Article

A Decade of Analysis: Household Food Insecurity Among Low-Income Immigrant Children

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Abstract

Our study advances literature on immigrant food insecurity by examining whether national-level differences in immigrant and nonimmigrant families' risk of food insecurity persist across time and for different ethnic/racial groups. Using data from the Current Population Survey Food Security Supplement for low-income households with children aged 0 to 17 years, we examine trends (2003-2013) in immigrant and nonimmigrant food insecurity overall and for different ethnic/racial groups. We also assess how immigrant families are faring compared with their nonimmigrant peers in the wake of the Great Recession and its prolonged recovery period. We find that among low-income households with children, noncitizen immigrant households and their U.S.-born household counterparts experience similar levels of food insecurity, while citizen immigrant households demonstrate the lowest levels of food insecurity. Citizen immigrant households, however, appear to have been most affected by the Great Recession and the protective influences of citizenship status do not appear to extend to Hispanic immigrants.

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Between 2008 and 2012, the annual rate of food insecurity among U.S. households with children reached peak levels with more than one in five households experiencing food insecurity (Coleman-Jensen, Gregory, & Singh, 2014). Though food insecurity rates among families appear to be declining, they remain significantly higher than the pre-2008 rates (19.5% in 2013 compared with 15.8% in 2007). Policy efforts to reduce food insecurity levels to prepeak levels will require an understanding of the patterns and predictors of household food insecurity. Research to date on the causes of food insecurity has largely focused on U.S.-born families (Cook & Frank, 2008; Gunderson, Kreider, & Pepper, 2011), with less focus placed on immigrant families. Children of immigrants, however, make up a growing share of the U.S. population with almost a quarter of children having one or more foreign-born parents (Van Hook, Landale, & Hillemeir, 2013). Compared with U.S.-born families, immigrant families are more likely to be poor (21% vs. 15%) and to experience food insecurity (25% vs. 21%; Chaudry & Fortuny, 2010).

Significant research on food insecurity among immigrant families has focused on the impacts of the 1996 Welfare Reform, which restricted immigrant access to the social safety net (Borjas, 2004; Van Hook & Balistreri, 2006). Only a few national-level studies have examined how the risk of food insecurity more broadly differs among U.S.-born and immigrant households and which risk factors in addition to policy may be more salient for immigrant households. The evidence to date on immigrant food insecurity is based mostly on studies that are locally based (Chilton et al., 2009; Kasper, Gupta, Tran, Cook, & Meyers, 2000; Kersey, Geppert, & Cutts, 2006; Kilanowski & Moore, 2010; Quandt, Arcury, Early, Tapia, & Davis, 2004), have only examined Mexican immigrants (Kaushal, Waldfogel, & Wight, 2013), or have utilized data from the late 1990s (Kalil & Chen, 2008; Kimbro, Denney, & Panchang, 2012). Though these studies have identified important risk factors that contribute to immigrant families' higher levels of food insecurity, the prevalence and relevance of these risk factors may differ across time and racial/ethnic groups.

Our study advances the literature on immigrant food insecurity by examining whether national-level differences in immigrant and nonimmigrant families' risk of food insecurity persist across time and for different ethnic/racial groups. Using data from the Current Population Survey Food Security

Supplement (CPS-FSS) for low-income households with children aged 0 to 17 years, we examine trends (2003-2013) in immigrant and nonimmigrant food insecurity overall and for different ethnic/racial groups. We pay special attention to the impact of the Great Recession in order to assess how immigrant families are faring in the wake of the recession and its prolonged recovery period. Our research question is exploratory but provides useful insight into how the risk and predictors of food insecurity differ across children of U.S.-born parents, foreign-born citizen (FBC) parents, and foreign-born noncitizen (FBNC) parents. We focus on citizenship status of the parents rather than child nativity because prior research suggests parent citizenship status is a stronger predictor of food insecurity (Kalil & Chen, 2008).

To preview the results, we find that the food insecurity risk of immigrants differs markedly between noncitizen and citizen immigrant households. Among low-income households with children, noncitizen immigrant households and their U.S.-born household counterparts experience similar levels of food insecurity, while citizen immigrant households demonstrate the lowest levels of food insecurity. Citizen immigrants, however, appear to have been most affected by the Great Recession and the protective influences of citizenship status do not appear to extend to Hispanic immigrants.

Background

Food Insecurity Consequences and Causes

The consequences of food insecurity are well-documented. Extant research has shown that food insecurity, defined as the inability to acquire sufficient or nutritionally acceptable and safe food for all family members due to financial constraints, is negatively associated with children's cognitive development, physical and mental health, and educational achievement both in the short and long term (Cook & Frank, 2008; Gundersen et al., 2011; Van Hook et al., 2013). The few studies that have focused on children of immigrants specifically find that household food insecurity is associated with poorer parent-rated child health (Chilton et al., 2009) and more mental health disorders in the family (Weigel, Armijos, Hall, Ramirez, & Orozco, 2007).

The causes of food insecurity, however, are less clear, even for U.S.-born populations. Research on nonimmigrant children identifies a host of risk factors for food insecurity, including standard socioeconomic and demographic characteristics (e.g., income, employment, education levels, marital status, household composition, minority status, and public benefit participation), age of oldest child (risk peaks when the oldest child reaches age 13-15), maternal factors (e.g., mental and physical health), availability of social

supports, and neighborhood conditions (Cook & Frank, 2008; Gundersen et al., 2011; Kimbro et al., 2012). Among these risk factors, familial economic resources appear to be the most important predictor of food insecurity, though many low-income households are food secure.

Food Insecurity and Immigrant Children

Research on children in immigrant households suggests that the risk of food insecurity differs by citizenship status and is only partly explained by differences in household characteristics and resources. Using Early Childhood Longitudinal Study–Kindergarten (1998-1999) data on young children (ages 5-6), Kalil and Chen (2008) found that, compared with children of U.S.-born parents, children of noncitizen immigrant mothers had a higher risk of food insecurity, while children of citizen immigrant mothers actually had a lower risk.[1] For noncitizen immigrant households, demographic differences (race/ethnicity) and household characteristics (parental education and employment; household size and structure) explained about half of the U.S.-born and noncitizen food insecurity gap, while differences in familial economic resources, participation in public benefit programs, parental health, and social integration did not contribute to the gap. For citizen immigrant households, in contrast, their lower risk of food insecurity remained robust to all controls. Other studies, which focus only on parent nativity status, suggest that the risk for food insecurity is higher among newly arrived immigrant families (Chilton et al., 2009) and among immigrant families living in concentrated Hispanic and foreign-born neighborhoods (Kimbro et al., 2012). Last, research comparing U.S.-born and Mexican immigrant households finds that the risk of food insecurity among Mexican immigrant households, no matter their citizenship status, is more sensitive to fluctuations in income than U.S.-born households (Kaushal et al., 2013).

Overall, these studies and the diverging trends for citizen and noncitizen immigrants suggest that immigrants' risk for food insecurity is more complex than just economic challenges and may reflect both risk and protective factors of immigrant families. No matter their citizenship status, immigrant families face several unique acculturation challenges (e.g., new language, new social norms, and changing family dynamics) that may increase their food insecurity risk beyond standard socioeconomic factors (Suárez-Orozco & Suárez-Orozco, 2001). Research on acculturation stress theory indicates that some of these challenges are overcome the longer immigrants live in the United States and learn to navigate new social norms and systems (Umaña-Taylor & Alfaro, 2009). Citizen immigrants, in particular, may face fewer challenges given that they qualify for more governmental support and are

more aware of community resources (Yu, Huang, Schwalberg, & Kogan, 2005). Community-based studies and national reports, for instance, find that food insecurity rates are lower among more acculturated immigrants as measured by citizenship status, English language usage, and time in the United States (Capps, Horowitz, Fortuny, Bronte-Tinkew, & Zaslow, 2009; Iglesias-Rios, Bromberg, Moser, & Augustson, 2015). This decline in food insecurity risk across acculturation levels aligns with classical assimilation theory's prediction that immigrants follow an upward trajectory path of assimilation (Gordon, 1964).

Classical assimilation theory, however, does not predict that immigrants' upward trajectory path of assimilation leads to an immigrant advantage—as appears to be the case for citizen immigrants, who according to prior research experience lower levels of food insecurity than their U.S.-born peers (Kalil & Chen, 2008). A similar immigrant advantage, though not only citizen immigrants, has been noted in other research areas of child development (Garcia Coll & Marks, 2012). One explanation for this advantage is the protective influence of immigrant families' resilience and optimistic attitudes (Kao & Tienda, 1995). Having experienced hardships in their home country, immigrant families expect to experience challenges on entering the United States but believe that through hard work they can overcome these challenges (Suárez-Orozco & Suárez-Orozco, 2001). Moreover, immigrants benefit from strong family support networks that can provide both social and material support to overcome food and other socioeconomic challenges (Crosnoe & Turley, 2011). The benefits of immigrant optimism and family supports are not dependent on citizenship status but are instead thought to be transmitted across immigrant generations (Kao & Tienda, 1995). Thus, according to this perspective immigrant families, no matter their citizenship status, may be less at risk of food insecurity than nonimmigrant families.

Racial/Ethnic Variation in Immigrant Food Security

Immigrant families' food insecurity risk is likely to differ across racial/ethnic groups, which face differing risk and protective factors. Research on food insecurity risk among racial/ethnic subgroups of immigrants, however, has mostly only focused on the Hispanic or Mexican experience (Kaushal et al., 2013; Kersey et al., 2006; Kilanowski & Moore, 2010; Quandt et al., 2004). Research on Hispanics finds that compared with non-Hispanic Whites, Hispanics are significantly more likely to experience food insecurity (23.7% vs. 10.6%, respectively in 2013; Coleman-Jensen et al., 2014) and that the risk of food insecurity is particularly high among immigrant Hispanics (Kaushal et al., 2013; Kersey et al., 2006; Quandt et al., 2004).

Though the majority of children of immigrants are of Hispanic origin (57.8%), children of immigrants come from every racial/ethnic background: non-Hispanic Asian (15.7%), White (16.6%), Black (7.9%), and mixed race (2.0%; Passel, 2011). Moreover, research on Mexican immigrants suggests that the observed protective influence of immigrant citizenship status (Kalil & Chen, 2008) may not operate similarly across racial/ethnic groups. Examining U.S.-born and Mexican immigrant households from 2001 to 2011, Kaushal et al. (2013) found that Mexican immigrant households, no matter their citizenship status, experienced higher rates of food insecurity than U.S.-born households. More research is needed to assess the food insecurity risk of other ethnic/racial groups besides Hispanics, in order to determine to what extent food insecurity risk is shaped by the immigrant experience and to what extent it is shaped by differing racial/ethnic inequalities immigrants encounter in the United States (Bean & Stevens, 2003).

The Great Recession and the Changing Economic Context of Settlement

The prevalence and relevance of immigrant food insecurity and its associated risk factors may have changed as a result of the Great Recession, which officially lasted from December 2007 through June 2009 (Kalil, 2013). As the most crippling economic recession since the Great Depression, the Great Recession severely disrupted the U.S. economy and led to widespread familial material hardship and peak levels of food insecurity (Andrews & Nord, 2009; Kalil, 2013). Recovery from the Great Recession has been prolonged and weak, with many families struggling to regain economic stability; a trend that may have a lasting impact on food insecurity.

For immigrant families, the impact of the Great Recession has been particularly pronounced. Emerging studies suggest that immigrants experienced greater job losses during the Great Recession but recovered faster in terms of job gains, though not earnings (Kochhar, Espinoza, & Hinze-Pifer, 2010; Liu & Edwards, 2014). Additionally, evidence suggests that the Great Recession affected the settlement patterns of immigrants. Though there was not large-scale exit of immigrants in response to the Great Recession, the arrival of new immigrants, particularly unauthorized, and dispersion of immigrants within the United States slowed considerably during the Great Recession (Ellis, Wright, & Townley, 2014; Passel & Cohn, 2009). These changes in the economic context and settlement patterns of immigrants within the United States have likely altered immigrant families' food insecurity risk. Consequently, prior studies on immigrant food insecurity, most of which are based on data from the mid-1990s to the early 2000s, may provide limited

insight into the food hardships of current immigrant families. We address this limitation by examining food insecurity risk before, during, and after the Great Recession to assess if and how immigrant families' food security risk has changed.

Study Design

Data

Analysis of our research questions relies on data from the CPS-FSS. Using a multistage stratified sample, the CPS collects monthly demographic and employment information from about 60,000 housing units across the United States for the civilian population. Using a rotating interview system, each housing unit in the CPS is interviewed for four consecutive months, ignored for 8 months, and then interviewed again for 4 months. The CPS-FSS is a supplementary questionnaire administered in December as of 2001 and focuses on household food consumption patterns and food security measures. The CPS is a good data choice for this project because it allows for a large, nationally representative sample that can be used to assess heterogeneous effects by familial immigration and citizenship status across racial/ethnic groups. Last, by pooling data from the 2003 to 2013[2] time periods, we can assess risks of food insecurity across time.

Sample

Our sample includes all low-income households with children (ages 0-17) between 2003 and 2013 ($N = 58{,}841$). We restricted our sample to children living in household 185% or below the federal poverty line to target households at risk of food insecurity and ensure comparability of our groups: immigrant (many of which are low-income) and nonimmigrant households (Kalil & Chen, 2008). Our sample is further restricted due to missing data on the dependent ($N = 319$) and independent variables ($N = 13$). Our final sample size is 58,509.[3]

Measures

Food Insecurity. Our key dependent variable is one measure of food insecurity for households with children. Following U.S. Department of Agriculture guidelines, CPS constructed a standardized measure of food insecurity using the standard set of 18 questions (see Coleman-Jensen et al., 2014). Food insecurity is a dichotomous measure (1 = food insecure; 0 = food secure)

identifying those who affirm three or more of the items. The food insecurity measure is retrospective based on experiences over the past 12 months.

Immigrant Groups and Characteristics. We define three mutually exclusive categories of households based on the head of household's nativity and citizenship status: U.S. born; FBC, and FBNC. Originally, we ran the analysis classifying groups based on reports of both the head of household and all children in the household: U.S. born, All FBC, All FBNC, and mixed status (i.e., citizenship/nativity status of the head of household and children differed). Because results did not differ for All FBNC and mixed status families, we combined them into one category, that is, FBNC, for simplicity. To account for differences in immigrant acculturation beyond citizenship, we use head of household's years in the United States (age for U.S.-born households).

Other Controls. Demographic controls include information about the household's race/ethnicity based on household head reports and divided into six mutually exclusive categories: non-Hispanic White, non-Hispanic Black, non-Hispanic Asian, non-Mexican Hispanic, Mexican, and other race. We distinguish Mexican from other Hispanics, since Mexicans are the largest and most disadvantaged immigrant group (Van Hook et al., 2013). Because of small sample sizes, we cannot further distinguish Hispanic subethnic groups or subethnic groups for other racial/ethnic groups. To control for family resource differences, we create several household indicators based on the responses of the head of household: age, age of oldest child, education level (less than a high school degree, high school degree, some college, and BA or more as the reference category), marital status (three mutually exclusive categories: ever married [but not currently], never married, and currently married as the reference category), number of members in the household, and family income. Given that immigration trends and food security factors differ between urban and rural areas, we control for whether the household lives in a metropolitan statistical area (MSA). To control for varying economic conditions, we include annual measures of the state unemployment and poverty rates.

The Great Recession. To assess the Great Recession, we create three mutually exclusive time periods: (1) prerecession (2003-2007), (2) the Great Recession (2008-2009), and (3) postrecession (2010-2013). Because the CPS-FSS food insecurity December question is annual, not monthly, and because it is retrospective over the past 12 months, we classify CPS-FSS data years based on overlap with the official dates of the Great Recession, December 2007 to

June 2009 (Kalil, 2013). We classify both the CPS-FSS 2008 data year (which covers food insecurity from December 2007 to December 2008) and 2009 data year (which covers food insecurity from December 2008 to December 2009) as the Great Recession and all data years prior to 2008 as prerecession and all data years post-2009 as postrecession. In other words, the prerecession category includes CPS data from December 2003 to December 2007, the Great recession category includes CPS data from December 2008 to December 2009, and the postrecession category includes data from December 2010 to December 2013.

Analysis

To assess how the risk of household food insecurity differs across children of U.S.-born parents, FBC parents, and FBNC parents, we evaluate proportion and mean differences in food insecurity and our control measures. We also examine food insecurity rates across race/ethnicity to assess the relative importance of minority and immigrant status. We then use probit regression to examine how differences in each of these factors as well as unobservable state differences contribute to the food insecurity gap. Our main analysis estimates the following probit model:

$$P\left(Y_{hjt} = 1 \mid X\right) = G\left(\beta_0 + X\beta\right) = G\left(\begin{array}{l} \beta_0 + \beta_1\left(I_{hjt}\right) + \beta_2\left(X_{hjt}\right) \\ + \beta_3\left(S_{jt}\right) + \beta_4\left(Y_t\right) + \beta_5\left(S_j\right) \end{array}\right)$$

$$h = 1, \ldots, N \;\left(\text{household}\right)$$
$$j = 1, \ldots, 51 \;\left(\text{states}\right)$$
$$t = 2003, \ldots, 2013 \;\left(\text{years}\right)$$

where $P(Y_{hjt} = 1 \mid X)$ indicates the probability that the household is food insecure. G is a function taking on values strictly between zero and one. β_1 represents the vector of coefficients that identify the household's nativity and citizenship status. β_2 and β_3 represent the coefficients from vectors of household and time varying state controls, respectively. β_4 represents the coefficients from year fixed effects that control for national shocks presumed to affect all observations equally (e.g., the great recession). β_5 represents the coefficients from state fixed effects that control for time invariant state characteristics (e.g., state-specific policies). All data are weighted and robust standard errors are clustered by state-year to correct for heteroskedasticity.[4]

To assess the impact of the Great Recession, we modify the above equation by including our three time period measures—prerecession (reference), Great Recession, and postrecession—in lieu of year fixed effects. We interact
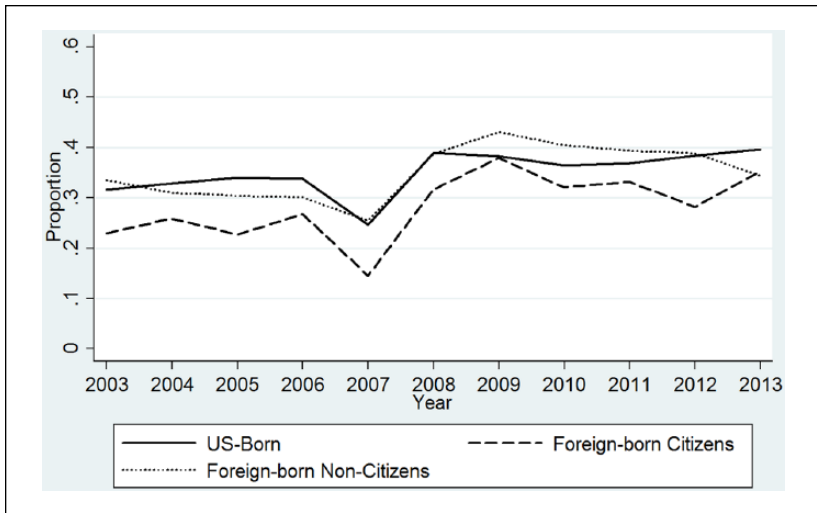
Figure 1. Trends in food insecurity rates for low-income household with children by nativity and citizenship status.

each of these time periods with the nativity and citizenship status indicators to assess whether there is heterogeneity in the association between the Great Recession and food insecurity.

Results

Food Insecurity Rates, Trends, and Predictors

We begin by examining in Figure 1 the 10-year trend in household food insecurity rates for low-income households with children by nativity and citizenship status. We find that FBC households with children consistently experience lower food insecurity rates than their FBNC and U.S.-born counterparts, except in 2009 when they experience food insecurity rates similar to that of their U.S.-born peers. Differences in the food insecurity rates between FBNC and U.S.-born households are minimal and fluctuate across time. Prior to 2007, food insecurity rates of FBNC households were generally lower than that of U.S.-born households, but the reverse is true after 2008 with FBNC households mostly experiencing higher food insecurity rates. These differences, however, are small suggesting that overall FBNC and U.S.-born low-income households with children face similar food insecurity risk.

In terms of the Great Recession, the figure provides striking, though only suggestive, evidence that the recession had a strong negative impact

on low-income family's food security, no matter their nativity or citizenship status. Between 2006 and 2007—the year leading up to the Great Recession—food insecurity rates drop for all households with children—a possible reflection of the boom before the bust. In 2008, however, food insecurity rates increase dramatically for all households with children (from 24% to 38%, which is a 58% increase)—a trend that, at least for immigrant households, continues through 2009. Postrecession recovery, however, has not been uniform across or even within groups. For instance, trends in food insecurity for FBC households, who appear to have been most affected by the recession (food insecurity rates increased 113% between 2007 and 2008), depict no clear path to recovery but instead depict erratic fluctuation. The only common trend is that no group has recovered to prerecession levels.

Next, we examine the demographic composition of each group (Table 1). Both citizen and noncitizen immigrant households with children have greater risk factors for food insecurity but also benefit from protective factors. In terms of risk, immigrant households, no matter citizenship status, are more likely to be of minority status, and FBNC households are significantly more likely to be of Mexican descent (60%) than FBC households (35%) and U.S.-born (10%) households. Both FBC and FBNC households are more likely to be headed by an individual with less than a high school degree (15% and 37%, respectively) than U.S.-born households (11%). FBC households, however, are also more likely to be headed by an individual with at least a BA degree (23%) than their U.S.-born counterparts (13%). This contrast in education levels likely reflects the duality of immigration, which brings both high- and low-skilled immigrants.

A strong protective factor that both FBC and FBNC immigrant households demonstrate is higher marital rates (70% and 69%, respectively, compared with 45% for U.S.-born households), and FBC immigrant households also demonstrate a higher average family income than U.S.-born and FBNC households. We find that the characteristics of the states where immigrant and nonimmigrant households with children live differ as well. The unemployment rates are slightly higher in states where immigrants live, while poverty rate differences are less consistent.

How Household and State Characteristics Contribute to Immigrant Food Insecurity

To understand how differences in resources and state economic conditions contribute to variation in food insecurity risk among immigrant households with children, we use multivariate regression. We report the marginal effects of the probit models that indicate the partial effect of X on the probability that Y equals 1 to simplify interpretation into percentage point changes. Unlike

Table 1. Descriptives of Low-Income Households (HHs) With Children by HH Nativity and Citizenship Status From Current Population Survey Food Security Supplement, 1997-2010.

	Head of HH, *M* (*SD*)			
	U.S. born	Fborn citizen	Fborn noncitizen	Diff[a]
Food security				
Food insecure (12 month)	0.36 (0.48)	0.30 (0.46)	0.35 (0.48)	a, c
HH characteristics				
Age of oldest child	10.00 (5.15)	11.17 (4.87)	10.19 (4.96)	a, b, c
Head of HH race/ethnicity				
Non-Hispanic White	0.57 (0.50)	0.10 (0.30)	0.06 (0.24)	a, b, c
Hispanic, non-Mexican	0.05 (0.22)	0.21 (0.41)	0.20 (0.40)	a, b, c
Mexican	0.10 (0.30)	0.35 (0.48)	0.60 (0.49)	a, b, c
Non-Hispanic Black	0.25 (0.43)	0.11 (0.31)	0.06 (0.24)	a, b, c
Non-Hispanic Asian	0.01 (0.12)	0.22 (0.42)	0.07 (0.26)	a, b, c
Other race, non-Hispanic	0.02 (0.13)	0.01 (0.07)	0.01 (0.07)	a, b, c
Head of HH age	37.39 (11.92)	42.66 (10.92)	37.46 (9.93)	a
Head of HH education				
<HS degree	0.11 (0.31)	0.15 (0.36)	0.37 (0.48)	a, b, c
HS degree	0.37 (0.48)	0.31 (0.46)	0.32 (0.46)	a, b
Some college	0.40 (0.49)	0.32 (0.46)	0.19 (0.39)	a, b, c
BA degree or more	0.13 (0.33)	0.23 (0.42)	0.12 (0.33)	a, c
Head of HH marital status				
Married	0.45 (0.50)	0.70 (0.46)	0.69 (0.46)	a, b
Ever married	0.26 (0.44)	0.19 (0.39)	0.14 (0.34)	a, b, c
Never married	0.28 (0.45)	0.11 (0.31)	0.18 (0.38)	a, b, c
Number in HH	4.03 (1.45)	4.59 (1.58)	4.59 (1.55)	a, b
Family income (in 1,000s)	24.18 (14.68)	28.83 (15.01)	23.80 (13.34)	a, b, c
Years in the United States in 10s (head of HH)	3.74 (1.19)	2.12 (1.03)	1.32 (0.91)	a, b, c
Urbanicity				
Lives in MSA	0.75 (0.43)	0.95 (0.22)	0.94 (0.24)	a, b, c
Lives in non-MSA	0.24 (0.43)	0.05 (0.22)	0.06 (0.23)	a, b
MSA not identified	0.01 (0.10)	0.00 (0.05)	0.01 (0.07)	a, b, c
State characteristics				
State unemployment rate	6.86 (2.18)	7.39 (2.43)	7.17 (2.38)	a, b, c
State poverty rate	14.05 (2.95)	14.01 (2.65)	14.25 (2.63)	b, c
N	45,672	3,989	8,848	

Note. HS = high school; Fborn = foreign born; MSA = metropolitan statistical area.
[a]Indicate statistical differences (*p* < .05) between the samples: a = U.S. born vs. Fborn citizen; b = U.S. born vs. Fborn noncitizen; c = Fborn citizen vs. Fborn noncitizen.

the coefficients in a linear regression model, coefficients in a probit model cannot be treated as partial derivatives, which are easy to interpret. For example, the coefficient, beta, on a fitted linear regression model tells us that a one unit increase in X increases Y by beta units. The marginal effects of a probit model allow for a similar interpretation; they tell us what the impact of a one-unit change in X is on the probability that Y is equal to one, or in our case, the probability that the individual is food insecure.

The baseline model in Table 2 (Model 1) provides the overall risk of food insecurity for each immigrant group after accounting for annual variations; that is, year fixed effects. Similar to the descriptive results, we find that FBC households with children have the lowest risk of food insecurity. FBC households' food insecurity risk is 7 percentage points lower than that of U.S.-born households and the result is statistically significant. In contrast, we find no significant difference in the food insecurity risk between FBNC and U.S.-born households after we adjust for annual fluctuations. The marginal effect is zero and nonsignificant.

Once we account for demographic differences (Model 2), the FBC household advantage compared with U.S.-born households remains the same—7 percentage point difference. FBNC households, however, also now have an advantage over U.S.-born households. The food insecurity risk among FBNC households is 2 percentage points lower than that of U.S.-born households and the result is statistically significant. In terms of demographic characteristics, the results indicate that minority groups, except for Asians, are more likely to experience higher rates of food insecurity. Because immigrant households are more likely to be of minority status, once we account for the negative association between minority status and food insecurity, the results suggest that FBNC immigrant households fare better than their U.S.-born household peers.

Next, we assess the influence of household characteristics (Model 3). Once we account for the higher marital rates among FBNC and FBC households and higher levels of family income among FBC households, the immigrant advantage for FBNC households is eliminated and the advantage for FBC households is reduced by half. The marginal effect for FBNC households remains the same but is no longer statistically significant. For FBC households, the marginal effect reduces from 7 percentage points to 5 percentage points—a near 40% reduction—but remains significant. As indicated by prior research, household age of oldest child, education, income, size, MSA residence, and marital status are associated with food insecurity risk. Similar to Kalil and Chen (2008), we do not find that years in the United States (a measure of acculturation/social integration) contribute to food insecurity risk. Since most immigrants must reside in the United States for at least 5 years before they can naturalize, citizenship

Table 2. Marginal Effects From Probit Models of Food Insecurity by Household (HH) Nativity and Citizenship Status for Low-Income HHs With Children, Current Population Survey, 2003-2013.

	Model 1	Model 2	Model 3	Model 4
	Baseline, ME (*SE*)	Demographics, ME (*SE*)	Household, ME (*SE*)	State, ME (*SE*)
HH nativity and citizenship status (U.S. born reference)				
Fborn citizen vs. U.S. born	−0.07 (0.01)***	−0.07 (0.01)***	−0.05 (0.02)**	−0.04 (0.02)**
Fborn noncitizen vs. U.S. born	0.00 (0.01)	−0.02 (0.01)*	−0.02 (0.01)	−0.02 (0.01)
Demographics				
Hispanic, non-Mexican vs. White		0.06 (0.01)***	0.02 (0.01)†	0.02 (0.01)*
Mexican vs. White		0.05 (0.01)***	0.01 (0.01)	0.00 (0.01)
Black vs. White		0.08 (0.01)***	0.02 (0.01)**	0.03 (0.01)***
Asian vs. White		−0.02 (0.01)	−0.01 (0.01)	−0.02 (0.01)
Other race vs. White		0.04 (0.02)†	0.00 (0.02)	0.00 (0.02)
HH characteristics				
Head of HH age (in 10s)			0.00 (0.00)	0.00 (0.00)
Age of oldest child (in 10s)			0.04 (0.01)***	0.04 (0.01)***
Head of HH education				
<HS vs. BA			0.10 (0.01)***	0.10 (0.01)***
HS vs. BA			0.07 (0.01)***	0.07 (0.01)***
Some college vs. BA			0.08 (0.01)***	0.08 (0.01)***
Head of HH marital status				
Ever married vs. married			0.08 (0.01)***	0.08 (0.01)***
Never married vs. married			0.03 (0.01)***	0.03 (0.01)***
Number in HH			0.02 (0.00)***	0.02 (0.00)***
Family income (in 1,000s)			−0.01 (0.00)***	−0.01 (0.00)***
Years in the United States in 10s (head of HH)			0.00 (0.00)	0.00 (0.00)
Lives in non-MSA vs. MSA			−0.04 (0.01)***	−0.04 (0.01)***
MSA not identified			−0.08 (0.02)***	−0.06 (0.02)**
State characteristics				
State unemployment rate				0.01 (0.00)*
State poverty rate				0.00 (0.00)†
Year FE	Yes	Yes	Yes	Yes
State FE	No	No	No	Yes

Note. N = 58,509. HS = high school; Fborn = foreign born; MSA = metropolitan statistical area; FE = fixed effect. Data are weighted and clustered by state-year.
†*p* < .10. *p* < .05. **p* < .01. ***p* < .001.

status likely captures some of this acculturation effect. Last, our results remain robust to the inclusion of state economic conditions and stagnant fixed effects (Model 4).
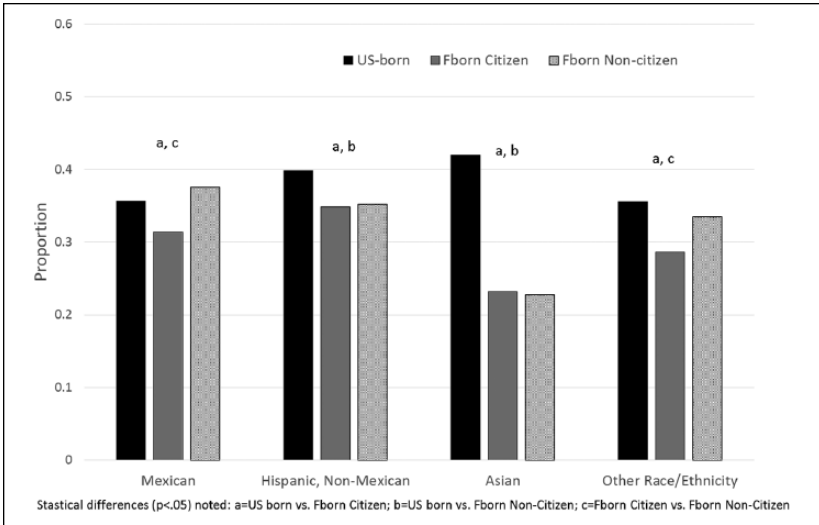
Figure 2. Racial/ethnic food insecurity rates for low-income households with children by household nativity and citizenship status (data years 2003-2013).

Racial/Ethnic Heterogeneity in Immigrant Food Insecurity

To assess whether immigrant food insecurity risk differs across racial/ethnic groups, we first examine overall unadjusted food insecurity rates in Figure 2. Because Asians and Hispanics are the two largest immigrant groups in our sample, we examine them separately and distinguish between Mexicans and Other Hispanics. We combine the remaining racial/ethnic groups (i.e., White, Black, and other race) into the Other Race/Ethnicity category since these racial/ethnic groups make up a relatively smaller share of the immigrant population.[5]

The results consistently show that low-income FBC households with children, no matter their racial/ethnic group, have lower rates of food insecurity than their counterparts in U.S.-born households. Asians have the largest food insecurity gap between FBC and U.S.-born households (0.23 vs. 0.42), while Mexicans have the smallest gap (0.31 vs. 0.36). For Hispanic, non-Mexicans the food insecurity gap between FBC and U.S.-born households is about 5 percentage points, and for the other racial/ethnic category that gap is about 7 percentage points. The results show more variation in food insecurity risk among FBNC households with children. For Mexicans and the other racial/ethnic group, food insecurity rates for FBNC households are higher than their

FBC counterparts, but no different from their U.S.-born peers. The opposite is true for Hispanic, non-Mexicans and Asians where food insecurity rates of FBNC households are lower than that of U.S.-born households, but are no different from that of FBC households.

Next, we run separate regressions for each ethnic/racial group to assess how differences in resources and state characteristics contribute to the food insecurity risk of immigrant households with children from different ethnic/racial groups (Table 3). For Asians, we find that FBC households as well as FBNC households have a lower risk of experiencing food insecurity than their U.S.-born ethnic/racial peers as seen by the negative and statistically significant marginal effects. For the other race/ethnicity category, we find that only FBC households have a lower risk of experiencing food insecurity compared with their U.S.-born ethnic/racial peers. The marginal effect for FBNC households is negative but not statistically significant at conventional levels. Among Hispanic, non-Mexican, and Mexican households, we find no difference in household food insecurity risk by nativity and citizenship status. The marginal effects for FBC and FBNC are relatively smaller and nonsignificant. Thus, household citizenship status does not appear to provide the same protective influence for Hispanic immigrants as for Asians and other ethnic/racial groups.

Overall, we find general consistency in the predictors of food insecurity across race/ethnicity with a few exceptions. In terms of consistency, we find that across all racial/ethnic groups household education, marital status, size, and income are strongly associated with food insecurity risk. One notable difference across racial/ethnic groups is that age of the oldest child is positively associated with food insecurity risk for all racial/ethnic groups, except Asians. Because Asians tend to have fewer children than other racial/ethnic groups age of oldest child may not capture the same resource constraints as for other racial/ethnic groups.

The Great Recession and Immigrant Food Insecurity

The results thus far have examined food insecurity risk adjusting for annual fluctuations to better understand overall patterns between low-income immigrants and nonimmigrant households with children. We now examine if and to what extent the Great Recession disrupts this pattern. We refocus our analysis on the full sample, that is, combine racial/ethnic groups, and add our economic recession indicators and interaction of these indicators with nativity and citizenship status to the models (Table 4).

The unadjusted (Model 1) and adjusted (Model 4) results remain relatively unchanged. Overall, results indicate that food insecurity rates have increased for all households with children in the wake of the recession but that the

Table 3. Marginal Effects From Probit Models of Food Insecurity by Household (HH) Nativity and Citizenship Status for Low-Income HHs Using Separate Regressions for Each Ethnic/Racial Group, Current Population Survey, 2003-2013.

	Mexican, ME (*SE*)	Hispanic, non-Mexican, ME (*SE*)	Asian, ME (*SE*)	Other race/ethnicity, ME (*SE*)
HH nativity and citizenship status (U.S. born reference)				
Fborn citizen vs. U.S. born	−0.03 (0.03)	−0.04 (0.03)	−0.11 (0.05)*	−0.08 (0.03)**
Fborn noncitizen vs. U.S. born	0.01 (0.02)	−0.04 (0.04)	−0.12 (0.05)*	−0.06 (0.03)†
HH characteristics				
Head of HH age (in 10s)	0.01 (0.01)	0.01 (0.01)	−0.01 (0.01)	0.01 (0.01)
Age of oldest child (in 10s)	0.02 (0.01)*	0.04 (0.02)*	0.00 (0.02)	0.06 (0.01)***
Head of HH education				
<HS vs. BA	0.06 (0.02)**	0.07 (0.03)*	0.13 (0.04)**	0.11 (0.01)***
HS vs. BA	0.04 (0.03)	0.02 (0.02)	0.04 (0.03)	0.08 (0.01)***
Some college vs. BA	0.05 (0.03)†	0.01 (0.03)	0.08 (0.02)**	0.09 (0.01)***
Head of HH marital status				
Ever married vs. married	0.05 (0.01)***	0.07 (0.02)**	0.07 (0.03)*	0.09 (0.01)***
Never married vs. married	0.03 (0.02)†	0.03 (0.02)†	−0.02 (0.03)	0.04 (0.01)***
Number in HH	0.02 (0.00)***	0.02 (0.01)**	0.03 (0.01)***	0.01 (0.00)***
Family income (in 1,000s)	−0.01 (0.00)***	−0.01 (0.00) ***	0.00 (0.00)***	−0.01 (0.00) ***
Years in the United States in 10s (head of HH)	0.00 (0.01)	0.00 (0.01)	0.02 (0.01)	−0.02 (0.01)†
Lives in non-MSA vs. MSA	−0.04 (0.02)†	−0.01 (0.04)	0.02 (0.03)	−0.05 (0.01)***
MSA not identified	−0.14 (0.06)*	−0.25 (0.13)†	−0.02 (0.20)	−0.05 (0.02)†
State characteristics				
State unemployment rate	0.01 (0.01)	0.02 (0.01)*	0.01 (0.01)	0.01 (0.00)
State poverty rate	−0.01 (0.01)	−0.01 (0.01)	0.00 (0.01)	0.01 (0.00)*
Year FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
N	10,041	4,628	2,429	41,417

Note. HS = high school; Fborn = foreign born; MSA = metropolitan statistical area; FE = fixed effect. Data are weighted and clustered by state-year.
†*p* < .10. **p* < .05. **p < .01. ***p < .001.

Table 4. Marginal Effects From Probit Models of Food Insecurity by Household (HH) Nativity and Citizenship Status and Macro-Economic Conditions for Low-Income HHs With Children, Current Population Survey, 2003-2013.

	Model 1	Model 2	Model 3	Model 4
	Baseline, ME (*SE*)	Demographic, ME (*SE*)	Household, ME (*SE*)	State, ME (*SE*)
HH immigration status (U.S. born reference)				
Fborn citizen vs. U.S. born	−0.07 (0.01)***	−0.07 (0.01)***	−0.05 (0.02)**	−0.05 (0.02)**
Fborn noncitizen vs. U.S. born	0.00 (0.01)	−0.02 (0.01)*	−0.02 (0.01)	−0.02 (0.01)†
Economic recession period (prerecession 2003-2007 reference)				
The "Great Recession" (2008-2009)	0.08 (0.01)***	0.08 (0.01)***	0.10 (0.01)***	0.09 (0.01)***
Postrecession (2010-2013)	0.07 (0.01)***	0.07 (0.01)***	0.08 (0.01)***	0.07 (0.01)***
*Immigrant * Economic recession*				
Fborn citizen * Great Recession	0.07 (0.02)**	0.07 (0.02)**	0.07 (0.02)**	0.07 (0.02)**
Fborn citizen * Postrecession	0.04 (0.02)†	0.04 (0.02)†	0.03 (0.02)	0.03 (0.02)
Fborn noncitizen * Great Recession	0.02 (0.02)	0.02 (0.02)	0.01 (0.02)	0.01 (0.02)
Fborn noncitizen * Postrecession	0.02 (0.02)	0.02 (0.02)	0.01 (0.02)	0.01 (0.02)
Demographics				
Hispanic, non-Mexican vs. White		0.06 (0.01)***	0.02 (0.01)*	0.02 (0.01)*
Mexican vs. White		0.05 (0.01)***	0.01 (0.01)	0.01 (0.01)
Black vs. White		0.08 (0.01)***	0.02 (0.01)**	0.02 (0.01)**
Asian vs. White		−0.02 (0.01)	−0.01 (0.01)	−0.01 (0.01)
Other race vs. White		0.04 (0.02)†	0.00 (0.02)	0.01 (0.02)
Head of HH age (in 10s)		0.00 (0.00)***	0.00 (0.00)	0.00 (0.00)
Age of oldest child (in 10s)		0.00 (0.00)***	0.04 (0.01)***	0.04 (0.01)***
Head of HH education				
<HS vs. BA			0.10 (0.01)***	0.10 (0.01)***
HS vs. BA			0.07 (0.01)***	0.07 (0.01)***
Some college vs. BA			0.08 (0.01)***	0.08 (0.01)***
Head of HH marital status				
Ever married vs. married			0.08 (0.01)***	0.08 (0.01)***
Never married vs. married			0.03 (0.01)***	0.03 (0.01)***
Number in HH			0.02 (0.00)***	0.02 (0.00)***
Family income (in 1,000s)			−0.01 (0.00)***	−0.01 (0.00)***
Years in the United States in 10s (head of HH)			0.00 (0.00)	0.00 (0.00)
Lives in non-MSA vs. MSA			−0.04 (0.01)***	−0.04 (0.01)***
MSA not identified			−0.08 (0.02)***	−0.08 (0.02)***
State characteristics				
State unemployment rate			0.00 (0.00)***	0.00 (0.00)†
State poverty rate				0.00 (0.00)
State FE	No	No	No	Yes

Note. N = 58,509. HS=high school; Fborn = foreign born; MSA=metropolitan statistical area; FE = fixed effect. Data are weighted and clustered by state-year.
†*p* < .10. **p* < .05. ***p* < .01. ****p* < .001.

increase has been most notable for FBC households. The main effects indicate that compared with the prerecession time period, food insecurity rates are 8 percentage points higher during the Great Recession and 5 percentage points higher during the postrecession period for all households (Model 4). However, the interaction terms for FBC households indicate an even stronger negative association of the recession on food insecurity. For FBC households, food security rates are an additional 7 percentage points higher during the Great Recession. The interaction term for the postrecession period is positive (suggesting an additional 3 percentage point difference) but not statistically significant. In contrast, the interaction terms for FBNC households are near zero and nonsignificant, meaning that the recession did not differentially affect them compared with their U.S.-born peers.

We also ran the recession models for each ethnic/racial group separately to assess potential ethnic/racial variation in the influence of the Great Recession (results not shown). The smaller sample sizes limits the interpretability of these result. Overall, however, the results were generally consistent across racial/ethnic groups and aligned with results in Table 4, that is, an overall negative association of the recession but greater for children in FBC households.

Finally, we ran several robustness checks (available on request). First, our results were robust to the use of the 30-day food insecurity measure, which focuses on more severe ranges of food insecurity (Coleman-Jensen et al., 2014). Second, because the risk and consequences of food insecurity differ for households with younger and older age children, we ran the results separately for different age groups based on age of the oldest child. We found that the results were most pronounced for households where the oldest child was 6 years or older. Third, using interaction models, we did not find evidence that food insecurity risk of immigrant households differed by whether they lived in a traditional (New York, New Jersey, Florida, California, Texas, or Illinois) or new destination state (all else), or in a state that provided immigrant-specific food stamp benefits (California, Connecticut, Maine, Minnesota, Nebraska, New York, Washington, and Wisconsin). Last, because the recession affected different states at different times, we ran an analysis interacting state unemployment rates and household nativity and citizenship status; results were consistent with the recession models.

Discussion

In this article, we explore how demographic, household, and state characteristics contribute to the food insecurity risk of low-income immigrant, both citizen and noncitizen, households with children. Advancing prior research, we are the first to examine the food insecurity risk of immigrant households

with children of all ages over a long time span (2003-2013), across racial/ethnic groups, and during the Great Economic Recession. In an era of changing immigration, economic and political contexts, this study provides essential information for policy makers as they continue to debate immigration and welfare reforms—both of which could have strong implications for the food security of immigrant households with children and subsequent incorporation of future immigrant generations.

Overall, we found that the food insecurity risk of low-income immigrant households with children differed by household citizenship status—a result that aligns with prior research (Kalil & Chen, 2008). During the decade of analysis (2003-2013), FBC households on average experienced significantly lower food insecurity rates than both U.S.-born and FBNC households (6 and 5 percentage point difference, respectively). The result was robust to annual fluctuations, which suggests that the FBC households' food security advantage is a consistent pattern and not a reflection of idiosyncratic year differences. In contrast, FBNC and U.S.-born households on average experienced similar food insecurity rates over the 10-year period, but there was evidence of small annual fluctuations. Because FBNC households tend to be more recent arrivals, part of the annual fluctuations of FBNC household food insecurity may reflect changes in migrant flows in addition to broader economic and political factors. This annual variation highlights the need to examine the dynamic processes of food insecurity and immigration patterns in order to better identify support systems that meet at the nexus of these processes.

Similar to previous research (Kalil & Chen, 2008; Kaushal et al., 2013), we found that differences in demographic and household characteristics/resources contributed to FBNC households' food insecurity risk and the observed FBC household food security advantage. Once we adjusted for the fact that immigrant households were more likely to be of minority status, FBNC households actually demonstrated a food security advantage over U.S.-born households. This result suggests that minority status in addition to immigrant status serves as a strong predictor of food insecurity. FBNC households, however, also benefited from protective factors. Both FBNC and FBC households benefited from strong family support (evidenced by higher marital rates) and FBC households also benefited from higher average incomes. These protective factors explained all of the FBNC household advantage and about half of the FBC household food security advantage. Additionally, in robustness checks, we found that this FBC household food security advantage was most pronounced for households with older children.

Not all FBC households, however, demonstrated a food security advantage over their U.S.-born peers. When we examined variation across racial/ethnic groups, we found that the food insecurity risk of Mexican and other Hispanic

FBC households did not differ from their U.S.-born peers. These results reaffirm the cause for concern for Mexican and other Hispanic immigrants, which are the largest and most disadvantaged immigrant racial/ethnic groups (Van Hook et al., 2013). The bifurcation of education levels observed among FBC households who demonstrated both high (bachelor's degree or more) and low (less than a high school degree) levels of education suggests differing selection processes into citizenship. Differing selection processes may explain why citizenship for Hispanics, who tend to be lower skilled, do not demonstrate the same advantages as for other higher skilled ethnic/racial groups.

For other ethnic/racial groups, that is Asians, and the other race/ethnicity category, we were never able to fully explain the FBC household food security advantage. Obviously, immigrants who are able to naturalize are advantaged in many observed (e.g., education) and unobserved ways (e.g., networks) than their FBNC counterparts (Sumption & Flamm, 2012), but it is less clear why they would be more advantaged than their U.S.-born low-income counterparts. It may be that once immigrants are able to obtain the same legal status as their U.S.-born counterparts (meaning they have unequivocal equal access to the same resources), which they are able to fully benefit from their optimistic attitudes. FBC households with children may be at lower risk of food insecurity because the parents in these households are optimistic/resilient but also know how to navigate formal (public assistance) and informal (social networks) resources that ameliorate food insecurity risk (Kao & Tienda, 1995; Yu et al., 2005).

The influence of the Great Economic Recession on food insecurity patterns among immigrants is the most striking result. Food insecurity rates for all households with children increased significantly during the recession and as of 2013 had yet to recover to prerecession levels. Moreover, the recession appears to have been the most detrimental for the most advantaged group of households with children—FBC immigrant families. These results align with broader research on the recession, which indicates that groups that were historically less vulnerable to food insecurity experienced the greatest increases in food insecurity (Andrews & Nord, 2009)—possibly because they were less connected to support systems prerecession. Our research adds to this evidence by demonstrating that FBC immigrant families are one of those typically advantaged groups to be most affected by the recession. The comparatively smaller effect on FBNC families does not necessarily mean that this group was less vulnerable to the recession, but instead may reflect the slowed growth of new arrivals that occurred during the recession. Overall, however, FBNC immigrant families struggled the most with food insecurity meaning that in recessionary and nonrecessionary times, supports are needed for this group.

As with all studies, ours has several limitations. Though we examine a larger sample of immigrant households over a longer period of time than any previous study, our analysis is cross-sectional and thus noncausal. Additionally, sample size challenges remain an issue when trying to examine subethnic groups; thus, we were not able to examine the diversity of experiences likely to exist among Asians, White, and Black immigrant groups. Last, some of the differences between immigrant and nonimmigrant households with children may reflect differences in how the populations respond to survey questions. Research has yet to examine whether food insecurity has the same meaning for immigrant and nonimmigrant populations. Given their optimism and relative deprivation perspective, immigrants may underestimate food concerns. We have no reason to believe, however, that this measurement error should systematically differ between citizen and noncitizens. Nonetheless, future research should examine the validity of food insecurity measures among immigrant populations.

Despite these limitations, our study advances prior research on food insecurity among immigrant children in low-income households—a research area that has largely been neglected. Our results demonstrate that policy efforts to end childhood hunger in the United States must take into account the nation's rapidly growing and diverse immigrant population as well as the changing economic landscape. Our results confirm earlier findings on the importance of citizenship status among immigrant households but also finds evidence that racial/ethnic background strongly shapes immigrant households' food insecurity risk as well. Additionally, our results indicate that in the wake of the Great Recession, low-income families with children, no matter their nativity and citizenship status, are struggling even more than prior years to meet basic food needs.

Policy efforts, including those already underway, are needed to address the ongoing economic and food hardships of low-income families with children. Expansions of food assistance programs are likely to benefit some low-income households but may miss many immigrant households, which are often ineligible for these programs or disconnected from them. To be effective, these policies and programs must be inclusive of immigrant households but should also build on the strengths of these households. In particular, future research should examine why low-income citizen immigrant households have a lower risk of food insecurity than their U.S.-born and FBNC counterparts. The coping mechanisms and resilience of citizen immigrant families may provide useful insight for policy makers as they design programs and policies to ameliorate the risk of food insecurity among all populations.

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Declaration of Conflicting Interests

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Notes

1. The authors examine seven different categories based on the parents and child's nativity and citizenship status. Though there is some variation across the categories, overall children in immigrant citizen households have lower food insecurity risk than their peers in U.S.-born households.
2. We start our analysis in 2003 because federal food stamp eligibility requirements for immigrants have remained consistent since this time.
3. To check for sample bias due to missing data, we used t tests to assess whether the means on the independent variables included in our analysis differed between our final sample and the sample excluded due to missing data on the dependent variable. The samples were similar on all independent variables with a few exceptions. In the excluded sample, the household head was on average older (by 1.5 years) and the household was more likely to reside in an MSA (86% vs. 80%).
4. Because individuals can appear in CPS twice, we also dropped duplicate observations and found similar results.
5. We ran all of our analysis separately for Whites and Blacks and found similar within racial/ethnic groups differences in terms of the influence of citizenship and nativity status but results were often nonsignificant—a likely reflection of sample size challenges.

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