Does an immigrant health paradox exist among Asian Americans? Associations of nativity and occupational class with self-rated health and mental disorders

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ABSTRACT

A robust socioeconomic gradient in health is well-documented, with higher socioeconomic status (SES) associated with better health across the SES spectrum. However, recent studies of U.S. racial/ethnic minorities and immigrants show complex SES-health patterns (e.g., flat gradients), with individuals of low SES having similar or better health than their richer, U.S.-born and more acculturated counterparts, a so-called "epidemiological paradox" or "immigrant health paradox". To examine whether this exists among Asian Americans, we investigate how nativity and occupational class (white-collar, blue-collar, service, unemployed) are associated with subjective health (self-rated physical health, self-rated mental health) and 12-month DSM-IV mental disorders (any mental disorder, anxiety, depression). We analyzed data from 1530 Asian respondents to the 2002–2003 National Latino and Asian American Study in the labor force using hierarchical multivariate logistic regression models controlling for confounders, subjective social status (SSS), material and psychosocial factors theorized to explain health inequalities. Compared to U.S.-born Asians, immigrants had worse socioeconomic profiles, and controlling for age and gender, increased odds for reporting fair/poor mental health and decreased odds for any DSM-IV mental disorder and anxiety. No strong occupational class-health gradients were found. The foreign-born health-protective effect persisted after controlling for SSS but became nonsignificant after controlling for material and psychosocial factors. Speaking fair/poor English was strongly associated with all outcomes. Material and psychosocial factors were associated with some outcomes — perceived financial need with subjective health, uninsurance with self-rated mental health and depression, social support, discrimination and acculturative stress with all or most DSM-IV outcomes. Our findings caution against using terms like "immigrant health paradox" which oversimplify complex patterns and mask negative outcomes among underserved sub-groups (e.g., speaking fair/poor English, experiencing acculturative stress). We discuss implications for better measurement of SES and health given the absence of a gradient and seemingly contradictory finding of nativity-related differences in self-rated health and DSM-IV mental disorders.

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Introduction

A consistent, robust socioeconomic gradient in health is well-documented with individuals at the highest socioeconomic status (SES) having better health, particularly mental health, than those at the bottom and all intermediary levels (Adler et al., 1994; Lynch & Kaplan, 2000; Marmot & Wilkinson, 2006). Yet, growing evidence from studies conducted across and within racial/ethnic minorities and within immigrants in the U.S. shows complex SES-health patterns (de Castro, Gee, & Takeuchi, 2010; Gavin et al., 2010; Kimbro, Bzostek, Goldman, & Rodriguez, 2008; Leu et al., 2008; Sanchez-Vaznaugh, Kawachi, Subramanian, Sanchez, & Acevedo-Garcia, 2009). They are sometimes referred to as an "epidemiologic paradox" (higher SES not associated with better health) or an "immigrant health paradox" (health-protective effect of foreign-born despite lower SES compared to their U.S.-born counterparts). Drawing on theories of health inequalities emphasizing material and psychosocial explanations for the SES-health gradient

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and segmented assimilation theory, we examined whether such a phenomenon exists in the fast-growing, heterogeneous Asian American population. We jointly investigated the associations of nativity and occupational class with subjective health and DSM-IV mental disorders to assess if an occupational class-health gradient exists, whether a health-protective effect exists for immigrants, and the role of subjective social status (SSS), material and psychosocial factors theorized to explain health inequalities.

SES-health gradient

Socioeconomic position generally refers to one's structural location within society based on one's education, occupation, income and wealth (Krieger, Williams, & Moss, 1997). A compelling body of evidence documents a robust socioeconomic gradient in health for a variety of outcomes including mortality, disability, cardiovascular health and particularly mental health (Adler et al., 1994; Lynch & Kaplan, 2000; Marmot & Wilkinson, 2006). A higher prevalence of mental disorders has been repeatedly found in groups of low SES individuals supporting an inverse relationship between mental disorder and social class (Perry, 1996).

Two prevailing theories, the theory of fundamental causes and the theory of the psychosocial effects of social position, offer different explanations for the SES-health gradient and different implications for measuring social position and reducing disparities (Link & Phelan, 2005; Wilkinson, 1999). According to the "fundamental causes" theory, social conditions such as socioeconomic status are fundamental causes of health because those in higher SES enjoy a wide range of health-enhancing resources such as power, money, knowledge and beneficial social conditions. This implies that those with better occupations enjoy greater access to resources and have better health. It prioritizes improving social conditions and reducing absolute material deprivation such as poverty in order to reduce health inequalities. In contrast, the psychosocial perspective argues that perceptions of social inequality resulting from relative social position, and not absolute levels of SES, and the stresses associated with it are more important to health. This suggests that those who perceive higher social standing will have better health and prioritizes reducing social inequality.

Empirical investigations of the SES-health gradient support the existence of complementary material and psychosocial pathways related to differential exposure to and experience of greater stress (Adler, 2006; Adler & Ostrove, 1999). Higher SES is associated with decreases in both stressful events and stress perceptions (Kessler, 1979). Higher degrees of wide-spread and prolonged stresses and more limited access to resources are argued to provide the most parsimonious and plausible explanation for the higher incidence of disorders among lower SES groups (Silvestri & Joffe, 2004).

Immigrant health paradox

However, growing evidence shows that some low SES, racial/ethnic minorities and immigrants exhibit similar or more favorable health than their richer, U.S.-born and more acculturated counterparts. Some call this as an "epidemiologic paradox" (higher SES not associated with better health) or an "immigrant health paradox" (health-protective effect of foreign-born despite having, on average, lower SES). Recent studies investigating the SES-health gradient, mostly using education and income, by comparing across and within racial/ethnic minorities and within immigrants, show complex patterns for a variety of health outcomes and health behaviors — the gradient is not necessarily monotonic and differs greatly by outcome, across race/ethnicity and nativity in the strength and even the direction of the SES-health relationship,

especially among immigrants (Gavin et al., 2010; Kimbro et al., 2008; Leu et al., 2008; Sanchez-Vaznaugh et al., 2009).

Recent studies of Asian Americans also highlight heterogeneity and complex SES-health patterns (de Castro et al., 2010; Gavin et al., 2010; Takeuchi et al., 2007). Gavin and colleagues found that higher income and higher education was not associated with lower risk of major depressive disorder (Gavin et al., 2010). Among Asian immigrants, de Castro and colleagues showed that education, occupation and income may not adequately capture how social disadvantage affects morbidity, specifically poor self-rated physical health, higher body mass index and smoking (de Castro et al., 2010). Asians who immigrated at a younger age also have greater prevalence of mood dysfunction than those who immigrated at older ages despite the attainment of higher education and income (Leu et al., 2008).

While potential explanations offered for the epidemiologic paradox focused on the healthy immigrant theory, culturally protective factors and social support (McGlade, Saha, & Dahlstrom, 2004), these studies also indicate potential limitations in SES measures such as education and income. They may not have the same meaning, may operate differently, have different impact across different racial/ethnic minority groups and/or reflect improper conceptualization and measurement of SES (Braveman et al., 2005; Shavers, 2007). These measures are also confounded by the context of migration (e.g., pre-migration SES), which can shape the direction and magnitude of post-migration social mobility. Immigrants of high SES in their countries of origin may struggle to find similar positions and assimilate down while immigrants of low SES in their country of origin may find it easier to assimilate up and out of poverty.

Studies of acculturation among Asian Americans and immigrants also suggest that the health-protective effect declines with longer residency for physical and mental health (e.g., high blood pressure, psychiatric disorders) perhaps owing to life stressors and discrimination and the adoption of diet and behaviors of mainstream U.S. culture; but the evidence is mixed (Diez Roux et al., 2005; Frisbie, Cho, & Hummer, 2001; Marmot & Syme, 1976; Sanchez-Vaznaugh, Kawachi, Subramanian, Sanchez, & Acevedo-Garcia, 2008; Takeuchi et al., 2007; Vega & Amaro, 1994; Williams et al., 2007).

Classic theories of acculturation depict a linear process of assimilation whereby greater acculturation is accompanied by a loss of the original culture and adoption of mainstream norms and behaviors (Park, 1950). However, segmented assimilation theory argues that patterns of acculturation, adaptation and assimilation may vary, and assimilation can be negative or downward (Portes & Zhou, 1993). Structural barriers and racism/discrimination may block the socioeconomic mobility and integration of immigrants. Culture-focused linear assimilation models and proxy unidimensional measures (e.g., length of stay) often used in public health studies of acculturation may have been limited in capturing the relevant structural and social contexts that enhance or damage immigrants' health (Abraido-Lanza, Armbrister, Florez, & Aguirre, 2006). There also exists a need to more critically and comprehensively consider the social context of immigration, the complex ways in which it combines with SES to affect different indicators of health, and to characterize neglected risk factors of stressors and strains associated with migration and adaptation such as acculturative stress and lack of access to healthcare (Williams & Mohammed, 2008; Williams, Mohammed, Leavell, & Collins, 2010).

Work, occupational class and health disparities

Work constitutes a significant context for understanding the SES-health patterns of Asian Americans. It is an important determinant of exposure to occupational hazards, a significant

component of one's psychosocial environment and source of income and benefits with significant effects on health (Lipscomb, Loomis, McDonald, Argue, & Wing, 2006). Occupation links education and income, and may be particularly salient for U.S. working adults because it is the direct cause of income and important work-related health benefits including health insurance and paid sick leave (Fiscella, Franks, Gold, & Clancy, 2000; Krieger et al., 1997; Lipscomb et al., 2006; Lynch & Kaplan, 2000; Macintyre, McKay, Der, & Hiscock, 2003).

Occupational class, a component of SES, theorized to operate through material (e.g., income) and psychosocial (e.g., work-stress) pathways, is shown to be a powerful, enduring determinant of health, sometimes independent of income and education, with differences in occupational class being associated with widening health inequities over time (Avendano et al., 2005; Black, Morris, Smith, & Tonwsend, 1999; Chandola, Ferrie, Sacker, & Marmot, 2007; Krieger et al., 1997; Kunst, Groenhof, & Mackenbach, 1998; Kunst, Groenhof, Mackenbach, & Health, 1998; Lynch & Kaplan, 2000; Marmot & Wilkinson, 2006; Marmot, Ryff, Bumpass, Shipley, & Marks, 1997). The Whitehall studies and the Wisconsin Longitudinal Survey show that occupational class are related to self-perceived health, depression and psychological well-being (Marmot et al., 1997).

Occupational class may offer distinct advantages in studying health because it is a marker of social position that determines job-related access to resources (e.g., health insurance) and constraints (e.g., inflexible work environment) and job demands (e.g., psychologically stressful working conditions) and rewards (e.g., income, benefits) which can influence health behaviors (e.g., smoking), health and mortality (Burgard, Stewart, & Schwartz, 2003). In 2001, the average hourly earnings of white-collar workers exceeded the average hourly earnings of blue-collar and service workers by approximately 45 percent and 100 percent, respectively (U.S. Department of Labor, 2003). They were also more likely to participate in retirement (59% vs. 21%), medical (50% vs. 22%), dental (37% vs. 15%) and vision (21% vs. 9%) benefits and paid holidays (86% vs. 54%) than service workers (U.S. Department of Labor, 2004).

Immigrant workers are disproportionately represented at the low-wage and lower-skilled end of the U.S. labor force (Capps, Fix, & Fortuny, 2007). They are more likely to have low-incomes, be uninsured and face barriers in accessing and using health services than U.S.-born; some of these are exacerbated for recent immigrants who face acculturative stresses such as not speaking English and finding employment (Carrasquillo, Carrasquillo, & Shea, 2000; Derose, Bahney, Lurie, & Escarce, 2009; Derose, Escarce, & Lurie, 2007; Okie, 2007). Many work-related factors contribute to greater stress at lower SES: insecure employment, low control at work, long working hours, lack of paid leave and dangerous working conditions (Brunner, 1997; de Castro, Fujishiro, Sweitzer, & Oliva, 2006).

Occupational class may be salient for understanding disparities affecting Asian Americans, 69% of whom are foreign-born, 39% of whom have limited English proficiency (LEP), certain ethnic subgroups of whom are more likely to have less than a high school education and be poor or near poor compared to non-Hispanic Whites (Reeves & Bennett, 2004). Systematically examining the dual contributions of nativity and occupational class independently and in combination with SSS, material and psychosocial factors, thus holds value for better understanding disparities among Asian Americans.

Objective

This study aims to understand the relationships of nativity and occupational class with the health of Asian Americans using a nationally representative sample that includes non-English

speaking Asians. We aim to: 1) describe how self-rated health and DSM-IV mental disorder varies by nativity and occupational class, 2) investigate whether nativity and occupational class are associated with self-rated physical health, self-rated mental health and validated measures of anxiety, depression and any mental disorder in the past 12 months, and 3) investigate whether a health-protective effect exists for immigrants after controlling for SSS, and 4) the role of material (uninsurance, perceived financial need) and psychosocial factors (discrimination, social support, acculturative stress).

Methods

Data source and study population

We analyzed data from Asian respondents to the 2002–2003 National Latino and Asian American Study (NLAAS), the first national epidemiological survey of Latinos and Asian Americans implemented to primarily assess mental illness and mental health services use (Alegria, Takeuchi, et al., 2004; Alegria, Vila, et al., 2004; Pennell et al., 2004). It used a modified version of the World Mental Health Survey Initiative's World Health Organization Composite International Diagnostic Interview (WMH-CIDI), a fully diagnostic instrument based on the criteria of the Diagnostic and Statistics Manual of Mental Disorders, Version 4 (DSM-IV) to assess diagnoses for a range of psychiatric disorders (Kessler & Ustun, 2004).

Eligible Asian respondents had to be 18 years of age or older, and living in the non-institutionalized population of the coterminous United States or Hawaii, and of Asian descent. The NLAAS instrument was administered by trained, bilingual, lay interviewers in the respondent's choice of the following languages: English, Chinese, Vietnamese, or Tagalog. The overall response rate was 66%. NLAAS included stratified samples of respondents in these ethnic subgroups: Chinese, Vietnamese, Filipino, and Other Asians. We analyzed data from 1530 of the 2095 Asian respondents in the labor force, as defined by the Bureau of Labor Statistics (inclusion criteria: being currently employed or unemployed but looking for work; exclusion criteria: being a student, disabled, retired, or homemaker) (U.S. Bureau of Labor Statistics).

Measures

Outcome variables

The 5 outcomes of interest were: self-rated physical health, self-rated mental health, any mental disorder in past 12 months, any anxiety disorder in past 12 months and any depressive disorder in past 12 months. The latter 3 measures were assessed by a WHO-CIDI diagnosis based on DSM-IV criteria.

Self-rated physical health. We categorized responses to "How would you rate your overall physical health – excellent, very good, good, fair, or poor?" as fair/poor vs. excellent, very good, good.

Self-rated mental health. We categorized responses to "How would you rate your overall mental health – excellent, very good, good, fair, or poor?" as fair/poor vs. excellent, very good, good.

Any mental disorder in the past 12 months. Based on a DSM-IV diagnosis of at least 1 disorder in any of the following 4 categories: anxiety disorders (agoraphobia without panic, generalized anxiety disorder, panic disorder, social phobia, or posttraumatic stress disorder), depressive disorders (major depressive disorder or dysthymia), substance use disorders (alcohol abuse, alcohol dependence, drug abuse, drug dependence) and any other DSM-IV disorder.

Any anxiety disorder in the past 12 months. Based on a DSM-IV diagnosis of at least 1 disorder from agoraphobia without panic, generalized anxiety disorder, panic disorder, social phobia, or posttraumatic stress disorder.

Depression in the past 12 months. Based on DSM-IV diagnosis of major depressive disorder or dysthymia.

Independent variables

The main independent variables of interest were nativity and occupational class.

Nativity. Nativity status was characterized dichotomously (foreign-born, U.S.-born).

Occupational class. Respondents were asked "What kind of work do you normally do? That is, what is your job called?" Service, blue-collar, and white-collar categories were assigned following standard practice based on primary employment in any of the 2000 U.S. Standard Occupation Classification groups. We categorized separately unemployed (being unemployed but looking for work) and 'other' (in army, refusals, "don't know" or missing/vague job descriptions that could not be classified into a broad occupational class).

Ethnicity. Using self-reported membership in an ethnic group, respondents were categorized as Chinese, Filipino, Vietnamese, and 'other Asian' (included Japanese, Korean, Asian Indian and other Asian ethnicity).

Limited English proficiency (LEP). We defined this as response of fair/poor (vs. excellent/good) to "How well do you speak English?"

Uninsurance. We defined 'uninsurance' as not having any health insurance coverage from various assessed sources (private coverage through one's own/spouse's employer, self-purchased private coverage, public coverage through Medicare or Medicaid, other coverage).

Annual household income. This was characterized as a poverty ratio based on the 2000 Federal Poverty Level (FPL) taking into account household size and categorized as: poor (<100% FPL), near poor (100–199% FPL), moderate income (200–299% FPL) and high income (≥300% FPL).

Subjective social status (SSS). Assessed using a 10-rung visual ladder scale where the first and tenth rung represent the lowest (worst off – least money, least education, worst jobs or no job) and highest social status (the best off – most money, most education and best jobs) in 3 forms: SSS in U.S., SSS in community, SSS in country of origin standing for immigrants ("Think of this ladder as representing where people stand in your country of origin. What is the number to the right of the rung where you think you would stand if you were still in your country of origin?").

Perceived financial need. We categorized responses to "In general, would you say (you have/your family living here has) more money than you need, just enough for your needs, or not enough to meet your needs?" as not enough vs. just enough or more than enough.

Social support. We included 3 measures:

a) Marital status. An indicator of social networks (Berkman & Syme, 1979) with unmarried individuals characterized as having low levels of social ties, was categorized as married, never married, widowed/divorced/separated.
b) Family Social Support. Assessed with a 3-item scale (Cronbach's alpha = 0.74) measuring structural support ("How often do you talk on the phone or get together with family or relatives who do not live with you") and perceived or emotional support from family or relatives ("How much can you open up to relatives who do not live with you if you need to talk about your worries"). Scores could range from 3 to 13.
c) Friend Social Support. Assessed with a 3-item scale (Cronbach's alpha = 0.66) similar to above but in reference to friends. Scores ranged from 3 to 13.

Perceived discrimination. The 9-item "experiences of everyday unfair treatment" scale (Cronbach's alpha = 0.91) measured the frequency of experiences such as being threatened or harassed, treated with less courtesy and receiving poorer service than others (Williams, Yu, Jackson, & Anderson, 1997). Responses could range from never (0) to almost everyday (5) with scores ranging from 0 to 45.

Acculturative stress. This was assessed for immigrants using 8-item Acculturative Distress scale (Cronbach's alpha = 0.57) taken from Mexican American Prevalence and Services Survey (Vega et al., 1998). Items focused on experiences upon immigration involving discrimination, fear of deportation, limited contact with family and friends, and difficulties with the English language, finding employment and seeking health services. Responses could be yes (1) or no (0) with scores ranging from 0 to 8.

Control variables

We also controlled for gender, age, education (<12 years, 12 years, 13–16 years, 17 years or more), and length of stay in U.S. as further described.

Statistical analysis

We conducted descriptive and bivariate analyses and multivariate logistic regression using the *svy* family of commands and *subpop* option in Stata 10.0 (StataCorp, College Station, TX) to accommodate NLAAS's complex survey design involving stratification, clustering and unequal probability sampling (Heeringa et al., 2004). Given the significant diversity among Asian subgroups based on nativity and ethnicity, we explored conducting multivariate analyses on samples stratified by ethnicity and nativity and testing for effect modification. However, our study was underpowered to reliably detect differences within the small sizes of the ethnicity and U.S.-born groups. We present descriptive statistics by ethnicity and nativity. We also controlled for ethnicity in our models to capture ethnicity-related differences in immigration context and levels of health unexplained by factors such as nativity (Frisbie et al., 2001; Uehara, Takeuchi, & Smukler, 1994) and obtained separate results for immigrants.

To achieve our aims, first, we obtained sociodemographic characteristics of the sample by nativity. Second, we examined the bivariate associations of ethnicity, nativity and occupational class and the 5 outcomes using Pearson's chi-square tests. Third, we ran a series of hierarchical multivariate regressions models. Models 1a and 1b separately estimated the associations of nativity and occupational class while controlling for age and gender. For comparison, we also obtained age-, gender-adjusted associations for education, income, SSS in U.S., community and country of origin (models 1c–g). Model 2 estimated the associations of both nativity and occupational class controlling for confounders (age, gender, ethnicity, education, limited English proficiency). Model 3 examined if a health-protective

exists for immigrants after additionally controlling for income and SSS. Model 4 additionally controlled for material (uninsurance, perceived financial need) and psychosocial factors (everyday discrimination, social support). Model 5 was Model 4 repeated for immigrants and adding immigration-related factors (SSS in country of origin, acculturative distress, duration of residence in U.S.).

Results

Table 1 presents select sociodemographic characteristics of the weighted sample (weighted sample size = 5.5 million). Seventy-six percent were immigrants averaging 15 years of residence in U.S. [17% residing in U.S. for 5 years or less while 31% had resided more than 20 years]. Immigrants differed from U.S.-born on some characteristics. Most strikingly, compared to U.S.-born Asians,

immigrants were significantly more likely to have less than high school education, be employed in blue-collar or service occupations, report lower SSS in U.S. and community and report speaking fair/poor English. They were more likely to have near-poor/moderate incomes but this was not statistically significant. These aggregate results suggest that Asian immigrants, on average, fare worse than U.S.-born Asians on some important SES indicators. Immigrants were slightly more likely to be older and much more likely to be married than U.S.-born Asians.

Descriptive results of self-rated health and DSM-IV mental disorder by ethnicity, nativity and occupational class

As seen in Table 2, there were important differences by ethnicity, nativity and occupational class. Ethnicity-related differences were

Table 1
Weighted sample characteristics of Asian Americans in the U.S. labor force, by nativity: 2002–2003 National Latino and Asian American Study

In labor force (5.5 million)	Unweighted sample size	Total, % or mean	Immigrant, % or mean	U.S. Born, % or mean	p-value
Nativity					
U.S. born	335	24	–	–	
Immigrant	1193	76	–	–	
Age, mean	1530	39	40	36	**0.001**
Gender					
Women	729	47	48	47	0.840
Men	801	53	52	53	
Ethnicity					
Chinese	445	28	30	22	**<.001**
Filipino	371	22	20	28	
Vietnamese	376	13	17	2	
Other Asian[a]	338	36	33	48	
English language proficiency					
Excellent/good	985	70	62	95	**<.001**
Fair/poor	545	30	38	5	
Education					
17 years or more	309	22	23	19	**<.001**
13–16 years	763	49	46	58	
12 years	262	17	16	21	
< 12 years	195	13	16	3	
Occupational class					
White-collar	918	61	59	70	**0.030**
Blue-collar	222	13	15	9	
Service	151	10	11	6	
Unemployed	145	9	9	8	
Other	94	6	6	7	
Annual household income					
High income, ≥300% FPL	1068	72	71	77	0.090
Moderate income, 200–299% FPL	161	10	11	6	
Near poor, 100–199% FPL	130	7	7	5	
Poor, <100% FPL	171	11	11	12	
SSS in U.S., mean	1502	6.0	5.8	6.4	**0.001**
SSS in community, mean	1492	6.4	6.3	6.7	**0.003**
Uninsurance	1525	13	14	11	0.154
Perceived financial need	1528	23	23	22	0.747
Perceived discrimination, mean	1528	7.8	6.9	10.3	**<.001**
Marital status					
Married	1011	66	74	40	**<.001**
Never married	377	25	19	47	
Widowed, separated, divorced	139	9	7	13	
Family social support, mean	1528	9.0	8.7	9.9	**<.001**
Friend social support, mean	1528	8.8	8.4	10.1	**<.001**
Immigrants only					
SSS in country of origin, mean	1193		6.9		
Acculturative stress, mean	1193		2.0	–	
Duration of residence in U.S. in years, mean	1193		15.8	–	

FPL = Federal Poverty Level, SSS = Subjective social status.
Results shown account for complex survey design due to clustering, stratification and unequal probability sampling.
Mean is shown for continuous variables (age, SSS in US, community and country of origin, perceived discrimination, family and friend social support, acculturative stress, duration of residence in US). Percentage shown for categorical variables.
Differences are statistically significant at $p < 0.05$ based on Pearson's chi-square tests of differences in proportions for categorical variables and 2-sample t tests for continuous variables. p-values <.05 are shown in bold.
[a] The "other Asian" category included those identifying as Japanese, Korean, Asian Indian and other Asian ethnicity.

Table 2
Fair/poor self-rated health and DSM-IV assessed mental disorders for Asians in the U.S. labor force, by ethnicity, nativity and occupational class: 2002–2003 National Latino and Asian American Study.

	Unweighted sample size	Self-rated physical health			Self-rated mental health			Any mental disorder in past 12 months			Any anxiety disorder in past 12 months			Any depression in past 12 months		
		Excellent/very good/good	Fair/poor	p-value	Excellent/very good/good	Fair/poor	p-value	No	Yes	p-value	No	Yes	p-value	No	Yes	p-value
	n	%	%		%	%		%	%		%	%		%	%	
Total	1530	89	11	–	93	7	–	90	10	–	94	7	–	95	5	–
Ethnicity																
Chinese	445	83	17	**0.000**	89	11	**0.003**	89	11	0.735	93	7	0.060	94	6	0.729
Filipino	371	92	8		94	6		90	10		94	6		95	5	
Vietnamese	376	83	17		91	9		93	7		96	4		96	4	
Other Asian[a]	338	93	7		97	3		89	11		92	8		94	6	
Nativity																
U.S. born	335	91	9	0.189	97	3	**0.009**	85	15	**0.001**	26	9	**0.033**	92	8	**0.028**
Immigrant	1193	88	12		92	8		92	8		25	6		95	5	
Occupational class																
White-collar	918	91	9	**0.036**	95	5	0.052	90	10	**0.021**	93	7	0.609	95	5	**0.042**
Blue-collar	222	86	14		91	9		95	5		96	4		98	2	
Service	151	85	15		91	9		90	10		94	6		94	6	
Unemployed	145	84	16		92	8		81	19		92	8		87	13	
Other	94	86	14		89	11		94	6		95	5		95	5	

[a] The "other Asian" category included those who identified as Japanese, Korean, Asian Indian and other Asian ethnicity.
Percentages shown are for weighted sample and account for complex survey design involving stratification, clustering and unequal probability sampling.
Differences are statistically significant at p<.05 based on chi-square tests of differences in proportions. p-values <.05 are shown in bold.

significant for both self-rated health measures but not for the DSM-IV measures, with higher proportions of Chinese and Vietnamese reporting fair/poor self-rated physical and mental health than Filipinos. Nativity-related differences were significant for self-rated mental health and all 3 DSM-IV measures but in opposite directions. Immigrants were more likely to report fair/poor mental health (8% vs. 3%, $p < 0.01$) but less likely to have any mental disorder (8% vs. 15%, $p < 0.01$), anxiety (6% vs. 9%, $p < 0.05$) or depression (5% vs. 8%, $p < 0.05$) than U.S.-born Asians. Occupational class differences also varied by outcome and were significant for all outcomes except anxiety. White-collar workers were less likely to report fair/poor self-rated physical health and fair/poor self-rated mental health, but the patterns were more complex for the DSM-IV measures. Unemployed Asians had the highest rates of any mental disorder and depression. In contrast to what the SES-health gradient posits, white-collar workers were not less likely to have any mental disorder, anxiety and depression than blue-collar and service workers.

Multivariate regression model results for self-rated physical and mental health (Tables 3 and 4), any mental disorder (Table 5) and anxiety and depression (Tables 6 and 7) are described next.

Associations of nativity and occupational class, each adjusted for age and gender, model 1a & 1b

Adjusting for age and gender, immigrants were more likely to report fair/poor mental health [adjusted OR: 2.60] but less likely to have any mental disorder and anxiety [adjusted ORs: 0.60 and 0.59] than U.S.-born Asians. Adjusting for age and gender, we found some significant differences by occupational class for self-rated physical and mental health but not for DSM-IV mental disorders. Compared to white-collar workers, blue-collar workers had significantly higher odds of rating both their physical and mental health as fair/poor [adjusted ORs: 1.73 and 1.99] while unemployed Asians had higher odds for rating their physical health as fair/poor [adjusted OR: 1.96]. We found no significant differences by occupational class for any of the 3 DSM-IV mental health outcomes.

Associations of nativity and occupational class, adjusted for confounders (age, gender, ethnicity, education, English language proficiency), model 2

Modeling both nativity and occupational class simultaneously with confounders, an immigrant health-protective effect emerges for fair/poor self-rated physical health [adjusted OR: 0.57]. LEP was strongly associated with fair/poor physical health [adjusted OR: 4.61]. We see the reverse pattern for fair/poor mental health. The immigrant health-protective effect became nonsignificant but LEP was strongly associated suggesting that language barriers may partially explain why immigrants report worse self-rated mental health.

For DSM-IV mental disorders, the strong health-protective effect persists for immigrants for any mental disorder and anxiety [adjusted ORs: 0.46 and 0.47, respectively]. Similar to self-rated physical health and self-rated mental health, LEP was strongly and consistently associated with all outcomes − any mental disorder, anxiety and depression [adjusted ORs: 2.87, 3.35 and 3.52, respectively]. Again, in contrast to what the SES-health gradient posits, we found no strong occupational class-health gradients.

Does an immigrant health-protective effect persist after accounting for SSS, model 3

We see a health-protective effect persisting with no change in magnitude for self-rated physical health, any mental disorder and

Table 3
Results of logistic regression on self-rated physical health for Asians in the U.S. labor force: 2002–2003 National Latino and Asian American Study

	Fair/poor self-rated physical health									
	Model 1a-g: each adjusted for age, gender[a]		Model 2: nativity + occupational class + confounders		Model 3: Model 2 + income + SSS		Model 4: Model 3 + material + psychosocial factors		Model 5: Model 4 + immigration-related factors, immigrants only	
	Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)	
Nativity										
U.S. born (Ref.)	1.00		1.00		1.00		1.00			
Immigrant	1.24	(0.80–1.93)	**0.57***	(0.35–0.94)	**0.56***	(0.31–0.98)	**0.52***	(0.30–0.92)		
Education										
17 years or more (Ref.)	1.00		1.00		1.00		1.00		1.00	
13–16 years	1.67	(0.96–2.91)	1.46	(0.87–2.47)	1.24	(0.74–2.10)	1.29	(0.77–2.15)	1.11	(0.73–1.69)
12 years	**2.91*****	(1.60–5.30)	1.67	(0.87–3.23)	1.36	(0.71–2.63)	1.33	(0.67–2.62)	1.02	(0.48–2.17)
< 12 years	**3.29****	(1.62–6.69)	1.44	(0.71–2.92)	1.09	(0.53–2.27)	1.18	(0.58–2.43)	0.88	(0.46–1.69)
English language proficiency										
Excellent/good (Ref.)			1.00		1.00		1.00		1.00	
Fair/poor			**4.61*****	(2.56–8.30)	**3.64*****	(2.05–6.47)	**3.37*****	(1.77–6.42)	**3.75*****	(1.86–7.57)
Occupational class										
White-collar (Ref.)	1.00		1.00		1.00		1.00		1.00	
Blue-collar	**1.73***	(1.03–2.90)	0.97	(0.61–1.56)	0.92	(0.56–1.50)	0.91	(0.54–1.53)	0.88	(0.47–1.64)
Service	1.52	(0.85–2.72)	0.95	(0.47–1.91)	0.92	(0.47–1.81)	0.91	(0.46–1.81)	0.85	(0.40–1.78)
Unemployed	**1.96***	(1.10–3.50)	1.51	(0.82–2.80)	1.26	(0.68–2.34)	1.19	(0.63–2.28)	1.34	(0.56–3.20)
Annual household income										
High income (≥300% FPL) (Ref.)	1.00				1.00		1.00		1.00	
Moderate income (200–299% FPL)	1.63	(0.92–2.88)			1.04	(0.52–2.08)	1.01	(0.50–2.06)	1.17	(0.50–2.74)
Near poor (100–199% FPL)	**2.85****	(1.38–5.88)			1.30	(0.57–2.99)	1.26	(0.54–2.94)	1.52	(0.66–3.49)
Poor (<100% FPL)	**2.13****	(1.22–3.73)			1.23	(0.57–2.67)	1.16	(0.48–2.83)	1.61	(0.66–3.93)
SSS in U.S.	**0.71*****	(0.62–0.81)			**0.82***	(0.69–0.97)	**0.84***	(0.71–1.00)	0.87	(0.70–1.09)
SSS in community	**0.80*****	(0.71–0.90)			1.00	(0.88–1.15)	1.01	(0.88–1.16)	0.96	(0.79–1.17)
Material factors										
Health insurance										
Any health insurance (Ref.)							1.00		1.00	
Uninsurance							1.03	(0.62–1.71)	1.01	(0.56–1.82)
Perceived financial need							**1.74****	(1.27–2.38)	1.48	(0.89–2.47)
Psychosocial factors										
Perceived discrimination							**1.03***	(1.00–1.07)	1.02	(0.98–1.06)
Marital status										
Married (Ref.)							1.00		1.00	
Never married							0.72	(0.30–1.70)	0.50	(0.20–1.23)
Widowed, separated, divorced							0.80	(0.42–1.53)	0.71	(0.29–1.79)
Family social support							1.03	(0.94–1.12)	1.02	(0.93–1.13)
Friend social support							0.92	(0.80–1.06)	0.92	(0.79–1.07)
Immigration-related factors										
SSS in country of origin	**0.89***	(0.80–0.99)							1.00	(0.88–1.14)
Acculturative stress									1.04	(0.91–1.19)
Duration of residence in U.S.									1.03	(0.99–1.07)

* p<0.05; ** p<0.01; *** p<0.001 ; Adj. OR = Adjusted Odds Ratio, 95% CI=95% Confidence Interval, FPL=Federal Poverty Level, SSS = Subjective Social Status
Results shown account for complex survey design due to clustering, stratification and unequal probability sampling
Models 2–5 also adjusted for age, gender and ethnicity
Statistically significant results (p<.05) are shown in bold.
[a] Age, gender-adjusted associations shown for nativity (model 1a), occupational class (model 1b), education (model 1c), income (model 1d), SSS in US (model 1e), SSS in community (model 1f), SSS in country of origin (model 1 g)

anxiety. Higher SSS in U.S. was associated with lower odds of fair/poor physical health only [adjusted OR: 0.82].

Role of material (uninsurance, perceived financial need) and psychosocial factors (perceived discrimination, social support), model 4

The health-protective effect persists only for self-rated physical health. It became nonsignificant for any mental disorder and anxiety. The association of LEP became nonsignificant for self-rated mental health but remained strongly associated with all other outcomes [adjusted ORs ranged from 2.47 to 3.37]. Material factors were also significantly associated with negative outcomes. Perceived financial need was strongly associated with self-rated physical and mental health [adjusted ORs: 1.74 and 3.06, respectively] while uninsurance was associated with self-rated mental health and depression [adjusted ORs: 1.94 and 2.59, respectively]. Perceived discrimination was strongly associated with self-rated physical health, any mental disorder, anxiety and depression [adjusted ORs: 1.03, 1.10, 1.08 and 1.11 for each 1 unit increase in score, respectively]. Associations of social support varied by outcome. Marital status was associated with all DSM-IV outcomes with Asians who had never married having significantly higher odds than married Asians [adjusted ORs ranged from 2.15 to 3.09]. Higher friend support was associated with lower odds of fair/poor mental health [adjusted OR: 0.85] and higher family support was protective of depression [adjusted OR: 0.89]. Given the strong associations of marital status, we further assessed whether marital status may be driving the health-protective effect. Repeating model 3 with marital status added, the health-protective association weakened and became nonsignificant for any mental disorder and anxiety disorder (results available upon request).

Table 4
Results of logistic regression on self-rated mental health for Asians in the U.S. labor force: 2002–2003 National Latino and Asian American Study

	Fair/poor self-rated mental health								
	Model 1a-g: each adjusted for age, gender[a]		Model 2: nativity + occupational class + confounders		Model 3: Model 2 + income + SSS		Model 4: Model 3 + material + psychosocial factors		Model 5: Model 4 + immigration-related factors, immigrants only
	Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)
Nativity									
U.S. born (Ref.)	1.00		1.00		1.00		1.00		
Immigrant	**2.60***	(1.12 – 6.05)	1.45	(0.65 – 3.22)	1.37	(0.62 – 3.03)	1.37	(0.60 – 3.10)	
Education									
17 years or more (Ref.)	1.00		1.00		1.00		1.00		1.00
13–16 years	2.08	(0.83 – 5.26)	1.94	(0.82 – 4.62)	1.72	(0.74 – 4.03)	1.50	(0.65 – 3.48)	1.19 (0.46 – 3.12)
12 years	2.56	(0.99 – 6.64)	1.77	(0.71 – 4.38)	1.29	(0.49 – 3.36)	1.05	(0.37 – 3.00)	0.81 (0.24 – 2.78)
< 12 years	**7.23***	(2.64 – 19.79)	**3.95**	(1.49 – 10.46)	**3.34***	(1.17 – 9.54)	**3.39***	(1.16 – 9.96)	2.76 (0.77 – 9.95)
English language proficiency									
Excellent/good (Ref.)			1.00		1.00		1.00		1.00
Fair/poor			**2.71**	(1.40 – 5.26)	**2.19***	(1.15 – 4.16)	1.77	(0.82 – 3.79)	**2.09*** (1.02 – 4.31)
Occupational class									
White-collar (Ref.)	1.00		1.00		1.00		1.00		1.00
Blue-collar	**1.99***	(1.10 – 3.61)	1.03	(0.51 – 2.08)	0.92	(0.42 – 2.00)	0.91	(0.43 – 1.94)	0.99 (0.43 – 2.32)
Service	1.46	(0.83 – 2.58)	0.83	(0.47 – 1.44)	0.66	(0.32 – 1.37)	0.56	(0.28 – 1.12)	0.46 (0.19 – 1.08)
Unemployed	1.75	(0.75 – 4.10)	1.36	(0.57 – 3.22)	1.08	(0.39 – 3.00)	0.73	(0.25 – 2.13)	0.74 (0.23 – 2.34)
Annual household income									
High income (≥300% FPL) (Ref.)	1.00				1.00		1.00		1.00
Moderate income (200–299% FPL)	1.32	(0.68 – 2.55)			0.75	(0.30 – 1.83)	0.61	(0.27 – 1.37)	0.65 (0.27 – 1.57)
Near poor (100–199% FPL)	2.47	(0.90 – 6.78)			0.95	(0.32 – 2.77)	0.65	(0.24 – 1.80)	0.66 (0.22 – 1.98)
Poor (<100% FPL)	1.89	(0.92 – 3.87)			1.13	(0.36 – 3.51)	0.56	(0.13 – 2.44)	0.55 (0.12 – 2.47)
SSS in U.S.	**0.71***	(0.59 – 0.85)			0.84	(0.67 – 1.05)	0.89	(0.73 – 1.09)	0.93 (0.76 – 1.14)
SSS in community	**0.76**	(0.64 – 0.90)			0.94	(0.77 – 1.15)	0.96	(0.82 – 1.13)	0.96 (0.82 – 1.13)
Material factors									
Health insurance									
Any health insurance (Ref.)							1.00		1.00
Uninsurance							**1.94***	(1.01 – 3.75)	**2.41*** (1.10 – 5.26)
Perceived financial need							**3.06***	(1.88 – 4.98)	**3.51*** (2.08 – 5.94)
Psychosocial factors									
Perceived discrimination							1.00	(0.97 – 1.03)	0.98 (0.94 – 1.02)
Marital status									
Married (Ref.)							1.00		1.00
Never married							1.74	(0.88 – 3.44)	1.56 (0.64 – 3.79)
Widowed, separated, divorced							1.73	(0.73 – 4.12)	**2.61*** (1.08 – 6.34)
Family social support							0.93	(0.84 – 1.03)	0.98 (0.87 – 1.10)
Friend social support							**0.85***	(0.78 – 0.93)	**0.82*** (0.75 – 0.91)
Immigration-related factors									
SSS in country of origin	0.89	(0.78 – 1.01)							1.00 (0.85 – 1.18)
Acculturative stress									0.99 (0.86 – 1.15)
Duration of residence in U.S.									1.02 (0.97 – 1.07)

* p<0.05; ** p<0.01; *** p<0.001 ; Adj. OR = Adjusted Odds Ratio, 95% CI=95% Confidence Interval, FPL=Federal Poverty Level, SSS = Subjective Social Status
Results shown account for complex survey design due to clustering, stratification and unequal probability sampling
Models 2–5 also adjusted for age, gender and ethnicity
Statistically significant results (p<.05) are shown in bold.
[a] Age, gender-adjusted associations shown for nativity (model 1a), occupational class (model 1b), education (model 1c), income (model 1d), SSS in US (model 1e), SSS in community (model 1f), SSS in country of origin (model 1 g)

Role of material, psychosocial and immigration-related factors (SSS in country of origin, acculturative stress, duration of residence in U.S.), model 5 (immigrants only)

Findings were mostly similar among immigrants. We again found no occupational class gradients in any of the outcomes (results available upon request). Notable differences included LEP being associated with self-rated mental health and acculturative stress being associated with any mental disorder and depression [adjusted ORs: 1.17 and 1.23, respectively]. Perceived discrimination remained strongly associated with any mental disorder, anxiety and depression.

Discussion

Our results indicate that nativity and occupational class influence the health of Asian Americans in complex ways which differ by type of health outcome studied. Overall, immigrants were more likely to work in blue-collar and service occupations and have, on average, worse socioeconomic profiles than U.S.-born Asians. We found a strong health-protective effect of being foreign-born for any mental disorder and anxiety in the past 12 months. This protective effect persisted after accounting for SSS but was nonsignificant after controlling for material and psychosocial factors. Furthermore, contrary to what the SES-health gradient hypothesis posits (higher SES/higher occupational class associated with better health outcomes), we did not find any strong occupational class gradients in any of the 5 outcomes, a finding which remained robust in analyses on immigrants. Our findings demonstrate the importance of material and psychosocial factors for the mental health of Asian Americans. Though we found a foreign-born health-protective effect for some outcomes, our findings caution against generalizing good health to all Asian immigrants using

Table 5

Results of logistic regression on any mental disorder in past 12 months for Asians in the U.S. labor force: 2002–2003 National Latino and Asian American Study

	Any mental disorder in past 12 months									
	Model 1a-g: each adjusted for age, gender[a]		Model 2: nativity + occupational class + confounders		Model 3: Model 2 + income + SSS		Model 4: Model 3 + material + psychosocial factors		Model 5: Model 4 + immigration-related factors, immigrants	
	Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)	
Nativity										
U.S. born (Ref.)	1.00		1.00		1.00		1.00			
Immigrant	**0.60***	(0.39 − 0.92)	**0.46****	(0.26 − 0.81)	**0.46****	(0.26 − 0.82)	0.69	(0.36 − 1.29)		
Education										
17 years or more (Ref.)	1.00		1.00		1.00		1.00		1.00	
13−16 years	**1.93***	(1.14 − 3.26)	1.82	(1.00 − 3.34)	1.61	(0.83 − 3.12)	1.39	(0.79 − 2.44)	1.42	(0.69 − 2.92)
12 years	1.92	(0.99 − 3.72)	1.58	(0.65 − 3.83)	1.37	(0.55 − 3.43)	1.23	(0.64 − 2.37)	1.68	(0.47 − 6.05)
< 12 years	1.70	(0.65 − 4.48)	1.56	(0.53 − 4.65)	1.27	(0.38 − 4.25)	1.24	(0.40 − 3.88)	1.59	(0.44 − 5.72)
English language proficiency										
Excellent/good (Ref.)			1.00		1.00		1.00		1.00	
Fair/poor			**2.87****	(1.45 − 5.70)	**2.59****	(1.40 − 4.77)	**2.59****	(1.40 − 4.81)	**4.06*****	(1.96 − 8.43)
Occupational class										
White-collar (Ref.)	1.00		1.00		1.00		1.00		1.00	
Blue-collar	0.61	(0.27 − 1.38)	0.51	(0.23 − 1.13)	0.53	(0.23 − 1.22)	0.64	(0.27 − 1.53)	**0.40***	(0.16 − 0.98)
Service	1.15	(0.66 − 2.00)	1.02	(0.57 − 1.83)	1.12	(0.57 − 2.19)	1.12	(0.57 − 2.22)	0.86	(0.34 − 2.18)
Unemployed	1.77	(0.86 − 3.66)	1.65	(0.78 − 3.49)	1.55	(0.68 − 3.55)	1.56	(0.78 − 3.14)	0.80	(0.26 − 2.50)
Annual household income										
High income (≥300% FPL) (Ref.)	1.00				1.00		1.00		1.00	
Moderate income (200−299% FPL)	0.85	(0.39 − 1.85)			0.65	(0.32 − 1.32)	0.67	(0.34 − 1.34)	0.74	(0.31 − 1.76)
Near poor (100−199% FPL)	0.87	(0.34 − 2.19)			0.77	(0.27 − 2.17)	0.66	(0.24 − 1.83)	0.31	(0.03 − 2.94)
Poor (<100% FPL)	1.68	(0.83 − 3.38)			1.36	(0.72 − 2.57)	0.82	(0.38 − 1.77)	0.97	(0.31 − 3.11)
SSS in U.S.	**0.84***	(0.73 − 0.96)			0.96	(0.77 − 1.18)	1.04	(0.86 − 1.26)	1.12	(0.91 − 1.37)
SSS in community	**0.83****	(0.74 − 0.92)			0.86	(0.72 − 1.04)	0.88	(0.75 − 1.03)	0.84	(0.68 − 1.04)
Material factors										
Health insurance										
Any health insurance (Ref.)							1.00		1.00	
Uninsurance							1.75	(0.96 − 3.18)	1.78	(0.84 − 3.79)
Perceived financial need							1.18	(0.59 − 2.37)	1.12	(0.38 − 3.31)
Psychosocial factors										
Perceived discrimination							**1.10*****	(1.06 − 1.13)	**1.09****	(1.04 − 1.14)
Marital status										
Married (Ref.)							1.00		1.00	
Never married							**2.67***	(1.26 − 5.66)	**3.47***	(1.17 − 10.29)
Widowed, separated, divorced							1.92	(0.92 − 4.02)	**2.81***	(1.14 − 6.96)
Family social support							0.94	(0.86 − 1.03)	1.01	(0.89 − 1.14)
Friend social support							1.01	(0.91 − 1.13)	0.94	(0.83 − 1.07)
Immigration-related factors										
SSS in country of origin	0.91	(0.80 − 1.04)							1.04	(0.89 − 1.21)
Acculturative stress									**1.17****	(1.04 − 1.31)
Duration of residence in U.S.									1.05	(0.98 − 1.12)

* p<0.05; ** p<0.01; *** p<0.001 ; Adj. OR = Adjusted Odds Ratio, 95% CI=95% Confidence Interval, FPL = Federal Poverty Level, SSS = Subjective Social Status

Results shown account for complex survey design due to clustering, stratification and unequal probability sampling

Models 2−5 also adjusted for age, gender and ethnicity

Statistically significant results (p<.05) are shown in bold.

[a] Age, gender-adjusted associations shown for nativity (model 1a), occupational class (model 1b), education (model 1c), income (model 1d), SSS in US (model 1e), SSS in community (model 1f), SSS in country of origin (model 1 g)

Table 6
Results of logistic regression on anxiety in past 12 months for Asians in the U.S. labor force: 2002–2003 National Latino and Asian American Study

	Any anxiety disorder in past 12 months									
	Model 1a-g: each adjusted for age, gender[a]		Model 2: nativity + occupational class + confounders		Model 3: Model 2 + income + SSS		Model 4: Model 3 + material + psychosocial factors		Model 5: Model 4 + immigration-related factors, immigrants	
	Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)	
Nativity										
U.S. born (Ref.)	1.00		1.00		1.00		1.00			
Immigrant	**0.59**[*]	(0.36 − 0.96)	**0.47**[*]	(0.26 − 0.86)	**0.47**[*]	(0.25 − 0.87)	0.66	(0.35 − 1.25)		
Education										
17 years or more (Ref.)	1.00		1.00		1.00		1.00		1.00	
13−16 years	**2.14**[*]	(1.18 − 3.90)	**2.12**[*]	(1.04 − 4.32)	1.89	(0.86 − 4.14)	1.71	(0.83 − 3.55)	1.67	(0.71 − 3.96)
12 years	1.07	(0.40 − 2.86)	0.86	(0.27 − 2.74)	0.80	(0.26 − 2.45)	0.73	(0.29 − 1.87)	0.76	(0.15 − 3.82)
< 12 years	0.97	(0.23 − 4.16)	0.77	(0.14 − 4.16)	0.62	(0.09 − 4.48)	0.63	(0.10 − 4.07)	0.80	(0.13 − 4.92)
English language proficiency										
Excellent/good (Ref.)			1.00		1.00		1.00		1.00	
Fair/poor			**3.35**[**]	(1.60 − 7.01)	**2.81**[**]	(1.38 − 5.72)	**2.66**[*]	(1.23 − 5.76)	**4.00**[**]	(1.47 − 10.91)
Occupational class										
White-collar (Ref.)	1.00		1.00		1.00		1.00		1.00	
Blue-collar	0.68	(0.28 − 1.65)	0.83	(0.32 − 2.16)	0.86	(0.34 − 2.19)	1.04	(0.42 − 2.58)	0.77	(0.29 − 2.06)
Service	0.82	(0.34 − 2.00)	0.93	(0.32 − 2.70)	0.98	(0.33 − 2.89)	0.94	(0.29 − 3.05)	0.44	(0.06 − 3.19)
Unemployed	1.02	(0.37 − 2.83)	0.98	(0.34 − 2.80)	0.86	(0.27 − 2.79)	0.97	(0.29 − 3.19)	0.60	(0.14 − 2.65)
Annual household income										
High income ($\geq$300% FPL) (Ref.)	1.00				1.00		1.00		1.00	
Moderate income (200−299% FPL)	0.61	(0.29 − 1.28)			0.51	(0.24 − 1.11)	0.52	(0.24 − 1.12)	0.81	(0.31 − 2.13)
Near poor (100−199% FPL)	0.99	(0.32 − 3.03)			1.01	(0.30 − 3.41)	0.95	(0.29 − 3.15)	0.61	(0.09 − 4.28)
Poor (<100% FPL)	1.91	(0.86 − 4.24)			1.79	(0.90 − 3.55)	1.21	(0.55 − 2.69)	0.90	(0.23 − 3.49)
SSS in U.S.	**0.85**[*]	(0.75 − 0.97)			0.96	(0.78 − 1.19)	1.03	(0.83 − 1.27)	1.10	(0.85 − 1.42)
SSS in community	**0.83**[***]	(0.75 − 0.91)			0.86	(0.73 − 1.00)	0.87	(0.74 − 1.03)	0.85	(0.70 − 1.03)
Material factors										
Health insurance										
Any health insurance (Ref.)							1.00		1.00	
Uninsurance							1.13	(0.40 − 3.17)	1.54	(0.42 − 5.71)
Perceived financial need							1.12	(0.56 − 2.23)	0.98	(0.31 − 3.12)
Psychosocial factors										
Perceived discrimination							**1.08**[***]	(1.04 − 1.13)	**1.09**[**]	(1.03 − 1.14)
Marital status										
Married (Ref.)							1.00		1.00	
Never married							**2.15**[*]	(1.05 − 4.41)	**3.28**[*]	(1.08 − 10.00)
Widowed, separated, divorced							1.64	(0.64 − 4.22)	2.39	(0.70 − 8.15)
Family social support							0.98	(0.87 − 1.10)	1.07	(0.92 − 1.25)
Friend social support							0.98	(0.85 − 1.13)	0.91	(0.79 − 1.04)
Immigration-related factors										
SSS in country of origin	0.91	(0.79 − 1.06)							0.99	(0.79 − 1.24)
Acculturative stress									1.16	(0.97 − 1.39)
Duration of residence in U.S.									1.02	(0.97 − 1.08)

[*] p<0.05; [**] p<0.01; [***] p<0.001 ; Adj. OR = Adjusted Odds Ratio, 95% CI=95% Confidence Interval, FPL=Federal Poverty Level, SSS = Subjective Social Status
Results shown account for complex survey design due to clustering, stratification and unequal probability sampling
Models 2−5 also adjusted for age, gender and ethnicity
Statistically significant results (p<.05) are shown in bold.
[a] Age, gender-adjusted associations shown for nativity (model 1a), occupational class (model 1b), education (model 1c), income (model 1d), SSS in US (model 1e), SSS in community (model 1f), SSS in country of origin (model 1 g)

terms like "immigrant health paradox." They oversimplify complex patterns and mask negative outcomes among underserved subgroups. We conclude by discussing some implications for better measurement of both SES and health given the absence of an occupational class gradient and the seemingly contradictory findings of nativity-related differences in self-rated health and DSM-IV mental disorders.

Consistent with prior studies of SES and health in racial/ethnic minorities and immigrants using SES measures of education and income, we found that occupational class was not strongly associated with subjective health and mental disorder for Asian Americans (de Castro et al., 2010; Gavin et al., 2010; Kimbro et al., 2008; Leu et al., 2008; Sanchez-Vaznaugh et al., 2009). This finding was robust even in analyses among immigrants. Our study contributes to the literature by identifying this in mental health outcomes known to be linked more robustly to SES in other populations using samples which included non-English speaking and U.S.-born and using occupational class.

Surprisingly, with the exception of self-rated physical health, higher SSS was not associated with better mental health. Material factors were associated with subjective health and depression (perceived financial need for self-rated physical and mental health, uninsurance for self-rated mental health and depression). They convey the salience of material resources for fulfilling basic life needs including healthcare needs. Fulfillment of basic and psychological needs (e.g., social support, love, respect) are shown to affect subjective well-being and negative feelings such as worry, sadness, depression and anger around the world including Asian regions and cultures (Tay & Diener, 2011). Our study also highlights the influential role of psychosocial stresses such as discrimination and acculturative stress which may be useful in considering the lack of an occupational class-health gradient. Why might Asian white-collar workers have similar or worse rates of mental disorder than Asian blue-collar and service workers?

Psychosocial factors such as discrimination and acculturative stress (associated with DSM-IV mental health outcomes

Table 7
Results of logistic regression on depression in past 12 months for Asians in the U.S. labor force: 2002–2003 National Latino and Asian American Study

	Any depression in past 12 months								
	Model 1a-g: each adjusted for age, gender[a]		Model 2: nativity + occupational class + confounders		Model 3: Model 2 + income + SSS		Model 4: Model 3 + material + psychosocial factors		Model 5: Model 4 + immigration-related factors, immigrants
	Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)		Adj. OR (95% CI)
Nativity									
U.S. born (Ref.)	1.00		1.00		1.00		1.00		
Immigrant	0.78	(0.46 − 1.31)	0.58	(0.32 − 1.06)	0.57	(0.30 − 1.08)	0.91	(0.46 − 1.78)	
Education									
17 years or more (Ref.)	1.00		1.00		1.00		1.00		1.00
13−16 years	1.83	(0.77 − 4.34)	1.71	(0.66 − 4.47)	1.28	(0.55 − 2.97)	0.98	(0.44 − 2.20)	1.20 (0.52 − 2.74)
12 years	**2.66***	(1.25 − 5.65)	1.93	(0.60 − 6.23)	1.52	(0.52 − 4.42)	1.40	(0.60 − 3.31)	2.18 (0.60 − 7.94)
< 12 years	0.95	(0.20 − 4.55)	0.71	(0.12 − 4.25)	0.39	(0.06 − 2.39)	0.37	(0.05 − 2.50)	0.62 (0.07 − 5.25)
English language proficiency									
Excellent/good (Ref.)			1.00		1.00		1.00		1.00
Fair/poor			**3.52***	(1.32 − 9.39)	**2.78***	(1.16 − 6.69)	**2.47***	(1.11 − 5.48)	**4.14**** (1.55 − 11.07)
Occupational class									
White-collar (Ref.)	1.00		1.00		1.00		1.00		1.00
Blue-collar	0.65	(0.17 − 2.42)	0.56	(0.15 − 2.17)	0.60	(0.15 − 2.31)	0.83	(0.24 − 2.90)	0.59 (0.11 − 3.10)
Service	1.65	(0.77 − 3.53)	1.45	(0.65 − 3.25)	1.58	(0.60 − 4.14)	1.54	(0.54 − 4.45)	1.92 (0.48 − 7.61)
Unemployed	2.27	(0.84 − 6.18)	1.94	(0.69 − 5.48)	1.79	(0.61 − 5.31)	1.64	(0.61 − 4.39)	1.05 (0.22 − 4.88)
Annual household income									
High income (≥300% FPL) (Ref.)	1.00				1.00		1.00		1.00
Moderate income (200−299% FPL)	1.11	(0.32 − 3.86)			0.71	(0.18 − 2.72)	0.80	(0.22 − 2.84)	0.53 (0.12 − 2.34)
Near poor (100−199% FPL)	1.52	(0.56 − 4.17)			1.40	(0.48 − 4.08)	0.97	(0.29 − 3.22)	0.65 (0.08 − 5.27)
Poor (<100% FPL)	**2.80***	(1.01 − 7.77)			2.15	(0.88 − 5.27)	1.01	(0.34 − 2.99)	1.18 (0.20 − 6.83)
SSS in U.S.	**0.75****	(0.63 − 0.89)			0.92	(0.67 − 1.26)	1.00	(0.77 − 1.30)	1.11 (0.85 − 1.45)
SSS in community	**0.74*****	(0.62 − 0.87)			0.78	(0.57 − 1.08)	0.82	(0.63 − 1.07)	0.78 (0.58 − 1.06)
Material factors									
Health insurance									
Any health insurance (Ref.)							1.00		1.00
Uninsurance							**2.59***	(1.23 − 5.46)	1.84 (0.57 − 5.89)
Perceived financial need							1.28	(0.49 − 3.35)	1.33 (0.29 − 6.00)
Psychosocial factors									
Perceived discrimination							**1.11*****	(1.06 − 1.15)	**1.11***** (1.05 − 1.17)
Marital status									
Married (Ref.)							1.00		1.00
Never married							**3.09***	(1.01 − 9.45)	**4.03*** (1.05 − 15.39)
Widowed, separated, divorced							2.22	(0.76 − 6.49)	**4.01**** (1.43 − 11.24)
Family social support							**0.89***	(0.79 − 1.00)	0.96 (0.82 − 1.12)
Friend social support							1.02	(0.90 − 1.16)	0.92 (0.77 − 1.10)
Immigration-related factors									
SSS in country of origin	0.90	(0.80 − 1.02)							1.08 (0.84 − 1.40)
Acculturative stress									**1.23**** (1.08 − 1.38)
Duration of residence in U.S.									1.06 (0.98 − 1.14)

* p<0.05; ** p<0.01; *** p<0.001 ; Adj. OR = Adjusted Odds Ratio, 95% CI=95% Confidence Interval, FPL=Federal Poverty Level, SSS = Subjective Social Status
Results shown account for complex survey design due to clustering, stratification and unequal probability sampling
Models 2–5 also adjusted for age, gender and ethnicity
Statistically significant results (p<.05) are shown in bold.
[a] Age, gender-adjusted associations shown for nativity (model 1a), occupational class (model 1b), education (model 1c), income (model 1d), SSS in US (model 1e), SSS in community (model 1f), SSS in country of origin (model 1 g).

independently of LEP) may hinder social mobility, acceptance, assimilation and integration into U.S. society and undermine the returns on health traditionally associated with attainment of better jobs and higher SES. Contrary to the widely held myth of Asian Americans being a model minority who have "made it" (assumes that all Asian Americans enjoy high SES and good health), Asians experience racial income inequity (after controlling for education, age, occupational prestige and number of hours worked, Asians earn less than their White and Black peers), occupational segregation (being segregated into lower-paying occupations with less access to higher-paying jobs), occupational discrimination and a "glass ceiling" (unbreakable, structural barriers) that blocks the upward occupational mobility of Asian professionals (Leong, 1998). Highly educated immigrants face employment-related difficulties in achieving similar statuses as their U.S.-born counterparts due to language difficulties, devaluation of foreign education credentials and "costs of sharing" from being economically responsible for additional dependents who

need help (Williams, 2005). Additionally, professionals such as managers and scientists may work in predominantly White settings, where their co-workers may not share similar ethnic/minority/immigrant backgrounds or understand their culturally influenced attitudes and behaviors. They may feel isolated if they perceive that they are being marginalized and lack co-worker support or workplace social support. The lack of an occupational class-health gradient observed in our study suggests that these occupational and immigration-related factors may play a role and deserve greater examination.

Social conditions and resources related to marriage and family may buffer negative effects of economic adversity on mental health and need further exploration. We could not determine the reasons behind the health-protective effect, but our results suggest marital status may be a potential contributing factor. Family and marriage are given central importance in Asian cultures with much emphasis placed on family well-being, particularly for children. Low SES immigrants may view their well-being through the well-being and

success of their children despite struggling in adverse socioeconomic circumstances.

Two key findings caution against generalizing good health to all Asian immigrants. First, our study highlights subsets of socially disadvantaged immigrants at risk of poor mental health. Stressors associated with migration and adaptations were independently associated with several negative outcomes − LEP for all 5 outcomes and acculturative stress for any mental disorder and depression. LEP may serve as a powerful marker for multiple social disadvantages. For example, language barriers can affect communication, the ability to access education and services including the social safety net and put workers at risk for discrimination. This can be distressing and undermine social and economic integration. Undocumented immigrants may face even greater marginalization related to exploitation, being uninsured and other hardships associated with their status. Asians with LEP are also more likely to endorse lower ratings of health that may be influenced by evaluations of health rooted in culture and language (Kandula, Lauderdale, & Baker, 2007). Though evidence regarding the relationship of LEP and mental health service use is mixed showing no association and lower odds of use (Takeuchi et al., 2007; Sentell, Shumway, & Snowden, 2007), LEP individuals may face difficulties accessing insurance and needed services.

Our findings can inform current debates regarding the conceptualization and measurement of acculturation by urging critical consideration of structural and contextual characteristics that may be significant for the language, economic and social assimilation of immigrants, their health and well-being. Acculturation-based models often examining the decline of health in immigrants over time tend to attribute it to stresses adapting to "mainstream" U.S. norms from "traditional" values and a "loss of culturally protective factors." This has led some scholars to call acculturation a "fuzzy" construct relying on simplistic and erroneous explanations of culture while ignoring socioeconomic factors and structural and contextual factors that affect immigrants' integration and experiences in U.S. society (Escobar & Vega, 2000; Hunt, Schneider, & Comer, 2004; Viruell-Fuentes, 2007). In our study, acculturative stress captures stresses of social and economic integration upon immigration (e.g., not speaking English, finding employment, seeking health services, experiencing discrimination) and was associated with poor mental health independently of SES, LEP and perceived discrimination.

While cultural factors may also be relevant, our results demonstrate that immigration-related stressors (e.g., LEP, acculturative stresses) and uninsurance are associated with poor health. They must be critically addressed in efforts to successfully reduce health disparities. Uninsured individuals with mental health conditions like depression face difficulties receiving needed care (Institute of Medicine, 2009). Future studies should comprehensively explore the mechanisms by which LEP, uninsurance and acculturative stress may negatively affect health, explanations for the health-protective effect of immigrants and whether the health-protective effect diminishes and the SES-health gradient becomes more pronounced with increasing duration of stay in the U.S.

Second, we did not find a foreign-born health-protective effect consistently across all outcomes which may have some implications for the measurement of mental health. We found differential effects of nativity by type of health outcome studied. Surprisingly, nativity influenced self-rated mental health and DSM-IV assessed mental disorders in seemingly opposite directions. Immigrants were more likely to rate their mental health as fair/poor but less likely to have a DSM-IV mental disorder or anxiety, with the latter persisting even after accounting for SES, language and confounders. These differential effects of nativity by type of health outcome studied (self-rated health vs. DSM-IV mental disorder) raise

previously documented concerns about instruments based on Western expressions of mental well-being adequately capturing the mental health of racial/ethnic minority populations. Do immigrants have better health or are diagnostic instruments like DSM-IV limited in capturing aspects of their well-being that may be better manifested in the self-ratings?

Though NLAAS data suggests that Asians may have lower rates of mental disorders than Whites, the researchers noted that NLAAS assesses disorders based on Western expressions of mental disorders and may result in underestimates (Takeuchi et al., 2007). Furthermore, the number of psychological symptoms among racial/ethnic minorities tends to be greater than for Whites even when rates of mental disorders may be lower (U.S. Department of Health and Human Services, 2001). Current diagnostic tools may not correctly identify cultural variations in reports of psychological symptoms. For example, a large study of Chinese Americans found that more than half of patients who experienced neurasthenia did not meet the criteria for a mood or anxiety disorder (Zheng et al., 1997).

Self-rated health measures represent health perceptions or subjective perceptions and include global evaluations of health (Patrick, 2005). Though proven predictors of mortality and morbidity (Idler & Benyamini, 1997), they are not well understood in terms of how respondents reach such evaluations. Future studies should explore these differences in self-rated mental health vs. DSM-IV mental disorders, whether distress may manifest in minority populations in unique ways better captured in subjective health ratings, and how these are socially patterned. Our findings also emphasize the importance of including Asians with LEP in future studies of Asian Americans. Constituting almost 40% of Asians, they suffer linguistic and social disadvantages not well-represented by Asian respondents to English language national surveys who likely have greater English language fluency, higher education and income, better healthcare access and health (Lee, Nguyen, Jawad, & Kurata, 2008).

A few limitations to our study deserve mention. First, the occupational class measure captures one's current occupation and has been critiqued for underestimating occupational gradient effects (Krieger, Barbeau, & Soobader, 2005). We also lacked data on some occupation-related characteristics (e.g., self-employed, working in a family-owned business) which, for immigrants, may be salient in making work meaningful (e.g., autonomy, increasing family cohesion). Though imperfect and without data on job-related characteristics and past occupations in the NLAAS, examining occupational class using the U.S. conventions allows comparability of our results to studies using the same conventions and remains useful for understanding how one's current occupation (most directly tied to income and benefits) affects health. Second, the NLAAS assessed self-reported data. Although the CIDI on which it is based has been tested extensively for test−retest reliability and validity (Wittchen, 1994), modifications were made and respondents may have been unaware of their health conditions (especially if they lacked health insurance and did not seek routine care), had difficulty understanding certain items and/or provided more socially desirable responses, particularly about psychosocial stresses and mental health. However, NLAAS domains were carefully tested and implemented in multiple stages to minimize such biases and shown to have good reliability for most measures (Alegria, Takeuchi, et al., 2004; Alegria, Vila, et al., 2004). Third, because the NLAAS was a cross-sectional survey, the temporality of occupational class and mental health is unknown and limits our ability to make causal inferences. Fourth, our sample may have lacked sufficient power to estimate some full models and may have resulted in less precise estimates and some marginally significant findings. However, NLAAS represents the best available national dataset including non-English speaking Asian respondents. Fifth,

we lacked data on immigrants' pre-migration SES in country of origin to properly characterize their social mobility in light of varied contexts of migration.

Our findings are notable because, to our knowledge, this is the first study to investigate the "immigrant paradox" in self-rated health and mental disorders using the SES indicator of occupational class in a nationally representative sample of U.S.-born and foreign-born Asian Americans including non-English speaking Asians. We found no strong occupational class-health gradients. Though we found an overall protective effect for immigrants for mental disorder, this may not be generalizable to all immigrants given other findings of immigration-related stressors of LEP and acculturative stress being associated with worse mental health. Our findings identify sub-groups of Asians (with LEP, facing acculturative stresses, uninsured) at risk for worse mental health and who might be targeted through culturally-centered policies and programs to provide language, social and health services and promote health. Greater attention to psychosocial stresses such as discrimination that may dampen benefits associated with attainment of higher SES and hinder social mobility and to social resources that may buffer the effect of economic adversities on mental health can help advance understanding of disparities. Elucidating these relationships further can also inform efforts to better integrate immigrants economically and socially, promote health and provide health services to those most in need among Asian Americans and other immigrant populations.

Acknowledgments

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