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**I HAVE MORE IMMEDIATE CONCERNS THAN BODY WEIGHT: THE  
RELATIONSHIP BETWEEN MEXICAN-AMERICAN STRESSORS AND WEIGHT  
PERCEPTIONS**

A Thesis in

Sociology and Demography

by

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## ABSTRACT

Recent work has shown that, among Mexican-American men, recently-arrived immigrants have the lowest tendencies to self-classify as overweight (net of BMI). Needs-based motivation theory suggests that there are more immediately pressing stressors than body weight issues. I examine the notion that newly-arrived Mexican men are at a disadvantage of being able to identify their overweight status because new immigrants experience a plethora of stressors that take precedence over body weight issues. Using data from the National Health and Nutrition Examination Survey (1999-2007), I explore the relationship of various types of stressors (immigration, economic, food insecurity, and medical conditions) and weight perceptions. Increases in the economic stressors (poverty and household crowding) decreased the odds of self-classifying as overweight. Poverty and household crowding were found to partially explain newly-arrived immigrant men's low tendency to self-classify as overweight. Some proponents may support the view that is the individuals' responsibility to exercise and take care of their body weight. However, society must help overweight individuals who do not perceive themselves as overweight because they are less likely to attempt to lose weight.

## TABLE OF CONTENTS

List of Figures.....	v
List of Tables.....	vi
Acknowledgements.....	vii
Chapter 1	
I Have More Immediate Concerns than Body Weight: The Relationship between Mexican-American Stressors and Weight Perceptions	
Introduction.....	1
Mexican-American Weight Perceptions.....	4
Problem Immediacy.....	5
Hypotheses.....	8
Stressors.....	8
Methods.....	11
Variables.....	11
Data.....	13
Sample.....	13
Analyses.....	14
Results.....	13
Hypothesis 1.....	19
Hypothesis 2 and 3, Entire Sample.....	20
Hypothesis 2 and 3, Overweight or Obese Sample.....	23
Discussion.....	26
References.....	30

**LIST OF FIGURES**

Figure 1. Percentage Who Classified Themselves as Overweight by Measured Weight and U.S. Exposure Group.....18

**LIST OF TABLES**

Table 1A: Descriptive Statistics of Analytic Sample by U.S. Exposure Group.....	15
Table 1B: Descriptive Statistics of Analytic Sample by U.S. Exposure Group, Age-adjusted Measures.....	16
Table 2: Logic Regression Models Predicting Overweight Self-Classification, Entire Sample.....	21
Table 3: Logic Regression Models Predicting Overweight Self-Classification, Overweight/Obese Sample.....	24

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## Chapter 1

### I Have More Immediate Concerns than Body Weight: The Relationship between Mexican-American Stressors and Weight Perceptions

#### Introduction

Obesity is a topic of large interest in America due to its life threatening health consequences, increasing rates, and overrepresentation among minorities. High body mass indices (BMI)<sup>1</sup> have been associated with diabetes, hypertension, and heart disorders among many other health problems (FX. 1991; Must, Spandan, Coakley, Field, Colditz, and Dietz 1999). Between 1994 and 2006, the prevalence of obesity among U.S. adults rose from 23% to 34% (World Health Organization 2011), and obesity is especially prevalent among minority groups such as Mexican Americans for both genders when compared to Non-Hispanic whites<sup>2</sup> (hereafter referred to as whites) (Flegal, Carroll, and Ogden 2010). Mexican-American obesity requires special attention because this group is currently the largest Hispanic minority in the United States, representing 10.3% of the U.S population (US Census Bureau 2010).

The study of weight perceptions is a crucial component of understanding obesity prevalence. Weight perceptions, or whether a person considers him/herself to be overweight, can both ameliorate *and* aggravate the health consequences of obesity. Individuals can classify themselves as underweight, normal weight, or overweight regardless of their actual measured weight. On the positive side, perceiving oneself to be overweight when one is, in fact,

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<sup>1</sup> Body Mass Index is measure of overweight derived from height and weight. BMI= mass (kg)/(height (m) squared). *Centers for Disease Control and Prevention. 2011. "About BMI for Adults." vol. 2011. Atlanta, GA: Centers for Disease Control and Prevention.*

<sup>2</sup> As of 2008, 45% of Mexican-American and 33% of white women were obese. Among men, 36% of Mexican Americans and 32% of whites were obese. *Flegal, Katherine , Margaret Carroll, and Cynthia Ogden. 2010. "Prevalence and Trends in Obesity Among US Adults, 1999-2008." JAMA 303:235-241.*

overweight by BMI standards, is associated with proactive health management and intentions to lose weight (Post, Mainous, Gregorie, Knoll, Diaz, and Saxena 2011). Additionally, overweight individuals who lose weight lower their risks of associated chronic conditions like diabetes, hypertension, and other lipid disturbances (Sjöström, Lissner, Wedel, and Sjöström 1999). On the negative side, however, perceiving oneself to be overweight has been associated with unhealthy dieting, drastic weight fluctuations, and psychological consequences including depression (Atlantis and Ball 2008; Chang and Christakis 2003; Kunkel 1987; Mann, Tomiyama, Westling, and Lew 2007; Perez, Voelz, Pettit, and Joiner 2002; Raudenbush and Zellner 1997; Strauss 1999). Since obesity is quite prevalent in Mexican Americans (Flegal, Carroll, and Ogden 2010), the health benefits of recognizing an overweight status may outweigh the psychological costs among this population.

Despite their high prevalence of overweight and obesity (Flegal, Carroll, and Ogden 2010), Mexican-Americans, especially men, have among the lowest odds of classifying themselves as overweight. Past literature consistently shows men to be much less likely than women to say they are overweight, (Ahluwalia, Ford, Link, and Bolen 2007; Van Hook, Altman, and Gonzalez in progress) (Martin, May, and Frisco 2010), so it is no surprise that Mexican-American men are less likely to classify themselves as overweight than Mexican-American women. However, a recent study found a puzzling pattern in which *newly-arrived* Mexican immigrant men had the lowest tendencies to classify themselves as overweight (net of BMI) among a sample of both Mexican residents and Mexican Americans net of BMI (Van Hook, Altman, and Gonzalez in progress). In other words, newly-arrived Mexican immigrant men were less likely to say they were overweight than even their peers in Mexico. This raises broader questions about the factors contributing to weight perceptions, as the unique pattern among recently-arrived men cannot be thoroughly explained by residence length in the United States.

One possible explanation for the unique pattern is that newly-arrived immigrants experience unique life circumstances in which they encounter a plethora of stressors involving their economic and migratory adjustment to the new American environment. Common stressors and hardships for newly-arrived Mexican immigrants include not speaking English, having an unauthorized or ambiguous legal status, poverty, unemployment/working low hours household crowding, and food insecurity (Cervantes, Padilla, and Salgado de Snyder 1991; Krivo 1995; Miranda and Matheny 2000; Padilla, Cervantes, Maldonado, and Garcia 1988; Rodriguez, Myers, Binham Mira, Flores, and Garica-Hernandez 2002; Schill, Friedman, and Rosenbaum 1998; Smart and Smart 1995). Newly-arrived Mexican immigrants have been shown to have more of these stressors than more assimilated Mexican-Americans (Chilton, Black, Berkowitz, and Casey 2008; De Jong and Madamba 2001; Kuyper, Espinosa-Hall, Lamp, Martin, Metz, Smith, Townsend, and Kaiser 2006). Additionally, these stressors seem to take a larger psychological toll on men among Hispanic immigrants (Padilla, Cervantes, Maldonado, and Garcia 1988).

The main idea explored here is that Mexican immigrant men in the U.S. have problems that are more immediately pressing than being overweight, and as a consequence, they are less likely to report themselves as overweight even if, by objective BMI standards, they are overweight. Although I focus on Mexican-American men, my research has broader implications because it explores the possibility that having immediate problems (like not speaking English, poverty, and food insecurity) may reduce the tendency to recognize other seemingly less immediate troubles like body weight. This may help explain newly-arrived Mexican immigrant men's low chance of self-classifying as overweight, but it could also apply more generally to other populations. The present study will be exploring this explanation.

My current study goes beyond past literature by introducing immediate problems such as immigration, economic hardship, food insecurity, and chronic medical condition stressors as determinants of weight perceptions. This paper focuses on three specific research questions: (1)

do Mexican immigrants have more stressors than U.S.-born Mexican Americans and U.S.-born whites? (2) What is the association between stressors and weight perceptions? And, (3) do stressors mediate the relationship between exposure to the U.S. and weight perceptions? This paper is structured in the following manner. First, I will review the literature on Mexican-American weight perceptions. Second, I will argue that some problems may be more immediately pressing than overweight. Third, I will give an overview of stressors that reflect immediate problems. Lastly, I will analyze and interpret empirical results in order to evaluate these research questions.

### **Mexican-American Weight Perceptions**

It is well established that Mexican origin women with more exposure to the U.S. are more likely to self-classify as overweight (Ahluwalia, Ford, Link, and Bolen 2007; Cachelin, Monreal, and Juarez 2006; Johnsen, Spring, Pingitore, and Somerfeld 2002; Van Hook, Altman, and Gonzalez in progress). Using bi-national datasets, researchers have been able to analyze weight perceptions across all stages of the migration and integration process by studying Mexican Americans and Mexicans residing in Mexico as well. Among women, the odds of perceiving oneself to be overweight (net of BMI) increases in a stepwise fashion as exposure to the United States increases, that is from low among Mexican residents, to steadily higher odds among newly-arrived immigrants, settled immigrants, and finally the highest odds among U.S.-born Mexican Americans and U.S.-born whites (Van Hook, Altman, and Gonzalez in progress).

The relationship of exposure to the U.S. and weight perceptions has been less clear among men. Mexican-American weight perception studies with male samples are rare. Among a mixed sample of both men and women, Ahluwalia et al. (2007) showed that those who spoke English well were more likely to perceive themselves to be overweight. However, the relationship between language and weight perceptions disappeared when men were analyzed separately. Bi-national data studies have provided more detailed insight to weight perceptions among men. The

bi-national dataset study showed that, when considering Mexican residents as well, newly-arrived immigrant men had the lowest odds of perceiving an overweight status (Van Hook, Altman, and Gonzalez in progress). The stepwise consistent positive effect of U.S. exposure on tendency to classify as overweight found among women was not present among men. This was considered an anomalous finding that merits further exploration of the underlying factors of weight perceptions.

### **Problem Immediacy**

The existence of a problem like overweight, as measured by BMI, does not necessarily mean that an individual will perceive it. Human needs and motivation theory posits that there are some types of problems that are of more immediate concern to humans than overweight. Problems that are threatening to human survival and safety are arguably the most immediate. Since humans tend to focus on solving one task at a time (Tallman, Leik, Gray, and Stafford 1993), individuals choose to deal with the most immediate concerns first. Thus, problems with higher immediacy are more likely to be recognized and dealt with (Tallman, Leik, Gray, and Stafford 1993).

First introduced by Maslow (1943), the Maslow hierarchy of needs suggests that humans assign more priority to needs that are essential for survival and safety. In other words, humans tend to meet their immediate needs before addressing other less immediate needs such as those involving self-esteem concerns like having a positive body image. Needs essential for survival include physiological necessities such as food, body heat, water, and sleep. Safety needs more broadly refer to resources (e.g. shelter and employment) that facilitate meeting the physiological needs.

More contemporary research on needs-based motivations has expanded on the hierarchy of needs; nevertheless, physiological and safety needs continue to be viewed as the most immediate human needs. Most of the contemporary theoretical advances have been in

understanding non-immediate human needs (status and esteem), but I will not elaborate on these because the focus here is on immediate needs. A recent theoretical reevaluation of the hierarchy of needs found that empirical findings in evolutionary psychology since Maslow (1943) continue to indicate that problems involving survival and safety are viewed as problems of higher priority than the problems related to status and esteem (Kenrick, Griskevicius, Neuberg, and Schaller 2010). Another contemporary theoretical piece on needs-based motivations clarified that physiological needs and psychological needs, like status and esteem, are different. The former are more difficult to ignore because humans have strong biological pain and ache responses when physiological needs are not met (Deci and Ryan 2000).

Even though high body mass indices have been linked to negative health outcomes (FX. 1991; Must et al. 1999), overweight is arguably not an immediate problem because it does not have immediate consequences on health. Obesity is a slow killer that most often leads to death through more lethal health risk factors such as heart disorders and diabetes (Mokdad, Ford, Bowman, Dietz, Vinicor, Bales, and Marks 2003). According to the most recent government data, obesity itself is not considered one of the top ten underlying causes of deaths in the United States (Heron 2011). Obesity-related health risk factors such as heart disorders and diabetes are more proximate factors that are listed instead of obesity and do appear on the top ten list. There are people who give their body weight much importance, but these people may not have any other concerns that are more pressing than overweight in their everyday lives.

Aside from overweight, there are some medical conditions that have more immediately apparent consequences on health. According to Center for Disease Control National Vital Statistics Reports, the top five leading causes of death include disease of heart, malignant neoplasms (cancer), cerebrovascular diseases, chronic respiratory diseases, and accidents (Heron 2011). People can learn from a media source or their physician what the leading causes of death are. Additionally, people with one or more of these conditions may have had conversations with

their physician about the seriousness of their condition, may take medication for treatment, and may feel less physically fit or face more physical limitations than those without a chronic health problem. Given the immediate impact of chronic health conditions on health and lifestyle, I speculate that individuals with these medical conditions may perceive themselves as having more immediate problems than being overweight. Given this potential distraction, they may even be less likely to say they are overweight even if they are, by objective measures, overweight.

Although newly-arrived immigrants tend to be healthier than natives, Hispanic immigrants often have unmet immediate needs that tend to take priority over other needs (such as building self esteem), and they regularly report these immediate needs as their main sources of stress. Common stressors among immigrant adults include financial shortcomings, food insecurity, fear of deportation, and lack of understanding of English and American culture (Cervantes, Padilla, and Salgado de Snyder 1991; Miranda and Matheny 2000; Padilla, Cervantes, Maldonado, and Garcia 1988; Rodriguez et al. 2002; Smart and Smart 1995). Of these, food insecurity may constitute the most immediate stressor because food is a direct physiological need. By contrast, body image stressors are not commonly reported by Hispanic *adult* immigrants, suggesting that this is not an important concern for them.

Even though not explored in this paper, there are alternate explanations for newly-arrived immigrants' low tendency to classify as overweight. These explanations are worth mentioning but could not be tested because the required variables were not available in the survey data used for this project. Newly-arrived Mexican immigrants often live in Spanish speaking enclaves that are isolated from Anglophone mainstream (Bauer and Epstein 2005). Anti-obesity campaigns may not be reaching these isolated enclaves. Like socioeconomic disadvantages (Berkman and Kawachi 2000), linguistic disadvantages may be putting immigrants in an environment of poor health literacy. Another possibility is that immigrant men in the U.S. lack a wife in their home to point out their weight gains. Many immigrant men are separated from their wives who stay

behind in Mexico (Gneu-Sotelo 1992; Lindstorm and Giorguli Saucedo 2002). A large portion of these immigrants may live with other men who are less concerned about their body image than their wives.

Overall, there are some signs that immediate needs may be overshadowing the overweight concerns of newly-arrived immigrants. It has been demonstrated that immigrants in the U.S. have more stressors related to immigration, economic wellbeing, and food insecurity than the native born (Cervantes, Padilla, and Salgado de Snyder 1991; Krivo 1995; Miranda and Matheny 2000; Padilla, Cervantes, Maldonado, and Garcia 1988; Rodriguez et al. 2002; Schill, Friedman, and Rosenbaum 1998; Smart and Smart 1995). Therefore, I speculate that immigrants, particularly the newly arrived, are more likely than natives to be concentrating their attention on these immediate stressors and may therefore be less likely to recognize themselves to be overweight, even if they are by objective measures.

### **Hypotheses**

The ideas discussed above led me to formulate the following hypotheses:

*Hypothesis 1: Mexican immigrant men, particularly new arrivals, experience more stressors than U.S.-born Mexican Americans, and U.S.-born whites.*

*Hypothesis 2: An increase in immigration, economic, food insecurity and medical condition stressors, particularly food insecurity, decreases the probability of classifying as overweight.*

*Hypothesis 3: Immigration, economic, food insecurity, and medical condition stressors explain the relationship between exposure to the U.S. and classifying as overweight.*

### **Stressors**

To test these hypotheses, it is crucial to identify key stress indicators that likely reflect unmet immediate needs. Although there is no general consensus on a comprehensive definition of stress, it is agreed that stress is a psychological and/or physiological response to demands put on the individual (Strickland 2001). Given that stress is a psychological and physiological response,

it can be quite difficult to measure this concept. Instead of using direct psychological or physiological measures of stress, social scientists often use indirect indicators of stress. I selected immediate stress indicators available in the National Health and Nutrition Examination Survey (NHANES), the data I used in this study, namely stressors related to immigration (ambiguous legal residence status and inability to speak English), economic insecurity (poverty, household crowding, and unemployment/working low hours), household food insecurity, and chronic medical conditions.

There are some types of stressors that are unique to the immigration experience. Jasso et al. (2005) have identified two subtypes of immigration stressors: *visa* stress and *migration* stress. Visa stress refers to stressors involved with obtaining a U.S. legal residence status. Migration stressors are those related to process of moving from Mexico to the United States excluding visa stressors. For the purpose of this study, I will be referring to both as immigration stressors. Two common immigration stressors that may reflect immediate needs are language and legal residence status. Several studies have documented that not being able to speak English increases stress (Miranda and Matheny 2000; Rodriguez et al. 2002; Smart and Smart 1995). For people residing in the U.S., not speaking English may increase the difficulty of navigating the American mainstream environment. Immigrants who don't speak English can have problems asking for traffic directions, finding items in a grocery store, reading utility bills, and interacting with English-only speakers such as doctors and employment supervisors. Additionally, high levels of stress have also been linked with an unauthorized status among immigrants because they have a fear of deportation (Cervantes, Padilla, and Salgado de Snyder 1991; Yoshikawa and Kalil 2011). Many Mexican immigrants who are not citizens of the US may be unauthorized immigrants. It is estimated that 80-85% of Mexican immigrants with less than 10 years of residence are unauthorized (Passel and Cohn 2009).

Beyond immigration-related stressors, anyone may experience stressors triggered by unmet economic needs. Unemployment has been shown to be related to increased stress according to a recent theoretical review (Bartley 2007). Working a low amount of hours, as well, may be increasingly stressful especially for immigrants because sending remittances is a central goal for them (Stark 2009). Another dimension reflecting economic needs, poverty, has been linked to increases in stress (Creighton, Hannan, and Creighton 1991; Evans and English 2003; Kasardaa 1993). Additionally, living in a crowded residence has been associated with increased stress (Aiello, Baum, and Gormley 1981) especially when the crowding is an obstacle to individuals' goals (Fleming, Baum, and Weiss 1987).

Another stressor that can be experienced by anyone, regardless of migratory status and place of residence, is having chronic medical conditions that pose immediate threats to health. Higher levels of stress have been associated with having chronic medical conditions such as heart and respiratory problems even when controlling for social-demographics (Shih and Simon 2008). These stress and chronic medical conditions relationships have not only been found in the United States but also in the Netherlands suggesting that this relation may be found among many human cultures (Ormel, Kempen, and Penninx 1997).

Finally, a stress indicator that reflects a direct physiological unmet need is food insecurity (Deci and Ryan 2000; Kenrick, Griskevicius, Neuberg, and Schaller 2010; Maslow 1943). Not having enough food to eat is stressful because humans simply cannot survive without food. Having food insecurity has been linked with higher stress when controlling for demographics, drug use, and domestic violence (Helflin, Siefert, and Williams 2005; Vozoris and Tarasuk 2002; Weigel, Armijos, Posada Hall, and Ramirez 2007; Whitaker, Phillips, and Orzol 2006).

## Methods

### Variables

The dependent variable in hypothesis 2 and 3, weight perception, was measured with the survey question: *How do you consider your weight?* Response options were: a) overweight, b) underweight, or c) about the right weight. These options were dichotomized to represent an overweight evaluation (=1) versus about the right weight or underweight evaluation (=0).

Stressor measures were used as the dependent variables for hypothesis 1 and independent variables in hypotheses 2 and 3. Immigration stressors were coded as dichotomous variables indicating whether the respondent did not Speak English or was not a U.S. citizen. The economic stressors included poverty, household crowding, and employment status. Poverty was coded based on the ratio of family income to poverty provided by NHANES and was collapsed into four categories: not in poverty (ratio  $\geq 1$ ), in moderate poverty ( $1 > \text{ratio} \geq .5$ ), in deep poverty (ratio  $< .5$ ), and the fourth category was coded as missing poverty data. A crowded household was defined as having one or more persons per room<sup>3</sup>. Only 4.2% of the analytic sample resided in a crowded household. The substantive conclusions of this paper were the same when the crowded household threshold (1 or more persons per room) was slightly modified in either direction. Employment status was divided into only two categories, unemployed/working low hours ( $\leq 20$  hours) and working  $\geq 21$  hours in order for these to have enough cases<sup>4</sup> for a robust analysis. NHANES pre-constructed a household food insecurity scale from a series of 10 questions based on a measure recommended by United States Department of Agriculture (Bickel, Nord, Price, Hamilton, and Cook 2000). This food insecurity scale has four categories: 1 = full food security, 2=marginal food security, 3= food insecure without hunger and 4= food insecure with hunger.

<sup>3</sup> Bathroom is not counted as a room by NHANES. The living room and kitchen are counted as rooms.

<sup>4</sup> Newly-arrived immigrants had only 3 unemployed respondents. When combining unemployed respondents with those who were working 20 or less hours, the cases added up to 46 for newly-arrived immigrants.

Lastly, a chronic medical condition scale (0-13) was constructed by adding one unit for having a history of any of the following: asthma, blood transfusion, trouble seeing with glasses, arthritis, heart failure, coronary heart disease, angina / angina pectoris, heart attack, stroke, emphysema, bronchitis, liver conditions, and cancer.

Race/ethnic groups by duration of U.S. residence were used as the set of independent variable categories for all the hypotheses. For the sake of simplicity, these groups will be referred to as U.S. exposure groups. Anyone who reported being of Mexican origin in the NHANES demographic questionnaire is considered a Mexican American. Mexican Americans were divided into three groups based on nativity and length of U.S. residence: newly-arrived immigrants (0-9 years), settled immigrants (10 or more years), and U.S.-born Mexicans. Finally, U.S.-born respondents who reported themselves as white and non-Hispanic were categorized as U.S.-born whites.

Anthropometric, social-demographic, and health related variables were used as control variables because of their known associations with both the outcome and the key independent variables (Ahluwalia, Ford, Link, and Bolen 2007; Martin, May, and Frisco 2010; Van Hook, Altman, and Gonzalez in progress). Age was divided into four categories: 25-34, 35-44, 45-54, and 55-64 in the same manner as the bi-national study (Van Hook, Altman, and Gonzalez in progress). Education was categorized as no high school diploma, high school diploma, and some college. The anthropometric controls, BMI and waist circumference (Kimm, Obarzanek, Barton, Aston, Similo, Morrison, Sabry, Schreiber, and McMahon 1996), were measured in the examination portion of NHANES and were used as continuous measures. Smoking status was controlled for and divided into three categories (never smoked, current smoker, and former smoker) due to its known association with weight and dieting behaviors (French and Jeffrey 1995). Finally, a dichotomous control variable was created to signal whether respondents had visited a doctor or health care professional in the past year because overweight people who are

told they are overweight but physician are more likely to classify as overweight (Post et al. 2011).

#### Data

Data from five waves (1999/2000, 2001/2002, 2003/2004, 2005/2006, and 2007/2008) of the continuous National Health and Nutrition Examination Survey (NHANES) were pooled for analysis. NHANES is a nationally representative, cross-sectional study of the U.S. population conducted by the Center for Disease Control and Prevention. The survey consists of two components: a questionnaire that collects socio-demographic data and an examination by a trained technician to collect anthropometric and bio-markers of health. Respondents had the option of answering NHANES questionnaires in Spanish or English. Data from multiple waves were pooled to ensure adequate sample sizes for Mexicans by duration in the United States.

#### Sample

The population universe of interest is limited to Mexican origin and U.S.-born white men of ages 25 to 64 residing in the United States. The sample was limited to this age range because this same range was used by the bi-national study that identified newly-arrived immigrant men's low tendency of self-classifying as overweight (Van Hook, Altman, and Gonzalez in progress). People of Mexican origin include both foreign and U.S. born. Underweight (BMI < 18.5) survey participants (N=37) were dropped because the meaning of the outcome (classifying oneself as overweight) is substantively different between underweight and normal/overweight individuals. Underweight respondents who perceive an overweight status may suffer from disordered eating or some other related psychological disorder (Atlantis and Ball 2008).

A small portion of the sample of interest had missing data. After exclusions based on race, ethnicity, gender, nativity, age, and weight status, the sample of interest consisted of 4,981 cases. Of these, less than one percent (N=13) had missing data on the dependent variable, weight perception, and an additional 606 cases had missing data on at least one of the independent

variables. After applying the sample of interest restrictions and dropping cases with missing data, 4,362 cases remained in the final analytic sample. A portion of the final analytic sample (N = 232) had poverty variable missing values, but these cases were kept for the quantitative analysis.

### Analyses

To evaluate **Hypothesis 1** (*Mexican immigrant men, particularly new arrivals, experience more stressors than, U.S.-born Mexican Americans, and U.S.-born whites*), I ran t-tests to assess whether there were differences in stressors between newly-arrived immigrants and the rest of the U.S. exposure groups. **Hypothesis 2** posits that *an increase in immigration, economic, food insecurity, and medical condition stressors decreases the probability of classifying as overweight*. To test this idea, I estimated logistic regression models to assess the associations between stressors and weight perception (1=overweight, 0=about the right weight or underweight). Key control variables reflecting actual weight (BMI, BMI squared, and waist circumference) were included in all logistic regression models. Finally, to test **Hypothesis 3** (*Stressors explain the relationship of exposure to the U.S. and classifying as overweight*), I used normal theory mediation tests<sup>5</sup> to assess whether stressor mediation is present (Hayes 2012). I programmed, ran, and weighted all my analyses in Stata 12.1- except for the mediation tests which were executed in SAS 9.3. All regression models were run on the full sample as well as on the subsample of overweight and obese men. These analyses were weighted using the examination weights provided by NHANES.

### Results

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<sup>5</sup> Initially I considered a Sobel mediation test, but this method cannot be used for complex regression models that have a dichotomous dependent variable and multiple continuous mediator variables (food insecurity and medical conditions). Hayes (2012) has provided a SAS macro and manual that uses normal theory mediation tests which can handle these methodological challenges.

Table 1A : Descriptive Statistics of Analytic Sample, by U.S. Exposure Groups  
(Unadjusted Means)

	Mexican Newly- arrived Immig.	Mexican Settled Immig.	US-born Mexican Americans	US-born Whites
<b>Sample size (N)</b>	316	640	481	2,926
<b>Classified Self as Overweight (%)</b>	26.2	48.7 *	59.0 *	56.8 *
<b>Measured BMI (Mean)</b>	26.9	28.6 *	29.9 *	28.6 *
BMI Standard Deviation	3.8	4.5 n/a	5.8 n/a	5.6 n/a
<b>Age (%)</b>				
25 to 34	64.4	26.6 *	38.4 *	23.3 *
35 to 44	25.0	40.8 *	28.4	27.4
45 to 54	8.3	22.9 *	21.4 *	30.6 *
55 to 64	2.4	9.7 *	11.9 *	18.7 *
<b>Married (%)</b>	63.1	75.9 *	62.4	68.0
<b>Education (%)</b>				
No High School Degree	70.9	69.9	23.8 *	11.2 *
High school Degree	18.2	15.1	27.0 *	27.1 *
Some College	10.9	15.0	49.2 *	61.7 *
<b>Has Visited Doctor (%)</b>	36.2	53.5 *	71.6 *	77.5 *
<b>Smoking Status (%)</b>				
Current Smoker	29.7	26.6	26.8	29.3
Former Smoker	21.5	27.6 *	24.5 *	27.6 *
Never Smoked	48.8	45.8	48.7	43.1 *
<b><u>ECONOMIC STRESSORS</u></b>				
<b>Crowded Household Resident (%)</b>	69.8	53.6 *	15.6 *	4.7 *
<b>Poverty Status (%)</b>				
Above Poverty Threshold	51.8	68.6 *	83.9 *	89.3 *
In Moderate Poverty	25.8	20.7	9.3 *	4.6 *
In Deep Poverty	15.4	4.7 *	3.4 *	1.8 *
Missing data	7.0	6.0	3.4	4.4 *
<b>Not Working/ Working Low Hours</b>	10.6	14.1	22.9 *	22.1 *
<b><u>IMMIGRATION STRESSORS</u></b>				
<b>Non-English Speaker (%)</b>	96.3	68.2 *	4.2 *	0.0 *
<b>Non-U.S. Citizen (%)</b>	87.2	58.6 *	0.0 *	0.0 *
<b><u>FOOD INSECURITY LEVEL</u></b>	2.0	1.8 *	1.4 *	1.2 *
<b><u>TOTAL MEDICAL CONDITIONS</u></b>	0.3	0.4 *	0.6 *	0.8 *

Source: NHANES (1999-2007)

Sample: Non-underweight adult men ages 25-64 residing in the U.S.

Includes only Mexican origin and U.S. born non-Hispanic white men.

\* p<.05 (Significantly different than newly arrived immigrants, T-Test)

Table 1B : Descriptive Statistics of Analytic Sample by U.S. Exposure Groups  
(Age-Adjusted Means)

	Mexican Newly- arrived Immig.	Mexican Settled Immig.	US-born Mexican Americans	US-born Whites
<b>Sample size (N)</b>	316	640	480	2,926
<b>Classified Self as Overweight (%)</b>	28.6	48.4 *	58.7 *	55.5 *
<b>Measured BMI (Mean)</b>	27.2	28.5	29.9 *	28.7 *
BMI Standard Deviation	25.8	7.2 n/a	7.1 n/a	5.8 n/a
<b>Age (%)</b>				
25 to 34	64.4	26.6 *	38.4 *	23.3 *
35 to 44	25.0	40.8 *	28.4	27.4
45 to 54	8.3	22.9 *	21.4 *	30.6 *
55 to 64	2.4	9.7 *	11.9 *	18.7 *
<b>Married (%)</b>	72.3	77.7	65.9	65.5 *
<b>Education (%)</b>				
No High School Degree	76.2	73.3	27.5 *	13.8 *
High school Degree	13.6	13.6	25.5 *	27.4 *
Some College	10.2	13.1 *	47.0 *	58.8 *
<b>Has Visited Doctor (%)</b>	45.8	56.8 *	75.1 *	77.7 *
<b>Smoking Status (%)</b>				
Current Smoker	30.5	25.6	26.4	32.1
Former Smoker	26.2	30.5	30.5	27.4
Never Smoked	43.3	44.0	43.1	40.4
<b><u>ECONOMIC STRESSORS</u></b>				
<b>Crowded Household Resident (%)</b>	67.8	51.8 *	14.3 *	5.9 *
<b>Poverty Status (%)</b>				
Above Poverty Threshold	47.1	66.6 *	83.2 *	84.8 *
In Moderate Poverty	24.8	21.0	8.3 *	8.0 *
In Deep Poverty	18.5	4.6 *	3.4 *	2.5 *
Missing data	9.5	7.9	4.1 *	4.7 *
<b>Not Working/ Working Low Hours</b>	15.2	19.9	26.7 *	26.8 *
<b><u>IMMIGRATION STRESSORS</u></b>				
<b>Non-English Speaker (%)</b>	87.1	61.1 *	5.2 *	0.0 *
<b>Non-U.S. Citizen (%)</b>	93.7	66.6 *	0.0 *	0.0 *
<b><u>FOOD INSECURITY LEVEL</u></b>	2.2	1.8 *	1.4 *	1.3 *
<b><u>TOTAL MEDICAL CONDITIONS</u></b>	0.5	0.5	0.8 *	0.9 *

Source: NHANES (1999-2007)

Sample: Non-underweight adult men ages 25-64 residing in the U.S.

Includes only Mexican origin and U.S. born non-Hispanic white men.

\* p<.05 (Significantly different than newly arrived immigrants, T-Test)

The descriptive characteristics of the analytic sample are displayed in two types of measures: unadjusted means and age-adjusted means. All estimates are weighted with the

NHANES person weights. Unadjusted means are displayed in table 1A and age-adjusted means are in table 1B<sup>6</sup>. Age-adjusted means<sup>7</sup> were provided because some U.S. exposure groups such as newly-arrived immigrants are composed largely of younger respondents. For example, among newly-arrived immigrants, 64.4 % of the cases are of ages 25-34 while this age group represents only 23.3 % of the cases for U.S. born whites. The age adjustments are based on the age-group representation in the analytic sample and the age-group representation within the U.S exposure group. Age-groups that are underrepresented within their U.S. exposure group relative to the analytic sample age group proportions are given more weight and vice-versa.

I will be discussing the descriptive characteristics by reviewing the unadjusted means (table 1A). The age-adjusted means (table 1B) will only be mentioned if the results were substantively different than in the unadjusted means. The tendency to classify as overweight increased with increased duration in the United States (newly-arrived immigrant 26.2%, settled immigrant 48.7% , and U.S.-born Mexican 59.0%); however, this is not surprising given that average BMI was also found to be higher with increased duration (newly-arrived immigrant 26.9, settled immigrant 28.6, and U.S.-born Mexican 29.9). Settled immigrants (75.9%) had higher rates of marriage than newly-arrived immigrants, but this was not true when adjusting by age. Education was found to increase across the U.S. exposure groups: newly-arrived immigrants (10.9%) had the lowest rates of college attendance followed by settled immigrants (15.0%), U.S.-born Mexican Americans (49.2%), and U.S.-born whites (61.7%). Doctor visit rates were higher with increased exposure to the United States (newly-arrived immigrants 36.2%, settled

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<sup>6</sup> BMI Standard deviations are increased drastically for newly-arrived immigrant men from table 1A to table 1B because the adjustments for older men increased their age-group-specific mean due to their heavy underrepresentation. The adjustments for younger newly-arrived immigrant men decreased their age-group-specific mean due to their heavy overrepresentation.

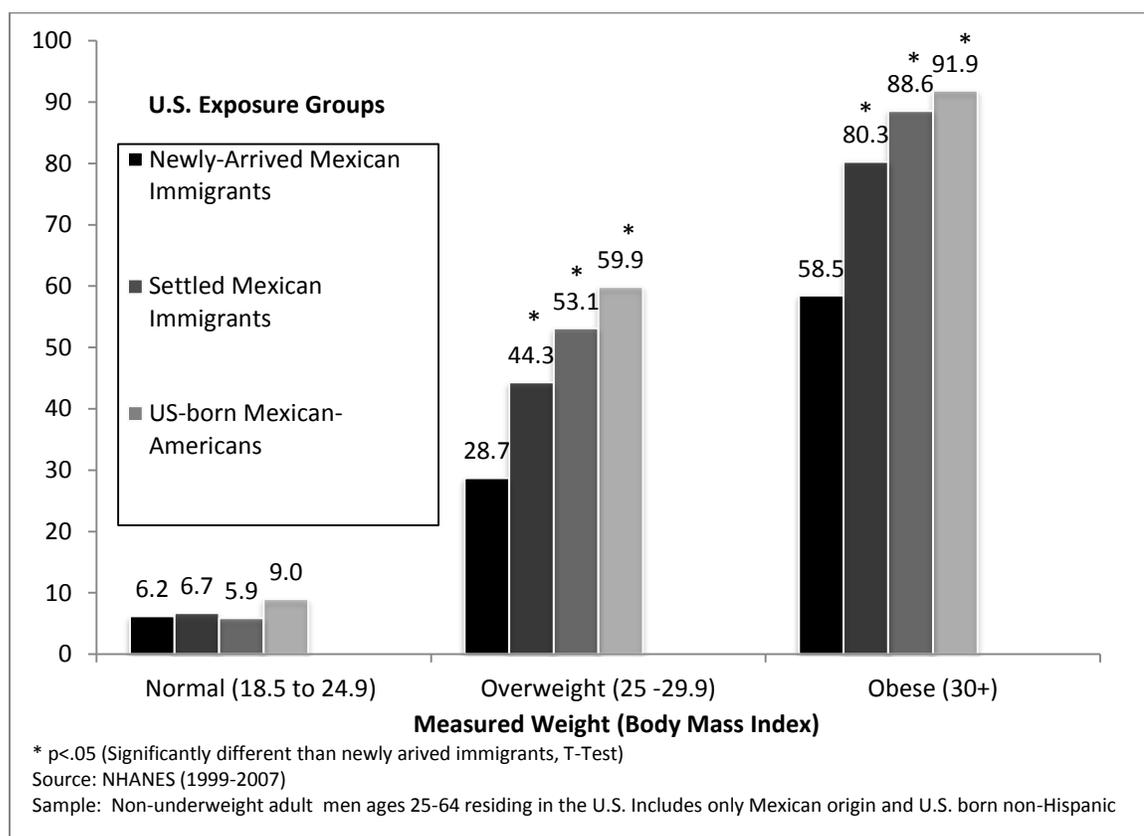
<sup>7</sup> Age-adjusted Mean =  $\int px X mx$

px = proportion of age group among the entire analytic sample

mx = weighted age-group-specific mean

immigrants 53.5%, U.S.-born Mexican Americans 71.6%, and U.S.-born whites 77.5%). Newly-arrived immigrants (21.5%) had lower former smoker rates than settled immigrants (27.6%), U.S.-born Mexican Americans (24.5%), and U.S.-born whites (27.3%), but these and all other smoking related significant differences disappeared when adjusting by age.

Figure 1: Percentage Who Classified Themselves as Overweight by Measured Weight and U.S. Exposure Group



Among the overweight and obese respondents, increased exposure to the U.S. was related to an increased tendency to classify as overweight. Figure 1 displays the relationship between U.S. exposure groups and weight perceptions. The vertical axis reflects the percentage of respondents who classified as overweight and the horizontal axis divides the sample by actual weight as measured by BMI. Among the obese respondents, 58.5% of newly-arrived immigrants, 80.3% of settled immigrants, 88.6% of U.S.-born Mexican-Americans, and 91.7% of U.S.-born

whites classified as overweight. Newly-arrived immigrant men stand out as the group with the lowest tendency to classify as overweight. One possible explanation for this pattern is that newly-arrived immigrants are less acculturated into U.S. society. However, bi-national studies have found that Mexican resident men, actually, have higher rates classifying as overweight (controlling for actual BMI) suggesting that there may be other underlying determinants of weight perceptions.

### *Hypothesis 1*

I ran t-tests to determine whether newly-arrived immigrants had more stressors than the rest of the U.S. exposure groups (hypothesis 1). To improve my stressor comparisons between U.S. exposure groups, I focused on analyzing the age-adjusted means (table 1B) because stressors have been shown to have correlations with age (Grune 2000; Jenkins 1993; Liu 1999). I only comment on significant differences. Hypothesis 1 is supported across two of the economic indicators. Newly-arrived immigrants (67.8 %) had a higher rate living in crowded households than settled immigrants (51.8%), U.S.-born Mexican Americans (14.3%) and U.S.-born whites (5.9%). Newly-arrived immigrants also had the highest rates of deep poverty (18.5%) among all the U.S. exposure groups and higher levels of moderate poverty (24.8%) than U.S.-born Mexican Americans (8.3%) and U.S.-born whites (8.0). Contradicting Hypothesis 1, newly-arrived immigrants (15.2%) had lower rates unemployed or working low hours than U.S.-born Mexicans (26.7%) and U.S.-born whites (26.8%). Hypothesis 1 is supported across the immigration and food insecurity stressors as well. Newly-arrived immigrants have the highest rates of not being able to speak English (87.1%) and being a U.S. non-citizen (93.7%). Additionally, settled immigrants (1.8), U.S.-born Mexican Americans (1.4), and U.S.-born whites (1.3) all had a lower mean food insecurity level than newly-arrived immigrants (2.2). Contrary to hypothesis 1 expectations, newly-arrived immigrants (.5) had a lower average number of medical conditions than U.S.-born Mexican Americans (.8) and U.S.-born whites (.9).

Americans (1.4), and U.S.-born whites (1.3) all had a lower mean food insecurity levels than newly-arrived immigrants (2.2). Contrary to hypothesis 1 expectations, newly-arrived immigrants (.5) had less mean medical conditions than U.S.-born Mexican Americans (.8) and U.S.-born whites (.9).

*Hypothesis 2 and 3, Entire Sample*

Table 2: Logistic Regression Models Predicting Overweight Self-Classification (Odds Ratios)

	Model 1	Model 2	Model 3	Model 4-6	Model 7
Sample Size (N)	4362	4362	4362	4362	4362
<b>U.S. Exposure groups</b>					
<b>(REF = U.S.-Born NH White)</b>					
Newly-Arrived Mex. Immigrant	0.30 ***	0.43 ***	0.63		0.67
Settled Mex. Immigrant	0.56 ***	0.73	0.96		1.01
U.S.-Born Mex. American	0.71 *	0.79	0.84		0.83
<b>BMI</b>	2.80 ***	2.75 ***	2.75 ***		2.75 ***
<b>BMI squared</b>	0.99 ***	0.99 ***	0.99 ***		0.99 ***
<b>Waist Circumference</b>	1.05 ***	1.05 ***	1.05 ***		1.05 ***
<b>Age (REF=25-34)</b>					
35-44		1.19	1.18		1.18
45-54		1.13	1.11		1.11
55-64		1.17	1.14		1.14
<b>Married</b>		1.20	1.17		1.18
<b>Education</b>					
<b>(REF = Some College or More)</b>					
No High School Degree		0.58 **	0.64 **		0.64 **
High School Degree		0.76 *	0.78 *		0.78 *
<b>Has Visited Doctor</b>		1.00	0.99		0.99
<b>Smoking Status</b>					
Current Smoker		0.91	0.95		0.94
Former Smoker		1.05	1.06		1.05
<b><u>ECONOMIC STRESSORS</u></b>					
Crowded Household Resident			0.61 ***~		0.60 ***~
<b>Poverty Status (REF = Above Poverty Threshold)</b>					
In Moderate Poverty			0.66 *~		0.65 *~
In Deep Poverty			0.59		0.58
Missing data			0.88		0.88
<b>Not Working/ Working Low Hours</b>			0.93		0.93
<b><u>IMMIGRATION STRESSORS</u></b>					
Non-English Speaker (%)				0.99	1.12
Non-U.S. Citizen (%)				0.77	0.85
<b><u>FOOD INSECURITY LEVEL</u></b>					
				0.95	1.04
<b><u>TOTAL MEDICAL CONDITIONS</u></b>					
				0.99	1.00
<b>Model Fit Statistics</b>					
Wald Chi-Squared	461.02	771.06	779.85		782.8
Pseudo R-Squared	0.40	0.40	0.41		0.41
<b>Wald Block Test P-Value</b>		0.00	0.00		0.01
Versus Model		1	2		2

\* p<.05, \*\*p<.01, \*\*\*p<.001, ~p<.05 (Normal Theory Mediation Test)

Source: NHANES (1999-2007)

Sample: Non-underweight men ages 25-64 residing in the U.S.

Includes only Mexican origin and U.S.-born N.H. white men.

Multivariate logistic regression models were estimated to assess whether the relationships between stressors and tendency to classify as overweight remain after applying anthropometric, social-demographic, and health related controls (hypothesis 2). Model 1 in table 2 includes the U.S. exposure groups plus anthropometric controls, BMI, BMI squared<sup>8</sup>, and waist circumference. The controls behaved in the expected direction. Increases in BMI and waist circumference were related to decreases in the odds of classifying as overweight. The rest of the non-anthropometric covariates were added in model 2 and the economic stressors were added in model 3. Consistent with hypothesis 2, men in crowded households had 39% lower odds of perceiving an overweight status. Also consistent with hypothesis 2, men in moderate poverty had 34% lower odds than men above the poverty threshold of saying they were overweight. Men in deep poverty had 41% smaller odds of classifying as overweight than men above the threshold, but this difference was not significant because there were not as many cases in the deep poverty category. Being unemployed or working low hours did not have a significant effect on weight perceptions. The immigration, food insecurity, and medical condition stressors were added independently in blocks on top of the previously listed controls for models 4, 5, and 6 respectively. For example, model 4 includes all the controls plus the immigration stressor block while model 5 includes all the controls plus the food insecurity stressor. The immigration, food insecurity, and the medical condition stressors did not have significant effects on men's weight perceptions. Finally, all of the control and stressor variables were included in model 7. Here, the economic stressors, crowded household (OR .60) and in moderate poverty (OR .65) had significant effects in the same direction as model 3.

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<sup>8</sup> BMI squared was negatively related to tendency to classify as overweight, meaning that effect of BMI weakens as BMI increases. For example, increases in BMI for obese (BMI is 30 or more) men have smaller effects on the probability of classifying as overweight than increases in BMI for overweight men (BMI is 25-29.99).

Hypothesis 3 predicts that stressors mediate the relationship between U.S. exposure groups and weight perceptions. According to model 1 in table 2, newly-arrived immigrants (OR .30), settled immigrants (OR .56), and U.S.-born Mexican Americans (OR .70) had lower odds of perceiving an overweight status than U.S-born whites. However, after incorporating all the covariates in model 2, only newly-arrived immigrants (OR .43) had lower odds of classifying as overweight. Once the economic stressors were added in model 3, the odds ratio of newly-arrived immigrants was no longer significant suggesting that mediation was occurring. Normal theory mediation tests indicated that household crowding and moderate poverty significantly mediate the relationship between the newly-arrived immigrant binary variable and tendency to classify as overweight for both model 3 and 7.

#### Hypothesis 2 and 3, Overweight or Obese Sample

Table 3: Logistic Regression Models Predicting Overweight Self-Classification (Odds Ratios)  
OVERWEIGHT AND OBESE SAMPLE

	Model 1	Model 2	Model 3	Model 4-6	Model 7
Sample Size (N)	3267	3267	3267	3267	3267
<b>U.S. Exposure groups</b>					
<b>(REF = U.S.-Born NH White)</b>					
Newly-Arrived Mex. Immigrant	0.27 ***	0.38 ***	0.57 *		0.61
Settled Mex. Immigrant	0.54 ***	0.71 *	0.96		1.01
U.S.-Born Mex. American	0.71 *	0.80	0.86		0.86
<b>BMI</b>	2.31 ***	2.27 ***	2.26 ***		2.27 ***
<b>BMI squared</b>	0.99 ***	0.99 ***	0.99 ***		0.99 ***
<b>Waist Circumference</b>	1.05 ***	1.05 ***	1.05 ***		1.05 ***
<b>Age (REF=25-34)</b>					
35-44		1.19	1.18		1.18
45-54		1.13	1.10		1.10
55-64		1.06	1.03		1.02
<b>Married</b>		1.25	1.22		1.22
<b>Education</b>					
<b>(REF = Some College or More)</b>					
No High School Degree		0.57 **	0.64 **		0.64 **
High School Degree		0.76 *	0.78 *		0.78
<b>Has Visited Doctor</b>		0.96	0.95		0.95
<b>Smoking Status</b>					
Current Smoker		0.90	0.94		0.94
Former Smoker		1.01	1.02		1.02
<b><u>ECONOMIC STRESSORS</u></b>					
Crowded Household Resident			0.59 **~		0.59 **~
<b>Poverty Status (REF = Above Poverty Threshold)</b>					
In Moderate Poverty			0.61 **~		0.61 **~
In Deep Poverty			0.54		0.54
Missing data			1.01		1.01
Not Working/ Working Low Hours			0.92		0.92
<b><u>IMMIGRATION STRESSORS</u></b>					
Non-English Speaker (%)				0.98	1.12
Non-U.S. Citizen (%)				0.75	0.84
<b><u>FOOD INSECURITY LEVEL</u></b>					
				0.90	0.99
<b><u>TOTAL MEDICAL CONDITIONS</u></b>					
				0.99	1.00
<b>Model Fit Statistics</b>					
Wald Chi-Squared	378.45	402.03	411.21		412.2
Pseudo R-Squared	0.22	0.22	0.23		0.23
<b>Wald Block Test P-Value</b>		0.00	0.00		0.00
Versus Model		1	2		2

\* p<.05, \*\*p<.01, \*\*\*p<.001, ~p<.05 (Normal Theory Mediation Test)

Source: NHANES (1999-2007)

Sample: Overweight and obese men ages 25-64 residing in the U.S.

Includes only Mexican origin and U.S.-born N.H. white men.

Hypothesis 2 was tested only on the overweight and obese (BMI) sample (table 3).

Everyone in this sample would classify as overweight if their weight perceptions were based solely on the objective BMI measure. Thus, using this sample restriction may provide more detail on the social-economic factors that impede overweight men from perceiving their overweight BMI status. The controls in model 1 and 2 worked in the same direction as in the entire sample. Consistent with hypothesis 2 (model 3), men in crowded households had 41% lower odds of perceiving an overweight status. Also consistent with hypothesis 1, men in moderate poverty had 40% lower odds of saying they were overweight than men that were above the poverty threshold. The immigration, food insecurity, and medical condition stressors were added independently in blocks on top of the controls for models 4, 5, and 6 respectively. None of the immigration, food insecurity, and medical condition stressors had significant effects. Finally, all of the control and stressors variables were included in model 7. Again, crowded household (OR .59) and in moderate poverty (OR .60) were significant.

Hypothesis 2 was tested only on the overweight and obese (BMI $\geq$ 25) sample (table 3).

Everyone in this sample would classify as overweight if their weight perceptions were based solely on the objective BMI measure. Thus, using this sample restriction may provide a more rigorous test of whether the socioeconomic factors impede overweight men from perceiving their overweight BMI status. The controls in model 1 and 2 worked in the expected direction as in the entire sample. Consistent with hypothesis 2 (model 3), men in crowded households had 41% lower odds of perceiving an overweight status. Also consistent with hypothesis 2, men in moderate poverty had 39% lower odds of saying they were overweight than men that were above the poverty threshold. Being unemployed or working low hours did not have a significant effect on weight perceptions. The immigration, food insecurity, and medical condition stressors were added independently in blocks on top of the controls for models 4, 5, and 6 respectively. None of

the immigration, food insecurity, and medical condition stressors had significant effects. Finally, all of the control and stressors variables were included in model 7. Again, crowded household (OR .59) and in moderate poverty (OR .61) were significant.

Hypothesis 3 (stressors mediate the relationship between U.S. exposure groups and weight perceptions) was tested on the overweight or obese sample as well. According to model 1 in table 3, newly-arrived immigrants (OR .27), settled immigrants (OR .54), and U.S.-born Mexican Americans (OR .71) had lower odds of perceiving an overweight status than U.S.-born whites. However, after incorporating all of the covariates in model 2, only newly-arrived immigrants (OR .38) and settled immigrants (OR .71) had lower odds of classifying as overweight. Once the economic stressors were added in model 3, the only single group that had lower odds of perceiving an overweight status was newly-arrived immigrants (OR .57). The effect of newly-arrived immigrant was still significant in model 3, but the effect did decrease in magnitude (from 62% lower odds than U.S.-born whites in model 2 to 42% lower odds in model 3) suggesting that some mediation was occurring. Normal theory mediation tests corroborated that household crowding and moderate poverty significantly mediate the relationship between the newly-arrived immigrant binary variable and tendency to classify as overweight for both model 3 and 7.

## **Discussion**

Human needs-based motivation theory postulates that there are problems that are more immediately pressing than body weight. This study explored the possibility that having these immediate problems decreases the chance of classifying as overweight (H2). Given that newly-arrived immigrant men had the largest number of stressors (H1), I speculated that these men would be at a disadvantage of being able to perceive an overweight status. In other words, I expected that newly-arrived immigrant men's high number of stressors would explain their low tendency to classify as overweight (H3).

Among all the stressors explored, economic stressors were the strongest factors of weight perceptions. Consistent with hypothesis 2, household crowding and moderate poverty decreased the odds of classifying as overweight for both samples (entire and overweight/obese sample). Contrary to what was expected, immigration, food insecurity, and medical condition stressors were not significant. These results constitute partial support for hypothesis 2 because not all the stressor indicators were significant.

The support regarding hypothesis 2, particularly the poverty stressor, highlights the importance that is given to money problems by society. Unlike other necessities like food, money can easily be used to trade for other family needs like shelter, safety, and food as well. Longitudinal natural experiments have demonstrated that humans have a strong happiness incentive for increasing their money resource pool (Gardner 2001); perhaps, because individuals know that they can cover other needs and goals with money. If impoverished people are overlooking their body weight health problems, they may be ignoring many other health problems as well. Future work should investigate what other health problems are not being perceived by economically disadvantaged people. The current study only analyzed Mexican-American and U.S.-born white men. Future studies should also test the association of economic stressors and weight perceptions on other groups such as women, African Americans, other immigrant nationalities, and people in other post-industrialized countries to determine whether this finding applies more broadly to other populations.

Even though household crowding was found to decrease the odds of classifying as overweight, it is unclear if it is actually stress related to immediate problems that triggers this. An alternate explanation is that crowded people may be comparing themselves with heavier people than those who live in non-crowded households. People in poverty, who more often live in

crowded households<sup>9</sup>, have higher rates of obesity (Drewnowski and Specter 2004). Thus, living in crowded households may be synonymous with living in a household with a heavier body weight norm. Additionally, recently-arrived immigrants in crowded households may be comparing themselves with even heavier housemates. Recently-arrived immigrants (average BMI 26.9, table 1A) often have living arrangements with settled immigrants, who have higher an average BMI of 28.6.

Since newly-arrived immigrants had the greatest number of stressors (H1), I hypothesized that stressors explained their low tendency to classify as overweight (H3). Hypothesis 1 was supported as newly-arrived immigrants tended to have the highest number of stressors across all the indicators except medical conditions. There was support for hypothesis 3 in the entire sample because after the economic stressors were added, the effect of newly arrived immigrant was not significant. There was only partial support for hypothesis 3 in the overweight or obese sample because even though the effect of the newly-arrived immigrants did diminish after the inclusion of the economic stressors, it was still significant. In other words, the effect of being a newly-arrived immigrant was not fully explained in the overweight or obese sample. Normal theory mediation tests corroborated that economic stressor mediation was occurring in both samples.

Surprisingly, the stressor variable related to the immigration and assimilation process was not associated with weight perceptions among Mexican men, and did not help explain the association between the U.S. exposure groups and weight perceptions. Historically, many immigrant health studies have failed to separate the effects of acculturation and socioeconomic status on health (Cohen 1992; Hunt, Schneider, and Comer 2004). Recently, studies that use immigrant acculturation measures (such as those based on residence length) in health studies have been criticized because these studies fail to theoretically and empirically link the mechanisms

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<sup>9</sup> Among men in poverty, 36% live in crowded households while only 7% of men outside of poverty reside in these.

through which acculturation influences health (Hunt, Schneider, and Comer 2004). The current study has provided evidence supporting the notion that health disadvantages often attributed to acculturation are, actually, partially explained through economic mechanisms.

The finding regarding the poverty stressor has implications on the controversial debate concerning whose responsibility is the health of the residents of the United States. On one hand, some may support the view that is the individuals' responsibility to exercise and take care of their body weight. However, how can people attempt to solve their overweight problems when they do not even know they are overweight? Overweight adults who do not know they are overweight are less likely to attempt to lose weight (Lemon, Rosal, Zapka, Borg, and Andersen 2009; Post et al. 2011). Other proponents may argue that society has some responsibility in helping the disadvantaged people identify their health problems. I have provided evidence indicating that men in poverty are, indeed, at a disadvantage of being able to identify their overweight problems.

This study has limitations, particularly limitations in measurement. First, one of the factors of the immigration stressor indicator was having an ambiguous legal resident status. Being a non-U.S. citizen was considered an ambiguous legal resident status due to the lack of a better measure. Even though the vast majority of surveys do not explicitly ask about legal resident status, there are some surveys, like the Los Angeles Family and Neighborhood Survey (L.A. FANS), which have included such question. However, to my knowledge there is no survey that includes this explicit legal residence question plus all the rest of the survey questions needed for the dependent, stressor, and anthropometric variables that I used. Third, it could be argued that the definition of a crowded household (one or more persons per room) is somewhat arbitrary. This variable was used in the construction of the economic stressor scale. Nevertheless, the substantive conclusions of this paper are the same when the threshold is set at .85 and .95 persons per room. When the threshold is set at 1.05 the direction and the magnitude of economic stress

effect are approximately the same but significant confidence in the results is lost because the cell sizes of the binary variable, crowded, become too small.

Despite some measurement limitations, I was able to show that men in moderate poverty and in crowded households were at a disadvantage of being able to identify their overweight problems. These weight perceptions disadvantages, which can be attributed to acculturation, are partially explained through these economic mechanisms. Given the high rates of overweight and obesity among Mexican-Americans, the health benefits of identifying overweight problems could be profound across the members of this minority group. If the U.S. society does have some responsibility for the health of disadvantaged individuals, then campaigns of awareness should be targeted on overweight and impoverished groups of people.

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