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What is This?

Gender, Acculturation, and Health among Mexican Americans

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Abstract

This study examines whether the relationship between acculturation and physical health varies by gender among Mexican Americans, and if the mechanisms that mediate the acculturation-health relationship operate differently by gender. Using the 1998–2007 National Health Interview Study, we construct a composite measure of acculturation and estimate regression models for the total number of health conditions, hypertension, heart disease, and diabetes. Immigrants with the lowest levels of acculturation are the healthiest, but this association is stronger for men. Medical care plays a central role in accounting for gender and acculturation differences across health outcomes—increased access to and utilization of medical care is associated with worse health, which suggests that better health among recent arrivals (particularly men) partially results from their lack of knowledge about their own poor health.

Nearly 38 million immigrants were living in the United States in 2008, totaling 12.5 percent of the U.S. population (U.S. Census Bureau 2008). Mexican immigrants comprise the single largest group and account for one-third of all U.S. immigrants who arrived between 1990 and 2000 (Kritz and Gurak 2004; Saenz 2004). Their number, coupled with the poorer economic conditions in Mexico, has garnered much debate among policy makers because immigrant health has important consequences for U.S. population health and the health care system. Significantly, Mexican immigrants appear healthy when they arrive in the United States, but through the process of acculturation—or integration into U.S. society—their health deteriorates to the level of their native-born counterparts (Markides and Eschbach 2005).

Whether this pattern varies by gender has received little attention, although some evidence suggests that both the initial and long-term health trajectories of Mexican immigrants might vary for men and women (Antecol and Bedard 2006; Read

and Gorman 2006). Gender is important for understanding the health of Mexican immigrants for three reasons. First, there are substantial differences in the health of men and women, and in how social, economic, and behavioral risk factors shape these disparities (e.g., Bird and Rieker 2008; Gorman and Read 2006). Second, migration processes differ for men and women, and thus the theories used to explain men's health may be less useful for understanding women's health (Kanaiaupuni

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2000). Finally, acculturation processes differ by gender due to lifestyle differences in Mexico, motivations for migrating, and subsequent reception in U.S. society (Donato et al. 2006). One implication for health is that women are more able to participate in health-damaging behaviors (such as alcohol consumption and smoking) in the United States than in Mexico (Lopez-Gonzalez, Aravena, and Hummer 2005).

Two questions guide our research on gender, acculturation, and health. First, does the relationship between acculturation and health vary by gender for Mexican Americans?[1] Second, do the mechanisms through which acculturation influences health vary by gender? In other words, does the process of becoming incorporated into American society have different health implications for Mexican American women and men, and do the mechanisms believed to link acculturation and health operate differently for men and women?

Answers to these questions have implications for theory, methods, and policy. Theoretically, we use a "gender lens" (Curran et al. 2006) by considering how gender shapes both migration and acculturation in ways that impact health, thereby extending prior research that either controls for gender or focuses on either men or women. Methodologically, we extend the work of Lopez-Gonzalez and colleagues (2005) and create a multi-dimensional measure of acculturation that incorporates nativity, duration of U.S. residence, citizenship, and language usage. Our measure improves on research that uses only single item measures such as nativity or time since arrival. From a public policy perspective, we move beyond broad indicators of health, such as self-rated health, to examine medical conditions that are life threatening and costly to treat. Our research may illuminate the differential impact that Mexican immigrant men and women may have on the U.S. health care system, given that men and women typically suffer from different health conditions (Rieker and Bird 2000). Further, by examining potential mediators of the acculturation-health relationship, our findings may suggest levers that policy makers could use to improve the health of Mexican Americans as they become part of U.S. society.

THEORY AND EVIDENCE
Gender, Immigrant Acculturation, and Health

Three bodies of research inform the current study: (1) research on immigrant health, (2) research on gendered patterns of migration and acculturation, and (3) research on gender disparities in health. The first body of research examines the importance of acculturation for explaining declining immigrant health with increasing duration in the United States (Antecol and Bedard 2006; Cho et al. 2004). The second highlights gender differences in migration and acculturation that can result in different outcomes for immigrant men and women (Donato et al. 2006; Hondagneu-Sotelo 1994; Kanaiaupuni 2000). The third offers explanations for gender differences in life expectancy, morbidity, and disability (see reviews by Bird and Rieker 2008; Gorman and Read 2007). The first body of literature has largely overlooked the gendered nature of migration and acculturation, the second has focused more on social and economic outcomes than on health, and the third has only begun to explore how gendered patterns of disease vary across race-ethnic and immigrant groups.

Health outcomes are shaped by the constraints that are placed on men's and women's health-related choices (Bird and Rieker 2008). Individuals routinely make decisions within a context of constrained choices; even if health is a priority, their decisions are not always healthy. Gender differences in health partly result from biological differences between men and women, but social circumstances and behavioral norms can maintain, diminish, or even exaggerate biological differences in health. The concept of "constrained choice" is useful for thinking about how migration and acculturation might have different health consequences for Mexican men and women. Mexico is a patriarchal society, where women are subordinate to men and responsible for maintaining domestic life, and men are viewed as providers and protectors of women. Although women have made gains in equity over time, substantial differences remain (Hondagneu-Sotelo 1994; Hondagneu-Sotelo and Cranford 1999; Kanaiaupuni 2000; Parrado and Flippen 2005).

Gender also influences the process of migration from Mexico to the United States. Even though female migration is increasing, more men migrate to the United States than women, and for different reasons (Hill and Wong 2005; Kritz and Gurak 2004). Men typically cross the border in search of employment or adventure, while women are more often accompanied by relatives or a "coyote" when they cross, often seeking family reunification (Boyd 1992; Curran et al. 2006; Donato et al. 2006; Donato and Patterson 2004; Hondagneu-Sotelo 1994). After arriving in the United States,

gender relations between Mexican men and women are reconstructed. Women often make modest gains in independence and decision-making ability that reflect an improvement in status vis-à-vis gender relations in Mexico (Parrado and Flippen 2005), whereas men lose status and power. These status changes may drive both women's desires to settle in the United States permanently and men's interest in returning to Mexico (Hondagneu-Sotelo 1994).

The concept of "constrained choices" allows us to identify two ways that pre- and post-migration gender relations may shape the health of Mexican American men and women. First, if women have less say than men over the migration decision and move for family reunification, women may be less selected on health than their male counterparts. This may contribute to the sicker profile of Mexican American women relative to Mexican American men (Read and Gorman 2006). At minimum, Mexican men migrate at younger ages than Mexican women (Kanaiaupuni 2000), suggesting that their health profile will be more positive.

Second, Mexican women participate in health-damaging behaviors at lower rates than men (Lopez-Gonzalez et al. 2005). Yet studies consistently show that female participation in behaviors including smoking, drinking, and poor diet increases with acculturation (Antecol and Bedard 2006; Lopez-Gonzalez et al. 2005; Markides et al. 1990). Female migrant networks are often made up of women of the same age who live in close proximity, where risky and nontraditional behaviors are encouraged (Curran and Saguy 2001). Further, resettlement is a stressful process for Mexican women, given their high rates of poverty, employment in low wage occupations, and potential for harm if men attempt to reassert their status through the use of violence or other forms of control (Hondagneu-Sotelo and Cranford 1999; Kritz and Gurak 2004).

The relationship between acculturation and health behaviors appears weaker for men. The stresses of resettlement for Mexican men are exacerbated by their relative loss of privilege and power, both within society at large and in comparison to women. As with other forms of stress, this can be damaging to the body over time, especially if men also continue to engage in unhealthy behaviors (Krueger and Chang 2008). However, it remains unclear whether and how the relationship between acculturation and physical health differs among men and women.

Mechanisms Linking Gender, Acculturation, and Health

The decline in health as immigrants spend more time in U.S. society has been attributed to several factors that are linked to acculturation. We focus on five factors that have well-established relationships with health, are differentially shaped by gender, and might be shaped by social policies: family, socioeconomic status, medical care, health behaviors, and mental health.

First, Mexican immigrants who are married are more likely to stay married than those born in the United States, and they tend to live in larger, extended families (Ramirez and de la Cruz 2003). Because family reunification is the focus of U.S. immigration policy, immigrants often settle in regions where they know other co-ethnic residents. This chain migration (Nee and Sanders 2001) means that immigrants come to the United States with strong network ties that facilitate adjusting to a new culture. Immigrants often utilize and provide supports such as economic exchanges and co-residence with extended kin. Extended families also protect health by providing positive social roles, discouraging risky behavior and violence, and encouraging healthy behaviors (Waite 2006). However, immigrants' family and social ties might weaken as they integrate into the United States (Alba and Nee 2003), and their health may also decline. Given that women are more tightly bound to family during the process of migration and resettlement (Donato and Patterson 2004; Hondagneu-Sotelo 1994), family characteristics might be more protective for women against acculturation-related health declines.

Second, Mexican immigrant men and women have high rates of employment (Larsen 2004). Employment provides income and tends to foster integration into the community. However, Mexican immigrants are more likely to work in low status and dangerous occupations than those born in the United States, and Mexican immigrants have lower levels of education than Mexican Americans who were born in the United States (Everett et al. 2008). Thus, because recent Mexican immigrants have lower income and work in less safe conditions than their less healthy but more acculturated counterparts, adjusting for work and socioeconomic factors may actually suppress the inverse relationship between acculturation and health. These relationships are also gendered: Mexican immigrant women are less likely to be employed,

and when they are working they engage in different types of work than men (Kritz and Gurak 2004). Male immigrants are also negatively selected on education because those with more education have better opportunities in Mexico, while women are positively selected on education (Kanaiaupuni 2000; Parrado and Flippen 2005).

Third, Mexican Americans, especially immigrants, have low levels of access to and utilization of health care (Ku and Matani 2001; Riedel 1998). The combination of jobs that provide poor quality health benefits and lower earnings leave many Mexican immigrants with financial barriers to health care access and utilization, even among citizens or those who have children who are citizens (Riedel 1998). Those who use fewer health care services may be unaware of some chronic health conditions that have relatively mild symptoms (e.g., hypertension), which, if left untreated, can lead to disability or death. Over time, the probability that immigrants come into contact with the health care system increases, and their health may appear to decline simply because previously undiagnosed problems are brought to their attention. Prior research has shown that men are less likely than women to utilize health care (Courtenay, McCreary, and Merighi 2002). Thus, immigrant women may be more likely to be diagnosed with medical conditions than men.

Fourth, cultural values of sending countries may initially protect immigrants by promoting healthier lifestyles. However, over time immigrants begin to undertake less healthy behaviors and increase their levels of smoking and drinking, and their body mass increases (Abraido-Lanza, Chao, and Florez 2005; Acevedo-Garcia et al. 2005; Antecol and Bedard 2006). Frequency of exercise, however, increases with acculturation (Abraido-Lanza et al. 2005). Because women experience greater health behavior changes with acculturation than men, health behaviors might explain a larger portion of the acculturation-health relationship for women.

Finally, immigrants may have different mental health experiences than Mexican Americans who were born in the United States. On one hand, the least acculturated immigrants may benefit from strong social ties that reduce stress and improve mental health (Rogler, Cortes, and Malgady 1991). First generation immigrants may experience less depression and greater well-being compared to those born in the United States (Harker 2001), and increased acculturation is associated with a higher risk of depression (Cuellar, Bastida, and Braccio

2004). On the other hand, the stress associated with moving to a new country may damage mental health, and greater acculturation may come with improved familiarity with surroundings, new friends and family ties, and improved mental health (Franzini and Fernandez-Esquer 2004; Rogler et al. 1991). Since women more often report depressive mood and anxiety disorders than men (Keyes and Goodman 2006; Rosenfeld 1999), psychological health might better account for the connection between acculturation and physical health among Mexican women, vis-à-vis men.

DATA AND METHODS

Data

We use the 1998–2007 waves of the National Health Interview Survey, an annual, cross-sectional survey conducted by the National Center for Health Statistics at the U.S. Department of Health. The National Health Interview Survey conducts face-to-face interviews with all members of sampled households. One sample adult (aged 18 and older) is randomly selected from each household for inclusion in the Sample Adult File, and each respondent is asked a detailed set of questions about health status, care, and behaviors. After restricting the sample to those who identify as Mexican or Mexican American, and keeping only those observations with valid information on our variables, our sample size is between 25,008 and 25,114.[2]

Measures

Our primary dependent variable is a sum of eight life threatening or costly medical conditions. Respondents were asked yes/no questions about whether they had ever been told by a doctor or other health professional that they had hypertension, heart disease (coronary artery disease, angina pectoris, or any other heart condition or disease), stroke, diabetes, emphysema, cancer (excluding skin cancer), asthma, or ulcer. The number of conditions offers a broad summary of respondents' health and indicates their burden of co-morbidity. Because the conditions listed may have different implications for long-term disability or mortality, and have different prevalence rates for men and women, we also examine hypertension, heart disease, and diabetes separately—three health conditions that are prominent contributors to disability and mortality in the United States.

Table 1. Components of Acculturation Status Measure

	Acculturation Status		
	Class 1 (recent arrivals)	Class 2 (multicultural)	Class 3 (melting pot)
Duration of U.S. Residence, %			
<1 year	3.4	0.0	0.0
1–4 years	26.5	0.1	0.5
5–9 years	36.2	2.1	1.1
10–14 years	30.1	3.0	1.8
15+ years	1.4	91.2	12.8
U.S.-born	2.3	3.1	83.8
U.S. citizen, %	3.3	33.2	97.5
Any Spanish during interview, %	77.1	75.9	12.9
Sample Size	6,307	5,377	13,324

Our key predictor is acculturation. We extend the work of Lopez-Gonzalez et al. (2005) and create a measure of acculturation that draws on four pieces of information: nativity (U.S. born vs. foreign born); duration of U.S. residence for foreign-born respondents (less than one year through 15 years and above); citizenship status (citizen vs. noncitizen); and language of interview (English only vs. any Spanish). We add language to their measure because language acquisition is central in shaping the lives of immigrants and because Mexican migrant women have poorer English skills than Mexican migrant men (Boyd 1992).

We use "latent class analysis" to create our acculturation variable. Latent class analysis is an inductive statistical method that uses patterns among observed variables (i.e., nativity, duration of U.S. residence, citizenship, and language usage) to infer membership in unobserved subpopulations, or "latent classes" (Magidson and Vermunt 2004). Because we do not have an a priori assumption about the number of classes that best capture the process of acculturation, we compare models that assume between 1 and 15 classes. The Bayesian information criterion indicates that models specifying three classes fit the data best (Muthén and Muthén 2007).[3]

Table 1 shows the percentage distribution of each of the observed acculturation variables across the three classes. Class 1 is comprised of "recent arrivals" to the United States, who have the lowest levels of acculturation and who may have the least power to promote their own well-being: 96 percent have been in the United States for 14 or fewer years, only 3 percent are U.S. citizens, and

77 percent spoke some Spanish during the interview. Class 2 captures a "multicultural" group who have substantial ties to the United States as well as strong roots to their Mexican heritage: Over 91 percent have lived in the United States for 15 or more years and 33 percent are citizens, although 76 percent spoke some Spanish during the interview. Multicultural individuals may be fairly integrated into U.S. society, although they may also be marginalized from the dominant aspects of American culture that do not share their Mexican roots. Class 3 encompasses a group of individuals who conform to the "melting pot" metaphor of acculturation and who have fewer ties to their Mexican heritage: Nearly 97 percent have lived in the United States since birth or for 15 or more years, over 97 percent report being U.S. citizens, and only 13 percent spoke any Spanish during the interview.

In addition to age, we adjust for several sets of potential mediating factors (see Table 2 for specific categories): (1) family characteristics (marital status, household composition); (2) socioeconomic status (employment status,[4] completed years of education, income-to-poverty ratio); (3) access to medical care (insurance status, usual source for care, index of financial barriers to medical care,[5] time since last saw a doctor); (4) health behaviors (smoking status, alcohol consumption, body mass index [BMI], physical activity[6]); and (5) psychological distress, which is based on an index of six questions that ask, "During the past 30 days, how often did you feel [symptom]?" The symptoms for the psychological distress index include, "so sad that nothing could cheer you up," "nervous,"

Table 2. Sample Characteristics, by Gender and Acculturation Status[a]

	Women (N = 13,679)			Men (N = 11,329)		
	Class 1 (recent arrivals)	Class 2 (multicultural)	Class 3 (melting pot)	Class 1 (recent arrivals)	Class 2 (multicultural)	Class 3 (melting pot)
Age, mean	32.1 (13.4)	45.1 (18.9)	39.7 (21.3)	31.0 (10.4)	44.0 (15.1)	38.5 (17.6)
Family Characteristics						
Marital status, %						
Married, spouse in home	68.2	65.6	51.7	49.3	73.4	55.6
Married, spouse not in home	1.8	1.4	1.4	9.4	3.5	1.0
Cohabiting	7.8	5.0	6.6	7.9	4.6	7.5
Divorced or separated	5.7	11.3	13.3	3.7	5.9	8.2
Widowed	2.4	7.2	5.8	0.4	1.5	1.4
Never married	14.2	9.5	21.1	29.3	11.0	26.4
Any children under age 5, %	54.0	28.7	28.8	40.9	27.6	24.1
Any adults aged 65 and older, %	4.3	16.5	16.3	2.2	12.2	12.3
Socioeconomic Status						
Employment status, %						
Currently working, low status occupation	31.5	37.1	34.7	79.3	69.5	50.1
Currently working, high status occupation	5.3	8.6	25.7	6.0	7.8	23.9
Currently working, dangerous occupation	1.8	1.8	1.1	8.8	6.7	7.2
Homemaker	54.9	35.8	19.1	0.7	0.8	0.6
Student	2.5	1.1	4.0	1.3	1.0	3.6
Retired	1.0	7.5	7.5	0.8	7.0	7.1
Not working, unable to work	1.4	6.0	6.1	1.6	5.3	5.6
Not working, other reason	1.5	2.2	1.7	1.4	1.0	1.9
Education level, %						
Less than high school	70.2	70.1	29.8	67.7	70.5	28.3
High school graduate	17.5	16.7	30.5	20.7	17.0	31.6
Any college	12.4	13.2	39.7	11.6	12.5	40.1
Family income-to-poverty ratio, mean	5.7 (3.8)	6.8 (3.9)	8.3 (4.0)	6.2 (3.7)	7.2 (3.8)	9.1 (3.8)
Medical Care						
Access to medical care, %						
Insured with a usual place for care	29.6	55.8	71.1	20.2	47.4	61.0
Not insured or no usual place for care	34.2	26.4	18.5	26.3	26.9	22.1

(continued)

Table 2. (continued)

	Women (N = 13,679)			Men (N = 11,329)		
	Class 1 (recent arrivals)	Class 2 (multicultural)	Class 3 (melting pot)	Class 1 (recent arrivals)	Class 2 (multicultural)	Class 3 (melting pot)
Not insured and no usual place for care	36.7	17.8	10.4	53.4	25.7	16.9
Any financial barriers to medical care, %	19.6	19.4	18.6	13.5	13.1	13.6
1+ years since last doctor visit, %	33.0	22.4	16.7	64.1	41.8	34.2
Health Behaviors						
Smoking status, %						
Never smoked	88.8	85.2	76.4	68.8	57.3	58.7
Current smoker, every day	2.7	4.4	7.9	9.9	12.6	13.1
Current smoker, some days	2.8	2.9	4.6	8.8	8.6	9.6
Former smoker	5.7	7.6	11.2	12.6	21.5	18.6
Alcohol use, %						
Lifetime abstainer	68.8	59.7	37.5	27.6	21.2	16.4
Former drinker	9.5	12.3	13.1	8.7	17.5	11.8
Current drinker, 1–2 per occasion	15.6	21.2	33.0	25.6	26.6	31.7
Current drinker, 3–4 per occasion	4.1	5.0	11.4	17.1	16.8	20.1
Current drinker, 5+ per occasion	2.1	1.7	5.0	21.1	18.0	20.1
Body mass index, %						
Underweight (BMI < 18.5)	1.9	1.4	1.6	0.7	0.7	0.5
Normal weight (18.5 ≤ BMI < 25.0)	41.1	28.4	35.7	36.5	22.9	24.3
Overweight (25.0 ≤ BMI < 30.0)	36.0	37.3	30.3	46.7	50.7	43.8
Obese (BMI ≥ 30.0)	21.1	33.0	32.3	16.1	25.7	31.3
Frequency of exercise, mean	1.6 (1.1)	1.6 (1.1)	1.9 (1.3)	1.7 (1.1)	1.7 (1.1)	2.2 (1.4)
Mental Health						
Psychological distress, mean	1.4 (.8)	1.5 (1.0)	1.5 (1.3)	1.2 (.5)	1.3 (.6)	1.3 (.6)
Medical Conditions[a]						
Number of medical conditions, mean	0.3 (.7)	0.6 (1.3)	0.6 (1.2)	0.1 (.4)	0.4 (.9)	0.5 (.9)
Hypertension, %	10.5	24.3	19.8	4.9	16.0	18.4
Heart Disease, %	3.4	7.4	6.4	1.8	4.0	5.5
Diabetes, %	3.6	11.7	8.7	1.6	9.4	8.0
Sample size	3,272	2,818	7,589	3,035	2,559	5,735

Note: Standard deviations in parentheses.

[a]Wald tests indicate that all measures are significantly different across gender and acculturation groups at the *p* < .05 level, with the exception of "not working, other reason."

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"restless or fidgety," "hopeless," "that everything was an effort," and "worthless." Each item ranges from 1 ("none of the time") to 5 ("all of the time"); we take their average as the index measure (α = .88).

Analysis

We use negative binomial regression to account for over-dispersion in the number of health conditions. We use separate logistic regression models for hypertension, coronary heart disease, and diabetes. All analyses are weighted to represent the non-institutionalized U.S. population, and they use the "svy" commands in Stata to estimate Taylor linearized standard errors that account for the complex sampling frame used by the National Health Interview Survey (National Center for Health Statistics various years; StataCorp 2007). We use the method described by Korn and Graubard (1999) to estimate standard errors appropriately when pooling data across sampling frames, as recommended by the National Center for Health Statistics (2007).

RESULTS

Table 2 presents weighted sample characteristics by gender and acculturation. Compared to men, women are older and more likely to report that they live with children under the age of 5 or adults age 65 or older, and to be divorced, separated, or widowed. Proportionally fewer women work in low status or dangerous occupations, and they are more likely to be homemakers. Men and women have similar levels of education, although women have less income. Women report greater access to and utilization of medical care services than men, despite greater financial barriers to medical care. Women also smoke, drink, and exercise less than men. Men are more likely than women to be overweight, but women are more likely to be obese. Women also report higher rates of psychological distress, hypertension, heart disease, diabetes, and more medical conditions.

Table 2 also demonstrates how these relationships differ by acculturation status. Recent arrivals (class 1) are younger, and they are more likely to have young children at home, to report lower income, and to have limited access to medical care. Recent arrivals also have the lowest levels of drinking, smoking, obesity, mental distress, and medical conditions. Individuals in the multicultural group (class 2) are older than recent arrivals,

are less likely to live with children under age 5, are more likely to live with adults aged 65 or older, and have less education. However, compared to recent arrivals, those in the multicultural group are somewhat more likely to work in high status occupations, have better access to medical care, and have higher incomes, but they are also less likely to have never smoked, less likely to abstain from drinking, and less likely to be of normal weight. Finally, those in the melting pot group (class 3) are marked by higher likelihood of working in high status occupations, and high levels of education, access to health care, and exercise. However, those in the melting pot group are also more likely to be current smokers, and they are more likely to report drinking three or more drinks per occasion.

Table 3 presents rate ratios from negative binomial regression models for the number of medical conditions. Model 1 adjusts for age and shows that both the main effects for gender and acculturation status, along with the interaction terms, significantly predict the number of reported medical conditions. Figure 1 graphs the predicted values from model 1 (see "age-adjusted" models on the left side of graph) and shows two important patterns. First, women in all three groups report more medical conditions than men. Second, the gender gap in the age-adjusted number of medical conditions is largest among recent arrivals (class 1), smaller among those in the multicultural group (class 2), and smallest among those in the melting pot group (class 3). The closing gender gap with increasing levels of acculturation is driven by faster increases in the number of medical conditions among men than among women. Further, the substantial gender difference in medical conditions among recent arrivals supports the perspective that Mexican American women are less selected on health than men when migrating to the United States.

Models 2 through 5 examine potential mediators that link gender and acculturation status to medical conditions. Family characteristics (model 2) and socioeconomic status (model 3) do little to diminish the relationship between gender, acculturation, and medical conditions. However, Model 4 shows that after adjusting for the medical care variables, the main effects of the acculturation variables are greatly diminished and the multiplicative term for an interaction between female gender and class 2 (the multicultural group) falls from significance. Model 5 further adjusts for health behaviors and mental health, and we observe only modest reductions in the main effects of the

Table 3. Rate Ratios from Negative Binomial Regression Models for the Number of Medical Conditions, Mexican Americans Living in the U.S., 1998–2007

	Model 1	Model 2	Model 3	Model 4	Model 5	Gender-stratified Model 5	
						Women	Men
Female	1.83***	1.84***	1.79***	1.41***	1.41***	—	—
Acculturation status (reference: Class 1–recent arrivals)							
Class 2 (multicultural)	1.66***	1.62***	1.60***	1.33***	1.26**	1.08	1.27**†
Class 3 (melting pot)	2.39***	2.32***	2.22***	1.75***	1.61***	1.14*	1.58***†
Female × Class 2 (multicultural)	0.77**	0.77**	0.77**	0.88	0.86	—	—
Female × Class 3 (melting pot)	0.61***	0.62***	0.63***	0.72***	0.71***	—	—
Age	1.04***	1.04***	1.04***	1.04***	1.03***	1.03***	1.03***
Family Characteristics							
Marital status (reference: Married, spouse in home)							
Married, spouse not in home	0.95	0.97	1.09	1.14	1.24	1.07	
Cohabiting	1.24***	1.18**	1.18**	1.15**	1.10	1.21*	
Divorced or separated	1.11*	1.02	1.03	1.02	1.00	1.03	
Widowed	0.85***	0.81***	0.84***	0.89**	0.87**	0.89	
Never married	0.99	0.91*	0.96	1.00	0.95	1.07	
Any children under age 5	0.90**	0.88***	0.88***	0.89***	0.90*	0.89	
Any adults aged 65 and older	0.92*	0.91*	0.90***	0.94	1.01	0.84*†	
Socioeconomic Status							
Employment status, (reference: Working, low-status occupation)							
Currently working, high status occupation		1.12*	1.08	1.12*	1.08	1.15*	
Currently working, dangerous occupation		0.94	0.96	0.97	0.80	1.01	
Homemaker		1.06	1.05	1.05	1.02	1.14	
Student		1.04	0.98	1.04	1.19	0.80	
Retired		1.30***	1.24***	1.22***	1.17*	1.33***	
Not working, unable to work		2.37***	1.90***	1.48***	1.49***	1.46***	
Not working, other reason		1.43***	1.38***	1.25*	1.18	1.30	
Education level (reference: Less than high school)							
High school graduate		0.99	0.96	0.98	0.97	0.99	

(continued)

Table 3. (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Gender-stratified Model 5	
						Women	Men
Any college		1.15***	1.05	1.07	1.02	1.15*†	
Family income-to-poverty ratio		0.98***	0.98***	0.99**	0.99**	0.99	
Medical Care							
Access to medical care (reference: Insured with usual place for care)							
Not insured or no usual place for care			0.92*	0.93*	0.92*	0.94	
Not insured and no usual place for care			0.70***	0.72***	0.71***	0.74***	
Any financial barriers to medical care			1.66***	1.41***	1.44***	1.36***	
1+ years since last doctor visit			0.51***	0.54***	0.57***	0.51***	
Health Behaviors							
Smoking status (reference: Never smoked)							
Current smoker, every day				1.11*	1.16**	1.06	
Current smoker, some days				1.13*	1.20*	1.07	
Former smoker				1.20***	1.23***	1.17***	
Alcohol use (reference: Lifetime abstainer)							
Former drinker				1.17***	1.10*	1.34***†	
Current drinker, 1–2 per occasion				1.01	1.01	1.07	
Current drinker, 3–4 per occasion				0.99	0.97	1.06	
Current drinker, 5+ per occasion				1.05	1.05	1.12	
Body mass index (reference: Normal weight)							
Underweight				1.03	0.87	1.54†	
Overweight				1.13***	1.15**	1.10	
Obese				1.61***	1.61***	1.60***	
Frequency of exercise				0.98	1.02	0.96*†	
Mental Health							
Psychological distress				1.30***	1.29***	1.32***†	
BIC	−5,251.2	−5,262.2	−5,969.5	−7,132.4	−8,060.5	−4,361.8	−3,293.5

*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

Note: Sample size, full sample (models 1–5) = 25,008; women only = 13,679; men only = 11,329. All models control for survey year.

†Odds ratios for men and women differ at the $p \leq .05$ level or less.
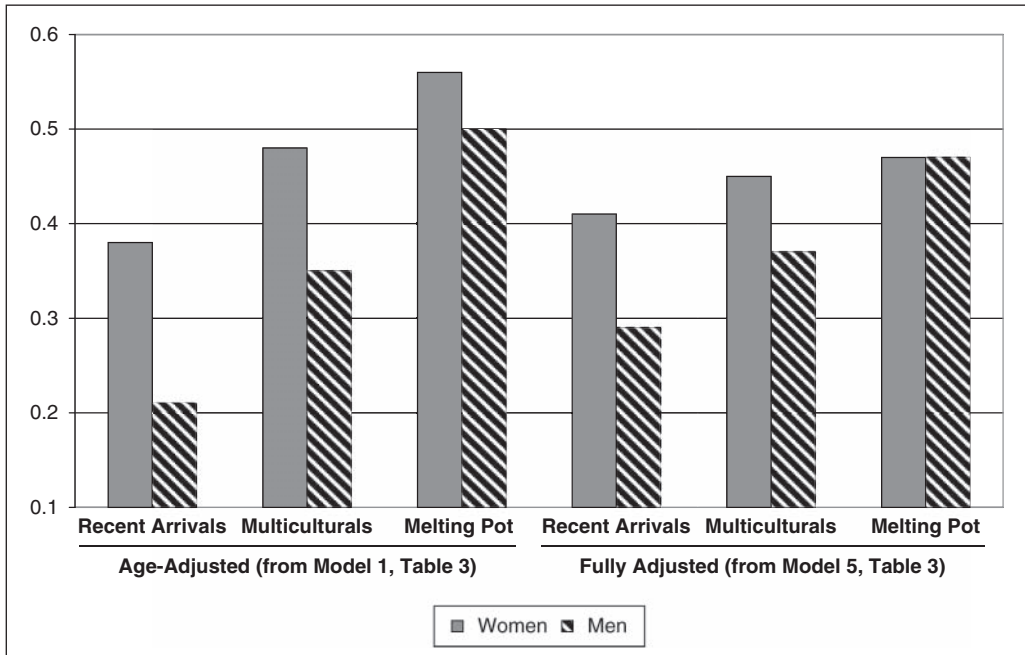
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Figure 1. Predicted number of medical conditions by gender and acculturation status

acculturation variables.[7] However, the BIC statistic indicates that including each set of variables substantially improves model fit (Raftery 1995), with the largest improvement seen when including the medical care measures in model 4. The fully adjusted model is also graphed in Figure 1 (see right side of graph). This figure shows that adjusting for potential mediators partially closes, but does not eliminate, gender and acculturation differences in the number of conditions. Notably, with adjustment for control variables, among recent arrivals (class 1), the expected number of conditions increased more substantially for men (from .21 to .29) than for women (from .38 to .41), and while the gender gap is smaller after adjustment for control variables, a sizeable difference remains. For multicultural (class 2) adults, the gender gap is also reduced, but not eliminated, with adjustment for control variables. However, among adults in the melting pot group (class 3), the mediators reduced the expected number of conditions more for women than for men, and as a result the gender gap in medical conditions was eliminated.

The last two columns of Table 3 estimate the full model separately for men and women and test whether the mediators differ significantly by gender (Clogg, Petkova, and Haritou 1995).[8] Acculturation status is more strongly associated with the number of medical conditions among Mexican American men than women. Other factors differ as well, and in each case the effect on medical conditions is stronger for men. Relative to women, being a former drinker and reporting more psychological distress more strongly increase the number of medical conditions among men, and frequent exercise and living with adults aged 65 or older more strongly reduce the number of conditions among men. The effect of education also differs significantly by gender, and it is associated with significantly more medical conditions among men but not women.

The number of medical conditions provides insight into the total burden of disease, but it may obscure differences among specific conditions. Thus, we examine hypertension, heart disease, and diabetes separately in Table 4 (panels A, B, and C). To save space, we do not show the control measures, although we follow the same modeling strategy as we used in Table 3. Bayesian inflation criterion (BIC) statistics indicate that each set of variables substantially improves the fit of each model in Table 4. Several important patterns emerge. First, the gender-by-acculturation interaction terms are significant in model 1 for each health outcome. Consistent with the findings for the number of conditions, the relationship between

Table 4. Odds Ratios from Logistic Regression Models for Hypertension, Heart Disease, and Diabetes, Mexican Americans Living in the U.S., 1998–2007

	Model 1	Model 2	Model 3	Model 4	Model 5	Gender-Stratified Model 5	
						Women	Men
Panel A: Hypertension (N = 25,101)							
Female	2.12***	2.12***	1.98***	1.50**	1.47*	—	—
Acculturation status (reference: Class 1: recent arrivals)							
Class 2 (multicultural)	1.48**	1.43*	1.43*	1.17	1.07	0.96	1.07
Class 3 (melting pot)	2.42***	2.36***	2.31***	1.78***	1.53***	0.95	1.39*†
Female × Class 2 (multicultural)	0.78	0.80	0.80	0.92	0.88	—	—
Female × Class 3 (melting pot)	0.47***	0.48***	0.49***	0.57***	0.58***	—	—
BIC	−4,219.9	−4,174.7	−4,355.7	−4,819.8	−5,348.3	−2,967.7	−2,111.6
Panel B: Heart disease (N = 25,108)							
Female	1.72**	1.84***	1.82**	1.48*	1.43	—	—
Acculturation status (reference: Class 1)							
Class 2	1.03	1.07	1.04	0.86	00.82	0.93	0.77
Class 3	1.80***	1.81***	1.56*	1.24	1.19	0.82	1.04
Female × Class 2	1.04	0.97	0.99	1.10	1.09	—	—
Female × Class 3	0.62*	0.58*	0.60*	0.67	0.65*	—	—
BIC	−1,134.8	−1,087.2	−1,279.2	−1,380.6	−1,485.8	−717.4	−504.8
Panel C: Diabetes (N = 25,114)							
Female	2.00***	2.04***	1.88**	1.27	1.09	—	—
Acculturation status (reference: Class 1)							
Class 2	2.50***	2.27***	2.29***	1.73**	1.52*	1.12	1.65**
Class 3	2.63***	2.48***	2.60***	1.81***	1.58**	1.04	1.71***†
Female × Class 2	0.58*	0.61*	0.62*	0.76	0.81	—	—
Female × Class 3	0.48***	0.50**	0.52**	0.66	0.71	—	—
BIC	−2,213.7	−2,227.9	−2,375.5	−2,787.2	−3,098.5	−1,652.0	−1,187.5

acculturation and each specific condition is stronger for men than women, and the gender gap in each condition is largest among those in class 1 (recent arrivals) and is smallest in class 3 (melting pot). For example, the predicted probability of hypertension is 11 percent for men in class 1; 14 percent among men in class 2; and 22 percent among men in class 3 (results not shown). For women, this relationship is almost flat: 19 percent of women in class 1 and 22 percent of women in classes 2 and 3 are predicted to have hypertension.

Second, access to and utilization of medical care explains the largest share of the associations among gender, acculturation, and each medical condition. Odds ratios for acculturation, gender, and the interaction terms are substantially reduced for each medical condition after adjusting for medical care in model 4. Third, the last two models on Table 4 stratify by gender and show differences in our ability to explain the relationship between acculturation and each medical condition. For hypertension, the fully adjusted model shows no significant relationship with acculturation status among women, although men in the melting pot group (class 3) continue to have 37 percent higher odds of hypertension compared to men in the recent arrivals group (class 3). For heart disease, the fully adjusted model shows no significant relationship between acculturation and heart disease for either men or women. The relationship between acculturation and diabetes is not significant for women, but it is strong for men. Relative to men in the recent arrivals group (class 1), men in the multicultural (class 2) or melting pot (class 3) groups are 65 percent more likely to report diabetes. However, only in class 3 is the odds ratio for men significantly larger than the odds ratio for women.

CONCLUSION

The deteriorating health of immigrants as they acculturate into American society has fostered much research and caused substantial consternation among policy makers. We complicate the literature on immigrant health by finding that the common pattern of declining health with increasing acculturation holds more strongly for men than women. Specifically, gender gaps in medical conditions are greatest among the least acculturated Mexican Americans, with women reporting poorer health than men. However, this gap closes with increasing acculturation, as men's health declines

at a faster pace than women. While the lack of data on non-immigrants living in Mexico and the cross-sectional nature of the data necessitate confirmation with longitudinal data that considers the health profile of immigrants vis-à-vis their counterparts who never migrated to the United States, our findings nonetheless offer evidence that the health consequences associated with migration and acculturation differ for Mexican men and women. The large gender gap among the least acculturated suggests that the selection of healthy individuals into migration occurs more strongly among men than women.

Second, we contribute to the literature on gender and migration by examining the mediators that link acculturation to health, and our results suggest that the process of acculturation into U.S. society differs by gender in ways that are important for health. Past scholarship suggests several possible routes through which the behaviors and characteristics of men and women might differentially link acculturation and health status, including marriage and family characteristics, socioeconomic status, health behaviors, and mental health—each of which, to our surprise, contributed only modestly to the gender-by-acculturation pattern in medical conditions seen in this sample of Mexican American adults. This is not to say that these measures are not relevant for health, as many are significant, independent predictors of medical conditions. Rather, access to and use of medical care is the single pathway connecting acculturation to health that appeared to substantially shape gender disparities. Diminished access to and utilization of medical care were associated with fewer medical conditions, and men report less contact with the medical system than women. This finding suggests that the better health among Mexican American men in the recent arrivals group (class 1) largely results from their lack of knowledge about their own poor health.

Prior research finds that immigrants have longer lives than those born in the United States (Markides and Eschbach 2005). Our findings contrast to prior research, as we find that much (but not all) of the difference in medical conditions results from the limited receipt of medical care among male immigrants, suggesting that they do not know that they are sick. From a health policy standpoint, this suggests that newer immigrants, particularly men, require greater improvements in medical care access than those who have been in the United States longer.

Overall, remarkably few gender differences persisted across the health outcomes we examined. One exception is education, where having any college education was associated with relatively *worse* health for Mexican American men on all health outcomes, but not for women. Poorer health among better educated men may reflect the fact that better educated Mexican immigrant men have fewer opportunities to find work that utilizes their education (Portes and Zhou 1993) and promotes health. Conversely, physical activity was more protective for men than women against hypertension, diabetes, and total medical conditions—possibly because men have higher levels of physical activity (see Table 2). Several other mediators (e.g., alcohol consumption, body mass, living with older family members) also exhibited gender differences across one or two of the outcomes, possibly due to differences in the etiology of each condition, or chance, but no consistent gender differences were apparent.

Our analyses highlight areas that policies might target to promote the health of Mexican immigrants. Many of the mediators operated similarly by gender, thus interventions that target those mechanisms might improve the health of all Mexican Americans. Although this finding might seem counterintuitive, it is consistent with prior studies that find that social status differences between men and women are greater across racial-ethnic groups than within them (Read and Gorman 2006). In other words, Mexican American men and women are located in similar social positions that limit their access to health promoting resources. Future policies might aim to encourage community outreach programs to provide education on diet and exercise. These interventions may also benefit those who face similar obstacles to good health.

Our study has several strengths. First, we use a large, nationally representative sample of Mexican Americans that allows stratified analyses by gender and includes numerous potential mediators of the acculturation-health relationship. Second, we focus on medical conditions rather than more global, ambiguous self assessments. In addition to modeling the total number of medical conditions, we examine three medical conditions that are life threatening, expensive to treat, and that vary by gender among adults (i.e., hypertension, diabetes, and heart disease). Consistency across the outcomes underscores the importance of some of our mediators for health, such as access to medical care. Across health conditions, we find stronger relationships between acculturation and health for

men than for women, further underscoring the need to consider both in research on health.

Divergent findings across conditions also highlight the multidimensional nature of health that a single summary measure cannot capture. For example, the persistently elevated odds of diabetes among Mexican American men in the multicultural (class 2) and melting pot (class 3) groups—differences that remained even after we adjusted for the full array of mediators—suggests that being a recent arrival (class 1) is especially protective against some medical conditions. Our results suggest the need for future studies to include measures (e.g., detailed food consumption) that may be inadequately captured by our current covariates and that might have different implications across the medical conditions.

Finally, prior research typically relies on a single indicator of acculturation (e.g., Antecol and Bedard 2006; Cho et al. 2004) or combines multiple items into indices (Lopez-Gonzalez et al. 2005). We extend this research by using latent class analysis to identify patterns that emerge from the items that tap into acculturation. We find two distinct groups that are comprised primarily of first generation immigrants, although those groups vary in their levels of citizenship, language usage, and time spent in the United States. A third group holds mostly U.S. born Mexican Americans or long-term first generation immigrants, those who have very high levels of citizenship and low levels of Spanish language usage during the interview. To our knowledge, prior research has not empirically identified these distinct groups of Mexican Americans in the United States, nor has it examined differences in health across these groups.

Our study is not without limitations. First, like most prior research, we cannot directly assess the impact of selective migration, since the National Health Interview Survey lacks comparative information on non-immigrants who continued to live in Mexico. However, we find that less acculturated Mexican Americans have significantly better health than more acculturated Mexican Americans, even after adjusting for factors that have likely changed after immigration (e.g., access to health care, health behaviors) or that may shape selection to migration into the United States (e.g., education). Second, we have examined the acculturation-health relationship as an individual process, even though the migration decisions of men and women from the same family are certainly connected. To some extent, we have likely mis-specified the nature of the gender-acculturation-health relationship. Future

data collection efforts that include detailed information on health and migration for couples and their families, and not just individuals, could address this limitation.

A third limitation is that we rely on cross-sectional, self-reported data. Recall bias may lead to an under-reporting of medical conditions, although it is unclear whether this would operate differently across acculturation and gender groups. This study is also limited by the measures included in the National Health Interview Survey. We were unable to test factors relating to stress, discrimination, or social support, all factors that differentially influence health status across gender and race-immigrant groups. Thus, our findings require confirmation with a broader range of measures. Longitudinal data would also offer insight into selective migration, and they might help identify more clearly the causal impact of the mediators, and to account for selective mortality. Due to the scarcity of longitudinal data, future work could use data from multiple sources to provide a more comprehensive picture of the selective forces that shape men's and women's migration and health.

Although greater acculturation into U.S. society might help Mexican immigrants find better jobs, attain greater acceptance, and ultimately become more successful, acculturation may also bring the risk of worsening health. Our findings suggest that some of this increase is due to the diagnosis of previously unreported medical conditions. That increasing acculturation is associated with more medical conditions, especially among men, presents a burden to both immigrants and the U.S. healthcare system. Contrary to much discussion in the popular media, it is the most acculturated Mexican Americans (including those born in the United States), and not recent immigrants, who appear less healthy and more likely to require resources to manage those conditions. Future work must further endeavor to uncover the origins of those differences, while recognizing the importance of gender for understanding the acculturation-health relationship.

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NOTES

1. We use the term Mexican American to refer to Mexicans living in the United States, both foreign- and native-born.

2. Total number of medical conditions (25,008), hypertension and heart disease (25,101), and diabetes (25,114). The percent missing on most variables was less than 3, with the exception of family income-to-poverty ratio (24 missing). As a result, for income we use a single, conditional mean imputation that introduced a stochastic component into the imputed values to better reflect the variability found among the nonimputed cases (see Gelman and Hill 2007).

3. Although research suggests that acculturation has multiple dimensions (Lopez-Gonzalez et al. 2005), prior theory does not precisely state how those dimensions fit together. In ancillary analyses, we created an eight category variable that combined duration of residence, citizenship, and language, although some of the categories held few individuals and did not clearly reflect the acculturation experiences of the Mexican Americans in our data. LCA allows us to use identify latent patterns among the acculturation variables without imposing our own criteria on the data in a manner that might not reflect the experiences of the Mexican Americans in our sample.

4. High status occupations include: executive, administrative, and managerial; professional specialty; technicians and related support; and sales occupations. Low status occupations include: administrative support; private household; service; farming, forestry, and fishing; precision production, craft, and repair; operators, fabricators, and laborers; and transportation and material moving occupations. Dangerous occupations include: protective service; military; and handlers, equipment cleaners, helpers, and laborers.

5. Derived from three items (α = .70), and dummy variable coded as 1 if the respondent had delayed medical care, did not receive medical care, or did not receive prescribed medications for financial reasons during the last 12 months.

6. Average of three items (α = .66) that ask about the frequency of participation in vigorous activities, moderate activities, and muscle strengthening activities, where 1 = never, 2 = less than once a week, 3 = 1–2 times per week, 4 = 3–4 times per week, and 5 = 5+ times per week.

7. Ancillary analyses added health behaviors and psychological distress in separate steps. Because psychological distress did little to mediate the relationship between gender, acculturation, and medical conditions, we present only the combined model.

8. Supplemental analyses estimated all models in Tables 3 and 4 separately by gender. But those findings were similar to those presented, so we show only models from the pooled sample, with the exception of model 5.

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Bios

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Erratum

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In Table 3 on pages 448 and 449, some data were incorrectly placed or were missing. The following is how the table should have appeared.

Table 3. Rate Ratios from Negative Binomial Regression Models for the Number of Medical Conditions, Mexican Americans Living in the United States, 1998 to 2007

	Model 1	Model 2	Model 3	Model 4	Model 5	Gender-Stratified Model 5	
						Women	Men
Female	1.83***	1.84***	1.79***	1.41***	1.41***	—	—
Acculturation status (reference: Class 1: recent arrivals)							
Class 2 (multicultural)	1.66***	1.62***	1.60***	1.33***	1.26**	1.08	1.27**†
Class 3 (melting pot)	2.39***	2.32***	2.22***	1.75***	1.61***	1.14*	1.58***†
Female × Class 2 (multicultural)	.77**	.77**	.77**	.88	.86	—	—
Female × Class 3 (melting pot)	.61***	.62***	.63***	.72***	.71***	—	—
Age	1.04***	1.04***	1.04***	1.04***	1.03***	1.03***	1.03***
Family characteristics							
Marital status (reference: Married, spouse in home)							
Married, spouse not in home		.95	.97	1.09	1.14	1.24	1.07
Cohabiting		1.24***	1.18**	1.18**	1.15**	1.10	1.21*
Divorced or separated		1.11*	1.02	1.03	1.02	1.00	1.03
Widowed		.85***	.81***	.84***	.89**	.87**	.89
Never married		0.99	0.91*	0.96	1.00	0.95	1.07
Any children aged < 5 years		.90**	.88***	.88***	.89***	.90*	.89
Any adults aged ≥ 65 years		.92*	.91*	.90**	.94	1.01	.84*†
Socioeconomic status							
Employment status (reference: Working, low-status occupation)							
Currently working, high-status occupation			1.12**	1.08	1.12*	1.08	1.15*
Currently working, dangerous occupation			.94	.96	.97	.80	1.01
Homemaker			1.06	1.05	1.05	1.02	1.14
Student			1.04	.98	1.04	1.19	.80
Retired			1.30***	1.24***	1.22***	1.17*	1.33***
Not working, unable to work			2.37***	1.90***	1.48***	1.49***	1.46***
Not working, other reason			1.43***	1.38***	1.25*	1.18	1.30
Education level (reference: Less than high school)							
High school graduate			.99	.96	.98	.97	.99
Any college			1.15***	1.05	1.07	1.02	1.15*†
Family income/poverty ratio			.98***	.98***	.99**	.99**	.99

(continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Gender-Stratified Model 5	
						Women	Men
Medical care							
Access to medical care (reference: Insured with usual place)							
Not insured or no usual place for care				.92*	.93*	.92*	.94
Not insured and no usual place for care				.70***	.72***	.71***	.74***
Any financial barriers to medical care				1.66***	1.41***	1.44***	1.36***
≥1 year since last doctor visit				.51***	.54***	.57***	.51***
Health behaviors							
Smoking status (reference: Never smoked)							
Current smoker, every day					1.11*	1.16**	1.06
Current smoker, some days					1.13*	1.20*	1.07
Former smoker					1.20***	1.23***	1.17***
Alcohol use (reference: Lifetime abstainer)							
Former drinker					1.17***	1.10*	.34***†
Current drinker, 1 to 2 per occasion					1.01	1.01	1.07
Current drinker, 3 to 4 per occasion					.99	.97	1.06
Current drinker, ≥5 per occasion					1.05	1.05	1.12
Body mass index (reference: Normal weight)							
Underweight					1.03	.87	1.54†
Overweight					1.13***	1.15**	1.10
Obese					1.61***	1.61***	1.60***
Frequency of exercise					.98	1.02	.96*†
Mental health							
Psychological distress					1.30***	1.29***	1.32***†
BIC	−5,251.2	−5,262.2	−5,969.5	−7,132.4	−8,060.5	−4,361.8	−3,293.5

*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

Note: Sample size, full sample (models 1–5) = 25,008; women only = 13,679; men only = 11,329. All models control for survey year.

†Odds ratios for men and women differ at the $p \leq .05$ level or less.