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Generational Differences Among Mexican-Americans in Nutrition, Obesity, and Health Outcomes: Implications for Health Incorporation

DISSERTATION

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DEDICATION

To My Parents

"It can be hard to remember what one's anticipatory image of something was once you're on the other side. I'm not longer sure exactly what I was waiting for, but I do know that it was something wholly unfamiliar and thrilling."
-David Rakoff, *Don't Get Too Comfortable*

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ABSTRACT OF THE DISSERTATION

Generational Differences Among Mexican-Americans in Nutrition, Obesity, and Health Outcomes: Implications for Health Incorporation

By

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Professor Frank Bean, Chair

This dissertation examines the health of Mexican-Americans across generations in the United States and addresses some of the questions involving the Latino health paradox, that is, how poor immigrants could report better health than groups that have been in the United States for longer periods. Using data from Add Health, the research shows that obesity increases across generations. It examines obesity, health status and nutrition. Compared with the third-plus generation, the children of immigrants are somewhat more likely to be obese as children but less likely to be obese as adults. The higher the education of the parents, the lower the level of obesity. In terms of nutrition, the first generation eats the most fruits and vegetables, although their consumption is unrelated to obesity. The second generation is the most likely to eat fast food, frequent consumption of which doubles the odds of obesity by adulthood. Family closeness lowers the odds of obesity. All in all, the results show the complexity of the relationships between time in the United States (whether measured as an actual temporal interval or as family generations) and health patterns within immigrant group.

CHAPTER 1

INTRODUCTION

The narrative surrounding immigration and health is not a new one – indeed, fears that new immigrants would be the vectors through which disease could enter the United States have been present for centuries. From fears that Chinese immigrants would bring bubonic plague (Kraut 2010), to suspicions of all Mexicans spreading typhus (Molina 2011), to the flow of immigrants that was correlated with the Spanish flu pandemic of 1918 (Kraut 2010), these are tropes that are always present in public discourse. In 2009, the threat of swine flu led Sheriff Joe Arpaio to issue facemasks and gloves to his deputies for use when they interacted with immigrants (Romero 2011). More recently, this summer's Ebola outbreak in Western Africa has stoked fears that the unaccompanied minors who are fleeing the unrest in Central America might be carrying the virus into the United States (Boerma 2014), even though human cases of Ebola have never been reported outside of Africa (CDC 2014).

These assumptions about immigrants are especially ironic in light of the fact that immigrants actually arrive in the United States with better health than native-born Americans of the same ethnicity. An immigrant's health actually tends to get worse the longer they are in the United States, and this phenomenon is known as the immigrant health paradox. More specifically for Hispanic immigrants, this is known as the Hispanic health (or epidemiological) paradox.

The idea of the Hispanic "epidemiological paradox" first emerged in 1986, in relation to mental health (Markides and Coreil 1986). The researchers conducting the study were puzzled that recently arrived Hispanic immigrants had better health outcomes than native-born Hispanics. They deemed this a paradox because lower levels of education and socioeconomic status were usually associated with lower health outcomes. Recently arrived Hispanic immigrants had less

education than native-born Latinos and were not citizens, which made many ineligible for health programs or public assistance, but these characteristics did not make for worse health outcomes.

More recently, a study observed that without the flow of Asian and Hispanic immigrants to the United States since 1965, the current obesity epidemic would actually be far worse than it is. Hispanic immigrants were more likely to have a lower BMI than native-born Hispanics, but as immigrants spend more time in the U.S., they are more likely to mirror health outcomes of the native-born Hispanic population (Hao and Kim 2009).

In 2005, a New England Journal of Medicine (NEJM) article profiled in the New York Times caused a great deal of debate and discussion in the media and among public health officials. The topic was obesity and life expectancy. The authors concluded that for the first time, children might have lower life expectancies than their parents due to high rates of obesity. They also called attention to the rising economic costs associated with treating obesity and its side effects: about $70 billion to $100 billion, noting that such costs would only increase as obese children and adolescents aged. Many called the authors alarmist and pessimistic, while the authors responded that their projections were actually quite conservative (Olshanky et al. 2005).

Further, a 2009 study found that as adolescents transition to adulthood, a downward pattern occurs in their health outcomes. Obesity, diet, and access to health care all deteriorate as adolescents and young adults age. But despite this decline in physical health, depressive symptoms and suicidal ideation actually decrease as young adults age.

The immigrant paradox has been studied for over 25 years. With the Hispanic population as the largest minority group in the United States, it is important to understand how the human capital – i.e. health—that immigrants arrive with changes (and deteriorates) as time passes. That without the influx of healthy immigrants, the obesity epidemic would be much worse is an

interesting finding, especially in light of nativist and anti-immigrant fears that newcomers bring disease with them, or that immigrants are a drain on the nation's healthcare system.

The fertility rate among Hispanics has continued to rise since 1990 (US National Center for Health Statistics 2007). Therefore, it is important to study the health of children of immigrants. If immigrants lose their health advantage as they spend time in the United States, how will acculturating to American culture affect their childrens' health outcomes? Will the children of immigrants continue to experience some sort of protective healthy effect by virtue of their parents' nativity? Will their health look like that of the children of the native born? The current obesity epidemic has been often discussed as a public health matter – indeed, First Lady Michelle Obama's "Let's Move" initiative strives to encourage higher levels of physical activity and improve nutritional habits. The idea that today's children could have a lower life expectancy (Bell and Miller 2000) than their parents is not only disturbing, it could also represent the first time that life expectancies have not risen for later generations because of technological, medical, or scientific advances. Lastly, the transition to adulthood has been a popular topic of discussion since the Great Recession, particularly in regards to the children of immigrants as compared to the children of the native born.

The transition to young adulthood "represents a significant developmental period […] and involves more autonomy and life decisions" than earlier developmental stages (Fuligni and Pedersen 2002). As adolescents get older, the dynamics of their relationships may change drastically—or not at all—particularly their relationships with their families. It makes sense, then, that adolescents of different socioeconomic statuses, ethnicities, and families will have distinct health behaviors during their transition to adulthood. What will the transition to

adulthood look like for Mexican-American adolescents and young adults? How will the health outcomes of the first, second, and third-plus generations differ from each other?

My dissertation will fill an important gap in the literature about the health of Latinos in the United States – or more specifically, the health of Mexican-Americans. Latinos are not a monolithic entity – even immigrants from the same country can have vastly different migration experiences, posses differing amounts and types of human capital, and arrive in distinct contexts of reception. Studying Latino health is further complicated by the classification of all Latin American origin migrants into the large category of "Hispanic/Latino." Even when there is a breakdown by national origin in data sources, different circumstances can still be obscured. For example, a "Central American" category would include immigrants from both Costa Rica and El Salvador, two countries with drastically different economies, resources, and reasons for migration. Much of the research about the health of Hispanic young adults has used these broad categories to compare Latino health to non-Hispanic whites, African-Americans, and Asian Americans. My dissertation will focus on the generational differences in health between Mexican-Americans specifically.

WHY MEXICAN-AMERICANS?

Mexican-Americans are an important case to study for several reasons. First of all, Mexican-Americans have the longest history of migration the United States of all Latino/Hispanic groups. After all, many Mexican-Americans in the Southwest did not have to migrate to the United States – they may have lived in the territory that was purchased by the United States through the Treaty of Guadalupe Hidalgo and became American citizens when these territories were annexed. As Edward Telles and Vilma Ortiz point out, "a wide variety of

scholars – from the most nationalist of Chicano historians to nativists like [Samuel] Huntington – have noted, no other ethnic group in the United States has had the same relation with its origin country (2009)."

In addition to the complicated and neo-colonial history that Mexico and the United States share, there is the simple matter of geography: Mexico is the United States' neighbor to the South. This proximity – especially before the age of the internet – meant that the relationship that Mexican-Americans had with Mexico was distinct from the relationship a migrant from an Asian, European, or even South American country had with their homelands. Indeed, a scene from the 1997 biopic of Selena Quintanilla-Perez's life sums this up well. The family patriarch is discussing the difficulties that bicultural Mexican-Americans can experience when trying to fit into Anglo and Mexican-American cultures:

> "Our family has been here for centuries. And yet they treat us as if we just swam across the Rio Grande. I mean, we gotta know about John Wayne and Pedro Infante. We gotta know about Frank Sinatra and Agustín Lara. We gotta know about Oprah and Cristina. […] Japanese-Americans, Italian-Americans, German-Americans, their homeland is on the other side of the ocean. Ours… is right next door. Right over there. And we gotta prove to the Mexicans how Mexican we are, and we gotta prove to the Americans how American we are. We gotta be more Mexican than the Mexicans and more American than the Americans both at the same time. It's exhausting. Damn! Nobody knows how tough it is to be a Mexican-American (Nava 1997)."

Finally, although all immigrant groups have to contend with nativist sentiments and xenophobia, nativism and alarmism directed at Mexican immigrants is particularly acute (Chavez 2001). Because of these reasons, I decided to focus on Mexican-Americans.

RESEARCH PLAN

In Chapter 2, I analyze and synthesize the arguments and perspectives researchers utilize to address the Latino health paradox – the data artifact theory, the selectivity theory, and the sociocultural explanation. In this chapter, I focus on the participants during adolescence. I examine self-reported health and obesity at Wave II, as well as obesity at Wave III.

In Chapter 3, I utilize nutrition data collected at Wave II to determine whether there are generational differences in the consumption of "healthy" foods – in this case, fruits and vegetables. I also examine the frequency of family dinners and frequent consumption of fast food in order to determine whether these factors will have an impact on whether adolescents are more likely to eat the recommended amount of fruits and vegetables.

Chapter 4 focuses on familism and family relationships. I study whether a sense of family cohesion and closeness to parents can affect health, in this case measured by a diagnosis of diabetes at Wave IV as well as obesity at Wave IV.

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CHAPTER 2

THE LATINO HEALTH PARADOX

Contemporary international migration scholarship examines many facets of the immigration phenomenon, including who migrates, why they migrate, and how they fare once they arrive in the United States. One facet of immigrant life that draws the attention of many scholars is health, and how health outcomes, health behaviors, and the prevalence of disease change as immigrants remain in the United States. Frequently studied health behaviors include physical exercise (Gordon-Larsen et al. 1999) and patterns of tobacco and alcohol use (Lopez-Gonzalez et al. 2005). Chronic ailments are studied as well; for example, since diabetes affects Hispanic populations disproportionately, it is a major concern in many immigrant communities (Escarce et al. 2006). Another ailment of interest among Hispanic groups is hypertension, as sustained elevation of blood pressure is a risk for heart disease and stroke (Escarce et al. 2006).

Beyond interest in particular health conditions, many scholars have devoted effort to analyzing and explaining the immigrant "epidemiological paradox" (Markides and Coreil 1986; Rumbaut 1999; Harris 1999; Escarce et. al. 2006; Read et. al. 2005a; Palloni and Arias 2004; Smith and Bradshaw 2006; Eschbach et. al. 2006). This is the finding that certain immigrant groups (e.g. Mexican-American immigrants) have better health outcomes and lower rates of morbidity and mortality than native-born, non-Hispanic white populations. These immigrant groups tend to have completed fewer years of education than non-Hispanic whites, to be of a lower socioeconomic status than non-Hispanic whites, and have lower levels of access to healthcare services. Therefore, it is expected that these immigrants would have worse general health and higher rates of mortality than non-Hispanic whites.

A number of studies that explore the epidemiological paradox are conducted with adult immigrants and focus on whether the length of time the immigrant has spent in the United States has an impact on their health outcomes (Read et al. 2005a; Palloni and Arias 2004; Smith and Bradshaw 2006; Weeks and Rumbaut 1991); other studies focus on reproductive outcomes (Weeks et al. 1999; Hummer et al. 2007). Although findings indicate that rates of immigration have peaked (Myers 2008), a question to consider is whether this health benefit will manifest itself in the children of immigrants as well – foreign born children, or children born in the United States. Therefore, it is important to examine the health of immigrant adolescents and adolescents with immigrant parents as they transition to adulthood.

My study will build on existing research about immigrant health in the United States and research that utilizes the Longitudinal Study of Adolescent Health (Add Health). This research will contribute to the existing literature by analyzing the immigrant paradox using the so-called "sociocultural explanation" for the paradox.

LITERATURE REVIEW

Previous studies utilizing Add Health have also focused on obesity (Popkin and Udry 1998; Gordon-Larsen et al. 1999). For example, Harris (1999) finds that first generation adolescents have better health outcomes than second-generation adolescents and are less likely to engage in risky behaviors. Further research utilizing Add Health finds that second and third-plus generation Hispanic adolescents are more likely to be obese when compared to the first generation of Hispanic immigrants. Furthermore, scholars find that as adolescents age, access to health care and health decrease, while risky behaviors increase (Harris et al. 2006).

Several perspectives attempt to explain the immigrant paradox (Acevedo-Garcia & Bates 2008). The data artifact theory asserts that a paradox does not exist, and that the unusually low rates or mortality or morbidity are due to misreported data. The selectivity argument approaches the paradox by focusing on the immigrants themselves and argues that any health advantages are due to immigrant self-selection; only the healthiest people migrate. Lastly, the sociocultural explanation focuses on the aspects of immigrant families and communities that may positively affect health, or health behaviors and beliefs immigrants may bring with them to the United States.

The Data Artifact Argument

The data artifact argument hypothesizes that the cause of unusually low rates of morbidity and mortality in immigrant communities is due to the underreporting of illnesses and deaths by immigrants. Immigrants are less likely to utilize health care services than either white Americans or native-born populations of the same ethnicity. In 1998, Latino immigrants accounted for $962 in per capita health expenditures, as compared to native-born Latinos who accounted for $1,870 in per capita expenditures (IPC 2006). Immigrants are also less likely to have access to health insurance – foreign-born adults are three times less likely than native-born adults to be insured. Furthermore, legal permanent residents may believe that seeking publicly funded insurance will make them ineligible for eventual U.S. citizenship (IPC 2006), while undocumented immigrants may fear seeking help from medical professionals or institutions for fear of being deported. For example, in the aftermath of California's Proposition 187, the usage of primary care services among Latinos significantly decreased. Rates of usage in Latino communities were low, even after the proposition was ruled unconstitutional (Fenton et al.

1997). All of these factors would contribute to artificially low levels of morbidity in immigrant communities.

Researchers suggest that Hispanic deaths are miscounted because ethnicity is not clearly reported on death certificates, and these errors are caused by discrepancies in racial classifications between the census and vital statistics data (Smith and Bradshaw 2006). A competing finding is that Hispanic ethnicity *is* measured accurately on death certificates for foreign-born Hispanics, although the misreporting of Hispanic ethnicity may be responsible for the less pronounced health advantage for U.S. born Hispanics (Eschbach et al. 2006). However, researchers also find that an undercounting of deaths does not account for the benefits that Hispanic ethnicity seems to provide (Palloni and Arias 2004).

The Selectivity Question

Gans notes that, "immigrants are the most ambitious and energetic people, and their lesser fellow nationals stay home (2000: 76)." This viewpoint suggests that the reason immigrant health outcomes appear paradoxical is because immigrants are the "cream of the crop" – the healthiest and most resilient people in their respective countries of origin. They are the people who are ambitious enough to decide to leave their country of birth, courageous enough to start over in a new country, and healthy enough to endure the often-dangerous trip.

The "salmon-bias effect" is the theory that older and sicklier adults return to their countries of origin and die there, lowering the recorded mortality rate for the Hispanic population in the United States. The salmon-bias effect credits reverse selection for the immigrant health paradox (Vega et al. 2009). This effect has been observed in communities of some foreign-born Hispanic immigrants – these are instances when immigrants return to their home countries after a

period of unemployment (Palloni and Arias 2004) or due to health problems (Vega et al. 2009). The departure of the immigrants that may be more prone to illness or death will lower the morbidity and mortality rates for those immigrants that remain in the United States. Even when this return migration has been found to have an effect on mortality rates, the effect is too small to be the sole reason for the epidemiological paradox (Turra and Elo 2008). In a 2007 study, researchers analyzed infant mortality data for U.S. born Mexican-American women, Mexican immigrant women, and U.S. born non-Hispanic white women within one week after birth. The researchers postulate that women with newborn children are unlikely to migrate to another country, thereby eliminating a possible salmon-bias effect. They find that babies born in the United States to Mexican-born women will experience infant mortality rates 10 percent lower than babies born in the United States to non-Hispanic white women (Hummer et al. 2007).

The Sociocultural Explanation

Among Hispanic economic immigrants, the majority of low-skilled migrants are of Mexican origin (Durden 2007a). Low-skilled immigrants and refugee groups tend to stay close to other co-ethnic populations, as these are areas where they have established strong social ties and networks, and where it is easier to find jobs and housing (Portes and Rumbaut 2001). Groups of more highly educated immigrants are less likely to stay in one area, as their skills enable them to find jobs more easily without established social networks. Strong co-ethnic networks and bonds lead to another explanation for the immigrant paradox – the sociocultural explanation. The sociocultural explanation credits features like social support, co-ethnic communities, familism, religion, and norms related to diet and substance use (Acevedo-Garcia and Bates 2008; Durden 2007b; Lopez-Gonzalez 2005) as the explanation for the immigrant health paradox.

Consequently, studies crediting the sociocultural explanation focus on whether and to what degree these protective factors wane as the length of time spent in the United States increases. However, studies that aim to test the sociocultural explanation have been limited by the unavailability of data about community ties, social networks, and individual connections (Palloni and Arias 2004).

A large amount of research in immigration focuses particularly on the beneficial effects of strong families and social networks. For example, in Miami, Cuban expatriates run a system of bilingual, private schools that are staffed mostly by first-generation Cubans who share the beliefs and values of the students' parents (Rumbaut and Portes 2001). This environment provides a higher level of social control, and the second-generation students who attended these schools are able to benefit from the social ties they can form there. Similarly, Vietnamese families have high rates of cohesion and function within a more collectivist environment (Portes and Rumbaut 2001), which can ameliorate their low levels of education and other human capital. Finally, researchers also find that moderate levels of familism prove to be beneficial to adolescents (Fuligni et al. 1999). Familism is the high value that Latinos place on family relationships and responsibilities, which can include high rates of family cohesion and feelings of family obligation. This sense of familism is associated with higher levels of positive emotional well-being (Fuligni et al. 2002). Interestingly, even third- generation Asian and Latin American adolescents have strong familial ties (Fuligni et al. 1999).

In addition to maintaining strong family ties and strong coethnic communities over generations, Latino immigrants are also exposed to a new food culture through the media – and school-aged children are exposed to “American” treats and foods at school. These foods are typically high in calories and low in nutritional value. The overconsumption of calories can lead

to excess weight and obesity. Over the last thirty years, there has been an increase in obesity rates – the CDC estimates that 30 percent of Americans can be classified as obese, and recent research suggests that the current obesity trend in the United States would be much more severe and more widespread without the influx of immigrants since 1965 (Lingxin and Kim 2009). In addition, the United States has experienced an increase in the consumption of sugars, which researchers have linked with the prevalence of kidney and cardiovascular disease (Johnson et al. 2007). Fast food restaurants have more than doubled in the United States, and the rate of consumption of fast food among children has also increased at an amazing rate – from two percent of total "energy" consumption in the late 1970s to 10 percent of total "energy" consumption in the mid-1990s (Bowman et al. 2004). These patterns of behavior may be part of the reason that later generations of immigrants have a lower health "advantage" than more recently arrived immigrants (Acevedo-Garcia and Bates, 2008). Classical theories suggest that assimilation is the process through which the immigrant "acquire[s] the memories, sentiments, and attitudes of other persons and groups and, by sharing their experience and history, are incorporated with them in a common cultural life" (Park and Burgess 1924, cited in Rumbaut 1997). If this is the "normal" or "mainstream" that immigrants are assimilating to, it is easy to see why immigrants may adopt more negative health behaviors. Indeed, children may see adopting these behaviors as part of being "American" and seek the approval of their peers through their consumption of the same food and treats that their native-born counterparts enjoy (Santora 2006). In this case, we are led to wonder if assimilation is actually bad for children's health (Rumbaut 1999).

In summary, there are three arguments that seek to explain the Latino health paradox: the data artifact theory, the selectivity argument, and the sociocultural explanation. The sociocultural

explanation focuses on facets of immigrant communities as the reason that immigrants have more positive health outcomes. The sociocultural explanation posits that as immigrants spend more time in the United States and become acculturated, the positive and protective effects of immigration will decrease. Therefore, these are my hypotheses: first, I hypothesize that the first generation will have the greatest health advantage over the second and third-plus generation. Second, I hypothesize that the first generation will see a decrease in their positive self-reported health outcomes and an increase in excess obesity by Wave III, because the longer that immigrants are in the United States, the worse their health outcomes tend to be. Lastly, the benefits that immigration may provide will decrease with each further generation.

DATA

To examine adolescent health, I will utilize the National Longitudinal Study of Adolescent Health. Add Health is a nationally representative study that investigates "the causes of health and health-related behaviors of adolescents and their outcomes in young adulthood" (Harris 2008). The study features a multi-survey, multi-wave, interdisciplinary design. Questionnaires were distributed to parents, school administrators, and students, and the study was conceived with a longitudinal goal in mind. The topics explored deal with many different aspects of student life – health, education, aspirations, and nutrition, among many others. The rationale behind choosing to utilize Add Health for this analysis is three-fold: first, this study provides valuable information about nativity and parental countries of origin. Other datasets that focus on the children of immigrants are regional – projects such as the Children of Immigrants Longitudinal Study (CILS), the Immigration and Intergenerational Mobility in Metropolitan Los Angeles Study (IIMMLA), and The New York Second Generation Project – and therefore, are not nationally

representative. Other datasets include a variety of health and well-being measures such as the National Health and Nutrition Examination Survey (NHANES), but do not ask questions about parental nativity. Thus, NHANES could be (and has been) utilized to study health patterns among first generation immigrants, but not their children. Second, this study is longitudinal and follows respondents from adolescence as they transition to adulthood.

In this chapter, I will utilize Waves I through III of Add Health. The data from Wave I was collected during 1994 and 1995. Wave II of the Add Health data was collected in 1996. Wave III data was collected in 2001 and 2002 (Carolina Population Center 2008). Add Health uses a multistage, stratified, school-based, cluster sampling design, and students from 80 high schools, both public and private (Perreira et. al 2005). The initial sample size for Wave I was 20,745. Students provided information about their general health, friendships, education, aspirations, and family relationships, among other things. Parental responses (N=17, 670) provided personal information about the parent, such as age, citizenship, use of public assistance, and race as well as information about the child, such as their general health, information about illnesses or handicaps, and education. The respondent's biological mother or another female head of household completed the responses to the parental questionnaire in over 90 percent of the cases.

Wave I Measures

The measures I am utilizing from Wave I are parental responses to questions about socioeconomic status and the adolescent's health history. The following questions were used to measure socioeconomic status: household income, parental education, and household use of public assistance. In a series of six questions, the parent was asked if any household member had

received either Social Security, Supplemental Security Income (SSI), Aid to Families with Dependent Children (AFDC), food stamps, unemployment benefits, worker's compensation, or a housing subsidy or public housing. I created a dichotomous variable for use of public assistance if the parent had indicated that someone in their household had participated in any of the programs. The parent also answered a question about the adolescent's health history – in this case, whether the adolescent was obese.

Wave II Measures

The dependent variables are self-reported general health and obesity. General health is a one-item question that asks, "In general, how is your health? Would you say excellent, very good, good, fair, or poor?" The original scale varies from 1-5; for this analysis I created a dichotomous variable by collapsing excellent, very good, and good as the reference category (coded as 0); fair and poor were collapsed to create the poor/fair group (coded as 1). I chose to dichotomize the variable in this way because much of the literature follows this protocol when studying general health (Harris, 1999; Harris et al. 2005; Read et al. 2005a; Read et al. 2005b).

Furthermore, although there is concern about the adequacy and validity of measures of self-reported health in the past, there is a growing recognition and acceptance of the "perceptual" nature of health (Schuster et al. 2004). Both epidemiological research and research on social support demonstrates that self-rated health is a strong and important measure of health (Idler and Kasl 1991; Finch and Vega 2003; Harris et al. 2006).

I classified participants as obese based on their individual Body Mass Index (BMI). I created the variable for BMI using the participants' height and weight as recorded by the interviewer, and by using the Centers for Disease Control (CDC) formula:

$$\text{BMI} = \frac{(\text{weight in pounds} * 703)}{(\text{height in inches})^2}$$

Respondents with a BMI under 18.5 are considered "underweight." The "underweight" responses are few and were excluded from the analysis. The "healthy weight" category ranges from BMIs between 18.5 to 24.9. The "overweight" category ranges from BMIs between 25 and 29.9. Those with BMIs equal or greater to 30 are considered obese.

For the purposes of this project, I chose to dichotomize obesity as other researchers have done (Harris 1999), and coded respondents with a BMI above 30 as obese. Examining obesity is important for several reasons. Carrying excess weight is a risk factor for many diseases, such as diabetes and hypertension. At Wave II, respondents with a BMI of 30 or above were 10.6 percent of the sample, and at Wave III, obese respondents were 32.2 percent of the sample.

Obesity is a popular topic of conversation in the media as well as in our everyday lives. Excess weight can lead to high blood pressure, heart disease, and a myriad of other conditions that will affect quality of life and overall life expectancy. Many states have numerous anti-obesity measures designed to stimulate physical activity, reduce the consumption of high-fat foods, and encourage the development of healthy and balanced diets. Measures geared toward children are especially important because childhood obesity can be a predictor for future health problems and chronic illnesses. For example, Latinos are at a higher risk for Type II diabetes (Vega, Rodriguez, and Gruskin 2009). Researchers are finding that more children are being diagnosed with Type II diabetes; this is cause for concern because diabetes is found to shorten

life expectancy an average of twelve years (Manuel and Schultz 2004). Diabetes has always been considered a disease of middle age and beyond, and it is unclear how the life expectancy of diabetes patients who were diagnosed in adolescence or early adulthood will be affected. Latina women are especially at risk for being overweight and obese (Yeh et al. 2009) and later generations of Latina women are at the highest risk. Additionally, women are more likely to lose the protective effect of immigration more rapidly than men (Hao and Kim 2009).

Utilizing BMI as a dependent variable to measure obesity does have certain limitations. BMI does not take into consideration muscle mass or body structure – therefore, very athletic people with large muscle mass may be considered "obese" by utilizing BMI alone. A more holistic and customized measure would be percentage of body fat; however, in this data set only height and weight data are available. Secondly, BMI does not take childbearing history into consideration and does not make any distinctions for differences in ethnicity or age. In later waves of Add Health, waist-to-height ratio is collected so that is an option for analysis utilizing data from Wave IV.

The primary independent variable used is generational status. Ethnicity is self-identified by the respondent. In order to determine nativity, I created three separate variables. The first identifies "first generation" immigrants – respondents born outside the United States. The second identifies "second generation" respondents – respondents who are native born, but with at least one foreign-born parent. The third identifies the remaining respondents who identified as Hispanic – the "third-plus" generation, meaning respondents who are native-born to native-born parents. This last generational variable is not as specific as would be desirable given that no information exists about the nativity of the respondent's grandparents, so a comparison to a true third generation cannot be made. Families with older histories in the United States will have

experiences that are quite far removed from the contemporary "immigrant" experience. Lastly, a dichotomous variable identifies Hispanic respondents, compared to the reference category of non-Hispanic white. Throughout my results, discussion, and conclusion I will refer to the respondents who were born outside of the United States as the "first-generation" and the "1.5 generation" interchangeably. This is because the majority of the respondents can be technically classified as 1.5, but there are also some respondents who would be best described as members of the "1.75-generation" (those who migrated before the age of 5) or the "1.25 generation" (those who migrate between the ages of 13-17) (Rumbaut 2004).

The other independent variables used as controls are characteristics shown to be particularly significant for adolescent health such as parental education, household use of public assistance, family structure, gender, age, and nativity. Parental education is measured by four dichotomous variables – less than high school, high school diploma (or equivalent), some college, and a bachelor's degree or higher. The people in the adolescent's household determine family structure – two biological parents, a stepmother or stepfather, or a single parent. These are all coded as dummy variables.

Wave III Measures

The dependent variable for Wave III is obesity. All of the independent variables used in the analysis for Wave III are the same as those used for Wave II. Parental education was once again utilized in the analysis at Wave III, in an effort to determine whether early inequalities have a bearing on later life outcomes as research suggests (van Der Berg 2006).

METHODOLOGY

The bivariate analysis seeks to identify differences on the key independent and dependent variables using chi square tests. Next, a multivariate analysis is performed for each dependent variable by using a series of four logistic regressions. Model 1 includes the generational independent variables, gender, and age. Model 2 adds the variables for socioeconomic status (the use of public assistance) and parental education. Model 3 adds the variables for family structure, and finally, Model 4 adds the variable for obesity at Wave II.

RESULTS

Bivariate Results, Waves II and III

Table 2.1 examines selected independent and dependent variables for non-Hispanic white and Mexican-American respondents. At Wave II, there are no significant differences in self-reported health between non-Hispanic white and Mexican-American respondents. There is also not a significant difference between non-Hispanic white and Mexican-American adolescents when it comes to obesity. However, there is a significant difference in the level of parental education between white and Mexican-American parents. Only 5.8% of Mexican-American parents have a college degree compared to 24.7% of non-Hispanic white parents who have a college degree ($p=<0.001$). There is also a significant difference between white and Mexican-American respondents' household use of public assistance – 75.5% of Mexican-Americans received some form of public assistance compared to 80.5% of white households ($p=<0.01$). Lastly, there is a significant difference in family structure between white and Mexican-American respondents. The percentage of Mexican-Americans adolescents who live in a nuclear, two-parent home is higher (62.9%) than that of white adolescents (31.2%, $p=<0.01$). The percentage

of Mexican-Americans who live with a single parent (28.3%) is also higher than that of white adolescents who live with a single parent (25.2%, p=<0.01). Table 2.2 presents data from respondents at Wave III, although none of the differences between non-Hispanic white young adults and Mexican-American young adults are not statistically significant.

Tables 2.3 and 2.4 examine generational differences for obesity, self-reported health, and education. At both Wave II and Wave III, there are no statically significant differences between generations for either obesity or self-reported health. However, there is a generational difference in parental education – the first generation has the highest percentage of parents who did not complete high school (80.6%, p=<0.001), while the third generation-plus has the highest percentage of high school graduates (27.9%, p=<0.001). The parents of the third generation-plus also have the highest percentage of college graduates (7.9%, p=<0.001).

Multivariate Results, Wave III

Table 2.5 shows the results of a logistic regression for the odds of reporting fair or poor health at Wave II. At model 1, females have higher odds of reporting poor health (OR=2.28, p=<0.05). Model 2 adds controls for socioeconomic status and parental education. Model 3 adds controls for family structure. At model 3, the odds for reporting poor health for female respondents decrease in significance (OR=2.30, p=<0.10). The final model adds the control for obesity at Wave II, and being obese increases the odds of an adolescent reporting poor health (OR=2.41, p=<0.10). In the final model, the odds for females reporting poor health increase and become more significant (OR=2.46, p=<0.05).

Table 2.7 shows the results of a logistic regression for the odds of being obese at Wave III. At model 1, third generation-plus Mexican-Americans are more likely to be obese than first

generation Mexican-Americans, with an odds ratio of 1.45 (p=<0.10). In model 2, the odds for third generation-plus Mexican-Americans increase (OR=1.64, p=<0.10). In model 3, the odds stay about the same (OR=1.62, p=<0.10). However, in model 4, the odds are no longer significant. This could be because Model 4 adds the control for obesity at Wave II. Similarly, respondents whose families received public assistance at Wave I were more likely to be obese in Models 2 and 3 (OR=1.73 and OR=1.82, p=<0.01), but after the control for obesity was added, the increased odds of being obese were no long significant. For females, the odds of being obese are more or less consistent across the four models—females have statistically significant lower odds of being obese at Wave III (OR=0.48, p=<0.01). Lastly, respondents whose parents had completed some college were also less likely to be obese at Wave III (OR=0.57, p<=0.10).

DISCUSSION AND CONCLUSION

Prior studies find that foreign-born adolescents enjoy better health outcomes than non-Hispanic whites. I theorized that first-generation immigrants would have higher health outcomes because they would enjoy the positive effects of strong immigrant social networks. I hypothesized that first-generation adolescents would lose some of this health advantage as they aged – so they would be more likely to obese at Wave III. Lastly, I hypothesized that this protective effect would decrease over generations – so the second generation would have lower positive health outcomes than the first, and the third would have lower positive outcomes than the second.

Through my bivariate analysis, I find that at Wave II there is not a significant difference between generations for general health or for obesity. However, at Wave III there is a significant difference between generations for obesity – the first generation has the lowest percentage of

obesity at 19.6% (p=<0.01). The second generation's rate of obesity increases by ten percent – 29.1% of the second generation has a BMI above 30. Finally, the third generation's rate of obesity increases by a further ten percent, with 39.1% of third generation-plus respondents classified as obese. For general health, the pattern is the same, although the differences between generations are much smaller – 5% of the first generation, 5.1% of the second generation, and 8.6% of the third generation-plus report poor health (p=<0.01).

In Table 2.5, females are more likely to report poor health across all four models. At Model 4, the odds of reporting health for women are the highest across all the models (OR=2.46, p=<0.05). The analysis in Table 2.5 fails to find any generational differences associated with reporting poor health. Perhaps the most interesting finding (although not entirely surprising) is that respondents who are obese at Wave II are more likely to report poor health (OR=2.41, p=<0.10).

In the Wave III multivariate analysis, the Mexican-American third generation-plus has higher odds of being obese at Wave III (OR=1.62, p=<0.10), until the control variable for obesity at Wave II is added. Another interesting finding is that women are less likely to be obese at Wave III (OR=0.48, p=<0.01). It also appears that socioeconomic status is a significant for the risk of obesity – respondents whose household's received public assistance at Wave I were more likely to be obese (OR=1.82, p=<0.05), although the odds were not significant once the control for Wave II obesity was added. Lastly, respondents whose parents were more educated – in this case, had completed some college – had lower odds of being obese at Wave III (OR=0.57, p=<0.10).

It is well established that as adolescents age they become more sedentary, and unhealthy habits and behaviors increase (Harris et al. 2006); interestingly, this pattern of older age correlated with heavier weight is not confirmed at Wave III. The generational results are very interesting and partly confirm my hypotheses – third generation respondents do have higher odds of being obese, until obesity at adolescence is controlled for.

Table 2.1. Selected independent and dependent variables from Wave II, in percentages.

	Wave II	
	Non-Hispanic White	Mexican-American
Self-reported health		
Excellent/Very good/Good	93.9	92.2
Fair/Poor	6.1	7.8
Weight		
Not obese	89.6	91.1
Obese	10.4	8.9
Parental education		
Less than high school	8.9***	55.7***
High school graduate	33.9	18
Some college	32.5	20.5
Bachelor's degree or higher	24.7	5.8
Family's use of public assistance		
Yes	80.5**	75.5**
No	19.5	24.5
Family structure		
Two-parent home	61.2**	62.9**
Stepfamily	13.7	8.8
Single parent home	25.2	28.3
Age	16.6	16.6
N	11,034	1,762

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 2.2. Selected independent and dependent variables from Wave III, in percentages.

	Wave III	
	Non-Hispanic White	Mexican-American
Self-reported health		
Excellent/Very good/Good	95.4	94.5
Fair/Poor	4.6	5.5
Weight		
Not obese	68.7	66.2
Obese	31.3	33.8
Respondent's education at Wave III		
Less than high school	16	15.1
High school graduate	32	30.5
Some college	40.6	42.7
Bachelor's degree or higher	11.4	11.7
Age	21.9	22
N	11,034	1,762

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 2.3. Descriptive statistics for dependent variables and parental education for Mexican-American adolescents by generational status at Wave II, in percentages.

	Mexican-Americans at Wave II		
	First generation	Second generation	Third generation-plus
Self-reported health			
Excellent/Very good/Good	95.2	92.6	90.3
Fair/Poor	4.8	7.4	9.7
Weight			
Not obese	88.2	89.3	92.8
Obese	11.8	10.7	7.2
Parental education			
Less than high school	80.6***	79.8***	24.9***
High school graduate	10.5	8.4	27.9
Some college	3.5	11.2	39.4
Bachelor's degree or higher	5.4	0.6	7.9
Age	16.6	16.5	16.6
N	272	510	563

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 2.4. Descriptive statistics for dependent variables and education for Mexican-American young adults by generation at Wave III, in percentages.

	Mexican-Americans at Wave III		
	First generation	Second generation	Third generation-plus
Self-reported health			
Excellent/Very good/Good	98.6	93.7	94.7
Fair/Poor	1.4	6.3	5.3
Weight			
Not obese	68.1	69.2	60.8
Obese	31.9	30.8	39.2
Respondent's education at Wave III			
Less than high school	17.8	15.9	11.9
High school graduate	38.6	32.6	32
Some college	29	40.6	45.3
Bachelor's degree or higher	14.6	10.9	10.8
Age	22	21.9	21.9
N	272	510	563

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 2.5. Logistic regression coefficients for the odds of reporting poor health at Wave II, controlling for demographics, family structure, socioeconomic status, and obesity at Wave II.

	Model 1	Model 2	Model 3	Model 4
Generational status				
Mexican 2nd generation	1.19	1.05	0.98	1.03
Mexican 3rd generation	1.54	1.35	1.38	1.54
(Ref: Mexican 1st generation)				
Demographics				
Female	2.28*	2.26+	2.30+	2.46*
Age	0.99	0.97	0.98	0.94
Socioeconomic status				
Use of Public Assistance		1.04	1.19	1.14
Parental education				
High school or equivalent		0.99	1.05	1.10
Some college		1.12	1.09	0.97
College graduate		0.41	0.43	0.40
(Ref: Less than high school)				
Family structure				
Stepfamily			0.67	0.79
Single parent			0.60	0.54
(Ref: Two-parent family)				
Obesity				
Obese at Wave II (BMI ≥ 30)				2.41+
	F=2.2	F=0.97	F=1.30	F=1.30
	P=0.07	P=0.47	P=0.23	P=0.23
N	6600	6413	6413	6362

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 2.6. Logistic regression coefficients for the odds of being obese (BMI>30) at Wave II, controlling for demographics, family structure, and socioeconomic status.

	Model 1	Model 2	Model 3
Generational status			
Mexican 2nd generation	1.25	1.09	1.05
Mexican 3rd generation	0.80	0.91	0.94
(Ref: Mexican 1st generation)			
Demographics			
Female	0.61	0.72	0.68
Age	1.11	1.00	1.01
Socioeconomic status			
Use of Public Assistance		1.79	1.80
Parental education			
High school or equivalent		0.76	0.82
Some college		1.14	1.13
College graduate		1.56	1.56
(Ref: Less than high school)			
Family structure			
Stepfamily			0.22 +
Single parent			0.99
(Ref: Two-parent family)			
	F=1.20	F=0.54	F=0.65
	P=0.32	P=0.83	P=0.77
	6539	6362	6362

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 2.7. Logistic regression coefficients for the odds of being obese at Wave III, controlling for demographics, family structure, socioeconomic status, and obesity at Wave II.

	Model 1	Model 2	Model 3	Model 4
Generational status				
Mexican 2nd generation	0.94	1.15	1.13	1.01
Mexican 3rd generation	1.45+	1.64+	1.62+	1.58
(Ref: Mexican 1st generation)				
Demographics				
Female	0.55**	0.46**	0.45**	0.48**
Age	1.09	1.01	1.02	1.01
Socioeconomic status				
Use of Public Assistance		1.73*	1.82*	1.35
Parental education				
High school or equivalent		1.36	1.35	1.50
Some college		0.70	0.69	0.57+
College graduate		1.03	1.10	0.83
(Ref: Less than high school)				
Family structure				
Stepfamily			1.47	1.30
Single parent			0.77	0.76
(Ref: Two-parent family)				
Obesity				
Obese at Wave II (BMI ≥ 30)				1.07
	s			
	F=4.24	F=2.49	F=2.23	F=2.28
	P=0.003	P=0.02	P=0.02	P=0.02
	6496	6330	6330	6287

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

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CHAPTER 3

NUTRITION, FAMILY MEALS, AND FAST FOOD CONSUMPTION DURING ADOLESCENCE: IMPACTS FOR OBESITY OUTCOMES AT YOUNG ADULTHOOD FOR MEXICAN-AMERICANS

The last 25 years of the 20th century saw a remarkable change in the food landscape of the United States: from the increase in the use of convenience foods, to the increase in fast food options for consumers, to the globalization of the kinds of food we eat. Food is a very important part of our lives – this is an understatement, as food provides the nourishment that is necessary for our bodies to function. Norms and customs about food and meals can vary widely between different families, communities, and countries. In the case of immigrants, food can play an important part of acculturation and assimilation. Food also offers opportunities for socializing and socialization. The children of immigrants are often acutely aware that the food their peers and classmates eat is drastically different from the food their parents cook at home. This may lead to intergenerational culinary conflict for families, as children often want to eat "American" food in an effort to fit in with their friends (Santora 2006). On the other hand, for later-generation immigrants, ethnic dishes and foods are one of the ways they can express symbolic ethnicity, even if they do not have a strong ethnic identity in their day-to-day lives (Gans 1979).

In the late 1970s, fast food was only 2 percent of children's total energy consumption; by the mid-1990s, fast food consumption had increased to 10 percent of total energy consumption (Bowman et al. 2004). The proliferation of fast food restaurants has corresponded with the increase in the consumption of sugar, which researchers have linked to both kidney and cardiovascular disease (Johnson et al. 2007). The increase in fast food and eating meals away from home has been attributed to a variety of things, including women in the workforce (Sheely

2008; Lin, Guthrie, and Frazão 1999), the rise of automobiles and commuting (Sallis and Glanz 2009), to the decrease of family mealtimes, and to increased marketing by the food manufacturers of America (Lin, Guthrie, and Frazão 1999; Koch 1966).

Because of the increase in consumption of processed and fast foods, it is important to study the consumption of more nutrient-dense food, such as fruits and vegetables. Poor diets can lead to malnutrition and obesity; indeed, an increasing number of people are both obese and malnourished (Tanumihardjo et al. 2007). In this chapter, I will analyze the patterns of fruit and vegetable consumption, fast food consumption, family meals, and obesity for Mexican-American adolescents and young adults. I am interested in examining whether Mexican-American adolescents who consume the daily-recommended amounts of fruits and vegetables will experience a lower rate of obesity as young adults. I am also interested in exploring whether adolescents who share frequent dinners with their parents are more likely to consume the daily-recommended amounts of fruits and vegetables, as some research suggests (Larson et al. 2008; Pearson, Biddle, and Gorely 2008). I will attempt to link acculturation to the consumption of fruits and vegetables, and I will argue that first and second generation immigrants will be more likely to have a healthier diet.

LITERATURE REVIEW

Immigration, Acculturation, and Nutrition

Immigrant families bring with them norms and traditions about food, cooking processes, and meals. Much like the beneficial effect recent immigration has on health outcomes, there seems to be a protective effect for families with "limited acculturation" when it comes to

nutrition (Mazur, Marquis, and Jensen 2003). Literature surrounding the Latino health paradox has shown that good health outcomes decrease as immigrants spend time in the United States and become more acculturated (Popkin and Udry 1998). Some studies have already examined the relationship between acculturation and nutritional behavior among immigrants (Kaiser et al. 2001; Guendelman and Abrams 1995). Mazur and his colleagues found that limited acculturation was beneficial to Hispanic adolescents, as it diminished the negative association between poverty and diet for Hispanic adolescents. Limited acculturation was defined as households where only Spanish was spoken (Mazur, Marquis, and Jensen 2003). Furthermore, there is a marked difference in nutritional behavior for individuals of different socioeconomic groups (Landale, Oropesa, and Gorman 1999). Individuals residing in lower-income households were shown to have higher intakes of energy, protein, and sodium (Mazur, Marquis, and Jensen 2003); a higher energy intake may be due to cheaper but unhealthy processed or fast food. The first generation will likely be the poorest, and so later generations would theoretically have access to more nutritious food.

In this chapter, I will be measuring acculturation by using immigrant generation. Will immigrant generation have an effect on nutritional habits? Do immigrant norms about food and mealtimes play a role in the households of second and third-plus generation adolescents? Where do immigrant families stand in this new food and nutrition landscape? What are their patterns of fruit and vegetable consumption and family meals?

I hypothesize that Mexican-American first and second generation adolescents will be more likely to eat the daily recommended amount of fruits and vegetables than third generation-plus Mexican-American and white adolescents. As families become more acculturated, I predict that the positive effect of immigration on nutritional habits will decrease. I also propose that first

and second generation immigrant families will be more likely to share more mealtimes together, which will also have an impact on whether or not an adolescent eats the daily recommended amount of fruits and vegetables. Finally, adolescents who eat more meals with their parents and who eat the recommended amount of fruits and vegetables at Wave II will be less likely to be obese at Wave III.

Family Mealtimes

Societal changes have affected the American family structure and indeed the family's daily timetable. More than ever, meals are frequently eaten on the go or in the workplace. An increased number of mothers in the workforce, extended work hours, and long commutes are all reasons why sharing meals may have become a rare occurrence in some families (Hamilton and Wilson 2009). Eating habits and patterns vary widely in American families today; adolescents may eat fewer meals with their family because of a parent's work schedule, their after-school activities or an after-school job. Some families may eat together in the kitchen or dining room, some families might eat together in the living room while watching television, and in some families adolescents eat alone in their rooms (Neumark-Sztainer 2006). In spite of this variety of possible dinner configurations, there is also data that has reported an increase in family dinners – between 1998 and 2005, a Columbia University study found that there was an 11 percent increase in adolescents who ate dinner with their families at least five times per week (Rockett 2007). Older children are less likely to eat dinner with their families – only 27 percent of 12 to 17 year olds reported that they ate dinner every day with their parents, as opposed to 41 to 45 percent of younger children (Gillman et al. 2000).

The general pattern of research regarding mealtimes suggests that adolescents benefit from family meals and that "a greater number of meals per week in the presence of family" are correlated with a more nutritious diet (Hamilton and Wilson 2009). The presence of at least one parent during the evening meal lowered the odds for the poor consumption of fruits, vegetables, and dairy products (Videon and Manning 2003); an increased frequency of family dinner was also associated with a lower consumption of saturated and trans fats, soft drinks, and fried foods (Gillman et al. 2000). Adolescents who ate 3 or fewer meals a week with a parent were less likely to consume the daily recommended amount of vegetable servings (Videon and Manning 2003), and the converse was found to be true as well (Gillman et al. 2000). Lastly, adolescents who shared consistent mealtimes with their family consumed healthier foods and were less likely to consume soft drinks (Neumark-Sztainer 2006).

Family meals also provide a venue to reinforce family values and create shared meanings (Neumark-Sztainer 2006); they also provide an opportunity for parents to model good nutritional behavior (Hamilton and Wilson 2009; Sabo and Robinson 2009). This influence is most important in young children, as they are developing food preferences and eating behaviors. After all, "children are not born with a preference for French fries rather than green beans (Sabo and Robinson 2009)." However, shared family meals remain important for adolescents since eating habits developed in adolescence continue into young adulthood (Videon and Manning 2003). Findings from Project EAT reveal that 74 percent of adolescents reported that they enjoyed eating meals with their families (Neumark-Sztainer et al. 2003).

Fast Food Consumption

In 1970, a quarter of total food spending was devoted to the food-away-from-home sector – by 1995, this had increased to about 40 percent (Lin, Guthrie, and Frazão 1999). There are a variety of reasons why the consumption of fast food and food-away-from-home has increased since 1970. Many of the reasons discussed for the decline of family meals are also related to the increase in food-away-from-home and specifically, in fast food consumption.

For example, the increase of households where both parents work outside the home could be a factor in whether a family is more likely to consume fast food regularly (Guthrie, Lin, and Frazão 2002). Fast food restaurants are ubiquitous, and are designed to produce food identically and rapidly. Indeed, the "standardization of management practices and menu offerings has allowed fast food establishments to grow into large, recognizable corporate chains" (Guthrie, Lin, and Frazão 2002)," which makes it possible for families to consume familiar food no matter what McDonald's or other fast food location they choose to go to. The development of the drive-through is also related to the increase in fast food consumption – some restaurants did not have drive-through service until 1975. In 1970, there were about 30,000 fast food restaurants, and by 1980, that number had increased to 140,000. Fast food had sales had increased by about 300 percent (Paeratakul et al. 2003). The ease of accessing fast food makes it an attractive option for families that do not have a lot of time for cooking. It is also interesting to note that when families eat together but eat food that is not cooked at home, the nutritional benefits that children can experience from family meals decrease (Rockett 2007).

The food industry's budget for advertising to children and adolescents is massive – food and beverage manufacturers spend between $10 and $15 billion a year (Linn and Novosat 2008). Advertising and marketing of foods "influences the food preferences, purchase requests,

purchase, and consumption of children and youth (Hinton 2010)." Exposure to television advertising is positively correlated with body fat in children and adolescents, and television watching is also associated with a reduced consumption of fruits and vegetables.

Many times, fast food is a cheaper option for families than cooking a meal from scratch. This may be one of the reasons for the increase in consumption of food prepared away from home. One of the reasons fast food is cheap and seen as "affordable" is due to government farm subsidies. The original purpose of subsidies was to maintain a steady and reliable supply of food for consumers in the United States (Fields 2004). However, subsidies mean that some crops are being produced in higher volumes and quantities – for example, wheat, soybeans and corn. Because there is an incentive for farmers to grow these crops (in the form of subsidies), farmers are less likely to grow other crops such as fruits and vegetables. Subsidies promote the overproduction of food, regardless of the market's demand (Elinder 2005). In addition, the subsidies affect the affordability of foods that are available to consumers. Foods that are primarily made up of subsidized ingredients are artificially cheap – this makes other foods that do not contain subsidized ingredients seem even more expensive.

The frequent consumption of fast food is an important variable to consider when examining nutrition for several reasons. First, a higher consumption of fast food is correlated with poor nutritional habits and obesity. For example, adolescents who consumed fast food at least three times per week were found to have a higher caloric intake and fat consumption when compared to adolescents who ate less fast food. Adolescents who frequented fast food restaurants also had a lower intake of fruits and vegetables (French et al. 2001).

Second, when people eat food away-from-home, they are more likely to consume more calories. In many ways, eating away from home is the perfect storm for the overconsumption of

calories and indeed, overeating. For instance, "away" food is more calorically dense, and tends to be higher in fat, lower in fiber and usually includes fewer nutrients like calcium and iron (Guthrie, Lin, and Frazão 2002; Hinton 2010). Eating away from home might also provides environmental cues that may trigger overeating, such as large portion sizes. Portion sizes have increased dramatically in the past 30 years (Hinton 2010), and when people are presented with more food, they will consume more (Kessler 2009). The food industry increases its profits by selling bigger muffins, bigger soft drinks, and bigger hamburgers – and most of the ingredients used to make these foods are cheap and unhealthy, like palm or coconut oil (Kessler 2009). Guthrie and colleagues state "as early as the age of 5 years, individuals are stimulated to eat more by the presence of larger portion sizes (Guthrie, Lin, and Frazão 2002)." Larger portion sizes also make consumers feel like they are getting a "good deal" (Kessler 2009). Also, there is more variety at restaurants than is available at home and this may also trigger some people to eat more than they usually would. Third, some researchers have found that up to one-third of an adolescent's away-from-home meals are from fast food restaurants (French et al. 2001). Fast food restaurants are cheap and readily available to adolescents so it makes sense that they would frequent these restaurants if they are spending time with other adolescents.

Fruit and Vegetable Consumption: Patterns and Benefits

Fruit and vegetable consumption has been widely utilized as a measure in studying adolescent nutrition and health overall. The majority of adolescents do not eat the recommended amount of fruits and vegetables. The regular consumption of fruits and vegetables (F/V) promotes health (Pearson, Biddle, and Gorely 2008) and is correlated with a lowered risk of cardiovascular disease, Type 2 diabetes, and several types of cancer (Xie et al. 2003; Larson et

al. 2012; Kim et al. 2011). A diet with a high consumption of fruits and vegetables can also aid in weight management (Kim et al. 2011). The daily recommended amounts for fruit and vegetable consumption for adolescents who participate in less than 30 minutes of physical activity a day are as follows: 1.5 cups of fruit and 2.5 cups of vegetables for females and 2 cups of fruit and 3 cups of vegetables for males (Kim et al. 2011). Xie and colleagues found that only 6.5 percent and 18.5 percent of their sample consumed the recommended daily amount of vegetables and fruit respectively. In fact, French fries or other types of potatoes make up about half of the vegetables consumed by the typical American adolescent (Befort et al. 2006).

Across the board, most adolescents are not consuming enough fruits and vegetables, and some patterns emerge when examining the consumption of fruits and vegetables. Kim and colleagues found that although adolescents of all ethnicities consume considerably lower amounts of fruits and vegetables than is recommended, African-American and Hispanic adolescents consume less F/V than non-Hispanic white adolescents. Xie and colleagues had a contradictory finding: they found that African-American adolescents in Georgia actually had a higher consumption rate of fruits and vegetables combined when compared to White adolescents. In Minnesota, African-American adolescents also ate more fruit than whites. Overall, non-Hispanic white adolescents had the lowest rates of fruit consumption, and Hispanic whites had the lowest consumption of vegetables (Xie et al. 2003).

Neuhouser and colleagues found that Mexican-Americans in their study consumed one additional serving of fruits and vegetables when compared with the non-Hispanic whites in their study. However, less acculturated Mexican-Americans ate almost half a serving more of fruits and vegetables when compared with more acculturated Mexican-Americans. Additionally, as acculturation increased, the consumption of fat also increased (Neuhouser et al. 2004).

Hypotheses

H1. First generation Mexican-American adolescents will have "healthier" diets, that is, they will be more likely to consume the recommended amount of fruits and vegetables daily.

H2. First and second generation adolescents Mexican-Americans will be more likely to share an evening meal with at least one parent than white and third-plus generation respondents.

H3. Having a "healthy" diet at Wave II (recommended amount of F/V and a low fast food consumption) will be associated with a lower risk of obesity in young adulthood (Wave IV).

DATA

The National Longitudinal Study of Adolescent to Adult Health (Add Health) is a nationally representative study that investigates the causes of health and health-related behaviors of adolescents and their outcomes in young adulthood (Carolina Population Center 2002). The study features a multi-survey, multi-wave design. I will utilize parental data from Wave I (collected in 1994-1995), and adolescent/young adult data from Wave II (collected in 1996) and Wave III (collected in 2001 and 2002). Add Health used a multistage, stratified, school-based, cluster sampling design, and sampled students from 80 high schools, both public and private (Carolina Population Center 2002; Perreira et al. 2005).

Independent Variables

The independent variables are generational status, generational status by ethnicity, race/ethnicity, parental education, family income, family structure, use of public assistance (by the family at Wave I), gender, age, family structure, family mealtimes, and frequent consumption of fast food. Generational status was determined by the respondent's place of birth and their

parent's place of birth. A respondent is classified as first generation if they are foreign-born (that is, not born in the United States) and both their parents were also foreign-born. A respondent is classified as second generation if they are US-born with at least one foreign-born parent. A respondent is classified as third generation-plus if both the respondent and both parents are native-born. Generational status by ethnicity is determined by a respondent's generational status and the respondent's ethnic self-identification. The respondent must self-report as Mexican, Mexican-American, or Chicano. Parental education was self-reported by the caregiver that completed the parental questionnaire. I created four dichotomous variables for parental education: not a high school graduate, high school graduate, some college, and being a college graduate-plus. Family income is divided into three categories based on the parent-reported household income at Wave I. Families who reported a yearly household income of $34,999 or less were classified as low income, families who reported incomes of $35,000-$69,999 were classified as middle income, and families who reported incomes of $70,000 or higher were classified as high income. There are four dichotomous variables that represent family structure – the first, a two-parent household, second, an adolescent who lives in a household with one of their parents and a stepparent, third, an adolescent who lives in a single parent household, and lastly, an adolescent who has an extended family member in their household. Use of public assistance is determined by the parental report of public assistance programs utilized by anyone in the household at Wave I. Family mealtimes are measured by the number of days a parent is present with the adolescent while he or she is eating dinner. The threshold of 4 family meals/dinners has been used to measure a high number of family meals in literature before (French 2001; Hammons and Fiese 2011; Videon and Manning 2003), so I decided to use it here as well. Consequently, an adolescent who reports having a parent present during their evening

meal at least four times in the previous week is considered to have a "high" amount of family meals. Frequent fast food consumption is measured by the adolescent's self-reported consumption of fast food per week. An adolescent who reports eating at a fast food restaurant 3 or more times per week has been utilized as a measure of "frequent fast food consumption" by previous researchers.

Dependent Variables

Wave II data provides nutritional data, including the fruit and vegetables that each respondent consumed the day before , so daily fruit and vegetable consumption is the first dependent variable. I created a dichotomous variable to measure the daily-recommended consumption of fruits and vegetables – at least 3 servings of vegetables and at least 2 servings of fruit (Grimm and Blanck 2011). In the second multivariate analysis, the fruit and vegetable variable is also used as an independent variable. The second dependent variable is Body Mass Index (BMI) at Wave III. BMI was calculated using the respondent's weight and height as recorded by the interviewer.

METHODOLOGY

The bivariate analysis seeks to identify differences on the key independent and dependent variables using chi-square tests. Next, multivariate analysis is performed for each dependent variable by using a series of four logistic regressions for the dependent variables. In the first multivariate analysis, Model 1 includes race, age, gender, and generational status. Model 2 includes the controls for family structure, family mealtimes, and frequent consumption of fast food. Model 3 adds the variables for mother's education. Lastly, Model 4 adds the variables for

family income and use of public assistance at Wave I. In the second multivariate analysis, Models 1 are set up the same way as in the first analysis. In Model 2, the variable for marital status is added. Model 3 adds the variables for education at Wave III and the use of public assistance. Lastly, the variables for F/V consumption, frequent fast food consumption, and family meals at Wave II are added in Model 4.

RESULTS

The first bivariate analysis (Table 1) indicates that there is not a statistically significant difference between the F/V consumption of the Mexican-American first, second, and third generations. The highest percentage of F/V consumption is 24.3 percent for the third-plus generation. The first and second generation's percentage of F/V consumption is nearly identical (20.4 percent and 20.1 percent, respectively). Some research suggests that Mexican-Americans may have a higher consumption of fruits than vegetables (Neuhouser et al. 2004), so I decided to analyze fruit and vegetable consumption separately. The results were mixed, for example, the third-plus generation did have a higher consumption of fruits than vegetables (37.7 percent to 33.5 percent). The first and second generations, however, had a higher consumption of vegetables than fruits (see Table 3.1).

The second bivariate analysis (Table 3.2) examined the relationship between family mealtimes and generational status. The first generation has the highest rate of family meals (65.4 percent), and the rates for family meals for the second and third-plus generation are the same (61.6 percent). Table 3.2 also examines the rate of fast food consumption among generations.. The second generation has the highest rate of fast food consumption – 37.6 percent of Mexican-American second generation adolescents consume fast food three or more times a week. The

third-plus generation's rate of fast food consumption is only 26.4 percent, and the second generation is not much higher at 29.8 percent.

The last bivariate analysis considers the relationship between obesity at Wave III (measured by a BMI over 30) and immigrant generations, and finds that there is not a statistically significant difference between generations. In this analysis, the third generation-plus has the highest rate of obesity (39.2 percent), followed by the first-generation (31.9 percent). The second generation has the lowest rate of obesity (30.8 percent). In comparison, the non-Hispanic white rate of obesity at Wave III is 31.3 percent.

Multivariable Analysis

In Model 1, older respondents are more likely to eat the recommended amount of fruits and vegetables (OR=0.84, p=<0.05). Females are less likely to consume the recommended amount of fruits and vegetables (OR=0.71, p=<0.10). Model 2 adds the variables for family meals and fast food. Respondents who eat dinner with their families at least four times per week are very significantly more likely to eat the recommended amount of fruits and vegetables (OR=2.90, p=<0.001). Conversely, respondents who eat fast food at least 3 times per week are less likely to consume the recommended amount of fruits and vegetables (OR=0.48, p=<0.01). In Model 3, respondents who eat dinner with their families remain more likely to get the recommended amount of fruits and vegetables, but the addition of parental education variables means that respondents who frequently consume fast food do not have lower odds of not consuming enough fruits and vegetables. Finally, Model 4 adds the variables for socioeconomic status. In this model, both females and older respondents are less likely to eat the recommended amount of fruits and vegetables (OR=0.56, OR=0.85, p=<0.10). Respondents who eat at least 4

dinners with their families each week continue to have very high odds of consuming the recommended amount of fruits and vegetables (OR=3.7, p=<0.01).

Table 3.5 shows the odds for being obese at Wave III. In Model 1, Third generation-plus Mexican-Americans are more likely to be obese (OR=1.45, p=<0.10). However, females are less likely to be obese (OR=0.55, p=<0.01). This trend remains in Model 2, although the odds for third generation-plus Mexican-Americans increase slightly and become more significant (OR=1.88, p=<0.05). In Model 3, respondents who were frequent consumers of fast food at Wave II are more likely to be obese (OR=1.53, p=<0.10). Finally, the addition of socioeconomic status in Model 4 decreases the significance of the odds of third generation-plus Mexican-Americans being obese (OR=2.03, p=<0.10). Females continue to have lower odds of being obese, and frequent fast food consumers see their odds of being obese increase and become more significant (OR=2.25, p=<0.01). Middle income also appears to be protective as compared to low income – adolescents with middle income homes have lower odds of being obese (OR=0.49, p=<0.10).

Limitations

One of the main limitations is in not being able to distinguish immigrant generation past the second generation. Adolescents who are in the third generation plus category could be legitimately third generation Mexican-American, or they could be from families that have been in the United States since Mexico became the United States. This may be remedied in future waves of data: the Add Health Parent Study data will seek out the parents of respondents for information about them. There is also interest in conducting a study for the children of Add Health respondents, in this case, there would be a "true" third generation as the parents of the

second generation respondents would be the grandchildren of first generation immigrants to the United States.

DISCUSSION AND CONCLUSION

I was interested in examining whether differences existed in nutritional habits among Mexican-American adolescents of different generations. Would the immigrant health paradox extend to nutritional habits? Would first and second generation adolescents would have healthier nutritional habits?

As I discussed in the introduction, the food landscape that post-1965 immigrants must navigate as they arrive in the United States is very different than what was available to earlier waves of immigrants. The mid 1960s and 1970s saw an increase in convenience foods, frozen foods, and a difference in the way that the food industry manufactured food (Koch 1966; Sheely 2008). The first generation did have the highest consumption rates of vegetables and combined F/V. One of the reasons that there might not be much difference between the first and second generation's consumption of combined F/V is because most of the first generation Mexican-American respondents arrived in the US at a very young age – only 21 percent of them arrived in the US after the age of 12. This means that the majorities of respondents attended elementary school in the United States, and were socialized alongside the second and third generation.

I was also interested in whether frequent family dinners would have an impact on nutritional habits and on eventual obesity. In this case, there did not seem to be a significant generational difference in the frequency of family dinners. I had originally thought that the first generation would have the highest percentages of respondents eating dinner with their parents,

which I attributed to higher rates of familism that tend to be typical among the first generation (Fuligni, Tseng, and Lam 1999).

Much of the research on frequency of family meals uses different thresholds for what constitutes or what defines frequent family meals; I decided to use three meals per week. Some studies have utilized higher numbers of meals to denote significant family time spent together; perhaps a higher number would have yielded some significant findings. My reasoning was that many of the studies that utilized a higher number of family meals to measure family time dealt with younger children, and that even three meals a week could be considered frequent for adolescents since they are more likely to have activities, part time jobs, and school-related events that would prevent them from sharing dinner with their families. The parents of first and second-generation adolescents may also have work schedules that prevent regular evening meals.

The first generation did not have the lowest percentage of fast food consumption – the generation with the lowest percentage of fast food consumption was actually the third-plus. The first generation had the second lowest rate of fast food consumption, and the highest percentage of fast food consumption is in the second generation (37.6 percent). That the first generation did not have the highest consumption of fast food is not too surprising, but it is unexpected that the second generation's fast food consumption is 8 percentage points higher than the third generation-plus.

Table 3.1. Percentages for Mexican-American and non-Hispanic white respondents who consumed the daily-recommended amount of fruits and vegetables at Wave II.

	Combined F/V Consumption		Fruit Consumption		Vegetable Consumption	
Mexican-American 1st Gen.	20.4	(n=43)	31.7	(n=77)	39.2	(n=87)
Mexican-American 2nd Gen.	20.1	(n=72)	28.7	(n=122)	33.4	(n=136)
Mexican-American 3rd Gen.+	24.3	(n=93)	37.7	(n=156)	33.5	(n=162)
Non-Hispanic white	24.5	(n=1729)	34.2	(n=2838)	36.4	(n=3310)

Table 3.2. Percentages for Mexican-American and non-Hispanic white respondents who consumed fast food frequently and had dinner with at least one parent four or more times a week at Wave II.

	Frequent Family Dinners		Frequent Fast Food Consumption	
Mexican-American 1st Gen.	65.4	(n=144)	29.8	(n=70)
Mexican-American 2nd Gen.	61.6	(n=223)	37.6	(n=128)
Mexican-American 3rd Gen.+	61.6	(n=259)	26.4	(n=125)
Non-Hispanic white	65.9	(n=4964)	35.8	(n=2821)

Table 3.3. Percentages for Mexican-American and non-Hispanic white respondents who are obese (BMI ≥ 30) at Wave III.

	Obese at Wave III	
Mexican-American 1st Gen.	31.9	(n=57)
Mexican-American 2nd Gen.	30.8	(n=108)
Mexican-American 3rd Gen.+	39.2	(n=127)
Non-Hispanic white	31.3	(n=2164)

Table 3.4. Logistic regression coefficients for the odds of daily consumption of the recommended amount of fruits and vegetables at Wave II, controlling for family structure, socioeconomic status, and family meals at Wave II.

	Model 1	Model 2	Model 3	Model 4
Generational status				
Mexican 2nd generation	1.04	1.06	1.17	0.81
Mexican 3rd generation	1.33	1.18	1.32	1.24
(Ref: Mexican 1st generation)				
Demographics				
Female	0.79	0.74	0.66	0.56+
Age	0.84*	0.90	0.88	0.85+
Family structure				
Stepfamily		1.19	1.59	2.56*
Single parent		0.87	0.92	0.83
Extended family		0.99	0.74	0.61
(Ref: Two-parent family)				
Family dinners				
Family dinner at least 4x/week		2.90***	3.00***	3.70**
Fast food 3+ times/week		0.48**	0.61	0.68
Parental education				
High school or equivalent			0.62	0.62
Some college			1.01	1.21
College graduate			0.99	1.24
(Ref: Less than high school)				
Socioeconomic status				
Use of Public Assistance				1.02
Middle Income				0.86
High Income				0.25+
(Ref: Low income)				
F-score	1.85	3.45	2.12	1.62
p-value	0.12	0.0008	0.02	0.08
N	6462	6443	6291	6170

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 3.5. Logistic regression coefficients for the odds of being obese at Wave III, controlling for family structure, socioeconomic status, fast food, family meals, and fruit/vegetable consumption at Wave II.

	Model 1	Model 2	Model 3	Model 4
Generational status				
Mexican 2nd generation	0.94	1.16	1.14	1.07
Mexican 3rd generation	1.45+	1.88*	1.85*	2.03+
(Ref: Mexican 1st generation)				
Demographics				
Female	.55**	0.54**	0.52**	0.48*
Age	1.09	1.07	1.07	0.99
Family structure				
Stepfamily		1.56	1.63	1.72
Single parent		1.43	1.47	1.06
Extended family		1.34	1.34	0.96
(Ref: Two-parent family)				
Nutrition at Wave II				
Family dinner at least 4x/week		1.24	1.25	1.15
Fast food 3+ times/week		1.46	1.53+	2.25**
Fruit/vegetable consumption		1.10	1.12	1.17
Education at Wave III				
High school or equivalent			1.69	1.47
Some college			1.47	1.39
College graduate			1.34	1.47
(Ref: Less than high school)				
Socioeconomic status				
Use of Public Assistance				1.31
Middle Income				0.49+
High Income				0.94
(Ref: Low income)				
F-score	4.24	2.06	2.19	1.58
p-value	0.003	0.03	0.01	0.08
N	6496	6354	6354	6116

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

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CHAPTER 4

FAMILISM AND IMMIGRANT GENERATION: MEASURING OBESITY AND DIABETES

Researchers have been investigating the Latino health paradox for over 20 years. Studies have examined the trajectory of Latino health as the time spent in the United States increases (Yeh et al. 2009), how parental nativity affects access to health care (Durden et al. 2007), and the relationship between acculturation and nutritional behavior among immigrants (Kaiser et al. 2001; Guendelman et al. 1995), just to name a few. Many have tried to make an argument that the explanation for the immigrant health paradox is a sociocultural one; however, many of the sociocultural measures used by researchers have not successfully measured acculturation and assimilation. This is due largely to the unavailability of data that includes information about community ties, social networks, and individual connections (Palloni and Arias 2004). Studies have measured acculturation by language use preference, time spent in the United States, naturalization, consumption of Spanish media, and a variety of other proxies.

With the Hispanic population as the largest minority group in the United States (Census 2012), it is important to understand how immigrant human capital – in the form of positive health outcomes – is altered as time spent in the United States increases. Do factors exist that can protect the health benefits immigrants bring with them from deteriorating?

Returning to the topic of sociocultural explanations for the immigrant health paradox, one immigrant advantage often cited is family. It is not uncommon for immigrants to experience high degrees of family cohesion, live with extended family members, or to have family members that can be counted on for social support. Much has been written and discussed in regards to familism, the high value that Latinos place on family relationships and responsibilities. Is it

possible that the largest advantages that Latinos bring with them—even more important than good physical health—are their family structures and familial support? Does familism have a positive effect on the health of Mexican-American young adults? In addition, if there is a positive health benefit associated with familism, will it still prove to be protective for third generation-plus Mexican-Americans? I hypothesize that a high degree of familism will be associated with lower negative health outcomes, and that these negative outcomes will be more likely in the third generation-plus respondents.

LITERATURE REVIEW

Acculturation

Park and Burgess describe acculturation as "a process of interpenetration and fusion in which persons and groups acquire the memories, sentiments, and attitudes of other persons and groups, and, by sharing their experience and history, are incorporated with them in a common cultural life (Park and Burgess 1921)." Higher levels of acculturation have generally been associated with lower levels of familism. As immigrants become more "Americanized," their values and things they consider important may change. Social norms for native-born American families may be different than for immigrant families, and a variety of factors may affect family cohesion and the roles that parents and children play.

One of these factors is human capital. Immigrants from different countries or regions possess different levels and kinds of human capital; one example of human capital is education level. For example, a high percentage of Filipino immigrants have a college education (44.8%); only 12% of Filipino immigrants are not high school graduates (Rumbaut and Portes 2001). In addition, Filipino immigrants tend to have higher percentages of English language abilities and

fluency, which would make their transition to American society easier for the family and decrease the chances of role reversal.

Role reversal occurs when the authority and power that parents typically exercise is transferred to the children. Role reversal is more likely in families with native-born children and where parents have lower levels of acculturation. For example, parents with a low percentage of English fluency and low levels of formal education will find it harder to navigate American society and may turn to their English-speaking children for help. "In many respects [parents with low levels of English ability] become dependent on their children for daily contact with the outside world […] hence putting the children who act as interpreters and translators on behalf of the parents in an authoritative position (Rumbaut and Portes 2001)." Role reversal can lead to conflict in families and decrease family cohesion.

Low-skilled immigrants commonly settle in areas where there are large co-ethnic communities to take advantage of networks that may provide access to jobs, housing, and support for new arrivals (Light 2008). A good example of the support that strong networks provide is observable in some Vietnamese communities. The level of formal education among Vietnamese immigrants is low; however, second generation Vietnamese-Americans achieve high levels of education. Strong coethnic communities serve to reinforce values of family loyalty and obligation. Coethnic communities also serve to reinforce the authority of the parents, which decreases the chances for a manifestation of role reversal in an immigrant family. Religious organizations can also function in a similar role, particularly by encouraging family cohesion and "linguistic-cultural continuity" (Crane 2003). Latino churches can also provide an environment where common values and social norms are shared, and parental authority is retained (Portes and Rumbaut 2001).

Christerson et al. propose a parenting type they call "communal nurturance" to identity the combination of communal authority, control, and nurturance that they found in the lives of the Latino adolescents in their sample (Christerson et al. 2010). Communal nurturance highlights the "high valuing of familism and collectivism among Latinos and their effects on parenting practices" (Christerson et al. 2010). They find that second generation Latino adolescents have a higher level of surveillance and parental control than third generation-plus Latinos, and that third generation-plus Latino adolescents are less likely to enjoy a high level of family cohesion. Thus, third generation-plus Latino adolescents are more likely to engage in risky behaviors.

Familism

Studies that examine the effects of familism are plentiful, and their findings vary widely. The way in which researchers choose to operationalize and measure familism also varies. For example, familism can manifest as feelings of family obligation. Children of immigrants grow up acutely aware that the process of immigrating to the United States is difficult in the best of circumstances – for unauthorized migrants, the journey can be expensive, dangerous, and even life threatening. Because of this, many second-generation adolescents and young adults feel that they must honor their parents' sacrifices through high levels of achievement (Suarez-Orozco 1987; Fuligni 1997; Smith 2008) or by giving back to their families (Suarez-Orozco and Suarez-Orozo 1995) whether materially or by providing emotional support. Immigrants often come to the United States to seek the American Dream not only for them, but also for their children. This concept of the children of immigrants making good on their parents' sacrifice is also referred to as the "immigrant bargain (Smith 2008)." The immigrant bargain would not be as salient for third generation adolescents and young adults; they would not have this same sense of

indebtedness to their parents. The acculturation literature has often highlighted the shift away from familism and family cohesion that increasing acculturation tends to bring about in Latino families and later generations. In spite of this, Latinos in the third generation report strong familial ties (Fuligni et al. 1999), and even a moderate sense of familial obligation was correlated with positive emotional well-being (Fuligni and Pedersen 2002). Fuligni and Pedersen also suggest that family obligation is actually positive to young adults as it allows them to play a responsible role within their families (2002). Perhaps even low amounts of familism and family cohesion in the third generation could be beneficial to young adults.

Another aspect of familism is the emphasis on collectivism and collectivistic traditions (Fuligni, Tseng, and Lam 1999). This is in contrast to the individualism that is a part of mainstream (and traditionally, white) American culture. However, being close to family members, both geographically and emotionally is a value that is highly prized in Latino and Asian American families (Triandis 1990; Fuligni, Tseng, and Lam 1999). For example, a higher degree of family support and cohesion has been found to be associated with a lower amount of psychological distress, especially for people of color. Latino and African American schizophrenic patients with higher levels of family cohesion had lower levels of general emotional distress for both patients and their family members. Interestingly, this was not the case for the white patients in the study. The authors concluded, "Improving family relations may have a particularly beneficial impact […] for minorities (Weisman et al. 2005)." In pregnant Latinas, familism was positively correlated with feeling more supported and feeling less anxiety about their pregnancy; however, only in foreign-born Latinas was strong social support associated with higher birth weights (Campos et al. 2008). The authors suggest that U.S. born Latinas might see familism as something that has the potential to have negative side effects in addition to family

support – "familialism may be a source of undesirable difference from European American culture's emphasis on independence and separation from family (Campos et al. 2008)."

Findings about familism have mostly presented evidence of positive effects, although some studies have identified instances when familism had a negative effect (Desmond and Turley 2009). In research about education, familism has been found to mitigate negative experiences that students of color may experience (Ream 2005; Zhou and Bankston 1998). Familism has also been positively correlated with high school graduation (Furstenberg and Hughes 1995). However, high levels of familism have also been associated with lower rates of college enrollment (Desmond and Turley 2009; Turley, Desmond, and Bruch 2010). In this case, adolescents who have positive relationships with their parents are more likely to want to live at home during college.

In light of these findings, will high levels of familism in Latino families be associated with positive health outcomes? Family cohesion has been found to be positively associated with an increase in physical activity for adolescents (Ornelas et al. 2007), and familism and the presence of extended kin in a household (aunt, uncle, grandparent) are correlated with a lower risk of severely violent behavior (Estrada-Martínez et al. 2011). Family and friend support has also been shown to have a positive effect on self-rated physical and mental health (Mulvaney-Day et al. 2007). In this paper, I will analyze the relationship between familism and health outcomes. I will measure familism through a scale (Desmond and Turley 2009) that measures family warmth and parental cohesion, and will analyze the effect this has on health outcomes, measured by obesity, and a diagnosis of diabetes.

DATA

The National Longitudinal Study of Adolescent to Adult Health (Add Health) is a nationally representative study that investigates the "causes of health and health-related behaviors of adolescents and their outcomes in young adulthood" (Carolina Population Center 2008). Questionnaires were distributed to parents, school administrators, and students, and topics range from educational aspirations to social networks to health and nutrition. Add Health provides valuable information about nativity and parental countries of origin; other studies that have focused on the children of immigrants have been regional and not nationally representative. This study is longitudinal and follows respondents from early adolescence through their transitions to adulthood.

Independent Variables – Demographics and Controls, Parental Data

Wave I data was collected during 1994-1995. At Wave I, parental respondents provided information about use of public assistance. These variables, along with the respondent's education at Wave IV will be utilized to measure socioeconomic status.

In a series of questions, the parent was asked if any member of his/her household had received Social Security, Supplemental Security Income, Aid to Families with Dependent Children, food stamps, unemployment/worker's compensation, or a housing subsidy/public housing in the last month. I created a dichotomous variable for use of public assistance if the parent had indicated that someone in their household had participated in any of the programs.

Independent Variables – Demographics and Controls, Adolescent Data

An adolescent is considered first generation if they are foreign born, as well as both parents. If both parents are foreign-born and the adolescent is native born, the adolescent is considered second generation. Lastly, if both the parents and adolescent are US-born, the adolescent is considered third generation, or more accurately "third generation-plus." Future research utilizing Add Health respondents might be able to produce an accurate third generation, as the data currently available make no generational distinctions beyond the first and second. The later waves of Add Health include questions about the respondents' own children, and an Add Health Parent Study is planned that may include questions about the nativity of the respondent's grandparents. I will refer to the respondents who were born outside of the United States as the "first-generation" and the "1.5 generation" interchangeably. This is because the majority of foreign-born respondents can technically be considered "1.5 generation" because they were brought to the United States as children; however, but there are also respondents who could be described as members of the "1.75-generation" (those who migrated before the age of 5 – 32.1 percent of the sample) or the "1.25 generation" (those who migrate between the ages of 13-17 – 25.6 percent of the sample) (Rumbaut 2004). Respondents who migrated to the United States between the ages of 6 and 12 make up 42.3 percent of the sample.

The education variable is constructed using data provided by the respondent at Wave IV. Education is measured by four dichotomous variables – less than high school, high school diploma (or equivalent), some college, and a bachelor's degree or higher. Gender and age at Wave IV are the last control variables.

Independent Variables – Family Structure and Familism, Wave I

At Wave I respondents provided information about the residents of their household. Respondents provided data about their parents or caretakers and siblings. I created dichotomous variables for respondents with two-parent homes, respondents who lived with stepfamilies, and respondents living with single parents.

The measure for family cohesion is based on three items: (1) "How much do you feel that people in your family understand you?," (2) "How much do you feel that you and your family have fun together?", and (3) "How much do you feel that your family pays attention to you?" (Lopez Turley et al. 2010). Cronbach's alpha for this scale is .79.

The measure for closeness to parents is based on four items: (1) How close do you feel to your mother/father? (2) How much do you think she/he cares about you? (3) How much do you agree/disagree that your mother/father is warm and loving toward you? (4) How much do you agree/disagree that you are satisfied with the way your mother/father and you communicate with each other? The reliability coefficient for this item is .83.

Dependent Variable – Obesity

Measuring and studying obesity is important for several reasons. Carrying excess weight is a risk factor for many diseases that can affect quality of life and overall life expectancy, such as diabetes, hypertension, and heart disease (Hao and Kim 2009). More than 95% of Type II diabetes cases are attributable to overweight/obesity (Bouldin et al. 2006). Additionally, the cost of treating obesity-related comorbidities is very high, and the obesity rate indicates that taxpayers may need to spend a large amount for future healthcare costs if the overweight/obesity trend is

not reversed soon (Olshansky et al. 2005). In this chapter, obesity is measured by using body mass index (BMI) at Wave IV.

Respondents with a BMI under 18.5 are considered "underweight" – these responses are excluded, as being underweight carries with it health dangers and side effects that could be just as serious and harmful as being overweight or obese. The "not obese" category ranges from BMIs of 18.5 to 29.9. Those with BMIs equal or greater to 30 are considered obese. Utilizing BMI as a dependent variable to measure obesity does have certain drawbacks. BMI does not take into consideration muscle mass or body structure – therefore, very athletic people with large muscle mass may be considered "obese" by utilizing BMI alone. A more holistic and customized measure would be percentage of body fat. Secondly, BMI does not take childbearing history into consideration and does not make any distinctions for differences in ethnicity or age.

Dependent Variable – Diabetes

An increasing number of children are being diagnosed with Type II diabetes, which has been found to shorten life expectancy an average of twelve years (Manuel and Schultz 2004). Since Type II diabetes has been considered a disease of middle age, it is unclear how severe the effect on life expectancy would be for cases diagnosed in adolescence or early adulthood. Before 1992, only 4% of pediatric diabetes cases were Type II; in 1994, 16% of new pediatric diabetics were Type II (Deckelbaum and Williams 2001). In at least 10% of children with Type II diabetes life-threatening complications will occur by young adulthood (Olshansky et al. 2005). At Wave IV, the respondents disclosed whether they had ever been diagnosed with diabetes. Diabetes will be measured using a dichotomous variable.

METHODOLOGY

Using a series of logistic regressions, I will analyze the odds of being diagnosed with diabetes at Wave IV across generations, while controlling for demographic characteristics (gender and age), socioeconomic status, and immigrant generation in order to test my hypotheses. Model 1 adds the controls for generational status – Mexican-American second and third generation respondents. The reference category is Mexican-American first generation respondents. Model 2 adds the variables for familism and being obese at Wave IV, as obesity is often comorbid with diabetes. Model 3 adds controls for family structure; one for respondents living in a blended or stepfamily, and one for respondents living with a single parent. The reference category for these variables is a nuclear, two-parent family. Lastly, Model 4 adds the variables for socioeconomic status – the use of public assistance in a respondent's household at Wave I, and the respondent's education at Wave IV. The reference category for education is respondents who did not finish high school.

The objective of the second set of analyses is to calculate the odds of being obese at Wave IV. Models 1 through 4 are set up in the same order as the regressions analyzing the odds of being diabetic, however, these analyses add a diabetes diagnosis at Wave IV as a control in Model 2.

RESULTS

Table 3 examines the results of the logistic regression analyzing the odds of being diabetic at Wave IV. The first significant result appears in Model 2 – a higher family cohesion score is correlated with higher odds of being diagnosed with diabetes (OR=1.63, p=<0.10). The odds decrease slightly in Model 3 (OR=1.61), and then increase at Model 4 (OR=1.65, p=<0.10).

Model 4 adds the variables for respondent's education, and as expected, a higher level of completed education is correlated with a lower risk of being diagnosed with diabetes. Both respondents who have completed some college (OR=0.21, p=<0.05) and respondents with a college degree are less likely to be diagnosed with diabetes (OR=0.10, p=<0.05). None of the other results are significant, although at Model 4, the odds of second generation Mexican-Americans being diagnosed with diabetes are in the predicted direction (OR=0.63, p=NS), as are the odds for third generation-plus Mexican-Americans (OR=2.56, p=NS).

In table 4, the analysis focuses on the odds of being obese for respondents at Wave IV. In Model 1, Mexican-American second-generation respondents are more likely to be obese (OR=1.46, p=<0.10). However, in the next models this is no longer significant. The next variable that is significantly associated with obesity is family cohesion in Model 2 – higher levels of family cohesion are associated with a decreased risk of being obese at Wave IV (OR=0.81, p=<.10). These odds stay the same in Model 3, and then decrease and become more significant in the final model (OR=0.78, p=<0.05). In Model 4, high school graduates are more likely to be obese (OR=1.96, p=<0.10).

DISCUSSION AND CONCLUSION

The findings present some mixed results. First of all, the bivariate findings indicate that there is not a significant difference in obesity between non-Hispanic whites and Mexican-Americans at Wave IV. There also isn't a significant difference in educational attainment between non-Hispanic whites and Mexican-Americans, although the percentage of non-Hispanic whites with a bachelor's degree is slightly higher, while Mexican-Americans have a higher percentage of respondents who have completed some college. This could be due to the fact that

Mexican-Americans tend to finish college at later ages than non-Hispanic whites, and are more likely to be part-time students (Fry 2002). The last bivariate comparison of non-Hispanic whites and Mexican-Americans examines family structure at Wave I, and is statistically significant ($p=0.05$). The percentage of Mexican-American respondents living in a nuclear family as adolescents is slightly larger than for white respondents (63.2 percent to 62.5 percent, respectively); this trend is also true for single parent households. While under a quarter of white respondents live in a single parent home (24 percent), 29.9 percent of Mexican-American respondents live in a single parent household. The average age for non-Hispanic whites at Wave IV is 28.5, and 28.4 for Mexican-Americans. The bivariate generational analysis does not reveal any statistically significant results for either a diabetes diagnosis or obesity at Wave IV. However, second generation Mexican-Americans have the highest rate of obesity when compared to first and third-plus generation Mexican-Americans (41.3 percent), but the lowest rate of diabetes (1.67 percent). This is peculiar because obesity and diabetes are often related – it might be the case that some respondents are diabetic, but have not yet been diagnosed.

The multivariate analyses are similarly peculiar. I hypothesized that there would be a generational difference in degrees of familism – the first and second generation would be more likely to display high levels of familism, and that familism would have protective effects. However, Table 3 shows that instead of family cohesion being associated with lower odds of having been diagnosed with diabetes, the opposite is true. However, in the analysis for the odds of obesity, the relationship between family cohesion and obesity was in the predicted direction – family cohesion was protective against obesity, and the odds of being obese are reduced by 22 percent. There are a number of things that could explain these results. First of all, high levels of family cohesion might be associated with lower levels of self-care, which could manifest as

neglecting to go to the doctor. The argument could also be made that since families of a lower socioeconomic status are more likely to have higher rates of family cohesion and/or familism because they have less resources and therefore depend more on their families for social support these families would also have decreased access to health care services. Mexican-Americans who have high degrees of family cohesion or familism might find this stressful, which could manifest as physical illnesses. Lastly, the idea that familism might not only have positive effects but negative ones as well has been documented in a variety of ways (Desmond and Turley 2009; Desmond, Turley, and Bruch 2010). This may be another example of that.

Table 4.1. Selected independent and dependent variables from Wave IV.

	Wave II	
	Non-Hispanic White	Mexican-American
Weight		
Not obese	62.3%	63.4%
Obese	37.7	36.6
Education at Wave IV		
Less than high school	8.3	9.9
High school graduate	17.2	16
Some college	42.8	43.3
Bachelor's degree or higher	31.8	30.8
Family structure (from Wave I)		
Two-parent home	62.5*	63.2*
Stepfamily	12.6	7.9
Single parent home	24	28.8
Age	28.5	28.4

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 4.2. Dependent variables for Mexican-American adolescents by generation, Wave IV.

	Mexican-Americans		
	1.0 generation	2.0 generation	3.0 generation+
Weight			
Normal weight	68.1%	58.7%	63.1%
Obese	31.9	41.3	36.9
Chronic Illness			
Does not have diabetes	96	98.3	94.5
Has diabetes	4	1.67	5.5

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 4.3. Logistic regression coefficients for the odds of having diabetes at Wave IV, controlling for familism, obesity, family structure, use of public assistance, and education at Wave IV.

	Model 1	Model 2	Model 3	Model 4
Nativity by ethnicity				
Mexican 2nd generation	0.92	0.62	0.67	0.63
Mexican 3rd generation	3.19	2.40	2.48	2.56
(Ref: Mexican 1st generation)				
Demographics				
Female	0.97	1.41	1.40	1.27
Age	1.15	1.13	1.11	1.07
Familism				
Parental closeness		0.59	0.55	0.49
Family closeness		1.63+	1.61+	1.65+
Weight				
Obese at Wave IV		2.39	2.42	2.24
(Ref: Not obese at Wave IV)				
Family structure				
Stepfamily			0.37	0.39
Single parent			1.58	1.83
(Ref: Two-parent family)				
Socioeconomic status				
Welfare				0.73
Education at Wave IV				
High school or equivalent				0.80
Some college				0.21*
College graduate				0.10*
(Ref: Less than high school)				

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

Table 4.4. Logistic regression coefficients for the odds of being obese at Wave IV, controlling for familism, diabetes, family structure, use of public assistance, and education at Wave IV.

	Model 1	Model 2	Model 3	Model 4
Nativity by ethnicity				
Mexican 2nd generation	1.46+	1.42	1.43	1.45
Mexican 3rd generation	1.23	1.16	1.16	1.23
(Ref: Mexican 1st generation)				
Demographics				
Female	0.87	0.94	0.94	0.98
Age	1.07	1.07	1.07	1.07
Familism				
Parental closeness		1.22	1.22	1.32
Family closeness		0.81+	0.81+	0.78*
Diabetes				
Diagnosed with diabetes by Wave IV		2.47	2.45	2.26
(Ref: Not diagnosed with diabetes)				
Family structure				
Stepfamily			0.99	0.91
Single parent			1.05	0.99
(Ref: Two-parent family)				
Socioeconomic status				
Welfare				1.34
Education at Wave IV				
High school or equivalent				1.96+
Some college				1.60
College graduate				0.85
(Ref: Less than high school)				

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

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CHAPTER 5

CONCLUSION

The summer of 2009 was marked by intense debate about President Obama's proposed Affordable Care Act – "Obamacare," as it was pejoratively known – and fears that socialized medicine would bring about death panels (Rutenberg and Calmes 2009) and bottom of the rung healthcare. Neither the death panels nor the socialized medicine materialized, and now that the Affordable Care Act (ACA) has been implemented, it seems as though the most important results are the increased access to health care services for people who were previously uninsured, and savings in healthcare costs for the American people. The decreased healthcare spending is particularly important given that in 2005, the American economy was projected to spend about $70 billion to $100 billion treating obesity and co-morbid conditions and diseases, and these costs were projected to rise as children and adolescents who were obese grew into young adulthood (Olshansky et al. 2005).

The financial cost is not the only concern when it comes to dealing with obesity, of course – the largest area of concern is the effect that obesity and co-morbid conditions will have on adolescents and young adults. Type II diabetes has always been considered a disease of adulthood, and an increasing number of children are being diagnosed with Type II diabetes. How will the disease affect their development and their life expectancy? This dissertation uses Add Health data to examine these matters for young adult Mexican-Americans, who are particularly interesting for several reasons. First, recent Mexican immigrants are increasingly settling in new destinations (Light 2006) – destinations that are not accustomed to sizeable populations of immigrants. Secondly, Mexican-Americans are a diverse group, and it is important to understand how acculturation will impact their health outcomes. Are there protective factors that can

influence positive health outcomes? Lastly, Add Health provides a unique opportunity to follow Mexican-American respondents from adolescence to adulthood. A Wave V is planned which will include data about the respondent's children, which is particularly exciting as this would be a chance to study a true third generation.

My dissertation fills a gap in the current research about the Latino health paradox by utilizing a longitudinal, nationally representative data set to examine Mexican-Americans at four developmentally important time periods. In Chapter 2, I sought to identify generational differences in self-reported general health and obesity. I found that at Wave II (when the respondents are between the ages of 12-21), there are not significant differences between generations for general health or obesity. However, at Wave III there is a significant difference – the first generation has the lowest percentage of obesity, which is in line with my hypotheses. The second generation's rate of obesity increases by ten percent – 29.1% of the second generation is obese. Finally, 39.1% of third generation-plus respondents classified as obese. In my multivariate analysis, I find that females are more likely to report poor health than males, and respondents who are obese are also more likely to report poor health. At Wave III, respondents who are third generation-plus are more likely to be obese, until obesity at Wave II is controlled for.

Chapter 3 examined the relationship between immigrant generation and nutrition. I hypothesized that first and second generation Mexican-Americans will be more likely to have more "nutritious" eating habits – in this case, I used fruit and vegetable consumption to measure "good" nutrition. I also hypothesized that first and second generation respondents would be more likely to eat dinner with their families frequently, and that they would be less likely to consume fast food frequently. The first generation did have the highest consumption rates of vegetables

and combined fruits and vegetables; this finding was not surprising. Another finding that confirmed one of my hypotheses was that respondents who frequently consumed fast food had higher odds of being obese; I also found that third generation-plus Mexican-Americans were more likely to be obese.

Chapter 4 examined the effects of familism – specifically, family cohesion, and parental closeness. Will familism protect against diabetes and obesity? On a bivariate level, Interestingly, family cohesion was actually associated with higher odds of being diagnosed with diabetes. However, when I tested my hypotheses for the odds of being obese, familism did indeed seem to have a protective effect against obesity.

LIMITATIONS AND FUTURE RESEARCH

Perhaps the greatest limitation in this dissertation is a very imprecise third generation-plus variable. This is a function of the design of Add Health: respondents do not answer any questions about their grandparents' nativity, so there is no way of determining their true generational status. In addition to a subsequent wave of Add Health, there is also a planned Add Health Parent Study. This could prove to be very interesting as well – it could provide more details about the respondent's home life as adolescents and young adults, and it would provide another Mexican-American generation to examine. Another interesting factor that I was unable to include in my analysis is legal status. There are no questions about documentation or citizenship in Add Health (although obviously someone who is born in the US is automatically a citizen, so all second generation respondents are not undocumented), so it is not possible to determine the effect that being undocumented would have on health. This could be a variable that would have a great effect on someone's health: both because of the stress that those who are

undocumented struggle with, and because people who are undocumented have decreased access to healthcare services.

As far as dependent variables are concerned, BMI can be a controversial measure of obesity. BMI does not take into consideration ethnicity or childbearing history, and very muscular people can be technically considered obese. Body fat percentage would be a more adequate way to measure obesity, but that is not available in the data. However, in future research, I plan to utilize additional measures of health. For example, Wave IV data includes waist measurements I could use to calculate waist-to-height ratio, which researchers have used to measure obesity in addition to utilizing BMI. Future research should seek to improve measures of generation, integration status, and obesity.