennettian 2020). Rates of asset poverty also differ by race, with Black children having higher rates of asset poverty than White children (rates of asset poverty for Hispanic families are unknown).

Disproportionately high rates of both food insecurity and net worth poverty among Black and Hispanic households suggest a focus on these subgroups is warranted. Given that only one-third of Black and Hispanic children who experience net worth poverty also experience income poverty, net worth poor children may have been overlooked in previous considerations that focused on income poverty alone. The relatively large fraction of Black and Hispanic children who experience both income and net worth poverty may have higher rates of food insecurity than Black and Hispanic children who experience net worth poverty by itself.

## DATA AND METHODS

We study these ideas using data from Panel Study of Income Dynamics (PSID), a nationally representative household panel survey that contains detailed information on food security as well as wealth, income, and essential control variables. The PSID is one of the few national surveys that incorporates the U.S. Household Food Security Survey Module developed by the Economic Research Service at the U.S. Department of Agriculture (USDA). The PSID also includes comprehensive information on household assets and debts, making it an ideal dataset for examining the relationship between NWP and food insecurity and to explore how this relationship varies with the assets and debts owned by the family.

To create our sample, we merge family- and individual-level PSID data sets for 2015–2021 and pair individual-level demographics for the reference person (the primary respondent interviewed) for each household with household-level characteristics. Our observation period began in 2015, as this was the first year the PSID collected information on food

security. We limit the sample to households with children (less than age 18) currently residing in the family unit. We also limit our sample to households with a reference person age 64 and under because the wealth and food-related contexts may differ for older households (Chang, Chatterjee, and Kim 2014, Gibson-Davis and Percheski 2018). Our final analysis sample consists of 14,303 household-year observations via pooling the PSID data from 2015, 2017, 2019 and 2021. This represents 5,762 unique households with children (hereafter, child households). For descriptive analysis of the sample (e.g., Table 1), we use data from one year (2021), which has a sample size of 3,496. For the mixed effect analyses, we use the full sample of 14,303.

Our dependent variable is a dichotomous measure of household food insecurity derived from the 18-item version of the U.S. Household Food Security Survey Module. In this module, respondents are asked 18 questions characterizing their experiences meeting basic food needs. As an example, respondents are asked whether it was often true, sometimes true, or never true in the past 12 months that “We] worried whether [my / our] food would run out before [I / we] got money to buy more.” We use the number of affirmative answers (often or sometimes true) to categorize households into one of four food security levels: high, marginal, low, or very low (Coleman-Jensen et al. 2021a). Following the USDA classification and convention in the food insecurity literature (Coleman-Jensen et al. 2021a, Gundersen et al. 2021), we create a binary variable for food insecurity: households categorized as having low or very low food insecurity are considered food insecure. In our sample, approximately 12% of households were food insecure in 2021, consistent with USDA estimates for households with children (Coleman-Jensen et al. 2020). We also conducted supplementary analyses using a continuous measure of food insecurity. The continuous measure comes from the PSID’s scaled version of the 18-item US Household Food Security Survey Module. The raw score is the summation of affirmative responses to the Food Security items. Households with children are considered food insecure if they answer affirmatively to 3 or more of the 18 questions. Results were substantively the same if we used this continuous measure.

We use the PSID’s imputed household net worth variable to measure NWP, consistent with previous research on wealth using the PSID (Pfeffer 2018, Pfeffer and Killewald 2018). Net worth is defined as assets less debts; assets include stocks, real estate, and checking and savings accounts net of a broad range of debt, including medical, legal, student, family loan, and credit card debt. Following previous work (Haveman and Wolff 2005, 2004), we exclude the value of retirement assets and the value of vehicles from our net worth calculations because these are relatively illiquid and are not typically included in measures of NWP (Gibson-Davis, Keister, and Gennetian 2021).

To measure IP, we use the PSID’s imputed total household income variable, which includes wages, salaries, social security, and other income received by the reference person and spouse/partner, taxable and social security income from other household members, and all transfer income. Transfer income includes cash transfers such as Temporary Assistance for Needy Families, unemployment compensation, worker compensation, child support, and financial support from relatives. Income, as well as wealth, were converted to 2021 dollars using the Consumer Price Index.

We define NWP and IP relative to the 2021 poverty line (US Census Bureau 2021). Following previous work (Gibson-Davis, Keister, and Gennetian 2021, Brandolini, Magri, and Smeeding 2010), we consider households to be net worth poor if their net worth (total assets minus total debts) is less than 25% of the federal poverty line, adjusted for family composition. According to this definition, a household experiencing NWP does not have sufficient resources to maintain an adequate standard of living for at least three months. Although an arbitrary time frame, three months may correspond to the amount of savings displaced when a household suffers an income shock (see Brandolini et al. 2010 for a discussion of the robustness of NWP definitions). In 2021, the poverty line for a household of four was \$27,740 (US Census Bureau 2021); a household would be net worth poor if their net worth was less than \$6,935. Note that because we use constant dollars, we adjust for over-time variation in wealth, income, and poverty thresholds. Sensitivity analyses (described later) examine the robustness of our results to alternative definitions and thresholds of NWP.

Our first set of analyses use a four-category measure of joint NWP-IP poverty status, where households are divided into one of four mutually exclusive categories: not net worth or income poor, net worth poor only, income poor only, or both income and net worth poor. Second, we used a mutually exclusive, three-category division of net worth poverty status: (1) no net worth poverty, (2) asset poverty, and (3) debt poverty (these models also control for a dichotomous indicator of being income poor). Asset-poor households are those households whose levels of assets are insufficient to bring them above the net worth poverty line (these households may or may not have debts). Debt-poor households refers to households whose assets exceed the net worth poverty threshold, but their levels of debts bring them below the net worth poverty threshold.

In our analyses, we adjust for different household- and individual-level characteristics. Covariates include age of reference person, number of children in the household (2, 3 or more, with 1 child as the default), age of the youngest child (if youngest is aged 6 to 12, if youngest is aged 13 to 17, with youngest child less than age 6 as the default), race/ethnicity of reference person (with non-Hispanic White as the default), year 2017, 2019 and with 2015 as the default), education (high school or equivalent, some college, bachelor's degree or more with less than a high school degree as the default), marital status (=1 if married), and receipt of SNAP benefits (=1 if household is receiving SNAP benefits). Weighted descriptive statistics, for both the full sample and by race/ethnicity, are presented in Appendix Table A1). We present descriptive statistics for 2021; results for the three other years are consistent with 2021 and are available upon request.

We use mixed effects logistic regression models (or generalized linear mixed models) to estimate the relationship between poverty status and food insecurity. The advantages of mixed effects models over other logistic regression models are that they account for nonindependence within households across years, accommodate for over-dispersion among responses, account for the complex sampling features of the PSID, and allow for both between- and within-household analysis. To determine the appropriate mixed effects model, we compared models with fixed- and random-slopes using Akaike and Bayesian information criterion. Based on these criteria, we used a mixed effects logistic

regression model with household-level random effects. We present average marginal effects to summarize the effects of poverty categories, NWP categories, and race/ethnicity on our model predictions. Average marginal effects are calculated by averaging the marginal effect for each observation in the sample (Mize 2019). In supplementary analyses, we used generalized estimation equations (or population-averaged models) with an independent correlation structure. Results from these models were substantively similar to the results discussed below and are available on request.

## RESULTS

### Descriptive Statistics: Poverty and Food Insecurity

We begin by describing the prevalence of poverty in our sample, using weighted descriptive means (Table 1). In 2021, 34% of child households experienced NWP, more than three times higher than the proportion who experienced IP (11%). Results by joint NWP and IP, consistent with past work (Gibson-Davis, Keister, and Gennetian 2021), indicate that net worth poverty was the modal form of poverty (25% of child households were net worth poor; an additional 9% were net worth and income poor), with only a small fraction being income poor (3%). Of those who experienced net worth poverty, asset poverty was 3.3 times more common than debt poverty (26% and 8%, respectively). Relative levels of poverty were consistent across time (results not shown, but available upon request). In all years, net worth poverty was the most common type of poverty, accounting for 25–30% of all households. The fraction of households who were income poor but not net worth poor never exceeded 3%.

Net worth poverty was also the most common form of poverty for all racial and ethnic groups, with 60% of Black, 48% of Hispanic, and 24% of White children experiencing net worth poverty (either alone or in conjunction with income poverty). As a fraction of all poverty experienced, net worth poverty accounted for 92 to 94% of the poverty experienced by Black, White, and Hispanic child households. As with the full sample, relatively few child households experienced income poverty alone (4% for Black and Hispanic child households; 2% for White child households). Within each racial group, children were more likely to experience asset poverty than debt poverty. However, large racial and ethnic gaps existed in the prevalence of asset poverty, with 50% of Black child households and 42% of Hispanic child households being asset poor, relative to only 16% of White child households. Experiences of debt poverty were more comparable (6% for Hispanic child households, 11% for Black child households, and 8% for White child households).

Within each racial group, child households were more likely to experience asset poverty than debt poverty. However, large racial and ethnic gaps existed in the prevalence of asset poverty, with 50% of Black child households and 42% of Hispanic child households being asset poor, relative to only 16% of White child households. Experiences of debt poverty were more comparable (6% for Hispanic child households, 11% for Black child households, and 8% for White child households). In terms of the prevalence of food insecurity (Table 2), descriptive statistics indicate that child households who experience poverty of any type were more likely to be food insecure than households that did not experience poverty. Households that experienced net worth poverty by itself were five times more likely to be food insecure

than households who were not poor (22% and 4%, respectively). Households that were either income poor or income and net worth poor had the highest rates of food insecurity (34%). Families who were asset poor (30%) were three times more likely to be food insecure than families who were debt poor (10%).

Mirroring results for the full sample, within each racial and ethnic group, households that experienced net worth poverty were substantially more likely to be food insecure than households that were not poor (e.g., among White households, 23% for net worth poverty versus 3% for not being poor). For Black and White child households, the highest rates of food insecurity (39% and 36%, respectively) were found among households that were both net worth and income poor. Among Hispanic child households, rates of food insecurity were slightly higher among those who were income poor (33%) versus those who were both income and net worth poor (30%).

Asset poverty, regardless of race or ethnicity, puts households at the highest risk of food insecurity (28%, 24%, and 36%, respectively, for Black, Hispanic, and White child households). In contrast to the universally higher rate of food insecurity for asset poverty, debt poverty is associated with higher rates of food insecurity for two of the three racial and ethnic subgroups. For White and Hispanic households, debt poverty increases food insecurity, relative to households who were not net worth poor (e.g., Hispanic debt poor households had a food insecurity risk of 16.3%, nearly twice as high as Hispanic households who were not net worth poor). For Black households, however, debt poverty was associated with a slightly lower risk (5.1% for debt poor households versus 6.5% for households who were not net worth poor).

### Net Worth Poverty and Food Insecurity

Results from our mixed effects regression models, depicted as predicted probabilities (Figure 1, Table 3), provide support for the idea that net worth poverty is associated with food insecurity even when IP is held constant. Models underlying these predicted probabilities are presented in Appendix Table A2. The figure depicts the predicted likelihood of being food insecure, after adjusting for demographic covariates (described above). Results indicate that predicted food insecurity rates are more than twice as high among child households that were net worth poor (0.19) relative to child households that were not poor (0.07). The predicted value for net worth poor households was lower than, but not statistically distinguishable from, the predicted value for income poor households (0.23). Results are also consistent with the idea that experiencing both types of poverty is associated with food insecurity. Child households that experienced both net worth and income poverty had predicted rates (0.20) that were statistically higher than child households that were not net worth poor; these rates were statistically indistinguishable from rates for the other two poverty categories.

When expressed as average marginal effects (AME, Table 3), results indicate that all three poverty categories, relative to the no poverty category, are associated with a significant increase in experiencing food insecurity. Relative to not being poor, net worth poverty was associated with an 11% increase in food insecurity, with the joint presence of net worth and income poverty associated with a 13% increase. Income poverty was associated with the

largest effect (15%), but these estimates did not differ at conventional levels of statistical significance from the effects of the other two poverty categories.<sup>i</sup>

### Asset and Debt Poverty

The next set of analyses compares how wealth holdings differ across the three types of net worth poverty categories (not net worth poor, asset poor, debt poor) (Table 4). Results are presented for 2021; estimates for other years are available upon request. Estimates indicate that asset-poor households have a qualitatively different wealth profile than the other two groups. To begin, asset poor child households exhibited enormous differences in asset levels and holdings. Nearly all households that were not net worth poor or were debt poor reported owning at least one asset, whereas only 41% of asset poor households said the same. Asset-poor households, not surprisingly, had the lowest levels of assets, but the disparity between their asset levels and the other two categories was staggering (at the median, \$0 asset poor, \$81,677 debt poor, \$406,291 for not net worth poor). Asset poor households also differed in their debt profile: they were approximately half as likely as the other two groups to own a debt, and they had relatively low levels of debt (median levels were \$0). The wealth profile of debt poor households, on the other hand, was less distinct. While their asset levels, relative to those who were not net worth, was about one-fifth the size, the share of debt poor households who had an asset was identical. Notably, debt levels between the debt poor and the not net worth poor were also comparable (only about \$12,000 difference at the median). To summarize, asset-poor households differ from other households in having little or no saved assets to draw on in times of financial distress. Moreover, these households may not have access to credit markets given their low current debt levels. Debt poor households, on the other hand, appear to be less asset-rich version of households who were not net worth poor but have comparable levels of debts.

Given the distinctive wealth ownership of asset poor households, it is perhaps not surprising that asset poverty puts child households at high risk of food insecurity (Figure 2, Table 5). Results indicate that though both types of net worth poverty, relative to not being net worth poor, were associated with increased likelihoods of food insecurity, effects associated with asset poverty were substantially larger than those associated with debt poverty (see Appendix Table A2, Model 2, for underlying regression results). After controls for income poverty status and other covariates, the predicted value of food insecurity for those who were asset poor was 0.20, more than twice as high as estimates for those who were not poor. Households who were debt poor also had slightly higher predicted rates (0.142) than households who were not poor (0.09). Expressed as an AME (Table 5) asset poverty was associated with a 11% increase in food insecurity, relative to 6% for debt poverty (both estimates significant at  $p < .001$ ). The asset and debt poverty estimates differed from each other at conventional levels of statistical significance, indicating that asset poverty was associated with a larger increase in food insecurity than was debt poverty.

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<sup>i</sup>In supplementary analysis, we also investigated duration of net worth poverty (see Appendix Table A3). We classified households into one of four mutually exclusive duration variables: never NWP, NWP for a minority of waves observed, NWP for a majority of waves observed but not all, and NWP for all waves observed. Using a weighted mixed effects logistic regression model, we find that duration of NWP may be related to food insecurity, insofar as those who were net worth poor for all waves had a statistically larger risk of food insecurity relative to those who were NWP for a minority of waves.

## Poverty Estimates by Race and Ethnicity

Findings using the four-way classification of poverty (Table 6, Panel A) indicate that for each racial and ethnic subgroup, households that experience net worth poverty, relative to those that are not poor, were at statistically higher risk of being food insecure. The increase in risk ranges from 10 and 11 percentage points for Black and White households, respectively, to 14 percentage points for Hispanic households. For Black child households, the risk of food insecurity among the net worth poor is 17%, relative to 6% for those who are not poor. Households who were either income poor or were both income and net worth, as compared to those who were not poor, were also at increased risk. Income poverty was associated with the highest risk, with estimates that were roughly two to three percentage points (depending on subgroup) higher than the estimates associated with net worth poverty. Estimates for income and net worth poverty did not differ at conventional levels of statistical significance from each other. By poverty category, Hispanic child households had notably higher rates of food insecurity, with estimates ranging from 0.23 for net worth poverty to 0.28 for income poverty.

Both asset and debt poverty are positively associated with food insecurity, and the association does not differ significantly by race (Panel B).<sup>ii</sup> Within each racial and ethnic subgroup, the effects found for asset poverty were at least twice as large as those for debt poverty. Among White child households, for example, the AME for asset poverty for .112, relative to .053 for debt poverty. Consistent with the analyses for the full sample, within each racial and ethnic group, the estimates for asset poverty were statistically significantly larger than those for debt poverty. These findings indicate that, despite marked racial/ethnic differences in both poverty and food insecurity, children from each racial/ethnic group experience similar risks of food deprivation, with the biggest risk arising from asset poverty.

## Sensitivity and Robustness Checks

We undertook a number of analyses to ensure that results were not sensitive to definitions of net worth poverty. We note that the purpose of robustness testing of regression models is to explore how regression coefficients and standard errors respond to alternative model specifications. Our robustness checks do not speak to robustness of food insecurity as a measure, nor can they inform if and how food insecurity could be assessed in various ways. Rather, our robustness tests do effectively show that the models that we present as our main empirical tests are, indeed, robust to several different specifications.

Appendix Table A5 includes mixed effects logistic regression models that define net worth poverty in seven unique ways. In these definitions, we identify a household as net worth poor if their net worth – defined in each of the six ways – is less than one fourth of the federal poverty line. For example, in the first model, we define net worth poverty as

<sup>ii</sup>Appendix Table A4 presents estimates of asset and debt levels by net worth poverty status by racial and ethnic group. Consistent with full sample results, results indicated that within each racial and ethnic group, those who experienced asset poverty have very few assets (Black and Hispanic asset poor households, notably, have a median asset level of \$0) with very little debt. Within each racial and ethnic group, debt poor households had lower levels of assets than did those who were not net worth poor, but higher levels of debt (with the exception of Hispanic debt poor households, whose debt levels were lower than Hispanic not net worth poor households).

net worth omitting home equity. In this specification, a household is considered net worth poor if their net worth, not including home equity, is less than one fourth of the federal poverty line. In each model specification shown in this table, net worth poverty is associated with higher food insecurity for child households, even when income poverty is controlled. Moreover, in each of the six model specifications, households that are both net worth poor and income poor have notably high rates of food insecurity. All models control for age, age squared, number of children in the household, the age of the youngest child, respondent education, race and ethnicity, marital status, receipt of SNAP benefits, and year.

The first model in Appendix Table A5 defines net worth poverty without home equity. The second model defines net worth poverty using only financial assets. Defining net worth in these two ways highlights the role of monetary assets (that is, assets other than those in the primary residence, and financial assets). The significant effect of NWP in these first two models are consistent with prior evidence the liquid assets are an important part of the reason that wealth deprivation can lead to food insecurity (Chang, Chatterjee, and Kim 2014). The third specification highlights the importance of nonliquid assets and shows that net worth poverty defined this way is still associated with greater food insecurity, even when income poverty is controlled. This suggests that assets are important even beyond their ability to facilitate short-term spending.

The fourth model in Appendix Table A5 defines income poverty as less than 200 percent of the federal poverty line, rather than 100 percent. The fifth model defines net worth poverty more broadly than in our other models as having net worth less than one-half the median wealth. Even when it is defined broadly, net worth poverty is associated with greater food insecurity. The sixth model in Appendix Table A5 defines net worth poverty using only home equity, and the seventh model defines net worth poverty using just home equity less total debts. We include these final two model specifications to look as closely as possible at the various ways net worth is understood and defined and to highlight the robustness of the association between net worth poverty and food insecurity. Again, in these final two models, net worth poverty is associated with greater food insecurity for child households even when income poverty is controlled.

## CONCLUSION AND DISCUSSION

Food insecurity is a risk factor for significant short- and long-term health, cognitive, and socio-emotional and behavior issues resulting from lack of adequate and stable nutrition, particularly for children. Prior research shows that economic precarity increases the risk of food insecurity (Coleman-Jensen et al., 2021; Gundersen and Ziliak, 2015), but this research also demonstrates that income poverty, by itself, is an inadequate predictor of food insecurity. We contribute to this literature by examining the independent role of wealth deprivation, as measured through net worth poverty, as an economic risk factor for food insecurity, the underlying dimensions of asset versus debt, and differential experiences of poverty and food insecurity by race and ethnicity.

Among households with children, we find an association of IP with food insecurity consistent with prior literature but also that NWP is associated with food insecurity beyond

the effects of IP (Gundersen et al., 2014; Rabbit et al., 2023). In particular, when households are classified into one of four mutually exclusive categories (not poor, net worth but not income poor, income but not net worth poor, income and net worth poor), we find that net worth poverty, either alone or in combination with income poverty, is predictive of food insecurity. The effects associated with net worth poverty are comparable to those for income poverty: relative to base rate of 7.3%, for child households who are not poor, net worth poverty increases the risk of food insecurity by 11 percentage points and income poverty by 15 percentage points. These findings suggest that both flows of resources into the household (income) and the stock of resources available to the household (both assets and debts) matter to food insecurity risk.

This study points to the importance of decomposing wealth into its key components of assets and debts (Chang et al., 2014; Brewer, 2020, Loibl et al., 2022 and empirically capturing the relative contribution of each on food insecurity risk. Results show that both assets and debts are important for understanding food insecurity. However, asset-deprivation (i.e., asset-based poverty) is more strongly associated with food insecurity than debt (i.e., debt-based poverty): roughly one in three child households who are asset poor experienced food insecurity, relative to one in ten child households who are debt poor. This finding is consistent with the hypothesis that wealth offers families a pool of resources to tap in the event of a financial crisis. Indeed, an analysis of asset and debt holdings by poverty status shows that asset-poor families have low rates of ownership of assets (41%) and low median asset levels (\$0).

Results also reveal that household debt matters, although the mechanism underlying how debt affects food insecurity likely differs from mechanisms underlying how assets affect food insecurity. Debt-poor families may, indeed, have substantially more assets on which they might draw to meet spending needs. However, families may be juggling payments on debt that incur higher long-term costs over meet certain current spending needs.

Findings confirm previous understanding of patterns of income and wealth deprivation differences by racial or ethnic group (Gibson-Davis et al., 2021; Rabbitt et al., 2023): Black and Hispanic households are more likely (on most measures) to experience both poverty and food insecurity. However, once we control for other confounding factors, we find no race/ethnic difference in the association between poverty and food insecurity. Thus, economic precarity across aspects of income and wealth are significant for understanding food insecurity for children across racial and ethnic groups.

There are several strengths and limitations to this work that are important considerations for future research. First, this work adds important information to the literatures on both poverty and food insecurity, but it also leaves open room for future research to further explore this important association. In particular, the PSID data is an extraordinary resource, but the sample has limitations. For example, we are unable to fully explore the mechanisms linking NWP and food insecurity. Those mechanisms are complex, ranging from the neighborhood and household levels (e.g., location in a food desert, financial shocks that strain resources) to micro-level processes by which individual bodies are able to use a food source's nutrients. A complete exploration of these mechanisms would require multiple data sources and would

result in several papers, or perhaps a book-length manuscript. Future research might study one or more of these mechanisms.

Second, and related to the first limitation, the PSID does not contain the data to test ideas about food utilization or stability. It contains detailed information on food availability and some information on food access, but research designed to look at all four components of the food insecurity model we describe in our background section would require additional data. Future research could broaden the scope of our work by using other data sources to study the association between NWP and food insecurity more broadly. Third, although the longitudinal aspect of the PSID enables modeling the association between poverty and food insecurity over multiple waves of data, PSID families are not entirely representative of the U.S. population, including families with children and several underrepresented groups (e.g. contemporary representation of Hispanic, American Indigenous, Asian American and/or Pacific Islanders). Fourth, data used for this study were collected during the COVID-19 pandemic, raising questions about whether the extraordinary events occurring during data collection affected respondent behaviors, responses, or experiences of poverty or food insecurity. Finally, we were able to explore race and ethnic differences in the association between poverty and food insecurity for some large groups, but unable to parse heterogeneity underlying these groups. Hispanic families, for example, vary across countries of origin, immigration timing to the U.S., nativity status of household members, and a variety of other cultural dimensions including language.

This study expands understanding of the consequences of economic well-being on food insecurity. Previous research shows that income deprivation (income poverty) is a risk factor for food insecurity, but also that income poverty, by itself, is an insufficient predictor of food insecurity (Gundersen, Kreider, and Pepper 2011, Brewer 2020). This study demonstrates that NWP is an independent indicator of financial vulnerability, beyond income poverty, that increases food insecurity risk. This highlights the potentially key role of a family's stock as well of flow of resources in consideration of policy investments.

### Acknowledgements:

We acknowledge funding from the National Institutes of Health (R21HD107249). This article was published via expedited review through the AJAE's call for the Special Issue on the Economics of Inequity in Agricultural, Food, and Environmental Systems

### Appendix Table A1.: Descriptive Statistics, Full Sample and by Race/ Ethnicity, 2021

	Full Sample	Race/Ethnicity		
		Black	Hispanic	White
Age (years)	40.7	39.0	40.2	41.2
Number of children				
One	0.40	0.44	0.39	0.41
Two	0.37	0.31	0.36	0.36

	<b>Full Sample</b>	<b>Race/Ethnicity</b>		
		<b>Black</b>	<b>Hispanic</b>	<b>White</b>
Three or more	0.23	0.24	0.26	0.22
Age of youngest child				
0–5	0.43	0.44	0.45	0.42
6–12	0.34	0.36	0.33	0.34
13–17	0.23	0.20	0.22	0.24
Education				
Less than high school (reference)	0.15	0.17	0.32	0.08
High school or equivalent	0.23	0.26	0.28	0.22
Some college	0.25	0.34	0.22	0.25
Bachelor's degree or more	0.37	0.23	0.18	0.45
SNAP receipt	0.21	0.36	0.30	0.14
Married	0.64	0.38	0.57	0.72
Sample size	<i>3,496</i>	<i>1,315</i>	<i>547</i>	<i>1,536</i>

Numbers represent proportions unless otherwise indicated. Estimates are weighted.

### Appendix Table A2.: Mixed Effects Logistic Regression, Food Insecurity

	<b>Model 1</b>	<b>Model 2</b>
Joint Poverty Status		
Not poor (reference)	--	--
Net worth poor	3.187 <sup>***</sup> [2.463,4.125]	--
Income poor	4.106 <sup>***</sup> [2.671,6.310]	--
Income and net worth poor	3.386 <sup>***</sup> [2.308,4.968]	--
Net worth poverty status		
Not net worth poor	--	--
Asset poor	--	2.984 <sup>***</sup> [2.232,3.990]
Debt poor	--	1.802 <sup>**</sup> [1.299,2.498]
Income poor	--	1.299 [.987,1.710]
Race/ethnicity		

	<b>Model 1</b>	<b>Model 2</b>
White (reference)	--	--
Black	.942 [.751,1.181]	.919 [.728,1.159]
Hispanic	1.322 [.979,1.785]	1.327 [.980,1.797]
Other race/ethnicity	1.764 [.858,3.628]	1.76 [.843,3.676]
Age	.978 [.912,1.049]	.981 [.916,1.051]
Age squared	1.00 [.999, 1.001]	1.00 [.999, 1.001]
	Model 1	Model 2
Education		
No high school diploma (reference)	--	--
High school graduate	.676 <sup>***</sup> [.545,.838]	.667 <sup>***</sup> [.538,.829]
Some college	.584 <sup>***</sup> [.443,.770]	.606 <sup>***</sup> [.454,.808]
Bachelors' degree or more	.299 <sup>***</sup> [.204,.439]	.304 <sup>***</sup> [.205,.449]
Married	.600 <sup>***</sup> [.484,.742]	.618 <sup>***</sup> [.496,.769]
Number of children		
One (reference)	--	--
Two	.904 [.725,1.126]	.903 [.722,1.128]
Three or more	1.158 [.937,1.431]	1.176 [.950,1.455]
Age of youngest child		
0–5 (reference)	--	--
6–12	1.052 [.868,1.275]	1.054 [.867,1.282]
13–17	1.296 [.967,1.736]	1.269 [.941,1.712]
SNAP receipt	2.129 <sup>***</sup>	2.050 <sup>***</sup>

	<u>Model 1</u>	<u>Model 2</u>
	[1.746,2.595]	[1.669,2.518]
Year		
2015 (reference)	--	--
2017	1.023 [.874,1.198]	.989 [.844,1.160]
2019	1.079 [.892,1.307]	1.038 [.858,1.256]
2021	.844 [.691,1.032]	.802* [.674,.997]

\* p<.05,  
 \*\* p<.01,  
 \*\*\* p<.001. All estimates weighted. Estimates represent odds ratios. 95% confidence intervals in brackets. n=14,303.

### Appendix Table A3: Predicted Probability of Food Insecurity by Duration of Net Worth Poverty (n=14,303)

	<u>Probability</u>
Never NWP	.071 [.053, .089]
NWP across minority of waves	.124 [.095, .152]
NWP across majority of waves, but not all	.154 [.132, .175]
NWP across all waves	.193 [.168, .218]

Notes: 95% confidence intervals in brackets. Estimates from a weighted mixed effects logistic regression model adjusting for income poverty, age, race/ethnicity, education, marital status, receipt of SNAP, age of youngest child, number of children, and year.

### Appendix Table A4: Asset and Debt Holdings, by Net Worth Poverty Status and Race/Ethnicity, 2021

	<u>Black</u>			<u>Hispanic</u>			<u>White</u>		
	<u>Mean</u>	<u>Median</u>	<u>Proportion with assets</u>	<u>Mean</u>	<u>Median</u>	<u>Proportion with assets</u>	<u>Mean</u>	<u>Median</u>	<u>Proportion with assets</u>
	Not net	368,526	228,277	.99	509,195	289,534	1.00	893,391	481,685

<b>Panel A: Asset levels</b>									
	<b>Black</b>			<b>Hispanic</b>			<b>White</b>		
	<b>Mean</b>	<b>Median</b>	<b>Proportion with assets</b>	<b>Mean</b>	<b>Median</b>	<b>Proportion with assets</b>	<b>Mean</b>	<b>Median</b>	<b>Proportion with assets</b>
worth poor	(721,010)			(1,152,777)			(1,480,844)		
Asset poor	569 (1,393)	0	.35	948 (1,779)	0	.41	1,084 (1,751)	105	.57
Debt poor	157,200 (165,652)	63,876	1.00	82,030 (107,814)	35,420	1.00	274,052 (529,680)	136,128	1.00

<b>Panel B: Debt levels</b>									
	<b>Black</b>			<b>Hispanic</b>			<b>White</b>		
	<b>Mean</b>	<b>Median</b>	<b>Proportion with debts</b>	<b>Mean</b>	<b>Median</b>	<b>Proportion with debts</b>	<b>Mean</b>	<b>Median</b>	<b>Proportion with debts</b>
Not net worth poor	113,753 (164,394)	52,357	.68	130,378 (170,205)	51,310	.69	225,772 (357,312)	152,883	.80
Asset poor	12,955 (39,845)	0	.36	7,461 (16,859)	0	.40	19,783 (65,478)	838	.40
Debt poor	156,911 (134,582)	136,128	1.00	80,333 (99,325)	39,791	1.00	334,139 (616,072)	167,543	1.00

Standard deviations in parentheses. Black n=1,315; Hispanic n=547; White n=1,536. Notes: Estimates are weighted and expressed in dollars unless otherwise noted.

### Appendix Table A5: Mixed Effects Logistic Regressions Predicting Household Food Insecurity across Alternate Definitions of Net Worth Poverty (Odds Ratios)

	<b>Net Worth without Home Equity</b>	<b>Liquid Assets Only</b>	<b>Nonliquid Assets Only</b>	<b>Income Less than 200% Federal Poverty Line</b>
Type of Poverty				
None (reference)				
Just net worth	5.574 <sup>***</sup> [4.049,7.675]	6.153 <sup>***</sup> [4.748,7.974]	2.336 <sup>***</sup> [1.802,3.028]	3.629 <sup>***</sup> [2.696,4.885]

	<b>Net Worth without Home Equity</b>	<b>Liquid Assets Only</b>	<b>Nonliquid Assets Only</b>	<b>Income Less than 200% Federal Poverty Line</b>
Just income	4.869 <sup>***</sup> [2.745,8.637]	5.535 <sup>***</sup> [1.480, 6.932]	4.008 <sup>***</sup> [2.482,6.470]	4.374 <sup>***</sup> [3.115,6.141]
Income and net worth	7.024 <sup>***</sup> [4.473,11.029]	7.264 <sup>***</sup> [4.963,10.631]	2.788 <sup>***</sup> [1.893,4.106]	6.391 <sup>***</sup> [4.512,9.051]
	<b>Less than Half the Median Wealth</b>	<b>Just Home Equity</b>	<b>Just Home Equity Minus Debt</b>	
Type of Poverty				
None (reference)				
Just net worth	3.071 <sup>***</sup> [2.363,3.991]	2.369 <sup>***</sup> [1.865,3.008]	2.254 <sup>***</sup> [1.776,2.861]	
Just income	4.014 <sup>***</sup> [2.529,6.372]	4.412 <sup>***</sup> [2.723,7.148]	4.409 <sup>***</sup> [2.610,7.450]	
Income and net worth	3.371 <sup>***</sup> [2.292,4.957]	2.731 <sup>***</sup> [1.907,3.911]	2.726 <sup>***</sup> [1.906,3.898]	

Notes: Statistical significance levels are denoted as:

\* p<.05,

\*\* p<.01,

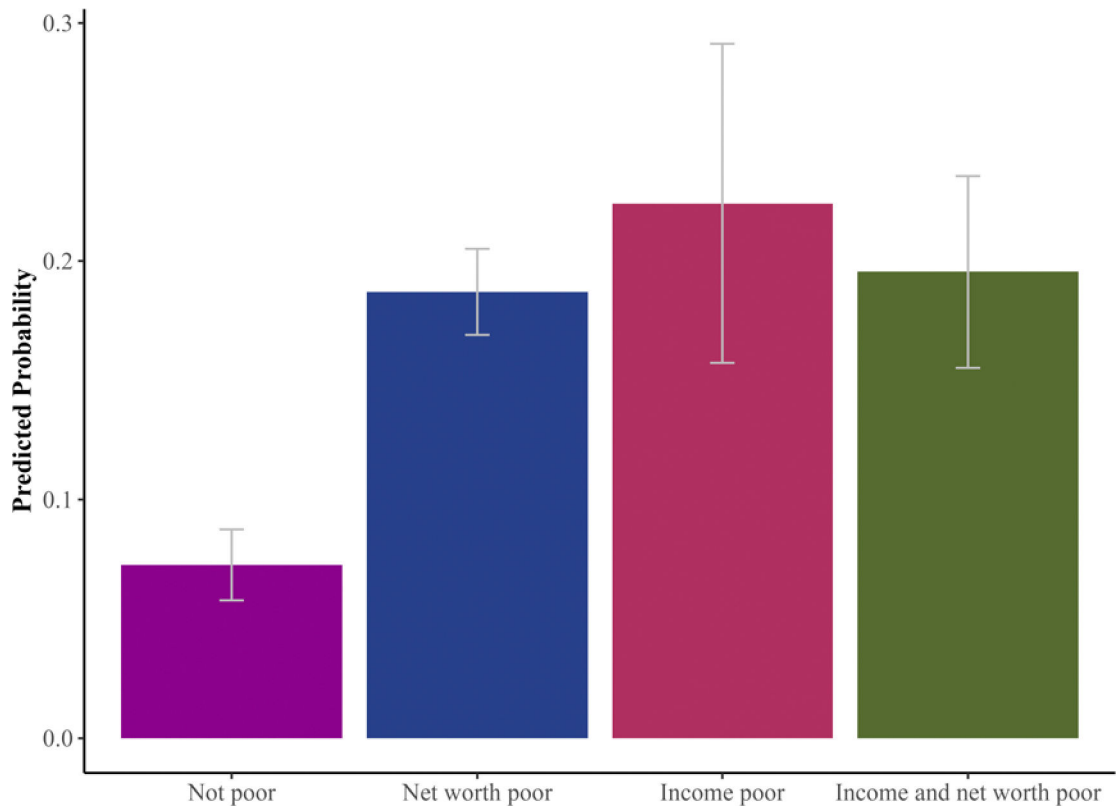
\*\*\* p<.001. n = 14,303. All estimates weighted. Exponentiated coefficients. 95% confidence intervals in brackets. Estimates from a weighted mixed effects logistic regression model adjusting for age, square of age, number of children in household, age of youngest child, education of reference person, race/ethnicity of reference person, marital status, receipt of SNAP benefits, and year. Sample includes households with children in family unit and with reference person between 18 and 64 years old from 2015, 2017, 2019, and 2021 PSID waves.

## Works Cited

- Addo Fenaba R, Houle Jason N, and Simon Daniel. 2016. "Young, black, and (still) in the red: Parental wealth, race, and student loan debt." *Race and Social Problems* 8 (1):64–76. [PubMed: 30026879]
- Bahn Kate, and Cumming Carmen Sanchez. 2020. U.S. occupational segregation by race, ethnicity, and gender. Washington Center for Equitable Growth.
- Brandolini Andrea, Magri Silvia, and Smeeding Timothy M. 2010. "Asset-based measurement of poverty." *Journal of Policy Analysis and Management* 29 (2):267–284.
- Brewer Mackenzie. 2020. "Household debt and children's risk of food insecurity." *Social Problems* 67 (3):565–584.
- Chang Yunhee, Chatterjee Swarn, and Kim Jinhee. 2014. "Household finance and food insecurity." *Journal of Family and Economic Issues* 35 (4):499–515.
- Coleman-Jensen Alisha, Rabbitt Matthew P., Gregory Christian A., and Singh Anita. 2020. Household Food Security in the United States in 2019. Washington, DC: U.S. Department of Agriculture, Economic Research Service.
- Coleman-Jensen Alisha, Rabbitt Matthew P., Gregory Christian A., and Singh Anita. 2021a. Household Food Security in the United States in 2020. Washington, DC: U.S. Department of Agriculture, Economic Research Service.
- Coleman-Jensen Alisha, Rabbitt Matthew P., Gregory Christian A., and Singh Anita. 2021b. Household Food Security in the United States in 2020. In ERR-298. Washington, DC: U.S. Department of Agriculture, Economic Research Service.
- Denney Justin T, Brewer Mackenzie, and Kimbro Rachel Tolbert. 2020. "Food insecurity in households with young children: A test of contextual congruence." *Social Science & Medicine* 263:113275. [PubMed: 32823047]

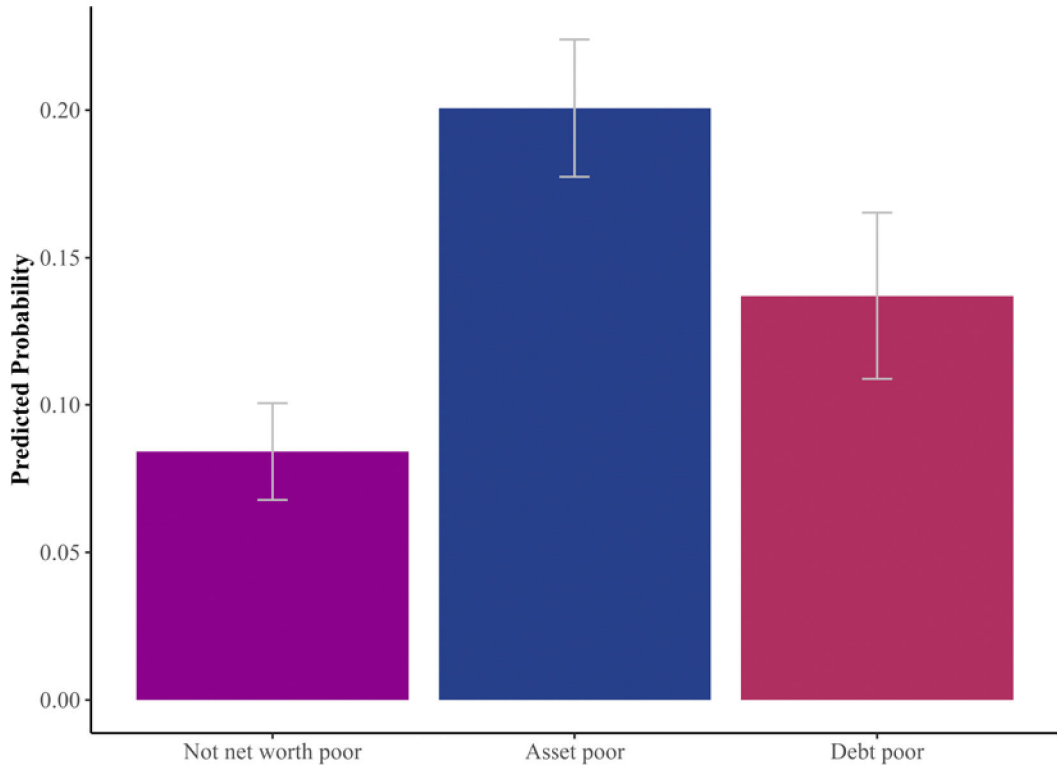
- Fitzpatrick Katie and Coleman-Jensen Alisha. 2014. "Food on the Fringe: Food Insecurity and the Use of Payday Loans." *Social Service Review* 88(4):553–93.
- Gibson-Davis CM, and Percheski Christine. 2018. "Children and the elderly: Wealth Inequality among America's dependents." *Demography* 55 (3):1009–1032. [PubMed: 29736891]
- Gibson-Davis Christina, Keister Lisa A., and Gennettian Lisa. 2020. "Net Worth Poverty in Child Households by Race and Ethnicity, 1989–2019." *Journal of Marriage and Family* DOI:10.1111/jomf.12742.
- Gibson-Davis Christina, Keister Lisa, and Gennettian Lisa. 2021. "Net Worth Poverty in Child Households by Race and Ethnicity, 1989–2019." *Journal of Marriage and Family* 83:667–682 doi: 10.1111/jomf.12742. [PubMed: 34887593]
- Gibson-Davis Christina, Keister Lisa, Gennettian Lisa, and Lowell Warren. 2022. "Net Worth Poverty and Child Development." *Socius*. doi: 10.1177/23780231221111672.
- Gibson-Davis Christina, Keister Lisa A, and Gennettian Lisa A. 2021. "Net worth poverty in child households by race and ethnicity, 1989–2019." *Journal of Marriage and Family* 83 (3):667–682. [PubMed: 34887593]
- Gundersen Craig, Hake Monica, Dewey Adam, and Engelhard Emily. 2021. "Food insecurity during COVID-19." *Applied economic perspectives and policy* 43 (1):153–161. [PubMed: 33042509]
- Gundersen Craig, Kreider Brent, and Pepper John. 2011. "The economics of food insecurity in the United States." *Applied Economic Perspectives and Policy* 33 (3):281–303.
- Gundersen Craig, and Ziliak James P. 2014. "Childhood food insecurity in the US: trends, causes, and policy options." *The Future of Children*:1–19.
- Haveman Robert, and Wolff Edward N. 2004. "The concept and measurement of asset poverty: Levels, trends and composition for the U.S., 1983–2001." *Journal of Economic Inequality* 2:145–169.
- Haveman Robert, and Wolff Edward N. 2005. "Who are the asset poor? Levels, trends, and composition, 1983–1998." In *Inclusion in the American dream: Assets, poverty, and public policy*, edited by Sherraden Michael, 61–86. New York: Oxford University Press.
- Helton, Jackson Dylan B, Boutwell Brian B, and Vaughn Michael G. 2019. "Household food insecurity and parent-to-child aggression." *Child maltreatment* 24 (2):213–221. [PubMed: 31094579]
- Hobbs Savannah, and King Christian. 2018. "The unequal impact of food insecurity on cognitive and behavioral outcomes among 5-year-old urban children." *Journal of Nutrition Education and Behavior* 50 (7):687–694. [PubMed: 29753634]
- Jackson Dylan B, and Testa Alexander. 2021. "Household food insecurity and children's oral health: Findings from the 2016–2018 National Survey of Children's Health." *Journal of public health dentistry* 81 (2):150–161. [PubMed: 33251647]
- Jessiman-Perreault Geneviève, and McIntyre Lynn. 2017. "The household food insecurity gradient and potential reductions in adverse population mental health outcomes in Canadian adults." *SSM-population health* 3:464–472. [PubMed: 29349239]
- Johnson Anna D, and Markowitz Anna J. 2018a. "Associations between household food insecurity in early childhood and children's kindergarten skills." *Child Development* 89 (2):e1–e17. [PubMed: 28321849]
- Johnson Anna D, and Markowitz Anna J. 2018b. "Food insecurity and family well-being outcomes among households with young children." *The Journal of Pediatrics* 196:275–282. [PubMed: 29703363]
- Jyoti Diana F, Frongillo Edward A, and Jones Sonya J. 2005. "Food insecurity affects school children's academic performance, weight gain, and social skills." *The Journal of nutrition* 135 (12):2831–2839. [PubMed: 16317128]
- Killewald Alexandra. 2013. "Return to being black, living in the red: A race gap in wealth that goes beyond social origins." *Demography* 50 (4):1177–1195. [PubMed: 23658068]
- Killewald Alexandra, and Bryan Brielle. 2016. "Does Your Home Make You Wealthy?" *RSF: The Russell Sage Foundation Journal of the Social Sciences* 2 (6):110–128.
- Killewald Alexandra, and Bryan Brielle. 2018. "Falling behind: The role of inter- and intragenerational processes in widening racial and ethnic wealth gaps through early and middle adulthood." *Social Forces* 97 (2):705–740.

- King Christian. 2018. "Food insecurity and child behavior problems in fragile families." *Economics & Human Biology* 28:14–22. [PubMed: 29197238]
- Loibl Căzilia, Rhodes Alec P, Moulton Stephanie, Haurin Donald, and Edmunds Chrisse. 2022. "Food insecurity among older adults in the US: The role of mortgage borrowing." *Applied Economic Perspectives and Policy* 44 (2):549–574.
- Massey Douglas S. 2015. "The Legacy of the 1968 Fair Housing Act." *Sociological Forum*.
- Mize Trenton D. 2019. "Best practices for estimating, interpreting, and presenting nonlinear interaction effects." *Sociological Science* 6:81–117.
- Oliver Melvin L, and Shapiro Thomas. 1995. *Black Wealth, White Wealth: A New Perspective on Racial Inequality*. New York, NY: Routledge.
- Park Clara Y, and Eicher-Miller Heather A. 2014. "Iron deficiency is associated with food insecurity in pregnant females in the United States: National Health and Nutrition Examination Survey 1999–2010." *Journal of the Academy of Nutrition and Dietetics* 114 (12):1967–1973. [PubMed: 24953790]
- Percheski Christine, and Gibson-Davis Christina. 2020. "A Penny on the Dollar: Racial Inequalities in Wealth among Households with Children." *Socius* 6:1–7. doi: 10.1177/2378023120916616.
- Pfeffer Fabian T. 2018. "Growing Wealth Gaps in Education." *Demography* 55 (3):1033–1068. [PubMed: 29589320]
- Pfeffer Fabian T, and Killewald Alexandra. 2018. "Generations of advantage. Multigenerational correlations in family wealth." *Social Forces* 96 (4):1411–1442.
- Rabbitt Matthew P., Hales Laura J., Burke Michael P., and Coleman-Jensen Alisha. 2023. "Household Food Security in the United States in 2022 <https://www.ers.usda.gov/publications/pub-details/?pubid=107702>."
- Rhone Alana, Ver Ploeg Michele, Dicken Chris, Williams Ryan, and Breneman Vince. 2017. "Low-Income and Low-Supermarket-Access Census Tracts, 2010–2015 <https://www.ers.usda.gov/webdocs/publications/82101/eib-165.pdf?v=42752>." *Economic Information Bulletin*.
- Ribar David, and Hamrick Karen. 2003. "An analysis of poverty and food sufficiency dynamics." Washington, DC, USDA economic research service.
- Schmeer Kammi K, and Piperata Barbara A. 2017. "Household food insecurity and child health." *Maternal & Child Nutrition* 13 (2):e12301. [PubMed: 27126348]
- Seligman Hilary K, Laraia Barbara A, and Kushel Margot B. 2010. "Food insecurity is associated with chronic disease among low-income NHANES participants." *The Journal of nutrition* 140 (2):304–310. [PubMed: 20032485]
- Stuff Janice E, Casey Patrick H, Szeto Kitty L, Gossett Jeffrey M, Robbins James M, Simpson Pippa M, Connell Carol, and Bogle Margaret L. 2004. "Household food insecurity is associated with adult health status." *The Journal of nutrition* 134 (9):2330–2335. [PubMed: 15333724]
- Thomas Margaret MC, Miller Daniel P, and Morrissey Taryn W. 2019. "Food insecurity and child health." *Pediatrics* 144 (4).
- US Census Bureau. 2021. "Poverty Thresholds." <https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html>.
- Vozoris Nicholas T, and Tarasuk Valerie S. 2003. "Household food insufficiency is associated with poorer health." *The Journal of nutrition* 133 (1):120–126. [PubMed: 12514278]
- Whitaker Robert C, Phillips Shannon M, and Orzol Sean M. 2006. "Food insecurity and the risks of depression and anxiety in mothers and behavior problems in their preschool-aged children." *Pediatrics* 118 (3):e859–e868. [PubMed: 16950971]
- World Bank. 2023. "What is Food Insecurity?" <https://www.worldbank.org/en/topic/agriculture/brief/food-security-update/what-is-food-security>."
- Ziliak James P. 2015. "Income, program participation, poverty, and financial vulnerability: Research and data needs." *Journal of Economic and Social Measurement* 40 (1–4):27–68.
- Ziliak James P, Haist Margaret, and Gundersen Craig. 2008. *The causes, consequences, and future of senior hunger in America*: Citeseer.



**Figure 1:**  
Predicted Probability of Food Insecurity by Poverty Type

*Notes:* n = 14,303. Estimates from a weighted mixed effects logistic regression model adjusting for age, square of age, number of children in household, age of youngest child, education of reference person, race/ethnicity of reference person, marital status, receipt of SNAP benefits, and year. Sample includes households with children in family unit and with reference person between 18 and 64 years old from 2015, 2017, 2019, and 2021 PSID waves.



**Figure 2:**  
Predicted Probability of Food Insecurity by Net Worth Poverty Categories  
*Notes:* n = 14,303. Estimates from a weighted mixed effects logistic regression model adjusting for age, square of age, income poverty, number of children in household, age of youngest child, education of reference person, race/ethnicity of reference person, marital status, receipt of SNAP benefits, and year. Sample includes households with children in family unit and with reference person between 18 and 64 years old from 2015, 2017, 2019, and 2021 PSID waves.

**Table 1.**  
Poverty Status, 2021

	<u>By Race/Ethnicity</u>			
	<u>Full Sample</u>	<u>Black</u>	<u>Hispanic</u>	<u>White</u>
Net worth poor	34.0	60.0	47.9	23.6
Income poor	11.0	23.9	17.3	6.1
Joint poverty status				
Not poor	63.8	36.1	48.0	74.9
Net worth poor	25.0	40.0	34.7	19.0
Income poor	2.7	3.9	4.1	1.5
Income and net worth poor	8.6	20.0	13.2	4.6
Net worth poverty status				
Not net worth poor	66.4	40.0	52.1	76.4
Asset poor	25.7	49.5	41.6	15.6
Debt poor	7.9	10.5	6.4	7.9
Sample size	<i>3,496</i>	<i>1,315</i>	<i>547</i>	<i>1,536</i>

Notes: Cells include weighted percentages.

**Table 2.**  
Food Insecurity by Poverty Status and Race/Ethnicity, 2021

	<u>By Race/Ethnicity</u>			
	<u>Full Sample</u>	<u>Black</u>	<u>Hispanic</u>	<u>White</u>
Overall	12.0	16.8	16.0	8.9
Joint poverty status				
Not poor	4.0	4.2	7.4	3.1
Net worth poor	22.0	17.6	21.2	23.2
Income poor	34.3	27.7	33.4	26.3
Income and net worth poor	34.2	35.8	29.5	38.9
Net worth poverty status				
Not net worth poor	5.2	6.5	9.4	3.6
Asset poor	29.7	27.6	24.3	35.6
Debt poor	10.2	5.1	16.3	8.0
Sample size	<i>3,496</i>	<i>1,315</i>	<i>547</i>	<i>1,536</i>

Notes: Cells include weighted percentages.

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**Table 3:**  
 Predicted Probability of Food Insecurity and Average Marginal Effects (AME) by Joint Poverty Status  
 ( $n=14,303$ )

	<u>Probability</u>	<u>AME</u>
Not poor	.073 [.058, .088]	--
Net worth poor	.185 [.167, .203]	.112 *** [.088, .136]
Income poor	.226 [.159, .293]	.153 *** [.087, .219]
Income and net worth poor	.197 [.157, .237]	.125 *** [.079, .169]

Notes:

\*  
 $p < .05$ ,

\*\*  
 $p < .01$ ,

\*\*\*  
 $p < .001$ . 95% confidence intervals in brackets. Estimates from a weighted mixed effects logistic regression model adjusting for age, square of age, number of children in household, age of youngest child, education of reference person, race/ethnicity of reference person, marital status, receipt of SNAP benefits, and year. Sample includes households with children in family unit and with reference person between 18 and 64 years old from 2015, 2017, 2019, and 2021 PSID waves.

**Table 4:**  
Asset and Debt Holdings, by Net Worth Poverty Status, 2021

<b>Panel A: Asset levels</b>			
	<u>Mean</u>	<u>Median</u>	<u>Proportion with assets</u>
Not net worth poor	791,064 (1,364,310)	406,291	0.99
Asset poor	808 (1,523)	0	0.41
Debt poor	199,590 (409,597)	81,677	1.00
<b>Panel B: Debt levels</b>			
	<u>Mean</u>	<u>Median</u>	<u>Proportion with debts</u>
Not net worth poor	199,936 (312,821)	132,987	0.80
Asset poor	13,496 (45,786)	0	0.40
Debt poor	234,516 (478,375)	120,421	1.00

Standard deviations in parentheses. n=3,496.

Notes: Estimates are weighted and in dollars.

**Table 5**

Predicted Probability of Food Insecurity and Average Marginal Effects (AME) by Net Worth Poverty Status

	<u>Probability</u>	<u>AME</u>
Not net worth poor	.085 [.068, .101]	--
Asset poor	.197 [.174, .221]	.113*** [.081, .144]
Debt poor	.142 [.115, .169]	.058*** [.027, .089]

Notes:

\*  
p<.05,\*\*  
p<.01,

\*\*\*  
p<.001. 95% confidence intervals in brackets. AME=Average marginal effect of poverty type versus not being poor. Estimates from a weighted mixed effects logistic regression model adjusting for age, square of age, number of children in household, age of youngest child, education of reference person, race/ethnicity of reference person, marital status, receipt of SNAP benefits, and year. Sample includes households with children in family unit and with reference person between 18 and 64 years old from 2015, 2017, 2019, and 2021 PSID waves.

**Table 6.** Predicted Probability of Food Insecurity and Average Marginal Effects (AME) by Poverty Status and Race/Ethnicity

Panel A: Joint Poverty Status		Black		Hispanic		White	
	Probability	AME	Probability	AME	Probability	AME	AME
Not poor	.061	--	.091	--	.065	--	--
	[.042, .079]		[.064, .118]		[.052, .078]		
Net worth poor	.165	.104***	.227	.137***	.173	.108***	.108***
	[.143, .188]	[.086, .125]	[.184, .271]	[.108, .175]	[.152, .193]	[.086, .134]	[.086, .134]
Income poor	.206	.144***	.277	.187***	.215	.150***	.150***
	[.139, .271]	[.084, .204]	[.197, .358]	[.117, .261]	[.149, .279]	[.088, .212]	[.088, .212]
Income and net worth poor	.186	.125***	.253	.163***	.195	.129***	.129***
	[.147, .225]	[.085, .164]	[.197, .309]	[.111, .219]	[.151, .238]	[.084, .176]	[.084, .176]

Panel B: Net worth poverty status		Black		Hispanic		White	
	Probability	AME	Probability	AME	Probability	AME	AME
Not net worth poor	.071	--	.107	--	.077	--	--
	[.051, .091]		[.077, .136]		[.062, .091]		
Asset poor	.178	.107***	.247	.140***	.189	.112***	.112***
	[.152, .208]	[.083, .136]	[.208, .297]	[.106, .186]	[.164, .221]	[.083, .148]	[.083, .148]
Debt poor	.122	.050***	.174	.068***	.130	.053***	.053***
	[.089, .144]	[.019, .073]	[.123, .218]	[.023, .103]	[.099, .151]	[.019, .078]	[.019, .078]

\* p<.05,

\*\* p<.01,

\*\*\*

p<.001. 95% confidence intervals in brackets. Notes: AME=Average marginal effect of poverty type versus not being poor. Estimates from a weighted mixed effects logistic regression model adjusting for age, square of age, number of children in household, age of youngest child, education of reference person, race/ethnicity of reference person, marital status, receipt of SNAP benefits, and year. Sample includes households with children in family unit and with reference person between 18 and 64 years old from 2015, 2017, 2019, and 2021 PSID waves.