2016

Food Insecurity, Social Inequality, and Social Policy

Sara Strickhouser
University of Central Florida

FOOD INSECURITY, SOCIAL INEQUALITY, AND SOCIAL POLICY

by

SARA STRICKHOUSER
B.A. Stetson University, 2008
M.A. University of Central Florida, 2013

A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
in the Department of Sociology
in the College of Sciences
at the University of Central Florida
Orlando, FL

Spring Term
2016

Major Professor: James D. Wright

ABSTRACT

Research shows that food insecurity rates and experiences vary by subpopulation. This dissertation examines the rates and experience of food insecurity across subpopulations using a wide variety of sociodemographic factors, thus expanding the current research on social determinants of food insecurity. Subtopics surrounding the current food insecurity research are also explored. These topics include determinants of food deserts, SNAP (or food stamps) utilization, and household adaptation strategies. This research shows that current measurements of food insecurity lack the detail needed to understand why households are food insecure besides lacking income. Using Bourdieu's four forms of capital, this study considers factors beyond income to understand the determinants of food insecurity.

Quantitative analyses utilize nationally representative data from the 2013 Current Population Survey Food Security Supplement, as well as representative food security data collected for Orange County, FL and state of Florida. Qualitative interviews were conducted to examine adaptation strategies of households with children. This research finds that a number of determinants besides income contribute to household food insecurity and encourages policymakers to move beyond income as the major determinant of food insecurity and consider other household and demographic characteristics as equally important to understanding the problem of food insecurity in the US today.

Dedication

I dedicate this dissertation to my parents, Charles and Rhonda Strickhouser. Throughout my life, I have yet to come across people as generous and thoughtful as you both. I hope I have as much patience, understanding, and good advice to impart on my children as you did to me. Thank you for your never ending positive attitudes and support for all of the decisions I have made along the way, no matter how crazy they were. I would never have made it this far without you two.

ACKNOWLEDGMENTS

Thank you to my coauthor, mentor, and friend, Dr. Jim Wright, for your invaluable guidance over the years. I do not think anyone could have made grad school as fun and exciting as you did. I am forever indebted to you for the wealth of knowledge and tricks of the trade you have imparted upon me, all the while maintaining nothing but patience along the way. I will miss the crazy work days and intriguing discussions.

Thank you to my committee, Dr. Melanie Hinojosa, Dr. Ray Hinojosa, Dr. Thomas Bryer and Dr. Amy Donley for your feedback and guidance through the dissertation process. Melanie and Ray, thank you for your intriguing courses and helpful advice.

Thank you to my husband-to-be, Jorge Vega, for your inexhaustible faith in my every endeavor and the unconditional love you show me every day; but mostly, thank you for putting up with me through this entire process. And thank you to my sister and brother, Amy Meridith and Charles Strickhouser, who have made it all so fun.

To my cohort and classmates, in particular, Alyssa Mullins, without whom I would have never made it through the theory comp, and Jenny Nguyen, without whom I would have never taken a vacation.

Finally, a very special thank you must go to Traci Milbuta. The number of hours you have listened to me gripe and the number of questions I have asked you throughout my five years are immeasurable. I know I will never be able to repay you for the guidance, encouragement, and laughs that have gotten me where I am today. I will miss our daily conversations immensely.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE: INTRODUCTION

The history of humanity includes innumerable battles with hunger across diverse populations. Famines and droughts have affected every nation at one time or another. Although most would not consider the modern day United States to be a country struggling with issues of hunger, a recent federal report determined that 14.3 percent, or 17.5 million, of U.S. households were *food insecure* in 2013. And this number has grown since 1995, when data was first collected on the topic (See Figure 1) (A. Coleman-Jensen, Gregory, & Singh, 2014).

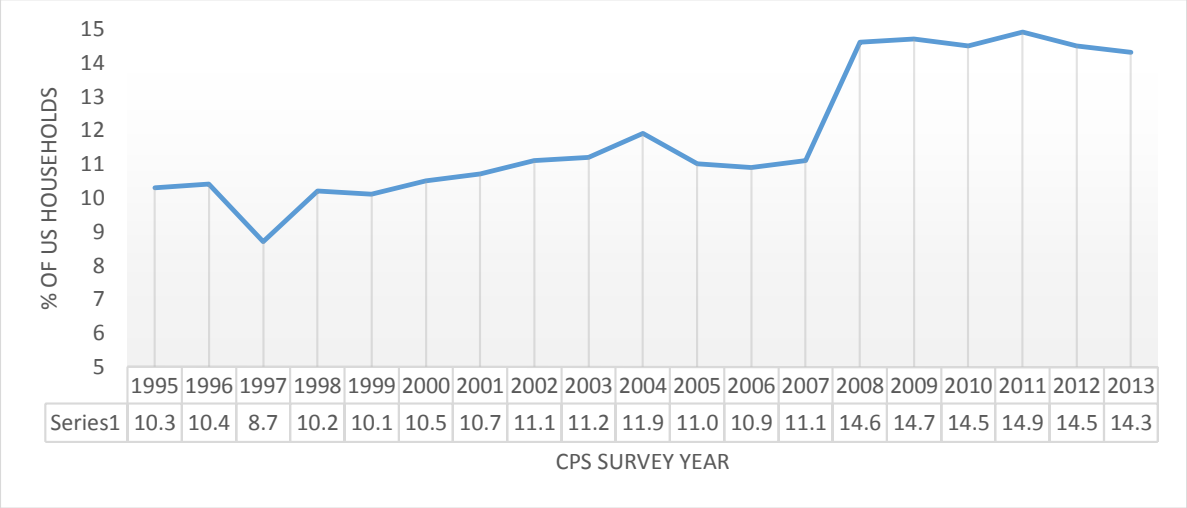

Figure 1. Food Insecurity of US Households

These households, and the individuals that make them up, were not labeled as suffering from *hunger*, however, but *food insecure*. *Hunger* refers to the physical sensation resulting from a lack of food. Merriam-Webster defines it as "a craving or urgent need for food" and the USDA previously defined it as "the uneasy or painful sensation caused by lack of food" (Merriam-Webster, 2004). *Food insecurity* refers most commonly to the inability to secure sufficient food (or anxiety about that ability). But the term has been used in a wide range of settings to mean many different things.

Globally, the term, first used at a 1974 World Food Conference, referred to nation-states having "sufficient food to sustain a steady expansion of food consumption and to offset fluctuations in production and prices." Today, the term refers to both global food insecurity, as well as food insecurity among even smaller units than nations, such as communities, households, and individuals. This research uses the term to refer to food insecurity on the national, community, household and individual scale, or in other words, the way it is used by the US Department of Agriculture (USDA), to refer to the "access [to food] at all times for an active, healthy life for all household members" (A. Coleman-Jensen et al., 2014).

Long before the term *food security* took center stage as the most common way to discuss the issue of hunger in the US, this nation became aware of the rates of hunger that existed among some of our most vulnerable populations. CBS reported on the issues in a documentary, "Hunger in America". The documentary aired Thanksgiving 1968 and revealed, to national viewers, stark images of malnourished children of sharecrop workers, lethargic and starving children from the Mississippi Delta and the black inner city, and destitute families from Appalachia. The country was outraged and demanded something be done to end the extreme rates of hunger many thought only existed in developing countries.

Response came in the form of the creation of a Senate subcommittee on poverty and employment. *Hunger* was initially fought with the food stamp program, reinstated in 1964 as a food discount program, along with continued support of the National School Lunch Program (NSLP), in place since 1946. By 1977, the food stamp program became an entitlement program and additional food and nutrition assistance programs were instated including Special Supplemental Nutrition Program for Women, Infants and Children or WIC (1974) and the National School Breakfast Program or NSBP (1975).

Always housed within the USDA, each food and nutrition assistance program worked to stamp out hunger for a different population. School breakfast and lunch programs targeted children, food stamps targeted various vulnerable populations, and WIC targeted poor mothers. With all these programs in place, forms of hunger seen in the CBS documentary decreased. Many believed it was time to turn from talking about hunger in America to talking about food insecurity instead. To be sure, there was then and still is today plenty of hunger in American. But, as we will see, hunger was eliminated from the nation's public policy vocabulary.

Calls to measure changes in the rate of hunger since the 1960s calls to action were set in motion came twenty years later in the 1980s. The President's Task Force on Food Assistance in 1984 reported, "There is no official 'hunger count' to estimate the number of hungry people, and so there are no hard data available to estimate the extent of hunger directly". By 1990, the National Nutrition Monitoring and Related Research (NNMRR) Act of 1990 suggested in its report that the USDA begin to monitor *food security*.

Enter 'food insecurity' onto the national scene and the near abandonment of 'hunger' as a national issue. The NNMRR Act of 1990 called for a ten-year comprehensive plan which included the development of "a standardized mechanism and instrument(s) for defining and obtaining data on the prevalence of 'food insecurity' or 'food insufficiency' in the United States and methodologies that can be used across the NNMRR Program and at State and local levels." By 1994, the USDA's Food and Nutrition Service (FNS) co-sponsored a National Conference on Food Security Measurement and Research and from this conference was born the 18-item Core Food Security Module (CFSM), the ubiquitous measurement tool used to measure food security in the US.

First implemented in 1995, the Core Food Security Module comes attached as a supplement survey to the Current Population Survey, a national survey conducted monthly by the Bureau of Labor Statistics at the Census (Details of the CPS can be found in Chapter 2). Major modifications were made to the survey to improve data quality and reduce respondent burden in 1998 (Gary, Mark, Cristofer, William, & John, 2000). Since 1998, the Food Security Supplement containing the 18-item Core Food Security has been collected for the USDA-FNS.

The amount of research on food insecurity in the US skyrocketed after the NNMRR call for the monitoring of "food security" and the yearly implementation of the CPS-FSS (See Figure 2). A search (using Google Scholar, a liberal and sweeping search engine) for academic articles with the keyword "food security" published in 1970 turns up 175 hits. Compare this to a search for the same term in 1990 (2,000 hits), 2000 (7,830 hits), and in 2015 (105,000 hits). Research on the topic has uncovered a plethora of important and diverse findings on topics ranging from the health consequences of food insecurity to issues of access and how food insecurity affects different groups differently.

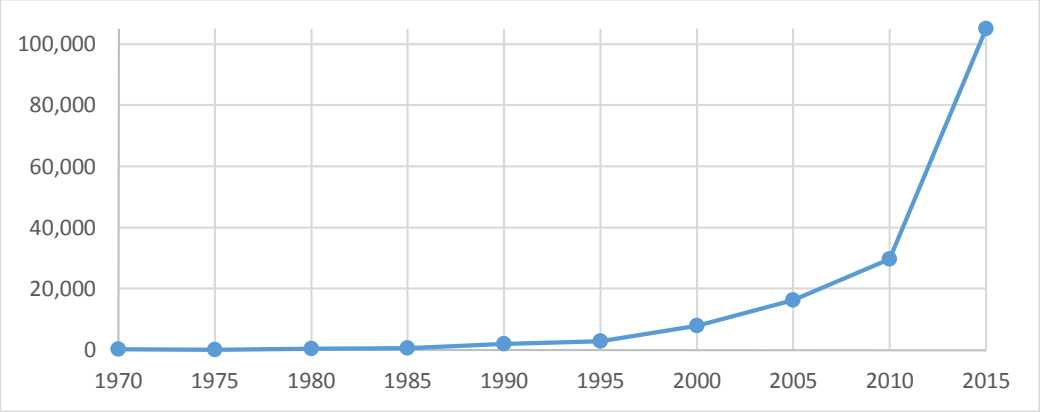

Figure 2. Google Scholar Hits for "Food Security" by Year

For example, we now know that food insecurity is most prevalent among households with children, disabled individuals, and female-headed households (A. Coleman-Jensen et al., 2014;

Franklin et al., 2012; Gundersen, Kreider, & Pepper, 2011; Mark Nord, 2010). Research has developed new terms related to food insecurity like 'food desert' (Cummins, 2002; Shaw, 2006; Ver Ploeg, 2010). Other findings include mixed conclusions about the efficacy of existing federal programs aimed at decreasing food insecurity (Condon et al., 2015; Mabli, Ohls, Dragoset, Castner, & Santos, 2013; Nord & Golla, 2009; Tiehen, Jolliffe, & Gundersen, 2012a). Most recently, research has focused on the health consequences of food insecurity, especially given First Lady Obama's Let's Move! campaign (Hendrickson, Smith, & Eikenberry, 2006; Leung et al., 2013; Monsivais & Drewnowski, 2007; Seligman, Bolger, Guzman, Lopez, & Bibbins-Domingo, 2014).

Many food insecurity researchers conclude that food insecurity is a result of insufficient income (Poppendieck, 1999; Pringle, 2013). The conflict and class theories of Karl Marx have historically been used to provide an explanation of poverty, or the unequal distribution of assets, as well as uncover how poverty and wealth (or food insecurity and food security) can exist simultaneously, as they do in the US (Ankarloo, 2005; Marx, 2008). In the case of food insecurity, unequal distribution of income ultimately results in an unequal distribution of food. Like all other commodities in capitalist economies, food is a commodity to be produced and sold for the purpose of capital accumulation and only coincidentally to satisfy an essential human need.

The current study contributes to the conflict perspective that food insecurity exists in the US (and elsewhere) not because of any shortage of food supply but because of an unequal distribution of income. Income inequality results in the unequal access to food experienced by those with the lowest amount of economic capital. The primary goals of this research are thus to: (1) extend the research on food insecurity and the extent of its effects across various

subpopulations; (2) determine the fit of conflict theorizing with food insecurity by implementing a theoretical model to explain food insecurity using conflict theory; (3) challenge common assumptions about the reasons food insecurity occurs; and (4) contribute to the development of data-based policy recommendations.

Theoretical Background

Because much of the research on food security is conducted outside the discipline of sociology and within the disciplines of policy, health, economics, and even geography, theory is not often a major focus of the research. Indeed, it could be said that the entire research literature is descriptive and atheoretical. Food insecurity is often described by authors as an urgent social issue warranting immediate action from policy makers. This urgency can be found in the "Policy Implications" section of many academic articles and policy reports (Brown, Shepard, Martin, & Orwat, 2007; Fricke et al., 2015) and in the "What to Do" sections of books on the topic (Poppendieck, 1999; Pringle, 2013).

Because much theorizing around hunger and food insecurity takes place within other disciplines, I wish to briefly review two theorists outside of sociology who take up the issue of hunger but whose theories help us understand the current status of the issue: economist Amartya Sen and psychologist Abraham Maslow. Amartya Sen has written seminal pieces on why hunger and famine exist across the globe (Sen, 1983, 1999). Here we examine his theory of food as entitlement, a good starting point to then examining how sociological theory can frame this issue.

What Sen makes clear is that in modern times, famine is not (usually) the result of a shortage in food production but a problem of who is or is not *entitled* to food. This idea was novel at the time it was written because it directly counters the Malthusian idea that famine exists because population growth outpaces food growth, a problem that Malthus predicted would

eventually lead to a global food crisis (Malthus, 1872). By *entitlement*, Sen means that some are able to secure food through either direct ownership of land to grow food or are able to convert wealth or wages to food. (He uses the word entitlement in an economic sense, not to mean "deserving.") As the world becomes increasingly industrialized, however, it becomes harder for people to secure food via land ownership. They must rely on wealth and wages. Knowing this, it becomes clear why so many are unable to secure food globally: extreme poverty is a reality for billions of people, and without wealth or income, food security is outside their reach.

Unfortunately, without food, other important needs cannot be met. Feeding oneself makes up the base to what Abraham Maslow refers to as the "hierarchy of needs", the distribution of human needs where according to his theory one cannot reach any of the more advanced needs without first fulfilling physiological needs, such as feeding oneself. If a person's physiological needs remain unmet they are inhibited from fulfilling more complex needs like personal safety, love and belonging, things that turn out to be what Americans are culturally encouraged to achieve.

As is explained through Sen's theory, famine, or in the case of this research, food insecurity, is not the result of a shortage of food but the lack of ability to exchange wealth for food. This is certainly the case in the US, the world's wealthiest nation whose food production (and food waste) could feed the country's population and beyond (Gunders, 2012). Yet, millions of Americans are food insecure. Although food insecurity and famine are quite different phenomena, they no doubt occur for a similar reason: Despite the absolute higher incomes of people in the US, the cost of food relative to income makes it increasingly difficult for many people to secure enough food. In other words, millions of Americans lack the wealth they need to exchange it for food. In the meantime, US culture expects Americans to be productive and

seeking to fulfill basic physiological needs and beyond, including things like belonging, self-esteem, or status -- things that Maslow argued cannot be achieved without first meeting basic physiological needs such as feeding yourself. This core American national character that is so oriented toward achievement and "fixed on the future" means that the inability for the "lower class" to secure basic needs and thus their inability to pursue higher level goals becomes a basis for stigmatizing the poor (Katz, 2013).

Karl Marx and Conflict Theory

The theories above provide a basis for understanding how food insecurity could exist in a wealthy nation like the US. To expand on the above theories using a sociological perspective, we turn to the thinking of Karl Marx. "According to Marx, social theory should focus on how people influence and are influenced by their material conditions: for example, their degree of hunger…" (p. 75) (Turner, 2012) Marx, a sociologist, economist, and political activist, among other titles, depicts the organization of societies as being in constant conflict. In general, conflict theory proposes that resources are unequally distributed, which creates tensions within societies and ultimately conflict among subpopulations within that society (Turner, 2012). Like Sen, Marx examines the *exchange value* of *capital* (and lack thereof) in securing human needs.

Marx on Capital and the Weakening of Wages

For Marx, human "life involves before anything else eating and drinking, a habitation, clothing, and many other [material] things" (p.16) (Marx & Engels, 1947). The freedom to obtain these things is restricted, however, when the division of labor creates a dominant class who controls the means of production and a subordinate class who are exploited and alienated. As in modern day America, the dominant class is becoming richer and the poor and working classes are expanding but are increasingly powerless to change their status. Low wage rates have

weakened the *exchange value* of the labor of the subordinate class, or the value of the work produced by laborers that can be exchanged for wages. Unemployment and low wages continue to keep many from ever securing the *capital*, or income-producing assets, needed to move out of the subordinate class (Marx, 1967). Using Marx's terms, *labor power*, or the capacity to work that capitalists purchase from workers, has diminished, especially since the Great Recession in 2007. The result is a widespread inability for Americans to secure even the most basic of human needs, including food.

Evolving Human Need

Marx also theorizes about how new technology evolves human needs over time. The quality and amount of food labeled acceptable by the USDA has moved beyond the subsistence level it was in the early twentieth century. Marx explains that human need evolves as new technology is introduced into a society, specifically, that human need escalates and diversifies with the use of new technology (Marx, 1904). In the case of the US, the move away from an agrarian society to the agricultural corporations that feed the country today, may help explain our move away from talking directly about hunger to talking about food security. As an advanced society, our needs have shifted from simply keeping people from starvation to keeping them food secure, or free from the worry that they will be unable to obtain food in the future.

To be sure, these evolving semantics do not mean hunger had been eradicated. What this does help us understand is why we ever stopped talking about hunger and started talking about food security. A discussion of hunger implies a direct need to be filled immediately. Food security is a term that implies the future-focused planning of a society to ensure people are not worried about obtaining food, specifically because of a lack of money.

This last qualifier, "because of a lack of money", is an important part of the food security discussion. It is included as part of the definition used by the USDA, as well as the one used in this research, and it is why Marx's theories are so useful. He describes the inability to secure basic needs as an issue of the unequal distribution of capital, specifically. This dissertation builds upon this theory by examining more closely the effect of low incomes across different groups, as well as what food insecurity looks like across groups when income is held constant.

The Undeserving Poor and Poverty

The modern result of diminished labor power and subsequent diminishing of capital possessed by the subordinate classes is the poverty that exists in the US today, where great wealth exists alongside an enormous poor and working class, and the chasm widens daily as cost of living outpaces wage increases. Like Marshall observed of British Poor Laws in 17th century, these laws separated the needs of the poor as separate to the needs of the rest of society and only when the poor surrendered their membership in the community would their needs be met (Marshall, 1950). Likewise, after poverty was "rediscovered" in the 1960s, politicians, scientists, and eventually the population at large began "othering" those in poverty, thanks in large part to policies that invoked punitive measures on those deemed undeserving of government assistance (Harrington, 1962). During this time, policymakers, with guidance from scientists and experts, decided that to solve the problem of poverty there had to be a way to determine who should be helped. There was a need within the US to enforce policies that would systematically differentiate between the *deserving* and *undeserving poor*.

The dichotomy between the deserving and undeserving poor was based heavily on how individual behavior led people into poverty while focusing less on the larger social and economic structures and forces behind it. This way of thinking, that the poor have 1) gotten themselves into

their situation because of individual behavioral shortcomings and 2) that those already in poverty are at great risk of remaining in the culture of poverty because of a lack of will to get out of it, has led to the systematic stigmatization of this group since the 1960s and long before. This way of thinking implies that some poor people are deserving (widows, orphans, the disabled) while others are not. It is easy to see then how the nation has stigmatized those unable to feed themselves or their families just as they do with those who cannot afford housing or those who are unkempt. "Look at those people, they can't even feed (clothe, house) themselves!" Like the homeless and destitute, the hungry in this country are demonized for being unable to help themselves. This stigmatization continues to divide the nation on the issue of government assistance and often incapacitates legislators from moving forward on poverty-fighting policy.

Conflict is the Outcome

Ultimately, Marx predicts this alienation will drive the working class to seek change. While not the uprising Marx may have predicted, we have seen recent increases in the unrest over the need for a living wage, and the debate around increasing the minimum wage been taken up in the current presidential debates (Kilen, 2015). Thus, Marx's theory even helps us understand the social unrest among many of the nation's working poor, those who are unable to secure basic needs like food despite every attempt to exchange their labor for adequate wages.

Factors Beyond Income

While much of the literature and many times this dissertation find that income is the strongest determinant of food security, there is no doubt more to the story. This research explores what happens when income is held constant and other known critical factors affecting food security are explored across 4 major topics prevalent in food security research today: 1) Extent and Correlates of Food Security 2) Adaptation Techniques 3) SNAP and 4) Food Deserts. To

analyze these topics using a theoretical framework that considers factors beyond income, I use the theories of Pierre Bourdieu.

Bourdieu and Food Security

Moving past the approaches described above, I use an adapted model of Bourdieu's forms of capital to explain the reasons besides income that food insecurity exists among US households. The model includes Bourdieu's concepts of *economic, social, cultural and symbolic capital*, Shilling's concept of *physical capital*, as well as Bourdieu's theories behind the interplay of *structure* and *agency* and the importance of considering the *field* in which social phenomena occur and the *habitus* that comes with these varying *fields*.

Bourdieu's Four Forms of Capital

This research benefits from the use of Bourdieu's four forms of capital (2011) because it moves the analysis and discussion to include factors beyond income, while still considering income as a major factor affecting food security. By examining all the forms of capital that an individual (or more often household) has, it is possible to produce a more complete picture of the phenomenon of being or becoming food insecure and what resources are available to people in US society to get themselves out of a food insecure state. Specifically, what forms of capital must one have to navigate through the food insecure experience successfully, and for those who cannot get out of a food insecure state, which forms of capital do they likely lack.

Economic capital is capital in the form of money or wealth and when we focus on income to understand food insecurity, the result, though insufficient, "is not entirely disastrous" (Burchi & De Muro, 2015)(p4). In fact, we know from our discussion of Marx and capital that income turns out to be a strong predictor of the ability to obtain resources and from the current research we know it to be, thus, a strong predictor of food security status. But to take us beyond income,

Bourdieu reminds us that economic capital can be exchanged for other forms of capital. Money can be used to become a part of a group (social), purchase knowledge in the form of education, for example, (cultural), or buy prestige and respect (symbolic). When we discuss physical capital, Bourdieu would also admit it is possible now in the modern medical age to buy health and improve upon the body (or gain physical capital). Unfortunately, the other forms of capital (social, cultural, symbolic, physical) cannot be exchanged as easily, if at all, for economic capital. For the food insecure, this is presents a major barrier to obtaining food.

Social capital are resources derived from group membership. This comes often in the form of friends or family. Resources drawn from groups can act as safety nets for individuals (and their families or households) in times of need or crisis when they have expended all of their other resources. Social capital is an important resource when discussing the need and ability for households to cope with food insecurity because coping strategies are often contingent upon resources pulled from one's social network.

Cultural capital manifests in the form of knowledge and experience with forms of culture present within one's society. Educational attainment is commonly cited as an important form of cultural capital in modern, industrialized societies like the US. Also included are command over the language(s) spoken among the dominant group and knowing how to navigate appropriately through one's society (knowing the accepted customs or practices). For those seeking assistance with food insecurity, it helps to have an understanding of the American ideal of making your own way. US culture demands that individuals show they are attempting to "pull themselves up by their own bootstraps" in order to be deemed "deserving" of any assistance (whether federal or private). Cultural capital proves critically important as a resource upon which one can draw knowledge throughout life and during times of hardship.

Symbolic capital exists in the form of relative prestige. For some, military service and subsequent veteran status will prove beneficial when seeking out assistance during tough times. Because veterans are a respected group, the value of veteran status will not likely turn directly into economic capital. What prestige can "buy", however, is favorable advantage over someone who does not carry this prestige. An employer may seek out veterans to hire as a way to demonstrate their admiration for the status (Bourdieu, 1990).

Physical capital is a form of capital inspired by Bourdieu's forms of capital but developed by Chris Shilling (2012). Physical capital refers to the ability to draw upon the physical body as a resource. Within the discussion of food insecurity, where the body suffers from insufficient and/or unreliable quantities of food, it is appropriate to highlight the body as the entity through which other forms of capital manifest. Thinking this way, the state of the physical body will impact the potential development of the other forms of capital. Physical capital is most often exchanged for economic capital (in the form of a working body) but economic capital can also be exchanged to purchase physical capital (in the form of physical enhancement like makeup or exercise classes or simply access to healthcare to maintain well-being). But the physical body also contains characteristics that influence a person's ability to obtain membership into groups (social), knowledge (cultural), and prestige (symbolic). In this way, we can talk about the corporeal consequences of a lack of other forms of capital, an important point of discussion in the food insecurity literature.

<u>The interplay of structure and agency</u>

Bourdieu argues that one cannot study structure without considering agency, and vice versa. He believes there is an everlasting interaction between the two, with one always influencing the other to some degree. Structure refers to the process of socialization that

influences individuals from outside themselves by influencing and limiting their choices and opportunities. Agency refers to the ability for an individual to make an autonomous decision and corresponding action, despite the pressure that structure may place on them to act in another way. Sociologists have long debated which most strongly influences human behavior. Bourdieu believed it was simultaneously both and that in order to understand a phenomenon, in this case food insecurity, scholars must examine both of these forces, internal and external to the individual.

Food security is a political issue. It is a policy-driven issue that exists at the structural level. Simultaneously, food insecurity is a personal struggle that is affected by personal choices so, at times, it is free of these larger structural forces. In an extreme case, and for the sake of example, individuals can choose to skip meals in the form of anorexia. Most of the time, of course, food insecurity is the result of a mix of the two forces: structure and agency. More often, the story of food insecurity results from structural level issues (not enough funding for SNAP mixed with high unemployment due to a struggling economy) that drive people into a food insecure state. Yet part of the story is what people choose to do to stay out of a food insecure state or what they do to get out of such a state. In other words, in what ways they can and are willing to exercise agency.

We see the power of agency over structure when we examine the number of poor who remain food secure, despite very low income. If we were to look only at structural factors, we might predict that a person who is poor would be food insecure because they simply do not have the economic means to obtain sufficient food. The structural barriers to obtaining economic capital such as high unemployment and low wages are out of an individual's control and, according to Marx's theory, that one must obtain capital to exchange it for goods, an individual

with no capital would likely be food insecure. Yet, not all who are poor are food insecure. This is because there are things that remain in the control of the individual, what Bourdieu calls *agency*. For example, those who "manage" their food insecurity (mostly the chronically food insecure) may report lower levels of food insecurity because they have adapted to their low food supply. They stretch meals or buy low cost foods. In this way, agency can overpower structure.

Habitus and field

In addition to taking into consideration the various forms of capital available and the influence of both structure and agency on individuals in a food insecure state, it is helpful to examine what Bourdieu refers to as *habitus* and *field* to gain an even more inclusive and complete understanding of food insecurity in the US. *Habitus* refers to the set of acquired sensibilities, tastes, or preferences obtained by embodying certain social structures (gender, race, class discrimination), as they are practiced over time. They are essentially habits. Since different people and groups carry out their existence in different places and among different circumstances, we must also consider the *field* in which one performs and repeats their *habitus* (Bourdieu, 1990).

Within the discussion of food security, for example, we know that food taste and preference is heavily determined by custom and habit. The habit of keeping the skin on chicken and frying it is a southern dietary preference. It is, however, unhealthy. Yet, even with an increase in the nutritional knowledge of the fried chicken (an increase in cultural capital), the *habitus* within the *field* is a strong force, even with increased amounts of capital gained through a healthy cooking class. Thus, we must contextualize the attainment of capital within the *field* and among the *habitus* that exists for the individual and the family so as not to oversimplify the ability to move out of a food insecure state by simply increasing capital.

CHAPTER TWO: DATA, METHODS, AND MEASUREMENT

Methodology

As Bourdieu does in one of his best known works *Distinction: A Social Critique of the Judgment of Taste* (1984), this research combines both quantitative and qualitative work. Using Bourdieu's theoretical framework, I include both a positivistic approach where survey data is used to uncover social facts and "lived experiences" are explored through qualitative interviews. Only through this combination can a complete picture of the issue of food security be constructed. In this way, like Bourdieu's approach, this research explores (in order to negotiate) influences between both external social structures and subjective experiences (*structure* and *agency*). The quantitative data described below each contain variables that represent various measures of the different forms of capital including each of the four described by Bourdieu (economic, social, cultural, symbolic), as well as Shilling's physical capital, along with indicators of structure (SNAP availability due to region, for example) and agency (coping mechanisms such as visiting a food pantry or cutting the size of meals).

Methods

Quantitative Approach: Survey data

Following the food security research to date, this dissertation primarily uses secondary analysis of nationally representative survey data to answer the research questions within each chapter. Mainly, I use the nationally representative secondary dataset, the Current Population Survey (CPS). All of these datasets use the same food security measurement (USDA's Core Food Security Module) and are nationally representative. To supplement these larger national datasets, I utilize statewide data from the Statewide Hunger Survey conducted by the Institute for

Social and Behavioral Sciences at UCF in 2014 for AARP Foundation, as well as a version of this statewide survey conducted with only Orange County, FL residents.

Data Analysis of Quantitative Data

A large proportion of the information we have on food security utilizes univariate analyses and at most, descriptive statistics including percentages and cross-tabulations of food security across a wide variety of socioeconomic and demographic characteristics. The USDA, the leading voice on food security in the US, primarily uses these descriptive forms of analysis (A. Coleman-Jensen et al., 2014; A. Coleman-Jensen, Nord, Andrews, & Carlson, 2011). The current literature is in need of more social science-guided, multivariate analyses, a major contribution of this dissertation.

For example, we will see in Chapter 3 that beyond knowing the rates at which different racial and ethnic groups experience food insecurity, it is possible to know the strength of different races in predicting food insecurity when holding other factors known to affect food security constant, like income and household composition. Multivariate analyses of nationally representative data uncover these more nuanced relationships between sociodemographic characteristics and food insecurity not often detailed in the literature.

Common Independent and Control Variables for Quantitative Analysis

Quantitative analyses included a number of different topics and a variety of dependent variables. However, there are some control variables that are included in each quantitative model. Models using CPS data controlled for: gender, age, race, ethnicity, marital status, educational attainment, children present in household, employment status, income, poverty status and geographic region.

It may appear that this is a mix of the units of analysis at the individual and household level. However, the CPS, like many datasets measuring food insecurity, utilizes household level variables when possible (household income, for example). For variables that seem to be characteristics of an individual but are important to the analysis of food security, the personal characteristics of the reference person are applied to the household analysis. Therefore, the race of the reference person is applied to the analysis using household as the unit of analysis.

Qualitative Data: In-depth Interviews

To date, there is limited research collected qualitatively on the experience of food insecurity. Much of the qualitative research has been conducted on such broader issues as poverty (Edin & Lein, 1997; Narayan, Chambers, Shah, & Petesch, 2000) or welfare use (Campbell, 2014; Halpern-Meekin, Edin, Tach, & Sykes, 2015; Hays, 2003). Within these studies, food insecurity is touched upon but only as a consequence of living in poverty. There have been a few qualitative studies on the experience of food security but they tend to come from outside the US (Chan et al., 2006; Hamelin, Habicht, & Beaudry, 1999; Kortright & Wakefield, 2011; Power, 2008). The insight using this form of data collection is invaluable and should be bolstered.

Qualitative interviews were conducted with food pantry clients at Manna Food Pantry in Pensacola, FL in February 2016. The clients had at least one child under the age of 18 living in the household and were asked to detail their experience with food insecurity, specifically how they adapt to food shortages in the household. Short surveys were distributed after the interview. The survey included basic demographic information, as well as the Food Security Module Short Form which is the six-item sequence that when aggregated shows the level of food security experienced by that household.

Measuring Food Security

The official food security measurement from the US Department of Agriculture uses what some refer to as arbitrary cutoff points. Nevertheless, it is widely used (A. Coleman-Jensen et al., 2014), accepted across disciplines (social sciences, nutrition and medicine) and its validity has been proven over time (Carlson, Andrews, & Bickel, 1999). Studies across various subpopulations show the Core Food Security Module to be a valid and reliable measurement according to analyses of item-score correlations, Cronbach's alpha, and Rach models (Gulliford, Mahabir, & Rocke, 2004; Kendall, Olson, & Frongillo Jr, 1995; Laraia, Siega-Riz, Gundersen, & Dole, 2006).

The USDA took an interest in food security after the 1990 National Nutrition Monitoring and Related Research Act (NNMRR). Among other calls to action, the act pressed for the USDA to develop "a standardized mechanism and instrument for defining and obtaining data on the prevalence of 'food insecurity' or 'food insufficiency' in the United States and methodologies that can be used across the NNMRR Program and at State and local levels." In 1994, following a detailed review of the literature on food insecurity, the USDA's Food and Nutrition Service co-sponsored a National Conference on Food Security Measurement and Research, the outcome of which was the now-famous 18-item Food Security Supplement to the CPS, administered for the first time in 1995.

Major modifications to the survey to improve data quality and reduce respondent burden were made in 1998, and the survey has been administered annually ever since. Key players in the early years were Abt Associates in Cambridge, MA, and Mathematica Policy Research in Princeton, NJ. Researchers at the state and local levels were quick to adopt the USDA items and scales. The 18-item USDA scale or abbreviated versions of it are employed by virtually all food

security researchers within (and many outside of) the US. These 18-items are displayed in Table 1 below along with the marginal frequencies according to the most current USDA report available (A. Coleman-Jensen et al., 2014).

Table 1. Survey Questions Used by USDA to Assess Household Food Security with 2013 USDA Marginal Frequencies

1. "We worried whether our food would run out before we got money to buy more." Was that often, sometimes, or never true for you in the last 12 months?

Often true [4.9%]
Sometimes true [13.9%]
Never true [81.2%]

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

Often true [3.4%]
Sometimes true [12.2%]
Never true [84.4%]

3. "We couldn't afford to eat balanced meals." Was that often, sometimes, or never true for you in the last 12 months?

Often true [3.8%]
Sometimes true [11.0%]
Never true [85.2%]

4. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn't enough money for food? (Yes/No)

Yes [8.6%]
No [91.4%]

5. (If yes to question 4) How often did this happen--almost every month, some months but not every month, or in only 1 or 2 months?

Almost every month [3.0% of all HHs or 35% of those who answered Yes to #4]
Some months but not every month [3.7% of all HHs or 43% of those who answered Yes to #4]
In only one or two months [1.9% of all HHs or 22% of those who answered Yes to #4]

6. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food? (Yes/No)

Yes [8.8%]
No [91.2%]

7. In the last 12 months, were you ever hungry, but didn't eat, because there wasn't enough money for food? (Yes/No)

Yes [4.4%]
No [95.6%]

8. In the last 12 months, did you lose weight because there wasn't enough money for food? (Yes/No)

Yes [2.9%]
No [97.1%]

9. In the last 12 months did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? (Yes/No)

Yes [1.7%]
No [98.3%]

10. (If yes to question 9) How often did this happen--almost every month, some months but not every month, or in only 1 or 2 months?

Almost every month [0.6% of all HHs or 35% of those who answered Yes to #9]
Some months but not every month [0.7% of all HHs or 40% of those who answered Yes to #9]
In only one or two months [0.4% of all HHs or 25% of those who answered Yes to #9]

(Questions 11-18 are asked only if the household includes children age 0-17)

11. "We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food." Was that often, sometimes, or never true for you in the last 12 months?

Often true [3.6%]
Sometimes true [12.7%]
Never true [83.7%]

12. "We couldn't feed our children a balanced meal, because we couldn't afford that." Was that often, sometimes, or never true for you in the last 12 months?

Often true [1.8%]
Sometimes true [8.2%]
Never true [90%]

13. "The children were not eating enough because we just couldn't afford enough food." Was that often, sometimes, or never true for you in the last 12 months?

Often true [0.7%]
Sometimes true [3.6%]
Never true [95.7%]

14. In the last 12 months, did you ever cut the size of any of the children's meals because there wasn't enough money for food? (Yes/No)

Yes [2.3%]
No [97.7%]

15. In the last 12 months, were the children ever hungry but you just couldn't afford more food? (Yes/No)

Yes [1.3%]
No [98.7%]

16. In the last 12 months, did any of the children ever skip a meal because there wasn't enough money for food? (Yes/No)

Yes [0.8%]
No [99.2%]

17. (If yes to question 16) How often did this happen--almost every month, some months but not every month, or in only 1 or 2 months?

Almost every month [0.2% of all HHs or 30% of those who said Yes to #16]
Some months but not every month [0.3% of all HHs or 42% of those who said Yes to #16]
In only one or two months [0.2% of all HHs or 28% of those who said Yes to #16]

18. In the last 12 months did any of the children ever not eat for a whole day because there wasn't enough money for food? (Yes/No)

Yes [0.2%]
No [99.8%]

Food Security Categories

To categorize an individual or household (the more frequently used unit of analysis), the USDA sums the number of affirmative answers. Affirmative answers include obviously "yes" responses, but less obviously "almost every month" and "some months but not every month". Likewise, "often" or "sometimes" are considered affirmative answers while "never" is not. Then, if a household has responded affirmatively to 0-2 questions, they are considered *food secure*, 3-5 questions, they are *low food secure*, and 6 or more, they are *very low food secure* status. This is different in households with children where an 18-item scale is the category of *low food secure* is 7 or more, instead of 5 for households with children.

Table 2. Percentage of US Households by Food Security Raw Score, 2013

Households with Children: 18-item Scale

Number of Conditions Reported	Percent of Households	Food Status
0	69.3	
1	6.2	Food Secure
2	5.0	(80.5%)
3	3.9	
4	2.9	
5	2.7	Low Security
6	2.2	(13.6%)
7	2.0	
8	1.8	
9	1.1	
10	1.0	
11	0.6	
12	0.5	
13	0.2	Very Low
14	0.2	(5.9%)
15	0.1	
16	0.1	
17	0.1	
18	0.1	

Households without Children : 10-item Scale

Number of Conditions Reported	Percent of Households	Food Status
0	80.5	
1	4.2	Food Secure
2	3.3	(88.1%)
3	3.4	
4	1.6	Low Security
5	1.4	(6.4%)
6	1.8	
7	1.5	
8	1.0	Very Low
9	0.4	(5.4%)
10	0.7	

Source: Coleman-Jensen et al., Household Food Security in the United States: Statistical Supplement. USDA Economic Research Service, September 2014, p. 11

It is clear with this short description that the measurement of food security developed by the USDA lacks detail and makes it difficult to decipher between various food insecure situations. For example, is there really no difference between a household who never has anxiety about food (0 affirmative responses) and those who have 2 affirmed anxieties about food or between 5 (*low food secure*) and 6 (*very low food secure*)? [Some say no. (A. J. Coleman-Jensen, 2010)] The scale has been prolifically used since 1995. Still, there are quite a number of issues that have been addressed in the literature (Nord & Coleman-Jensen, 2014; Webb et al., 2006), including criticism by the scale's own author (Radimer, Olson, & Campbell, 1990; Radimer, Olson, Greene, Campbell, & Habicht, 1992), but no critique has resulted in serious reconsideration of the use of the scale.

Datasets

Analyses for the dissertation comes primarily from the 2013 Current Population Survey Food Security Supplement (CPS-FSS) available for public use from the US Census' file transfer protocol (FTP) server. The Basic CPS is collected monthly and primarily collects labor force data about the civilian noninstitutionalized population living in the U.S. The CPS uses a multistage area probability sample based on results of the decennial census, with coverage in all 50 states and the District of Columbia. The Census Bureau for the Bureau of Labor Statistics adds a food security supplement to the Basic CPS survey each December to gather nationally representative data on the food security in the US (aka the December Food Security Supplement). This supplement asks respondents questions on food spending, minimum food spending needed, food assistance participation, food sufficiency and security questions, and ways of avoiding or ameliorating food deprivation. From these data, the USDA obtains their food security figures each year. It is for this reason these data is most appropriate. Data calculated

from this dataset will be comparable to the myriad data that exists within USDA reports, the guiding literature for all food security research. The food security supplement has been asked since 1995 as is displayed in the chart below. In addition to appending multiple years, the December Supplement can also be appended to other months of CPS data collection. For example, the Annual Social and Economic Supplement collected in March contains more detailed data on respondents' most recent labor force experiences. Depending on the needs of the analyses, the CPS offers many household details that can be extracted from the data, as well.

A second dataset used is the Statewide Hunger Survey completed in 2014 by the Institute for Social and Behavioral Sciences at UCF on behalf of AARP Foundation. In this survey, low and moderate income families were intentionally over-sampled because of the known association between low-income and food insecurity. Weights calculated upon completion of data collection to compensate for the over-samples allow generalization to the state of Florida. In sum, surveys were completed with 894 respondents.

A third dataset which uses the same Statewide Hunger Survey but interviews only Orange County, FL residents is used as well. This version of the questionnaire detailed above oversamples low-income populations and asks all of the questions from the Statewide version, plus an additional battery of questions to measure chronic food security. Questions regarding chronicity and additional forms of anxiety over food (questions on the reasons for not buying more fruits/vegetables and on transportation) included in this survey and provide insight into issues not touched upon by the larger, nationally representative samples.

Conclusion

Despite the discussed shortcomings of the USDA's food insecurity measurement, it is a well-known tool and its popularity allows for standardized comparisons across datasets. The

three datasets used here allow for conclusions to be drawn about the national population, the state of Florida, and residents of Orange County, FL. These additional state and county datasets provide data on more detailed food security questions not asked in the nationally representative CPS. Finally, the use of qualitative data provides insight into a topic for which there is less data in existence than there is for the quantitatively measured food security topics.

CHAPTER THREE: EXTENT AND CORRELATES OF FOOD INSECURITY IN THE US TODAY

Although food insecurity is commonly discussed in terms of national rates, food insecurity affects individuals and social groups to varying degrees. For example, we know that low income households, households with children, and minority-headed households have disproportionately higher rates of food insecurity according to previous literature (A. Coleman-Jensen et al., 2014; Gundersen & Gruber, 2001; Jyoti, Frongillo, & Jones, 2005). This chapter expands the description of the national food insecurity scene using the most up-to-date data available, the 2013 Current Population Survey Food Security Supplement. Knowing which groups experience the highest rates of food insecurity is important when understanding how food insecurity is affecting Americans differently so that policy can effectively target the most at risk groups. Though we know which groups are at the greatest risk for food insecurity thanks to previous literature, the analyses presented here use the most current data to explore more detailed statistics across a wider variety of subpopulations.

This chapter first confirms existing statistics reported by the USDA and then expands upon the most recent USDA report, the official word on food insecurity in the US. This chapter uses the same national data as the 2013 USDA national food security report, the 2013 CPS data, but adds a larger variety of descriptive statistics and performs multivariate analyses (A. Coleman-Jensen et al., 2014). For example, this chapter first confirms that 14.3% of US households in 2013 were food insecure, that households with children were more food insecure, and that rates of insecurity were substantially higher for households living below the poverty line. This chapter expands upon the existing findings and reports, for example, on food insecurity rates for households with and without children and for households at each of the 3 food security

levels. This enables more detailed cross comparisons across groups. These statistics are unavailable in the 2013 USDA report.

This chapter also expands on the frequency of coping mechanisms used by different groups, another topic discussed in the USDA report whose statistics are limited within the report. For example, Table 5 compares rates of food pantry use across the total population, the food secure and food insecure at all levels. These analyses are small additions to the 2013 official report but provide additional insight into the experiences of food insecure households across important subgroups.

This chapter focuses on the following 4 research questions:

> Research Question 1: What is the extent of food insecurity in the US today, and which groups of the US experience the greatest threat to food security according to the most up to date data?
>
> Research Question 2: What are the strongest predictors of food insecurity in the US today?
>
> Research Question 3: Are there differences in the predictive power of known correlates when models are stratified by gender, race/ethnicity, and poverty level?
>
> Research Question 4: To what extent do groups experience chronic versus episodic food insecurity?

Methods

Data

The current research uses the 2013 Food Security Supplement (FSS) of the Current Population Survey (CPS) (also known as the December Food Security Supplement) conducted by the Census Bureau for the U.S. Department of Agriculture. The CPS is the most widely-used dataset for studying national rates of food insecurity and the source of USDA statistics on food security. The CPS is a complex, probability sample.

Some questions are asked of a smaller subsample of respondents. Program participation (SNAP, WIC, school breakfast, school lunch, and Day care/Headstart) are asked only of those who pass two screening criteria: they had to respond affirmatively to a question about whether or not they ran short on money for food in the last 12 months *and* they also needed to be identified as poor (below 185% of the FPL, federal poverty line). Second, questions on prepared meals (meals delivered to home and meals eaten at a community center) were asked only of respondents age 60 and over. Footnotes about these subsamples are also located in the footnotes of the tables.

Variables

Of the 20 predictor variables included in the multivariate analysis, all but two are coded as categorical variables. *Age* of respondent and *number of own children in the household under 18* are measured as continuous variables. *Number of persons in the household* uses 2 person households as the reference group for the other 4 categories of 1-person household, 3-4-person household, 5-6-person household and 7 or more-person household. *Poverty* status, *difficulties with activities of daily living*, *SNAP* and *WIC* receipt, *Hispanic* ethnicity, and four *food shopping patterns* (shopped at grocery store, warehouse club, restaurant, other) are each dummy coded variables. *Family income* is categorized into 16 income groups. The reference group for income ($30,000-$35,000) was chosen to be able to compare both lower and higher income levels to what can be considered a middle range income. Employed is the reference group for the *employment status* which is compared to unemployed, retired, disabled, and other employment status categories. *Education* is categorized into 4 categories with high school degree as the reference group so that there are lower (less than high school) and higher (Some college, college degree) levels of education to compare. *Marital status* uses married as the reference group to

compare to other groups widowed, divorced, and never married. *Race* is categorized as white, black, other with white as the reference group. *Household type* is described using 6 categories with husband/wife married family used as the reference group. *Region* of the country uses Northeast as the reference group to compare to 3 other US regions. *Metropolitan area size* ranges from the 1,000,000 (the minimum size of a metropolitan area) up to 5,000,000+ with the middle category of 250,000-500,000 used as the reference group.

Sample

The 2013 FSS data file includes records from 42,084 households each represented by a single reference person. A reference person is one adult respondent from each household who answers questions about the typical experiences and behaviors of all other members of the household (cite). All data were weighted using the food security supplemental weights as recommended by CPS FSS technical documentation to produce nationally representative estimates of the US adult population as has been done in previous studies using these data (cite).

The sample is comprised of households with reference persons 18 and older (weighted N=122,808,942) (See Table 3). The CPS collects data on households with reference persons age 15 to 17 (weighted N=203,186), as well. Brief analyses are done and labeled using the 15 to 17-year-old population, but these cases were removed for all other analyses. The households were comprised of mostly white (79.7%), non-Hispanic (87.3%) householders and most (83%) are above 100% FPL. Just over one in 10 households are female-headed (12.6%) and the average household size is 2.5 persons with an average of .52 children.

Table 3. Sample Characteristics of 2013 CPS (%)

	Total Sample	Sample Age 15-17	Food Insecure	Female-headed HHs (of families)
Weighted Sample Size (n)	122,808,942	203,186	17,460,911	15,488,120
At or below 100% FPL	17.0	45.2	42.1	34.0
Female	50.5	51.1	59.8	100
Race				
White	79.7	67.7	69.5	65.9
Black	13.1	22.3	23.8	26.6
Other	7.2	10	6.7	7.5
Hispanic	12.7	46.1	21.1	20.4
Marital Status				
Married*	49.9	4.5	32.7	4.2*
Widowed	10.0	1.3	7.9	15.7
Divorced/Seperated	18.4	1.9	29.8	42.0
Never Married	21.7	92.3	29.6	38.2
Homeowner	65.6	39.8	39.6	47.1
Age (Mean, St. Dev.)	50.7 (17.0)	16.2 (.80)	46.2 (15.4)	42.3 (16.4)
Employment Status				
Employed	59.8	18.4	48.5	59.4
Unemployed	3.9	4.9	10.3	6.1
Retired-Not in LF	21.8	0.0	11.4	12.6
Disabled-Not in LF	6.4	0.0	18.2	8.7
Other-Not in LF	8.0	76.7	11.6	13.1
Education Level				
Less the High School	11.1	90.9	21.7	16.3
High School Diploma	28.0	7.7	35.3	31.0
Some College	28.6	1.4	31.5	49.1
Bachelor's degree or higher	32.3	0.0	11.5	6.3
Female-headed Household	12.6	44.6	26.1	100
Household Size (Mean, St. Dev.)	2.5 (1.44)	3.87 (1.30)	2.7 (1.69)	3.2 (1.35)
Number of Own Children in HH (Mean, St. Dev.)	.52 (.98)	.11 (.41)	.74 (1.18)	0.99 (1.16)
Food Security Status				
High or Marginal Food Security	85.7	76.4	-	70.4
Low Food Security	8.7	18.9	60.9	19.6
Very Low Food Security	5.6	4.7	39.1	10.0

Data Source: Current Population Survey December Food Security Supplement 2013. Data weighted by HHSUPWGT
*Marital status "Married" for female-headed households indicates respondent legally married with no spouse not present only

Results: Univariate Analyses

Stratified Sample Characteristics

Table 3 shows there are some notable differences in household characteristics when the sample is stratified. The total sample, for example, includes 17.0% of households living at or below 100% of the federal poverty level. This rate doubles for households headed by women (34.0%), rises to 42.1% for households labeled food insecure and increases even slightly higher to 45.2% for households where the reference person (usually the head of the household) is 15-17 years old. Although black households make up just 13.1% of the total households in the sample, they make up 23.8% of food insecure households and 26.6% of female-headed households. Rates of those identifying as Hispanic follow a similar pattern. While Hispanics make up just 12.7% of the total sample, they make up 21.1% of food insecure households, 20.4% of female-headed households, and 46.1% of households headed by individuals under the age of 18. Food insecure households are more likely to be headed by an unwed person (67.3%), 2.5 times more likely to be unemployed than the general population and 2 times more likely to be female-headed. Finally, female-headed households are larger than the average household and contain on average more children. They are twice as likely to be at or below the poverty line but their rate of employment (59.4%) is nearly identical to that of the total sample (59.8%).

Food Insecurity Rates

Univariate analyses in Table 4 show that within the national population, 14.3% of households are food insecure. According to the table, those with the highest rates of food insecurity include disabled households (40.7%), low-income households (35.2%), black (25.9%) or Hispanic (23.6%) households, and households headed by a divorced individual (23.1%). Food insecurity rates among low-income households are 3 times higher than the general population

(35% of households at or below FPL are food insecure compared to 9.9% of households above this FPL). Black households have food insecurity rates approximately double (25.9%) that of white (12.4%) or other (13.1%) race households, as do Hispanic households when compared to non-Hispanic households (23.6% v 12.9%, respectively). Households headed by persons under 18 and households headed by women experience significantly higher rates of food insecurity than the population at large. The rate of food insecurity among youth-headed households is 23.6%, and it is 29.6% for female-headed households compared to 14.3% for the general population. Those who are divorced or separated fare worse than any other marital status. Food insecurity rates decrease as age group increases, with the youngest group (18-34) the most food insecure (18.4% food insecure). Disabled households fare worse than even unemployed households (food insecurity rates of 40.7% v 37.4%, respectively). Finally, Southern region and smaller metropolitan areas (100,000-249,999) are also more food insecure than other regions of the country and larger metropolitan regions.

Table 4. Food Insecurity Rates across Various Demographics (%)

	Total Population (N=122,808,942)		Households with Children (n=34,377,407)	
	Food Secure	Food Insecure	Food Secure	Food Insecure
Weighted Sample Size (n)	104,916,761	17,460,911	27,980,985	6,396,423
	(85.7%)	(14.3%)	(81.4%)	(18.6%)
Poverty				
Above 100% FPL	90.1	9.9	87.6	12.4
At or below 100% FPL	64.8	35.2	12.4	42.6
Family Income				
< $5,000	65.7	34.3	56.4	43.6
$5,000-$7,499	62.4	37.6	50.5	49.5
$7,500-$9,999	61.4	38.6	51.1	48.9
$10,000-$12,499	69.1	30.9	58.8	41.2
$12,500-$14,999	72.0	28.0	61.1	38.9
$15,000-$19,999	74.0	26.0	59.0	41.0
$20,000-$24,999	78.3	21.7	63.7	36.3
$25,000-$29,999	79.6	20.4	61.7	38.3
$30,000-$34,999	82.4	17.6	68.3	31.7
$35,000-$39,999	84.1	15.9	75.0	25.0
$40,000-$49,999	89.0	11.0	83.4	16.6
$50,000-$59,999	91.3	8.7	85.1	14.9
$60,000-$74,999	93.4	6.6	89.3	10.7
$75,000-$99,999	95.3	4.7	93.6	6.4
$100,000-$149,999	97.2	2.8	96.7	3.3
$150,000+	98.6	1.4	98.3	1.7
Gender (use this? Looking at HHs)				
Male	88.4	11.6	86.9	13.1
Female	83.2	16.8	76.9	23.1
Race				
White	87.6	12.4	83.2	16.8
Black	74.1	25.9	68.6	31.4
Other	86.9	13.1	85.2	14.8
Ethnicity				
Hispanic, any race	76.4	23.6	72.6	27.4
Non-Hispanic, any race	87.1	12.9	83.5	16.5
Marital Status				
Married	90.7	9.3	87.1	12.9
Widowed	88.8	11.2	78.6	21.4
Divorced/Separated	76.9	23.1	69.1	30.9
Never Married	80.6	19.4	66.0	34.0

	Total Population (N=122,808,942)		Households with Children (n=34,377,407)	
	Food Secure	Food Insecure	Food Secure	Food Insecure
Household Own/Rent				
Homeowner	91.4	8.6	89.5	10.5
Rent	74.9	25.1	67.6	32.4
Occupied without payment	80.4	19.6	73.1	26.9
Age				
18-34	81.6	18.4	75.9	24.1
35-49	83.9	16.1	83.5	16.5
50-59	84.8	15.2	86.9	13.1
60-64	87.0	13.0	81.0	19.0
65-69	89.4	10.6	79.0	21.0
70-74	92.6	7.4	82.4	17.6
75+	94.0	6.0	70.8	29.2
Employment Status				
Employed	88.4	11.6	84.8	15.2
Unemployed	62.6	37.4	57.1	42.9
Retired-Not in LF	92.6	7.4	82.0	18.0
Disabled-Not in LF	59.3	40.7	47.9	52.1
Other-Not in LF	79.5	20.5	78.4	21.6
Education Level				
Less the High School	72.1	27.9	64.1	35.9
High School Diploma	82.1	17.9	72.9	27.1
Some College	84.4	15.6	79.2	20.8
Bachelor's degree or higher	94.9	5.1	94.1	5.9
Household Type				
Husband/Wife Primary HH	91.0	9.0	87.4	12.6
Husband/Wife Primary HH (AF)	92.8	7.2	93.5	6.5
Male-headed Household w Family	78.6	21.4	78.2	21.8
Female-headed Household w Family	70.5	29.5	65.2	34.8
Single Male Householder	85.2	14.8	-	-
Single Female Householder	84.9	15.1	-	-
Household Size				
1	85.2	14.8	-	-
2	89.4	10.6	70.9	29.1
3	84.7	15.3	83.3	16.7
4	84.6	15.4	85.1	14.9
5	81.6	18.4	81.3	18.7
6	73.2	26.8	72.6	27.4
7+	69.0	31.0	68.8	31.2

	Total Population (N=122,808,942)		Households with Children (n=34,377,407)	
	Food Secure	Food Insecure	Food Secure	Food Insecure
Number of Own Children <18 in HH				
0	87.5	12.5	-	-
1	83.0	17.0	42.9	38.3
2	83.1	16.9	38.5	34.2
3	76.9	23.1	13.4	17.6
4	71.6	28.4	4.0	6.9
5+	64.5	35.5	1.2	3.0
Has one of 6 disabled conditions	74.4	25.6	54.0	46.0
Region				
Northeast	87.7	12.3	84.6	15.4
Midwest	86.5	13.5	83.2	16.8
South	84.3	15.7	78.7	21.3
West	86.0	14.0	81.7	18.3
Metropolitan Area Size				
100,000-249,999	83.6	16.4	77.7	22.3
250,000-499,999	85.3	14.7	80.9	19.1
500,000-999,999	85.5	14.5	81.2	18.8
1,000,000-2,499,999	86.0	14.0	82.4	17.6
2,500,000-4,999,999	87.4	12.6	84.4	15.6
5,000,000+	86.3	13.7	81.8	18.2
Not identified or nonmetropolitan	84.8	15.2	78.7	21.3

Data Source: Current Population Survey December Food Security Supplement 2013. Data weighted by HHSUPWGT

Household type and composition generate variety in food insecurity rates. Singles with families (that is single-headed households with others in the households though not necessarily children) fare worse than dual parent families or singles living alone. Female-headed households of families have the highest food insecurity rates (29.5%) of all household types. For households of singles, it does not appear to make much difference whether the single person is male or female. Their food insecurity rates are only slightly different (14.8% for males v 15.1% for females). Household size also affects food insecurity rates. On the whole, as household size increases so does food insecurity. A family of 3, for example has a food insecurity rate of 15.3%. A family of 6 has a food insecurity rate of 26.8%. The results also show that the number of own children living in the household, on average, increases the rate of food insecurity. Having 0 children in the household results in an overall food insecurity rate of 12.5%. When this increases by just 1 child, food insecurity jumps to 17.0% and rises to 40.8% with the presence of 5 children.

Food Insecurity Rates among Households with Children

Table 4 also presents food insecurity rates across various demographics of households with children. In general, households with children hold a higher rate of food insecurity (18.6%) than the general population (14.3%). The last two columns of Table 4 show that nearly one in five (18.6%) households with children are food insecure, and this number more than doubles for low-income households (42.9%). Across racial groups, black households with children report the highest rates of food insecurity (31.4%) compared to white households with children (16.8%) and other race (14.8%) households with children. As with the total sample, Southern region and small metro areas suffer the highest rates of food insecurity.

Rates of food insecurity stay fairly comparable between households with and without children across age groups until about age 60. For those ages 60-64 with no children, food insecurity rate is 13.0%. For the same age group, but in households with children, the rate is 19.0%. Even clearer is the burden children put on the oldest old. For households age 75+ with no children, the food insecurity rate is 6.0%, no doubt thanks to the safety net this country provides for its seniors. For those 75+ with children in the household, however, the food insecurity rate is an alarming 29.2%. Householders over the age of 75 appear to be critically affected by the presence of children in the household. With nearly 1 in 3 of these households labeled as food insecure, children in a household with a caretaker of advanced age suffer the greatest food insecurity when comparing all age groups. Older households likely live off of fixed incomes and may suffer from more health problems, making it hardest for this age group to ascertain sufficient food to feed the household. Although the youngest households suffer from the second highest food insecurity rates (1 in 4 young households with children suffer from food insecurity), they likely do not suffer from as many health problems as the elderly and will potentially increase income through employment or education.

Household type and composition seem to affect food insecurity rates for households with children as they do with the households of the general population. Female-headed households of families suffer food insecurity at a rate of 34.8% compared to 21.8% for male-headed households with families and 12.6% for husband/wife households of families. Different from the general population, households with children with a householder who has never been married suffer the highest rates of food insecurity across marital status groups. Like the total sample, the disabled and unemployed have the highest rates of food insecurity across employment type within households with children (52.1% and 42.9%, respectively).

On the whole, as household size increases so does the rate of food insecurity. For each additional child in the household, however, the pattern is not as clear cut. As the number of children increases, the rate of food insecurity seems to increase sometimes and other times it falls for each additional child. In short, there are major differences in rate of food insecurity when a typical household moves from 0 children (food insecurity rate of 12.5%) to 1 (food insecurity rate of 17%). The rate hovers around 20% until the number of children rises to 5, when the rate of food insecurity jumps to 40%. Then food insecurity rates appear to drop for households with 6 or more children.

What may be even more interesting are the similar rates of food insecurity across household sizes for the total population compared to households with children. It appears that no matter if the household size grows because of children or just extra people (as may be the case for the larger households in the general population), food insecurity rates increase at about the same rate for the general population and households with children. Take, for example, a household of 3 in the general population (food insecurity rate of 15.3%) and a household with children where the total household size is also 3 (food insecurity rate of 16.7%). The just slightly higher rates of food insecurity for households with children show that while children do place more burden on households and drive up food insecurity rates across the board, simply having additional people in the household, whether they are children or not, presents a burden on the food security of the household, as well.

Food Expenditures

Table 5 displays the food expenditure rates of the general population, as well as of those labeled food secure versus food insecure (food insecurity is then broken down into 3 categories as it is by the USDA: Food insecure-All, Food insecure-With low food security, and Food

insecure-With very low food security) households. Food secure households report visiting conventional food outlets (supermarkets, warehouse clubs, and restaurants) more frequently than their food insecure counterparts. Food insecure households (at each level) shop at alternative food outlets ("Other") with slightly more frequency than food secure households.

It appears that the average amount spent in the previous week at a supermarket varies only slightly between the food secure ($122.71, SD=75.96) and food insecure ($118.24, SD=81.55). Food secure households spend more on average on food away from home by $20. They also report spending more on food last week ($132.40 (SD=108.11)) and estimate that they usually spend $125.60 (SD=87.17) on food per week. In contrast, food insecure households, on average, report spending $108.70 (SD=97.98) on food last week and believe they usually spend $105.61 (SD=81.40) on food each week. Most poignantly, 59.6% of food insecure households (and 70.9% of very low food insecure households) believe they need to spend more in order to buy *just enough* food to meet the needs of their household compared to just 8.3% of food secure households.

Table 5. Food Expenditures, Coping Strategies, and Program Participation

	Total Sample	Food Secure	Food Insecure		
			All	With Low Food Security	With Very Low Food Security
Weighted Sample Size (n)	122,808,942	104,916,761	17,460,911	10,625,444	6,835,467
EXPENDITURES					
Last week, shopped at					
Supermarket (%)	89.0	89.5	85.6	87.6	82.4
Warehouse clubs/produce stands (%)	33.4	33.8	31.4	32.7	29.4
Restaurant (%)	62.1	64.8	46.0	48.8	41.7
Other (%)	3.2	3.2	3.6	3.5	3.7
Total spent at supermarket, Mean (St. Dev.)	$122.07 (76.79)	$122.71 (75.96)	$118.24 (81.55)	$124.31 (82.48)	$108.22 (78.97)
On nonfood items	$22.22 (27.95)	$22.46 (27.66)	$20.82 (29.60)	$22.64 (31.05)	$17.79 (26.75)
Total spent at warehouse clubs	$60.95 (63.88)	$62.29 (64.59)	$52.67 (58.66)	$56.65 (60.70)	$45.70 (54.22)
On nonfood items	$16.50 (29.18)	$16.91 (29.73)	$13.91 (25.37)	$15.18 (26.23)	$11.67 (23.61)
Total spent on food away from home	52.29 (50.07)	$54.48 (51.23)	$34.44 (34.52)	$35.44 (33.78)	$32.61 (35.77)
Total spent for food last week	$129.00 (107.04)	$132.40 (108.11)	$108.70 (97.98)	$116.73 (100.18)	$96.22 (93.09)
Usual amount spent for food per week	$122.67 (86.64)	$125.60 (87.17)	$105.61 (81.40)	$112.04 (83.99)	$95.54 (76.09)
Need to spend more/less?					
More (%)	15.8	8.3	59.6	52.3	70.9
Less (%)	27.2	30.5	8.3	9.5	6.4
Same (%)	57.0	61.3	32.1	38.2	22.7

	Total Sample	Food Secure	Food Insecure		
			All	With Low Food Security	With Very Low Food Security
COPING STRATEGIES					
Try to make your food go further (%)	24.1	13.6	87.1	82.0	95.0
Could get emergency food if needed (%)	68.9	68.6	69.7	69.2	70.9
Food Pantry Use					
Received food from food pantry in last 12 months (%)	11.4	4.5	26.0	20.2	35.2
Almost every month (%)	31.0	26.5	32.7	25.3	39.4
Some months but not every month (%)	31.9	27.1	33.6	34.9	32.5
Only 1 or 2 months (%)	37.1	46.4	33.7	39.9	28.1
Received food from pantry past 30 days (%)	52.8	47.5	54.8	48.0	61.0
Soup Kitchen Use (%)					
Ate meals at soup kitchen in last 12 months	1.3	0.4	3.3	1.7	5.7
Almost every month	33.6	33.6	33.7	22.8	38.8
Some months but not every month	36.3	27.9	38.5	33.6	40.9
Only 1 or 2 months	30.0	38.6	27.8	43.6	20.3
Ate meals at soup kitchen in past 30 days	61.1	54.3	62.9	61.5	63.5
*Prepared Meals** (%)					
Meals delivered to home past 30 days	5.0	4.1	7.8	7.7	7.9
Ate meals at a community program past 30 days	6.0	5.0	9.0	8.6	9.6
PROGRAM PARTICIPATION**					
Received SNAP in the last 12 months (%)	26.5	18.1	42.8	40.2	46.6
Total SNAP received most recently, Mean (St. Dev.)	$241.39 (169.9)	$252.68 (171.8)	$232.60 (167.8)	$246.67 (169.49)	$215.00 (163.96)
Participation in past 30 days (%)					
School Breakfast	81.7	80.2	83.2	82.7	84.2
School Lunch	54.2	44.3	69.8	68.5	72.3
Day care or Headstart	10.4	8.9	12.8	12.5	13.5
WIC	13.8	12.4	16.1	17.0	14.5

Data Source: Current Population Survey December Food Security Supplement 2013. Data weighted by HHSUPWGT

*Questions asked only of respondents 60 and older

Coping Strategies of the Food Insecure

Everybody seems to do what they can to limit their food costs, the food insecure more so. According to Table 5, one in 10 households in the general population report they have used a food pantry in the past 12 months. This rate drops drastically when looking at the food insecure populations. While just under 5% of the food secure population has used a food pantry in in the last 12 months, 26% of the food insecure population reports having to use a food pantry. More of an emergency coping mechanism, soup kitchens are used less frequently, with just 1.3% of the general population saying they have used a soup kitchen in the last 12 months. But, this rate doubles when asked of the food insecure population (3.3%). Most people know where they could get emergency food if needed, with the least food secure households reporting the highest rates, indicative of their being plugged into the emergency food system of pantries and soup kitchens.

A subsample of respondents over the age of 60 was asked questions on prepared meals. Among this subsample, small percentages of both food secure and food insecure households had received prepared meals, including home delivered meals and meals provided at community programs, in the 30 days prior to the survey (November 2013). Still, food insecure households received prepared meals more frequently. When it comes to coping by stretching food, fewer than 1 in 4 households in the general population report trying to stretch their food. In contrast, food insecure households report almost unanimously (87.1%) that they attempt to stretch their food in some way. This rate increases to 95.0% for households with very low food security.

Program Participation Rates

The Food Security Supplement asks about program participation only to those who pass two screening questions. Those who say that they have run out of money for food in the last 12 months *and* qualify as poor are asked about participation in various programs. Food insecure

households within this subsample participated in all programs with more frequency than food secure households. They participated in SNAP twice as often as the food secure, yet food secure households participating in SNAP reported receiving $20 more in their last SNAP receipt than food insecure households (14.5%). Within the subsample, WIC participation is highest among households with low food security (17.0%) compared to those with full food security or those with very low food security. For households at any level of food insecurity within this subsample, participation in school breakfast programs hovers around 83%. Participation rates for school lunch vary more widely across food security levels, with 44.3% of food secure households participating in the school lunch program compared to 69.8% of all food insecure households.

Food Expenditure Patterns among Food Insecure Households with Children

Table 6 examines food expenditure patterns of households with children for the total sample and for all food security levels. The general population reports spending $122.07 at the supermarket last week (data from Table 3), while households with children report spending $156.58 on food last week, $34 more than the general population. It appears that no matter the severity of food insecurity, shopping patterns remain fairly constant. Households with children report nearly the exact same amount spent last week at the supermarket whether they have low or very low food insecurity ($145). Total amounts reported spent last week hovers at $142 for both food insecure with low and very low food security. However, those with very low food security report 3 out of 4 times that they need to spend more on food to feed their families, compared to just one in ten food secure households with children.

Table 6. Food Expenditures, Coping Strategies, and Program Participation for Households with Children

	All Households with Children	Food Secure HHs with Children	Food Insecure HHs with Children		
			All	With Low Food Security	With Very Low Food Security
Weighted Sample Size (n)	34,377,407	27,837,173	6,396,423	4,504,610	1,891,813
EXPENDITURES					
Last week, shopped at					
Supermarket (%)	92.8	93.6	89.6	90.0	88.7
Warehouse clubs/produce stands (%)	39.1	40.2	34.5	35.7	31.6
Restaurant (%)	67.9	71.5	52.6	53.4	50.8
Other (%)	3.5	3.4	4.0	3.4	5.6
Total spent at supermarket, Mean (St. Dev.)	$156.58 (82.5)	$159.14 (81.3)	$145.65 (87.0)	$145.66 (86.0)	$145.62 (89.4)
On nonfood items	$26.64 (31.3)	$27.28 (30.8)	$23.86 (32.7)	$25.28 (33.5)	$20.35 (30.5)
Total spent at warehouse clubs	$73.86 (70.8)	$76.01 (71.5)	$63.36 (66.1)	$65.24 (67.2)	$58.28 (62.5)
On nonfood items	$19.56 (32.6)	$20.35 (33.4)	$15.79 (28.1)	$16.72 (28.5)	$13.29 (26.8)
Total spent on food away from home	$55.49 (49.2)	$58.84 (50.7)	$36.68 (33.9)	$37.08 (32.9)	$35.68 (36.4)
Total spent for food last week	$172.20 (117.6)	$179.51 (118.5)	$142.21 (108.7)	$142.21 (107.6)	$142.19 (111.4)
Usual amount spent for food per week	$159.80 (95.1)	$165.81 (95.3)	$134.62 (89.9)	$135.01 (90.1)	$133.66 (89.3)
Need to spend more/less?					
More (%)	19.4	10.0	59.1	53.0	73.7
Less (%)	27.5	32.3	7.7	8.6	5.6
Same (%)	53	57.7	33.2	38.5	20.7
COPING STRATEGIES					
Try to make your food go further (%)	30.1	17.4	85.0	81.1	94.4
Could get emergency food if needed (%)	69.3	69.1	69.9	69.7	70.6
Received food from food pantry last 12 months (%)	12.0	4.3	25.9	19.9	40.2
Almost every month (%)	23.7	17.5	25.5	17.6	34.9
Some months but not every month (%)	31.2	27.2	32.3	33.7	30.7
Only 1 or 2 months (%)	45.1	55.2	42.2	48.7	34.4

Received food from pantry in past 30 days (%)	47.9	41.5	49.8	44.1	56.6
Ate meals at soup kitchen in last 12 months	0.9	0.2	2.2	0.9	5.2
Almost every month (%)	28.2	33.9	27.2	1.1	38.3
Some months but not every month (%)	41.3	35.0	42.5	49.8	39.4
Only 1 or 2 months (%)	30.5	31.1	30.4	49.1	22.4
Ate meals at soup kitchen in past 30 days (%)	56.7	54.6	57.1	39.3	64.7
Meals delivered to home past 30 days* (%)	3.7	1.8	6.9	8.4	3.4
Ate meals at a community program past 30 days*(%)	4.4	2.8	7.3	7.3	7.2
PROGRAM PARTICIPATION**					
Received SNAP in the last 12 months? (%)	34.9	25.8	49.8	46.6	57.1
Total SNAP received most recently, Mean (St. Dev.)	$331.39 (173.7)	$345.08 (170.2)	$319.96 (176.0)	$314.35 (173.6)	$330.06 (179.7)
Participation in past 30 days (%)					
School Breakfast	81.8	80.3	83.2	83.1	83.3
School Lunch	54.8	44.1	71.4	69.8	74.8
Day care or Headstart	10.3	8.8	12.9	12.4	14.0
WIC	18.2	16.8	20.7	20.7	20.6

Data Source: Current Population Survey December Food Security Supplement 2013. Data weighted by HHSUPWGT

*Asked only of respondents 60 and older

**Questions asked only of participants who have run out of money for food in past 12 months and are at or below 185% FPL

Coping Strategies among Food Insecure Households with Children

Large majorities of food insecure households in Table 6 report trying to make their food go further (81.1% of those with low food security and 94.4% of those with very low food security). A quarter of all food insecure households with children have received food from a food pantry in the last 12 months, and 7.3% report they had eaten meals at a community program in the past 30 days.

It is food insecure with very low food security households with children who fare the worse. Over half (56.6%) have received food from a food pantry in the past 30 days and 65% have eaten at a soup kitchen in the past 30 days. Chapter 4: How Families Adapt explores these coping mechanisms further through qualitative interviews with families using an emergency food pantry.

Program Participation Rates among Households with Children

Table 6 also shows that households with children participate in food and nutrition assistance programs with higher frequency than the general population. This makes sense in light of the screening process for who gets asked these questions (poor and has run out of money for food in the last 12 months). Households with children tend to be poor and run out of money for food at higher rates than the general population. Of those asked questions on program participation, one half of food insecure households with children received SNAP in the last 12 months compared to 42.8% of food insecure households among the general population (Table 3). Rates of participation in school breakfast and lunch programs, WIC and Daycare or Headstart are all higher for food insecure families with children than food insecure households in the general population (Table 3). The rate of WIC participation, for example, is higher among food insecure

families with children (83.2%) than among the food insecure asked these questions in Table 5 (16.1%).

Food Insecurity Rates among Disabled Households

Those identified as "Disabled" (under employment status) within the total sample have the highest rate of food insecurity across all groups presented in Table 2. Table 5 details these statistics for disabled households further to explore which disabilities exist at the highest rates for these households. Among those reporting their employment status as "Disabled," 40.7% are food insecure.

The Food Security Supplement also asks 6 questions about difficulty with daily activities including 1) being deaf/hard of hearing, 2) being blind/difficulty seeing, 3) having difficulty remembering/making decisions, 4) walking/climbing stairs, and 5) dressing/bathing or doing errands. Compared to those individuals whose employment status is "Disabled," 25.6% of households headed by someone who has difficulty with any 1 of these 6 conditions were food insecure. Out of the 6 conditions, it is households headed by someone who has difficulty remembering/making decisions who suffer the highest rates of food insecurity (37.1%), followed by those who have difficulty dressing/bathing (29.9%) and those who are blind/have difficulty seeing (28.1%).

Table 7. Rates of Food Insecurity across Various Disabilities (%)

Weighted Sample Size=122,808,942	Food Secure	Food Insecure
Employment Status: Disabled	59.3	40.7
Does your disability from accepting any kind of work in the next 6 months? (Yes)	59.8	40.2
Disabilities		
Deaf or hard of hearing	84.2	15.8
Blind or difficulty seeing	71.9	28.1
Difficulty remembering or making decisions	62.9	37.1
Difficulty walking or climbing stairs	73.3	26.7
Difficulty dressing or bathing	70.1	29.9
Difficulty doing errands	72.6	27.4
Has any of 6 disability conditions above	74.4	25.6

Results: Bivariate Analysis

Bivariate analyses were used here to confirm the assumptions needed to run logistic regression models. Diagnostics for statistical issues including multicollinearity and linearity between any continuous dependent variables and the dependent variable revealed that all assumptions for binary logistic regression were met. Bivariate analyses were also used to investigate the relationship between food insecurity, poverty status, marital status, household type, et al. In the end, chi-square tests of independence showed significant relationships between food security status and all dependent variables. This is likely due to the large sample size.

Results: Multivariate Analysis

To measure the predictive ability of various household characteristics to predict food insecurity, a basic binary logistic regression model was run (See Table 8). Then this basic model was run separately for numerous subgroups that had the highest odds of food insecurity according to the basic model (results of subgroup analyses not provided in table). All predictors in the basic model were significant ($p<.001$) and the model was significant X^2 (1) = 1,155,347, $p< .001$. The model explained 14.7% (Nagelkerke R^2) of the variance in food security. Eight additional models were run for the following subgroups: married and unmarried, 1 person households and 2+ person households, under 60 and 60+, and at or below 100% FPL and above 100% FPL. All predictors across all of stratified models were significant ($p<.001$) except for 16 predictors, six of which were still significant ($p<.05$).

Twenty-three independent variables had odds ratios above 1 though many just barely. Notable increases in odds ratios include: 1) SNAP participation (OR=2.47), 2) having a difficulty with an activity of daily life (i.e. a disability) (OR=1.88), 3) being unemployed (OR=1.56), 4)

being a single male (OR=1.55), 5) living alone (OR=1.49), and 6) living below 100% of the federal poverty level (OR=1.39). When compared to their respective reference groups (not receiving SNAP, have no disabilities, being employed, being in a married household, living in a 2-person household, and living above 100% of the federal poverty level) and holding all other variables in the model constant, these predictors were significant predictors of food insecurity ($p<.001$).

Other significant variables in the model included race, education, Hispanic ethnicity, and metropolitan area size, and region. Compared to whites, black households had 37% higher odds of food insecurity while other races had lower odds (OR=.86, $p<.001$). Compared to those who hold a high school degree, all education levels fare better, even those who have less than a high school degree, if only slightly lower odds of being food insecure (OR=.94, $p<.001$). Hispanics have higher odds of food insecurity (OR=1.06, $p<.001$) than non-Hispanics and those living in smaller metropolitan regions (with populations of 100,000-200,000) have higher odds of food insecurity (OR=1.24, $p<.001$) than those in larger metro areas of 1,000,000-2,500,000 persons, holding all other variables in the model constant.

Table 8. Weighted Logistic Regression of Food Insecurity

N=18,150,579	Total Sample*	
	Odds Ratio (OR)	95% Confidence Interval
Age (Years)	1.01	(1.01, 1.01)
Number of Own Children in HH	1.06	(1.06, 1.06)
Number of People in Household		
1	1.49	(1.48, 1.50)
2	-	-
3-4	0.88	(.87, .88)
5-6	0.89	(.88, .89)
7+	1.04	(1.03, 1.04)
Poverty	-	-
At or below 100% FPL	1.39	(1.33, 1.34)
Above 100% FPL	-	-
Family Income ($)		
< 5,000	0.43	(.43, .43)
5,000-7,499	0.57	(.56, .57)
7,500-9,999	0.54	(.54, .54)
10,000-12,499	0.59	(.59, .60)
12,500-14,999	0.56	(.55, .56)
15,000-19,999	0.57	(.57, .57)
20,000-24,999	0.52	(.52, .52)
25,000-29,999	0.82	(.81, .82)
30,000-34,999	-	-
35,000-39,999	1.17	(1.16, 1.18)
40,000-49,999	0.83	(.83, .84)
50,000-59,999	0.95	(.94, .95)
60,000-74,999	0.98	(.97, .98)
75,000-99,999	1.10	(1.09, 1.10)
100,000-149,999	0.77	(.77, .78)
150,000+	0.44	(.43, .44)
Employment Status		
Employed	-	-
Unemployed	1.56	(1.55, 1.57)
Retired-Not in LF	0.51	(.50, .51)
Disabled-Not in LF	0.91	(.90, .91)
Other-Not in LF	0.85	(.85, .86)
Difficulties with Activities of Daily Living		
Yes	1.88	(1.87, 1.89)
No	-	-
Education Level		
Less the High School	0.94	(.94, .95)
High School Diploma	-	-
Some College	0.87	(.87, .87)

Bachelor's degree or higher	0.58	(.57, .58)
Marital Status		
Married	-	-
Widowed	1.07	(1.06, 1.08)
Divorced/Separated	1.16	(1.15, 1.16)
Never Married *(p<.01)	0.98	(.97, .98)
Race		
White	-	-
Black	1.37	(1.37, 1.37)
Other	0.86	(.86, .87)
Ethnicity		
Hispanic	1.06	(1.06, 1.06)
Non-Hispanic	-	-
Household Type		
Husband/Wife Primary Family	-	-
Husband/Wife Primary Family (AF)	0.54	(.54, .55)
Male-headed Family	1.16	(1.15, 1.17)
Female-headed Family	1.33	(1.32, 1.34)
Male Individual	1.55	(1.53, 1.56)
Female Individual	1.13	(1.12, 1.14)
Region		
Northeast	-	-
Midwest	0.99	(.98, .99)
South	1.05	(1.05, 1.06)
West *(p>.05)	0.99	(.98, .99)
Metropolitan Area Size		
100,000-249,999	1.24	(1.23, 1.24)
250,000-499,999	0.91	(0.91, 0.91)
500,000-999,999	1.00	(1.00, 1.01)
1,000,000-2,499,999	-	-
2,500,000-4,999,999	0.96	(0.95, 0.96)
5,000,000+	1.10	(1.09, 1.10)
SNAP Receipt in Past 12 months		
Yes	2.47	(2.46, 2.47)
No	-	-
WIC Receipt in past 30 days		
Yes	0.85	(.84, .85)
No	-	-
Shopped at grocery store in the last week		
Yes	0.87	(.87, .87)
No	-	-
Shopped at warehouse club in the last week		
Yes	1.01	(1.01, 1.01)
No	-	-
Bought food at restaurant last week		

Yes	0.79	(.79, .80)
No	-	-
Bought food from other kind of place		
Yes	1.52	(1.51, 1.53)
No	-	-
Nagelkerke R^2	0.15	
Intercept	-0.52	

Data Source: 2013 Current Population Survey Food Security Supplement
All data weighted by Food Security Supplement Household Weight
*All variables in the model were significant ($p < .001$) unless otherwise specified.

Income did not predict food insecurity in the way it was expected. We would expect the odds of food insecurity to decrease as income increases. In general, this was the case. But two of the higher income groups reported an unexpected increase in the odds for food insecurity. The model shows that compared to households with an income of $30,000-$35,000, all income categories have *lower* odds of food insecurity except for two income categories: (1) those with a household income of $35,000-$40,000 and (2) those with a household income of $75,000-$100,000. In other words, food insecurity is highest among households in the $30,000-$40,000 range and in the $75,000-$100,000 range.

Descriptive statistics run on these income groups uncovered more. Households in the $35,000-$40,000 who have increased odds of food insecurity according to the regression model, are poorer and less educated. They are more frequently minority or Hispanic households than the general population and tend to have slightly larger households than the general population (more total members and children). A quarter (25.6%) is single female-headed households compared to 12.6% of the general population. This income group receives program assistance at higher rates than the general population, likely because they more easily qualify for the benefits with their lower income level. Interestingly, they report that they need to spend more on food 48.5% of the time, almost exactly as often as those making $75,000-$100,000 reported (47.3%).

In comparison, it appears that food insecure households at income level $75,000-$100,000 are slightly younger, have larger families and more children (most are married and if not married live in at least a 2-person household), and are more educated than the general population. This group is made up of more black households than the total sample and appear to suffer from what could be labeled underemployment. Since 75% report being employed (85.4% full time at that), these are not, overall, households with employment problems but households

that are unable to meet basic needs in spite of having higher incomes. This group may be suffering the lingering effects of the Great Recession, households who once had big paychecks to cover big expenses and now do not. They simultaneously have larger than average families and the financial burden of children strains their income for basic necessities like food. They participate in food assistance programs much less frequently than the general population because they likely do not qualify for assistance with such a high income. Yet, almost half say they need to spend more on food in order to meet the needs of their family and 86% admit to trying to make food or food money go further.

Next, logistic regression models stratified by subgroups determined how factors confirmed to be predictive of food insecurity in the basic model in Table 8 (age, poverty status, marital status, and household size) interacted with the outcome variable. These subgroups were chosen because of their ability to predict food insecurity in the basic model. Using binary logistic regression, these 8 models (not included here due to volume) show how the predictive strength of the independent variables in the basic model changes when the model is narrowed to specific subgroups.

Across all subgroups, each independent variable remained a significant predictor of food insecurity with very few exceptions. In general, in every subgroup examined, race, age, education, poverty status, SNAP participation and having difficulties with at least one activity of daily life predicted food insecurity in the same direction with approximately the same strength. For each subgroup model (as well as Model 1), black race increases the odds of food insecurity when compared to whites, while Other race decreases the odds when compared to whites, holding all other variables in the model constant. Age remains a consistent predictor of a slight (always less than 1.6%) increase in the odds of food insecurity across subgroups. For all models,

every education level has decreased odds for food insecurity compared to those with a high school degree (this includes even those with less than a high school degree). Poverty (at or below 100% FPL) predicted an increase in the odds of food insecurity for every model but predicted food insecurity for those over 60 with the most strength.

Each model also confirmed that single male households always have the highest odds of food insecurity when compared to a married family household. (The only exception was for the subgroup of households above 100% FPL, which showed that female-headed families had just slightly higher odds than single male households.) In addition, holding all other variables in the model constant, female-headed households of families always had higher odds of food insecurity than male-headed households (as compared to the reference group of a married family household).

The basic model, model in Table 8, shows Hispanics have slightly higher odds of food insecurity than non-Hispanics. However, when the focus is narrowed to compare the old and young, we see this relationship between ethnicity and food insecurity change. Older Hispanics (60+) have lower odds for food insecurity (OR=.90, $p<.001$) than their under 60 counterparts. We also see that Hispanics living below the poverty line have decreased odds of food insecurity (OR=.87, $p<.001$) than poverty level non-Hispanics. Other differences among the subgroup analyses include greatly increased odds for 1-person household status (as compared to 2-person household) to predict food insecurity for the over 60 subgroup (OR=9.56, $p<.001$). This is another indication that seniors remain a vulnerable population. Living alone is a strong predictor of food insecurity for seniors specifically, and as age progresses, living alone becomes a more likely reality as spouses pass and family becomes sparse. Over 60 households also experienced

the highest increase in odds of food insecurity for every one child (under 18) increase (OR=1.89, p<.001).

A final difference across subgroups was the way shopping at an alternative food outlet (not a supermarket, warehouse club, restaurant) proved to be a strong predictor of food insecurity for those over 60 (OR=5.91, p<.001) compared to those under 60 (OR=1.56, p<.001) and the total sample (OR=1.53, p<.001).

Discussion

Examining the univariate statistics, it is clear there are groups who fare far worse than others when it comes to food insecurity. Low-income, young, families with children, minorities, the disabled, and female-headed households are among the groups with the highest rates of food insecurity. These are vulnerable groups, shown from previous literature to be at risk for poverty and poor health conditions. Following existing literature, as age increases, food insecurity decreases. The oldest group (75+) has the lowest food insecurity rate of all age groups and the youngest (18-34) have the highest. In addition, single-parent families fare worse than married households, though it is female-headed households that have the highest rate of food insecurity of any household type.

Households with children look slightly different. Rates of food insecurity, for example, do not diminish as age increases. For a household with caretakers of advanced age, children present an especially heavy burden. Often, children leave home over time and the burden of feeding a family is lessened as parents get older. Instead, this analysis shows that the oldest group (75+) of families with children have the highest rate of food insecurity. This group likely includes many grandparents raising grandchildren. Interestingly, the group with the second highest rate of food insecurity among households with children are the youngest group. Among

households with children, the young and the old, therefore, should both be considered particularly vulnerable groups.

Household size and number of children in the household affects the rate of food insecurity in what appears to be a mostly linear way, according to the univariate statistics. With regards to household size, a household of 2, for example, has a rate of food insecurity of 10.6%, while a household of one has a slightly higher rates of 14.8%. Having children increases rates of food insecurity in a totally linear way moving from 12.5% for households with 0 children to 35.5% for households with 5 or more children. Therefore, it appears that living alone and having *any* number of children result in higher rates of food insecurity.

The shopping patterns of the food insecure follow the presumed pattern. Food insecure households spend less money at shopping outlets and report going shopping less frequently. Rates of coping (food pantry/soup kitchen use) are much higher for the food insecure, of course, and exceedingly high for those with very low food security. A quarter of the food insecure (compared to 4.5% of the food secure) have used a food pantry in the last year. Program participation is higher among the food insecure. Programs including SNAP, WIC, and Headstart are used more frequently by the food insecure (within the subsample asked these program participation questions). Counter intuitively, it is the food secure households who receive receive the highest average SNAP benefit ($253) compared to the food insecure ($233). These descriptive statistics highlight the way that poor, food insecure households' must rely on the emergency food system to resolve food insecurity issues, despite attempting to make their food and food dollars stretch.

Multivariate Discussion

The basic multivariate logistic regression model confirms that many characteristics we know are strongly tied to food insecurity, such as income and employment, even with other factors held constant. It also asserts that it is not the old who suffer most frequently from food insecurity as the odds of food insecurity increase by under 1% for every year increase in age.

Overall, it is household type that seems to be critical in predicting food insecurity. First, compared to married individuals those who are widowed or divorced/separated have higher odds of being food insecure. Furthermore, compared to 2 person households, households with one person and households with 7 or more people, have higher odds of food insecurity. Finally, the model shows that compared to married couple families, single men have 55% increased odds of food insecurity and female-headed households of families have 33% increased odds of food insecurity. From these results, we can conclude that living alone (especially for men), being widowed or divorced/separated, or being a single-mother are the household types that are at the highest risk for food insecurity.

The results show that in the basic model, SNAP participation is the strongest predictor of food insecurity. While it is argued that food insecurity predicts SNAP participation, there is evidence that shows this relationship moves in both directions and that SNAP participation can make a household more food insecure (Gray, 2014). This is not necessarily bad news. It is possible that SNAP enrollment processes ensure that the most food-insecure families are the most likely to receive help. SNAP favors those with the lowest incomes, largest family sizes, and fewest resources, all things we know to be associated with food insecurity. In addition, those with a disability as well as the elderly often qualify for benefits. The relationship between SNAP and food insecurity is discussed further in Chapter 5: SNAP and Food Insecurity.

Another interesting finding from the model in Table 8 includes having any 1 of 6 difficulties with an activity of daily living in the basic model predict food insecurity is much stronger predictor of food insecurity than Disability status (under employment status). For those with an official Disability status (i.e. that is their employment status as determined by the CPS is "Disabled-Not in labor force" which is most likely determined by their reporting receipt of SSDI, Social Security Disability Insurance), their odds of food insecurity are lower even compared to employed individuals. However, for those respondents labeled by the CPS dataset as having a disability (because they answered affirmatively to one of six questions that asks about difficulties with activities of daily life), we see disability (in this sense of the word) become a very strong predictor of increased odds for food insecurity. This may mean that because those with official disabled status likely receive enough financial assistance through SSDI (Social Security Disability Insurance) that their food security is more ensured. For those who simply have trouble dressing themselves, seeing, or remembering things (3 of the 6 items measuring difficulty with activities of daily living), their food security is more compromised because they do not have official assistance to utilize like their officially disabled counterparts.

Income as a predictor of food insecurity acted in a surprising way in the model. By taking a middle income range as the referent group, the hope was to be able to see that, in general, lower incomes had higher odds of food insecurity and higher incomes had lower odds of food insecurity. Yet, the results show that the income groups $35,000-$40,000 and $75,000-$100,000 have higher odds for food insecurity than the reference category of $30,000-$35,000.

How can two such drastically different income levels both be experiencing increased odds of food insecurity? This does not intuitively make sense. One would expect the lowest income ranges to have the highest odds food insecurity. One household, while more educated

and earning more total income, is larger and what seems like a high income level is not enough to cover the needs of the household. Are these households with big expenses that once matched bigger incomes? I.e. the new (post-Recession and still have not recovered) poor? The other, with a significantly lower income, has different more traditional problems seen among the poor such as higher levels of official poverty status and less education. Despite both being labeled food insecure, it is difficult to see these experiences as the same or even closely comparable.

One theory is that over time, adaptation to stretching the food and food money they have (especially in low income households (Edin & Lein, 1997; Halpern-Meekin et al., 2015) leads them to report lower frequency of food insecure experiences compared to those with higher incomes who are experiencing episodic bouts of food insecurity and are more likely to report they have concerns about feeding the household. From this result of the analysis, it is clear not all food insecure households are alike and not all experiences and solutions will be the same either. This issue is taken up further in the chapter on adaptation (Chapter 4).

In general, the subgroup analysis highlighted 2 major issues. Subgroups of those over 60 and those living in a 1-person household uncovered the biggest changes in the ability for some variables to predict food insecurity. This may mean that those over 60 and those in 1-person households, while they do not have the highest rates of food insecurity, are most severely affected by a factors like employment and shopping patterns that did not prove to be nearly as strong predictors of food insecurity for the general population.

A Brief Discussion of Chronic versus Episodic Food Insecurity

One way the CPS is limited is in measuring if the food insecurity is a chronic or episodic problem for the household. Because the CPS only asks about the last 12 months, a period of time with which I cannot measure the chronicity of food insecurity, I use the Orange County Food

Security Survey done by the Institute for Social and Behavioral Sciences in 2015. This survey asks how long food insecurity has been a problem for the household with responses ranging from less than one year to "all my life". This analysis first examines how chronicity, as defined here, is socially distributed. Then, multivariate analysis uncovers which social factors are significant predictors of chronic food insecurity.

Data

Table 9 shows the 3 questions that address chronicity along with their frequencies. They occur as follow-up questions to the first 3 food insecurity module questions. To be asked the chronicity questions, the respondent had to report that the scenarios in questions 1 through 3 were *often* or *sometimes* true.

Table 9. Orange County Food Security Survey, Chronicity Questions, Frequencies

(1) "(I/We) worried whether (my/our) food would run out before (I/we) got money to buy more." Was that…	
Often (%)	6.1
Sometimes (%)	16.3
Never (%)	77.6
How many days did this happen in the last 30 days? [Mean (SD), Median]	4.4 (5.7), 2.0
0 days (%)*	25.3
How long has this been a problem for you and your family? (Years) [Mean (SD), Median]	2.5 (2.4), 1.0
All my life (%)	8.8
(2) "The food we bought just didn't last, and (I/we) didn't have money to get more." Was that…	
Often (%)	4.6
Sometimes (%)	14.3
Never (%)	81.1
How many days did this happen in the last 30 days? [Mean (SD), Median]	4.7 (5.3), 3.0
0 days (%)*	16.0
How long has this been a problem for you and your family? (Years) [Mean (SD), Median]	2.6 (2.4), 1.0
All my life (%)	7.1
(3) "(I/We) couldn't afford to eat balanced meals." Was that…	
Often (%)	5.9
Sometimes (%)	11.9
Never (%)	82.2
How many days did this happen in the last 30 days? [Mean (SD), Median]	8.9 (8.6), 7.0
0 days (%)*	9.5
How long has this been a problem for you and your family? (Years) [Mean (SD), Median]	2.9 (2.8), 2.0
All my life (%)	16.6

Defining Chronic and Episodic Food Insecurity

If a respondent says the scenario in each of the 3 question has been a problem for them and their family for 2 years or more, they are given a point and that scenario is considered to be a chronic problem for them. The respondent can then have a score of 0-3 points. For purposes of analysis, having a chronic problem with any 1 of these 3 scenarios (i.e. has a score of at least 1), *and* who has been ultimately labeled food insecure (according to the rest of the questions asked in the module) is considered chronically food insecure.

Chronicity Results and Discussion

Univariate analyses in Table 10 show that rates of chronic food insecurity are highest among households with 4 or more children in the household (80% chronically food insecure) and those that are disabled (also 80% of whom are chronically food insecure). Households that do not own a car (77.8% chronically food insecure), as well as those who live in the city of Orlando (71.4%) compared to the rest of Orange County, also show high rates of chronic food insecurity. Still, rates of chronicity were fairly stable among this subsample of food insecure households. Indeed, bivariate results (also included in Table 6) show only that there was a significant difference in rates of chronicity was between those with and without a car ($X^2=6.04$, $p<.05$).

In order to uncover how sociodemographic factors were related to chronicity, multivariate analysis was conducted. A binary logistic regression model using 15 independent variables to predict chronic food security (versus not chronic, i.e. episodic) was used. Diagnostics for statistical issues such as multicollinearity or complete separation revealed no need for adjustments.

In the end, none of the predictor variables were significant in predicting chronic food insecurity. Although this may be because of the small sample size, I interpret this as meaning

two major things: 1) There is no significant difference across the sociodemographic characteristics of households who are chronically food insecure and episodically food insecure. On the whole, food insecure households, whether chronically food insecure or episodically food insecure, are made up more frequently of vulnerable households: low income, less educated, those living alone and those living in substantially larger households with more children. And, 2) when holding all other things constant, each predictor on its own is unable to predict chronicity. In the real world, factors do not work independently of each other and in the case of chronicity, holding so many factors constant may simply reveal the interaction of many household characteristics to predict chronic food insecurity.

Table 10. Chronic Food Insecurity Rates by Demographic

	Food Insecure	
Total Weighted Subsample (N=133)	Chronic (%) 58.6	Episodic (%) 41.4
Gender		
Male	67.9	32.1
Female	51.3	48.7
Race		
White	57.4	42.6
Black	57.6	42.4
Other	59.5	40.5
Ethnicity		
Hispanic	55.0	45.0
Non-Hispanic	58.9	41.1
Marital Status		
Married	67.4	32.6
Divorced/Separated	57.6	42.4
Widowed	57.1	42.9
Never Married	48.9	51.1
Age		
18-29	40.0	60.0
30-64	62.9	37.1
65+	53.3	46.7
Income (% Area Median Income)		
Extremely Low Income (30% or less AMI)	67.4	32.6
Very Low Income (31-50% AMI)	45.5	54.5
Low Income (51-80% AMI)	64.0	36.0
Moderate Income (81-120% AMI)	66.7	33.3
High Middle/Affluent Income (120%+ AMI)	36.4	63.6
Living Arrangement		
Alone	66.7	33.3
With Spouse or Partner	64.7	35.3
With Your Children	47.6	52.4
With a Spouse Partner and Children	65.5	34.5
With Other Family Members	53.1	46.9
Some Other Arrangement	46.2	53.8
Children		
Child Present	57.6	42.4
No child present	58.7	41.3
Grandchild		
Grandchild Present	66.7	33.3
No Grandchild Present	54.5	45.5

	Food Insecure	
	Chronic (%)	Episodic
Car Ownership (X2=6.04, p<.05)		
Owns Car	51.5	48.5
Does Not Own Car	77.8	22.2
Employment Status		
Working	52.7	47.3
Unemployed	52.2	47.8
Retired	66.7	33.3
Permanently Disabled	80.0	20.0
Homemaker,Student,Other	42.9	57.1
Education Level		
High School Graduate or Less	69.2	30.8
Some College, No degree	41.7	58.3
Associate's Degree	44.4	55.6
Bachelor's Degree	68.4	31.6
Graduate or Professional Degree	50.0	50.0
Household Size		
1	66.7	33.3
2	51.5	48.5
3	65.5	34.5
4	45.0	55.0
5	70.6	29.4
6+	56.3	43.8
Number of Children Under 18 in HH		
0	58.7	41.3
1	54.5	45.5
2	65.2	34.8
3	25.0	75.0
4+	80.0	20.0
Region		
City of Orlando (Zip)	71.4	28.6
Orange County (not incl Orlando)	54.7	45.3
Distsance from Grocery Store		
1 mile or less	61.0	39.0
More than 1 mile	57.6	42.4
Food Security Status		
Fully Food Secure	-	-
Moderately Food Insecure	54.0	46.0
Severely Food Insecure	68.1	31.9

Data Source: 2015 Orange County Food Security Survey collected by ISBS

CHAPTER FOUR: HOW FAMILIES ADAPT TO FOOD INSECURITY

Coping with food insecurity is a reality for many households. For households with children, the need cut the budget in one place to make ends meet in another, is an all too familiar experience. Research on how families adapt to conditions of poverty shows that sacrifices of many kinds are made to provide the basic necessities to household members. A seminal piece on this subject written in 1977 (Edin & Lein) explores the experiences of welfare mothers who must "make ends meet", to borrow from the title. In this research, Edin and Lein uncover coping strategies that include such tradeoffs as foregoing employment to avoid having to pay for child care, relying on friends, family or boyfriends as sources of income, or engaging in illegal activities such as selling of food stamps, to acquire cash.

The research on coping with food insecurity shows similar results. Research done by Mariana Chilton et al. (2013) through the Witnesses to Hunger, Participatory Action Research Study 2008-2013 uncovers three major types of coping mechanisms: appraisal, emotion-focused, and problem-focused. Appraisal coping strategies include feelings of acceptance of the situation, comparing self to others who are worse off, and saying they are not hungry. Emotion-focused coping includes strategies like substance abuse, using faith or religion to cope, or feeling that their current situation is better than when they were young. The final form of coping includes problem-focused strategies such as coupon use, changing the quality of diet, generating income, participating in public assistance and utilizing social networks (Chilton et al., 2013).

This chapter focuses mainly on the general experience with food insecurity as recounted by the member of the household seeking out emergency food assistance and the methods everyone in the household must take to adapt to a shortage in food. Interviews were also

supplemented by survey data, a mixed-mode method seen only in Chilton's work but in no other research.

Methods

Interviews and surveys were collected at Manna Food Pantry in Pensacola, FL in February 2016. With the blessing of the Director, I was able to speak with pantry clients in a separate room after they were served. Eligible participants were pantry clients with children under 18 living in the household, no matter how the client was related (or not) to the child(ren). Clients were given a consent form while I explained the nature of the research. If verbal consent was given, the interview began, followed by the completion of a 22-item survey (Interview questions and survey located in Appendix B and C) Participants were given an extra bag of food from Manna as compensation for their time.

Interviews began by discussing what it is like in their household when food is plentiful, or at least not a major concern. The interview then moved to how the portions, quality, etc. change when the pantry begins to look bare. Finally, the interviewer attempted to uncover the strategies used when food is so low it becomes a stressor. The ways the client balances making food last with nutritional quality were also explored. Interviews lasted 10 minutes on average.

Upon completion of the interview a survey was handed to the client. The survey was self-administered, though respondents were able to ask questions if clarification was needed. Two participants were read aloud the survey as they were unable to read and see well. The questionnaire included 22 items: the six-item food security scale (developed by the USDA) to identify food security status, questions regarding assistance received, and basic sociodemographic questions. Knowledge of 2-1-1 was asked on behalf of Manna Food Pantry for their records.

Six-Item Food Security Scale

The Six-Item Food Security Scale provided an acceptable substitute to the 18-item Food Security Module. According to the Economic Research Service at the USDA, "It has been shown to identify food-insecure households and households with very low food security with reasonably high specificity and sensitivity and minimal bias compared with the 18-item measure. It does not, however, directly ask about children's food security…" (*U.S. Household Food Security Survey Module: Six-Item Short Form* 2012). The specific food security of the children in the household was not relevant to uncovering and exploring the adaptation practices of these families and so the full module for households with children presented an unnecessary burden to participants.

The main benefit to using the short form is the lessening of respondent burden. The participants in this study were coming in to what was for many an uncomfortable interview, despite the good will of the pantry volunteers. Many of the clients at Manna Food Pantry voiced that they wish they did not have to come to the pantry. For this reason, the short form of the food security module was used and interviews were kept to approximately 10 minutes.

Sample

The sample is a convenience sample and is not representative of any population. In addition, the sample was not only biased in that it interviewed respondents who were food insecure enough for food to come to the pantry, the sample was also made up of people who agreed to spend an extra 20-30 minutes at the pantry to participate. This is likely indicative of their severe high need for food. Nevertheless, the stories and data explored below contribute to our understanding of the adaptation strategies of households with children under 18.

Table 11. Sample Characteristics of Food Pantry Participants

(N=29)	(%)
Income	
Less than $10,000	27.6
$10,001-$15,000	41.4
$15,001-$20,000	20.7
$20,001-$30,000	6.9
$30,001-$40,000	0.0
$40,001-$50,000	0.0
$50,001-$$65,000	3.4
$65,001-$75,000	0.0
$75,000+	0.0
Female	79.3
Age (Mean, St. Dev.)	46 (12.9)
Race	
White	48.3
Black	37.9
Other	13.8
Hispanic	3.4
Marital Status	
Married	25.0
Widowed	10.7
Divorced/Separated	53.6
Never Married	10.7
Employment Status	
Working	20.7
Temporarily Laid Off	3.4
Unemployed	24.1
Retired	3.4
Permanently Disabled	41.4
Homemaker	6.9
Education Level	
High School Graduate or Less	58.6
Some College, No Degree	20.7
Associate's Degree	10.3
Bachelor's Degree	6.9
Graduate or Professional Degree	3.4
Household Composition	
Household Size (Mean, St. Dev.)	4.1 (2.3)
Number of Children Under 18 (Mean, St. Dev.)	2.52 (2.0)
Number of Grandchildren under 18 in HH (Mean, St. Dev.)	0.93 (2.37)
Child received free/reduced cost Lunch in last 30 days	89.3

	(%)
Receive SNAP	55.2
Receive WIC	24.1
Has family members in area for times of trouble	
Yes, many	3.6
Yes, one or two	50.0
No, no one	46.4
Food Security Status	
High or Marginal Food Security	3.4
Low Food Security	37.9
Very Low Food Security	55.2

Data Source: Manna Food Pantry: 2016 Parent Study

Table 11 shows the characteristics of the respondents (N=29). All of the respondents had at least one child under 18 in the household. The average household size was 4.1 and the average number of children in the household was 2.5. Respondents were also asked, of the number of children under 18 in the household, how many were grandchildren. The average number of grandchildren was just under 1 (0.93). All but one respondent was determined to be food insecure according to the USDA six-item short form used at the beginning of the survey. The majority of respondents were female and divorced or separated. Half of the respondents were white while the remaining half were mostly black. The sample included just one Hispanic respondent. Nine out of ten respondents made less than $20,000 in 2015, before taxes. Half of the respondents were separated or divorced with a quarter currently married. Two out of every 5 respondents were permanently disabled (41%) and one in five was currently employed (21%). The average age was 46 (SD=12.9). The majority (68%) had a high school degree or less.

Results

Results follow the coping strategy categories identified by Chilton et al. (Chilton et al., 2013) while also identifying challenges to adapting to food insecurity in households with children not yet seen in the research. The most popular responses to how households adapt to food insecurity include strategies Chilton et al. (2013) describe as problem-focused including food pantry use (given where the interview took place), nutrition and food related adaptations, public assistance participation and social networks. Pseudonyms are used below to protect the identity of the participants.

Food Quality and Quantity Adaptations

By far the most common responses included adapting meals to meet the food shortages in the household. These meal adaptations included cutting portion sizes of what was served, making

large pots of starch-based meals like pasta and rice to "eat on" for multiple days (maximum reported: 4 days), and making meals that were void of pricier items such as meat. In particular, adults in the household were happy to report they cut the size and/or quality of their meals to ensure the children were well-fed. They often explained that the children "always eat first." Carla, 64, who lives with her 14 and 12-year-old children, her 10-year-old grandchild, and sometimes also cares for her 6-year-old grandchild, feels food should not be rationed out. "This is America! But I've gone to bed and not eaten because the kids ask for the sandwich I was going to eat, but I say 'Yes, by all means, eat it.'" Carla's household was labeled as very low food security according to her survey results.

Portions were stretched when households began to run low on food. Three respondents reported eating Ramen noodles to fill hungry bellies and hot dogs were identified by 3 different respondents as cheap options that they knew the children would eat. Meals during times when food supply was low would also consist of a "random" assortment of ingredients, including "whatever is in the pantry", reports Rhonda, a 31-year-old single mother of 3 who lives in a household labeled very low food secure. She recently made a pot of spaghetti and had only Italian dressing to top it with. "It wasn't too bad," she says, but that meal is the reason she called Manna Food Pantry. She realized the food supply had dwindled to an alarming level that made her uncomfortable. Other filler foods included pancakes for dinner (n=2) and macaroni and cheese (n=7).

Other households described making a big pot of beans or rice, something inexpensive and filling, and eating those leftovers for days. Jan, 46, who cares for (and has custody of) her 12 grandchildren says she always makes big pots of hamburger helper or pasta to feed everyone. Terry, a 32-year-old mother with three teenage children makes a big pot of beans or "something

that will last all day" when food is low. Her kids often want to snack on something all day, especially on the weekends, so this helps with their snack cravings.

Adaptations to Shopping Patterns

Almost all participants reported "looking for deals" and shopping at low-cost grocery stores to buy off brand food on a regular basis. Other adaptations, however, include buying in bulk when they can. Mary, 44, lives with her husband, 57, and three children. She explained that she gives cash to her neighbor who has a Sam's Club membership and they split the cost of buying things in bulk. Gina, 49, wondered though when she buys in bulk if it just means the food will be used faster by the household. "My daughter (16) sees we have plenty of something because I bought in bulk and thinks she can eat as much as she wants when really we still need to eat strategically." Vicki, 49, lives with her 14-year-old son and explained that she understands, "It would be better to buy in bulk, but I don't have the money to cover such a large expense."

Five respondents say they use coupons but Beth explained "they are getting hard to find unless you buy the newspaper" which she cannot afford. Two respondents say that they do not use coupons because it's cheaper to just buy the off brand and that coupons do not help much with food items, only non-food items.

Food Prep and Storage

Some respondents described their strategy for stocking up when food (i.e. money for food) is available. Packages of food that can be bought cheaply but contain too much food to eat before it spoils get frozen, cooked and flash frozen. Joan, 38, who lives with her partner and her 3 children said she will bake 80 biscuits and flash freeze them. She said she went into debt to buy a deep freezer but that it was worth it. "It has made a huge difference in how much food I can prepare and store." Ron, 54, is disabled and lives with his son (15). He uses his food stamps

mainly to buy meat to put in the freezer. For canned goods, he stocks up from the donations he receives from the food pantry.

Food Production

One respondent, a 79-year-old who lives with his wife and two granddaughters has both a summer and winter garden. He explained when times are the hardest, he can at least go to the garden and grab peas, beans, okra, tomatoes and cucumbers, whatever is ripe. The winters are difficult though and his garden is usually bare for those months. Joan, who lives with her husband and their three children, eats lots of eggs because they have chickens. They are sure not to waste anything and even feed any scraps of food to the chickens. Mary, 44, explained that when things get bad they "can always go blackberry picking" to get something healthy into their meals. Finally, Sharon explained that she has deer meat sausages from her uncle in Alabama that she keeps in the deep freezer and uses when food supply is very low in her household.

"Desperate" Food Sources

For some respondents, desperate times called for what they considered desperate measures and food was obtained from sources they explain they would rather not seek out. Gina, 49, lives with her teenage daughter and explained the worst thing she ever had to do to provide food for her family was call her daughter's father. She never contacts him and hopes things never get so bad that she has to again. Carla, 46, took all the Christmas gifts she received and rode her bike to Walmart to return them. She explained that items can be returned without a receipt for store credit. She took back the gifts to buy food and even splurged and bought potato chips for the house. She knew she needed food for the household more than the gifts.

Other respondents reported that their most "desperate" time was "right now" and that after eating a few nights with no meat or on only carb-heavy meals, they knew they needed to

seek assistance from the pantry. Three respondents explained that the food from the pantry helps them stock up on canned goods and non-perishable items and this "frees up" money (in the form of cash or SNAP benefits) to purchase more expensive items like meat, eggs, and milk.

Grandparents Caring for Children

Adaptation strategies were, for the most part, similar whether the interviewee was a parent or grandparent caring for children under 18. Some notable differences, however, for grandparents included the stress of dealing not just with caring for the children but dealing with their own child who has left the children under their care. Carla, 46 who cares for her 10 and 6-year-old grandchildren admits, "My daughter is…I don't know where." According to her survey, she receives SNAP but because she does not have custody of the six-year-old, this child presents an unaccounted for burden on the food supply in her household. Beth, 58, who cares for her 3-year-old great-grandson with the help of her husband (60), must fight with her granddaughter (the child's mother) to get her to share the SNAP and WIC benefits that she is receiving but not sharing with Beth. Grandparents, in short, are presented with the extra challenge of being advanced in age and caring for young ones, as well as being forced to deal with their children or grandchildren who do not often make the caretaking process any easier by withholding and not offering to help to older adults whose incomes are often fixed, or at least limited.

Children's Age and Food Preferences: Young Children

Despite their best efforts to adapt food quality and quantity, shopping patterns, and seek out unconventional sources for food, many parents and grandparents of children in the household described the children as picky eaters. First, those with young children in the household (9 and under) describe the children as picky "in the way that all young kids are picky", explained Kathy, 30, whose children are 8 and 3. "They don't like to eat their vegetables and they like to eat

peanut butter and jelly sandwiches all the time." Tanya, 49, said the same thing about her 8-year-old son who always wants PB&J. Roseanne, 75, the great-grandmother of a three-year-old, said "I can't get the youngest one (4) to eat breakfast." She explained this toddler is just picky and not a fan of breakfast time meals.

Children's Age and Food Preferences: Grade school-age Children

Children around the age of 11 and 12 were reported as being less picky than their younger siblings but ate much larger portions. Roseanne, 75, explained that the 11-year-old-boy "eats like a horse!" and when food is scarce it is "hard to tell a growing boy (11) and girl (8) they cannot have seconds at dinner." Around this age, children seem to also become very interested in eating items such as pizza and Chef Boyardee at just about every meal, even though their parents have trouble affording such foods and know they are not healthy for the children. "I know the kids want pizza and popcorn, and that's ok every now and then but not all of the time," explained Carla, 46, and caretaker of a 14, 12 and 10-year-old. Arthur lives with his two granddaughters and explained he hates pizza but his granddaughters (13, 12) and wife love it so he will get it when they can afford it.

Children's Age and Food Preferences: Teen Children

Food preferences of teenage children present a unique challenge to parents and grandparents not presented by other age groups. Teenagers are more susceptible to fads and popular culture than their younger siblings, which may explain why five participants said their children not just picky, but picky in particular ways. These five participants explained their children are concerned with their health in one of two specific ways: They are concerned with food's effect on their physical appearance (i.e. wanting to lose weight) or they have ethical objectives through vegetarianism.

Personal appearance and the impact of health and nutrition on their physical appearance was important to four girls in three households. Their ages range from 12-18. For a 17-year-old living in low food secure household, eating right had become important to her in recent years. According to her mother, Evelyn (55), "Her aunt bought her a pass to a gym a while back and now she wants to eat blueberries all the time, but I tell her we can't afford them. And she says she needs money to go to a gym, but I tell her if she wants to exercise bad enough she'll go run outside." Sharon's daughter is 17 and an amateur model. For this reason, Sharon says, her daughter will not eat any carbs. Arthur's two great-granddaughters, 12 and 13, try to eat healthy because they say they want to lose weight.

For two households, feeding the children was particularly difficult because one child did not eat meat. Rhonda, 53, is diabetic. Her 15-year-old daughter does not eat meat. "She won't eat all day, or just eats breakfast and goes all day and gets tired. I tell her she needs more protein." In addition, Rhonda must prepare food for a 2-year-old and 17-year-old boy, who both eat meat. She said, "Everyone eats something different" at mealtimes. Likewise, Terry, 32, says her kids, 16, 15, and 1 are very picky. "One doesn't eat meat. One doesn't eat vegetables. At least one will want something else at every meal."

Children's Age and Food Preferences: Young Adult Children

For participants with children in the household who were approaching the age of independence (18), older children in the household provided food preparation and support compared to the younger ones who were presented more as a food supply burden. Sharon, 40, recounted a time when her daughter (18) "went out with her friends and they had fried chicken and she saved some and brought it home for me. I made gravy using some parts of the chicken and rice. If she hadn't brought it home that night, I would have just had gravy and rice." Keira,

46, says her 16-year-old daughter prepares her own food on the nights she has to work. Fran, 53, says her 17-year-old granddaughter helps prepare food for the rest of the household (including 2 adults and 2 children total). Wes is 56 and explained, "Me and the oldest boy (17) do most of the cooking. And mostly, the other kids (13 and 14) do for themselves when they can."

Multi-Generational Households and Food Preferences

In addition to handling the preference requests of children, multi-generational households also experience challenges in feeding older adults in the household (usually parents) along with what can often be picky children. Evelyn, 55, cares for her mother (85) and two teenage daughters. She explained, "My mother is from New York and likes lamb. But we eat chicken. She was raised in Spain and is stubborn because she wants to eat fancier stuff." Of course, she must also cater to her teenage daughters who like to eat "junk food". All the while, she says "I could eat a boiled egg, go to work and be good." The challenge of adapting a household to a food insecure state is enhanced when multiple generations are being asked to share a low food supply and it appears that in the end, the caretaker always sacrifices the most, as was the case for Evelyn.

Discussion

This chapter includes details on strategies of adapting to food insecurity specifically for households with children under 18. While it reaffirms a number of themes seen in previous research about ways food insecure households adapt (Chilton et al., 2013), it adds to the literature by examining some specific challenges households with children face when trying to provide enough food for the family.

Beyond the confirmation that parents are cutting the sizes of their meals, skipping meals and generally enduring the brunt of the food insecurity in the household, and that stretching

meals, making meals with "random" ingredients, and calling on friends and neighbors when food is running alarmingly low, this research confirms that "kids are kids" when it comes to eating. By this, I mean that children, especially young ones, only know that they are hungry and that they want this food or that one. The challenge this presents to food insecure families with little ones includes the pressure to cater to these childhood whims of any child, no matter their socioeconomic status. All children love mac n' cheese, pizza, and snack foods. And for children young enough, they can boycott the healthy stuff by refusing to eat. For adolescents and teenagers, it can be hard for them to wrap their heads around why some weeks they can afford to buy potato chips and other weeks they cannot. All the while, parents, grandparents, and great-grandparents are attempting to simply "fill the bellies" of their children and are forced to give them what they can, whether the kids want it or not. For many of the interviews, this was the heartbreaking truth about their food insecurity.

In addition, children coming into an age where they are attempting to create their own identity (say 12, 13 and beyond), identifying as a vegetarian or eating salads and fruit because they want to conduct healthy eating habits, creates an uphill and often losing battle for parents who try to explain that vegetarianism and clean, healthy eating is not in the family budget. Yet all of the people I interviewed admitted to catering to these whims if it meant the child would eat.

In the end, each respondent I spoke with had one common goal: to ensure their children or grandchildren did not suffer the effects of food insecurity. This often means "filing up their bellies" with dense carbohydrates like Ramen noodles or corn bread, but still, more than anything else, they want their children to always feel full. This means allowing them to go back for seconds if they want them or being able to pull a snack out of the pantry on the weekend if

they need to, even if it means “I cut the portion size of my meals to make sure the children get enough.” This goal of providing unlimited and palatable food for their children is the main goal and biggest challenge facing these emergency food pantry clients.

CHAPTER FIVE: FOOD INSECURITY AND SNAP

This chapter is based on a paper currently under review with the Journal of Hunger and Environmental Nutrition co-authored with Melanie Hinojosa and Jenny Nguyen. They have given permission for this manuscript to be used here.

Food assistance comes in a variety of forms from large federal food and nutrition assistance programs aiding millions of Americans to small food banks and soup kitchens run by local community agencies, churches, and other charitable entities. By far, the largest food assistance program in the US is the federal Supplemental Nutrition Assistance Program, or SNAP (formerly known as Food Stamps) (See Figure 3). In 2014, the United States Department of Agriculture (USDA) reported that 46.5 million people (14.6% of the total US population) participated in SNAP at an average monthly benefit of $133 for an individual and $488 for a family of 4. The number of participating households has risen drastically from the inception of the food stamp program in 1969, when just 2.8 million Americans (or 1.43% of the population) participated (See Figure 3). As we see later, participation rates tend to ebb and flow in conjunction with poverty trends and the larger economic cycle (USDA, 2012a).

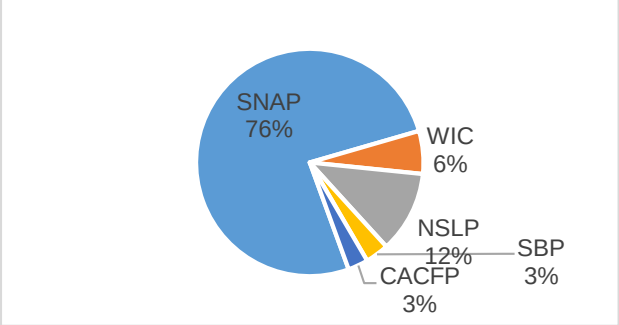

Figure 3. Federal Expenditures on Food and Nutrition Assistance FY 2013

This chapter reviews literature on the impact of SNAP benefits on the food insecurity and nutritional status of households. The chapter uses descriptive statistics to examine the household makeup of SNAP-participating households compared to the total population. Key issues that this chapter addresses are as follows: (1) Which household characteristics are the strongest predictors of SNAP participation in a multivariate analysis? And (2) can a composite index score which sums characteristics known to be predictive of SNAP successfully predict SNAP participation in a separate model?

The following analyses are intended to tell us which household characteristics are critical in determining who is most likely to use SNAP, and how when combined into an index, these characteristics are able to predict SNAP participation by knowing not which characteristics a household has, but how many. This approach presents an additional form of prediction to be used alongside a traditional logistic regression model which predicts the outcome not by considering all variables in the model but by holding each of them constant to determine the predictive power of a single factor.

SNAP History

The Food Stamp Program was reauthorized as a permanent program by Congress in 1964, but was initially implemented in the 1930s as a way to dispose of agricultural surplus when so many were going hungry during the Great Depression. By the end of WWII, however, agricultural surpluses ended along with the original program (P. Wilde, 2013). At this point, many counties left the program since they were no longer mandated to participate, leaving many of the nation's poorest counties unserved by any federal food assistance programs. It was not until the poverty investigations by a Senate subcommittee on employment and poverty and the subsequent CBS special "Hunger in America" in the 1960s that alarming levels of destitution and

starvation were uncovered and the food stamp program was revisited as a potential solution to the problem of hunger in America (Poppendieck, 1999). The official reauthorization of the Food Stamp Program in 1964 allowed participants to purchase food stamps as a discounted rate in order to purchase federally mandated food stuffs, until the Food Stamp Act of 1977 which transformed the program into an entitlement program by eliminating the required purchase of food stamps.

Although the Food Stamp program was enacted in one sense to combat hunger (what one might consider a social service), the program remains tied to the agricultural industry in some ways, and thus is still housed under the US Department of Agriculture. Today, SNAP does not relieve the food market of agricultural surplus like it once did. But SNAP dollars do make major contributions to the national food economy via retail food purchases and in this way still subsidize agriculture. Wilde (2012) found that SNAP benefits account for 10% of national food retail spending and the SNAP budget for 2015 was $63.9 billion. In the end, despite the program's seeming Health and Human Services-like objective (a federal department whose purpose is to "protect the health of all Americans and provide essential human services" and which houses so many other entitlement programs (HHS.gov)), SNAP remains regulated by the USDA and connected to the agricultural industry.

To detail the connection between SNAP and US agricultural industry, the program is authorized every five years or so in the US Farm Bill, an omnibus bill that acts as the primary agricultural and food policy tool of the federal government. But this relationship between SNAP benefits and farmers' profit is much less direct than it was when agricultural surplus was being bought up by the government and distributed to the hungry. The USDA still sees SNAP dollars spent on food as a major economy booster and as an indirect subsidy of farmers. But SNAP

dollars have been found not to benefit farmers as directly as they have in the past. Most of the money spent goes to the cost of processing and transporting food with little left over to directly benefit the farmer (Clarkson, 1975). This was the case in 1975 when a study by Clarkson was done and is surely the case now since processed food has become cheaper and an increasingly large component in the American diet.

Especially left out of this process are smaller fruit and vegetable farmers. Food stamp beneficiaries used to be forced to purchase agricultural surplus (using their Blue stamps), which included seasonal surplus fruits and vegetables. Because that is no longer the case, food purchases with SNAP dollars are mostly made up of more processed foods. In this way, SNAP does not benefit smaller farmers but major food processing and food distribution corporations (Pringle, 2013).

To assist in supporting agricultural producers more directly, federal programs exist to promote SNAP use at farmers markets and small food retailers. The shift to EBT cards overall is popular with administrators and SNAP participants, but farmers markets are often not able to accept such tender. There has been growing demand for markets and small retailers to accept EBT (Jones, 2011; Streit, 2014). A May 2015 USDA Press Release announced $3.3 million in grants will be awarded to farmers markets across the country to help pay for the administrative costs of implementing SNAP EBT card service (USDA, 2015). Research finds that the total number of retailers participating has jumped considerably and pilot programs have found that increasing the number of outlets that accept EBT cards sometimes results in an increase the number of SNAP dollars spent at such retailers (FRAC, 2009). Still, other pilot studies show less increase in SNAP use at markets than predicted (USDA, 2009, 2012b). In either case, the increased push to accept SNAP benefits at smaller agricultural retailers is a step in the right

direction to better food justice, the idea that no matter what kind of neighborhood a person lives in, they can access nutritious food sources (Alkon & Agyeman, 2011; Morland, Wing, Roux, & Poole, 2002).

Eligibility Requirements and Benefits

To be eligible for SNAP benefits, a household must gross a monthly income of less than 130 percent of the Federal poverty guideline, less than 100 percent of the poverty guideline in net monthly income, and hold less than $2,000 in assets. Households with a person over 60 or with certain types of disability only need to meet the net income test. Persons already receiving Temporary Assistance for Needy Families (TANF), General Assistance, or Supplemental Security Income (SSI) are automatically qualified to receive SNAP benefits, exempting them from the above income and asset requirements. All eligible individuals must also meet non-income based criteria. Eligibility rules require the person be a citizen (or eligible non-citizen) and that able-bodied adults between 18 and 49 work at least 20 hours per week, are looking for work, or are registered to work or participate in an employment training program, otherwise their benefits are subject to a time limit such that if the employment requirements are not met, benefits will be limited to three months every three years (Gray, 2014). Benefit amounts vary widely depending on the above eligibility requirements. The average SNAP-participating household received $257.93 in benefits per month in FY 2015 while the average monthly benefit for an individual was $126.90.

In the wake of the Great Recession (the 18-month recession spanning December 2007 to June 2009 that ranks as the worst economic downturn sing the Great Depression in the 1930s), SNAP participation rates have been driven up drastically (See Figure 4). In 2007, SNAP participation included 26 million Americans. By 2011, 45 million Americans received SNAP

benefits. And in December 2012, a record 47.8 million Americans received SNAP benefits. This peak in program participation follows not only the increased need of many American families, but also the increased benefits allotted to each household. The American Recovery and Reinvestment Act of 2009 (ARRA, also known as the Stimulus Act) temporarily increased benefits. This temporary increase ended prematurely, however, at the beginning of FY 2014, when benefits were decreased. A family of four, for example, saw a 5.4% decrease in benefits (Oliveira, 2014).

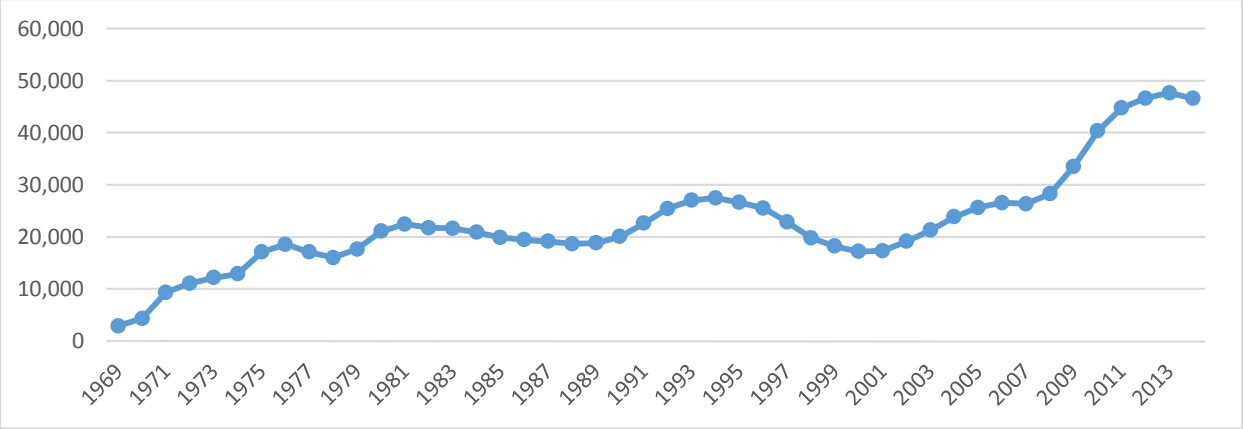

Figure 4. SNAP Participation

SNAP requirements are mostly uniform nationwide and states generally use standards set by Congress to determine eligibility and benefits, although states do have some discretion over certain details. Examples of the 24 options states can decide for themselves include (as described in a USA state options report): requiring households to report the household's circumstances at various intervals in various ways; choosing which reported household changes to act upon in order to provide the household with the maximum benefit; eliminating the 6 month check in for elderly or disabled with no earnings and requiring only a yearly check in; selecting the types of disqualifications a state agency wants to impose on SNAP recipients (USDA, 2013).

Some states have used their autonomy over certain aspects of SNAP to loosen restrictions (thus bolstering participation rates and benefit allotments) in order to pump dollars back into the pockets of families and the state economy (Poppendieck, 1999; USDA, 2013). Hanratty (2006) discovered that reductions in certification requirements (relaxation of asset limits, for example) resulted in increased access to Food Stamps according to Survey of Income and Program Participation (SIPP). Ganong (2013) reports that 18% of the increase in SNAP participation between 2007 and 2011 can be explained by the relaxing of state's eligibility requirements and program rules. Loosening requirements is an effective way to boost program participation, because, as we will see, many of the most vulnerable do not claim their SNAP benefits because of the eligibility restrictions and requirement barriers.

Participation in SNAP

SNAP is an entitlement program, meaning the federal government has committed to provide the funds to the program no matter how many eligible people participate. But not all who are eligible will participate (Delaney, 2013). According to a 2011 USDA report on trends in participation, only 72% of eligible Americans participate in SNAP and only 60% of eligible working poor participated in 2009 (Leftin, Eslami, & Strayer, 2011). In addition, participation rates vary across states. California, Texas and Florida have some of the lowest participation rates (below 70%) while states like Washington, Oregon, Maine and West Virginia have some of the highest (above 82%) (USDA, 2012a).

Participation in SNAP is known to vary by a number of factors. SNAP participation follows rates of poverty, economic climate, and policy decisions both federally and state mandated (Andrews & Smallwood, 2012; Mabil, 2010; McKernan, Ratcliffe, & Rosenberg, 2003; Tiehen, Jolliffe, & Gundersen, 2012b; USDA, 2012a). At the household level, a USDA

report shows that many SNAP participants are households with children present (57%), households with an elderly member (16%), or households that include a disabled member (20%) – these three categories make up 93% of all participants. The elderly and disabled, along with single parents and their children account for the largest proportion of long-term SNAP participants (USDA, 2012a). This USDA report also reveals that the elderly have the lowest participation rates where just above one-third of eligible elderly receive benefits. Low participation rates also exist among non-citizen parents with citizen children and able-bodied childless adults.

Barriers to enrollment and maintenance of benefits also affect participation rates. Across most groups, participation is mainly a function of the amount of benefits received. The USDA finds that as benefits increase, so does participation no matter the household type. This has been the case for the last 35 years the department has studied participation rates (USDA, 2012a). To reaffirm these findings, the report also finds that participants do, in general, receive higher benefits than eligible non-participants would receive, which implies that low benefit levels are another important reason for non-participation.

Research shows that getting oneself successfully enrolled in SNAP is repeatedly reported to be difficult and cumbersome, especially to those over 60. Much qualitative research on why eligible individuals do not participate shows that it is often not that individuals are unaware of their eligibility but rather that they have determined that the burden of the application and qualification process greatly outweighs the potential benefit (Clancy, Bowering, & Poppendieck, 1989). The often miserable treatment applicants receive and their fruitless attempts to establish eligibility prove to be enough to deter potential participants, leaving them hungry or reliant on emergency food assistance provided by food pantries and soup kitchens (Poppendieck, 1999).

The USDA has, in the past, allocated funds for outreach and education in order to bolster participation among these low-participating groups (although cuts to outreach efforts made under the Reagan administration have never been fully restored).

This finding is especially true for the elderly, who have the lowest rates of participation of all eligible groups (Levedahl, Ballenger, & Harold, 1994). Both quantitative and qualitative research uncover behavioral explanations for the low rates of participation among the elderly. These explanations include reasons that are similar for the general population (benefits are too low and the cost of applying, in time and effort, is too high; lack of information). But for the elderly, stigma surrounding use of government assistance and their perceived lack of need vary from the general population (Geiger, Wilks, & Livermore, 2014; McConnell, Ponza, & Cohen, 1999).

Demonization and Stigma

Until the 1990s, participants were required to purchase paper food stamps. Today, benefits are distributed through electronic benefit transfer (EBT) cards. The move to EBT cards was intended to reduce fraud and make the program more appealing to potential participants by reducing stigma.

The aversion to using federal assistance programs is the result of decades of stigma surrounding most entitlement programs. Entitlement programs such as welfare and other antipoverty programs took big hits politically and publically. Politicians from Reagan to Clinton vowed to weed out those who are undeserving of federal assistance and ultimately, "welfare as we know it" ended (Gilens, 2009; Halpern-Meekin et al., 2015). This stigma to participating in federal assistance programs is an important factor to consider when examining SNAP participation. As mentioned above, some of the most deserving (in the eyes of the American

public) and most in need are the elderly. But older generations, in particular the Silent Generation (born between mid-1920s to early 1940s) see government assistance as a handout they do not want to take from others who they feel may need it more (Taylor, 2014). Although increases in SNAP benefits were approved after the recession via the ARRA, benefits have been cut in the wake of public and political outcry that handouts such as SNAP benefits are going to the undeserving. For the most part, this outcry is the result of common misconceptions about who receives SNAP (Kasperkevic, 2014; Katz, 2013). A particularly common charge is that many "ABAWDs" – Able-bodied Adults without Dependents – are receiving SNAP benefits, when in fact the huge majority of SNAP users are families with children, disabled, and elderly. Eligibility requirements make ABAWDs eligible for 3 months of benefits every 3 years but only if ABAWDs work at least a part time job or participate in job training programs. Sluggish economic and job growth make both requirements difficult and there are anticipated cuts to program benefits beginning in 2016. Five billion dollars were excised from SNAP in across the board cuts made in November 2013, with yet another billion on the chopping block for 2016. The current (Republican) budget plan calls for cuts to social program spending of $125 billion between 2021 and 2025, thus assuring that SNAP will continue to experience huge opposition among politicians and the public, most of whom apparently praise these cuts (Bolen, 2015; Rosenbaum & Keith-Jennings, 2015). All this is occurring, of course, just as the need for food assistance appears to be increasing.

SNAP and Nutrition

To be food secure, according to its official definition from the USDA, one must have sufficient access to *nutritious* food. While SNAP benefits do increase caloric intake, recipients are free to purchase foods they like, and those often include processed or less healthy foods

thanks to policy changes in the 1970s (Andreyeva, Tripp, & Schwartz, 2015). It is no surprise, then, that starting in the 1970s, research on the health outcomes of SNAP recipients became of interest to policy makers and researchers. In general, studies show that SNAP users do spend more on less nutritious, processed foods than on wholesome foods like milk, meat, and fruits and vegetables (Pringle, 2013) and intake less than the recommended amount of whole grains, fruits, vegetables, fish, and nuts (Leung et al., 2012).

Since the concern over health outcomes and SNAP use first arose, research has attempted to link SNAP use to a number of different chronic diseases known to affect the food insecure at higher rates. These include diabetes and obesity. SNAP usage and its connection to obesity, in particular, remains the most controversial issue. Some feel SNAP benefits encourage purchase of sugary, high-calorie, cheap foods and that poor food choices may lead to increased obesity among SNAP users (Shenkin & Jacobson, 2010). But there is mostly contradictory evidence on whether or not SNAP increases rates of obesity among those who receive benefits (Dinour, Bergen, & Yeh, 2007; Franklin et al., 2012). The most consistent findings appear to show strong links between food insecurity and obesity among women SNAP recipients (Franklin et al., 2012; Townsend, Peerson, Love, Achterberg, & Murphy, 2001). The connection between obesity and SNAP use for men and children remains undetermined (Holben, 2010). A May 2015 study by the USDA confirms the connection between obesity and SNAP participation (Condon et al., 2015), but this comes at the end of a long line of studies claiming such connections that have so far been proven to be shaky. Still, the potential link to obesity is a cause for concern.

The relationship between food insecurity and SNAP is strong but measuring its effects is difficult (Nord, 2012). The impact of SNAP on food insecurity is affected by a number of methodological factors including at what point the outcomes are measured (months or years after

beginning to receive SNAP benefits or after participants have left the program), which population is measured (low versus very low food secure, for example), and for how long (often using cross-sectional versus longitudinal methods). For these reasons, it is difficult to isolate the effects of SNAP and research on its success at ameliorating food insecurity is mixed (Nord & Golla, 2009).

The following examples demonstrate the difficulty of isolating the effects of SNAP. Many cross-sectional studies find a strong association between SNAP participation and food insecurity but not necessarily because SNAP is not effective at decreasing food insecurity (Jensen, 2002; Nord, 2012). Research finds this association may exist because the most food insecure families self-select into SNAP and the positive effects of SNAP are not strong enough to make this group appear much better off than their non-SNAP counterparts (Nord & Golla, 2009). Some longitudinal studies, on the other hand, show that leaving SNAP increases food insecurity. A 2010 study using a 2-year panel sample from the CPS Food Security Supplement by Nord and Coleman-Jensen uncovered that those who had recently left SNAP were more likely to be food insecure when compared to households who remained in the program (Nord & Coleman-Jensen, 2010). Research isolating the effects of SNAP participation is growing and overall, reveals that SNAP aids food insecure households (Tiehen et al., 2012a). The degree to which SNAP decreases food insecurity, however, remains to be fully determined (Nord & Golla, 2009; Ratcliffe, McKernan, & Zhang, 2011).

SNAP plays a large and complicated role in the food insecurity of many Americans. Unfortunately, not all needy Americans partake in SNAP benefits. The analysis below explores which household characteristics are able to predict SNAP participation and adds an innovative

way to measure risk for needing SNAP using a composite "Risk Index" to predict participation in a way that varies slightly from traditional forms of prediction.

Methods

Data

Original research reported here uses the 2013 Food Security Supplement (FSS) of the Current Population Survey (CPS) (also known as the December Food Security Supplement) conducted by the Census Bureau for the U.S. Department of Agriculture. The CPS is the most widely-used dataset for studying national rates of food insecurity and SNAP usage and is the major source of USDA statistics on food security. The CPS is a complex multi-stage area probability sample. Each December since 1995, the CPS has collected data on food insecurity from US households in the Food Security Supplement.

The CPS Food Security Supplement is a robust dataset produced by the US Census Bureau. The methodology used by the CPS is thorough and the data collected can be generalized to the US population. The purpose of the CPS Food Security Supplement is to collect data on the rate of food insecurity and its economic consequences including the rate of food assistance program utilization and household food expenditures. Additionally, the full 18-item USDA food security module questions is asked of all those who say they run short on food and who do not have enough of the kinds of food they want to eat in their household.

Sample

The 2013 FSS data file includes records from 53,896 households each represented by a single reference person. A reference person is one adult respondent from each household who answers questions about the typical experiences and behaviors of all other members of the household (A. Coleman-Jensen et al., 2014). Of the total reference persons (n=27,654), we have

included here the 10,479 cases with valid data on SNAP participation in our analysis. In order to be asked about their participation in SNAP, respondents had to pass the "common screen", two questions to determine if the respondent will be asked more detailed questions about their household food security situation. The two questions from the common screen are:
The remainder of the sample of reference persons (n=17,175) were considered food secure by the CPS because they did not pass the "common screen" and, thus, were not asked more detailed questions about their food security situation, nor about their participation in SNAP. While it is possible that this method excludes some food insecure households and even some households containing current SNAP participants, the literature shows that there is a strong association between those who answer affirmatively to the screening questions (i.e. "passed") and their likelihood of utilizing SNAP (Nord & Golla, 2009). For this reason, those who do not pass the "common screen" questions are assumed to be fully food secure and not likely SNAP participants or eligible to participate.

Although it is not impossible for a respondent identified as fully food secure by the USDA to participate in SNAP, identifying these individuals is not possible using the CPS. While this method may lead to a systematically biased sample, the screening process rules out those who are most likely food secure, and therefore, are not the focus of this study. For those who pass the "common screen" questions and are, in turn, labeled food insecure at some level, the survey launches into the USDA's Core Food Security Module and are asked more detailed questions on coping with food insecurity, including receipt of SNAP benefits. In this way, we confirm we are only missing data on respondents who are food secure (according to the USDA's definition) and simultaneously participating in SNAP, an unlikely though not impossible combination. (cps.ipums.org) Given the set-up of the skip logic of the questionnaire, we can only

analyze data on the 10,479 respondents who were asked about SNAP receipt in the 12 months prior to data collection in December 2013.

All data were weighted using the food security supplemental weights as recommended by CPS FSS technical documentation to produce nationally representative estimates of the US adult population as has been done in previous studies using these data.

Andersen's Behavioral Model

The model guiding data analysis is the Andersen Behavioral Model. The model allows for an examination of SNAP participation across three domains: need factors, enabling factors, and predisposing factors. *Predisposing factors* consist of the structural factors in place in society that make an individual more likely to be in a position to need SNAP benefits. Predisposing factors include sociodemographic factors like race/ethnicity, gender, household income, number of children in the household, marital status and age. *Enabling factors* impede or enable the use of SNAP benefits and include factors like the region of the country (where policies may differ), metropolitan versus rural areas, and the educational level or employment status of potential participants. *Need factors* include measures of the subjectively and objectively evaluated need for SNAP benefits. It is not enough to simply be food insecure. An individual must also meet objective criteria (income test) in order to be eligible for enrollment. But, if a person subjectively considers their household food insecure, they may be more interested in enrolling in SNAP than their counterparts who do not subjectively perceive the need for food assistance.

Variables

The dependent variable being predicted is the dichotomous variable: SNAP participation. The variable is coded as 1=Yes, reports receives SNAP benefits and 0=No, does not report receiving SNAP benefits.

Predisposing Factors

There are seven predisposing factors included in this analysis. Individual factors predisposing a household to SNAP use include age, gender, and income level. Race and ethnicity are used as measures of social structure. Two measures of family structure, marital status and the number of own children under 18, are included in the predisposing category, as well. Age is measured using four categories: under 35, 36-49, 50-59, and 60 and up. Gender includes male and female categories. Income is comprised of 7 categories: under $20,000, $20-39,999, $40-49,999, $50-59,999, $60-69,999, $70-74,499, to $75,000+. Race is divided into white, black and other and ethnicity is measured as Hispanic and non-Hispanic. Marital status is measured dichotomously as married or not married and the number of own children in the household ranges from 0 to 4 or more. Although any children under 18 not legally claimed by the respondent are not counted in this variable, we believe the number of *own* children in the household under 18 is a more stable measure of the daily burden legally-guarded children place on household food security. In addition, the CPS FSS asks only about one's own children and not details of children not legally part of the household.

Race and ethnicity are used as measures of social structure in order to follow the Andersen Behavioral Model. Two measures of family structure, marital status and the number of own children under 18, are included in the predisposing category, as well. Age is measured using four categories: under 35, 36-49, 50-59, and 60 and up. Gender includes male and female categories. Income is comprised of 7 categories: under $20,000, $20-39,999, $40-49,999, $50-59,999, $60-69,999, $70-74,499, to $75,000+. Race is divided into white, black and other and ethnicity is measured as Hispanic and non-Hispanic. Marital status is measured dichotomously as married or not married and the number of own children in the household ranges from 0 to 4 or

more. Although any children under 18 not legally claimed by the respondent are not counted in this variable, we believe the number of *own* children in the household under 18 is a more stable measure of the daily burden that legally-guarded children place on household food security. In addition, the CPS FSS asks only about one's own children and not details of children not legally part of the household.

Enabling Factors

For Andersen, community and personal enabling resources contribute to the ability to access and utilize health services.(Andersen, 1995) Enabling resources are measured here using employment status, one measure of social structure (education level), and two measures of community type (region and metropolitan residence). Education includes four categories (less than high school, high school degree, some college, four-year degree or higher). Employment status categories include employed, unemployed, retired, disabled or not in labor force. Region includes Northeast, Midwest, South and West. Metropolitan residence is dichotomized into categories of metropolitan and non-metropolitan.

Need Factors

According to Andersen, need must be identified and defined in order for use to take place. To account for need in the model, there are two measurements included. The first is a subjective measurement of perceived need that identifies if individuals feel 1) they have enough of the kinds of food they want to eat, 2) enough but not always the *kinds* of food they like to eat, or simply 3) sometimes or often not enough to eat. This is also the first question in the USDA's food security measurement and is used in the Current Population Survey as part of the criteria with which to determine who is asked the full battery of questions in the USDA Core Food Security Module (CFSM). The criteria for being asked the full CFSM include if an individual is

below 185% of the poverty line, reports running short on money for food, or reports the household does not have enough to eat.

To measure evaluated need, the CPS sums each affirmative response to the USDA's 18-items of the CFSM. Households with more than two food insecure conditions reported are labeled as food insecure (any level). From the raw score, the USDA most often labels households using 3 food security status categories: food secure, low food secure or very low food secure. These are the 3 categories used in this analysis.

Risk Index

A Risk Index was created to measure the combined effect of the individual factors known to predict SNAP participation. The index measures the risk associated with 13 variables determined to affect SNAP participation through multivariate analyses. The presence of any of these 13 factors was determined a risk because they were significant predictors of SNAP participation, which is indicative of the risk that a household is food insecure and will participate in a food and nutrition program reserved for those in need. To create the index, 13 factors from the modified Andersen Behavioral Model were analyzed using a logistic regression model to determine their ability to predict SNAP participation. Each of the 13 factors were significant ($p<0.001$) in predicting SNAP participation in the logistic regression model. For each of the following 13 factors, respondents are assigned a 0 (if they do not have the attribute) or a 1 (if they have the attribute): female, under 60, non-white, Hispanic, unmarried, has at least 1 own child under 18 in household, family income under $20,000, residence outside the West, non-metropolitan residence, less than college education, unemployed, perceived need, and evaluated need. The index minimum is 0, meaning the respondent had none of the risk characteristics and the maximum is 13, which means that the respondent had all of the risk characteristics. Due to

low frequencies, the index was recoded so that those with 0 to 2 risk factors were coded together and individuals with 10 or more risk factors were top coded.

Analytic Strategy

This study utilizes multivariate logistic regression analyses to predict the odds of SNAP participation controlling for predisposing, enabling, and need factors. We also stratified the logistic regression model by predisposing, enabling, and need factors, to examine their ability to predict SNAP separately. Another logistic model including only the Risk Index was run. Within the logistic regression models, we obtained the predicted probabilities (using the EMMEANS command in SPSS) of participating in SNAP by various predisposing, enabling, and need factors.

Results

The weighted descriptive statistics in Table 12 show differences in the demographic characteristics of SNAP users versus the general population. Higher rates of SNAP usage appear among women, blacks, and Hispanics, than among the general population, as has been shown in the literature on SNAP participation and as was predicted. SNAP participants have lower rates of married status with more than twice as many married individuals within the total sample than within the SNAP participant sample. SNAP participants are younger, have children living in the household more frequently, and over half report a family income of less than $20,000 compared to just 14% of the general population. They live in the south most often, but there is almost no difference in the rate of metropolitan living among SNAP and non-SNAP users. They are significantly less educated and rates of unemployment are substantially higher for SNAP users. As was expected, rates of perceived and evaluated need of food are much higher for those using SNAP with 20% claiming they sometimes or often do not have enough of the kinds of food they

like to eat compared to just 4.5% of the general population and over half (54%) are categorized as having low or very low food security compared with just 13.9% in the total sample.

Table 12. Weighted Frequencies for Total Sample and SNAP Users

	Total Sample (%)	SNAP Recipient (%)
SNAP Participation	*29.0*	*100*
Predisposing		
Age		
Under 35	22.6	41.9
35-49	28.9	30.4
50-59	20.9	14.5
60 and up	27.6	13.2
Female	49.3	70.2
Race		
White, non-Hispanic	79.9	64.5
Black, non-Hispanic	12.1	28.6
Other	8.0	6.9
Hispanic	14.8	27.1
Married	74.1	37.5
Number of children		
0	57.6	36.7
1	17.8	20.7
2	16.0	21.6
3	6.0	13.4
4+	2.6	7.6
Family Income		
Less than $20,000	14.4	56.3
$20,000-$39,999	11.0	21.9
$40,000-$49,999	10.9	10.6
$50,000-$59,999	8.7	4.4
$60,000-$69,999	8.4	2.3
$70,000-$74,999	10.4	2.4
$75,000+	36.1	2.0
Enabling		
Region		
Northeast	17.8	15.5
Midwest	21.4	19.7
South	38.2	44.1
West	22.6	20.7
Metropolitan	84.4	82.0
Education		

	Total Sample (%)	SNAP Recipient (%)
Less than high school	11.0	27.8
High school degree	27.8	35.9
Some college	28.5	30.3
College degree (4 year)	32.7	6.0
Employed	62.9	43.7
Need		
Perceived		
Enough of the kinds of food we want to eat	75.8	36.2
Enough but not always the kind of food we want to eat	19.7	43.8
Sometimes or often not enough to eat	4.5	20.0
Evaluated		
Fully or Marginally Food Secure	86.1	46.0
Low Food Secure	9.3	33.7
Very Low Food Secure	4.6	20.3
Risk Index		
0-2	11.3	0.1
3	15.8	0.7
4	19.8	2.2
5	17.1	5.7
6	12.2	10.4
7	9.5	17.6
8	6.8	21.4
9	4.3	14.6
10+	3.3	5.7
N	**81,113,091**	**8,878,535**

Data Source: 2013 Current Population Survey Food Security Supplement
All data are weighted using the Food Security Supplement Household Weight.

Table 13 shows the results of the logistic regression analyses. We find that the strongest predictors of SNAP usage follow the literature identically. According to the full model (Model 1, Table 13), the model and all predictors in the model were significant at the $p<.001$ level. The following predisposing factors within the behavioral model had the greatest odds of being SNAP users: females (Odds Ratio or OR=1.28) as compared to males, those under 35 (OR=1.83) compared to those above 60, blacks (OR=1.75) as compared to whites, and Hispanics (OR=1.12) as compared with non-Hispanics. In the overall model, the dominating predictive factor was income. Those with yearly family income below $20,000 had nearly 10 times (OR=9.76) the odds of participating in SNAP when compared to the most affluent group of $75,000+, holding all other variables in the model constant. Family size was the next strongest predictor where those with 4 or more children had higher odds (OR=3.21) of SNAP participation compared with 0 children when holding all other variables in the model constant. Marital status proved to be the third strongest predictor of SNAP participation such that unmarried respondents were over 2 times more likely to participate in SNAP (OR=2.18) compared with their married counterparts when holding all other variables in the model constant. Among the enabling factors, living outside the West, living in a non-metropolitan area (OR=1.04) compared to living in a metropolitan area, have less than a high school degree (OR=2.49) compared to having a college degree, and being disabled (OR=2.92) compared to being employed made up the enabling characteristics with the highest odds of SNAP usage. Finally, as was predicted, those with the highest perceived and evaluated need for food had the highest odds of SNAP participation compared to their food secure counterparts.

In Model 2 of Table 13, the Risk Index proved to significantly predict SNAP participation (OR=1.83, $p<.001$). Because the index includes dummy coded versions of the 13

independent variables in Model 1, Model 2 includes only the Risk Index to avoid multicollinearity with the other predictor variables in Model 1.

Table 13. Logistic Regression of SNAP Participation

	Odds Ratios (OR)	95% Confidence Interval	Odds Ratios (OR)	95% Confidence Interval
N=81,113,091	**Model 1***		**Model 2***	
PREDISPOSING				
Male	-		-	
Female	1.28	(1.27,1.28)	-	
Age				
Under 35	1.83	(1.83,1.84)	-	
36-49	1.50	(1.50,1.51)	-	
50-59	1.28	(1.27,1.28)	-	
60+	-		-	
Race				
White	-		-	
Black	1.75	(1.75,1.76)	-	
Other	1.15	(1.15,1.16)	-	
Hispanic	1.12	(1.11,1.12)	-	
Non-Hispanic	-		-	
Marital Status				
Married	-		-	
Not Married	2.18	(2.17,2.18)	-	
Number of children				
0	-		-	
1	1.19	(1.18,1.19)	-	
2	1.69	(1.69,1.70)	-	
3	2.82	(2.81,2.83)	-	
4+	3.21	(3.19,3.22)	-	
Family Income				
Less than $20,000	9.76	(9.71,9.82)	-	
$20,000-29,999	4.10	(4.07,4.12)	-	
$30,000-39,999	2.79	(2.78,2.81)	-	
$40,000-49,999	1.93	(1.92,1.94)	-	
$50,000-59,999	1.54	(1.53,1.55)	-	
$60,000-74,999	2.01	(1.99,2.02)	-	
$75,000+	-		-	
ENABLING				
Region				
Northeast	1.22	(1.22,1.22)	-	

	Odds Ratios (OR)	95% Confidence Interval	Odds Ratios (OR)	95% Confidence Interval
	Model 1*		**Model 2***	
Midwest	1.12	(1.11,1.12)	-	
South	1.09	(1.08,1.09)	-	
West	-		-	
Metropolitan	-		-	
Non-metropolitan	1.04	(1.03,1.04)	-	
Education				
Less than high school	2.49	(2.48,2.50)	-	
High school degree	1.85	(1.85,1.86)	-	
Some college	1.92	(1.91,1.93)	-	
4-year degree or higher	-		-	
Employment				
Employed	-		-	
Unemployed	2.23	(2.22,2.24)	-	
Retired	1.12	(1.11,1.12)	-	
Disabled	2.92	(2.91,2.93)	-	
Not in labor force	1.61	(1.61,1.62)	-	
NEED				
Food Security (Perceived)				
Enough of the kinds of food we want to eat	-		-	
Enough but not always the kinds of food we want to eat	1.28	(1.28,1.29)	-	
Sometimes or Often not the to eat	1.46	(1.45,1.46)	-	
Food Security (Evaluated)				
High or Marginal Food Security	-		-	
Low Food Security	1.96	(1.96,1.97)	-	
Very Low Food Security	2.10	(2.09,2.11)	-	
Risk Index			1.83	(1.83,1.83)
Nagelkerke R square	0.39		0.29	
Intercept	-0.88		-0.89	

Data Source: 2013 Current Population Survey Food Security Supplement
All data are weighted using the Food Security Supplement Household Weight.
*All variables in Model 1 and Model 2 were significant. ($p<.001$)

After the Risk Index was confirmed to be a significant predictor of SNAP participation in the Model 2 logistic regression, predicted probabilities were calculated for each of the nine values of the index from 0 to 2 factors to 10 or more factors. Figure 5 displays the predicted probabilities of SNAP participation for each value of the index. The calculated predicted probability values increase from a predicted probability value of .02 for those with 0 to 2 risk factors up to .74 for those with the 10 or more risk factors. With each additional risk factor, there is an average increase of .09. For this index, the predicted probabilities can be interpreted such that 2% of individuals with 0, 1, or 2 risk factors are predicted to use SNAP, up to those possessing 10 or more risk factors, of whom 74% percent are predicted to use SNAP.

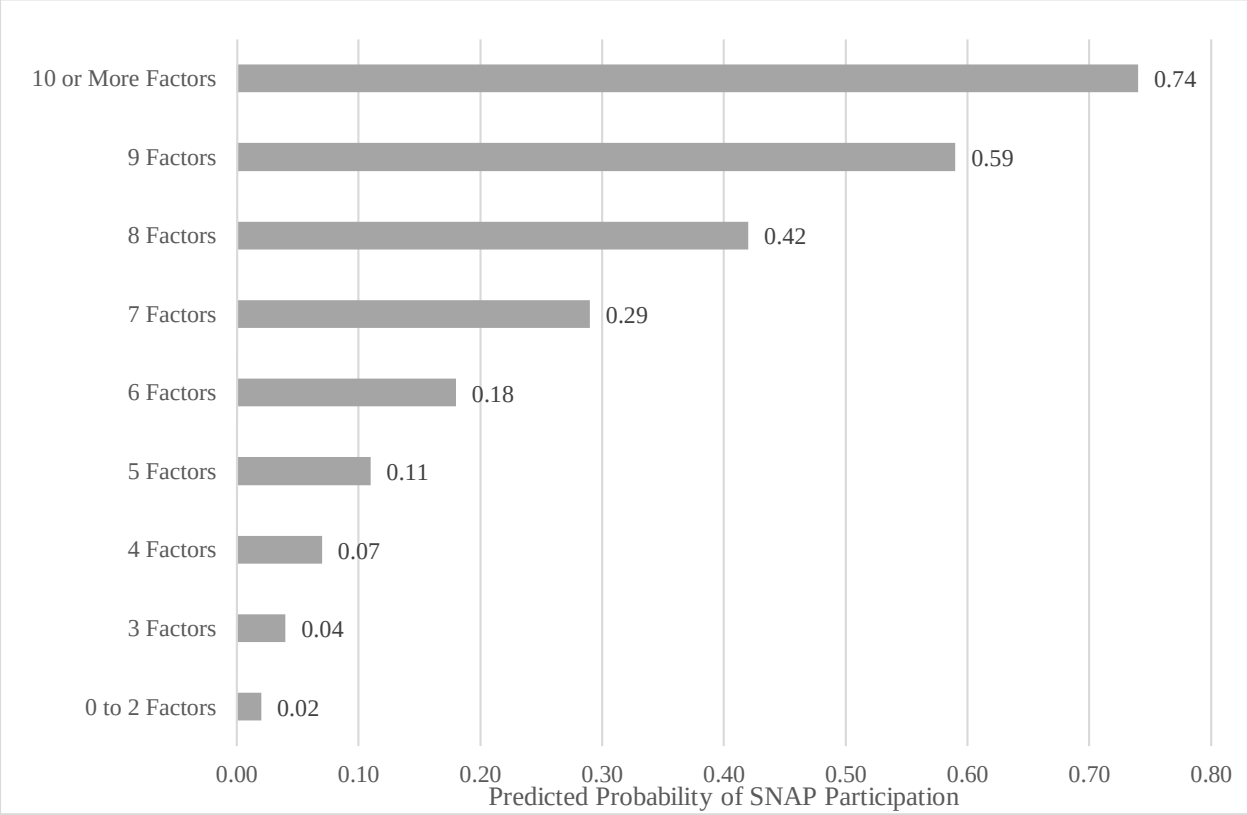

Figure 5. Predicted Probabilities of SNAP Participation by Risk Factors

Discussion

This study contributes to our base of knowledge related to predicting SNAP participation in several important ways. It substantiates the previous literature of known predictors of SNAP by using a nationally representative sample and extends our knowledge by utilizing an innovative way to examine risk factors through the creation of a Risk Index. This study also extends the use of Andersen's Behavioral Model to provide an understanding of the factors that contribute to the utilization of SNAP benefits.

Our results confirm previous research that women, minorities, the young, Hispanics, unmarried and poor individuals are more likely to participate in SNAP and those with the highest need for food seek food assistance. This research also adds to the discussion that it is not just objectively evaluated need (measured with the USDA's widely-used Core Food Security Module) that increases odds of SNAP participation. The literature is prolific on the strength of USDA-defined food security status in predicting SNAP participation. This research demonstrates it is also higher perceived food need that leads to higher rates of SNAP participation. Those with perceived need have indicated they feel they have "enough *but not always* the kinds of food they want to eat" or simply "sometimes" or "often" not enough to eat. This is the only question in the CFSM that does not ask about food shortage as a function of income. For this reason, it is helpful to know that perceived household food shortage is predictive of SNAP participation alongside its stronger objectively measured food security status that focuses on food security as a function of income.

This study demonstrates the value of using an adapted version of Andersen's Behavioral Model for predicting SNAP participation. The model provided a framework to understand the relationship between multiple factors and SNAP participation, an expansion to the often

demographic focused framework of other research on SNAP use. We found that all three factors (predisposing, enabling, and need) contribute to an individual's likelihood of using SNAP. The model shows that every factor in each category was a significant predictor at the same significance level ($p<.001$). Still, each category had one factor that stood out as the strongest predictor. For predisposing factors, we found that income was the strongest predictor of SNAP use, within both this category and the entire model. Under the enabling category, we found that disabled status was the strongest predictor. Finally, as is well-documented in the literature, evaluated need for food was the strongest predictor of SNAP participation within the category of need. Our adapted version of Andersen's model highlights first, that there are a variety of factors in different spheres of an individual's life (some controllable, some not) that help predict their odds of SNAP usage. An individual's ability to access resources, economic circumstances, household structure, and measured need are each contributing factors to their propensity to participate in SNAP. Understanding this ties what much of the literature on who participates in SNAP is already saying together.

Most importantly, this research demonstrates that by using the Risk Index, it is possible to predict SNAP participation not by knowing necessarily which factors an individual possesses but how many. The results of the analysis show that increases in the number of risk factors an individual possesses, regardless of which factor it is, increase the likelihood that an individual will use SNAP. This approach to predicting SNAP participation goes beyond individual characteristics and has not been seen in any other studies to date. We believe it allows for a more complete exploration of the complex reasons behind an individual's participation in SNAP. We suggest that this index be used as a summary indicator in addition to the analysis of the risk factors individually. What the index contributes is the ability to evaluate the consolidated and

additive effect of having multiple risk factors, enabling the use of a more holistic and continuous measurement in predicting SNAP participation.

The risk index developed in this study helps to evaluate the "joint and additive influence of multiple risk factors"(Moore, Vandivere, & Redd, 2006) from multiple aspects of an individual's life enabling the examination of the interplay of factors. The index could be used in practice as an adjunct to a food security questionnaire to understand who is at greater risk for needing SNAP benefits. The index can be used as a continuous measurement or by creating a cutoff point (we suggest 9 or more risk factors, which guarantees predicted probabilities above 50%) to indicate strong predicted likelihood of SNAP participation, no matter which 9 of the 13 factors are present.

In practice, this index may be useful to policy makers or emergency food agencies attempting to research which households are most likely to use SNAP, not necessarily interested in the exact sociodemographic makeup of the households. Using an index such as this one contributes to understanding that factors such as race and income do not act alone, but together increase odds that SNAP will be needed in a household in a way that goes beyond looking at the factors on their own (as a traditional logistic regression model does) or the interaction of these factors (as are commonly analyzed as interaction terms). This index then may be most useful to applied researchers interested in knowing basic odds of SNAP participation based on the index score each household receives.

Although the dataset focuses on macro level household characteristics known to affect SNAP usage, we have seen limited studies that utilize such a large, nationally representative sample as the CPS. Additionally, this study contributes detailed descriptions of the individuals using SNAP that vary from the unidimensional descriptions often used in SNAP participation

analyses where individual characteristics are described as though they exist independently of other characteristics we know interact with them.

CHAPTER SIX: FOOD DESERTS

Food insecurity, or the state of being without ready access to nutritious food, can exist for reasons besides a lack of money to buy food. It has come to the attention of researchers that access to food for some, remains a challenge in spite of available funds (Beaulac, Kristjansson, & Cummins, 2009; Dutko, Ver Ploeg, & Farrigan, 2012; Strickhouser, Wright, & Donley, 2014; Ver Ploeg, 2010). Beyond not having enough money to buy food, some research finds that individuals may have difficulty accessing food for two additional reasons: distance to a full-service grocery store and the lack of reliable transportation to a store. The USDA studies accessibility by taking into consideration these two factors. They do this by studying "accessibility". Within USDA research, accessibility is measured directly with distance so that when the USDA talks about accessibility they are talking about distance. In addition, the USDA takes into consideration access to transportation as a barrier to food access. They explain that "ownership of, or easy access to, a motorized vehicle may be the best marker of access regardless of whether someone lives in a poor area or not" (p.5) (Ver Ploeg, 2010) The sum of these two accessibility issues is usually discussed in terms of *food deserts*, areas where people have limited access to a variety of healthy and affordable food, often because of the distance to a store or a lack of transportation to get there (Dutko et al., 2012).

The concept of a food desert gained attention in the US in 2008 when Congress directed the USDA to evaluate how extensive the problem of access to food had become in the US. The evaluation determined how widespread food insecurity was, not just as a result of a lack of income, but as a function of access. By 2008, the USDA (via the CPS) had 13 years of nationally representative data on food insecurity. One of the biggest takeaways from over a decade of

research on the topic was that food insecurity was not evenly spread across the nation but had a tendency to be located in pockets of the country. As a way of defining and analyzing these pockets, the USDA developed the concept of a food desert.

Food deserts are defined by the USDA as regions that have: (1) large proportions of households with low incomes, (2) inadequate access to transportation, and (3) a limited number of food retailers providing fresh produce and healthy groceries for affordable prices (Dutko et al., 2012). To locate these areas, researchers from the USDA's Economic Research Service (ERS) compiled a list of census-tract level food deserts which meet the low-income and low-food-access criteria defined by the USDA. Of the 74,134 census tracts in the US, 9%, or 6,529, are labeled food deserts, affecting an estimated 23.5 million people (Dutko et al., 2012).

Food Deserts

In response to the directive of the Food, Conservation, and Energy Act (2008 Farm Act), the USDA assessed the extent of limitations to access of healthy and affordable food in 2009. "Food deserts" are measured at the census tract level. A census tract can be labeled a food desert when it is determined to be low-income and low-access, where 1) the poverty rate is greater than or equal to 20 percent of the total population or median family income does not exceed 80 percent of the area median income and 2) at least 500 people or 33 percent of the population are located more than 1 mile in urban areas or 10 miles in rural areas from the nearest supermarket or large grocery store (Dutko et al., 2012). The research done by the USDA in 2009 ultimately identified 6,500 census tracts that meet the above two criteria.

Food deserts are described by researchers as the reason that some areas, rural and urban, suffer from disproportionately high rates of food insecurity (Walker, Keane, & Burke, 2010). These areas lack sufficient access, which is why the 2008 Farm Act proposed to examine food

deserts further. The USDA's definition of food security states that only those with "access at all times" to adequate food can be considered food secure (A. Coleman-Jensen et al., 2014). For those living in a food desert, the lack of access to food outlets prevents residents of these areas from obtaining food security (Cummins, 2002; Ver Ploeg, 2010).

The term is said to have originated in Scotland in the 1990s to refer to areas with poor access to an affordable and healthy diet (Cummins, 2002). Today, the concept has become more mainstream, invoking images of dietary wastelands where food, and especially healthy food, is difficult to access. For example, a 2011 USA Today article (Eversley) describes the term extensively. By 2015, an author from the same media outlet glosses over the term, provides no definition, and jumps directly into the story of the article about food deserts in Memphis (Cannon, 2015). The concept is no longer the obscure term it used to be and has become a major focus within the discussion of food security.

Food deserts have recently received much public attention because of the current and widespread preoccupation with the health of the nation. With obesity and chronic disease racing at alarmingly high rates, particularly for the poor, lack of access to nutritious food has become cause for concern. Those living in poor or rural areas with little or no access to full-service supermarkets that sell healthy foods such as fresh fruits, vegetables, whole grains, fresh dairy and meat, seemed to disproportionately suffer from chronic disease (Hendrickson et al., 2006; Schafft, Jensen, & Hinrichs, 2009) . Instead, some areas appeared to only offer fast-food or convenience store type food outlets, venues known for their convenience but not for their healthy foods (Lewis et al., 2011).

Current Measurements of Food Deserts

The USDA has set the official measurement of a food desert. The USDA determined census tracts to be the smallest, yet easiest to use, geographic units with which to identify food deserts. Measuring food deserts this way is not the most accurate, but for the USDA it is the most feasible. The USDA uses a method of measuring food deserts called area-based measurement. While useful, this type of measurement is not as accurate for generalizing data to finer units of analysis, such as individuals. For example, area-based measurement of food deserts is useful when low-income, low-access individuals are clustered but less so when they are scattered.

Imagine this scenario in which food desert measurements using area-based measurements are used to inform policy on opening a new grocery store. The food desert measurement method is applied and a food desert is labeled as being low-income and low-access, as the definition requires. It may seem to some that opening a new grocery store would resolve the problem of this food desert's lack of access to food. And in fact, when low-income and low-access people are concentrated within a food desert, the opening of a new store may be an effective method to combat food insecurity. If they are scattered, however, in an area with fewer low-income individuals, for example, a more effective policy may be lowering the cost of transportation to existing food outlets. This is the difference between issues of area-based access, which the current food desert methodology pinpoints, and individual-based access, which it cannot. Further investigation reveals that the USDA is in fact measuring food deserts with more accuracy than they initially let on. They are in fact using finer points of measurement initially, but widen these finer measurements to census tract level to make them useful for the general public (researchers) to analyze.

A 2009 USDA study highlights the limitations of the current food desert measurement method. A two-year panel study by the USDA found that "a small percentage of consumers" across the nation experienced what they had anticipated: inadequate access to affordable and healthy foods because of distance to and inability to access supermarkets or large grocery stores (USDA 2009). The study found that urban areas with food access issues tended to be more racially segregated with greater income inequality. Across small-town and rural areas, a lack of transportation infrastructure was the most common characteristic. While the report determined these were certainly areas with limited access, it remained inconclusive about whether or not limited access could be considered inadequate access, an important delineation when determining how policy can improve these areas.

This final conclusion, or lack thereof, of the 2009 USDA report acted as the starting point for the ongoing debate surrounding food deserts, what they are and how they can be eradicated. Research questions that followed this 2009 conclusion included: What constitutes an area that has inadequate access, and not just limited access? What can realistically be done to alleviate the inaccessibility of healthy foods in these areas? It is clear the current measurement is not perfect. Yet, it is the most widely used measurement and for this reason remains the principal method of measuring food access.

Food Deserts and Health

Possibly the loudest voices from the food desert debate come from those who see food insecurity as a public health issue. As was mentioned above, the USDA framed their 2009 Report to Congress on food deserts as a matter of concern over public health. (The first sentence of the report's summary states: "Increases in obesity and diet-related diseases are major public health problems. These problems may be worse in some U.S. communities because access to

affordable and nutritious foods is difficult." p.iii) (Ver Ploeg, 2010). Although research is not wholly congruent on the connection of food deserts and detrimental health effects, it is clear that there are notable effects on the health outcomes of those living in a food desert (Hendrickson et al., 2006; Schafft et al., 2009). The research on food deserts as a culprit to the growing number of chronically diseased and obese people might be seen as a way to make the issue easier for politicians and the public alike to get behind. Framing the issue of food deserts as a public health issue, and not simply a social issue, highlights the partisan reaction that the issue has produced.

Despite health being a reason food deserts have received attention, the research directly connecting food deserts to diet-related diseases is weak (Budzynska et al., 2013). In addition, while some research shows that residents of food deserts have overall higher rates of illness (Hilmers, Hilmers, & Dave, 2012; Walker et al., 2010), much of the research does not take into consideration the larger environment within which food deserts exist (*The public health effects of food deserts: Workshop summary*, 2009). Access to food is often just one of many issues that affect how people eat and their resulting health outcomes (Beaulac et al., 2009).

When framed as a public health issue, the research on food deserts and their relationship to chronic disease is vast. A Google Scholar search for "food desert" + "health" produced 3,320 results related to the topic. For a term that has really only existed within the research on food security since the 2009 push by the USDA to study the topic, this is striking. All the way up to the White House, food deserts have become a cause for concern. First Lady Michelle Obama considers access to healthy foods one of the five pillars necessary to address childhood obesity. Research on food deserts as a concern of public health often examines specific populations and the effects of a lack of access to healthy foods on some specific health outcome (Walker et al., 2010; Zenk et al., 2005). Research focuses on rates of chronic diseases including heart disease,

diabetes, and obesity, on vulnerable populations such as children, the elderly, and the poor (Laraia 2007; Larson et al 2009).

Food Deserts, Race and Poverty

Food deserts tend to follow geographic lines of poverty. Alkon (2011) explains that the geographic delineation of food deserts can be seen as an ebb and flow of capital, often within major cities, where racialized zoning and redlining demarcate what was once the "crowning glory of past capital development" but is now "a prison which inhibits the further progress of accumulation (of capital)" (p. 94). Research shows that additional demographic factors besides race and poverty tend to characterize food deserts. Food deserts tend to be low-income with large minority populations. This can mean that food desert residents not only lack access to a grocery store but other resources as well, like banks, hospitals, transportation infrastructure, and recreational areas. Lack of access to food is just one in a long list of needs in these communities. This lack of resources means large vulnerable populations reside in these areas, making the inaccessibility of food even more problematic.

There are federal programs to promote the building of new stores (mainly the Healthy Food Financing Initiative which subsidizes grocery stores opening in food deserts). Still, providing easy access to food "does not mean they'll buy it," claims a 2015 New York Times article. Poverty affects not just the ability to purchase food, but the ability to get there. Transportation limitations affect the poor disproportionately more often than the general food desert population. For those with physical limitations, this becomes a serious issue as well, despite available income. If building grocery stores takes us only half way to solving the problem of access of healthy food (Cummins et al. 2014), what else can be done?

Mobility and Access

Most often, food deserts are described as places where there is no full-service grocery store within the census tract or one that does exist is too far for most of the population to reach with ease. (The USDA says this is one mile or more in urban areas and ten or more miles in rural areas.) Yet research shows that the inability to access fresh food can exist for other reasons. Transportation is cited as a reason people cannot access food within the research (Cotterill & Franklin, 1995). In addition to barriers of infrastructure, car ownership is predictive of food access issues for households. Without a car, a household tends to have more difficulty accessing food (Coveney & O'Dwyer, 2009). Even the USDA remarks in its 2009 study of food deserts that "There will certainly be people who live in a low-income area with limited access but who themselves have adequate resources to travel to a supermarket regularly. Ownership of, or easy access to, a motorized vehicle may be the best marker of access regardless of whether someone lives in a poor area or not" (p.4) (Ver Ploeg, 2010).

The combination of carlessness and distance to the nearest grocery store is important to understanding the barriers faced by those whose access issues stem less from the absence of a store and more from the inability to get to one. On the other hand, for those with a car the difference between one mile, three miles or five miles is a matter of cents compared to the difference in burden of walking one, three or five miles. Said differently, it does not matter if you live a quarter mile or more than ten miles away, distance matters less when you have a car (Dubowitz, Zenk, Ghosh-Dastidar, et al. 2015). This issue of transportation and accessibility become even more complex when physical limitations are taken into consideration (Gundersen et al., 2011; Lee & Frongillo, 2001). The current USDA measure of food deserts does not consider either of these kinds of mobility limitations. Although some measures of food insecurity take

into account transportation to some extent, there is room to expand the definition, which is more frequently based entirely on the cost of food. Adding access to transportation to the definition and measuring overall access to transportation instead of access to a car may be a way to make such an improvement. This chapter takes up one main research question: Are food deserts really about geography? And is access to healthy food less a function of distance and a more a function of access to reliable transportation?

Food deserts are by definition a problem of geography. Research shows that distance to a grocery store can affect accessibility to adequate food. Having no access to a car in an auto-dependent country like the US can be highly problematic no matter what kind of access to other resources one has (Grengs, 2010). Car culture favors those who can afford to own and operate a private vehicle. This chapter explores what role not being able to rely on one's own means of transportation plays in predicting food insecurity.

Methodology

Sampling

Data for this chapter come from a statewide telephone survey done in 2014 by the Institute for Social and Behavioral Sciences at UCF. Analyses use a weighted, representative sample of Florida residents (N=825). Respondents come from 58 of Florida's 67 counties (87%), although numbers from all counties were dialed. The design was a probability sample of phone-owning households, with both landline and cell phone numbers acquired. Low to moderate-income households were oversampled leaving affluent households under-sampled. Data are weighted to correct for this oversampling so that the results generalize to the state, unless otherwise specified.

Dependent Variable: Food Insecurity

Following the USDA measurement, this variable sums the number of affirmative responses given to any of the 10 USDA Food Security Module questions asked in this survey and dichotomizes the results. A person is food insecure if they say yes to at least three of these questions and severely food insecure if they answer yes to six or more.

Independent Variables

Distance to Grocery Store: This question asked respondents to estimate how far they lived from the nearest full-service grocery store. Responses from the survey ranged from a quarter mile or less to five or more miles. This variable was recoded into both continuous and nominal level variables for use in multiple models. The continuous level version of the variable was calculated using the midpoint of each of the six distance categories. Six dummy coded distance variables were created in order to treat distances as dichotomized categories.

Car Ownership: This variable is dichotomized so that car ownership includes those who own or lease a car. Those who respond they do not own or lease a car are labeled as not car owners.

Mode of Transportation: Respondents were asked how they typically get to the grocery store. Response options included drive my own car, borrow someone else's car, someone drives me, or take the bus/walk/ride a bike/other.

Control Variables

Gender is measured as male or female. Age is categorized into 3 groups: 18-34, 35-64, and 65+. Employed, married, and Hispanic ethnicity are dummy coded. Race is coded into white, black and other. Education is coded into 3 categories from high school or less, to some college, to a Bachelor's degree or higher. Household size includes categories from 1 to 3 or more persons.

Results

Table 14 presents sample characteristics for the total sample of Florida residents, low-income households, and carless households. The table shows that a majority of the total sample are white (73.4%), non-Hispanic (84.9%), female (53.7%), and 30-64 years old (49.6%). They are mostly of moderate income or above (58.5%) with a college degree or above (33.7%) and employed (42.1%). A large majority of the sample (68.7%) live more than one mile from a full-service grocery store with 14% living five miles or more from the nearest grocery store. Respondents almost unanimously drive their own cars to get to the store (87%). Nearly one in every five households in the total sample is food insecure.

Sample Characteristics: Carless Sample

A small proportion (5.4%) of the total weighted sample reports not owning a car. This population differs in many ways from the total sample of Florida residents. Carless households are more frequently black and Hispanic households (28.7% and 22.0%, respectively) than the total sample (11.7% and 15.1%, respectively). More than half are extremely low or very low income (68.7%) and are food insecure (53%). Nearly a third of the carless sample live five or more miles away from a grocery store compared to just over a tenth of the total sample. To get to the closest store, they most often report that someone drives them (41.3%) or they take the bus (23.1%). Just 6.4% report driving themselves compared to 87% of the total sample.

Low-Income Sample

Overall, the low-income sample shares more characteristics with the carless sample than does the total sample. The low-income sample is more similar in its rates of black and Hispanic households (28.7% and 22.0%, respectively) when compared to carless households (20.0% and 19.3%, respectively). However, the low-income sample drives to the grocery store at rates more

similar to those of the total sample (77.5% and 87.0%, respectively) and live at similar distances from the grocery store (68.7% of total sample live more than one mile compared with 67.7% of low-income sample).

Table 14. Weighted Sample Characteristics

	Total Sample (%)	Low-Income* (%)	Carless (%)
Food Insecure	17.5	32.8	53.0
Owns Car	94.6	88.0	0.0
Age			
18-29	28.1	33.0	24.0
30-64	49.6	41.5	48.5
65+	22.3	25.4	27.5
Income			
Extremely Low Income	11.2	27.0	32.1
Very Low Income	11.7	28.3	36.6
Low Income	18.6	44.7	21.8
Moderate Income	23.2	-	4.5
High Mid/Affluent	35.3	-	5.1
Female	53.7	64.0	63.8
Race			
White	73.4	64.2	57.8
Black	11.7	20.0	28.7
Other	14.9	15.9	13.6
Hispanic	15.1	19.3	22.0
HH Size			
1 person	17.0	24.1	38.7
2 persons	36.0	30.6	18.1
3+ persons	47.0	45.3	43.1
Married	49.4	31.3	7.3
Employed	42.1	32.8	26.8
Education			
High school degree or less	28.0	44.7	46.8
Some college/Associate's degree	38.2	38.8	33.0
Bachelor's degree or higher	33.7	16.4	20.3
Distance			
Quarter mi or less	8.2	9.9	8.6
Quarter to half mi	6.2	5.9	3.0
Half to 1 mi	16.9	16.5	10.1
1-2 mi	29.6	24.1	20.8
3-5 mi	25.1	23.3	29.6
5+ mi	14.0	20.2	27.9
Transportation			
Drive own car	87.0	77.5	6.4
Borrow car	3.5	4.5	7.7
Someone drives me	4.1	8.1	41.3
Bus/Walk/Bike/Other	5.4	10.0	44.7
N	**823**	**341**	**44**

*Weighted by weight4

*Low-income is defined as having extremely low, very low or low income

Data Source: ISBS 2014 Statewide Food Insecurity Data

Bivariate Analysis

Bivariate analyses were used to investigate the relationship between food insecurity, distance to grocery store, and access to transportation. Chi-square tests of independence show significant relationships between food insecurity and carlessness for both the total weighted sample (X^2=41.11, $p < .001$) and the unweighted low-income sample (X^2=5.18, $p < .05$). (Weights correct for the oversample of low-income respondents and so are removed for low-income sample analyses.) There was also a significant relationship between food insecurity and distance to grocery store for *the total sample* (X^2=25.07, $p < .001$) but *not* for the low-income sample.

Logistic Regression

Table 15 presents the results of four logistic regression models. Models 1 and 2 compare the strength of distance to a store and car ownership in predicting food security among the total sample (Model 1) and the low-income sample (Model 2), while holding other sociodemographic factors constant. Model 3 and 4 examine the predictive strength of the same variables as Models 1 and 2 except that transportation is measured across four response options, instead of the dichotomized car ownership variable. Model 3 uses the total sample and Model 4 the low-income subsample. The standardized coefficients were used to compare the predictive strength of the variables in questions, distance to store and transportation, between the general population and low-income populations across Models 1 and 2, then 3 and 4.

Model 1 was statistically significant, X^2 (1) = 278.17, $p < .001$. The model explained 39.1% (Nagelkerke R^2) of the variance in food security. Of the eleven predictor variables, six were significant predictors of food security. Among the sociodemographic variables, age, race, ethnicity, and household size were all significant predictors of food security. When holding all

other variables in the model constant, middle aged respondents (Odds Ratio=2.00, p <.05), black households, (OR =2.49, p < .01), Hispanics (OR=2.38, p < .01), and household sizes with three or more persons (OR=2.44, p<.05) had increased odds of being food insecure compared with young (18-29), white, and non-Hispanic, and one person households, respectively. The strongest predictor in the model was income. Compared to the most affluent (120%+ area median income), extremely low income households were 27.10 times more likely to be food insecure and those in the very low income category were 32.87 times more likely to be food insecure, when holding all other variables in the model constant. Odds for those of low income and moderate income fall to 9.04 (p<.001) and 6.02 (p<.001) compared to the most affluent.

Model 2 analyzed a weighted subsample of low-income respondents (N=411). Overall, the model was significant and explained 36% of the variance in the dependent variable. Of the ten predictor variables in the model, five variables were significant predictors of food security. Of the sociodemographic variables, age, income, race, ethnicity, and household size were significant predictors. Those age 35-64 had 2.98 (p < .001) increased odds than those 18-34 of being food insecure, when holding all other variables in the model constant. For those extremely low and very low income had 3.09 (p < .05) and 4.12 (p < .001) increased odds of food insecurity compared to low-income respondents, when holding all other variables in the model constant. When compared to white respondents, black respondents had 4.19 (p < .01) increased odds of being food insecure, when holding all other variables in the model constant. Hispanics had increased odds of food insecurity (OR=2.72, p < .05) compared to non-Hispanics and three person or more households had increased odds (OR=2.92, p <.05) of food insecurity compared to one person households, when holding all other variables in the model constant.

Table 15. Weighted Logistic Regression of Food Security

	Model 1		Model 2		Model 3		Model 4	
	Total Sample		Low Income Subsample		Total Sample		Low Income Subsample	
Transportation Measure	Owns Car		Owns Car		Transport to Store		Transport to Store	
	Odds Ratio (OR)	95% Confidence Interval	Odds Ratio (OR)	95% Confidence Interval	Odds Ratio (OR)	95% Confidence Interval	Odds Ratio (OR)	95% Confidence Interval
Age								
18-34	-	-	-	-	-	-	-	-
35-64	2.00*	(1.10, 3.65)	2.98**	(1.39, 6.40)	1.94*	(1.04, 3.62)	.37*	(1.37, 6.86)
65+	0.90	(.39, 2.09)	1.42*	(.52, 3.86)	0.82	(.34, 1.99)	1.30	(.46, 3.13)
Income								
Extremely Low Income	27.10***	(9.40, 78.08)	3.09*	(1.40, 6.85)	25.02***	(8.55, 73.24)	2.78*	(1.23, 6.27)
Very Low Income	32.87***	(11.79, 91.61)	4.12***	(1.93, 8.81)	34.34***	(12.11, 97.38)	4.17***	(1.92, 9.06)
Low Income	9.04***	(3.46, 23.66)	-	-	9.68***	(3.65, 25.63)	-	-
Moderate Income	6.02***	(2.38, 15.24)	N/A	N/A	6.17***	(2.40, 15.85)	N/A	N/A
High Mid/Affluent	-	-	N/A	N/A	-	-	N/A	N/A
Gender								
Male	1.12	(.68, 1.83)	0.90	(.47, 1.69)	1.00	(.60, 1.66)	0.74	(.38, 1.45)
Female	-	-	-	-	-	-	-	-
Race								
White	-	-	-	-	-	-	-	-
Black	2.49**	(.23, .87)	4.19**	(1.86, 9.41)	2.20*	(1.12, 4.30)	3.71**	(1.60, 8.62)
Other	1.61	(.83, 3.14)	1.78	(.74, 4.26)	1.73	(.87, .3.46)	1.72	(.69, 4.32)
Ethnicity								
Hispanic	2.38**	(1.27, 4.46)	2.72*	(1.23, 6.00)	2.14*	(1.12, 4.09)	2.59*	(1.14, 5.89)
Non-Hispanic	-	-	-	-	-	-	-	-
Household Size								
1 person	-	-	-	-	-	-	-	-
2 persons	0.84	(.366, 1.92)	0.80	(.31, 2.09)	0.82	(.35, 1.91)	0.77	(1.23, 6.27)
3+ persons	2.44*	(1.10, 5.42)	2.92*	(1.16, 7.34)	2.06	(.90, 4.73)	2.31	(1.92, 9.06)
Marital Status								
Married	-	-	-	-	-	-	-	-
Not married	0.61	(.33, 1.13)	0.57	(.26, 1.25)	0.515*	(.27, .97)	0.43*	(.18, .99)
Employment								

	Model 1		Model 2		Model 3		Model 4	
	Total Sample		Low Income Subsample		Total Sample		Low Income Subsample	
Transportation Measure	Owns Car		Owns Car		Transport to Store		Transport to Store	
	Odds Ratio (OR)	95% Confidence Interval	Odds Ratio (OR)	95% Confidence Interval	Odds Ratio (OR)	95% Confidence Interval	Odds Ratio (OR)	95% Confidence Interval
Employed	-	-	-	-	-	-	-	-
Unemployed	1.23	(.73, 2.08)	1.07	(.54, 2.11)	1.09	(.63, 1.87)	0.93	(.46, 1.90)
Education								
High school degree or less	1.46	(.72, 2.98)	1.12	(.44, 2.82)	1.26	(.60, 2.62)	0.87	(.34, 2.26)
Some college/Associate's	1.50	(.77, 2.94)	1.22	(.48, 3.08)	1.48	(.75, 2.95)	1.23	(.48, 3.14)
Bachelor's or higher	-	-	-	-	-	-	-	-
Food Access								
Distance	1.17*	(1.02, 1.34)	1.08	(.91, 1.27)	1.18*	(1.03, 1.35)	1.09	(.919, 1.28)
Owns Car								
Yes	-	-	-	-	-	-	-	-
No	2.00	(.83, 4.83)	2.20	(.87, 5.60)	-	-	-	-
Transportation to Grocery Store								
Drive own car	-	-	-	-	-	-	-	-
Borrow car	-	-	-	-	5.55**	(1.86, 16.54)	8.48**	(1.79, 40.15)
Someone drives me	-	-	-	-	2.80*	(1.04, 7.55)	3.77*	(1.20, 11.8)
Bus/Walk/Bike/Other	-	-	-	-	4.28***	(1.79, 10.28)	3.65**	(1.37, 9.70)
Nagelkerke R^2	0.39		0.36		0.42		0.40	
Intercept	-1.62***		-.779***		-1.62***		-.778***	
N	**825**		**411**		**825**		**411**	

Data Source: ISBS Statewide Food Insecurity Survey 2014

*Weighted by weight4

Within Model 1 and 2, the continuous measure of distance to grocery store proved to be a significant predictor of food insecurity among the total sample (OR=1.17, $p<.05$) in Model 1 but not among the low-income subsample in Model 2. Holding all other variables in Model 1 constant, for every one unit increase in distance, there was a 17% increase in the odds of being food insecure. Car ownership did not significantly predict food insecurity in Model 1 or Model 2.

Model 3 and 4 are identical to Model 1 and 2 except that Model 3 and 4 measure transportation across 4 modes most commonly used to get to the grocery store instead of car ownership which was used in Models 1 and 2. Models 3 and 4 examined the predictive strength of access to transportation when transportation to the grocery store was measured across four modes: drive my own car, borrow someone else's car, someone drives me, and bus/walk/bike/other. Model 3 included the total sample and Model 4 included only low-income respondents. Among the sociodemographic predictors, both models show that age, income, race, ethnicity, and marital status, were significant predictors of food insecurity.

Both Model 3 and Model 4 show transportation was a significant predictor of food insecurity across all modes. Compared to those who drive their own car, those who borrow a car, have someone drive them, and bus/walk/bike/other all had increased odds of food insecurity. For both samples, it is those who borrow someone's car who had the highest odds of food insecurity. For the total sample, those who borrow a car were 8.5 times more likely to be food insecure (OR=8.48, $p<.01$) and for the low-income sample those who must borrow a car were 5.5 times more likely to be food insecure (OR=5.55, $p<.01$), holding all other variables in the models constant. For the low-income sample (Model 4) those who have someone drive them (OR=3.77, $p<.05$) or bus/walk/bike/other (OR=3.65, $p<.01$) also had increased odds of food insecurity. For the total sample compared to those who drive themselves, those who have someone drive

them (OR=2.80, $p<.05$) or bus/walk/bike/other (OR=4.28, $p<.001$) both had increased odds of food insecurity. Distance was only a significant predictor in Model 4 among the total sample (OR=1.18, $p<.05$).

A final set of models examined the dichotomized version of each of the six categories of distance asked in the original questionnaire across the total sample (Models 5-10) and the low-income sample (Models 11-16). These models included the same set sociodemographic factors used in Models 1-4 of this chapter and measured access to transportation as car ownership. Two of the 12 models found a dichotomized version of distance to be significant. Models 8 and 9 showed distance was a significant predictor of food insecurity. Model 8 dichotomized distance as 2 miles or less/more than 2 miles and Model 9 dichotomize distance as 3 miles or less/more than 3 miles. Compared to those who live 2 miles or less, those who live more than 2 miles had increased odds of being food insecure (OR=1.87, $p<.01$). Those living less than 3 miles had lower odds of food insecurity (OR=.534, $p<.01$) than those who live 3 miles or more from a grocery store.

Discussion

Table 10 demonstrates there are clear differences across characteristics of the total sample, low-income households and the carless population. On the whole, low-income and carless households fare worse than the total population. Carless households, however, fare even worse within the categories of food insecurity than the low-income population and certainly much worse than the general population. A staggering 53% of carless households are food insecure, compared to 17.5% of the total sample and 32.8% of the low-income sample. Carless households are made up of larger proportions of females and black and Hispanic respondents than either the total sample or the low-income sample. Just 7.3% of carless respondents report

being married compared to half the total sample. More than half (57.5%) of the carless sample live more than 3 miles from the nearest grocery store compared to 39.1% of the total sample and 43.5% of the low-income sample. As expected, the carless sample has someone drive them or bus/walks/bikes/other at substantially higher rates than any other sample. For example, the total sample reports having someone drive them at a rate of 4.1% while 41.3% of the carless sample reports using this mode of transportation. Likewise, the total sample reports 5.4% bus/walk/bike/other while the carless sample reports using this mode of transportation at a rate 44.7%.

From these descriptive statistics it is clear that while rates of sociodemographic factors like income, race, education, and gender are closer between low-income and carless populations than between the general population and carless population, access for carless populations appears to be more of a problem. Carless populations live further from grocery stores and report substantially higher rates of reliance on other people to drive them to the store or on alternative modes of transportation like public transportation and walking and biking. If we consider transportation to be a major limitation to accessing adequate food, the carless population should be considered the most vulnerable, maybe even more vulnerable than the low-income population generally.

Demographic predictors of food security stayed mostly the same across all four logistic regression models in Table 11. Across each model, low income, black race, and Hispanic ethnicity proved to be significant predictors of increased odds of food insecurity compared to high income, white race, and non-Hispanic respondents. Household with 3 persons or more significantly predicted increased odds of food security when holding car ownership constant (Models 1 and 2) but did not significantly predict food insecurity in Models 3 and 4 (measuring

mode of transportation constant). In Models 3 and 4, being unmarried decreased the odds of food insecurity, although this was not the case for Models 1 and 2.

The models in Table 11 show an even stronger predictor among the low-income population. For both populations, car ownership was not a significant predictor of food insecurity. In addition, distance was a significant predictor, at least among the total samples. For the total samples in Model 1 and 3, as distance increases, so do the odds of food insecurity. The odds of food insecurity increased by 17% in Model 1 (holding car ownership constant) and 18% in Model 3 (holding mode of transportation constant) for every one-unit increase in distance. In contrast, for low-income respondents, it does not matter how far they live from the nearest grocery store. Distance was not a significant predictor in either low-income model (2 and 4).

Models 3 and 4 replaced car ownership as the measure of transportation with mode of transportation most commonly used by the respondent to get to the grocery store (4 categories). Interestingly, this transformed transportation into a significant predictor of food insecurity for both the total sample and the low-income sample. This may be interpreted such that car ownership does not directly affect food insecurity but that access to reliable transportation does. Overall, the models show that if you do not drive yourself to the store, your odds of food insecurity increase, not that car ownership itself is predictive of food insecurity. No matter what, if you do not drive yourself to the store, your odds of food insecurity increase. However, it is those who must borrow someone else's car who have the largest increase in odds of food insecurity (OR=5.55, $p<.01$ for total sample and OR=8.48, $p<.01$ for low-income sample). Model 3 (total sample measuring transportation with 4 categories) is the only model where both distance and transportation are significant.

Using Model 3, we see that by changing car ownership to mode of transportation, then comparing the odds ratios of distance and transportation, it is possible to conclude that transportation is in fact a stronger predictor of food insecurity than distance. In percentages, a one-unit increase in distance increases one's odds of being food insecure by 18%. In comparison, for those borrowing someone else's car to get to the grocery store compared to driving themselves we see a 555% increase in the odds of food insecurity, 280% for those having someone drive them to the store, and 428% increase for those taking the bus, walking, biking or something else not listed, holding all other variables in the Model 3 constant.

The final models (Models 5-16, not displayed) were used to determine whether or not the one-mile cutoff used by the USDA proved to be a significant predictor of food insecurity among both the total sample and the low-income sample analyzed here. Logistic regression models included each of the same variables as Models 1 and 2 and changed only how distance was measured. These models showed that when distance is dichotomized at 1 mile, distance is not a significant predictor of food insecurity. It was only when distance was dichotomized at the 2 mile and 3-mile mark that it became a significant predictor of food insecurity, and only for the total sample. Like the distance within the low-income samples of Models 2 and 4, no matter how distance was dichotomized in Models 5-16, it was not significant for the low-income sample confirming once more that for low-income households, distance to a grocery store is not a significant predictor of food insecurity.

These final models showing distance significant at the 2 and 3-mile mark demonstrate that while distance is a significant and linear predictor of food insecurity among the total population, the 1 mile mark used to define food deserts by the USDA is arbitrary and the literature based on this 1 mile mark is inadequate. In addition, distance is only ever a significant

predictor among the total samples or general population, yet, literature on distance to a store is reserved for mostly low-income populations. For instance, the USDA uses distance and low-income status exclusively to identify food deserts. The findings in this chapter demonstrate the need for an increased understanding of the way distance to stores and transportation act as barriers to food security. It appears from these findings that measures of distance and transportation to the grocery store need to move beyond the current measures of (1) carlessness and (2) the one-mile dichotomy. These results show there is more going on among both these barriers to access.

CHAPTER SEVEN: CONCLUSIONS

Discussion

This study examined the factors contributing to household food insecurity in the US. In addition, the study included detailed examination of some of the most prominent topics being researched today in the field of food security. Measures of food insecurity were limited to the USDA's definition of food insecurity, while determinants of food insecurity included a wide range of measures with a focus on sociodemographic and geographic factors.

Four research objectives were addressed in this study: (1) extend the research on food insecurity and the extent of its effects across various subpopulations; (2) determine the fit of conflict theorizing with food insecurity by implementing a theoretical model to explain food insecurity using conflict theory; (3) challenge common assumptions about the reasons food insecurity occurs; and (4) contribute to the development of data-based policy recommendations.

The first objective was accomplished mainly through the extensive univariate and multivariate statistics completed in Chapter 3. These analyses confirmed that households with children remain at the highest risk for food insecurity and that minority households experience higher rates of food insecurity across a variety of subgroups. Household size was found to increase food insecurity rates, no matter if the additional people were children or adults. Finally, disabled households are at great risk for food insecurity and future food security policy would benefit from a stronger realization that this subpopulation is highly vulnerable to food insecurity, despite small household size or even being young.

The second objective was achieved through each chapter. Both quantitative and qualitative methods confirmed that conflict theorizing using Marx's theory of capital is a

powerful way to examine the food security issue. As most research focuses on income as the main determinant of food insecurity, Marx's theory, that one needs capital to exchange for goods, fits most food security research. However, Bourdieu's theory that other forms of capital beyond economic was also considered and proved to augment the study by examining how factors beyond income, such as social ties, education, and physical abilities, can play a role in predicting food insecurity. Future research will benefit from examining the differences in food insecurity rates and experiences of those who suffer less from a lack of economic capital, and more from a lack of Bourdieu's additional 3 forms of capital (social, cultural and symbolic) and Shilling's physical capital.

The third objective was met by examining more closely the current measures of terms such as food deserts and food insecurity. The food desert analyses in Chapter 6 uncovered the need for more research on the food desert definition. As it stands, the measurement of a food desert turns out to be somewhat arbitrary. The importance of the distance in miles to a grocery store, specifically, needs to be reconsidered and placed in the context of whether the household has access to a car or physical ability to transport oneself to a grocery store, not just distance. In addition, each chapter challenges the current measure of food insecurity by examining factors beyond income that demonstrate the strength of other factors like car access and physical ability to predicting food insecurity.

The fourth objective of contributing to the development of data-based policy recommendations was accomplished via the first three. By (1) confirming known determinants and uncovering new ones, by (2) exploring, theoretically, the effect of sociodemographic and geographic characteristics, and by (3) utilizing these theoretical factors beyond income in the analyses in each chapter, this study has accomplished its fourth objective. Policy can benefit

from the research done here by considering how the strength of each determinant changes across subpopulations. This indicates that one factor will not hold the same strength for all demographic subgroups and should not be considered a blanket cause of food insecurity (in the way that income currently is in the research). Policy makers may utilize these results to confirm the need for specialized action for specific groups.

Theoretical Implications

This dissertation uses Marx's theory of capital to examine the importance of income as a determinant of food insecurity. Much of the literature finds that food insecurity works as a function of income; and this dissertation is no exception. In every multivariate analysis included here, income is as a strong and significant predictor of food insecurity, no matter what other factors are included in the model. There is no doubt that Marx's theory explains why so many American households have trouble securing enough food for their family.

This dissertation adds to the conversation of why food insecurity exists by applying Bourdieu's theory that there are different forms of capital besides economic capital that affect one's ability to exchange capital for food. We see from multivariate analyses in Chapter 3 that while income and employment were strong predictors of food insecurity, factors such as SNAP participation, household composition, and living with a disability were strong factors, as well. SNAP participation, for example, creates economic capital (as it is a form of income), but requires cultural capital. Knowing how to navigate the social services system to apply is a form of capital that is only possessed by some. Likewise, household composition may act as form of social capital where household members can call upon each other, while disability acts as a lack of physical capital that inhibits the exchange of physical capital for goods.

These examples above enlighten the food security scholar to the fact that both economic and social, cultural, symbolic, and physical capital must be simultaneously considered if the factors that are contributing to a household's food insecurity are to be fully understood. Data are often analyzed by isolating single factors to determine which one or two factors should be focused on as the "root of the problem". This study suggests that each household contains a number of characteristics that must be considered if the problem is to be solved.

Policy Implications

Moving the focus past income includes updating the current measure of food security. The USDA's Core Food Security Module measures food security entirely as a function of income. Each question asks if there has been anxiety over food shortage or the possibility of food shortage (i.e. the food didn't last, we worried about running short on food, we cut the size of meals) within the household "because there was not enough money for food." Because of this question wording, it is no surprise that so much of the food security research focuses on how income (and its correlates: un- and underemployment, job loss, recession effects, etc.) has created vast food insecurity in the country today. However, systematic understanding of factors beyond income, like household composition, age of householders, and disability status, combined with a maintained focus on income's effect, would result in a more powerful approach to food security research.

It becomes apparent that across the many groups examined by this dissertation, food insecurity is a very different experience depending on a number of factors. Chapter 3 demonstrated that factors such as sociodemographic characteristics, household composition, and geographic region, all affect food insecurity, and differently for different subgroups. In Chapter 4, I uncovered that the experience of food insecurity for households with children is quite

different from how food insecurity affects the lives of seniors, for example. The challenge to obtaining food exists for different reasons for these two subgroups: for a young family, lack of income due to unemployment may create temporary shortage, but for disabled adults living in a food desert, such as examined in Chapter 6, not being able to drive a car is a major barrier to accessing food and will likely result in chronic food insecurity. Policy makers and agencies working with food insecure populations would be wise to consider these differences across subpopulations. Solutions such as increasing SNAP utilization, as was examined in Chapter 5, are not always the answer, though current policy tends to look to increased SNAP utilization as the ultimate solution. Chapter 5 demonstrated that many vulnerable populations are not utilizing SNAP and this likely will not change. Therefore, policy and agencies working to end food insecurity must take a step back and examine the food insecure household as an entity with many parts, not as one single unit with one single solution.

APPENDIX A: IRB LETTER

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Sara M. Strickhouser**

Date: **February 05, 2016**

Dear Researcher:

On 02/05/2016, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review:	Exempt Determination
Project Title:	Manna Food Pantry: 2016 Parent Study
Investigator:	Sara M. Strickhouser
IRB Number:	SBE-16-11922
Funding Agency:	
Grant Title:	
Research ID:	N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Kanille Chay

IRB Coordinator

APPENDIX B: MANNA FOOD PANTRY PARENT GUIDING QUESTIONS

1. What kinds of foods/meals/snacks do you typically eat in your household? What are your family's favorite foods?
2. What do you do when these and other foods are unavailable in your house?
3. What is it like preparing food in your house, for yourself, other adults in the household, or your children?
4. What do people do when they are struggling to get food for their family?
5. Have you had experiences like these in the last 12 months? What kind?
6. Did you ever skip meals, reduce portion sizes, or give children to family members or foster care to ensure they were provided for?
7. What made you decide to come to a food pantry for food assistance?
8. Do you think the food you and your family typically eat is healthy or could it be healthier?
9. Do you think the adults in your household get enough of fruits, vegetables, grains and protein? (Give examples) Do you think the children get enough of each? [If no to any] Why is this the case?

APPENDIX C: MANNA FOOD PANTRY PARENT SURVEY QUESTIONNAIRE

Participants with Children Questionnaire

Your participation in this survey is completely voluntary and confidential. You have the right to refuse to answer any question you want. You may also terminate the survey at any time.

You are going to read five brief statements that may or may not resemble the current situation in your household and I'd like you to tell me if the statement was often true, sometimes true, or never true for your household in the last 12 months--that is, since last January (2015).

1) The first statement is, "The food that we bought just didn't last, and we didn't have money to get more." Was that often, sometimes, or never true for your household in the last 12 months?

❍ Often true
❍ Sometimes true
❍ Never true
❍ Don't Know or Refused

2) "We couldn't afford to eat balanced meals." Was that often, sometimes, or never true for your household in the last 12 months?

❍ Often true
❍ Sometimes true
❍ Never true
❍ Don't Know

3) In the last 12 months, since last November, did 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?

❍ Yes, almost every month
❍ Yes, some months but not every month
❍ Yes, only 1 or 2 months
❍ No
❍ Don't Know

⇨ In the last 30 days, how many days did this happen? _____ days or Don't Know

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

❍ Yes

❍ No
❍ Don't Know

5) In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for food?

❍ Yes
❍ No
❍ Don't Know

6) Do you or anyone in your household participate in the SNAP, EBT, or Food Stamps program?

❍ Yes
❍ No
❍ Don't Know/Prefer not to answer

7) How about WIC, the federal nutrition assistance program for Women, Infants and Children?

❍ Yes
❍ No
❍ Don't Know/Prefer not to answer

---

8) During the past 30 days, did any children in the household (between 5 and 18 years old) receive free or reduced-cost lunches at school?

❍ Yes
❍ No
❍ Don't Know/Prefer not to answer

---

9) Have you ever heard of 2-1-1?

○ Yes
○ No
○ Don't Know/Prefer not to answer

---

10) Which of the following best describes the kind of residence or dwelling unit you and your family live in? Is it a…

❍ Single family home (Detached or duplex/triplex)
❍ A mobile or manufactured home
❍ An apartment
❍ A town home
❍ A condominium
❍ Something else _____

11) Are you currently married, separated, divorced, widowed, or have you never married?

❍ Currently married
❍ Separated
❍ Divorced
❍ Widowed
❍ Never Married
❍ Don't Know/Prefer not to answer

12) Are you working now, temporarily laid off, unemployed, retired, permanently disabled, a homemaker, a student, or what?

o Working
o Temporarily laid off
o Unemployed
o Retired
o Permanently Disabled
o Homemaker
o Student
o Other _____
o Don't Know/Prefer not to answer

13) Do you or anyone in your household receive any monthly income from:

	Yes	No
Social Security	❍	❍
SSI (Supplemental Security Income)	❍	❍
SSDI (disability income)	❍	❍
Veteran's Administration (VA pension)	❍	❍
Child support payments from a previous spouse	❍	❍
Alimony payments from a previous spouse	❍	❍

14) Do you have family members in the area who can help you out if you run into troubles?

❍ No, no one
❍ Yes, one or two
❍ Yes, many
❍ Don't Know/Prefer not to answer

15) Do you consider yourself Hispanic or Latino?

- ❍ Yes
- ❍ No
- ❍ Don't Know/Prefer not to answer

16) What do you consider as your racial or ethnic background?

- ❍ White
- ❍ African American, Black
- ❍ Asian
- ❍ Multi-racial
- ❍ Other _____
- ❍ Don't Know/Prefer not to answer

17) What is your level of educational attainment?

- ❍ High school graduate or less
- ❍ Some college, no degree
- ❍ Associate's degree
- ❍ Bachelor's degree
- ❍ Graduate or professional degree
- ❍ Don't Know/Prefer not to answer
- ❍

18) What year were you born? _____

19) How many adults live in your household? _____

20) How many children under 18 live in your household? _____

    a. How many of these children are grandchildren? _____

21) How many unrelated householders live there? (Roomers, boarders, etc.) _____

22) If you added together the yearly incomes, before taxes, of all the members of your household for last year, 2015, what would the approximate income total be?

- o Less than $10,000
- o $10,001-$15,000
- o $15,001-$20,000
- o $20,001-$30,000
- o $30,001-$40,000
- o $40,001-$50,000
- o $50,001-$65,000
- o $65,001-$75,000
- o $75,000+

23) What is your gender?

- ❍ Male
- ❍ Female

REFERENCES

Alkon, A. H., & Agyeman, J. (2011). *Cultivating food justice: race, class, and sustainability*: MIT Press.

Andersen, R. M. (1995). Revisiting the behavioral model and access to medical care: does it matter? *Journal of Health and Social Behavior*, 1-10.

Andrews, M., & Smallwood, D. (2012). What's behind the rise in SNAP participation? *Amber Waves, 10*(1), 1T.

Andreyeva, T., Tripp, A. S., & Schwartz, M. B. (2015). Dietary Quality of Americans by Supplemental Nutrition Assistance Program Participation Status: A Systematic Review. *American journal of preventive medicine, 49*(4), 594-604.

Ankarloo, D. (2005). Marx on Poverty: A Theoretical Exposition'. *Economists and Poverty: From Adam Smith to Amartya Sen. Ed. by Daniel Rauhut, Neelambar Hatti and Carl-Axel Olsson. New Delhi: Vedams*, 77.

Beaulac, J., Kristjansson, E., & Cummins, S. (2009). Peer Reviewed: A Systematic Review of Food Deserts, 1966-2007. *Prev Chronic Dis, 6*(3).

Bolen, E. (2015). *Approximately 1 Million Unemployed Childless Adults Will Lose SNAP Benefits in 2016 as State Waivers Expire*. Retrieved from

Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste*: Harvard University Press.

Bourdieu, P. (1990). *The logic of practice*: Stanford University Press.

Bourdieu, P. (2011). The forms of capital.(1986). *Cultural theory: An anthology*, 81-93.

Brown, J., Shepard, D., Martin, T., & Orwat, J. (2007). The Economic Cost of Domestic Hunger: Estimated Annual Burden to the United States. An analysis commissioned by The Sodexho Foundation, in partnership with The Public Welfare Foundation and Spunk Fund. *Inc, June, 5*, 2007.

Budzynska, K., West, P., Savoy-Moore, R. T., Lindsey, D., Winter, M., & Newby, P. (2013). A food desert in Detroit: associations with food shopping and eating behaviours, dietary intakes and obesity. *Public Health Nutr, 16*(12), 2114-2123.

Burchi, F., & De Muro, P. (2015). From food availability to nutritional capabilities: Advancing food security analysis. *Food Policy*.

Campbell, A. L. (2014). *Trapped in America's Safety Net: One Family's Struggle*: University of Chicago Press.

Cannon, J. (Producer). (2015, 9/6/15). Memphis mobile market creates oasis in food desert. Retrieved from http://college.usatoday.com/2015/03/27/memphis-mobile-food-market-creates-oasis-in-food-desert/

Carlson, S. J., Andrews, M. S., & Bickel, G. W. (1999). Measuring food insecurity and hunger in the United States: development of a national benchmark measure and prevalence estimates. *J Nutr, 129*(2), 510S-516S.

Chan, H. M., Fediuk, K., Hamilton, S., Rostas, L., Caughey, A., Kuhnlein, H., . . . Loring, E. (2006). Food security in Nunavut, Canada: barriers and recommendations. *International Journal of Circumpolar Health, 65*(5).

Chilton, M., Rabinowich, J., Breen, A., & Mouzon, S. (2013). *When the systems fail: Individual and household coping strategies related to child hunger.* Paper presented at the Paper commission by the National Academies of Sciences Child Hunger Symposium.

Clancy, K., Bowering, J., & Poppendieck, J. (1989). Audit and evaluation of food program use in New York State—Report on phase one *Report to the New York State Legislature and the New York State Department of Health*.

Clarkson, K. W. (1975). *Food Stamps and Nutrition*. Retrieved from Washington, D.C.:

Coleman-Jensen, A., Gregory, C., & Singh, A. (2014). *Household Food Security in the United States in 2013* (173). Retrieved from

Coleman-Jensen, A., Nord, M., Andrews, M., & Carlson, S. (2011). Household food security in the United States in 2010. *USDA-ERS Economic Research Report*(125).

Coleman-Jensen, A. J. (2010). US food insecurity status: toward a refined definition. *Social Indicators Research, 95*(2), 215-230.

Condon, E., Susan, D., Keri, J., Carolyn, L., James, M., Emily, M., & Katherine, N. (2015). Diet Quality of Americans by SNAP Participation Status: Data from the National Health and Nutrition Examination Survey, 2007-2010. *Food and Nutrition Service, US Department of Agriculture. Retrieved from http://www. fns. usda. gov/sites/default/files/ops/NHANES-SNAP07-10. pdf*.

Cotterill, R. W., & Franklin, A. W. (1995). *The urban grocery store gap*. Retrieved from

Coveney, J., & O'Dwyer, L. A. (2009). Effects of mobility and location on food access. *Health & place, 15*(1), 45-55.

Cummins, S. (2002). Food deserts. *The Wiley Blackwell Encyclopedia of Health, Illness, Behavior, and Society*.

Delaney, A. (2013). Food Stamps Avoided by Millions of Eligible Americans. *Huffington Post*. Retrieved from http://www.huffingtonpost.com/2013/08/01/food-stamp-cuts_n_3691093.html

Dinour, L. M., Bergen, D., & Yeh, M.-C. (2007). The food insecurity–obesity paradox: a review of the literature and the role food stamps may play. *J Am Diet Assoc, 107*(11), 1952-1961.

Dutko, P., Ver Ploeg, M., & Farrigan, T. L. (2012). *Characteristics and influential factors of food deserts*: US Department of Agriculture, Economic Research Service.

Edin, K., & Lein, L. (1997). *Making ends meet: How single mothers survive welfare and low-wage work*: Russell Sage Foundation.

Eversley, M. (Producer). (2011, 9/6/15). Programs cropping up across USA to address 'food deserts'. *USA Today*. Retrieved from http://usatoday30.usatoday.com/news/nation/2011-07-13-food-deserts-farmers-market-agriculture_n.htm

FRAC. (2009). *Implementing EBT at Washington, D.C. Farmers' Markets: A Final Report to the U.S. Department of Agriculture, Agricultural Marketing Services from D.C. Hunger Solutions*. Retrieved from

Franklin, B., Jones, A., Love, D., Puckett, S., Macklin, J., & White-Means, S. (2012). Exploring mediators of food insecurity and obesity: a review of recent literature. *J Community Health, 37*(1), 253-264. doi:10.1007/s10900-011-9420-4

Fricke, H., Hughes, A., Schober, D., Pinard, C., Bertmann, F., Smith, T., & Yaroch, A. (2015). An Examination of Organizational and Statewide Needs to Increase Supplemental Nutrition Assistance Program (SNAP) Participation. *Journal of Hunger & Environmental Nutrition, 10*(2), 271-283.

Ganong, P., & Liebman, J. B. (2013). *The decline, rebound, and further rise in SNAP enrollment: Disentangling business cycle fluctuations and policy changes*. Retrieved from

Gary, B., Mark, N., Cristofer, P., William, H., & John, C. (2000). Guide to Measuring Household Food Security, Revised. *Measuring Food Security in the United States: Reports of the Federal Interagency Food Security Measurement Project*.

Geiger, J. R., Wilks, S. E., & Livermore, M. M. (2014). Predicting SNAP Participation in Older Adults: Do Age Categorizations Matter? *Educational Gerontology, 40*(12), 932-946. doi:10.1080/03601277.2014.912837

Gilens, M. (2009). *Why Americans hate welfare: Race, media, and the politics of antipoverty policy*: University of Chicago Press.

Gray, K. F. (2014). *Characteristics of Supplemental Nutrition Assistance Program Households: Fiscal Year 2013*. Retrieved from

Grengs, J. (2010). Job accessibility and the modal mismatch in Detroit. *Journal of Transport Geography, 18*(1), 42-54.

Gulliford, M. C., Mahabir, D., & Rocke, B. (2004). Reliability and validity of a short form household food security scale in a Caribbean community. *BMC Public Health, 4*(1), 1.

Gunders, D. (2012). Wasted: How America is losing up to 40 percent of its food from farm to fork to landfill. *Natural Resources Defense Council*.

Gundersen, C., & Gruber, J. (2001). *The dynamic determinants of food insufficiency.* Paper presented at the Second food security measurement and research conference.

Gundersen, C., Kreider, B., & Pepper, J. (2011). The economics of food insecurity in the United States. *Applied Economic Perspectives and Policy*, ppr022.

Halpern-Meekin, S., Edin, K., Tach, L., & Sykes, J. (2015). *It's Not Like I'm Poor*: University of California Press.

Hamelin, A.-M., Habicht, J.-P., & Beaudry, M. (1999). Food insecurity: consequences for the household and broader social implications. *J Nutr, 129*(2), 525S-528S.

Hanratty, M. J. (2006). Has the food stamp program become more accessible? Impacts of recent changes in reporting requirements and asset eligibility limits. *Journal of Policy Analysis and Management, 25*(3), 603-621.

Harrington, M. (1962). The Other America: Poverty in America: New York: Macmillan.

Hays, S. (2003). *Flat broke with children: Women in the age of welfare reform*: Oxford University Press.

Hendrickson, D., Smith, C., & Eikenberry, N. (2006). Fruit and vegetable access in four low-income food deserts communities in Minnesota. *Agriculture and Human Values, 23*(3), 371-383.

Hilmers, A., Hilmers, D. C., & Dave, J. (2012). Neighborhood disparities in access to healthy foods and their effects on environmental justice. *Am J Public Health, 102*(9), 1644-1654.

Holben, D. (2010). Position of the American Dietetic Association: food insecurity in the United States. *J Am Diet Assoc, 110*(9), 1368-1377.

Jensen, H. H. (2002). Food insecurity and the food stamp program. *American Journal of Agricultural Economics*, 1215-1228.

Jones, P. a. R. B. (2011). Supporting equitable food systems through food assistance at farmers' markets. *Am J Public Health, 101*(5), 781-783.

Jyoti, D. F., Frongillo, E. A., & Jones, S. J. (2005). Food insecurity affects school children's academic performance, weight gain, and social skills. *J Nutr, 135*(12), 2831-2839.

Kasperkevic, J. (2014). Food stamps: why recipients are haunted by stigmas and misconceptions. *The Guardian*. Retrieved from http://www.theguardian.com/money/2014/apr/17/food-stamps-snap-coordinators-challenges

Katz, M. B. (2013). *The Undeserving Poor: America's Enduring Confrontation with Poverty: Fully Updated and Revised*: Oxford University Press, USA.

Kendall, A., Olson, C. M., & Frongillo Jr, E. A. (1995). Validation of the Radimer/Cornell measures of hunger and food insecurity. *J Nutr, 125*(11), 2793-2801.

Kilen, M. (2015). Minimum wage debate: meet people living on it. *USA Today*. Retrieved from http://www.usatoday.com/story/news/politics/elections/2016/2015/11/10/minimum-wage-debate-meet-people-living/75497770/

Kortright, R., & Wakefield, S. (2011). Edible backyards: a qualitative study of household food growing and its contributions to food security. *Agriculture and Human Values, 28*(1), 39-53.

Laraia, B. A., Siega-Riz, A. M., Gundersen, C., & Dole, N. (2006). Psychosocial factors and socioeconomic indicators are associated with household food insecurity among pregnant women. *J Nutr, 136*(1), 177-182.

Lee, J. S., & Frongillo, E. A. (2001). Nutritional and health consequences are associated with food insecurity among US elderly persons. *J Nutr, 131*(5), 1503-1509.

Leftin, J., Eslami, E., & Strayer, M. (2011). *Trends in Supplemental Nutrition Assistance Program Participation Rates: Fiscal Year 2002 to Fiscal Year 2009*. Retrieved from Washington, DC:

Leung, C. W., Blumenthal, S. J., Hoffnagle, E. E., Jensen, H. H., Foerster, S. B., Nestle, M., . . . Willett, W. C. (2013). Associations of food stamp participation with dietary quality and obesity in children. *Pediatrics, 131*(3), 463-472. doi:10.1542/peds.2012-0889

Leung, C. W., Ding, E. L., Catalano, P. J., Villamor, E., Rimm, E. B., & Willett, W. C. (2012). Dietary intake and dietary quality of low-income adults in the Supplemental Nutrition Assistance Program. *Am J Clin Nutr, 96*(5), 977-988. doi:10.3945/ajcn.112.040014

Levedahl, J. W., Ballenger, N., & Harold, C. (1994). Comparing the emergency food assistance program and the food stamp program: recipient characteristics, market effects, and benefit/cost ratios. *Agricultural economic report (USA)*.

Lewis, L. B., Sloane, D. C., Nascimento, L. M., Diamant, A. L., Guinyard, J. J., Yancey, A. K., & Flynn, G. (2011). African Americans' access to healthy food options in South Los Angeles restaurants. *Am J Public Health*.

Mabil, J. (2010). *Effects of economic conditions and program policy on state food stamp program caseloads, 2000 to 2006*: DIANE Publishing.

Mabli, J., Ohls, J., Dragoset, L., Castner, L., & Santos, B. (2013). *Measuring the Effect of Supplemental Nutrition Assistance Program (SNAP) Participation on Food Security*. Retrieved from

Malthus, T. R. (1872). *An Essay on the Principle of Population Or a View of Its Past and Present Effects on Human Happiness, an Inquiry Into Our Prospects Respecting the Future Removal Or Mitigation of the Evils which it Occasions by Rev. TR Malthus*: Reeves and Turner.

Mark Nord, A. C.-J., Margaret Andrews, Steven Carlson. (2010). *Household Food Security in the United States, 2009* (108). Retrieved from

Marshall, T. H. (1950). *Citizenship and social class* (Vol. 11): Cambridge.

Marx, K. (1904). *A contribution to the critique of political economy*: International Library Publishing Company; London, Kegan Paul, Trench Trubner, Limited.

Marx, K. (1967). Capital: A Critical Analysis of Capitalist Production, vol. 1. Edited by Frederick Engels. Translated by Samuel Moore and Edward B. Aveling: London: Lawrence & Wishart.

Marx, K. (2008). *Das capital*: DC Books.

Marx, K., & Engels, F. (1947). The German Ideology, ed. R. Pascal: New York: International Publishers.

McConnell, S., Ponza, M., & Cohen, R. R. (1999). *Report on the Pretest of the Reaching the Working Poor and Poor Elderly Survey Volume I*. Retrieved from

McKernan, S.-M., Ratcliffe, C. E., & Rosenberg, E. (2003). Employment factors influencing food stamp program participation. *The Urban Institute, June*.

Merriam-Webster. (2004). *Merriam-Webster's collegiate dictionary*: Merriam-Webster.

Monsivais, P., & Drewnowski, A. (2007). The rising cost of low-energy-density foods. *J Am Diet Assoc, 107*(12), 2071-2076. doi:10.1016/j.jada.2007.09.009

Moore, K. A., Vandivere, S., & Redd, Z. (2006). A sociodemographic risk index. *Social Indicators Research, 75*(1), 45-81.

Morland, K., Wing, S., Roux, A. D., & Poole, C. (2002). Neighborhood characteristics associated with the location of food stores and food service places. *American journal of preventive medicine, 22*(1), 23-29.

Narayan, D., Chambers, R., Shah, M. K., & Petesch, P. (2000). *Voices of the Poor: Crying out for Change*: New York: Oxford University Press for the World Bank.

Nord, M. (2012). How much does the Supplemental Nutrition Assistance Program alleviate food insecurity? Evidence from recent programme leavers. *Public Health Nutr, 15*(05), 811-817.

Nord, M., & Coleman-Jensen, A. (2010). Food Insecurity After Leaving SNAP*. *Journal of Hunger & Environmental Nutrition, 5*(4), 434-453.

Nord, M., & Coleman-Jensen, A. (2014). Improving Food Security Classification of Households With Children. *Journal of Hunger & Environmental Nutrition, 9*(3), 318-333.

Nord, M., & Golla, A. M. (2009). Does SNAP decrease food insecurity. *Untangling the self-selection effect*.

Oliveira, V. (2014). The Food Assistance Landscape: FY 2013 Annual Report. *USDA-ERS Economic Information Bulletin*(120).

Poppendieck, J. (1999). *Sweet charity?: Emergency food and the end of entitlement*: Penguin.

Power, E. M. (2008). Conceptualizing food security for Aboriginal people in Canada. *Canadian Journal of Public Health/Revue Canadienne de Sante'e Publique*, 95-97.

Pringle, P. (2013). *A place at the table: The crisis of 49 million hungry Americans and how to solve it*: PublicAffairs.

The public health effects of food deserts: Workshop summary. (2009). IOM (Institute of Medicine)

National Research Council (NRC). The National Academic Press. Washington, DC.

Radimer, K. L., Olson, C. M., & Campbell, C. C. (1990). Development of indicators to assess hunger. *J Nutr, 120*, 1544-1548.

Radimer, K. L., Olson, C. M., Greene, J. C., Campbell, C. C., & Habicht, J.-P. (1992). Understanding hunger and developing indicators to assess it in women and children. *Journal of Nutrition Education, 24*(1), 36S-44S.

Ratcliffe, C., McKernan, S.-M., & Zhang, S. (2011). How much does the Supplemental Nutrition Assistance Program reduce food insecurity? *American Journal of Agricultural Economics*, aar026.

Rosenbaum, D., & Keith-Jennings, B. (2015). House Budget Would Slash SNAP by $125 Billion Over Ten Years.

Schafft, K. A., Jensen, E. B., & Hinrichs, C. C. (2009). Food deserts and overweight schoolchildren: Evidence from pennsylvania*. *Rural Sociology, 74*(2), 153-177.

Seligman, H. K., Bolger, A. F., Guzman, D., Lopez, A., & Bibbins-Domingo, K. (2014). Exhaustion of food budgets at month's end and hospital admissions for hypoglycemia. *Health Aff (Millwood), 33*(1), 116-123. doi:10.1377/hlthaff.2013.0096

Sen, A. (1983). *Poverty and famines: an essay on entitlement and deprivation*: Oxford University Press.

Sen, A. (1999). Commodities and capabilities. *OUP Catalogue*.

Shaw, H. J. (2006). Food deserts: towards the development of a classification. *Geografiska Annaler. Series B. Human Geography*, 231-247.

Shenkin, J. D., & Jacobson, M. F. (2010). Using the Food Stamp Program and other methods to promote healthy diets for low-income consumers. *Am J Public Health, 100*(9), 1562.

Shilling, C. (2012). *The body and social theory*: Sage.

Streit, K. (2014). *Selling Direct to SNAP Recipients: Strategies for Success*. Retrieved from

Strickhouser, S., Wright, J. D., & Donley, A. (2014). *Food Insecurity Among Older Adults Full Report*. Retrieved from

Taylor, P. (2014). *The next America: Boomers, millennials, and the looming generational showdown*: PublicAffairs.

Tiehen, L., Jolliffe, D., & Gundersen, C. (2012a). *Alleviating Poverty in the United States: The Critical Role of SNAP Benefits* (132). Retrieved from

Tiehen, L., Jolliffe, D., & Gundersen, C. (2012b). How State Policies Influence the Efficacy of the Supplemental Nutrition Assistance Program in Reducing Poverty. *Urbana, 51*, 61801-63605.

Townsend, M. S., Peerson, J., Love, B., Achterberg, C., & Murphy, S. P. (2001). Food insecurity is positively related to overweight in women. *J Nutr, 131*(6), 1738-1745.

Turner, J. H. (2012). *Theoretical sociology: 1830 to the present*: Sage.

U.S. Household Food Security Survey Module: Six-Item Short Form (2012). Retrieved from http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/survey-tools.aspx#six

USDA. (2009). *Brownsville Farmers' Market: New EBT Project and Marketing Campaign*. Retrieved from

USDA. (2012a). *Building a Healthy America: A Profile of the Supplemental Nutrition Assistance Program*. Retrieved from

USDA. (2012b). *Main Street Farmers Market: Final Performance Report*. Retrieved from

USDA. (2013). *State Options Report-Supplemental Nutrition Assistance Program*. Retrieved from http://www.fns.usda.gov/sites/default/files/snap/11-State_Options.pdf

USDA. (2015). USDA Announces Grants to Enable More Farmers Markets to Serve Low-Income Families [Press release]. Retrieved from http://www.fns.usda.gov/pressrelease/2015/012315

Ver Ploeg, M. (2010). *Access to affordable and nutritious food: measuring and understanding food deserts and their consequences: report to Congress*: DIANE Publishing.

Walker, R. E., Keane, C. R., & Burke, J. G. (2010). Disparities and access to healthy food in the United States: a review of food deserts literature. *Health & place, 16*(5), 876-884.

Webb, P., Coates, J., Frongillo, E. A., Rogers, B. L., Swindale, A., & Bilinsky, P. (2006). Measuring household food insecurity: why it's so important and yet so difficult to do. *J Nutr, 136*(5), 1404S-1408S.

Wilde, P. (2013). *Food policy in the United States: An introduction*: Routledge.

Wilde, P. E. (2012). The new normal: The supplemental nutrition assistance program (snap). *American Journal of Agricultural Economics*, aas043.

Zenk, S. N., Schulz, A. J., Israel, B. A., James, S. A., Bao, S., & Wilson, M. L. (2005). Neighborhood racial composition, neighborhood poverty, and the spatial accessibility of supermarkets in metropolitan Detroit. *Am J Public Health, 95*(4), 660-667.