

CONTEXTUAL INFLUENCES ON HOUSEHOLD
AND CHILD FOOD SECURITY AMONG
MEXICAN-ORIGIN MOTHERS OF YOUNG
CHILDREN

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CONTEXTUAL INFLUENCES ON HOUSEHOLD AND CHILD FOOD
SECURITY AMONG MEXICAN-ORIGIN MOTHERS OF YOUNG CHILDREN

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Food insecurity is related to numerous poor health and development outcomes, particularly in children. A greater proportion of Hispanic households in the U.S. experience food insecurity compared to non-Hispanic white households, but there is little evidence about distinctions between Hispanic ethnic subgroups in regards to food insecurity prevalence and coping strategies. Considering that Mexican-origin and Mexican American Hispanics are the largest Hispanic subgroup in the U.S. and that the majority of children living in poverty are Hispanic with at least one Mexican-origin parent, more research is needed to understand their distinct risk factors, as well as their immigrant experience and coping strategies, and how these relate to food security status. To date, there are no published data on food provisioning related to food security among Mexican-origin households in the northeast U.S. nor are there data that account for both the immigrant's life course and current ecological system in the U.S. The purpose of this research was to capture multiple levels of influence on household and child food security status and related coping strategies among Mexican-origin households with children, using a mixed-methods approach guided by two theoretical constructs: life course perspective and ecological systems theory. Analyses of national survey data revealed that among all Hispanic households in the U.S., Mexican- and Salvadoran-origin

households are most at risk and Cuban-origin are least at risk, compared to U.S.-origin Hispanic households. In addition, among U.S.-origin Hispanic households, those with Mexican and Puerto Rican nativity (maternal origin) are most at risk and those with Cuban nativity are least at risk, compared to Hispanics with U.S.-origin maternal nativity. In addition, our qualitative findings suggest that recent, low-income Mexican-origin mothers rely on culture and life course experiences, particularly those in Mexico, to shape how they feed their families and children in the U.S. These food-provisioning strategies exhibit important attributes of mothers towards maintaining a food secure household, particularly behaviors related to food resource management and planning. Understanding these multi-level contextual influences on Mexican-origin households provides valuable insight into ways to facilitate protective coping strategies through culturally-tailored programming at both federal and local levels.

BIOGRAPHICAL SKETCH

Amanda Christine McClain was born on 17 March 1980 in Memphis, Tennessee. She completed primary and secondary school in Memphis, receiving her high school diploma in 1998. Amanda's lower middle-class upbringing and witness to African American poverty and discrimination in the South, juxtaposed to the White wealthy class, proved to be formative to her views on equality and social justice. Simultaneously, Southern culture, particularly the cuisine and the historical and social ties to food, shaped her interest in nutrition and eating.

Amanda received a biology scholarship to attend the University of Evansville in Evansville, Indiana, graduating *cum laude* with a Bachelor of Science in Sports Medicine (minor in Biology) in 2002. Amanda then went on to pursue a Master of Science degree in Human Movement Science (Concentration in Health Promotion) at The University of Memphis. She completed her thesis, *A Descriptive Analysis of Physical Fitness and Activity Levels of Urban, African-American Middle School Students Enrolled in a Charter-like School*, and graduated with honors in 2005. Immediately following completion of her thesis, Amanda accepted a research associate position working on a National Institutes of Health (NIH)-funded project at the University of South Carolina, Arnold School of Public Health (ASPH). She remained at ASPH for five years, working as a research associate on several randomized-controlled trials testing interventions to facilitate nutrition and physical activity behavior change, particularly among low-income African American women.

Prior to starting her PhD training, Amanda dedicated several months to Spanish language immersion in Nicaragua. She traveled the country of lakes and volcanoes solo, while practicing Spanish and learning more about Nicaraguan history and culture, an experience that confirmed her interest in Latin American culture, history, and migration to the U.S. Amanda began her Community Nutrition PhD training at Cornell University in the Division of Nutritional Sciences in August 2010. During those years, she served as a teaching assistant for a variety of undergraduate nutrition courses, with extensive experience in the course Social Science Perspectives on Food and Nutrition. During academic year 2013-2014, Amanda received a United States Department of Agriculture-funded doctoral dissertation fellowship through the Research Innovation and Development Grants in Economics Center for Targeted Studies. Following completion of her PhD, Amanda will begin a NIH postdoctoral fellow position under the supervision of Dr. Josiemer Mattei in the Department of Nutrition at Harvard Chan School of Public Health in Boston, Massachusetts.

Dedicated to the Mexican-origin women who generously and graciously
volunteered their time and life stories

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CHAPTER 1

INTRODUCTION

Food and nutrition insecurity refers to a lack of consistent access to sufficient, nutritious, safe, and culturally-appropriate food for an active, healthy lifestyle.¹ In the U.S., Hispanic households have a higher prevalence (22.4%) of food insecurity compared to non-Hispanic white households (10.5%).² However, Hispanics of Mexican origin or Mexican descent make up the largest proportion of Hispanics,³ and the most rapid growth from recent immigrant populations over the last 10 years in the U.S. comes from births to Mexican-origin Hispanics.⁴ Likewise, the largest proportion of children living in poverty in the U.S. is Hispanic with at least one immigrant parent from Mexico,⁵ suggesting this Hispanic subpopulation may be more at risk of experiencing food insecurity and its related poor health and development consequences.^{6,7} Coping strategies for food insecurity among Mexican-origin households appear to differ depending on geographical location, situation, and life experience,^{8,9,10} and no published evidence currently exists on coping strategies for Mexican-origin families in the northeast U.S. Thus, more evidence is needed to not only characterize food insecurity by Hispanic ethnic subgroup, but to determine important risk and protective factors associated with food insecurity among Mexican-origin households in the northeast U.S. Such data will contribute to culturally-tailored approaches to reducing food insecurity.

The overarching goal of this research was to capture multiple levels of influ-

ence on household and child food security status and related coping strategies among Mexican-origin households with children, using a mixed-methods approach guided by two theoretical constructs: life course perspective^{11,12} and ecological systems theory.¹³ The following aims guided the research:

Aim 1: To identify and describe the perceived and experienced influences on child and household food security among low-income, immigrant, Mexican-origin mothers.

Aim 2: To elucidate the relationship of culture and life course with a Mexican-origin mothers ecological system in the U.S.

Aim 3: To characterize the severity and correlates of U.S. Hispanic household and child food insecurity, with emphasis on Mexican-origin.

Each of the following chapters addresses these research aims. Chapter 1 addresses aim 3 by characterizing household, adult, and food security by Hispanic ethnic subgroup using a nationally-representative survey dataset. Chapter 2 applies to both aims 1 and 2, capturing life course and cultural influences on food security from the perspective of low-income Mexican-origin mothers of young children, using qualitative interviews. Chapter 3 addresses, to some extent, all three aims by combining the survey data with the qualitative interviews in order to portray both existing food insecurity risk and protective factors among Mexican-origin households. Appendix A includes additional tables pertaining to

Chapter 2, including logistic regression outcomes for association between socio-demographics and country/region of origin and food assistance program participation and country/region of origin. Appendix B is for Chapter 3; it includes additional quotations from participants related to the emergent themes, a working conceptual framework, and photographs taken by participants. Appendix C includes qualitative interview guides and more complete participant characteristics than provided in Chapters 2 and 4.

Results from this work highlight influential individual, social, cultural, and life course influences to Mexican-origin households attempting to provide a food secure household for their children. As a consequence, study results provide culturally-appropriate strategies for developing culturally-tailored programming and policy approaches for at-risk Mexican-origin households in the U.S., particularly in the northeast.

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CHAPTER 2

ASSOCIATION OF HISPANIC COUNTRY OF ORIGIN AND ETHNIC SUBGROUP WITH FOOD INSECURITY RISK AMONG HISPANICS IN U.S.

2.1 Introduction

Food and nutrition insecurity refers to a lack of consistent access to adequate, nutritive, safe, and culturally-appropriate food for an active, healthy lifestyle.¹ Households near or below the Federal Poverty Line (FPL), households with children headed by a single parent, households with Black and Hispanic members,² and households with children of immigrant mothers³ are at a higher risk of food insecurity. In 2014, 22.4% of Hispanic households were food insecure, compared to 10.5% of non-Hispanic white households.²

This disparity has numerous individual, household, and population-based implications. Food insecurity is related to poor mental and physical health and poor dietary intake in adults^{4,5,6,7,8} and children.^{7,8,9,10,11,12,13,14} Likewise, food insecurity is associated with poor academic performance,^{15,16} and psychosocial developmental challenges in low-income children.^{11,15,16} Considering the majority of children living in poverty in the U.S. are Hispanic,¹⁷ these poor outcomes demonstrate the importance of targeting food insecurity among children of Hispanics since the health status of these children could compromise the child's development and educa-

tional achievement, and the future national health care system and U.S. workforce capacity.³ Furthermore, the large proportion of poor Hispanic children with immigrant parents further compromises household food security since immigrant-headed households often have poor English language proficiency,^{18,19,20} potentially limiting access to health and nutrition resources, and unpredictable jobs with irregular hours,^{4,21} low pay, and seasonal variation.⁴

However, food security prevalence may not apply to all Hispanics equally. Most statistics lump all Hispanics together, disregarding country of origin, a potential indicator of culture, socio-demographic characteristics of an immigrant's country of origin (sending country), reasons for immigrating to the U.S. Sending countries vary greatly in economics, social services, politics, norms, values, and relationships with the U.S.²² Furthermore, 35% of Hispanics in the U.S. are foreign-born,²³ supporting the case for some differentiation in how we assess health and nutrition disparities among Hispanics in the U.S. Several studies show that among households with children, those with foreign-origin mothers/caregivers versus U.S.-origin mothers/caregivers are at a significantly higher risk of food insecurity.^{3,24} Only two studies have assessed the association of specific Hispanic subgroup ethnicity and food security status,^{25,26} and the breadth of Hispanic ethnic origins studied was not inclusive of all possible countries of origin represented in the U.S., limiting our understanding of the potential role of Hispanic ethnic subgroup or country of origin on food security status. Since this is a large gap in the food security literature, identifying these differences may be influential in creating more

culturally-tailored approaches to prevent and reduce food insecurity among Hispanics.

The purpose of this study was to characterize household, adult, and child food security status by 1) Hispanic country/region of origin among all Hispanics in the U.S.; and 2) by Hispanic subgroup ethnicity for U.S.-origin Hispanics, using maternal country/region of origin as a marker for subgroup ethnicity. In addition, we aimed to elucidate some differences in food security risk by Hispanic country/region of origin and Hispanic ethnic subgroup using socio-demographic characteristics.

2.2 Methods

2.2.1 Data set

These analyses used data from the December 2013 Current Population Survey (CPS), a probability selected sample of approximately 60,000 U.S. households administered monthly by the U.S. Census Bureau. The household reference person, referred to as the householder, is the primary person (or one of the persons) owning or renting the housing unit, > 15 years old, and eligible to work. The December supplement includes assessment of household, adult, and child food security and are the data used to assess and report annual U.S. food security prevalence.

All data were exported in STATA 13.1 (StataCorp, College Station, TX, USA). The Cornell University Institutional Review Board approved this study.

2.2.2 Variables of interest

For these analyses, the dependent variables were household, adult, and child food security status in the last 12 months, measured by the 18-item United States Department of Agriculture (USDA) Core Food Security Module²⁷ and available in both English and Spanish.²⁸ Household food security status denotes the food security status of all members of the household (adult and child), a combination of the food security status of all adults in the household (10 questions) and the food security status of all children in the household (8 questions). A final score of the full module classifies a household as having high food security, marginal food security, low food security, or very low food security. Final scores for the adult portion and child portion of the module, separately, classify adults in the household as having high food security, marginal food security, low food security, or very low food security and children as having high/moderate food security, low food security, or very low food security.²⁷

Householders countries/regions of origin, as well as their maternal countries/regions of origin for U.S.-origin Hispanics, were the primary independent variables of interest. The following Latin American countries were included: Mex-

ico, El Salvador, Guatemala, Honduras, Cuba, Dominican Republic, Puerto Rico, and Colombia. Due to small sample sizes, the following countries were combined into one category, Other Central America: Belize, Costa Rica, Nicaragua, and Panama. Similarly, Argentina, Bolivia, Brazil, Chile, Ecuador, Guyana, Paraguay, Peru, Uruguay, and Venezuela were combined into one category, Other South America.

Based on other published studies on food security in Hispanic groups^{18,19,29} and on available variables, the following independent categorical predictors were tested for possible relationships with food security status: household income, household poverty level (above/below 130% FPL; above/below 185% FPL; above/below 200% FPL), age, household size, presence of children in household (< 18 years old & ≤ 5 years old), education of householder, marital status of householder, U.S. region, metropolitan/non-metropolitan residence, Spanish-only spoken, < 10 years in the U.S., and participation in two federal nutrition programs, the Supplemental Nutrition Assistance Program (SNAP) and the Supplemental Nutrition Program for Women, Infants, and Children (WIC).

2.2.3 Statistical analyses

We added the provided CPS household and replication weights to the dataset³⁰ and used the STATA survey command (svy) for these analyses to account for the non-random nature of this survey³¹. In addition, because the analyses were with a subset of the population sampled, we used the STATA subpopulation command (subpop) for all regression models. These commands account for the weights, survey design, and subpopulation analyses when calculating point estimates and variances.

We ran two separate subpopulation analyses: 1) all Hispanics and 2) U.S.-origin Hispanics. Because of the nature of the survey design, corrected χ^2 statistics were unavailable, so multinomial logistic regression was used to determine statistical associations between country/region of origin, socio-demographic correlates, and food security status. In addition, because of the limited number of observations, we added Honduras to the Other Central America group and Colombia to the Other South America group for the U.S.-origin Hispanic subpopulation analyses only. We first conducted multinomial logistic regression analyses among our total Hispanic subpopulation to identify significant associations between food insecurity risk and socio-demographics. Second, we used multinomial logistic regression analyses, for each of our subpopulations, to determine associations between socio-demographic correlates and country/region of origin. Based on these results, we built multinomial logistic regression models to characterize food secu-

rity risk. Results for the multinomial logistic regressions are presented as relative risk ratios (RRR) and confidence intervals (CI), with significance level set at $P < 0.5$.

2.3 Results

2.3.1 Sample characteristics

For all Hispanic households, at least half of households with householders originating from Mexico, Guatemala, Honduras, Dominican Republic, and Puerto Rico were below 130% FPL (Tables 2.1). Compared to U.S.-origin Hispanics, a larger proportion of householders originating from Latin America were over 18 years old, married, and had their own children <18 years old present in the household (Table 2.2-2.3). Householders originating from Mexico, El Salvador, Guatemala, Honduras, Dominican Republic, and Puerto Rico were less educated, compared to U.S.-origin (Table 2.2). Half of Guatemalan householders reported speaking only Spanish in the home, whereas less than 10% of householders from the U.S., Puerto Rico, Colombia, and Other Central America reported speaking only Spanish (Table 2.3).

Table 2.1: **Proportions (%) below Federal Poverty Line (FPL) by Country/Region of Origin among Hispanics in U.S. (n=14,333-18,535)**

Country/Region of origin	Below 130% FPL	Below 185% FPL	Below 200% FPL
U.S.	45.6	49.7	60.5
Mexico	52.9	55.6	71.2
El Salvador	45.6	48.2	61.7
Guatemala	52.7	45.4	59.9
Honduras	53.8	51.4	69.0
Cuba	39.8	46.8	52.7
Dominican Republic	52.5	43.6	61.5
Puerto Rico	50.8	45.1	58.1
Colombia	36.6	39.6	47.7
Central America	23.7	28.3	35.2
South America	24.5	30.0	38.5

Table 2.2: **Proportions (%) for Householder Characteristics by Country/Region of Origin among Hispanics in U.S. (n=13,301-18,535)**

Country /Region of Origin	Less than HS Diploma /GED	<18 years old	Unemployed	Married	<10 years in U.S
U.S.	15.2	49.6	6.0	32.5	-
Mexico	55.8	6.1	5.4	59.1	19.1
El Salvador	43.2	4.9	4.1	54.7	23.2
Guatemala	57.3	5.1	5.9	42.0	45.3
Honduras	56.2	6.4	10.2	47.2	46.1
Cuba	18.6	6.3	4.6	53.4	35.1
Dominican Republic	30.5	7.1	10.0	43.8	32.6
Puerto Rico	22.0	13.9	7.8	37.0	31.0
Colombia	15.3	7.8	7.3	53.6	29.0
Central America	10.2	4.5	1.4	55.2	20.2
South America	12.4	6.9	5.4	53.9	22.8

Table 2.3: Proportions (%) for Household Characteristics by Country/Region of Origin among Hispanics in U.S. (n=18,535)

Country/Region of Origin /Region of Origin	Presence of own children <18 years old	Presence of own children ≤5 years old	Speak only Spanish in home	Household size >4 persons
U.S.	15.8	8.3	8.0	38.6
Mexico	46.9	22.9	28.9	42.2
El Salvador	45.0	21.9	22.5	35.9
Guatemala	31.4	17.7	49.9	40.2
Honduras	40.12	20.5	27.8	23.0
Cuba	23.2	6.5	25.0	18.3
Dominican Republic	34.0	13.4	21.9	17.2
Puerto Rico	22.9	9.7	9.5	14.4
Colombia	42.4	14.3	8.1	10.3
Central America	41.9	13.7	6.8	20.8
South America	34.1	14.7	11.7	18.1

For U.S.-origin Hispanic households, over half of householders with Mexican, Salvadoran, and Guatemalan ethnicity (maternal origin) were poor (Tables 2.4). Householders with Cuban ethnicity had the least proportion in poverty. The proportion of householders with less than a high school education and unemployed was similar across ethnic subgroups, with the exception of Salvadoran, Central American, and South American ethnicity for employment status (Table 2.5). Householders with Mexican, Salvadoran, Guatemalan, Dominican, Central American, and South American ethnicity were younger and not married, whereas Cuban and Puerto Rican ethnicity householders were older and married. A higher proportion of Puerto Rican ethnic householders had children ages <18 or ≤5 present in the household, compared to other ethnic subgroups (Table 2.6). A greater proportion of Mexican, Salvadoran, Guatemalan, and Central American ethnic households were larger. Compared to households with U.S.-origin parents, householders with foreign-origin ethnicity had a larger proportion speaking only Spanish in the home, with the exception of Cuba and Puerto Rico.

Table 2.4: Proportions (%) Below Federal Poverty Line (FPL) by Country/Region of Origin among U.S-Origin Hispanics (n=11,241)

Country/Region of Origin	Below 130% FPL	Below 185% FPL	Below 200% FPL
U.S.	41.9	45.7	55.1
Mexico	55.5	60.8	75
El Salvador	58.6	62.9	74
Guatemala	56.1	51.3	64.9
Cuba	25.9	32.9	37.6
Dominican Republic	46.1	51.4	57.8
Puerto Rico	47.6	43.3	54.4
Central America	35.6	43.8	59.4
South America	31.6	28.9	41

Table 2.5: Proportions (%) for Householder Characteristics by Country/Region of Origin among U.S-Origin Hispanics (n=6,391-11,241)

Country /Region of Origin	Less than HS Diploma /GED	<18 years old	Unemployed	Married
U.S.	14.9	45.5	5.6	36.3
Mexico	16.5	57.0	6.9	31.0
El Salvador	13.7	64.6	2.8	21.9
Guatemala	13.4	62.2	7.6	17.4
Cuba	14.2	31.9	4.0	40.0
Dominican Republic	15.1	56.7	9.3	16.4
Puerto Rico	17.8	30.6	9.4	36.4
Central America	14.1	64.0	3.3	15.4
South America	9.5	63.3	2.1	27.5

Table 2.6: Proportions (%) for Household Characteristics by Country/Region of Origin among U.S-Origin Hispanics (n=11,225-11,241)

Country /Region of Origin	Presence of own children <18 years old	Presence of own children \leq 5 years old	Speak only Spanish in home	Household size >4 persons
U.S.	16.8	8.3	1.3	35.0
Mexico	13.6	8.3	20.0	50.1
El Salvador	11.1	6.7	19.5	47.6
Guatemala	12.2	3.6	31.6	45.3
Cuba	21.7	10.0	5.1	22.4
Dominican Republic	12.7	4.6	8.8	23.1
Puerto Rico	26.4	15.0	1.7	20.9
Central America	7.6	4.6	23.7	47.6
South America	15.2	9.0	7.5	22.1

2.3.2 Predictors of food insecurity risk

In the first multinomial logistic regression analyses, several socio-demographic factors were independently associated with food security status at the household, adult, and child level (Tables 2.7-2.9, respectively). Poverty level, SNAP participation, and WIC participation were independently associated with a significantly increased risk of any food insecurity at the household, adult, and child levels, except for very low food security among children. A high school degree/GED equivalent was associated with a significantly lower risk of any food insecurity at all three levels, while speaking only Spanish in the home and unemployment were independently associated with a significantly increased risk of any food insecurity at all three levels. Ages ≥ 18 years old were associated with significantly less risk of marginal, low, and very low food security at the household and adult level, but only ages 18 to 64 were associated with significantly lower risk of low child food security. Households with > 4 persons were significantly associated with increased risk of marginal and low food security at the household and adult level, as well as low food security at the child level. Having one or more Hispanic-origin parents was associated with significantly higher risk of marginal or low food security at the household and adult level and very low food security at the child level. Presence of householder's children <18 years or ≤ 5 years was associated with significantly greater odds of marginal and low household food security and marginal adult food security. However, presence of children <18 years was associated with significantly lower odds of low child food security, and presence of

children ≤ 5 years was associated with significantly lower odds of very low child food security. Last, a householder being married was associated with decreased risk of low food security at the household level and very low food security at the household and adult level.

Table 2.7: **Socioedemographic Factors Associated with Household Food Security Status Among Hispanics in U.S. (n=7,111-18,447)**

Predictor Variable <i>(Reference category)</i>	Marginal RRR (CI)	Low RRR (CI)	Very Low RRR (CI)
Income (Above)			
<i>Below 130% FPL</i>	3.24* (2.56-4.08)	4.38* (3.60-5.33)	6.12* (4.30-8.71)
<i>Below 185% FPL</i>	4.45* (3.48-5.69)	4.35* (3.54-5.35)	4.46* (3.29-6.04)
<i>Below 200% FPL</i>	3.82* (3.01-4.84)	4.62* (3.73-5.73)	4.28* (2.94-6.24)
Householder education (No)			
<i>HS diploma/GED</i>	0.64* (0.56-0.73)	0.69* (0.60-0.79)	0.61* (0.50-0.73)
Householder employed (Yes)			

Table 2.7 – continued from previous page – Household Food Security

Predictor Variable <i>(Reference category)</i>	Marginal RRR (CI)	Low RRR (CI)	Very Low RRR (CI)
<i>No</i>	2.20* (1.72-2.81)	2.75* (2.15-3.51)	3.87* (2.76-5.43)
<i>Not in labor market</i>	1.26* (1.11-1.42)	1.41* (1.23-1.61)	1.61* (1.34-1.94)
Female householder <i>(Male)</i>			
<i>Yes</i>	1.01 (0.91, 1.11)	1.10* (1.01, 1.21)	0.97 (0.84, 1.12)
Householder age <i>(<18)</i>			
<i>18-64 years old</i>	0.73* (0.65-0.81)	0.64* (0.58-0.71)	0.78* (0.66-0.92)
<i>≥ 65 years old</i>	0.64* (0.48-0.85)	0.45* (0.34-0.60)	0.65* (0.44-0.97)
Foreign Hispanic-origin parents <i>(No)</i>			
<i>Hispanic-origin mother and/or father</i>	1.51* (1.26-1.80)	1.35* (1.13-1.61)	1.12 (1.13-1.61)
U.S. Region <i>(North)</i>			
<i>Midwest</i>	0.81 (0.52-1.25)	0.75 (0.50-1.11)	0.61 (0.31-1.21)

Table 2.7 – continued from previous page – Household Food Security

Predictor Variable (Reference category)	Marginal RRR (CI)	Low RRR (CI)	Very Low RRR (CI)
<i>South</i>	0.86 (0.64-1.23)	0.82 (0.60-1.12)	0.81 (0.50-.31)
<i>West</i>	0.85 (0.62-1.16)	0.84 (0.64-1.10)	0.65 (0.39-1.07)
Residence (Metro area)			
<i>Non-metro area</i>	1.24 (0.87-1.77)	1.25 (0.88-1.78)	1.27 (0.70-2.33)
Householder marital status (Not married)			
<i>Married</i>	1.00 (0.86-1.15)	0.88* (0.85-0.90)	0.77* (0.64-0.93)
Household size (≤ 4)			
<i>> 4 persons</i>	1.42* (1.14-1.76)	1.57* (1.29-1.91)	1.32 (0.95-1.85)
Own children < 18 years (No)			
<i>Yes</i>	1.18* (1.08-1.29)	1.16* (1.07-1.28)	0.87 (0.74-1.03)
Own children ≤ 5 years old (No)			
<i>Yes</i>	1.38* (1.19-1.61)	1.30* (1.10-1.53)	0.98 (0.76-1.27)

Table 2.7 – continued from previous page – Household Food Security

Predictor Variable <i>(Reference category)</i>	Marginal RRR (CI)	Low RRR (CI)	Very Low RRR (CI)
Speak only Spanish in home <i>(No)</i>			
<i>Yes</i>	1.70* (1.26-2.29)	1.98* (1.49-2.64)	2.17* (1.45-3.27)
Householder immigration to U.S. <i>(≥10 years)</i>			
<i>(Among foreign-origin Hispanics only)</i>			
<i>< 10 years</i>	1.58* (1.19, 2.09)	1.13 (0.84, 1.51)	1.25 (0.81, 1.95)
SNAP participation <i>(No)†</i>			
<i>Yes</i>	2.12* (1.64, 2.73)	2.66* (2.11, 3.36)	3.88* (2.78, 5.41)
WIC participation <i>(No)†</i>			
<i>Yes</i>	1.70* (1.24, 2.32)	1.51* (1.09, 2.10)	2.15* (1.32, 3.48)

Note: For household food security, high food security is the comparison group.

Reference categories are italicized in parentheses; * $p < 0.05$

† SNAP= Supplemental Nutrition Assistance Program; WIC= Supplemental Nutrition Program for Women, Infants, and Children; Among respondents <185% FPL, and respondents >185% FPL answering 'yes' to food security screener question, "In the last 12 months, since December of last year, did you ever run short of

money and try to make your food or your money go further?”

Table 2.8: **Socioedemographic Factors Associated with Adult Food Security Status Among Hispanics in U.S. (n=7,111-18,447)**

Predictor Variable (<i>Reference category</i>)	Marginal RRR (CI)	Low RRR (CI)	Very Low RRR (CI)
Income (Above)			
<i>Below 130% FPL</i>	2.99* (2.38-3.75)	4.13* (3.40-5.03)	6.25* (4.45-8.78)
<i>Below 185% FPL</i>	4.15* (3.26-5.27)	3.93* (3.20-4.84)	4.19* (3.15-5.57)
<i>Below 200% FPL</i>	3.61* (2.88-4.51)	4.23* (3.36-5.33)	4.13* (2.92-5.85)
Householder education (No)			
<i>HS diploma/GED</i>	0.66* (0.58-0.75)	0.65* (0.57-0.75)	0.68* (0.57-0.83)
Householder employed (Yes)			
<i>No</i>	2.23* (1.72-2.88)	2.78* (2.17-3.57)	4.09* (2.93-5.72)
<i>Not in labor market</i>	1.27*	1.40*	1.57*

Table 2.8 – continued from previous page – Adult Food Security

Predictor Variable <i>(Reference category)</i>	Marginal RRR (CI)	Low RRR (CI)	Very Low RRR (CI)
	(1.13-1.43)	(1.22-1.61)	(1.31-1.89)
Female householder <i>(Male)</i>			
Yes	1.01 (0.93, 1.10)	1.07 (0.98, 1.18)	1.00 (0.87, 1.15)
Householder age (< 18)			
18-64 years old	0.71* (0.65-0.79)	0.74* (0.66-0.83)	0.78* (0.65-0.92)
≥ 65 years old	0.63* (0.48-0.83)	0.57* (0.41-0.78)	0.66* (0.44-0.97)
Foreign Hispanic-origin parents <i>(No)</i>			
Hispanic-origin mother and/or father	1.33* (1.13-1.58)	1.49* (1.24-1.79)	0.93 (0.73-1.18)
U.S. Region <i>(North)</i>			
Midwest	0.77 (0.50-1.17)	0.88 (0.57-1.34)	0.53* (0.30-0.95)
South	0.99 (0.73-1.36)	0.93 (0.64-1.33)	0.70 (0.44-1.09)
West	0.96	0.91	0.57*

Table 2.8 – continued from previous page – Adult Food Security

Predictor Variable <i>(Reference category)</i>	Marginal RRR (CI)	Low RRR (CI)	Very Low RRR (CI)
	(0.72-1.28)	(0.66-1.23)	(0.35-0.93)
Residence (<i>Metro area</i>)			
<i>Non-metro area</i>	1.31 (0.94-1.82)	1.06 (0.72-1.55)	1.42 (0.83-2.42)
Householder marital status (<i>Not married</i>)			
<i>Married</i>	1.01 (0.88-1.17)	0.85 (0.73-1.00)	0.75* (0.62-0.90)
Household size (≤ 4)			
<i>> 4 persons</i>	1.47* (1.18-1.83)	1.46* (1.19-1.79)	1.14 (0.80-1.62)
Own children ≤ 18 years (<i>No</i>)			
<i>Yes</i>	1.17* (1.07-1.27)	1.03 (0.98-1.20)	0.85 (0.72-1.00)
Own children ≤ 5 years old (<i>No</i>)			
<i>Yes</i>	1.36* (1.17-1.57)	1.16 (0.96-1.40)	1.06 (0.83-1.35)
Speak only Spanish in home (<i>No</i>)			
<i>Yes</i>	1.88* (1.40-2.51)	2.07* (1.56-2.76)	1.66* (1.08-2.54)
Householder immigration to U.S. (≥ 10)			

Table 2.8 – continued from previous page – Adult Food Security

Predictor Variable <i>(Reference category)</i>	Marginal RRR (CI)	Low RRR (CI)	Very Low RRR (CI)
<i>(Among foreign-origin Hispanics only)</i>			
<i>< 10 years</i>	1.47* (1.11, 1.95)	0.94 (0.68, 1.29)	1.45 (0.93, 2.24)
SNAP participation (No)†			
Yes	2.24* (1.76, 2.87)	2.40* (1.88, 3.06)	4.05* (2.89, 5.67)
WIC participation (No)†			
Yes	1.47* (1.08, 1.99)	1.49* (1.05, 2.12)	2.10* (1.36, 3.25)

Note: For adult food security, high food security is the comparison group. Reference categories are italicized in parentheses; * $p < 0.05$.

† SNAP= Supplemental Nutrition Assistance Program; WIC= Supplemental Nutrition Program for Women, Infants, and Children; Among respondents <185% FPL, and respondents >185% FPL answering 'yes' to food security screener question, "In the last 12 months, since December of last year, did you ever run short of money and try to make your food or your money go further?"

Table 2.9: **Socioedemographic Factors Associated with Child Food Security Status Among Hispanics in U.S. (n=4,984-14,052)**

Predictor Variable <i>(Reference category)</i>	Low RRR (CI)	Very Low RRR (CI)
Income (Above)		
<i>Below 130% FPL</i>	2.62* (1.96-3.51)	4.42* (1.58-12.39)
<i>Below 185% FPL</i>	3.78* (2.66-5.36)	3.44* (1.26-9.35)
<i>Below 200% FPL</i>	3.04* (2.04-4.52)	4.36 (1.00-18.92)
Householder education (No)		
<i>HS diploma/GED</i>	0.86* (0.75-0.99)	0.57* (0.38-0.84)
Householder employed (Yes)		
<i>No</i>	1.89* (1.37-2.61)	2.16* (1.10-4.24)
<i>Not in labor market</i>	1.30* (1.10-1.54)	0.88 (0.57-1.36)
Female householder (Male)		

Table 2.9 – continued from previous page – Child Food Security

Predictor Variable	Low	Very Low
<i>(Reference category)</i>	RRR (CI)	RRR (CI)
Yes	1.11 (0.99, 1.26)	0.77 (0.57, 1.03)
Householder age (<18)		
18-64 years old	0.82* (0.75-0.90)	1.07 (0.85-1.35)
≥ 65 years old	0.72 (0.38-1.35)	0.61 (0.15-0.20)
Foreign Hispanic-origin parents (No)		
Hispanic-origin mother and/or father	1.19 (0.94-1.51)	2.40* (1.11-5.19)
U.S. Region (North)		
Midwest	0.59 (0.32-1.07)	1.23 (0.22-6.75)
South	1.05 (0.63-1.74)	0.85 (0.21-3.43)
West	0.84 (0.53-1.32)	1.24 (0.35-4.35)
Residence (Metro area)		

Table 2.9 – continued from previous page – Child Food Security

Predictor Variable <i>(Reference category)</i>	Low RRR (CI)	Very Low RRR (CI)
<i>Non-metro area</i>	1.47 (0.92-2.34)	1.39 (0.36-5.35)
Householder marital status <i>(Not married)</i>		
<i>Married</i>	0.87 (0.73-1.03)	1.16 (0.71-1.91)
Household size (≤ 4)		
<i>> 4 persons</i>	1.52* (1.16-1.99)	1.24 (0.60-2.57)
Own children ≤ 5 years old <i>(No)</i>		
<i>Yes</i>	0.96 (0.81-1.14)	0.54* (0.30-0.98)
Speak only Spanish in home <i>(No)</i>		
<i>Yes</i>	2.36* (1.66-3.35)	2.87* (1.14-7.20)
Householder immigration to U.S. (≥ 10) <i>(Among foreign-origin Hispanics only)</i>		
<i>< 10 years</i>	1.11 (0.77, 1.59)	0.94 (0.32, 2.78)
SNAP participation <i>(No)†</i>		
<i>Yes</i>	1.74*	1.39

Table 2.9 – continued from previous page – Child Food Security

Predictor Variable	Low	Very Low
<i>(Reference category)</i>	RRR (CI)	RRR (CI)
	(1.30, 2.34)	(0.67, 2.88)
WIC participation (No)†		
Yes	1.56*	0.76
	(1.12, 2.18)	(0.23, 2.46)

Note: For child food security, high/moderate food security is the comparison group. Reference categories are italicized in parentheses; * $p < 0.05$.

† SNAP= Supplemental Nutrition Assistance Program; WIC= Supplemental Nutrition Program for Women, Infants, and Children; Among respondents <185% FPL, and respondents >185% FPL answering 'yes' to food security screener question, "In the last 12 months, since December of last year, did you ever run short of money and try to make your food or your money go further?"

2.3.3 Food insecurity risk

2.3.3.1 Country/region of origin, all Hispanics

2.3.3.2 Unadjusted models

Compared to U.S.-origin households for household food security status, households with Mexican-origin (RRR: 1.31; CI: 1.13-1.52) or Honduran-origin (RRR: 1.93; CI: 1.01-3.66) householders were associated with a significantly increased risk of marginal food security, and households with Mexican-origin (RRR: 1.22; CI: 1.04-1.43) householders were associated with increased risk of low food security. Households with Cuban-origin (RRR:0.50; CI: 0.27-0.91) householders were associated with a significantly decreased risk of marginal food security, and households with Cuban-origin (RRR: 0.21; CI: 0.11-0.38) or Other South American-origin (RRR:0.50; CI: 0.28-0.87) householders were associated with a significantly less risk of low food security. Compared to U.S.-origin households for adult food security, households with Mexican-origin householders were associated with significantly higher risk of marginal (RRR: 1.29; CI: 1.11-1.49) and low (RRR: 1.33; CI: 1.13-1.57) food security. Households with Cuban-origin householders were associated with significantly less risk of marginal (RRR: 0.47; CI 0.26-0.86), low (RRR: 0.28; CI: 0.15-0.53), and very low (RRR: 0.36; CI: 0.13-0.95) adult food security. Households with Other South American-origin householders were also associated with decreased risk of low adult food security (RRR: 0.53; CI: 0.29-0.97). At the child food security level, households with Other South American-

origin householders were associated with significantly less risk of low food security (RRR: 0.42; CI: 0.21-0.84), compared to U.S.-origin households. Households with Cuban-origin householders (RRR: <0.00; CI: <0.00) or Central-American origin (RRR: <0.00; CI: <0.00) were associated with significantly less risk of very low child food security.

2.3.3.3 Adjusted models

Since foreign-origin householders were older than U.S.-origin householders, we adjusted for both income and age in the multinomial logistic regression models demonstrating risk of household food insecurity as predicted by country of origin among all Hispanics. Using households with U.S.-origin Hispanic householders as the reference group, households with Mexican-origin or Salvadoran-origin householders were associated with increased risk of marginal and low household food security (Table 2.10). Households with Honduran-origin householders were associated with greater risk of marginal household food security. Households with Cuban-origin householders were significantly less at risk of low household food security. The models for adult level food security status were similar (Table 2.11). In addition, households with Cuban-origin householders were associated with a significantly decreased risk of very low adult food security. Last, households with householders originating from Mexico were associated with significantly increased risk of low child food security (Table 2.12). However, decreased very low child food security risk was significantly associated with households having

Other South American-origin and Cuban-origin householders.

Table 2.10: **Multinomial Logistic Regression of Household Food Security among All Hispanic Households in U.S., Adjusted for Income and Age (n= 14,052-18,447); * $p < 0.05$**

Country/region of origin	Marginal Food Security		Low Food Security		Very Low Food Security	
	RRR	CI	RRR	CI	RRR	CI
U.S.	1.00		1.00		1.00	
Mexico	1.41*	1.19-1.67	1.38*	1.14-1.67	1.19	0.90-1.56
El Salvador	2.03*	1.21-3.41	2.12*	1.23-3.70	1.12	0.56-2.25
Guatemala	1.88	0.87-4.06	0.83	0.36-1.89	1.94	0.76-4.94
Honduras	2.04*	1.02-4.05	1.16	0.49-2.73	1.88	0.54-6.50
Cuba	0.56	0.31-1.02	0.25*	0.13-0.46	0.43	0.15-0.84
Dominican Republic	0.89	0.47-1.68	1.31	0.76-2.27	0.49	0.14-1.66
Puerto Rico	1.28	0.78-2.12	1.24	0.79-1.95	1.06	0.58-1.91
Colombia	1.37	0.56-3.32	1.04	0.43-2.56	1.54	0.47-5.03
Other Central America	1.62	0.57-4.60	1.04	0.49-2.21	1.18	0.46-3.03
Other South America	1.04	0.64-1.69	0.75	0.42-1.32	0.81	0.42-1.56

Table 2.11: **Multinomial Logistic Regression of Adult Food Security among All Hispanic Households in U.S., Adjusted for Income and Age (n= 14,052-18,447); * $p < 0.05$**

Country/Region of Origin	Marginal Food Security		Low Food Security		Very Low Food Security	
	RRR	CI	RRR	CI	RRR	CI
U.S.	1.00		1.00		1.00	
Mexico	1.40*	1.18-1.66	1.41*	1.15-1.72	0.89	0.70-1.15
El Salvador	1.76*	1.02-3.06	1.96*	1.11-3.46	1.05	0.52-2.15
Guatemala	1.85	0.87-3.92	0.90	0.35-1.85	1.82	0.72-4.61
Honduras	2.01*	1.03-3.91	1.31	0.53-3.23	1.77	0.50-6.21
Cuba	0.54	0.30-0.99	0.32*	0.17-0.59	0.34*	0.13-0.90
Dominican Republic	0.69	0.36-1.29	1.38	0.78-2.43	0.43	0.13-1.48
Puerto Rico	1.21	0.78-1.87	1.15	0.69-1.93	1.17	0.65-2.12
Colombia	1.54	0.70-3.40	1.19	0.47-3.05	1.04	0.31-3.44
Other Central America	0.98	0.41-2.35	1.12	0.45-2.82	0.80	0.30-2.13
Other South America	1.03	0.64-1.63	0.75	0.41-1.39	0.88	0.42-1.53

Table 2.12: **Multinomial Logistic Regression of Child Food Security among All Hispanic Households in U.S., Adjusted for Income and Age (n= 14,052-18,447); * $p < 0.05$**

Country/Region of Origin	Low Food Security		Very Low Food Security	
	RRR	CI	RRR	CI
U.S.	1.00		1.00	
Mexico	1.33*	1.03-1.72	1.49	0.79-2.79
El Salvador	1.65	0.74-3.69	0.74	0.06-7.97
Guatemala	0.90	0.21-3.80	5.31	0.59-47.48
Honduras	1.78	0.52-6.08	1.83	0.27-12.40
Cuba	0.85	0.32-2.25	<0.00*	<0.00-<0.00
Dominican Republic	0.63	0.15-2.67	0.96	0.08-12.08
Puerto Rico	1.17	0.57-2.39	1.04	0.10-10.62
Colombia	2.16	0.79-5.91	4.39	0.53-36.60
Other Central America	0.63	0.20-2.01	<0.00*	<0.00-<0.00
Other South America	0.59	0.27-1.14	2.07	0.55-7.77

2.3.3.4 Hispanic ethnic subgroup, U.S.-origin Hispanics

2.3.3.5 Unadjusted models

Our subpopulation analyses of U.S.-origin Hispanics tested the association of food insecurity risk with Hispanic ethnic subgroup, using householders' maternal country of origin. Prior to building adjusted models, we found that households with Mexican (RRR:1.70; CI:1.35-2.15) or Salvadoran (RRR: 2.57; CI: 1.48-4.44) ethnicity householders were significantly more at risk of marginal household food security compared to U.S. ethnic Hispanics. Similarly, Mexican (RRR: 1.73; CI: 1.39-2.15), Salvadoran (RRR: 2.04; CI: 1.27-3.29), or Puerto Rican (RRR: 1.92; FI: 1.28-2.88) householder ethnicity was associated with increased risk of low household food security. Households with Cuban (RRR: 0.27; CI: 0.09-0.76) ethnic householders were associated with significantly less risk of low household food security. Results were similar at the adult level. In addition, households with Puerto Rican ethnic householders were associated with significantly greater risk of very low adult food security (RRR: 2.40; CI: 1.24-4.65). At the child level, households with Mexican ethnic householders (RRR: 1.31; CI: 1.01-1.70) were associated with significantly increased risk of low food security. Whereas, households with Cuban ethnic householders (RRR: <0.00; CI: <0.00) were significantly associated with less risk of very low child food security.

2.3.3.6 Adjusted models

Since Cuban and Puerto Rican householders were older than other U.S.-origin Hispanic subgroups, we adjusted for both income and age in our models. Compared to Hispanic households with U.S.-origin ethnicity, households with Mexican or Salvadoran ethnicity were significantly more at risk of marginal and low household food security (Table 2.13). Puerto Rican ethnicity was also associated with a significantly increased risk of low household food security. Cuban ethnicity was associated with significantly less risk of low household food security. For adult food security, Mexican ethnicity was associated with a significantly higher risk of marginal and low food security (Table 2.14). Salvadoran ethnicity was associated with significantly higher risk of marginal adult food security. Puerto Rican ethnicity was associated with increased risk of low and very low adult food security. Cuban ethnicity was associated with a significant lower risk of low adult food security. Last, significant associations of ethnicity and child food security were found only for decreased risk (Table 2.15). Dominican Republic ethnicity was associated with less risk of low child food security; Cuban ethnicity was associated with less risk for very low child food security.

Table 2.13: **Multinomial Logistic Regression of Household Food Security by Hispanic Ethnic Subgroup among U.S.-Origin Hispanic Households in U.S., Adjusted for Income and Age (n= 8,972-11,197); * $p < 0.05$**

Country/Region of Origin	Marginal Food Security		Low Food Security		Very Low Food Security	
	RRR	CI	RRR	CI	RRR	CI
U.S.	1.00		1.00		1.00	
Mexico	1.45*	1.13-1.85	1.43*	1.14-1.80	0.97	0.70-1.34
El Salvador	2.19*	1.29-3.72	1.69*	1.03-2.77	1.10	0.41-3.01
Guatemala	0.61	0.25-1.52	0.50	0.18-1.33	0.92	0.28-2.99
Cuba	0.44	0.17-1.14	0.30*	0.11-0.85	0.38	0.10-1.43
Dominican Republic	0.91	0.43-1.92	1.36	0.72-2.56	0.84	0.20-3.53
Puerto Rico	1.64	1.00-2.70	1.97*	1.28-3.03	2.00	0.90-4.41
Other Central America	0.66	0.26-1.65	0.59	0.25-1.39	0.96	0.18-4.80
Other South America	1.25	0.72-2.17	0.88	0.45-1.72	0.75	0.27-2.06

Table 2.14: **Multinomial Logistic Regression of Adult Food Security by Hispanic Ethnic Subgroup among U.S.-Origin Hispanic Households in U.S., Adjusted for Income and Age (n= 8,972-11,197); * $p < 0.05$**

Country/Region of Origin	Marginal Food Security		Low Food Security		Very Low Food Security	
	RRR	CI	RRR	CI	RRR	CI
U.S.	1.00		1.00		1.00	
Mexico	1.34*	1.04-1.73	1.42*	1.15-1.76	0.74	0.53-1.04
El Salvador	1.71*	1.03-2.85	1.70	1.01-2.88	0.95	0.34-2.65
Guatemala	0.71	0.30-1.70	0.49	0.18-1.36	0.85	0.26-2.76
Cuba	0.50	0.20-1.20	0.34*	0.13-0.91	0.24	0.04-1.40
Dominican Republic	0.80	0.29-2.20	1.38	0.71-2.68	0.72	0.17-2.99
Puerto Rico	1.30	0.77-2.20	2.04*	1.22-3.41	2.33*	1.18-4.58
Other Central America	0.72	0.32-1.63	0.66	0.26-1.65	0.82	0.14-4.80
Other South America	1.11	0.64-1.91	1.11	0.56-2.21	0.82	0.33-2.06

Table 2.15: **Multinomial Logistic Regression of Child Food Security by Hispanic Ethnic Subgroup among U.S.-Origin Hispanic Households in U.S., Adjusted for Income and Age (n= 8,972-11,197); * $p < 0.05$**

Country/Region of Origin	Marginal Food Security		Low Food Security		Very Low Food Security	
	RRR	CI	RRR	CI	RRR	CI
U.S.	–	–	1.00		1.00	
Mexico	–	–	1.13	0.87-1.47	1.79	0.76-4.18
El Salvador	–	–	1.22	0.60-2.50	1.01	0.09-11.01
Guatemala	–	–	0.38	0.09-1.69	4.12	0.51-33.11
Cuba	–	–	0.61	0.18-2.11	<0.00*	<0.00-<0.00
Dominican Republic	–	–	0.22*	0.05-0.93	4.52	0.33-61.50
Puerto Rico	–	–	1.69	0.75-3.77	3.83	0.45-32.69
Other Central America	–	–	1.15	0.35-3.75	0.50	0.04- 6.29
Other South America	–	–	0.52	0.17-1.51	3.01	0.83-10.85

2.4 Discussion

Findings from these analyses of the 2013 CPS December food security supplement demonstrate that food insecurity risk is not uniform across all ethnic subgroups of Hispanics in the U.S., presenting an important public health concern for identifying at-risk Hispanic households. Even after controlling for income, an important correlate of food insecurity, the ethnic group-specific differences remained significant. Simultaneously, these findings present an opportunity to prioritize identification of Hispanic ethnic subgroup-specific barriers and strengths to help shape effective approaches to reducing food insecurity. Cuban-origin households and U.S.-origin households with Cuban ethnicity were consistently less at risk of food insecurity. Mexican- and Salvadoran-origin households and U.S.-origin households with Mexican, Salvadoran, and Puerto Rican ethnicity were strongly associated with food insecurity.

Socio-demographic correlates of household food security risk in these analyses were similar to other published studies among Hispanics in North America. Decreased household food security risk was associated with increasing income,^{4,29,32,33} age³² and being employed,^{4,33} but increased risk was associated with larger household size,^{20,32,33} speaking only Spanish,^{18,19,20,29,32,34} presence of children,^{2,35} and participation in SNAP or WIC.^{18,19,29} The association with nutrition assistance program participation suggests that perhaps the neediest Hispanic households are the ones seeking assistance, a relationship previously observed in

cross-sectional studies and suggestive of program participation-selection bias.^{36,37} The non-significant association of program participation with child food security in this study contributes to limited and mixed results^{33,38,39} that often require capturing more details than a cross-sectional relationship of participation and child food security status. Although Skalicky *et al* found no association between food security status and SNAP or WIC participation among diverse, low-income infants and toddlers in Boston³⁸, Mabli *et al* reported that participation in the SNAP program for six months was associated with significantly reduced food security among children in a nationally-representative sample of households with children.³⁹ Among poor, Mexican-origin households with children on the Texas-Mexico border, food insecure children were more likely to live in households that ran out of SNAP benefits before the end of the month, suggesting a need for more understanding of both management and adequacy of monthly SNAP benefits.³³ Unlike other published findings among Hispanics,^{20,34} having children in the household was not associated with severe food insecurity at the household and adult levels. The latter may be an indication of the potential protective role of adults in the household, particularly mothers,⁴⁰ and participation in federal food and nutrition assistance programs (e.g. SNAP, WIC) targeting children. Children born in the U.S. and meeting income requirements are eligible for SNAP regardless of their parents' citizenship status.⁴¹

However, there was one important difference in association of food security risk with socio-demographic correlates in these analyses compared to others. We

found that foreign-origin Hispanic householders with <10 years in the U.S., compared to ≥ 10 years, were not associated with increased risk of food insecurity, as has been documented elsewhere.^{3,32,34} Comparable to our findings, Hadley *et al*⁴ also found no association between time in the U.S. and hunger among undocumented Mexican immigrants in NYC. These findings suggest considering the ethnic subgroup to which Hispanics belong may tell us more about food insecurity risk than years in the U.S., particularly since socioeconomic status differed between ethnic subgroups.

Published data on distinctions in food security risk by Hispanic ethnic subgroup and/or origin are limited. The USDA Economic Research Service recently released household food insecurity prevalence data by Hispanic ethnic subgroup and immigration status using years 2011 to 2014 of the CPS. The subgroups included households identifying as Mexican, Central/South American, Puerto Rican, Cuban, or Other Hispanic. While these data also show a much lower prevalence of food insecurity among Cuban Hispanics compared to other Hispanic subgroups,⁴² the report does not provide many country or region-specific rates, nor does it distinguish between foreign-origin and U.S.-origin Hispanic ethnic subgroups. In addition, because Mexicans represent the largest Hispanic ethnic group in the U.S.,²³ there are many published studies documenting food security risk for Mexican-origin or Mexican American Hispanics. While these studies show that Mexican-origin Hispanics^{33,34} and children with at least one Mexican-origin parent²⁴ have an increased risk of food insecurity, most compare Mexi-

can nativity to non-Latinos/Hispanics²⁴ or U.S.-origin Mexicans,^{33,34} and do not consider other Hispanic nativities.^{26,32} Of the available published data, no previous study provides a comprehensive picture of Hispanic ethnic subgroup differences. Chilton *et al*³ included immigrant mothers from Mexico, Central America, South America, Africa, and Caribbean but the analyses did not take into account mothers' origins, only if they were foreign-origin or not. More recently, Asfour *et al*²⁵ collected data from families from various ethnic backgrounds, including Cuban Hispanics, non-Cuban Hispanics, non-Hispanic Black, and Haitian. They found that non-Cuban Hispanics were less food secure than non-Hispanics and non-Haitian Blacks, and that families with foreign-born caregivers were less food secure than US-born caregivers. Perhaps the most comparable study accounting for Hispanic ethnic subgroups is the recent California Health Interview Survey (CHIS) data categorizing Hispanics as Mexican, Central American, Puerto Rican, Spanish-American, and South American. South Americans were significantly more likely to report household food security compared to Mexicans, Central Americans, and Puerto Ricans.²⁶

From a public health perspective, considering the current situation of Hispanic households in the U.S. in the context of ethnicity, life course, and policy is important for understanding and addressing disparities. More specifically, differences in sending country situations as well as migration history and immigration policy (e.g. migrants vs. refugees) are important for understanding how Hispanics manage and negotiate life in the U.S. Our results provide a clearer understanding

of how these Hispanic ethnic differences may shape food insecurity risk.

Beginning with the Latin American country with the most extensive history with and closest geographical proximity to the U.S., Mexico's out-migration was mostly for economic reasons, first as a part of two guest worker programs from the early 1900s to 1960s, then as undocumented immigrants still able to travel back and forth across the border. Upon passage of the Immigration Reform and Control Act of 1986 (IRCA) and increased border security, millions of undocumented Mexican migrants became legal citizens, and immigration slowed. Still, many of these immigrants permanently settled in the U.S., bringing their families to join them, while an additional 7.5 million unauthorized immigrants arrived from Mexico between 1990 and 2010⁴³ Despite the recent decline in immigration from Mexico to the U.S.⁴³, many ethnic Mexican Hispanics living in the U.S lack documentation and migrated for economic reasons, factors contributing to the overall vulnerability to food insecurity found in our analyses.

In contrast, civil- and guerilla wars of the 1970s and 1980s contributed to an influx of Salvadoran, Guatemalan, Honduran, and Nicaraguan migrants, many undocumented, to the U.S. In particular, those from El Salvador and Guatemala were mostly less-educated rural migrants, while migrants from Nicaragua were part of the well-educated, elite class. Migration rates declined in the early 1990s with the end of conflicts. However, previously developed migrant social networks con-

tributed to continued growth of undocumented Central Americans to the U.S. for economic reasons. More recently, migrants from El Salvador, Guatemala, and Honduras (The Northern Triangle) comprise the majority of Central Americans immigrating to the U.S.,⁴⁴ with a wave of undocumented minors arriving in the summer of 2014 due to growing violence and dwindling economic opportunities.⁴⁵ As supported by our findings, migrants from the Northern Triangle, particularly El Salvador, represent ethnic Hispanic subgroups at risk of food insecurity. Yet, they each have their own distinct culture that should be considered in the context of their immigration to the U.S.

For Puerto Rico, the story is very different. Since 1917, inhabitants of Puerto Rico have been U.S. citizens, able to move freely within the territorial boundaries of the U.S.⁴⁶ As population growth outpaced employment opportunities after the Great Depression, increasing numbers of Puerto Ricans began migrating to the mainland.⁴⁷ Chronic unemployment in Puerto Rico continues to drive migration today,⁴⁸ possibly explaining the high rates of poverty among U.S. mainland Puerto Ricans.²³ However, these analyses only showed U.S.-origin Puerto Ricans to be at increased risk of food insecurity, revealing a segment of this ethnic subgroup that needs attention.

Last, most Cuban-origin Hispanics in the U.S. are considered political refugees after the Cuban Revolution, granting them legal status and a path to citizenship.

There were four distinct waves of migration from Cuba to the U.S. from 1960 to 1980, with the first two waves comprised mostly of upper and upper middle class families and the latter two encompassing more socioeconomic variation.⁴⁹ However, Cubans in the U.S. are older and have higher incomes and levels of education than the Hispanic population overall,⁵⁰ helping to protect them from food insecurity.

In addition to migration history and secondary to political and economic factors, a Hispanic immigrant's adaptation to the U.S., once here, may rely on familiar cultural and life course practices from the country of origin. In the context of food insecurity, these practices are juxtaposed with a new culture less familiar and potentially less accepting of such practices. In fact, Renzaho & Mellor⁵¹ argue that coping strategies, as defined in the U.S. but employed by immigrants, may not always be in response to food insecurity, but may in fact be a part of an immigrants' culture. For example, the assessment of household food insecurity among Sudanese immigrants in Australia found food stressed households relying on help from friends and family, but Sudanese commonly practiced food sharing prior to migration.⁵¹ In a separate study, low income, Mexican-origin immigrant mothers in New York State relied on food staples, like rice, beans, and tortillas regardless of food security status because they were culturally familiar foods (Dissertation chapters 3 and 4). Agencies monitoring food security prevalence should take these cultural differences into account, and consider that current data may misrepresent true food insecurity and/or food insecurity-related coping strategies.

Understanding the contextual and culturally-specific practices of Hispanic immigrants, while differentiating between cultural norms and coping strategies, holds significant value in optimizing program effectiveness by tailoring outreach to the immigrants' culture, life course, and situation.

One of several strengths of this study is the use of a nationally-representative survey, particularly one that is the main source of national food security prevalence data for the U.S. Household survey weights account for actual population size and demographics that provide approximations of true food insecurity risk by country/region of origin. Likewise, unlike other published studies, these analyses account for more detailed Hispanic subgroups, which consider the differences in country of origin culture, characteristics, and migration history, important considerations for public health practitioners seeking to understand and reduce food insecurity risk. Differentiating by Hispanic country of origin allows for less sweeping generalizations and greater respect for the important ethnic subgroup differences that may assist in strengthening existing cultural, social, and human capital. Last, these analyses are comparable to other studies since they use a commonly employed, well-validated measure of food security, the USDA 18-item Core Food Security Module. Thus, continued monitoring of Hispanic subgroup food security is feasible, and annual comparison facilitates improvement in measurement and interpretation.

There are several important limitations to discuss. First, the dataset was cross-sectional. Despite the USDA module evaluating food security over the past 12 months, recall bias may skew responses, particularly in favor of the current household situation. Furthermore, more severe food insecurity is often episodic,² so a single measurement time point may not adequately capture the true, dynamic experiences of household food security. Assessing food security status longitudinally may help elucidate the role of Hispanic ethnic subgroup and socio-demographic correlates with food security status. Second, the dataset contained limited observations for certain Latin American countries of origin, resulting in some large but non-significant relative risk ratios and confidence intervals and the need to combine several countries into one category, the latter of which limits generalizability by ignoring small but important country-to-country differences. Interpretation of results for countries with limited observations should be done with caution. Likewise, there were too few observations for SNAP and WIC program participation by Hispanic ethnic subgroup to investigate ethnic subgroup differences in the relationship of federal food assistance with food security status. Third, undocumented immigrants are less likely to participate in surveys, so these results may under-represent hard-to-reach Hispanics, who may live in some of the most vulnerable households. Last, we did not analyze differences among Hispanic ethnic subgroups for individual food security module item responses. Individual item assessment by country/region of origin might provide more coarse, but important, information about households situation/context.

2.5 Implications

Culturally-tailored approaches to improve health, nutrition, and food access are an important part of public health.⁵² These analyses further this commitment to encouraging culturally-appropriate tactics to improving food security by identifying Hispanic ethnic subgroups most at risk and initiating a conversation about how we conceptualize Hispanic health disparities. Future surveys and studies should consider incorporating more sociocultural, food access, and household food provisioning measurements to better understand the pathways between Hispanic ethnic subgroup origin and food insecurity risk. Limited data exist on the role of ethnic subgroup-specific food provisioning on food security status, opening the door to identifying both barriers and capacities for efficient and effective implementation at multiple levels of influence (e.g. household, community, policy). In addition, limited data exist on child food insecurity, warranting future investigations into risk and protective factors and health and development implications. Given that marginalization is likely one culprit in Hispanic ethnic subgroup food insecurity differences, policy measures should seek to improve employment opportunities and standards, to reform immigration procedures/restrictions, and to facilitate greater access to federal food and nutrition programs.

These findings also highlight the importance of conducting more research to understand Hispanic ethnic subgroup differences in the relationship of food insecurity with dietary patterns. Food security may not translate to a healthy diet,²⁵

necessitating culturally-tailored programming. Studies elucidating these relationships can contribute to programs that take into account important cultural capital. In addition, improving food security status among Hispanics may be a way to simultaneously improve diet-related health disparities and outcomes, such as child health and development and adult health and chronic disease.^{26,53} Reducing Hispanic health disparities should begin by recognizing the influential cultural and historical differences existing among Hispanic ethnic subgroups and responding to the resulting unequal access to healthy food in a way that welcomes these differences as strengths moving forward.

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CHAPTER 3

CULTURAL AND LIFE COURSE INFLUENCES ON FOOD PROVISIONING AMONG MEXICAN-ORIGIN MOTHERS OF YOUNG CHILDREN

3.1 Introduction

The most rapid growth from recent immigrant populations over the last 10 years in the U.S. comes from births to Mexican-origin Hispanics.¹ In addition, the largest proportion of children living in poverty in the U.S. is Hispanic, and most of those children have at least one immigrant parent from.² Reported prevalence of food insecurity in Mexican-origin Hispanics ranges from about 30% of households^{3,4} to as high as twice the Hispanic national average⁴⁻⁹ of 22.4% of households.¹⁰ Food insecurity is also higher among immigrants with fewer years of residence in the U.S.¹¹ The high prevalence is concerning since food insecurity is associated with nutritional deficiencies, poor physical health, and psychosocial development in children.¹² Food insecure households often employ coping strategies, some protective and some risky, to help alleviate food insecurity. Protective coping strategies may be formal, such as participating in local and federal food programs,¹³⁻¹⁹ or informal,^{8,13-21} such as sharing meals with extended family to maximize resources.¹³⁻¹⁸ Immigrants meeting income requirements are eligible for federally-funded Supplemental Nutrition Assistance Program (SNAP) benefits only if they have resided in the U.S. legally for at least five years, though their citizen children are automatically eligible.²² These policy stipulations suggest many

immigrant families may not have access to an important safety net program and, therefore, may be at an increased risk for food insecurity. Yet, their informal coping strategies may also play a critical, supplementary role in maintaining a food secure household and protecting children from food insecurity.

The types of protective coping strategies used by Mexican-origin Hispanics appear to differ depending on geographical location, situation, context, and life experience.^{4,8,23} In two distinct regions of rural Texas (one rural, border community and one peri-urban, college city), Mexican-origin and Mexican American Hispanic households often relied on social networks⁴ and creative, culturally-familiar food acquisition and preparation methods^{20,24,25} as means to cope with food insecurity. In rural North Carolina, migrant and seasonal farmworkers with children used the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) to cope with food insecurity, while farmworkers without children were more likely to access food pantries and acquire fish and wild game as coping strategies.⁸ Use of certain coping strategies may be due not only to the accessible and available food environment, but also to differences in relationships with family, friends, neighbors, and others in communities.^{25,26} For example, rural Mexican-origin and Mexican American mothers living in California, Michigan, and Oregon reported differing use of community food banks based on perceived friendliness of their communities and trustworthiness of their neighbors. These perceptions of their communities also seemed to impact mothers' accrual of financial and food provisioning skills, including managing household finances, using coupons, and accessing food pantries; mothers with perceived friendlier com-

munities consistently reported gaining more skills.²³ While broad strategies are needed to reduce food insecurity in the U.S., the intricate differences in use of coping strategies underscore the necessity of context-specific research for translation into effective programming at multiple levels of influence.²⁷

Little is known about food insecurity in Mexican-origin Hispanic families in New York State (NYS), despite being the second largest Hispanic group in the state.²⁸ Mexican-origin Hispanics are also the second largest Hispanic group in two counties in the Hudson Valley region,²⁹ situated in the center halfway between the state capital, Albany, and New York City (NYC).³⁰ While the close proximity to NYC provides increased employment opportunities, it simultaneously results in rising housing costs that outpace income growth and mostly benefit higher income residents.³¹ A recent survey indicated that 60% of foreign-born individuals in Dutchess County in the Hudson Valley originate from Mexico.³² Similarly, Mexican-origin Hispanics are one of the largest Hispanic subgroups in Connecticut.^{33,34} Thus, data from the Hudson Valley may provide a good representation of the current immigrant situation in the northeast.

In order to capture important details of the immigrant experience in the U.S., consideration must be given to both the U.S. environment and the experiences of an immigrants origin since these together may impact her behaviors once in the U.S.,^{3,25,35} including how she manages household food supplies.³ The migratory process and the ecological system are important to the health outcomes of immigrants, especially women.^{25,36,37} Few other studies have employed an eco-

logical approach to understanding food insecurity among Hispanic or Mexican immigrants,^{4,23} and researchers emphasize the need for considering Hispanics prior experiences and practices in their home country to better understand the degree to which they modify their dietary habits once in the U.S.^{25,38} By expanding the view of potential influences beyond the household environment and current time point, additional important targets for intervention can be identified for a more comprehensive approach to preventing and reducing food insecurity. Thus, the objective of this research was to explore the influence of culture and life course on low-income, Mexican-origin mothers food provisioning practices and strategies in the U.S.

3.2 Methods

3.2.1 Theoretical approach

Two theoretical perspectives guided our data collection. First, Bronfenbrenner's Ecological Systems Theory provided a comprehensive approach to understanding the influences on household food provisioning by considering the multiple levels of influence: individual (e.g. skills, education), microsystem (e.g. child, spouse), mesosystem (e.g. employment demands), exosystem (e.g. community resources), and macrosystem (e.g. culture, policies).³⁹⁻⁴⁰ Second, life course perspective, or changing temporal, social location, and historical life experiences and

circumstances,⁴¹ provided recognition of the influence of culture and context on an individual over a lifetime⁴² since immigrants often view their current experiences and environments here in the U.S. through their past experiences in their country of origin.⁴³

3.2.2 Setting

We conducted qualitative interviews in two counties (Dutchess and Orange) in the Hudson Valley of New York State, a region approximately 90 miles north of NYC, and comprised of a mix of rural, urban, and suburban areas. The investigators capitalized on the senior investigator's (JD) role in established statewide Cooperative Extension (CE) activities and relationships in order to connect to the county-level CE offices and local stakeholders working with Mexican-origin families. The primary researcher (AM) strengthened and extended these relationships in the counties from June 2013 to May 2015 to facilitate recruitment. Community outreach and relationship-building activities included, but were not limited to, attending regular advisory committee meetings, convening with community stakeholders, and participating in local organizational events.

3.2.3 Sampling and recruitment

From January 2014 to May 2015, investigators purposively sampled women: 1) born in Mexico, 2) with 10 or fewer years in the U.S., 3) residing in one of the two New York counties, 4) with at least one child \leq 5 years old, and 5) living at $<200\%$ of the federal poverty line. The sampling frame included recruitment from both rural and urban areas of the two participating counties. Investigators also sought variation on a number of other potentially influential factors, including employment status, education level, household size, and social networks upon arrival to the U.S. Community stakeholder organizations, key informants, and community events (e.g. summer meal programs for children) provided access to eligible women for recruitment. Research staff contacted by phone any woman that expressed interest in the study in order to provide her with more details about the study, answer any questions, screen, and enroll her, if she met all study criteria. The Cornell University Institutional Review Board approved this study.

3.3 Qualitative interviews

This project employed qualitative methods in the form of three face-to-face interviews. The primary researcher, who is a native English speaker but bilingual, conducted all interviews with the assistance of a research aide whose first language was Spanish. The research staff asked enrolled participants to complete interviews within a two to three month period at the participant's preferred loca-

tion (e.g. participant's home, community center) and in the participant's preferred language (English or Spanish).

3.3.1 Interview 1

During interview 1 the research staff collected informed consent and basic demographic information and provided instructions for taking photos using a disposable camera given to the participant. This interview lasted about one hour. Participants had one to two weeks to take photos of anything important to how they feed their family and children. In order to ensure comprehension of the photo activity instructions, research staff asked participants to give examples of photos the participants would like to take. Furthermore, participants were instructed not to take photos of faces in order to maintain the anonymity of participants and their families. Participants received a written copy of the photo elicitation instructions and an honorarium for their participation in the interview, and scheduled a time for staff to pick up the camera for photograph development.

3.3.2 Interview 2

Interview 2 was an in-depth, semi-structured interview using participant-driven photo elicitation, was conducted two to three weeks after interview 1, and lasted approximately 90 minutes. Photo elicitation uses photographs to help guide the

interview, enhancing the traditional face-to-face interview method in that an image prompts greater brain capacity to process both words and images, resulting in the possibility of deeper, more extensive information being provided.⁴⁴ The method helps grasp both the "tangible and intangible" (p.1509) parts of a participant's life through reflection and meaningful triggers not always revealed in a standard interview.⁴⁵ Furthermore, images facilitate improved communication and understanding because both participant and researcher can comprehend an image, despite possible cultural differences.⁴⁴ For this reason, photo elicitation was an appropriate choice for research in this immigrant community.⁴⁶ The participant-driven aspect of the photo elicitation interview method allowed the participant to produce the photographs, invoking an inductive approach to the data collection.⁴⁵ Participants thus had more control over the research process and were empowered to bring attention to issues they considered important.⁴⁷ Research staff asked participants to choose four to five photographs for discussion. In order to maintain the participant-driven aspect of the method, research staff engaged participants in talking about their photographs using the SHOWED method. The SHOWED mnemonic is represented in the following general questions: 1) What do you SEE here? 2) What's HAPPENING here? 3) How does this relate to OUR lives? 4) Why does this issue EXIST? 5) What can we DO about it?⁴⁷⁻⁴⁹ Research staff asked each of these questions for each photo, supplementing with study-specific probes when necessary. At the end of the interview, research staff gave each participant an honorarium and her set of photographs, except the four to five discussed for the study records, and scheduled interview 3.

3.3.3 Interview 3

Interview 3 was in-depth and semi-structured, lasting approximately 90 minutes. Research staff began with a member check to ensure trustworthiness of information collected during the photo elicitation interview. The purpose of the third interview was to build upon the photo elicitation and gain additional insights and perspectives on the influences of the participant's life transition from Mexico to the U.S. on the quality and quantity of how they feed their children. In addition, the study investigator ended the interview by collecting household and child food security data using the 18-item Core Food Security Module⁵⁰ in the participant's preferred language. Prior research evaluated validity of the Spanish version of the module across different Hispanic populations.⁵¹

3.4 Analyses

Interview transcripts provided data for conventional qualitative content analysis complemented by field notes providing contextual information. We used ATLAS.ti 7 to manage and analyze data. Interviews were audio-recorded, translated and transcribed verbatim. Transcripts were checked for accuracy by the primary researcher and a bilingual research assistant.

Conventional content analysis included iterative coding related to the research

questions, while also allowing for identification of emergent themes. Analysis began at early stages of data collection in order to assist in concept development and subsequent data collection, including selection of participants and modification of interview guides.⁵² Iterative coding of transcripts led to emergent themes related to the research questions. Simultaneously, periodic peer debriefing occurred throughout the analytical process by the study investigators and the senior investigator's (JD) larger research team, including doctoral students, postdoctoral researchers, undergraduate research assistants, and senior research associates with no affiliation with the project. These peer-debriefing sessions consisted of review and discussion of several interview transcripts to limit investigator biases and strengthen credibility of the findings. No new data were revealed towards the end of data collection, indicating theoretical saturation. To determine intra-coder reliability, an additional researcher with experience in qualitative research coded a random sample (n=5) of participant interview transcript sets using the finalized codebook. She and the primary investigator discussed codes and drew consensus on any discrepancies in coding schemes or interpretations.

3.5 Results

3.5.1 Participant and Household Characteristics

Mothers' (n=27) socio-demographic and household characteristics are shown in Table 3.1. About two-thirds were currently living in urban areas. Most mothers were from states in Southern Mexico, particularly Oaxaca (n=10) and Puebla (n=9). They were young when they immigrated to the U.S., had low levels of education, were currently married or living with a partner, and were either not in the labor market or working part-time. Very few worked fulltime or were unemployed. Most mothers reported being food insecure during childhood in Mexico. At the household level, mothers had a median of two children, reported a household income of about \$1000 U.S. dollars a month, and lived in urban areas. Most mothers and/or their children were receiving WIC, but only about half of mothers reported their children's participation in SNAP. Almost half of households were food insecure. Two participants in the study had been in the U.S.>10 years, something not clear at the initial point of recruitment. Because they were genuinely interested in participating, we did not turn them away but instead completed all three interviews and included them in the analyses to provide additional comparisons.

Table 3.1: **Characteristics of Participant Mothers**
(n=27)

Participant Mothers	Median Years (Range)
Age	30 (22-41)
Age at immigration	22 (13-35)
Education	9th/10th grade (3rd grade-bachelor's degree)
Years in U.S.	9 (2-16)
	Number of participants
Married and/or living with partner	24
Working fulltime	4
Working part-time	8
Not in labor force	11
Unemployed (or few hours due to seasonality)	4
Food insecure in childhood	19
From southern Mexico (Federal District, Oaxaca, Puebla, Veracruz)	24
Child(ren) born in Mexico (living in Mexico or U.S.)	6

Table 3.1 – continued from previous page

Household Composition	Median number (range)
Children	2 (1-5)
U.S.-born children	1.5 (1-5)
Household size	5 (3-7)
Household Economics	Median U.S dollars (range)
Median monthly income	1,000 (0-2,399)
	Number of households
Employed partner in household	24
Non-nuclear family members in household	11
Live in urban areas	20
Receive WIC	22
Receive SNAP	14
Currently low or very low household food security	11
Currently low or very low child food security	10

3.5.2 Emergent Themes

Five themes emerged from these analyses of cultural and life course influences on food provisioning by Mexican-origin mothers in the U.S. For an expanded list of relevant quotes, see Appendix B. All themes related back to mothers' overall priority of providing home-cooked meals for their families. In order to develop and demonstrate relationships between concepts in our data, we used three key life course perspective concepts as a guide: social context, transitions, and turning points. The first three themes are part of the social context of mothers' lives in Mexico: food insecurity experiences in Mexico, agrarian experiences in Mexico, and traditional foods and flavors. The fourth theme, motherhood, was a life course transition. The fifth theme, health events, was a turning point in several mothers' lives.

3.5.3 Social context: social class and origin culture

3.5.3.1 Theme 1: "More possibilities here than there"

Socioeconomic class in Mexico and origin culture substantially influenced how mothers perceived their situations in the U.S. and how they responded with provisioning food for their families. Most mothers reflected on experiences of poverty and economic struggle growing up in Mexico, attributing limited income to erratic employment, often dictated by seasonal fluctuations in rainfall that impacted agri-

cultural income. Food insecurity experiences were common, particularly in early childhood, and characterized as lacking a variety of food, though some mothers recalled episodes of lacking any food and being hungry.

...we grew up very poor, we didn't have too much to eat, no ... there were no fruits at home, there were no vegetables, it was just a meal, like a soup. A plate of beans, tortillas. Always the tortillas, that we did, always. But a plate of beans, rice, and it was rare that we ate things like chicken, once a month or ... or it took long. [#0025, 9 years in U.S., 2 children]

On a daily basis in Mexico, mothers and their families relied on what they termed food "basics," such as beans, tortillas, and chiles, which were economical yet filling. Other food basics for some mothers included tomato salsa, eggs, cheese, rice, potatoes, nopales (cactus), squash, and watery soup (broth). Mothers remembered food variety, particularly meat and produce, in Mexico as being limited by income, availability, access, and affordability. Most mothers recalled eating meat and produce infrequently, anywhere from monthly to every few months. For many, life improved when they or their siblings were old enough to work and contribute to the household income, or when older siblings or their fathers migrated to the U.S. to work and send money back to their mothers for the household.

[Lacking food] was when I was little, when me and my siblings were very

young...from more or less five to ten. Ten, eleven years, because, my older sister started working, and economically it helped my dad a little bit. Then, afterwards, followed my other sister, even more help. Then there was my brother and the third one, the three oldest, and we didn't suffer anymore, we slept better. There was enough. It was always from five to twelve years old, eleven years or less. [#0017, 10 years in U.S., 2 children]

Regardless, most mothers perceived life to be better than the life they remembered in Mexico. Compared to Mexico, employment in the U.S. was more ubiquitous and reliable which meant a more steady and sufficient income. In addition, unlike Mexico, government support in the form of federal food and nutrition assistance programs like SNAP and the Supplemental Nutrition Program for Women, Infants and Children (WIC), were a welcomed relief for feeding their children when they qualified for these programs. Lastly, mothers perceived food to be more affordable and accessible than in Mexico. As a result, mothers expressed great value in the opportunities that were available in the U.S., compared to Mexico, to provide children with more food variety, particularly meat and produce. In the U.S., they provisioned meat, fruits, and vegetables for their children in larger quantities and with greater frequency, than what they recalled having during childhood in Mexico.

Because there's more work here... better benefits for you, for the children but not in Mexico because the kids suffer more. They have no help for not even for a doctor, nothing. [As for food,] well, the same. You eat beans, cheese, eggs, a little. You don't eat fruits as much, less, yogurt, little as well, but not here because we eat cheese and yogurts...for the kids, everything, it's much different than Mexico. [#0018, 9 years in U.S., 4 children]

Likewise, due to their food insecurity experiences in Mexico, mothers demonstrated adeptness at coping with seasonal unemployment and higher fresh food prices in the U.S. They primarily prepared home-cooked meals for their families and regularly provisioned 'food basics' as a means to save money. During periods of limited income, especially with seasonal unemployment, mothers relied more on food basics. Similarly, mothers accessed monetary savings they had purposefully stocked during more comfortable economic times, usually in warmer months when employment was steady. Consequently, for many families, diets were less diverse in the winter.

3.5.3.2 Theme 2: "We like to do things ourselves ... we like to have things from the land"

Mexican-origin culture influenced mothers' partiality to certain food characteristics and food acquisition practices when feeding their families. Most mothers

lived in rural areas or smaller towns in Mexico, and recalled agrarian experiences during their childhood. Yet, several mothers from urban areas in Mexico also spoke about exposure to agrarian lifestyles through open-air markets, fruit trees, butcher shops, and/or family members living in rural areas.

We used to eat, like I said before, um, if we didn't have the money to buy, we just used to eat the leafy greens because...the town that I lived, you know, everything could grow more and better – there were like leafy greens that we could go and take and eat, with probably beans most of the time and tortillas most of the time. [#0029, 8 years in U.S., 1 child]

Consequently, mothers favored provisioning fresh produce over canned or frozen. In fact, there was a certain level of distrust of canned, frozen, or packaged products for many mothers, skeptical of preservatives that may have been added. They often spoke about fresh produce (and meat) as being more 'natural,' and something better for their children.

...because as far as the nutritional aspect [the fresh produce is] very good, because, uh, you have to look for things to eat that are more natural so you don't get sick as often. That would mean fewer trips to the doctor. The more natu-

ral foods you eat, the less you go to the doctor. [#0023, 8 years in U.S., 1 child]

Thus, they sought opportunities to cultivate fresh produce whether they lived in urban or rural areas in the Hudson Valley. For example, many urban mothers accessed in-season produce through reduced-cost agricultural programs, like sliding scale Community Supported Agriculture (CSAs), farmers' markets, or U-pick farms. The latter also became an entertainment and educational experience to share with their children. Some urban and rural mothers acquired free fresh produce through their own farm employment, or through that of a spouse, friend, or relative. Other mothers planted their own gardens. In urban areas, gardens were smaller and less diverse due to the space constraints associated with living in apartments in higher density areas. These mothers planted food basics like tomatoes and chiles, while mothers in rural areas had larger yards supporting production of a greater quantity and variety of produce.

...we like to do things ourselves. We like to have our vegetables, our food and also um...we are like this, we are farmers and we work the land. And...and we like it, we...we like to have things from the land, like fruits and vegetables. It makes us feel happy. [#0037, 7 years, 1 child]

Provisioning fresh, local, and in-season produce was not just a source of value

fulfillment, but also a means of beneficial household resource management. For mothers with gardens or mothers that worked on farms, or had spouses that worked on farms, they relied heavily on free produce during warmer months in order to save money for other expenses and/or for winter.

Well, I would have liked to have taken photos of how I have my food in the ranch so you could see it all...all kinds of things we can get for free from there, tomatoes, fruits, peaches, everything, yes...[it's] important because I could show you that there at the ranch, where my husband works, we can save money and get healthy foods and...without paying. [#0014, 7 years, 2 children]

In addition, excess produce from gardens, U-pick farms, or farm employment could be frozen for use in winter when fresh produce was more expensive. While not all mothers froze in-season produce for later use, the few that did had strategies for the best, most appealing way to use the frozen produce in meals, such as soups, smoothies, or baking. In contrast, a few mothers experiencing food insecurity at the time of our interview noted that the lack of agrarian opportunities for them in the U.S. only exacerbated periodic economic hardships; they felt helpless in an already dire situation.

Back in the lots where we would work and all that, we always had what we needed at home; we had everything we needed. But here, if there's no money to go shopping, we can't buy what we need. Even if you're in need...I feel as if my hands are tied, because if I could I would plant, but when you can't you have to find a way to buy it...well, there was always food back in Mexico and when there was no money, at least there was always something to give the food flavor so it wouldn't taste bland, odorless, and not have to not want to eat it. [#0004, 6 years in U.S., 2 children]

3.5.3.3 Theme 3: "It feels...as if I were home"

In addition to impacting preference for fresh foods, origin culture shaped mothers' prioritization of provisioning traditional Mexican foods. They valued the traditional foods and flavors of Mexico. Preparing traditional foods elicited fond childhood memories of family members and events, evoking a mixture of feelings about the distance that now separated them from their family and country.

Oh my God! The taste, yes, because when I make something I remember what ingredients my mom used for making the food and um a lot of products I have it here. So, it's not the same taste but it's similar...when I'm making these foods, I remember my country. Especially my mom when she [was] cooking, and when we were little, yes. [With a meal like this, I feel] a lot of emotions,

sad, happy. Sad, because I miss my mom...happy because it's nice to have here...ingredients to make it, this soup, the chilaquiles. I say, it's not the same taste but it's similar. [#0006, 10 years in U.S., 1 child]

Preparing traditional foods was also a means to maintain Mexican culture and share it with their children. Many mothers demonstrated pride in preparing foods for their children that their mothers also provisioned for them as children, continuing a tradition to the next generation so that their children would not forget their Mexican heritage.

To not let my cultural roots die, where I come from – always remember the way my grandmother and mom cooked and kept the tradition alive...that my children, that my children learn how to eat Mexican food...that if someday they decide to go to Mexico and visit, they dare to order some dish that they don't know – and they don't ask, "how is it made? What does it have?" Because they know the dish and they have tried [it] at their mom's house. [#0032, 9 years in U.S., 3 children]

An additional benefit to provisioning primarily traditional Mexican food is that food basics mothers were accustomed to using and eating were readily available, affordable, and accessible, even though they made a trade-off with taste/flavor

since these foods were not quite the same as they remember in Mexico. In addition, because their economic situation in the U.S. was better and foods were more affordable, they were able to make more elaborate traditional meals (e.g. dishes with meat) more often. In Mexico, these types of meals were only for special occasions.

Over there [in Mexico, we ate chicken with mole and rice] once a week or at every party, whenever there was a party. Here? Well, you eat it more often than over there. You can eat it here daily, meals that...you don't eat in Mexico...because there's money, you have the possibility to buy things. But not in Mexico, because you know how much a pound of chicken costs? Infinite. But not here; as you can see, you can buy a lot of stuff. [#0018, 9 years in U.S., 4 children]

3.5.4 Transition: motherhood

3.5.4.1 Theme 4: "Before I had my [child] I didn't care how I ate."

The fourth emergent theme is related to a key construct of life course perspective that demonstrates the typical shifts that occur in life: transitions. In this case, motherhood was the role shift that changed food provisioning. With this transition, mothers placed a greater value on nutritious food since they were now

feeding a developing child, not just themselves. Most mothers experienced this transition in the U.S., but even for those that initially became mothers in Mexico, they had young children in the household in the U.S., which resulted in shifts in information and services. Mothers had expanded access to nutrition information that they did not have before their children were born, since children under five and U.S.-born children provided a gateway to previously untapped food and nutrition programs. Nutrition and/or child feeding education was almost always paired with financial support in the form of WIC checks, SNAP benefits, or Head Start meals. Local Head Start and maternal and child nutrition organizations also often offered home visiting services to monitor child development metrics in conjunction with providing education.

Well at the beginning, then yes, no? As everything, we arrived with nothing. We didn't have anything. So then we had to work, save money and fill the pantry...stock up like I stock up now. Well, no I'm able to stock up much better because then also they are giving me help through [SNAP], but before when I didn't have them, yes, it was more difficult. It was more difficult than now. [#0008, 12 years in U.S., 3 children]

Combined with the role transition into motherhood, this new access to information and services heightened the felt necessity for mothers to prioritize preparation of home-cooked meals and learn relevant skills for doing so. As a result, food provisioning changed in quality and process. Prior to children, some moth-

ers ate more "from the street" and often did not acquire healthy food to prepare at home. While others had prepared food at home or lived with someone that had been responsible for food preparation, transitioning into motherhood still introduced new considerations for food acquisition and preparation, such as child preferences and an added emphasis on nutritional value of foods.

Only sometimes...I prepared [homemade] tortillas, but only very few times...my sister who was still single...we were alone and I didn't eat too much Mexican food, maybe because I was alone, and at my job I would say, "Oh, a sandwich, or oh, a hamburger." But now I want my son to eat better and I want him to eat good food, not so much processed food. [#0037, 7 years, 1 child]

Once pregnant and then with the birth of their children, access to prenatal care and food and nutrition programs informed mothers of healthy ways to feed their children, while also encouraging them to seek and test out new strategies for shopping and preparing foods. They acquired more fruits, vegetables, whole grains, milk and yogurt, and lean meats to prepare at home, and they ate out less. Ultimately, motherhood for these mothers led to healthier, more economical food provisioning practices.

My life changed a lot after my son was born because, before I had my son, I didn't care how I ate. But after having my son I have learned many things.

Why? Because they come from [Head Start] and tell me, like that about [a local nutrition program]. Then they'll explain what I should feed him, how I should feed him, what's good for him, because what I eat he eats. If I eat things that are high in fat, all that, it affects him. For example, that food from McDonald's, fast food, that's very bad for [children] so I'm working on that. [#0006, 10 years in U.S., 1 child]

3.5.5 Turning Point: health events

3.5.5.1 Theme 5: "We are healthier and better."

The last emergent theme, health events, corresponded to an uncommon event according to life course perspective: a turning point. While health was an important influence in how almost all mothers discussed provisioning food for their families, a few mothers spoke of significant personal, spousal, and/or child health events that drastically changed the way they provisioned food for their families, often even abandoning some traditional but less healthy Mexican food and food preparation practices. Mothers experiencing this turning point mentioned provisioning fast food and fried food more frequently prior to the change. After the health event, they began acquiring more fruits, vegetables, leaner meats, and fewer packaged or pre-prepared foods. They also prepared more food at home, instead of eating fast food or eating at restaurants, and switched to healthier food preparation techniques (e.g. baking, roasting) instead of frying.

It's been around a month and a half since [my husband] went to see the doctor, and he told him it's been a huge breakthrough. And he even congratulated him, because he said this thing about...changing a food like we have, we grew up with this, to a meal that is only vegetables and they're things that don't have too much fat, and no more sodas, coffee, nothing. He says this is...it's very hard. [#0003, 8 years in U.S., 1 child]

Mothers discussed the turning point process as gaining nutrition knowledge, accumulating new food preparation knowledge and skills, and adjusting their food-shopping strategies and budget to accommodate the turning point. Healthcare providers diagnosed the health issue, and then provided basic education on the connection between nutrition and health outcomes. Home visiting programs and nutritionists helped mothers gain new knowledge and skills in putting this education into action at home. Mothers affected by this turning point perceived that the change was positive, both to the health of their family and to their household budget. As a result, mothers were extremely happy with the results of the changes and planned to continue provisioning food in this way.

At first it was a lot because I tell you, I felt I was spending more to buy – that is to say...instead of buying so many vegetables I bought nuggets or hamburger meat – so you don't spend that much [laughs] because...there is that type of food and it's very cheap. But buying more vegetables sometimes – yes one spends more. But when...one makes the purchase, it's a lot. But preparing it

and all that, I tell you, [there's] leftovers, and one stores it properly – and one continues eating, perhaps the next day the same [thing], and one would save [an extra] meal. [#0023, 8 years, 1 child]

3.6 Discussion

Providing low income, Mexican-origin mothers with the opportunity to demonstrate perceived influences on feeding their families, through both participant-driven photo elicitation and semi-structured interviews, revealed the critical roles of social context and culture at the point of origin, motherhood, and major health events in shaping food provisioning values and strategies here in the U.S. Most mothers experiences with economic hardships in Mexico provided context for their current low-income situation in the U.S.; they valued the increased opportunities to find employment, earn a higher income, access food and nutrition assistance, and feed their children greater variety than they had in Mexico. In other words, despite being low income and encountering income fluctuations due to seasonal employment in the U.S., most perceived their lives as better and with more opportunity, both in the present and future. And with the transition into motherhood, these women capitalized on newly available and accessible nutrition resources to feed their children a greater variety of food and a more balanced diet than they were afforded as children in Mexico.

These data confirm findings in the existing literature on food provisioning strategies for food insecurity among low-income, Mexican-origin Hispanics, as well as with White, Black, indigenous, urban, and rural populations in the North America. Limited evidence exists for food provisioning-related coping strategies among other foreign-born groups.⁵³ Previous studies documenting coping strategies for food insecurity revealed that low-cost food staples,^{8,18,20} gardening,^{13,16,17,19,54} farmers' markets and CSAs,¹⁹ food gathering,^{15,21} hunting and fishing,^{15,16,19,21} saving/preparing for winter or emergency,²¹ and home food preparation^{15-17, 21} were food provisioning-related coping strategies used by at-risk households. Previous North American studies on household food provisioning, particularly as it relates to food security, revealed greater participation in home gardening among low-income, rural residents compared to low-income, urban residents.^{15,16,19} While these studies did not directly consider life course as an influence, the findings, combined with ours, imply that home gardening may be an acceptable food provisioning strategy for individuals having spent some portion of their life in rural areas, or with agrarian experiences. Olson *et al* found that low-income, rural women with a vegetable garden had significantly greater household food supplies compared to women without a vegetable garden. Though the presence of a vegetable garden was not associated with food security status, the contribution to household food supplies reiterates the importance of this food provisioning strategy to low-income households.⁵⁵ However, investigators found fewer differences between rural and urban residents for other food provisioning strategies, also documented in our data, such as home food preparation strategies and specifically

seeking out fresh, local produce.^{15,16,19} Thus, rural or urban residence may only partially reveal potential influences on protective household food provisioning strategies, and life course may be equally important, particularly for foreign-born households.

Our findings emphasize and elucidate the important role of life course on Mexican-origin mothers' food acquisition and preparation practices and strategies in the U.S., a perspective not previously considered among a vulnerable population, mostly migrating in search of greater economic opportunities compared to the poverty of their home country.⁵⁶ A recent study of at-risk individuals in South Carolina also demonstrated the importance of considering food insecurity in the broader context of the life course, since the participants' current situations were better understood when important life events were identified as influential to both their food security and management of related circumstances.⁵⁷ Our participants' framing of their situation in the U.S. in the context of their formative years in Mexico was highly influential to how they perceived and acted upon opportunities to feed their families. Notably, most participants were from poor, rural areas of Mexico, where home food production and acquisition of fresh, local foods were pivotal for feeding a family, experiences that continued to influence their food provisioning preferences. Most commonly, mothers in our study provisioned similar food basics that they recalled regularly eating in Mexico. Relying mostly on a small group of basic foods during periods of food insecurity displays a culturally-appropriate strategy to ensure the family has enough to eat. These foods were

used to prepare meals with traditional flavors, an important concept to consider since culturally-acceptable foods are an important component of food security,⁵⁸ and because traditional dishes were meaningful in ways beyond just adequate nutrition for their families. Preference for⁵⁹ and provisioning of²⁵ culturally-familiar ingredients among Mexican-origin households, especially as a means to stretch the food dollar and periodically cope during difficult economic times, has been previously documented, and is not surprising given the social context of growing up in Mexico and regularly provisioning food basics as a way to fill the stomach and alleviate hunger.^{25,60} To the best of our knowledge, our study is the first to report specific food provisioning practices and strategies of low-income, foreign-born women in the context of their agrarian backgrounds, though researchers acknowledge the difficult shift in food provisioning that the foreign-born must make in order to settle in a new country.^{61,62}

For mothers experiencing or at risk of food insecurity in the U.S., these episodes were seasonal and typically tied to employment fluctuations. Several other qualitative studies support our findings that unstable employment facilitates periods of food insecurity for foreign-origin Hispanics in the U.S.^{8,23,54} Among seasonal and migrant farmworkers in North Carolina, even those households that had not experienced food insecurity were aware that it was a possibility. Respondents of households with children, most of which were women, were careful in managing household income to prepare for a potential job loss. Similar to our findings, participants reported purchasing and preparing more economical foods, like soup,

potatoes, and beans, as a means to stretch their food dollar, and maximizing opportunity by using available space for gardening. The authors posited that the capability of mothers to manage household resources through a variety of budgeting, saving, and economizing strategies may be related to their formal education level.⁸ Previous studies have demonstrated that lower maternal education is significantly associated with lower household food security.^{3,9,63,64} While the qualitative design of our study prevented us from demonstrating a statistical relationship between food security status and mothers formal education levels, our findings suggest that mothers abilities to manage household resources may not necessarily be related to formal education, but rather to pertinent life course experiences and corresponding personal values. Mothers approaches to food provisioning in difficult economic times relied heavily on experiential learning both in Mexico and over time (e.g. stocking non-perishable food basics; saving money in summer; acquiring reduced-cost, in-season produce).

Experiences in Mexico yielded a strong preference for fresh food, regardless of rural or urban origin and rural or urban residence in the Hudson Valley. Several published studies support these findings and further emphasize the critical function of considering life course when understanding foreign-born values and behaviors. First, the perceived quality of available food in the U.S appears to be situated in the context of previous life experiences. Foreign-born Brazilian, Latin American, and Haitian women expressed their belief that food from their home countries was more 'natural' and healthier than food in the U.S. because

it was produced with fewer chemicals.⁶⁵ Foreign-origin Hispanic women, including some from Mexico, living in Massachusetts perceived meat and poultry to be of lower quality and lacking freshness and flavor than what they remembered in their countries of origin, despite food overall being perceived as more affordable in the U.S.⁵⁹ Mexican-origin Hispanics also complained of meat and poultry containing chemicals for preservation and having a 'chemical' taste.^{25,59} Likewise, Park *et al* found that foreign-born Hispanic women discussed nutritious food in terms of freshness and lacking preservatives and processing.⁶⁶ Second, the way in which food is provisioned appears to be as important as the food itself. Quandt *et al* found that 40% of sampled Mexican-origin migrant and seasonal farmworkers in central North Carolina gardened, though gardening was not significantly associated with household food security status.⁸ Similarly, Mexican-origin Hispanics from Oaxaca and living in California mourned the loss of their agrarian lifestyles in Mexico and the affordance of gathering wild foods and growing their own produce.⁶⁰ Interestingly, Mexican-origin and Mexican American participants in Texas also recalled agricultural lifestyles in Mexico, including planting and growing crops, eating seasonally, and eating natural and fresh. Yet, once in the U.S., they reported almost no seasonality to food,²⁵ perhaps due to milder winters in Texas. The latter emphasizes the potential regional differences that the foreign-born encounter upon immigrating to the U.S., an influential factor on food security.²⁷

Framing current food provisioning practices in the context of life course may fa-

cilitate more effective programs, while also helping clarify the impetus for food-provisioning preferences and practices. Several other studies found that Mexican-origin and Mexican American mothers in the U.S. desired to feed their children a greater quantity of higher quality food, such as fruits, vegetables, and meat.^{25,67} Similarly, some foreign-born women perceived shopping for food as easier in the U.S. than in their countries of origin, since there was always money to buy good food and food was more available^{25,59} and affordable.⁵⁹ Analysis of nationally representative, cross-sectional data demonstrated that households with foreign-born reference persons prepared significantly more dinners in the home compared to households with U.S.-born reference persons. Similar differences were seen between households with and without dependents present.⁶⁸ Concurrently, the foreign-born must adapt to a new environment and culture using knowledge, skills, and ideals developed in a different context. Several studies with foreign-born participants revealed the difficulty in balancing the desire to prepare home-cooked meals with the realities of a time-constrained lifestyle in a Western country.^{65,69,70} Likewise, time spent in food preparation appears to differ between foreign- and U.S.-born Hispanic mothers, between Hispanic ethnic groups, and between working and non-working Hispanic mothers.⁷¹ These data support the need for future consideration of life course influences on food provisioning preferences and strategies, and how they relate to maintaining a food secure home, particularly among the foreign-born.

Perhaps more importantly, mothers in our study were willing and able to trans-

form these few foods into acceptable meals with traditional flavors. They reported infrequently dining out or provisioning fast food or take-away food for their families. Much like predominately foreign-born Hispanic women from other studies, food preparation was a sacred task performed with pride,^{25,49,59} and a means to cope with food scarcity and economic hardship, indicating their perception that there is always something to eat.⁴⁹ Johnson *et al* also reported that very low income Mexican-origin mothers, living along the Texas border with Mexico, prioritized home-cooked meals for their children, and suggested that home-cooked meals may have been a way to mitigate their families' experiences in poverty.⁷² However, a focus group study with low-income Mexican-origin and Mexican American participants in the Brazos Valley of Texas, an area about 100 miles northwest of Houston, revealed that despite performing some home food preparation, participants ate fast food or dined out weekly, ate fewer vegetables than in Mexico, and frequently provisioned frozen and ready-made meals. A potential influence is that these participants reported irregular work schedules and multiple jobs as a time constraint for purchasing and preparing food,²⁵ an issue not discussed by participants in our study.

Thus, regional variations to food provisioning practices and strategies among Mexican-origin Hispanics are important to consider in order to develop culturally-tailored programs for reduction and prevention of food insecurity. Additional work in Texas revealed that households with higher food security in *Colonias* along the Texas-Mexico border were more likely to purchase prepared foods

from friends and neighbors than food insecure households.⁴ Mobile food vendors, selling inexpensive fruits, vegetables, and prepared foods, and *pulgas*, or flea markets, were also important alternative food sources in the Colonias.^{4,73,74} In North Carolina, seasonal and migrant farmworkers reported informal borrowing agreements, as well as supplementing with wild game and fish when food supplies were running short. Local hunters provided the farmworkers with hunted deer and turkey while household members caught fish. They were able to keep these food sources frozen until needed.⁸ One urban participant in our study shared that her husband fished regularly at a local lake and this fish was not only a source of free, nutritious food, but also a way to stretch the household food budget. Yet, overall, the majority of provisioning strategies for these New York State mothers focused on acquisition or cultivation of in-season produce, preparation of home-cooked meals, and access of food and nutrition assistance programs.

Across participants, the transition to motherhood was an incredibly influential factor in food provisioning, in that it prioritized food preparation and expanded their access to both nutrition knowledge and economic assistance. Additionally, knowledge gained from previously untapped food and nutrition assistance programs enabled mothers to improve and diversify their food provisioning practices, particularly among those mothers experiencing a turning point due to a major health event. Though we did not explore it as a part of this study, mothers likely shifted their perception of food adequacy and quality due to access to nutrition programs. Dean *et al* demonstrated this in their account of Mexican-origin

Hispanics perceiving beans as nutritious in the U.S. versus filling when they lived in Mexico.²⁵ Likewise, a foreign-born Arab sample in Canada reported a shift in their awareness of the nutritional value of foods after arriving in Canada, with some incorporating more healthful Western foods into their diets.⁷⁵

Much like other studies with Mexican-origin Hispanics,^{8,23} participation in WIC was higher than participation in SNAP, potentially due to SNAP eligibility requirements,²² parental fear due to documentation status,^{76,77} institutional policies,⁷⁸ or few trustworthy, culturally responsive service providers.⁷⁹ Several participants in our study, when asked, either did not know about SNAP or expressed hesitation in applying because of rumors of participation affecting documentation status. By law, immigrants are eligible for SNAP benefits if they have citizen children or have resided in the U.S. legally for at least five years²² For our participants who were eligible, WIC and SNAP served as important resources for helping them feed their children, which is distinct from the Mexican-origin farmworkers in North Carolina, who reported participating in WIC and SNAP but did not speak about it in interviews as a way to supplement food for their households.⁸ Therefore, results from our study in New York reveal a potential, critical variation by region. While participation rates for SNAP are slightly higher in the Southeast region of the U.S. compared to the Northeast, these numbers are representative of all eligible and participating persons⁸⁰ and may not account for regional variations in marginalization of Hispanic immigrants.

This study has several notable strengths. First, it is the first to document cultural and life course influences on food provisioning among Mexican-origin mothers. Identification of these important influences is critical for reaching this often marginalized and at-risk population. Second, there are limited studies documenting food provisioning related to food security among Mexican-origin Hispanics in the Northeast U.S. and most are quantitative, limiting understanding of the processes at work in food insecure households.^{11,81,82} As seen from our results, food provisioning among Mexican-origin Hispanics is likely distinct by geographical region of the U.S., an important consideration for developing targeted approaches to reduce food insecurity. Third, the inclusion of participant-driven photo elicitation allowed the participant mother to produce the photos and guide the interview content, producing an emic perspective. The photos also allowed for triangulation of data, confirming themes not only in words but also in pictures. We were impressed by the similarity of the photos participants decided to take, attesting to the profound influence of social context and culture, and motherhood in the way they provisioned food. Last, each participant mother was interviewed three times. Thus, we were able to obtain rich, detailed accounts of life in Mexico and the U.S., while building trust and rapport with mothers.

Limitations of this study include a small, convenience sample and limited generalizability to the Lower Hudson Valley of NYS. Mothers that volunteered to participate may have been more motivated due to their own interest in nutrition. Likewise, some mothers working full time may not have participated due to time con-

straints. All full-time employed participants were from rural areas of one county where a unique stakeholder relationship developed in a community center serving immigrant farmworker families, and this person assisted in recruitment. Similar to many studies with immigrant populations, some eligible mothers may have refrained from volunteering because of documentation status and associated fear of being reported. In order to minimize this situation, we focused our recruitment efforts through trusted community stakeholders and re-assured eligible mothers that we would not ask about documentation status. Several mothers volunteered this information, affirming our assumptions that our sample contained a range of situations.

3.7 Implications

In light of the major migration shifts across the globe, framing nutrition behavior in the context of culture and life course has never been more important. These findings demonstrate several potential implications for creating targeted and culturally-tailored approaches,⁸³ preferably in concert with nutrition education and behavior change, to prevent and reduce food insecurity. Given that food provisioning is similar in many ways across low-income North Americans with agrarian life course experiences, efforts to reduce risk among Mexican-origin Hispanics may also be appropriate for other groups, especially the foreign-born. How-

ever, these considerations must be combined with local and regional situations to design and implement effective programming. First, culturally-appropriate outreach programs can assist households in managing resources, especially saving and preparing for seasonal unemployment, in order to prevent food insecurity. This includes, but is not limited to, increased participation in federal food and nutrition assistance programs for those who are eligible; enhancement of household budgeting and resource management skills; creation and/or identification of programs offering affordable, in-season produce; promotion and support of home food cultivation and preservation; and strengthening of food preparation knowledge and skills suitable to the U.S. food environment. Second, food insecure Mexican-origin mothers reported lacking variety and balance in food and meals they were able to provide their children, a finding previously documented quantitatively among Mexican Americans in California.^{3,5} Thus, future efforts must address access, affordability, and availability of nutritious foods that align with cultural preferences. Likewise, immigration reform is necessary to improve the livelihoods of these families. Documentation status, stable employment, and fair pay would greatly assist foreign-origin families in adequately and sufficiently feeding their children so that they can be the next generation of healthy, productive members of society.

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CHAPTER 4

**FOOD INSECURITY RISK AND PROTECTIVE FACTORS AMONG
MEXICAN-ORIGIN HOUSEHOLDS IN THE U.S.: A MIXED-METHODS
APPROACH**

4.1 Introduction

Food insecurity refers to individuals consistently lacking “physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life.”¹ In the U.S., Hispanic households have a higher prevalence (22.4%) of food insecurity compared to non-Hispanic white households (10.5%).² Published prevalence of household food insecurity among Mexican-origin Hispanics is even higher, ranging from 30% to around 50% in studies in California, Minnesota, North Carolina, and Texas.³⁻⁸ Studies of households with Hispanic-origin mothers, primarily from Mexico, also show that greater risk of household food insecurity is associated with fewer years in the U.S.,⁹ limited English proficiency,^{7,8,10-12} and limited formal education.^{7,8,10-12} Furthermore, remittances sent to family members in other places¹³ may limit the amount of resources that can go towards food. Since Hispanics of Mexican origin or Mexican descent make up the largest proportion of Hispanics,¹⁴ more needs to be elucidated about the relationship of food insecurity risk with their unique immigrant experience.

Likewise, children of Mexican-origin immigrants are at considerable risk, since the majority of children living in poverty in the U.S. are Hispanic^{15,16} and, of those Hispanic children, most have at least one parent originating from Mexico.¹⁵ Studies widely document the association of food insecurity with poor child physical health,¹⁷⁻²⁰ academic performance,^{21,22} psychosocial developmental challenges,^{19,21,22} and dietary intake.²⁴⁻²⁶ Specifically among Mexican-American children, studies show that children from food insecure households consume more fat, saturated fat, sweets, and fried snacks than children from food secure households,²⁶ and that greater food insecurity is also related to less variety of food,^{3,11} fewer fruits and vegetables,³ and less milk.¹¹

While the consequences of food insecurity on diet and health are well documented, more coordinated action and applied research is needed to reduce food insecurity. In 2010, the American Dietetic Association (now the Academy of Nutrition and Dietetics) released a position statement recommending several ways to reduce food insecurity, including adequate funding for food and nutrition assistance programs, food and nutrition education, and programs enabling economic self-sufficiency for individuals and families.²⁴ Food insecure households often employ a variety of coping strategies to help alleviate food insecurity, including participating in federal food and nutrition programs (e.g. Supplemental Nutrition Assistance Program (SNAP)), visiting food pantries, and using coupons.²⁷ Nord *et al* showed that SNAP ameliorated very low food security 20% to 50% in the short-term,²⁸ but some evidence suggests that SNAP use does not equate to a

healthy dietary pattern, particularly among Hispanics.²⁹ Studies also demonstrate that greater financial management skills among low-income households are associated with reduced food insecurity,^{30,31} and that nutrition education can improve food resource management skills.^{32,33} SNAP benefits combined with nutrition education that emphasizes food resource management may best serve to assist families in stretching their paycheck and SNAP benefits month-to-month,³⁴ while also improving dietary intake.

Recognizing cultural differences in household food provisioning is important for building effective approaches to reduce food insecurity among ethnic minority populations. The existing literature provides several examples of the differing food provisioning approaches employed by diverse households. Mexican-origin Hispanic households demonstrate a variety of food insecurity coping strategies that rely on social networks and creative food acquisition and preparation methods.^{7,35-38} Kaiser *et al* also found that Hispanic/Latino or female participants in a food and nutrition resource management class series demonstrated greater improvements in resource management skills than non-Hispanic/Latino or male participants, suggesting potential existing attributes within vulnerable households that can be strengthened to positively influence food security.³⁴ A study among diverse families with children enrolled in subsidized child care centers in Florida found that household food security status was associated with children's dietary behaviors but these associations differed by ethnicity, suggesting that food provisioning-related coping strategies also differed by ethnicity and food security

status. The authors found that food secure Cuban children consumed less unhealthy food than their food insecure counterparts, whereas food secure Haitian children consumed more unhealthy food and fruits and vegetables than food insecure Haitian children. For non-Cuban Hispanics and non-Hispanic Whites, there were no differences in these behaviors based on food security status.³⁹ Among low-income, pregnant Puerto Rican women in an urban area of Connecticut, the perception that nutritious foods, like fruit and fruit juice, were less fulfilling and less affordable led them to provision more of their traditional foods, like beans, rice, and meat.⁴⁰ In addition, low-income African American women in New York State elaborated on food management systems heavily reliant on several different generations of women in their families, evolving with the context of the family's current needs.⁴¹ Thus, culturally-relevant data that reveal both ethnic subgroup-specific protective and risk factors can contribute to culturally-tailored approaches for reducing food insecurity among Mexican-origin Hispanic families, a high-risk Hispanic subpopulation.

The objective of this study was to identify both factors that increase risk for and protect against food insecurity among Mexican-origin households, in order to provide culturally-tailored data for programming and policy efforts. A nationally-representative dataset and a qualitative sample of low-income, recent Mexican-origin immigrant mothers of young children worked in concert to characterize food security status and related food provisioning strategies.

4.2 Methodology

We conducted a mixed methods study of influences on food security among Mexican-origin households in the U.S., using a combination of the life course perspective^{42,43} and ecological systems theory⁴⁴ to guide our conceptualization of food security risk and protective factors. Qualitative interviews with low-income Mexican-origin mothers of young children first identified perceived influences on food provisioning strategies employed to maintain a food secure household. Findings from the qualitative data then guided variable choice for characterization of household and child food insecurity prevalence using the Current Population Survey (CPS). Further analysis of the qualitative data revealed human, financial, and cultural capital proactively employed and often protective against food insecurity. The Cornell University Institutional Review Board approved this study.

4.2.1 Qualitative data

4.2.1.1 Sampling and recruitment

Two adjoining counties (Dutchess and Orange) in the Hudson Valley of New York State (NYS) served as our study site. Comprised of a mix of rural, urban, and suburban areas,⁴⁵ these two counties lie in a region approximately 90 miles north of New York City (NYC). The investigators connected to county-level Cooperative Extension (CE) offices and local stakeholders working with Mexican-origin fami-

lies by capitalizing on the senior investigator's (JD) role in established CE activities and relationships. The primary researcher (AM) facilitated recruitment in the counties from June 2013 to May 2015 by strengthening and extending these relationships. Community outreach and relationship-building activities included, but were not limited to, attending regular advisory committee meetings, convening with community stakeholders, and participating in local organizational events. From January 2014 to May 2015, research staff purposively sampled women 1) born in Mexico, 2) with 10 or fewer years in the U.S., 3) residing in one of the two NYS counties, 4) with at least one child ≤ 5 years old, and 5) living at $<200\%$ of the federal poverty line. The sampling frame also considered rural versus urban areas of the two participating counties and eligible mothers with varying characteristics in terms of employment status, education level, household size, and social networks upon arrival to the U.S. The primary investigator (AM) accessed eligible women through community stakeholder organizations, key informants, and community events (e.g. summer meal programs for children). Research staff contacted by phone any woman that expressed interest in the study, in order to provide her with details about the study, answer any questions, screen, and enroll her, if she met all study criteria.

4.2.1.2 Qualitative interviews

Qualitative data collection included three interviews complemented by participant-driven photo elicitation.⁴⁶⁻⁴⁹ The primary researcher, a native English speaker bilingual in English and Spanish, conducted all interviews. A research aide whose first language was Spanish assisted. These research staff asked enrolled participants to complete three interviews at the participants preferred location (e.g. participants home, community center) and in the participants preferred language (English or Spanish). Each interview had a specific purpose and all three were completed within a two to three month period. Interviews lasted between one and two hours, with interview 3 usually being the longest. Participants received an honorarium after they completed each interview.

During interview 1, research staff collected informed consent and basic demographic information and provided instructions for taking photographs using a disposable camera given to the participant. They asked participants to take photographs of anything important to how they feed their family and children, and to complete the activity in one to two weeks. In order to ensure comprehension of the photographic activity instructions, research staff asked participants to give examples of photographs the participants would like to take. Furthermore, research staff instructed participants not to take photographs of faces in order to maintain the anonymity of the participants and their families. Research staff gave participants a written copy of the photo elicitation instructions and scheduled a time to

pick up the camera for photograph development.

Interview 2 was the participant-driven photo elicitation interview, completed approximately two to three weeks after interview 1. Photo elicitation uses photographs to help guide the interview, enhancing the traditional face-to-face interview method in that an image prompts greater brain capacity to process both words and images, resulting in the possibility of deeper, more extensive information being provided.⁴⁸ The method helps grasp both the “tangible and intangible” (p.1509) parts of a participant’s life through reflection and meaningful triggers not always revealed in a normal interview.⁴⁶ Furthermore, images facilitate improved communication and understanding because both participant and researcher can comprehend an image, despite possible cultural differences.⁴⁸ For this reason, photo elicitation was an appropriate choice for research in this immigrant community.⁴⁷ The participant-driven aspect of the photo elicitation interview method allowed the participant to produce the photographs, invoking an inductive approach to the data collection.⁴⁶ Participants thus had more control over the research process and were empowered to bring attention to issues they considered important.⁴⁹ Research staff asked participants to choose four to five photographs for discussion. In order to maintain the participant-driven aspect of the method, research staff engaged participants in talking about their photographs using the SHOWED method. The SHOWED mnemonic is represented in the following general questions: 1) What do you SEE here? 2) What’s HAPPENING here? 3) How does this relate to OUR lives? 4) Why does this issue EXIST? 5)

What can we DO about it?⁴⁹⁻⁵¹ Research staff asked each of these questions for each photograph, supplementing with study-specific probes when necessary. At the end of the interview, research staff gave the participant her set of photographs, but kept the four to five discussed for the study records.

In interview 3, research staff conducted a member check before beginning the semi-structured interview. The member check served to ensure trustworthiness of information collected during the photo elicitation interview. Interview 3 sought to gain additional insights and perspectives on the influences of the participant's life transition from Mexico to the U.S. on the quality and quantity of how they feed their children. The study investigator ended the interview by collecting household and child food security data using the 18-item USDA Core Food Security Module^{52,53} in the participants preferred language. Prior research evaluated validity of the Spanish version of the module across different Hispanic ethnic populations.⁵³

4.2.1.3 Qualitative analyses

Interview transcripts provided data for conventional qualitative content analysis, complemented by field notes providing contextual information. The research team used ATLAS.ti 7 to manage and analyze data. Conventional qualitative content analysis consisted of a series of steps: 1) audio-recorded interviews were

translated and transcribed verbatim; 2) transcripts were then checked for accuracy by a bilingual research assistant and the primary researcher (AM); 3) AM began coding transcripts in early stages of data collection to inform selection of participants and modification of interview guides; 4) AM continued iterative coding of transcripts related to the research questions, while also allowing for emergence insights, and identified preliminary themes; 5) peer debriefing sessions throughout the analytical process by the study investigators and the senior investigator's (JD) larger research team, including members with no affiliation to the project, served to provide critical feedback, limit investigator biases, and strengthen credibility of the findings; 6) no new data were revealed towards the end of data collection, indicating theoretical saturation, which allowed AM to solidify emergent themes; and 7) an additional researcher, with experience in qualitative research and no affiliation to the project, coded a random sample (n=5) of participant interview transcript sets using the finalized codebook to ensure intra-coder reliability. She and the primary investigator discussed codes and drew consensus on any discrepancies in coding schemes or interpretations.

4.2.1.4 Quantitative dataset

We analyzed data from the December 2013 Current Population Survey (CPS), a probability selected sample of approximately 60,000 U.S. households administered monthly by the U.S. Census Bureau.⁵⁴ The household reference person, re-

ferred to as the householder, is the primary person (or one of the persons) owning or renting the housing unit, > 15 years old, and eligible to work. A CPS supplement is administered each December to assess and report annual U.S. food security prevalence. The December supplement includes assessment of household, adult, and child food security using the USDA Core Food Security Module,⁵² as well as questions on food expenditures, federal nutrition assistance program participation, food access, food quality, and food safety. Household food security status includes a combination of the food security status of all adults in the household (10 questions) and all children in the household (8 questions). A final score classifies a household as being food secure (high or marginal food security) or food insecure (low or very low food security).⁵²

Based on other published studies on food security in Hispanic groups,¹⁰⁻¹² our qualitative sample socio-demographics, and available variables in the dataset, the following independent categorical predictors were tested for possible relationships with food security status: poverty level (130% Federal Poverty Line (FPL); 185% FPL; 200% FPL), characteristics of the householder (age, sex, education, marital status, employment status, <10 years in the U.S.), household characteristics (U.S. geographical region, household size, presence of children (<18 years old and ≤5 years old), Spanish-only spoken, and participation in SNAP and WIC), and food provisioning ("Last week, did you or anyone in your household buy food at a restaurant, fast food place, cafeteria or vending machine? (Include any children who may have bought food at the school cafeteria.)"). In addition, we

characterized median household income using the CPS income categories.

4.2.1.5 Quantitative analyses

We conducted two subpopulation analyses of total Mexican-origin households and Mexican-origin households with children. All data were exported and analyzed in STATA 13.1 (StataCorp, College Station, TX, USA). To calculate point estimates and variances, we added the CPS food security supplement household and replication weights, provided by the National Bureau of Economic Research,⁵⁴ to the dataset. Household weights provide representation for the total U.S. civilian population and replication weights estimate standard errors.⁵⁵ We used the STATA survey command (*svy*) for these analyses to account for the non-random nature of the data. In addition, because the analyses were with a subset of the population sampled, we used the STATA subpopulation command (*subpop*) for all regression models.⁵⁶ Because of the nature of the survey design, corrected χ^2 statistics were unavailable, so simple and multivariate logistic regressions were used to determine statistical associations between socio-demographic correlates, purchasing food out, and food security status. Results are presented as odds ratios (OR) and confidence intervals (CI), with significance level set at $P < 0.5$.

4.3 Results

4.3.1 Qualitative

4.3.1.1 Sample characteristics

The final sample of mothers (n=27) mostly originated from states in Southern Mexico, particularly Oaxaca (n=10) and Puebla (n=9) and had been in the U.S. a median of nine years (Table 4.1). Mothers were young when they immigrated to the U.S., had low levels of education, were currently married or living with a partner, and were either not in the labor market or working part-time. Very few worked full-time or were unemployed. Most mothers reported being food insecure during childhood in Mexico. At the household level, mothers had a median of two children, reported a household income of \$1000 U.S. dollars a month, and lived in urban areas. Most mothers and/or their children were receiving WIC, but only about half reported their children's participation in SNAP. Almost half of households were food insecure. Two participants in the study had been in the U.S. >10 years, something not clear at the initial point of recruitment. Because they were genuinely interested in participating, we did not turn them away but instead completed all three interviews and included them in the analyses to provide additional comparisons.

Table 4.1: **Characteristics of Participant Mothers**
(n=27)

Participant Mothers	Median Years (Range)
Age	30 (22-41)
Age at immigration	22 (13-35)
Education	9th/10th grade (3rd grade-bachelor's degree)
Years in U.S.	9 (2-16)
	Number of participants
Married and/or living with partner	24
Working full-time	4
Working part-time	8
Not in labor force	11
Unemployed (or few hours due to seasonality)	4
Food insecure in childhood	19
From southern Mexico (Federal District, Oaxaca, Puebla, Veracruz)	24
Child(ren) born in Mexico (living in Mexico or U.S.)	6

Table 4.1 – continued from previous page

Household Composition	Median number (range)
Children	2 (1-5)
U.S.-born children	1.5 (1-5)
Household size	5 (3-7)
Household Economics	Median U.S dollars (range)
Median monthly income	1,000 (0-2,399)
	Number of households
Employed partner in household	24
Non-nuclear family members in household	11
Live in urban areas	20
Receive WIC	22
Receive SNAP	14
Currently low or very low household food security	11
Currently low or very low child food security	10

4.3.1.2 Qualitative results

Mothers demonstrated various important attributes related to food provisioning for their households. Attributes included 1) resourcefulness and creativity with food provisioning; 2) valuing new knowledge and skill-building opportunities; 3) reflectiveness on poverty and food insecurity experiences; and 4) the ability to establish beneficial food-provisioning routines. Consequently, their food provisioning behaviors allowed them to meet theirs and their families' expectations while also stretching the household food dollar. All attributes and behaviors linked directly back to mothers' prioritization of food for their children over material goods and preparing and eating food at home, instead of "eating from the street." Thus, Mexican-origin mothers revealed financial, human, and cultural capital that may assist in protecting their households, particularly their children, from food insecurity. We present data using selected quotes with corresponding mothers' characteristics (time in U.S., number of children) and food security status (household secure (HFS), household food insecure (HFI), child food secure (CFS), child food insecure (CFI)).

Attribute 1: "I use my ingenuity." Mothers resourceful and creative approaches to provisioning food for the household served to stretch the household food dollar by minimizing food waste, preventing or using leftovers, and stocking up during periods of higher income, all the while appealing to the preferences of children and spouses and preventing boredom. Strategies to minimize food waste

included transforming perishable items into other forms, using food available in the household before buying more, and sharing excess food with friends and family.

...when it's the season when the tree produces peaches, we eat so many peaches that it gets to a point when we don't want to hear about peaches. So...when it's too many peaches and,...there is no way to eat it but we still have some, I start giving some to my friends or I cook it and I keep it and it lasts longer...I keep them in jars, like peaches in syrup, and you can keep them for a month in the refrigerator. And we can eat them; even after the season is over, we have saved peaches. [#0021, 8 years in U.S., 2 children, HFS, CFS]

Well, mostly the necessity of what are we going to eat – that makes me be creative and to save a little, that is if we need money to complete [a meal] we want. And that's what helps me, because, if I have beans and dough, then I won't buy additional things. Simply I will make the bean[s] and some tlacoyos (thick, corn tortillas filled with beans and/or meat) and the food is ready, yes. [#0014, 7 years in U.S., 2 children, HFS, CFI]

I'll say [to my kids], "We already have food at home or there's food in the house. I'm not going to spend more money out if we have food at home." And that's what I do. [#0017, 10 years in U.S., 2 children, HFS, CFS]

Mothers either liked or disliked food leftovers, a potential source of food waste,

and responded accordingly. Mothers disliking leftovers viewed them as food waste, and strived to prepare enough food for a single meal. Mothers viewing leftovers as an opportunity managed to dually maximize time and resources by modifying versatile ingredients (e.g. chicken, tortillas), cooked ahead of time, in different ways throughout the week. Regardless, providing varied meals, to prevent their spouses and children from getting bored, necessitated creativity in food provisioning.

I don't want leftovers; I try to cook just the portion that we need...because it is cheaper, because sometimes if I cook too much and it isn't eaten, I have to throw it away. So I try to cook just what I know we're going to eat, this way [an]other day I can cook different food. [#0032, 9 years in U.S., 3 children, HFS, CFS]

I boil the chicken and there are some dishes where you don't need to add the chicken from the beginning. And as it's boiled I can later cook it with different food and the dish isn't the same one. For example if I bought some breasts to cook them only on the grill it's usually some left and I can flake and prepare chili tacos and that's different. It's the same chicken, but it's different. And with the vegetables, I just boil them...but I get some left, and I can use them for a vegetable soup. So I can be looking for the way they don't get bored of eating the same food. [#0023, 8 years in U.S., 1 child, HFI, CFI]

Furthermore, some mothers were affected by limited income from seasonal em-

ployment and expensive, fresh produce during the winter. In response, during warm months with higher income, they often set money aside for winter, stocked up on non-perishable food "basics," or froze fresh, affordable, seasonal produce for use in the winter.

Yes, because my husband works...and I work...so it's enough for both of us and like for the winter, we save for rent and stuff. We can afford to save a little for winter and it's enough for everything. [#0024, 17 years in U.S., 3 children, HFS, CFS]

I wanted to share something that...we cultivate in the summer...it is to see how we [freeze] this and therefore no longer need to buy in the winter, because right now it is very expensive. [#0026, 9 years in U.S., 2 children, HFI, CFS]

...when you go to the stores that they sell bags, the small packets [of dried chiles and seasonings] and sometimes like I say you get them when you have [money]...when you have money you buy what is necessary. And you keep it stored, and we take all that stuff out when it's time to use it, when we need them because when we have to do something we take out all those ingredients. [#0030, 10 years in U.S., 1 child, HFI, CFI]

While economic necessity drove resourcefulness and creativity with managing household food provisioning for most mothers, success in doing so also seemed to

result in a renewed sense of self, especially as their role as primary food provider. As one mother stated, "...it increases ones self-esteem if people like what I make." Providing food they felt good about, and that their families enjoyed, strengthened their food provisioning self-efficacy, and appeared to be related to their desire to further develop food provisioning knowledge and skills.

Attribute 2: "In all things in life, one is never done learning." Situated in the context of their migration from Mexico to the U.S., most mothers strongly valued new knowledge and skills about nutrition and food provisioning. Mothers noted increased access to opportunities to gain knowledge in the U.S. compared to Mexico and they reported intentionally seeking out new knowledge and skills, as a result of valuing this access. Family, friends, media, and food and nutrition assistance programs were the primary sources of knowledge and skills. Despite being low income, mothers highly regarded new knowledge, since putting it into action was more feasible with a better household economy and increased food availability in the U.S. compared to Mexico. Nutrient and health qualities of foods, satisfying family preferences, and becoming a mother promoted knowledge- and skill-seeking behaviors.

The information of what vegetables have, that I know what has more nutrients, [has helped me achieve using them more in meal preparation] so the more vegetables I use, then...even the same vegetables, everything works sometimes even for a disease that we don't know. [#0013, 8 years in U.S., 1 child, HFS,

CFS]

...some people prepare foods this way and others in another way. And maybe the flavor is the same, but you yourself are the one who is slowly taking note...[I continue to learn a mix]...of everything, because...it is always going to be rice, but not the same every day, and you will not get bored...yes, the truth, yes, in all things in life, one is never done learning...even the best doctor has to always be studying, studying. [#0020. 7 years in U.S., 3 children, HFS, CFS]

I didn't know many things [when I first arrived in the U.S.]...as a [young] woman, you don't cook. You go out to the field and your mom cooks, and you come to start cooking, for the children. [It's] better, much better...in cooking more, in knowing more things...and not say, "Oh, I don't know how to do it. I can't cook." That's how you learn more, through [experience], through other people, you learn how to make your salads, your different meals, because we all cook different. [#0018, 9 years in U.S., 4 children, HFI, CFS]

Many mothers discussed receipt of nutrition information in the U.S., particularly through federal and local food and nutrition programs in which they had participated. Yet they emphasized that they yearned to learn more, not just about nutrition but also about preparing nutritious meals and snacks and stretching resources. This desire led them to access new information and ideas in a number of ways, including TV, Internet, workshops, and social networks.

...because I sometimes I [don't] know how to cook. I have a chicken, I'm having this, I'm having this but I don't know how to make it, so [I call my mom and she] gives me ideas, she tells me ideas. [#0006, 10 years in U.S., 1 child, HFS, CFS]

Well, because I didn't know how to cook. So, like here one has greater access to technology, to the Internet. So, if in YouTube there is a video, one can find an infinity of [recipes]. So, one can - there I learned to look for how to make some recipes. [#0023, 8 years in U.S., 1 child, HFI, CFI]

[I learned about the coupons] by myself...there is a show on TV so I got interested in it and I started to look for information...[#0031, 7 years in U.S., 2 children, HFI, CFI]

When asked how they would prefer to receive new knowledge and skills related to food provisioning, mothers stated wanting hands-on demonstrations and group-based programs, though they were not opposed to continuing to access information through media sources, presuming it met their needs. Hands-on demonstrations seemed to offer an opportunity to gain skills, while group-based programs introduced them to new social networks in which new ideas could be shared.

...it would be interesting to receive [information] physically, to see how they

do it, or to be there at the time that it's being made. [#0021, 8 years in U.S., 2 children, HFS, CFS]

...there are times that the [YouTube] videos are really long and very - they're not for my objective. So sometimes with so much - to begin, that they take out the advertising because before seeing the videos, they put publicity for toilet paper, for many things, but that is what they leave so that they have money...but it would be good to take out a bit of the publicity... [#0023, 8 years in U.S., 1 child, HFI, CFI]

I liked [the cooking class] because there were women from Puerto Rico, from Dominican Republic, and so I was able to learn from them, and they learned from us, the Mexican women. [#0035, 5 years, 2 children (1 in Mexico), HFS, CFS]

Prior experiences with poverty and food insecurity, primarily in Mexico, were at the core of most mothers' appreciation for and search of new food provisioning knowledge and skills. New knowledge and skills served a bigger purpose: to feed their children better than what they had during childhood in Mexico. Thus, mothers' reflectivity guided their food provisioning values and behaviors.

Attribute 3: "One learns from what one lives." The general feeling presented by mothers was that life in the U.S. was easier than in Mexico and, thus, so was feed-

ing their families. This reflectivity revealed how they perceived those hardships to help them value their lives in the U.S. and, as a result, balance values related to food provisioning. Mothers' reflection on hardships, whether in Mexico or in the U.S., appeared to be a way to maintain perspective and properly provision food, perhaps as a means to cope with current economic hardships for some. Feeding the family in the U.S. meant working hard for what was attainable and, notably, having fewer children.

Because she depended on her husband...when we came [from Mexico]...to live in Phoenix...my mother wasn't able to buy everything she wanted...due to problems about [my stepfather]...he worked but...when they have that alcohol problem then it's more difficult...so, when I separated from my mother and I came here to New York, then it was a little bit easier for me, easier when you live by yourself and you can do whatever you want, I think, to be the – instead of being there depending on the – let's say on a stepfather and a mother. [#0009, 9 years in U.S., 5 children, HFS, CFS]

Well, sometimes I think that it is okay, that sometimes one suffers in order to be someone more after...how would I say it? If one suffers, from the largest one thinks and appreciates - everything that happens to one, one values more, learns to value things...because one learns from that. One learns from what one lives...and I say, "If I lacked, if I lacked, well, that [my daughters] not lack what I lacked."...sometimes I say, "If the money doesn't go far enough for me, but that it be for them..." [#0025, 9 years in U.S., 2 children, HFI, CFS]

...it makes me sad because I say, well, families over there are bigger and I think, how do they manage? Because we didn't have too much to eat and there were others that didn't have ... they had less than we did and they had more babies, more children, and now I get to thinking I think, how did those people do it to be able to have enough money? [#0014, 7 years in U.S., 2 children, HFS, CFI]

In response to experienced hardships, mothers provisioned food for their families in ways that balanced several values: minimizing food waste, providing healthy foods for their children, and having sufficient food to eat. Feeding their children better than what they had in Mexico included provisioning a greater variety of foods they perceived as more nutritious, particularly fruits, vegetables, meat, and yogurt. Yet, mothers were conscientious of managing food resources as best they were able, given their prior food insecure experiences. Functioning concurrently with Attribute 1 (resourcefulness and creativity), there was a continual effort to minimize food waste and to accept that certain times, particularly during winter, called for simpler, less balanced meals.

I used to say [to my mom] "Why do they eat good and I don't?" My mom would say "do you need something?" "Yes, I need fruit. They eat fruit." Because, the majority of the kids would bring their apple...[laugh]. Now I have an apple in my house [laugh]. But yes, but it helps because you value things [laugh]...I relate it a lot [to my life now], because I don't like

when [my children] waste. And I really like to buy them something [only] when they really want it. [#0017, 10 years in the U.S., 2 children, HFS, CFS]

Well, at least we can't complain. Because we do, we do have food. I think that's the best thing, even if it's just a little, but we always have...but, we can't complain either because, even if it's just with a little bit of work, we do, we can get by during the winter. [#0026, 9 years in U.S., 2 children, HFI, CFS]

For many mothers, provisioning food in the U.S. was distinct from Mexico in that they were able to plan and prepare beyond day-to-day, since wages were higher and employment more abundant. However, food provisioning in the U.S. required new skills they had to learn and refine over time. Life in poverty continued to challenge developing such skills for some, while others managed to find some success and build confidence in their food provisioning abilities. In particular, mothers heading food secure households demonstrated savvy food provisioning skills and elaborate food provisioning routines, all centered on planning.

Attribute 4: "I try to save as much [money] as I can." Food provisioning for most mothers in food secure households was proactive in order to prepare for adequate management of economic resources; they were always considering how to save money in the present and for the future. Planning in itself was an attribute that appeared protective, but it was also an integration of the other attributes

mentioned: creativity/resourcefulness, desire to learn new knowledge and skills, and reflectivity on past hardships. Both short-term (e.g. weekly shopping and food preparation) and long-term (e.g. preparing for seasonal income fluctuations) planning strategies were instrumental in saving money. In planning for meals or shopping trips, mothers often first looked at what they had available in the house to determine what they needed, to prevent overbuying or duplicating ingredients. Some mothers also used sales, coupons, and/or ingredient prices to motivate purchases and facilitate ideas about meals they could prepare. Upon this planning, many mothers mentioned making a shopping list, while two mothers indicated they more or less had their list memorized. Most mothers shopped at a variety of locations (e.g. Wal-Mart, local/regional supermarkets, Mexican/Hispanic stores) every eight to fifteen days in order to maintain fresh food in the household and save money.

The meat I bought in the supermarket or sometimes I do try to see where they're the cheapest...when there's an offer, that they are on sale, I bring them from there. [#0007, 4 years in U.S., 2 children, HFS, CFS]

...to know, know what to buy when everything is expensive, to see what kind of vegetables are cheaper and know what to cook with that which is a bit cheaper. If I had thought to make tacos this week, but tortillas or oil or meat are very expensive, I change them for another more economical thing. It depends on, on things that are cheaper in the store. [#0032, 9 years in U.S., 3 children, HFS, CFS]

Longer term planning was typically for the winter months, when fresh produce was more expensive and incomes decreased with seasonal employment. Mothers planned for seasonality by saving money and stocking up on non-perishable food basics, like rice and beans, when they had a steady income. Some mothers also took advantage of lower cost, in-season produce by participating in sliding scale community supported agriculture (CSA) programs, purchasing from local farmers' markets, accessing U-pick farms, and/or bringing home free produce/meat from farm employment or from relatives. These savings during warmer months appeared to provide a reserve for the winter. Likewise, a few mothers reported accessing food pantries during the winter to help them remain food secure.

...well there at the [CSA program], I pay six dollars and I take a lot more vegetables than in the food store, and in this way I spend a little less...in the store I go and I pick up a pound, and over there I go and I pick up sometimes up to two, three pounds, and I get a lot of vegetables as well for six dollars, that in the store I would buy for about fifteen, twenty dollars...it's good, because in this season that there are vegetables, we feel good spending less, and we don't go as often to the store for vegetables. [#0016, 9 years in U.S., 2 children, HFS, CFS]

And we always try to have a little bit of everything, dry products like rice that last longer, we try to keep it in case we need it so that we don't have to go out to buy it. [#0019, 8 years in U.S., 3 children, HFS, CFS]

While these mothers managed to maintain a food secure household through the use of a variety of strategies, other mothers were more vulnerable. Certain situations seemed to destabilize the lives and abilities of these mothers to provision food adequately and with confidence: having a spouse deported, living in a rural area with poor food access, recent transition to a new city with higher rent, maternal unemployment, seasonal unemployment, and sending remittances to family in Mexico. Similarly, one particular coping strategy was indicative of food insecurity: lack of planning. Mothers that did not plan their shopping and/or food preparation tended to stock up upon receipt of SNAP funds and WIC checks, and otherwise shop more than once a week or from meal-to-meal. Whether these strategies were in reaction to lack of skills, were the cause of food insecurity, or were an interaction of the two was unclear. However, these mothers still displayed attributes of creativity/resourcefulness, desire to learn new knowledge and skills, and reflectivity on food insecure experiences.

4.3.2 Quantitative

4.3.2.1 Sample characteristics

Among Mexican-origin households in the CPS sample, 27.9% were food insecure and 17.2% had food insecure children. Most were married, working poor, with less than a high school degree or GED equivalent, and living in a metropolitan area (Table 4.2). Almost one-third of households spoke only Spanish, and roughly

40% had more than four persons living in the home. Since almost half of households had children and the focus of our qualitative sample was mothers, we also show characteristics for Mexican-origin households with children (Table 4.2). Of these households, 30.2% were food insecure and 16.9% had food insecure children. A larger proportion of households with children were classified as poor, though roughly the same proportion was employed, compared to all Mexican-origin households. Most households with children reported being married, having less than a high school education, and living in a metropolitan area. Approximately half of these households had at least one child ≤ 5 years old and more than four persons living in the home. About one quarter of households with children spoke only Spanish. Despite high proportions of poverty, Mexican-origin total households and households with children had low participation in the federal food and nutrition programs, SNAP and WIC. In our qualitative sample, we also found low participation in SNAP. Reflective of our qualitative findings, we included one food-provisioning variable from the CPS dataset: "Last week, did you or anyone in your household buy food at a restaurant, fast food place, cafeteria or vending machine? (Include any children who may have bought food at the school cafeteria.)" Only about 40% of households responded 'yes' to this question.

Table 4.2: Proportions (%) for Socio-Demographic and Food Provisioning Characteristics among total Mexican-origin households and only Mexican-origin households with children

Characteristics	% Total Households	% Households with Children
Household food insecure	27.88	30.18
Child food insecure	17.22	16.86
Income		
<i>At or below 130% FPL</i>	52.91	62.38
<i>At or below 185% FPL</i>	55.62	64.49
<i>At or below 200% FPL</i>	71.23	80.59
HS diploma/GED	44.20	43.98
Employed		
<i>Yes</i>	61.14	65.43
<i>No</i>	5.41	5.85
<i>Not in labor force (NILF)</i>	33.46	28.72
>18 years old	93.91	99.77

Table 4.2 – continued from previous page

Characteristics	% Total Households	% Households with Children
Female respondent	49.88	54.61
Married	63.19	79.70
<10 years in U.S.	19.06	17.95
Metropolitan area	91.79	92.54
Household >4 persons	42.23	54.09
Own children 18 years in household	46.88	–
Own children 5 years old in household	22.86	48.76
Speak only Spanish in home	28.94	25.97
Bought food out in past week	43.29	42.46
Received SNAP in last 12 months	25.91	33.24
Received WIC in last 30 days	20.68	23.52

4.3.2.2 Risk of food insecurity: logistic regression results

Overall, for both subpopulation analyses, poor households and households speaking only Spanish were the most at risk for household and child food insecurity (Table 4.3). The median income category for Mexican-origin households was \$30,000 to \$34,000 per year and for Mexican-origin households with children was \$25,000 to \$29,999 per year (data not shown in table). Mexican-origin households below 130%, 185%, or 200% FPL, reporting unemployment, with more than four persons, or speaking only Spanish were associated with increased risk of household food insecurity (Table 4.3). Mexican-origin households below 130% and 185% FPL or speaking only Spanish were associated with increased risk of child food insecurity (Table 4.4). Receiving SNAP or WIC was also associated with increased risk of household and child food insecurity. Among Mexican-origin households with children (Tables 4.5-4.6), the same factors, except WIC participation, contributed to increased risk of household and child food insecurity, with the addition of two factors: education and purchased food out in the past week. Householders having less than a high school education were associated with increased risk of child food insecurity, and not purchasing food out in the past week was associated with both household and child food insecurity. However, food secure and insecure households and children did not differ in many ways, including U.S. region of residence, marital status, presence of children (particularly children ≤ 5 years old), and recent immigration to the U.S.

Table 4.3: **Odds Ratios (ORs) for household food insecurity risk for Mexican-origin households**

Predictor variable <i>(Reference categories in parentheses)</i>	Household Food Insecure		
	OR	95% CI	
		Upper	Lower
Poverty level <i>(Above)</i>			
<i>At or below 130 % FPL</i>	3.11*	2.41	4.00
<i>At or below 185 % FPL</i>	2.67*	1.97	3.62
<i>At or below 200 % FPL</i>	3.45*	2.37	5.02
HS diploma/GED <i>(No)</i>	0.91	0.72	1.15
Employed <i>(Yes)</i>			
<i>No</i>	1.77*	1.23	2.53
<i>Not in labor force</i>	1.06	0.86	1.31
≥18 years old <i>(<18 years)</i>	1.47	0.92	2.36
Female respondent <i>(Male)</i>	1.04	0.89	1.20
U.S. region <i>(Northeast)</i>			
<i>Midwest</i>	0.72	0.25	2.09
<i>South</i>	0.99	0.37	2.64
<i>West</i>	0.82	0.32	2.12
Married <i>(Not married)</i>	0.94	0.76	1.17
Household >4 persons <i>(≤ 4 persons)</i>	1.50*	1.15	1.97

Table 4.3 – continued from previous page

Predictor variable (Reference categories in parentheses)	Household Food Insecure		
	OR	95% CI	
		Upper	Lower
Own children <18 years in household (No)	1.19	0.98	1.44
Own children ≤ 5 years old in household (No)	1.20	0.93	1.54
Speak only Spanish in home (No)	1.49*	1.06	2.10
<10 years in U.S. (≥ 10)	0.99	0.73	1.33
Bought food out in past week (No)	0.76	0.56	1.03
Received SNAP in last 12 months (No)	2.01*	1.49	2.72
Received WIC in last 30 days (No)	1.63*	1.10	2.42

* $p < 0.5$

Table 4.4: Odds Ratios(ORs) for child food insecurity risk for Mexican-origin households

Predictor variable <i>(Reference categories in parentheses)</i>	Child Food Insecure		
	OR	95% CI	
		Upper	Lower
Poverty level (<i>Above</i>)			
<i>At or below 130 %</i>	2.03*	1.25	3.30
<i>At or below 185 %</i>	2.82*	1.62	4.91
<i>At or below 200 %</i>	2.26	0.94	5.42
HS diploma/GED (<i>No</i>)	0.77	0.56	1.05
Employed (<i>Yes</i>)			
<i>No</i>	1.48	0.89	2.45
<i>Not in labor force</i>	1.03	0.80	1.33
≥18 years old (<i><18 years</i>)	1.17	0.67	2.04
Female respondent (<i>Male</i>)	1.01	0.86	1.19
U.S. region (<i>Northeast</i>)			
<i>Midwest</i>	0.76	0.17	3.29
<i>South</i>	1.33	0.35	5.03
<i>West</i>	0.87	0.23	3.29
Married (<i>Not married</i>)	0.85	0.62	1.16
Household >4 persons (<i>≤4 persons</i>)	1.39	0.91	2.13

Table 4.4 – continued from previous page

Predictor variable <i>(Reference categories in parentheses)</i>	Child Food Insecure		
	OR	95% CI	
		Upper	Lower
Own children ≤ 5 years old in household (<i>No</i>)	1.02	0.74	1.43
Speak only Spanish in home (<i>No</i>)	2.51*	1.46	4.30
<10 years in U.S. (<i>≥ 10</i>)	1.02	0.63	1.66
Bought food out in past week (<i>No</i>)	0.60	0.37	0.99
Received SNAP in last 12 months (<i>No</i>)	1.88*	1.21	2.90
Received WIC in last 30 days (<i>No</i>)	1.80*	1.16	2.79

* $p < 0.5$

Table 4.5: Odds Ratios(ORs) for household food insecurity risk for Mexican-origin households with children

Predictor variable (Reference categories in parentheses)	Household Food Insecure		
	OR	95% CI	
		Upper	Lower
Poverty level (<i>Above</i>)			
<i>At or below 130 %</i>	2.43*	1.76	3.36
<i>At or below 185 %</i>	2.09*	1.42	3.09
<i>At or below 200 %</i>	2.47*	1.54	3.97
HS diploma/GED (<i>No</i>)	0.79	0.57	1.09
Employed (<i>Yes</i>)			
<i>No</i>	2.26*	1.34	3.68
<i>Not in labor force</i>	1.02	0.8	1.29
Female respondent (<i>Male</i>)	1.14	0.98	1.33
U.S. region (<i>Northeast</i>)			
<i>Midwest</i>	0.83	0.24	2.95
<i>South</i>	1.11	0.33	3.72
<i>West</i>	0.99	0.31	3.10
Married (<i>Not married</i>)	0.79	0.57	1.11
Household >4 persons (≤ 4 persons)	1.16	0.87	1.57

Table 4.5 – continued from previous page

Predictor variable <i>(Reference categories in parentheses)</i>	Household Food Insecure		
	OR	95% CI	
		Upper	Lower
Own children 5 years old in household <i>(No)</i>	1.11	0.80	1.53
Speak only Spanish in home <i>(No)</i>	1.49*	1.02	2.19
<10 years in U.S. (≥ 10)	0.86	0.58	1.26
Bought food out in past week <i>(No)</i>	0.66*	0.47	0.94
Received SNAP in last 12 months <i>(No)</i>	1.73*	1.23	2.42
Received WIC in last 30 days <i>(No)</i>	1.23	0.84	1.93

* $p < 0.5$

Table 4.6: Odds Ratios(ORs) for child food insecurity risk for Mexican-origin households with children

Predictor variable <i>(Reference categories in parentheses)</i>	Child Food Insecure		
	OR	95% CI	
		Upper	Lower
Poverty level <i>(Above)</i>			
<i>At or below 130 %</i>	2.04*	1.31	3.16
<i>At or below 185 %</i>	2.65*	1.65	4.27
<i>At or below 2000 %</i>	2.41*	1.16	5.04
HS diploma/GED <i>(No)</i>	0.65*	0.44	0.96
Employed <i>(Yes)</i>			
<i>No</i>	1.62	0.91	2.89
<i>Not in labor force</i>	1.09	0.84	1.42
Female respondent <i>(Male)</i>	1.12	0.95	1.31
U.S. region <i>(Northeast)</i>			
<i>Midwest</i>	0.60	0.15	2.28
<i>South</i>	1.02	0.29	3.63
<i>West</i>	0.80	0.23	2.74
Married <i>(Not married)</i>	0.92	0.62	1.35
Household >4 persons <i>(≤4 persons)</i>	1.39	0.91	2.12

Table 4.6 – continued from previous page

Predictor variable <i>(Reference categories in parentheses)</i>	Child Food Insecure		
	OR	95% CI	
		Upper	Lower
Own children ≤ 5 years old in household <i>(No)</i>	1.09	0.75	1.59
Speak only Spanish in home <i>(No)</i>	2.21*	1.37	3.57
<10 years in U.S. (≥ 10)	0.97	0.57	1.65
Bought food out in past week <i>(No)</i>	0.55*	0.36	0.84
Received SNAP in last 12 months <i>(No)</i>	1.57*	1.04	2.39
Received WIC in last 30 days <i>(No)</i>	1.33	0.87	2.05

* $p < 0.05$

4.4 Discussion

This study identified several important risk and protective factors related to food security status among Mexican-origin households, particularly those with children living in the Northeast. These two datasets complemented one another by

illustrating distinct details to the overarching research objective. Combined, the datasets provide results that can inform future research and both local and national policy. Overall, household and child food insecurity prevalence among Mexican-origin households with children was slightly higher than the national prevalence for all Hispanic households with children in 2013, 28.0% and 15.7%, respectively.⁵⁷ Mothers interviewed as part of our qualitative study reported low incomes, which we confirmed in the quantitative data analysis as a significant risk factor for household and child food insecurity. Similarly, households in our qualitative sample roughly fell at or below 130% FPL and had at least one U.S.-born child, making them eligible for SNAP, yet only half participated. The quantitative results yielded a similar story, with approximately 60% of households with children being at or below 130% FPL and only about 30% participating in SNAP. In this way, the CPS data of Mexican-origin households with children supports our field experience, though the CPS does not distinguish between U.S.- and foreign-born children in the household. On the other hand, qualitative findings reveal a number of important attributes and behaviors of Mexican-origin mothers that appear to be protecting vulnerable households and children from food insecurity. In particular, we found that these attributes and behaviors all linked directly back to preparing food at home for their families, instead of purchasing food outside the home, as a means to manage economic resources while also meeting cultural ideals and family preferences. The CPS subpopulation analysis of households with children also revealed an association between reporting no purchase of food outside the home in the past week with household and child food insecurity, suggest-

ing that at-risk Mexican-origin families, like the ones in our qualitative sample, are mostly preparing food at home. Considering over half of Mexican-origin households with children in the U.S. are poor, these findings highlight potential human, financial, and cultural capital to be strengthened within households through increased access and participation in food and nutrition assistance programs that combine financial assistance with food resource management skill-building, particularly emphasizing planning.

A number of previous studies have documented the association of socioeconomic characteristics with food insecurity.^{2,58,59} Reports specific to Mexican-origin households only revealed associations between food insecurity and speaking only Spanish,^{8,11} having very low incomes,^{11,60,61} and working part-time or day labor employment.^{60,61} Our findings offer several new insights into limited data on food insecurity risk among Mexican-origin households in the U.S. First, we found a significant association between larger household size and household food insecurity among Mexican-origin households, but no association with child food insecurity, nor an association with household or child food insecurity among households with children. Early studies on the socioeconomic determinants of food security status found that food insecure households in the U.S. were larger.^{62,63} Among Mexican-origin households, Quandt *et al*⁷ and Rosas *et al*²⁶ found no association between household size and household food insecurity, but Sharkey *et al*⁶¹ found a significant association with child hunger. Each of these studies represented different areas of the U.S. (North Carolina, California, and Texas, respectively), suggest-

ing location-specific context or other household factors, such as remittances sent to family in other countries,^{13,60,64} may play a role in mitigating or exacerbating the role of household size among Mexican-origin households. Second, most other published studies reported an association between low education and household food insecurity,^{7,8,26,65,66} a relationship that was non-significant in our data set. The significant association we documented between householder education and food insecurity at the child level is of concern. Only one other study with Mexican-origin households⁶¹ reported a similar finding. All of these studies measured maternal education, whereas CPS provides householder education, which could be the mother, father, or other adult in the household. However, our qualitative findings suggest that the ability to prevent the most severe food insecurity, that of the child, may be more complex than maternal formal education alone. Furthermore, while several other published studies document an association between food insecurity and presence of children,^{7,8,12,65} we found no significant relationship. Both these quantitative findings and our qualitative data support previous documentation that adults in the household, particularly mothers, play a protective role against child food insecurity.⁶⁷ Last, results have been mixed on the association between food insecurity risk and time in the U.S.^{8,9,24,60} We found no association in the CPS data, but were able to expand on the specific risk and protective factors for recent immigrants in our qualitative data, an argument for understanding more about the life course of an immigrant aside from years in the U.S.

For the low-income mothers in our qualitative study, their 'food literacy,' as

termed by Vigden & Gallego, was highly influential to the food security of their household and children.⁶⁸ Food literacy refers to “a collection of inter-related knowledge, skills, and behaviors required to plan, manage, select, prepare, and eat food to meet needs and determine intake” (p. 54) and is a supportive structure that is strengthened over time.⁶⁸ The latter was especially evident in separating food insecure from food secure households that were much more skilled at short- and long-term planning, something not explicitly reported elsewhere among Mexican-origin households. These mothers prioritized shopping for low cost foods,^{69,70} especially those on sale or seasonal,⁷¹ and accessed a variety of stores including, local supermarkets, grocery stores (e.g. Mexican stores), and big box stores, like Wal-Mart.⁷⁰ Like Mexican women in a study in California,⁷⁰ several mothers did not shop with a list, but bought the same items at each shopping trip. This establishment of a successful food provisioning system seemed to protect their households and children from food insecurity, regardless of income, and warrants attention to the human (e.g. food preparation skills), financial (e.g. participation in SNAP), and cultural (e.g. traditional Mexican foods) capital available to Mexican-origin households.

Similarly, other studies of at-risk households and families in the U.S. demonstrate the important role of food literacy in coping with and preventing food insecurity, regardless of race, ethnicity, and urban or rural location. Previously reported food acquisition strategies, similar to our qualitative findings, included purchasing low-cost food or food on sale,^{28,7382} using coupons,^{27,72,73,7578,80} access-

ing food pantries,^{27,73,76,78,80,83} participating in SNAP,^{75,78,80,81,83} shopping at more than one store and/or comparing prices,^{40,64,75,77,81} acquiring in-season produce through farmers' markets or CSAs,⁸⁰ taking home leftovers,^{73,78} and sharing or exchanging food.^{79,80,83} In addition, previous studies documented use of some food preparation strategies as a means to manage household food security, such as using leftovers,^{75,77,81} preserving food,^{75,77,80} and using low-cost foods to create traditional meals.^{74,75} However, few studies have highlighted the importance of planning among poor households,^{40,72,75,76,79} consisting of creating shopping lists,^{72,75} planning meals,⁷² and storing food at home for emergencies.^{76,79} Planning may simultaneously facilitate both food security and adequate nutritional intake. Low-income, urban, Puerto Rican women reported increased intake of unhealthy foods when they did not plan ahead.⁴⁰ None of these studies linked the planning strategies to food security status, which may be important, given our findings. Likewise, only one study documented gaining new food provisioning knowledge and skills as a strategy for feeding families.⁷² These limited data emphasize the importance of future research testing the impact of food provisioning knowledge and skills, particularly planning, on food security status. Participants in our study demonstrate an opportunity to capitalize on this need since they consistently expressed their desire to gain additional knowledge and skills to feed their families better.

Up to now, no other studies have documented food-provisioning strategies of Mexican-origin households in the northeast, nor highlighted the important at-

tributes of this Hispanic sub-group that can potentially contribute to development of culturally-targeted approaches to reducing food insecurity. Several other studies have considered the food provisioning strategies in Mexican-origin households, but only in the Brazos Valley region of Texas,³⁵ along the Texas-Mexico border,³⁶⁻³⁸ and in North Carolina.⁷ Creativity and resourcefulness in food preparation has previously been identified as an important attribute of Mexican women in Texas,^{35,51} but not necessarily related to household and child food security. Likewise, several studies have reported Latina mothers, mostly Mexican, expressing a keen interest gaining knowledge (e.g. new recipes, nutritious eating), engaging in community-based and hands-on programming,⁷¹ and demonstrating capacity to increase food provisioning knowledge and skills,³⁴ but our findings provide a clearer understanding of strategies Mexican-origin mothers are using and which ones appear to be beneficial to food security. In addition, recognizing mothers' reflectiveness on their own food insecurity and poverty experiences is an important contribution to the food provisioning literature. Mexican-origin mothers report significantly greater levels of past food insecurity compared to U.S.-origin mothers⁸⁴ and these experiences appear to be related to obesity⁴ and more controlling food-related parenting practices.⁸⁵ Thus, future research should consider capturing this important life course influence as it relates not just to food security but daily food provisioning.

There are several notable strengths of this study. First, quantitative findings are representative of the national population of Mexican-origin households and, for

the first time, characterize the risk factors of the largest Hispanic subgroup in the U.S., increasing generalizability of findings. Second, the qualitative data complements the national survey data by providing insight into how the provisioning of food in Mexican-origin households is influential to their food security status. Thus, this data elucidates not only risk factors but also potential protective factors; in this case, the protective factors are human and cultural capital related to food provisioning among low-income Mexican-origin households. Third, the theoretical approach guiding data collection allowed for multiple levels of influence to be identified and better understood, leading to findings that can be integrated into local and national efforts to reduce food insecurity among Mexican-origin households.

Several limitations are also worth noting. First, the CPS data is cross-sectional, limiting understanding of the relationship between food security status and changes in certain sociodemographic variables. Second, there was a limited number of CPS food provisioning variables and most of them were not related to the food provisioning strategies used by mothers in our qualitative study. Based on our qualitative findings, adding more food provisioning variables, including culturally-appropriate ones, to national datasets may be important to understanding risk and protective factors for Mexican-origin households. Third, the CPS data does not consider other potential influences to food insecurity, such as cumulative family risks (e.g. poor maternal health, risky health behaviors, family disruption and conflict, parenting disruption),⁸⁶ remittances sent to family in Mexico^{13,60,64,69}

or acculturation.⁷⁰ Fourth, our qualitative data were derived from a small, convenience sample in NYS, limiting generalizability to the Lower Hudson Valley. However, the emergent attributes and behaviors of mothers confirmed similar findings in studies done in other states. Mothers that volunteered to participate may have been more motivated due to their own interest in nutrition. This suggests Mexican-origin mothers may be a potentially captive audience for nutrition education. Likewise, some mothers working full-time may not have participated due to time constraints. All full-time employed participants were from rural areas of one county where a unique stakeholder relationship developed in a community center serving foreign-born farmworker families, and this person assisted in recruitment. Similar to many studies with foreign-born populations, some eligible mothers may have refrained from volunteering because of documentation status and associated fear of being reported. In order to minimize this situation, we focused our recruitment efforts through trusted community stakeholders and reassured eligible mothers that we would not ask about documentation status. Several mothers volunteered this information, affirming our assumptions that our sample contained a range of situations.

4.5 Implications

These findings add culturally-relevant and nationally representative data to the existing literature on food insecurity experiences and coping strategies among

Mexican-origin Hispanics. The World Health Organizations Global Strategy on Diet, Physical Activity, and Health strongly recommends approaches to improving dietary intake be culturally relevant and population based.⁸⁷ Our data provide evidence that while Mexican-origin households are at a high risk of food insecurity, they also have human and cultural capital that may serve to be protective, particularly if it can be strengthened.³⁴ In addition, recent, low-income Mexican-origin mothers' prioritization of home-cooked meals may not only be important to preventing food insecurity, but also a culturally-appropriate way to improve dietary intake. Compared to several other studies of Mexican-origin immigrants,^{35,70} our mothers ate restaurant food, fast food, and take-away food less often. Increasing Mexican-origin households' access to and participation in federal food and nutrition assistance programs may serve not only to provide additional financial capital, but also to provide new knowledge and skills that will allow them to be more self-sufficient in the U.S. food environment.

Furthermore, certain food provisioning strategies, particularly planning strategies, may be instrumental in protecting households and children from food insecurity. We recommend that programs and agencies monitoring and measuring food insecurity include measures that assess individuals' and households' short- and long-term food provisioning strategies, as well as measures of the available food resource environment. Findings from large cross-sectional, longitudinal, and experimental studies would provide important data for programming and policy to reduce food insecurity, particularly by incorporating education and outreach

into existing food and nutrition programs.

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CHAPTER 5

CONCLUSIONS

Findings from this research emphasize several important details about food insecurity among Hispanic households in the U.S. First, food insecurity risk differs by Hispanic ethnic subpopulation, both those originating from Latin American countries and those born in the U.S. to foreign-origin parents. These findings and their related socio-demographic differences indicate that Hispanic ethnic origin or subgroup may be more predictive of food insecurity risk than Hispanic ethnicity as a whole. Hispanic ethnic origin and subgroup differences also emphasize the important role of life course since Hispanic immigrants in the U.S. migrated for distinct reasons and with diverse cultures and experiences. Second, Mexican-origin and Mexican ethnic households are a high-risk Hispanic subpopulation, with a large proportion living in poverty and having limited education and English language skills. However, low-income Mexican-origin mothers from southern Mexico and residing in the Lower Hudson Valley of New York State (NYS) demonstrate culturally-appropriate coping strategies by relying on culture and life course experiences, particularly those in Mexico, to shape how they feed their families and children in the U.S. These food-provisioning strategies exhibit important attributes of mothers towards maintaining a food secure household, particularly behaviors related to food resource management and planning.

In combination with studies conducted with Mexican-origin households in other

regions of the U.S., these findings provide both nationally-representative and context-specific data for future programming and policy efforts aimed at reducing food insecurity. There appears to be both an interest and a capacity from Mexican-origin mothers to access food and nutrition programs and to learn new food provisioning skills and knowledge that, in turn, can protect their households and children from food insecurity. Increased access to and participation in food and nutrition assistance programs is important, but of equal value is the integration of culturally-tailored food resource management education into existing federal food and nutrition programs (e.g. Head Start; Expanded Food and Nutrition Education Program (EFNEP); Supplemental Nutrition Assistance Program (SNAP); Supplemental Nutrition Program for Women, Infants, and Children (WIC)) and community efforts (e.g. agricultural programs, food pantries, community centers) that recognize life course influences and the various forms of capital (financial, human, and cultural) needed to promote food security in Mexican-origin households.

Furthermore, food provisioning, in the context of the life course and current ecological system, needs further robust investigation as it relates to household and child food security status among all at-risk households, regardless of race and ethnicity. While more formative work is needed to develop appropriate measures of food provisioning, future research should seek to elucidate the role of food provisioning strategies in food security status using a variety of research designs, including cross-sectional survey data, longitudinal cohort studies, and

experimental studies, preferably in the community setting. The latter can serve to test intervention feasibility and effectiveness for integration into existing food and nutrition programs, such as Head Start, SNAP, WIC, and EFNEP. Simultaneously, experimental studies would allow for testing of more complex interventions that incorporate multiple levels (e.g. individual, household, community, policy) of food security influence, as well as nutrition education, behavior change, and financial management education. Determining the right combination of individual, household, community, and policy strategies is imperative to improving the self-sufficiency of households and protecting their health and livelihood.

APPENDIX A
APPENDIX A OF CHAPTER 2

Table A.1: **Unadjusted Odds Ratios for Association of Demographic and Socioeconomic Characteristics with Country/Region of Origin for all Hispanics, U.S. is reference, * $p < 0.05$**

Country	Below 130% FPL		Below 185% FPL		Below 200% FPL	
	OR	95% CI	OR	95% CI	OR	95% CI
Mexico	1.34*	1.18, 1.53	1.27*	1.13, 1.43	1.61*	1.39, 1.88
El Salvador	1	0.65, 1.53	0.94	0.64, 1.38	1.05	0.71, 1.55
Guatemala	1.33	0.85, 2.07	0.84	0.52, 1.37	0.97	0.62, 1.53
Honduras	1.39	0.79, 2.43	1.07	0.61, 1.89	1.45	0.77, 2.72
Cuba	0.79	0.54, 1.15	0.89	0.65, 1.21	0.73	0.53, 1.00
D. Republic	1.32	0.82, 2.12	0.78	0.47, 1.29	1.04	0.63, 1.73
Puerto Rico	1.23	0.91, 1.67	0.83	0.60, 1.15	0.9	0.67, 1.21
Colombia	0.69	0.37, 1.28	0.66	0.37, 1.20	0.59	0.35, 1.01
Central America	0.37*	0.21, 0.64	0.40*	0.24, 0.65	0.35*	0.22, 0.57
South America	0.39*	0.28, 0.55	0.43*	0.32, 0.59	0.41*	0.31, 0.54

Country	HS Diploma/GED		<18 years old		Employed	
	OR	95% CI	OR	95% CI	OR	95% CI
Mexico	0.14*	0.13, 0.16	0.07*	0.05, 0.08	1.28*	1.16, 1.42
El Salvador	0.24*	0.17, 0.32	0.05*	0.03, 0.09	1.79*	1.37, 2.33
Guatemala	0.13*	0.09, 0.19	0.05*	0.03, 0.10	2.14*	1.49, 3.07
Honduras	0.14*	0.09, 0.22	0.07*	0.03, 0.16	1.55*	1.03, 2.32
Cuba	0.78	0.53, 1.15	0.07*	0.04, 0.11	1.11	0.85, 1.46
D. Republic	0.41*	0.26, 0.63	0.08*	0.05, 0.13	0.78	0.53, 1.17
Puerto Rico	0.63*	0.50, 0.81	0.16*	0.11, 0.25	0.70*	0.53, 0.93
Colombia	0.99	0.60, 1.63	0.09*	0.05, 0.16	1.37	0.95, 1.96
Central America	1.59	0.86, 2.93	0.05*	0.01, 0.21	1.80*	1.20, 2.69
South America	1.27	0.89, 1.80	0.08*	0.05, 0.12	1.47*	1.19, 1.81

Table A.2: Unadjusted Odds Ratios/Relative Risk Ratios for Association of Socio-demographic Characteristics with Country/Region of Origin among Foreign-Origin Hispanics, * $p < 0.05$

Country	Below 130% FPL		Below 185% FPL		Below 200% FPL	
	OR	95% CI	OR	95% CI	OR	95% CI
Mexico	–	–	–	–	–	–
El Salvador	0.74	0.47, 1.18	0.74	0.51, 1.09	0.65	0.43, 0.99
Guatemala	0.99	0.63, 1.56	0.66	0.41, 1.08	0.60*	0.38, 0.97
Honduras	1.03	0.58, 1.85	0.84	0.47, 1.52	0.9	0.48, 1.70
Cuba	0.59*	0.40, 0.87	0.70*	0.51, 0.97	0.45*	0.31, 0.65
D. Republic	0.98	0.60, 1.61	0.62	0.37, 1.02	0.65	0.39, 1.07
Puerto Rico	0.92	0.66, 1.28	0.66*	0.46, 0.93	0.56*	0.40, 0.78
Colombia	0.51	0.26, 1.00	0.52*	0.28, 0.98	0.37*	0.21, 0.66
Central America	0.28*	0.16, 0.49	0.31*	0.19, 0.52	0.22*	0.13, 0.36
South America	0.29*	0.21, 0.41	0.34*	0.25, 0.47	0.25*	0.18, 0.35

Country	HS Diploma/GED		<18 years old		Employed	
	OR	95% CI	OR	95% CI	OR	95% CI
Mexico	–	–	–	–	–	–
El Salvador	1.66*	1.23, 2.25	0.8	0.43, 1.50	1.39*	1.07, 1.82
Guatemala	0.94	0.66, 1.34	0.83	0.45, 1.52	1.67*	1.14, 2.42
Honduras	0.98	0.61, 1.58	1.06	0.43, 2.61	1.21	0.81, 1.80
Cuba	5.52*	3.71, 8.21	1.03	0.60, 1.78	0.86	0.65, 1.15
D. Republic	2.88*	1.82, 4.55	1.17	0.67, 2.04	0.61*	0.41, 0.91
Puerto Rico	4.47*	3.47, 5.75	2.48*	1.55, 3.96	0.54*	0.41, 0.73
Colombia	6.99*	4.17, 11.71 ₁₈₉	1.3	0.70, 2.42	1.06	0.74, 1.53
Central America	11.17*	5.92, 21.09	0.73	0.17, 3.18	1.4	0.93, 2.11
South America	8.93*	6.24, 12.78	1.14	0.71, 1.84	1.14	0.92, 1.41

Table A.3: **Unadjusted Odds Ratios for Association of Demographic and Socioeconomic Characteristics with Maternal Country of Origin among U.S.-Origin Hispanics, * $p < 0.05$**

Maternal Origin	Below 130% FPL		Below 185% FPL		Below 200% FPL	
	OR	95% CI	OR	95% CI	OR	95% CI
Mexico	1.73*	1.46, 2.05	1.84*	1.56, 2.16	2.45*	2.09, 2.86
El Salvador	1.97*	1.29, 3.00	2.01*	1.30, 3.13	2.32*	1.47, 3.65
Guatemala	1.78	0.98, 3.22	1.25	0.69, 2.27	1.51	0.83, 2.72
Cuba	0.49*	0.29, 0.81	0.58*	0.35, 0.97	0.49*	0.32, 0.75
D. Republic	1.19	0.74, 1.91	1.25	0.73, 2.14	1.11	0.67, 1.84
Puerto Rico	1.26	0.90, 1.78	0.91	0.65, 1.26	0.97	0.70, 1.34
Central America	0.77	0.38, 1.57	0.92	0.46, 1.87	1.19	0.60, 2.36
South America	0.64	0.40, 1.03	0.48*	0.32, 0.74	0.57*	0.37, 0.87
Maternal Origin	HS Diploma/GED		<18 years old		Employed	
	OR	95% CI	OR	95% CI	OR	95% CI
Mexico	0.88	0.77, 1.02	1.59*	1.38, 1.83	0.93	0.81, 1.08
El Salvador	1.1	0.74, 1.64	2.18*	1.55, 3.07	1.38	0.83, 2.27
Guatemala	1.13	0.65, 1.96	1.97*	1.21, 3.20	1.35	0.70, 2.61
Cuba	1.06	0.58, 1.91	0.56	0.32, 1.00	1.42	0.83, 2.42
D. Republic	0.99	0.58, 1.68	1.56	0.97, 2.51	0.83	0.49, 1.40
Puerto Rico	0.8	0.55, 1.16	0.53*	0.35, 0.79	0.91	0.68, 1.24
Central America	1.07	0.57, 1.99	2.13*	1.18, 3.83	1.14	0.61, 2.13
South America	1.67	0.92, 3.04	2.07*	1.42, 3.02	1.83*	1.05, 3.19

Table A.4: Relative Risk Ratios for Household Food Security among Foreign-Origin Hispanic Households, Adjusted for income

* $p < 0.05$

Country/Region of Origin	Marginal Food Security		Low Food Security		Very Low Food Security	
	RRR	95% CI	RRR	95% CI	RRR	95% CI
Mexico	1	–	1	–	1	–
El Salvador	1.46	0.84, 2.54	1.56	0.89, 2.73	0.94	0.63, 4.29
Guatemala	1.37	0.63, 2.98	0.62	0.27, 1.39	1.65	0.44, 5.75
Honduras	1.46	0.73, 2.93	0.85	0.36, 2.02	1.6	0.15, 0.82
Cuba	0.38*	0.20, 0.71	0.17*	0.09, 0.32	0.35	0.11, 1.45
Dominican Republic	0.61	0.32, 1.17	0.92	0.51, 1.65	0.41	0.46, 1.69
Puerto Rico	0.89	0.53, 1.50	0.88	0.55, 1.42	0.89	0.37, 4.40
Colombia	0.97	0.39, 2.43	0.76	0.32, 1.80	1.29	0.37, 4.41
Other Central America	1.15	0.39, 3.38	0.75	0.34, 1.64	0.97	0.37, 2.51
Other South America	0.74	0.46, 1.19	0.54*	0.30, 0.97	0.66	0.31, 1.42

APPENDIX B

APPENDIX B OF CHAPTER 3

B.1 Food insecurity experiences in Mexico

Food quantity, hunger (Mexico) *In my experience I didn't have good food and I couldn't - in school, the first years, I realized that I was very behind in school, very low grades. I can think that it was because I didn't have good food. I would go to school on an empty stomach. And there in school they don't give you anything...I think it influenced the way I developed in school. [#0021]*

Food variety (Mexico): *It didn't [happen], for example, that we spend a day without eating, no. Or that we ate just once, no. Our situation didnt get that bad. We always had something to eat. [There really wasnt much, just tortillas and beans. Or chilies, tomatoes.] Yes, but you always had something. [#0028]*

Food basics (Mexico): *Well, basic foods when youre poor, like beans, tortillas, rice, that fills you more and is more economic to buy. [#0023]*

Seasonality (Mexico): *What happens is that [in Mexico], there is land that's seasonal, which is when it rains, and the ground is irrigated, and not everyone has that land. And the ones that do have the seasonal land only, they only eat the fruit when it's - when it rains and when that season ends, just like here, then no more. [#0014]*

Employment, income, and food and nutrition assistance: *I have the possibilities to buy it, [more] than in Mexico. It's difficult in Mexico - I mean, there are stores, but the problem is that the economy is not enough...sometimes the house economy and the country economy because also the country, if you don't work you don't eat. There it isn't like here that that sometimes, if there's not work and you can go and ask for food somewhere and they give it to you. There in Mexico - well that I know there isn't that type of thing. [#0009]*

Valuing opportunities for food variety (U.S.) *...there are more possibilities here than there...the meats, the fruits, the vegetables, everything...when one eats a fruit [in Mexico], but just one, [it's] for three [people] let's say, not one for everyone [#0002]*

And I feel good because the way I was fed in Mexico it's...right now, I think I'm giving or feeding my girls well, unlike when I was a child. [#0016]

Food basics (U.S.): *What's there [in the pantry in winter]? Well, the most basic. We always try to have rice, beans, oil, sugar. That's what we always try to have there. [#0026]*

Coping with seasonality *The hardest time for me is winter. A little bit because my husband's job is slow, so what I try to do during the year is to buy little by little what is rice, beans. The stuff that won't spoil I would have it as a backup. When he is not working you know you can always put a pot of beans, grab a piece of cheese and you eat. That's why the hard times for me are in the winter.*
[#0017]

To try to choose what [vegetable] is a little cheaper [in winter] and not try to use what is most expensive, to try to know what dishes to cook with the food that is cheaper...I just go to the store and look for what is cheaper and try to bring it. And when I arrive here, at home, I see what I can cook with that sort of things.
[#0032]

B.2 Agrarian experiences in Mexico

Growing/Gathering food in Mexico: *...from the hens that...that were given to my mom. They gave her a few chickens and she would get the eggs from there. And she would feed us with those eggs. [#0030]*

...there is a place where you don't pay with money, I don't know if it still exists. But there is a place about an hour from where I live[d], you don't pay with money, we [brought] jicamas or peanuts and exchange[d] it for some type of fruit or vegetables or anything that other people [brought] too. It's not money but you exchange[d] stuff. [#0031]

You sow beans over there, just how you plant vegetables here. They used to plant this over there. They would collect the harvest and it was for the entire year. The beans and the corn, and that's how they made the tortillas too. [#0026]

Preference for fresh, natural: *In Mexico chicken is fresher and tastier. There, we don't use much Knorr Suiza [chicken stock] or something like that, everything is natural over there, while here you have to buy products to make it tastier. [#0006]*

Yes, I try to, always, most of the times I go to the supermarket I try to buy them fresh, I don't like to buy canned or frozen food...because I don't know how long they have been frozen or how much chemical compounds they have, so I always try to get everything fresh. [#0032]

Growing/Gathering Fresh produce in U.S: *I had a lot of crop and it was nice...I feel very satisfied that all the work I put in, without expecting for my garden, would have given - produced so much, it gave it, so I feel good. [It's special] because, like I say, I am instilling in my kids. You can't see it in the photo, but, lets say, if I harvest around five pounds of tomatoes a week, for about 8 to 10 dollars, I'm saving. So I can do this, so why not do it? [#0019]*

That's the, the vegetables that we plant in the summer and, and we put it in the freezer so we don't have to buy it now in the winter...it looks almost fresh...it is to see how we save this and therefore no longer need to buy in the winter, because right now [tomatoes and chiles are] very expensive. [#0026]

Yes, it's an opportunity and it's, um, it's, how can I say it, because since we work [in agriculture], it is a lot of help for us. Maybe we have a lot and other people don't; because, like the ones that live in [the nearby city] they work at factories or other things; maybe they earn more money at the factories or in better jobs, but they need to buy [produce] and we don't. [#0028]

Fishing: *[Fish is] a food that we can get without...for free. You just pay for the license, but it's very little, and we can get fish whenever. [#0014]*

B.3 Traditional foods and flavors of Mexico

Memories: *...we're so far away from our family and, sometimes, it feels like as if I were home [when I prepare potato tacos]. [Other foods that remind me of Mexico] well, something called chilaquiles that's for...in the morning, like for breakfast. And something else that's...well...mole...the pozole, all that...well, I feel, I feel as if I was back in el pueblo [the village] and I feel good because these are foods that one eats there, and also because it is for feeding my family. [#0014]*

Maintaining culture: *...I follow...the tradition of our Mexican food whether I'm here or in Mexico...well, the truth is we wouldn't change it for another food-our custom since childhood. [#0020]*

...well because I teach my children to learn, that how we lived there or what we did there, how we eat, that's why...yes, because I wouldn't want them to forget something traditional of ours...well it's important because we, our parents taught us to, that of, that's why I don't want them to forget and it's what I teach them. [#0026]

Food basics flavor-availability trade-off: *People say that long ago there was not Mexican things here. How did the people make it, right? Because yes, in truth we are accustomed to it. Tortillas are simply not the same as in Mexico, and you try them and taste the flavor at the beginning and say "no, no", then later, well it is our tortilla, that is, if there [is] a meal and we do not have a piece of tortilla, we feel that we didn't eat. We miss that, the dear tortilla. [#0020]*

Frequency of more elaborate traditional meals: *In Mexico, we didn't eat [vegetables and potatoes with pancita, a beef dish] very often because there it is more...things are more expensive, right? We did eat it, let's say, once a month... once or twice a month...these, mostly are special meals that are prepared when there is a...party...in Mexico. That is mostly when special meals are made, yes...here, it is easier to cook it, because as I say, having the food stamps [SNAP] I can buy the meat, as the meat is expensive, this meat and all the vegetables. It is easier here, to make these meals. [#0008]*

B.4 Motherhood

Food and nutrition program access: *SNAP and WIC help me a lot because WIC provides cheese, eggs, milk that is part of our daily food. And with SNAP I buy meat, vegetables, fruits. [#0002]*

Child nutrition and preferences : *...as adults, [grilled or baked meats are] what we ate. Now for the children we boil the chicken in a broth and with the broth from the chicken we prepare soup for the children, or we boil the beef, and with the broth we prepare rice or soup...because the children...do not like...to eat the meat like this, no. Or with a fork they don't like to eat it by itself. So one tries to get them to eat. [#0028]*

In Mexico if there isn't any, you don't eat meat, you might fry up some chiles, some beans and that's all. But not here, here you have to think about the kids. The kids can't just eat beans; they always need a piece of meat to eat. [#0004]

Knowledge and skills: *When my first daughter was born, we would go to the WIC. And there they told me that I had to eat vegetables, similarly when I was pregnant, they told me I had to eat vegetables. And I began learning that it is important to eat fruits and vegetables. [#0016]*

Well, this is something my mom would make for me and now I make it for my son. And I didn't know how to cook. I had to learn to cook for the baby, and my first soups would come out really bad and now, even my husband says "they're ok." After making soup all this time I'm improving. [#0010]

B.5 Health events

Change in diet quality: *Here, this is something, part of the pantry that we usually buy. If you notice most of the stuff that we buy is green, lots of vegetables, lots of broccoli, carrots. Before we didn't eat a lot of vegetables, but now when they detected lead [in him] we tried to increase it a lot, for us. So it's part of the groceries that we normally buy. [#0010]*

Gaining new knowledge and skills: *Well, the one who taught me- when my daughter had the lessons- the teacher would come and teach her at home. She was the one who told me [how to boil vegetables]. Because, since long before that [my husband] had health issues but we didn't listen. So I would tell the teacher all of that and she would tell me, "Well, you see this is a healthier way you can do this. Do it like this, put it in the oven or on the grill." Or she would tell me, "Just add the condiments you wish and it will be tasty." Or she would say, "Stick it in the oven, put the vegetables on top, cover them, wrap them in foil and stick them in the oven or in a pot like you were steaming them," she would say. And that is how I started doing it, and she was practically the one that taught me how to do it. [#0003]*

Positive outcomes: *We've had a benefit because we save more in the long time; and also in our health; I've felt better and he has now an ideal weight. So we [want] to stay here instead of buying food at the street. So this change has had a positive influence in our life, and this change is just investing time instead of buying processed food. [#0023]*

Figure B.1: **Conceptual Framework**

The figure below is a working conceptual framework providing a relational overview of concepts associated with the five emergent themes related to life course perspective, ultimately influencing preparation of home-cooked meals.

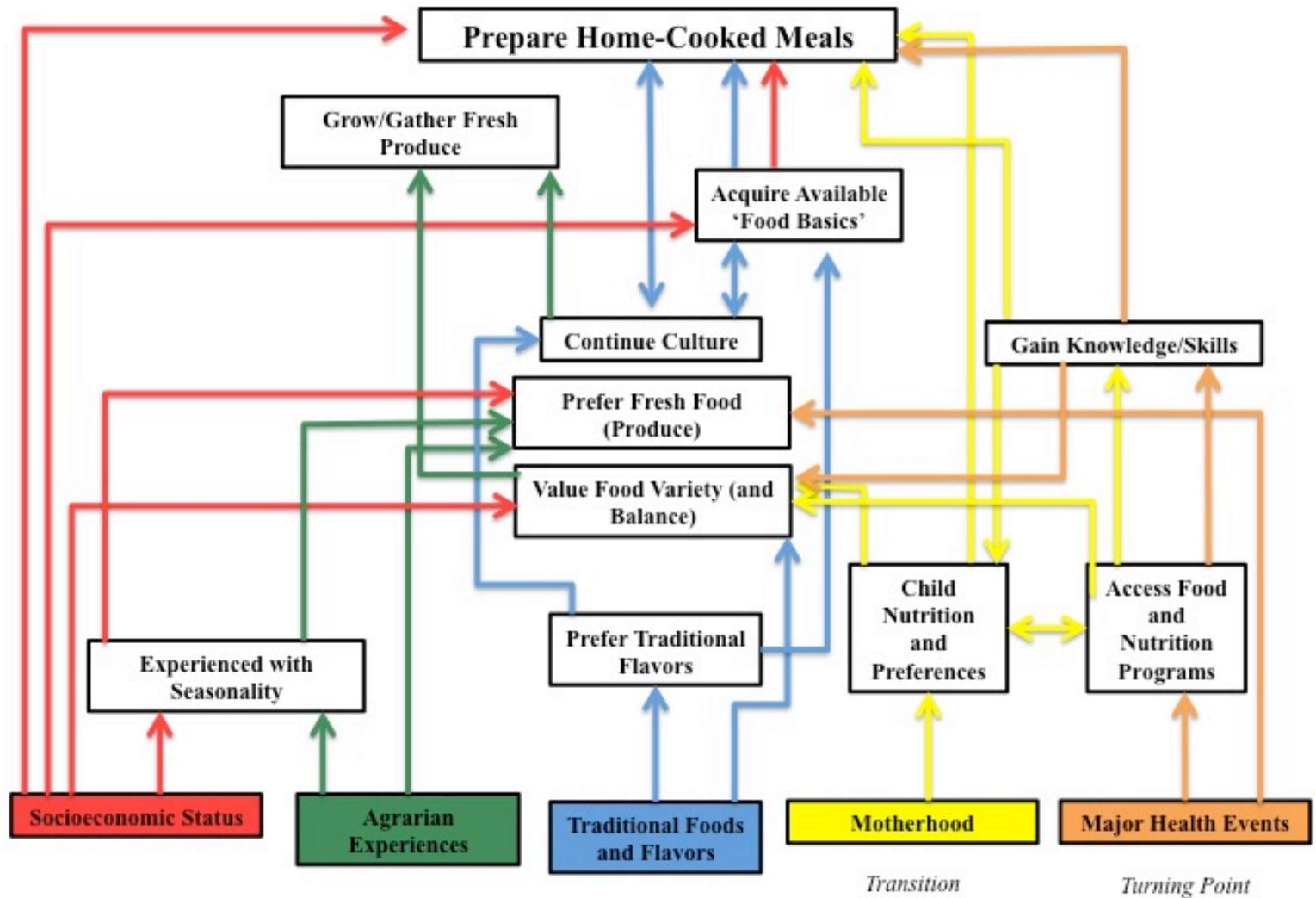




Figure B.2: Participant-produced photographs related to themes

Top photograph: Theme 1, non-perishable food basics [#0004]

Bottom photograph: Theme 2, Fresh produce from a CSA [#0016]



Figure B.3: Participant-produced photographs related to themes

Top photograph: Theme 3, A traditional Mexican meal, *pozole* [#0008]

Bottom photograph: Theme 4, Motherhood and feeding children [#0002]



Figure B.4: Participant-produced photographs related to themes

Theme 5, Health events, "Before we didn't eat a lot of vegetables" [#0007]

APPENDIX C

APPENDIX C: INTERVIEW GUIDES AND PARTICIPANT CHARACTERISTICS

C.1 Interview 1

C.1.1 Participant-driven photo elicitation

I am interested in understanding what influences how you feed your family here in the United States compared to when you were in Mexico. Please use this disposable camera to take photos of anything important to how you feed your family and children. Take photos to show how you obtain food for your family and children. Take photos to show how you prepare food for your family and children. Take photos to show anything that helps you or prevents you from feeding your family the way you want to feed them. Take photos that tell stories about both the easy and hard times you experience feeding your family and children. Also, take photos that show how you feed your family here in the United States compared to when you lived in Mexico.

For example, you may want to take photos of things in your kitchen, home, neighborhood, or community. Or you may want to take photos of you or other people doing things to help feed your family. I ask that you not take photos of people's faces for the study so that no one is identified. There are 27 exposures on this

camera and you can use them all. After taking photos for the study, if you want to take photos of your children and family, that's okay. I will give all of the photos to you at our next meeting.

Can you think of some things that you may want to take pictures of? What are some examples of things you can photograph?

You have one week to complete this activity. We will then pick up the camera from you so we can develop the photos. You will be able to keep a set of the photos for yourself at that second interview.

Any questions?

C.1.2 Childhood food security recall

Now I'm going to read you several statements people have made about their food situations when they were growing up. Please tell me whether these statements were often true, sometimes true, or never true for you when you were a child.

1. When I was a child, there were times when my family could not afford to feed me a balanced meal.
2. When I was a child, there were times when I was not given enough to eat because we couldn't afford enough food.
3. When I was a child, my family often ate the same foods for several days in a

row because we only had a few kinds of food on hand and we didn't have money to buy more.

4. When I was a child, I was hungry sometimes because we just couldn't afford more food.

5. As a child, I worried that there would not be enough to eat at home.

C.2 Interview 2

C.2.1 Introduction

Thank you for meeting again with us today. Did you have any problems taking photos over the last week?

Let's talk about some of the photos you took. This will take about one hour and a half. Can you choose four or five photos for us to talk about today?

C.2.2 Photo elicitation interview guide (based on SHOWED method)

1. What do you see in this photo?

a. Describe the photograph.

2. What is happening in this photo?

a. What were you doing when this photo was taken?

b. When was this photo taken?

c. Where was this photo taken?

d. How do you feel about what is happening in this photo?

e. What is special or important about this photo?

What reasons did you take this photo?

What else was going at the time you took this photo, but we cannot see in this photo? What is missing from this photo?

3. How does this (whats happening in the photo) relate to you and your familys life?

a. How does this (whats happening in the photo) relate to your life here in the United States?

b. How does this (whats happening in the photo) relate to your life when you lived in Mexico?

i. How does it (whats happening in the photo) relate to the people you still know in Mexico?

c. How does this (whats happening in the photo) relate to the life of other peo-

ple you know in your community here in (place of the interview in (Dutchess or Orange) County, NY)?

- i. Who are the people you know in your community?
 - ii. When you think of your community, who do you think of?
 - iii. When you think of your community, what do you think of?
 - iv. How do you define your community?
4. What are the reasons this issue exists? (Could be a problem, concern, or strength)
- a. How does your life in your house affect/influence this issue?
 - b. How does this issue affect/influence life in your house?
 - c. How do your relationships impact this issue?
 - d. How does this issue affect/influence your relationships?
 - e. How does your community impact this issue?
 - f. How does this issue affect/influence your community?
 - g. How is this issue different now compared to when you first came to the United States?
 - h. How is this issue different between Mexico and the United States?
5. How can understanding this issue lead to your empowerment?
6. What can we do about this issue?
- a. What can you do about this issue in your life?
 - b. What can the people you know do about this issue?
 - c. What can your community do about this issue?
7. What photos did you want to take but did not take?

C.3 Interview 3

C.3.1 Introduction

Thank you for meeting with us again today. Today will be our last interview and will last about one hour and a half. Any questions?

C.3.2 Member check

First, we would like to talk review some of the things we talked about in our last interview. We want to make sure we correctly understand the things you told me.

C.3.3 Interview guide

Now, we want to ask you more about your experiences over your lifetime until now. Think about these questions as a story of your life, from your birth in Mexico, over the period of migration to the U.S., until now, in (Dutchess/Orange) County with your children. We are interested to hear YOUR story!

1. Tell me about your home and lifestyle when you lived in Mexico.
 - a. What was your life like then?
 - b. What was your home like then?

2. Please describe your food and meals when you lived in Mexico.
 - a. How often did you eat?
 - i. Of the times you ate, which did you consider to be a meal?
 - ii. What influenced how often you ate?
 - b. What kinds of foods did you eat in a typical day?
 - i. What influenced the types of foods you ate?
 - ii. What kinds of foods did you eat for special occasions?
 1. What influenced the kinds of foods you ate for special occasions?
 - c. Who did you eat with?
 - i. What influenced whom you ate with?
 - ii. How was the food served?
 1. Was the food served to you, or did you serve yourself?
 2. What influenced how the food was served?
 - d. How much food did you have to eat?
 - i. What influenced how much you ate?
 - ii. What influenced the size of the portions?
 - iii. How did you feel about the amount of food you had to eat?
 - e. How did you and your family obtain food to eat?
 - i. What was the usual way you obtained food?
 1. Where did you obtain the food?
 2. How did you pay for the food?
 3. What reasons did you obtain food this way?
 - ii. What were less common ways you obtained food?

1. How often did you obtain your food this way?
 2. Where did you obtain the food?
 3. How did you pay for the food?
 4. What reasons did you obtain food this way?
- f. What influenced the kinds of foods you and your family had available to eat?
- i. How did you feel about the kinds of foods available to you to eat?
 - ii. What did you want to eat but was not available?
 - iii. How often was this food not available?
 - iv. What were the reasons this food was not available?
3. Tell me about your experiences with the preparation of food when you lived in Mexico.
- a. Who prepared the food?
 - b. What was the preparation of food like on a normal day?
 - c. What was the preparation of food like on a special occasion?
 - i. How often did this happen?
 - d. What was your role in preparing food?
 - i. How often did you participate in preparing food?
 - e. Tell me about the important skills (habilidades) you learned to prepare food.
 - i. Why were these skills important?
 - ii. Where did you learn these skills?
 1. How often did you use these skills?
 2. How do these skills relate to your life now?

- f. What did you enjoy about food preparation?
 - g. What did you not enjoy about food preparation?
 - h. Compared to the U.S., what was unique about the way food was prepared?
 - i. Compared to the U.S., what was similar about the way food was prepared?
4. Tell me about times in Mexico when you and your family did not have enough food to eat or had problems getting enough food to eat.
- a. What were the reasons you did not have enough to eat? What were the reasons you and your family had trouble getting enough food to eat?
 - b. Please describe these times when you did not eat very much.
 - i. Describe different meals.
 - ii. What foods did you eat? What foods did you NOT eat?
 - iii. How much did you eat?
 - iv. How did this influence how often you ate?
 - v. How did you obtain food to eat?
 - vi. How were the foods prepared?
 - vii. What ages/periods of time do you remember this happening?
 - c. How often did this happen?
 - i. How did you and your family cope during these times?
 - 1. What was helpful? How was this helpful?
 - 2. What was NOT helpful? How was this NOT helpful?
 - 3. What made it worse? How did it make it worse?
 - d. Describe how you and your family felt when you did not eat much.
 - i. How did you feel when you were worried about not having enough to

- eat?
- ii. How did you feel when you were hungry?
 - iii. How did you respond?
 - iv. How did your parents feel when there was not enough food to eat?
 - 1. How did they respond?
5. Tell me about times in Mexico when you and your family could not afford to have a healthy, balanced meal to eat.
- a. What were the reasons you did not have healthy, balanced meals?
 - b. What made the meals unhealthy or unbalanced?
 - c. Please describe the times when your family could not afford healthy, balanced meals.
 - i. Describe different meals.
 - ii. What foods did you eat? What foods did you NOT eat?
 - iii. How much did you eat?
 - iv. How did this influence how often you ate?
 - v. How did you obtain food to eat?
 - vi. How were the foods prepared?
 - vii. What ages/periods of time do you remember this happening?
 - viii. How did you feel when you did not have a healthy, balanced meal?
 - 1. How did your parents feel?
6. Tell me about people you knew in Mexico. These may be people that lived with you or other people you knew.
- a. Who were the people you lived with in Mexico?

- i. What role did they have in helping you have enough food to eat?
 - ii. What role did they have in helping you and your family have healthy, balanced meals to eat?
 - b. Besides the people you lived with, who else was important to you in Mexico?
 - i. What role did they have in helping you and your family have enough food to eat?
 - ii. What role did they have in helping you and your family have healthy, balanced meals to eat?
 - c. Who is still living in your town in Mexico?
 - d. What role do they have now that you live far away?
7. Tell me about any nutrition programs you or the people you lived with participated in when you lived in Mexico.
 - a. What were the names of those programs?
 - b. What did those programs provide to help with nutrition?
 - c. What activities did you do in those programs?
8. Tell me a little about why you decided to come to the U.S.
 - a. What did you gain by migrating?
 - b. What did you lose by migrating?
 - c. What most influenced your final decision to migrate?
 - d. Who was affected by your decision?
 - e. How were they affected by your decision?
9. Think about the times before you had children that you did not have enough

food to eat. This may be either before you left Mexico or after you arrived in the U.S.

- a. What were the reasons you did not have enough food to eat?
- b. What were the reasons you had trouble having enough food to eat?
- c. How often did this happen?
 - i. When it did occur, how long did these times last?
- d. How did you cope during these times?
 - i. What was helpful? How was this helpful?
 - ii. What was NOT helpful? How was this not helpful?
 - iii. What made it worse? How did it make it worse?
- e. How did you eat during these times?
 - i. What foods did you eat?
 - ii. What foods did you NOT have to eat?
 - ii. How did this affect the amount of food you ate?
 1. How was this different compared to when you had enough food?
 - iv. How did this affect how often you ate?
 - v. How did you get food to eat?
 - vi. How did you pay for the food?
 - vii. How were the foods prepared?
- f. How did you feel when there was not enough food to eat?
 - i. How did you feel when you were worried about not having enough to eat?
 - ii. How did you feel when you were hungry?

- iii. How did you respond?
10. Tell me about your home and lifestyle now in the United States.
- a. What is your lifestyle like here?
 - b. What is your home like here?
 - c. How is your lifestyle different from Mexico?
 - d. How is your home different from Mexico?
 - e. Who are your relatives here?
 - i. How often do you spend time with them?
 - ii. What types of activities do you do with them?
 - iii. How do they influence the way you feed your children?
 - f. Who are your friends here?
 - i. How often do you spend time with them?
 - ii. What types of activities do you do with them?
 - iii. How do they influence the way you feed your family?
11. Tell me about how you obtain food in the U.S. for your family.
- a. What foods do you purchase?
 - i. For which foods do you use your SNAP benefits?
 - b. What foods do you obtain through WIC?
 - c. What foods do you obtain from other sources?
 - i. Family?
 - ii. Friends?
 - iii. Food pantries?
 - iv. Gardens?

- v. Work?
 - d. Besides going to stores (super markets, etc) to buy food, from what other places do you buy food for your family?
 - i. Fast food?
 - ii. Restaurants?
 - iii. Prepared foods?
 - iv. How often do you purchase foods from these places?
12. Tell me about food preparation here in the U.S. for your family.
- a. Who prepares the food?
 - i. What is your role in preparing the food? How often do you participate in preparing the food?
 - b. What is the preparation of food like on a normal day?
 - c. What is the preparation of food like on a special occasion?
 - i. How often does this happen?
 - d. Tell me about the important skills (habilidades) you need to prepare food.
 - i. Why are these skills important?
 - ii. Where did you learn these skills?
 - e. What do you enjoy about food preparation?
 - f. What do you not enjoy about food preparation?
13. Please describe what it means to you to provide enough food for your children to eat here in the U.S.
- a. Can you give examples of specific times where you felt like you and your family had enough to eat?

- i. What did give your children to eat?
 1. What did you eat?
 - ii. Who else ate with you?
 - iii. How much did your children eat?
 1. How much did you eat?
 - iv. How did you get the food?
 1. How did you pay for the food?
 - v. How was the food prepared?
 - vi. How did you feel having enough food to give your children to eat?
 - vii. How did your children feel having enough food to eat?
- b. Tell me about times in the U.S. when you had trouble providing enough food for your children to eat.
- i. What were the reasons you had trouble providing enough food for your children to eat?
 - ii. How often does this happen?
 1. When it does occur, how long do these times last?
 - iii. How did you cope during these times?
 1. What was helpful?
 - a. How was this helpful?
 2. What was NOT helpful?
 - a. How was this not helpful?
 3. What made it worse?
 - a. How did it make it worse?

- iv. How did you and your family eat during these times?
 - 1. What foods did you eat?
 - 2. What foods did you NOT have to eat?
 - 3. How did this affect the amount of food you ate?
 - a. How was this different compared to when you had enough food?
 - 4. How did this affect the amount of food your children ate?
 - a. How was this different compared to when you had enough food?
 - 5. How did this affect how often you ate?
 - a. How did this affect how often your children ate?
 - 6. How did you get food to eat?
 - a. How did you pay for the food?
 - 7. How were the foods prepared?
 - v. How did you feel when there was not enough food to eat?
 - 1. How did you feel when you were worried about not having enough to eat?
 - 2. How did you feel when you were hungry?
 - 3. How did you respond?
 - vi. How did your children feel when there was not enough food to eat?
 - 1. How did your children feel when YOU were worried about not having enough to eat?
 - 2. How did they feel when they were hungry?
 - 3. How did they respond?
14. Please describe what it means to you to have healthy, balanced meals for you

and your children to eat in the U.S.

a. Can you give an example of specific times where you felt like you and your children had healthy, balanced meals to eat?

i. What did you give your children to eat?

1. What did you eat?

ii. What made the meals healthy and balanced?

iii. Who was eating with you?

iv. How did you get the food?

1. How did you pay for the food?

v. How was the food prepared?

vi. How did you feel having a healthy, balanced meal to eat?

b. Tell me about times in the U.S. when you could not afford to give your children a healthy, balanced meal to eat.

i. What were the reasons you could not provide healthy, balanced meals?

ii. What made the meals unhealthy or unbalanced?

iii. How did you and your children eat during these times?

1. What foods did you eat?

a. How were they prepared?

2. What foods did you NOT have to eat?

3. How was this different compared to when you could afford healthy, balanced meals?

4. How did you get food to eat?

5. How did you feel when you did not have healthy, balanced meals to

give your children to eat?

a. How did your children feel?

15. Think about times when you had few kinds of food available so you had to give your children the same foods several days in a row.

a. What were the reasons this happened?

b. What kinds of foods did you give your children the most often?

c. What kinds of foods did you give them the least often?

d. How did you obtain the food?

i. How did you pay for the food?

e. How were the foods prepared?

16. Think about your experiences with food and eating in Mexico compared to your experiences in the U.S. Describe how it is similar and different.

a. How is feeding your family different?

i. What helps you?

ii. What makes it harder?

iii. How do you feel about these differences?

b. What did you have in Mexico that you wish you had here for your children?

i. Why is this important?

c. What do you have in the U.S. for your children that you did not have in Mexico?

i. Why is this important?

17. Tell me about the traditional Mexican foods or dishes that you, your children, and your family normally eat here in the United States.

- a. How do you include Mexican food items in the meals you prepare?
 - b. How do you use the food you obtain to prepare traditional Mexican meals?
 - c. How do you obtain the foods you use to prepare these Mexican foods?
 - d. What makes these foods and dishes important?
18. Tell me about other common foods you and your family eat here in the United States.
- a. How do you obtain these foods?
 - b. How do you prepare these foods?
 - c. What makes these foods and meals important?
19. If nothing limited how you fed your family, what would be the ideal way to feed your family each day?
- a. What would make this ideal possible?
20. Is there anything else you would like to share with me?

C.3.4 18-item Core Food Security Module

HH1. [IF ONE PERSON IN HOUSEHOLD, USE "I" IN PARENTHETICALS, OTHERWISE, USE "WE."]

Which of these statements best describes the food eaten in your household in the last 12 months: enough of the kinds of food (I/we) want to eat; enough, but not always the kinds of food (I/we) want; sometimes not enough to eat; or, often not enough to eat?

Household Stage 1: Questions HH2-HH4 (asked of all households; begin scale items). [IF SINGLE ADULT IN HOUSEHOLD, USE "I," "MY," AND YOU IN PARENTHETICALS; OTHERWISE, USE "WE," "OUR," AND "YOUR HOUSEHOLD."]

HH2. Now I'm going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for (you/your household) in the last 12 months that is, since last (name of current month). The first statement is "(I/We) worried whether (my/our) food would run out before (I/we) got money to buy more." Was that often true, sometimes true, or never true for (you/your household) in the last 12 months?

HH3. "The food that (I/we) bought just didn't last, and (I/we) didn't have money to get more." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

HH4. "(I/we) couldn't afford to eat balanced meals." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

Screener for Stage 2 Adult-Referenced Questions: If affirmative response (i.e., "often true" or "sometimes true") to one or more of Questions HH2-HH4, OR, response [3] or [4] to question HH1 (if administered), then continue to Adult Stage

2; otherwise, if children under age 18 are present in the household, skip to Child Stage 1, otherwise skip to End of Food Security Module. NOTE: In a sample similar to that of the general U.S. population, about 20 percent of households (45 percent of households with incomes less than 185 percent of poverty line) will pass this screen and continue to Adult Stage 2. Adult Stage 2: Questions AD1-AD4 (asked of households passing the screener for Stage 2 adult-referenced questions).

AD1. In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?

AD1a. [IF YES ABOVE, ASK] How often did this happen- almost every month, some months but not every month, or in only 1 or 2 months?

AD2. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?

AD3. In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food?

AD4. In the last 12 months, did you lose weight because there wasn't enough

money for food?

Screeners for Stage 3 Adult-Referenced Questions: If affirmative response to one or more of questions AD1 through AD4, then continue to Adult Stage 3; otherwise, if children under age 18 are present in the household, skip to Child Stage 1, otherwise skip to End of Food Security Module. NOTE: In a sample similar to that of the general U.S. population, about 8 percent of households (20 percent of households with incomes less than 185 percent of poverty line) will pass this screen and continue to Adult Stage 3. Adult Stage 3: Questions AD5-AD5a (asked of households passing screener for Stage 3 adult-referenced questions).

AD5. In the last 12 months, did (you/you or other adults in your household) ever not eat for a whole day because there wasn't enough money for food?

AD5a. [IF YES ABOVE, ASK] How often did this happen-almost every month, some months but not every month, or in only 1 or 2 months?

Child Stage 1: Questions CH1-CH3 (Transitions and questions CH1 and CH2 are administered to all households with children under age 18) Households with no child under age 18, skip to End of Food Security Module. SELECT APPROPRIATE FILLS DEPENDING ON NUMBER OF ADULTS AND NUMBER OF CHILDREN

IN THE HOUSEHOLD. Transition into Child-Referenced Questions: Now I'm going to read you several statements that people have made about the food situation of their children. For these statements, please tell me whether the statement was OFTEN true, SOMETIMES true, or NEVER true in the last 12 months for (your child/children living in the household who are under 18 years old).

CH1. "(I/we) relied on only a few kinds of low-cost food to feed (my/our) child/the children) because (I was/we were) running out of money to buy food." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

CH2. "(I/We) couldn't feed (my/our) child/the children) a balanced meal, because (I/we) couldn't afford that." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

CH3. "(My/Our child was/The children were) not eating enough because (I/we) just couldn't afford enough food." Was that often, sometimes, or never true for (you/your household) in the last 12 months?

Screener for Stage 2 Child Referenced Questions: If affirmative response (i.e., "often true" or "sometimes true") to one or more of questions CH1-CH3, then con-

tinue to Child Stage 2; otherwise skip to End of Food Security Module. NOTE: In a sample similar to that of the general U.S. population, about 16 percent of households with children (35 percent of households with children with incomes less than 185 percent of poverty line) will pass this screen and continue to Child Stage 2. Child Stage 2: Questions CH4-CH7 (asked of households passing the screener for stage 2 child-referenced questions). NOTE: In Current Population Survey Food Security Supplements, question CH6 precedes question CH5.

CH4. In the last 12 months, since (current month) of last year, did you ever cut the size of (your child's/any of the children's) meals because there wasn't enough money for food?

CH5. In the last 12 months, did (CHILDS NAME/any of the children) ever skip meals because there wasn't enough money for food?

CH5a. [IF YES ABOVE ASK] How often did this happen-almost every month, some months but not every month, or in only 1 or 2 months?

CH6. In the last 12 months, (was your child/were the children) ever hungry but you just couldn't afford more food?

CH7. In the last 12 months, did (your child/any of the children) ever not eat for a whole day because there wasn't enough money for food?

(1) Coding Responses and Assessing Household Food Security Status: Following is a brief overview of how to code responses and assess household food security status based on various standard scales. For detailed information on these procedures, refer to the Guide to Measuring Household Food Security, Revised 2000, and Measuring Children's Food Security in U.S. Households, 1995-1999. Both publications are available through the ERS Food Security in the United States Briefing Room. Responses of "yes," "often," "sometimes," "almost every month," and "some months but not every month" are coded as affirmative. The sum of affirmative responses to a specified set of items is referred to as the households raw score on the scale comprising those items.

Questions HH2 through CH7 comprise the U.S. Household Food Security Scale (questions HH2 through AD5a for households with no child present). Specification of food security status depends on raw score and whether there are children in the household (i.e., whether responses to child-referenced questions are included in the raw score).

For households with one or more children:

Raw score 0-High food security

Raw score 1-2-Marginal food security

Raw score 3-7-Low food security

Raw score 8-18-Very low food security

For households with no child present:

Raw score 0-High food security

Raw score 1-2-Marginal food security

Raw score 3-5-Low food security

Raw score 6-10-Very low food security

Questions CH1 through CH7 comprise the U.S. Children's Food Security Scale.

Raw score 0-1-High or marginal food security among children (raw score 1 maybe considered marginal food security, but it is not certain that all households with raw score zero have high food security among children because the scale does not include an assessment of the anxiety component of food insecurity)

Raw score 2-4-Low food security among children

Raw score 5-8-Very low food security among children

C.4 Complete participant socio-demographics, food assistance, and food security characteristics

ID number	Season of Interview	Employment Status	Rural/Urban in U.S.	Origin in Mexico	Years in U.S.	Age at arrival (years)	Current Age (years)	Childhood FS
0002	Winter	N	Urban (Poughkeepsie (Pok))	Oaxaca	10	16	26	Food insecure
0003	Winter	N (looking for work)	Urban (Wappingers Falls)	Rural (San Gabriel, Jalisco)	8	19	27	Food insecure
0004	Winter	N	Urban (Pok)	Puebla	6	22	28	Food insecure
0006	Winter	N	Urban (Pok)	Veracruz	10	18	28	Food secure
0007	Winter	Y (PT own business)	Urban (Pok)	Urban (Monterey)	4	35	39	Food secure
0008	Winter/Spring	N	Urban (Pok)	Rural (Oaxaca)	12	22	33	Food insecure
0009	Spring	N	Rural (Dutchess Co)	Oaxaca	9	14	23	Food secure
0010	Spring/Summer	Y (PT)	Urban (Pok)	Urban (DF)	2	28	29	Food secure
0013	Fall/Winter	Y	Urban (Pok)	Urban (DF)	8	13	23	Food secure
0014	Summer	N	Urban (Pok)	Puebla	7	22	29	Food secure
0016	Summer/Fall	N	Urban (Pok)	Oaxaca	9	30	39	Food insecure
0017	Summer/Fall	Y (PT)	Urban (Pok)	Urban (DF)	10	23	34	Food insecure
0018	Summer/Fall	N	Urban (Pok)	Oaxaca	9	22	30	Food insecure
0019	Summer/Fall	N	Urban (Pok)	Oaxaca	8	24	32	Food secure

ID number	Season of Interview	Employment Status	Rural/Urban in U.S.	Origin in Mexico	Years in U.S.	Age at arrival (years)	Current Age (years)	Childhood FS
0020	Summer/Fall	Y (parttime)	Urban (Pok)	Urban (DF)	7	19	27	Food secure
0021	Spring	Y (I think PT)	Rural (Dutchess Co)	Oaxaca	8.5	21	32	Food insecure
0023	Spring	Y (PT)	Urban (Pok)	Oaxaca	8	22	30	Food insecure
0024	Winter	Y (PT)	Rural (Orange Co)	Jalisco	17	24	41	Food insecure
0025	Winter	Y (few hours, want more)	Rural (Orange Co)	Puebla	9	21	29	Food insecure
0026	Winter	Y (FT)	Rural (Orange Co)	Puebla	9	23	32	Food insecure
0028	Winter	Y (but seasonal so now unemployed)	Rural (Orange Co)	Puebla	10	19	30	Food insecure
0029	Winter	Y (PT to FT)	Urban (Middletown)	Puebla	8.5	13	22	Food insecure
0030	Winter/Spring	Y, but very little (seasonal)	Urban (Middletown)	Puebla	10	23	33	Food insecure
0031	Winter/Spring	N	Urban (Middletown)	Puebla	7	24	31	Food insecure
0032	Winter/Spring	Y (PT)	Urban (Middletown)	Rural (Puebla)	9	18	28	Food secure
0035	Winter/Spring	N	Urban (Middletown)	Urban (Durango)/Rural (Zacatecas)	5.5	22	26	Food insecure
0037	Winter/Spring	Y (FT)	Rural (Orange Co)	Oaxaca	7.5	21	29	Food insecure

ID number	Income (\$)	SNAP	WIC	Head Start	Non-nuclear family members in household	Household Size	# children in household	# children born in Mexico	Spouse/ Partner	Spouse/Partner Employed	Current Household FS	Current Child FS
0002	1200-1599	Y	Y	Y	0	5	3	0	Y	Y	High FS	High/Marginal FS
0003	<\$800	Y	N	Y	0	3	1	0	Y	Y	Low FS	Low FS
0004	800-1599	Y	Y	N	1	5	2	0	Y	Y	Low FS	Low FS
0006	800-1199	Y	Y	Y	0	3	1	0	Y	Y	Marginal FS	High/Marginal FS
0007	1200-1599	N	Y	N	0	4	2	1	Y	Y	High FS	High/Marginal FS
0008	2000-2399	Y	Y	N	1	6	3	0	Y	Y	Very low FS	Low FS
0009	0	Y	Y	N	0	6	5	0	N	NA	High FS	High/Marginal FS
0010	800-1199	N	Y	N	1	4	1	0	Y	Y	High FS	High/Marginal FS
0013	1400	N	Y	N	0	3	1 (+pregnant)	0	Y	Y	High FS	High/Marginal FS
0014	1200-1599	N	Y	N	1	5	2	1	Y	Y	Marginal FS	Low FS
0016	1920	Y	Y	N	0	4	2	0	Y	Y	High FS	High/Marginal FS
0017	1200-1599	Y	Y	Y	1	5	2	0	Y	Y	Marginal FS	High/Marginal FS
0018	920	Y	Y	N	0	6	4	0	Y	Y	Low FS	High/Marginal FS
0019	1160-1200	Y	Y	N	0	5	3	2	Y	Y	High FS	High/Marginal FS

ID number	Income (\$)/Month	SNAP	WIC	Head Start	Non-nuclear family members in household	Household Size	# children in household	# children born in Mexico	Spouse/ Partner	Spouse/Partner Employed	Current Household FS	Current Child FS
0020	2000-2399	N	Y	N	1	6	3	1	Y	Y	Marginal FS	High/Marginal FS
0021	1200-1599 (deduct rent from husband's pay)	N	N	N	0	4	2	0	Y	Y	Marginal FS	High/Marginal FS
0023	1200-1599	N	Y	N	0	3	1	0	Y	Y	Low FS	Low FS
0024	< 800	N	Y	Y	0	5	3	0	Y	Y	High FS	High/Marginal FS
0025	\$300-399 (boss provides housing)	Y	Y	Y	0	4	2	0	Y	Y	Low FS	High/Marginal FS
0026	\$400-499 (boss provides housing)	N	N	Y	0	4	2	1	Y	Y	Low FS	High/Marginal FS
0028	<800	N	Y	Y	1	6	4	0	Y	Y	Marginal FS	Low FS
0029	<800 (Not sure if from whole house or just her)	N	N	Y	5	7	1	0	N	NA	Low FS	Low FS
0030	180	Y	N	Y	2	4	1	0	N	NA	Very low FS	Very low FS
0031	1200-1599	N	Y	Y	0	4	2	0	Y	Y	Low FS	Low FS
0032	800-1199	Y	Y	Y	0	5	3	0	Y	Y	Marginal FS	High/Marginal FS
0035	800-1199 (house); <800 (spouse)	N	N	Y	3	6	1	1 (still in Mexico)	Y	Y	Marginal FS	High/Marginal FS
0037	800-1199	Y	Y	Y	1	4	1	0	Y	Y	Low FS	Low FS