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**Why Do Hispanics Report Poor Health?**

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## Abstract

Despite the health and survival advantages of Hispanics relative to non-Hispanic whites, Hispanics report themselves to be in worse health than whites. Prior research indicates that these ethnic differences in self-reported health (SRH), measured by a simple question asking individuals to assess their overall health status, persist in the presence of an extensive set of explanatory variables. In this paper we use data from the first wave of the Los Angeles Family and Neighborhood Survey (L.A.FANS) to test four hypotheses regarding Hispanic-white differences in SRH. We evaluate whether poorer health reports among Hispanics result from: (1) differences in meaning between the Spanish and English versions of the SRH question; (2) somatization of emotional distress by Hispanics; (3) varying levels of acculturation among Hispanics; and (4) measures of SES and health that are often omitted in other studies.

Our results provide new insights into the validity of these explanations and suggest avenues for future research. First, they underscore the importance of language of interview, suggesting that translation issues between the Spanish and English versions of the SRH question give rise to some of the differences. Second, although respondents who are depressed are more likely to report poor SRH, this study provides little evidence to support the somatization hypothesis. Third, none of our measures of acculturation – household language, age of immigration, duration of U.S. residence, and documented status – is significantly associated with reports of poor health, although some of the models indicate that foreign-born Hispanics report poorer health than their native-born counterparts. Finally, whereas controls for health status exacerbate the ethnic discrepancies in SRH, adjustment for SES – especially years of schooling – narrows, but does not eliminate, the gap. The second wave of L.A.FANS incorporates new questions that are likely to permit more in-depth assessments of these hypotheses in future analyses.

## **Introduction**

The growth of the Hispanic population in the United States over the past 30 years has generated a large body of research on Hispanic health. Most of this research focuses on the “Hispanic paradox,” i.e., the observation that Hispanics have lower mortality than non-Hispanic whites at most ages despite their lower average socioeconomic status (Franzini, Ribble & Keddie, 2001; Williams, 2001; Morales, Kington, Valdex & Escarce, 2002; Palloni & Arias, 2004). The “paradox” applies primarily to Mexicans and Central and South Americans; Puerto Ricans, who have the lowest SES among Hispanic groups, have significantly higher mortality than whites (Hummer, Rogers, Amir, Forbes & Frisbie, 2000; CDC, 2002; Palloni & Arias, 2004). Hispanics as a group are also more likely to have healthier behaviors; for example, compared to non-Hispanic whites, they are less likely to use alcohol and to smoke (CDC, 2002), more likely to eat high fiber and high protein diets, and more likely to have occupations involving physical activity (Morales et al., 2002).

Despite these health advantages, Hispanics, on average, report poorer self-rated health status (SRH) than non-Hispanic whites and members of other ethnic groups (Arcia, Skinner, Bailey & Correa, 2001; Finch, Hummer, Reindl & Vega., 2002; Ren & Amick, 1996; Shetterly, Baxter, Mason & Hamman, 1996; Franzini & Fernandez-Esquer, 2004). SRH measures an individual’s assessment of his/her overall health status in terms of four or five adjectives, for example, excellent, very good, good, fair, or poor. White-Hispanic differences in SRH are particularly large for Mexicans and Puerto Ricans (Franzini & Fernandez-Esquer, 2004), but are common to all Hispanic groups, even when socioeconomic status, nativity, and other measures of health are held constant (Cho, Frisbie & Rogers, 2004; Shetterly et al., 1996).

Ethnic differences in SRH are important for at least three reasons. First, SRH is highly correlated with clinical assessments, is predictive of subsequent mortality even when objective health measures are held constant (Idler & Benyamini, 1997; Fayers & Sprangers, 2002; Burstrom & Fredlund, 2001), and is strongly correlated with other health indicators and health behaviors (Franzini & Fernandez-Esquer, 2004; Manderbacka, Lundberg & Martikainen, 1999). For these reasons, this simple question is frequently incorporated into health interview and social science surveys. If Hispanics assess a given level of health differently than members of other ethnic groups, the use of SRH as an overall measure of health is questionable, particularly in analyses of ethnic or immigrant status differences in health.

Second, individuals' assessments of their own health status may have important effects on their decisions about health care utilization and other behaviors. Thus, if Hispanics, *ceteris paribus*, view their own health as poorer than others do, they may be more likely than other groups to seek health care or use self-care. Although health care utilization rates are, in fact, *lower* among Hispanics than whites or other groups (Dey & Lucas, 2006), this discrepancy is most likely due to lower rates of health insurance coverage and poorer access to health care for Hispanics (Prentice, Pebley & Sastry, 2005) rather than to differences in perceptions about the need for health care.

Third, examination of the reasons behind Hispanic – non-Hispanic differences in SRH may provide useful insights into social and cultural differences in defining health and illness. Understanding group differences in the social construction of health and illness can, in turn, improve the design of public health programs and the delivery of health care.

Previous research on Hispanic – non-Hispanic differences in SRH has been hampered by data and methodological limitations. For example, three prominent studies are based on

exclusively Hispanic samples (e.g., Angel & Guarnaccia, 1989; Arcia, 1998; Franzini & Fernandez-Esquer, 2004). Other problems include the lack of data on key variables such as language of interview, immigration status, duration of residence in the United States, mental health, and acculturation. In this paper we test several hypotheses about why Hispanics and whites differ in terms of SRH, using a broad range of information from the first wave (2000-2001) of the Los Angeles Family and Neighborhood Survey (L.A.FANS-1). In the following section, we review past research and outline our hypotheses. Next, we describe the L.A.FANS data and our methods. In the last two sections, we present and discuss our results.

## **Hypotheses**

We test four hypotheses derived from previous research on Hispanic – non-Hispanic differences in SRH. The first is that poorer self-rated health among Hispanics is an artifact of differences in meaning between Spanish and English language versions of the SRH question (Phillips, Hammock & Blanton, 2005; Franzini & Fernandez-Esquer, 2004). Angel and Guarnaccia (1989) found a strong interview language effect on SRH in the Hispanic Health and Nutrition Examination Study (HHANES). For example, among Mexican Americans in excellent or very good health (based on objective criteria), 52% of those interviewed in Spanish reported fair or poor health, compared to only 20% of those interviewed in English.<sup>1</sup> The usual translation of the English response categories (excellent, very good, good, fair, and poor) is *excelente, muy buena, buena, regular, and mala*. “*Regular*” in Spanish can mean “okay” or “fine” (but also “so-so”), whereas in English, “fair” clearly connotes sub par health. Angel and Guarnaccia (1989: p1234) also suggest that there may be language-related differences in “anchoring,” i.e., *buena* or *regular* may be used to describe normal health in Spanish (or in

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<sup>1</sup> Calculated from Table 2 of Angel and Guarnaccia (1989).

respondents' countries of origin), while excellent and very good may imply having no health problems – i.e., normal health – in English (or in the United States).

A second hypothesis is that health assessments among Hispanics are more likely to reflect emotional states than reports of health by non-Hispanics. Specifically, Angel and Guarnaccia (1989) suggest that Mexicans and Puerto Ricans are more likely to “somatize,” i.e., to experience psycho-social problems, such as affective distress, in physiological terms. Hispanics may also be more likely than Asian immigrant groups to have depressive symptoms because they experience higher levels of racism (Franzini & Fernandez-Esquer, 2004). Several studies of Hispanics have shown a strong association between perceived racism and SRH, depression, and mental health (Finch et al., 2002; Finch, Kolody & Vega, 2000). This hypothesis suggests that affective states, such as depression, may be more prevalent among Hispanics as well as more likely to affect SRH for Hispanics than for whites or others. Thus, we would expect differences in SRH between whites and Hispanics to decrease if depression is taken into account.

A third body of research suggests that differences in SRH between Hispanics and others diminish as Hispanics become more “acculturated,” or integrated into mainstream American society (Arcia et al., 2001; Angel & Guarnaccia, 1989; Angel & Thoits, 1987; Arcia, 1998; Shetterly et al., 1996; Finch et al., 2002; Markides & Lee, 1991). Angel and Thoits (1987) describe ways in which Mexican culture may affect perceived health status through the recognition, interpretation, and reporting of physical symptoms and emotional states. More recent research suggests that it may be socially unacceptable for traditionally oriented Hispanics to boast or be optimistic about their health (Shetterly et al., 1996). Because of the importance of cultural influences, self-evaluations of health among Hispanics are likely to vary with time spent

in the U.S., age at immigration, and degree of integration into U.S. society. For example, immigrants exposed to American culture at a younger age may evaluate their health in a manner more consistent with native born Americans, as Angel and Angel's (1992) results suggest. Several previous studies have explored the association between acculturation and SRH using language of interview as the primary or sole measure of acculturation. However, an association between language of interview and SRH could be due either to translation problems (i.e., obtaining equivalent meanings of the response categories in both languages, as discussed above) or to a more traditionally-oriented cultural understanding of health. In this study, we attempt to separate the effects of language and acculturation on SRH by using both respondents' reports about whether Spanish is the only language spoken in the household (a measure of acculturation) and the language of interview. Given the complexity of the acculturation process, we also use information about age at immigration and duration in the U.S. as additional measures of integration into U.S. society.

Finally, poorer self-reports of health among Hispanics may reflect aspects of quality of life, socioeconomic status, or health which are inadequately measured in previous research. A number of studies have shown that educational attainment and family income are strongly associated with SRH among Hispanics (Arcia, 1998; Ren & Amick, 1996; Ostrove, Adler, Kuppermann & Washington, 2000). However, previous studies have rarely examined other aspects of socioeconomic status, such as unemployment and health insurance coverage, both of which we consider in this study. Although we are not able to control for clinical measures of health status as Angel and Guarnaccia (1989) and Arcia (1998) do, we include a number of other measures of health status to minimize the chance that unmeasured health differences between Hispanics and whites are the source of variation in SRH.

## **Data and Methods**

### *Data*

The analyses presented here use data from the first wave of the Los Angeles Family and Neighborhood Survey (L.A.FANS-1), a survey of adults, children, and neighborhoods in Los Angeles County. The survey employed a stratified random sampling design which over-sampled poor neighborhoods and households with children under age 18. Data for L.A.FANS-1 were gathered from approximately 40-50 households in each of 65 census tracts between April 2000 and January 2002, yielding a total sample size of about 3,000 households. More than half of the sample was Hispanic (mostly of Mexican origin), and interviews were conducted in Spanish and English.

L.A.FANS collected information about two types of adult respondents. First, one randomly selected adult age 18 or over (RSA) from each sampled household was interviewed. Second, for each child that was randomly selected in households with children under age 18, that child's primary caregiver (PCG), typically the mother, was interviewed. In 41% of households, the same individual was designated as both the PCG and the RSA. The analyses presented in this paper use both of these samples – RSAs and PCGs (mothers only) – and examine them separately because questions regarding depression differed between these two groups of respondents. For ease of description, these samples are sometimes referred to as the sample of adults (RSAs) and mothers (PCGs).

### *Measures*

#### Outcome variable

The dependent variable for all analyses is an indicator of fair/poor self-rated health status. All respondents were asked the following question: “Would you say your health in general is excellent, very good, good, fair, or poor?” We follow a large body of prior research which has transformed this measure of SRH into a dummy measure by coding those reporting fair or poor health with a value of 1 and those reporting good, very good, or excellent health with a value of 0. For convenience, we refer to the outcome of “fair/poor” health as “poor” health in the remainder of the analysis.

### Ethnicity and Immigrant Status

Due to the relatively small sample sizes of non-white, non-Hispanic groups, this study is limited to Hispanics and native-born non-Hispanic whites (whom we refer to simply as “whites”). Respondents were considered to be of Hispanic ethnicity if they reported Latino as their only racial category, or, for those who reported more than one race, if they reported that their race was best described by “Latino/Hispanic/Latin American.” Mexicans are the only group with a sufficiently large sample size to be distinguished from other persons of Hispanic origin. Respondents who reported Mexico as their place of birth and all respondents who reported themselves as Mexican/Mexicano or Mexican American are considered to be of Mexican origin. Nearly three-quarters of the foreign-born Hispanics in the sample who were not born in Mexico were born in either El Salvador or Guatemala, and approximately 15 percent were born in either Honduras or Nicaragua. Most of the remaining foreign-born, non-Mexican individuals were born in South American countries (no one South American country dominated). The analyses employ the following set of six mutually exclusive categories to simultaneously represent ethnicity, national origin, nativity status, and age at immigration: 1) Native-born non-Hispanic white; 2)

Mexican foreign-born, immigrated as a child (by age 17); 3) Mexican foreign-born, immigrated as an adult (after age 17); 4) Mexican native-born; 5) Other Hispanic, foreign-born; and 6) Other Hispanic, native-born. As described in more detail later, we also estimate statistical models using alternative characterizations of the Mexican foreign-born population in order to assess the potential impact of different measures of acculturation.

### Other Explanatory Variables

All models include age and sex, along with the six-category variable denoting ethnicity and immigrant status. In order to examine the hypotheses described earlier, groups of variables pertaining to (1) physical health characteristics and health behaviors, (2) language, (3) socioeconomic status, and (4) depression are added successively to the basic model to assess the degree to which these variables account for ethnic differences in SRH.

The analysis incorporates several variables pertaining to individuals' physical health status and health-related behaviors. We excluded reports of non-serious health conditions, because respondents' responses regarding the presence of these conditions are likely to depend heavily upon their access to and utilization of health care, i.e., respondents who visit a doctor more frequently are more likely to be diagnosed with these conditions. Health-care access and utilization, in turn, are related to ethnicity and immigrant status. As a result, analyses presented here rely on health measures that we believe are the least likely to be misreported. We include two measures of anthropometry derived from self-reports of height and weight: overweight/obese is defined as having a BMI of 24.5 or above,<sup>2</sup> and height – a variable that

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<sup>2</sup> Although overweight/obesity status for individuals under age 21 is generally assessed from age and gender-specific growth charts, for these analyses we use a single cut-off of BMI for all adults ages 18 and over. For more information about official definitions of overweight and obese in adults and children, see <http://www.cdc.gov/nccdphp/dnpa/bmi/bmi-for-age.htm>.

reflects childhood nutrition and infection – is measured in inches. We also include respondents’ reports of physical or psychological problems that limit their work. Respondents who have ever been told by a doctor that they have a heart attack, cancer/malignancy, coronary heart disease, or lung cancer are considered to have a “serious condition.” Finally, we include indicator variables for heavy drinking (defined as those who have had five or more drinks in a single drinking episode at least once in the past 30 days) and current smoking, based on previous studies that link these behaviors to self-assessments of health.

Two explanatory variables pertain to language. The first, which was reported in the household roster, denotes whether or not Spanish is the only language spoken in the respondent’s household. This measure captures one aspect of the degree of acculturation of the respondent. A second variable examines whether the respondent’s interview was conducted in Spanish and is used to identify potential language effects associated with the SRH question.

Variables measuring socioeconomic status are educational attainment, family income, current employment status, and current health insurance. Data on educational attainment come from self-reports of education obtained in the United States and/or other countries. Because foreign and domestic education categories do not directly correspond, responses were coded into three categories of education: less than secondary education, secondary education, and some post-secondary education. Family income, imputed by the L.A.FANS project in cases of missing data,<sup>3</sup> is divided into quartiles, and employment status is based on whether or not individuals report that they are currently working. We also include whether or not the respondent reports currently having any health insurance. In cases where the respondent did not provide a response regarding existence and type of insurance, this information was taken from the household roster.

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<sup>3</sup> See [www.lasurvey.rand.org](http://www.lasurvey.rand.org) for more details.

L.A.FANS-1 obtained information regarding psychological depression for the two samples. Both RSAs and PCGs were asked to report if a doctor had ever told them that they had major depression. The measure derived from these reports, which is included in the analysis for RSAs, is problematic, both because those who were diagnosed by a physician as having depression are likely to be a select group and because respondents may be hesitant to acknowledge this diagnosis. Thus, this measure may underestimate the true prevalence of depression. PCGs (but not RSAs) were also asked to complete the Composite International Diagnostic Interview (CIDI) short-form Depression Inventory.<sup>4</sup> For the sample of mothers (PCGs), we use a measure based on the CIDI short-form that denotes the probability that the respondent was depressed during the past 12 months.

Several other variables were included at early stages of the analysis but were dropped from the final models because the variables were generally not significantly associated with reports of poor health in exploratory analyses. These variables include marital status, two measures of social involvement (religious service attendance and participation in organizations), and two neighborhood-level variables (ethnicity of the neighborhood and an index of social cohesion of the neighborhood).

### *Statistical Analysis*

We use binomial logistic regression to predict poor self-rated health status for each sample. The coefficients and standard errors are adjusted for neighborhood clustering of the sample by including a random effect for census tract in all models. We estimate nested models in order to examine whether and how the coefficients associated with ethnicity are altered by the

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<sup>4</sup> For more information about the Composite International Diagnostic Interview (CIDI) Short Form Depression Inventory, see <http://www.who.int/msa/cidi/>.

successive addition of substantive groups of variables to the model, in line with our hypotheses. All models are unweighted but include the following control variables to adjust for the sampling design and for non-response (Sastry & Pebley, 2003): total number of people in the household, presence and number of children under age 18, and poverty status and tract size of the respondent's neighborhood.

In order to determine whether the effects of various predictor variables on poor SRH differ by ethnicity, we included interaction terms between Hispanic ethnicity and sex, age, education, and depression in exploratory models. Because none of these interaction terms was statistically significant at the .05 level, they are not included in the final models.

As noted earlier, this analysis is limited to Hispanics and native-born whites. Respondents who have missing values for the outcome or any of the explanatory variables (with the exception of those with imputed income values) are excluded from the analysis: 14% of cases for the all-adult sample and 19% for PCGs. The resulting sample sizes for analysis are 1,708 for RSAs (adults ages 18 and over) and 1,161 for PCGs (mothers of the randomly selected children). A total of 617 individuals belong to both of these samples.

Fewer than two percent of respondents in each sample have missing values for SRH. The explanatory variable with the highest percentage of missing cases is the indicator for being overweight/obese (9% missing for RSAs and 13% for PCGs). Respondents excluded because of missing values for SRH have characteristics that are largely similar to those with non-missing values. Cases excluded from the analyses due to missing values for one or more of the explanatory variables, however, are more likely to report poor self-rated health status than are those included in the analyses. For example, for the sample of RSAs, 32 percent of those

excluded from the analysis sample reported poor SRH, compared with 23 percent of those included in the analysis sample.

## **Results**

Tables 1 and 2 present descriptive statistics for the samples of adults and mothers, respectively. In each case, the number of Hispanic native-born individuals who are not of Mexican origin is quite small – 44 for the sample of all adults and 25 for the mother-based sample – thereby limiting the statistical power of comparisons involving this group.

As shown in the first row of Table 1, approximately 11 percent of white adults report poor health status, a value that is significantly smaller than those for all other groups except native-born Hispanics of non-Mexican origin. The differences between immigrants and native-born persons are particularly striking: for example, persons born in Mexico are about three times as likely as whites and about twice as likely as U.S.-born Mexicans to report poor health. The ethnic differences in reports of poor health for mothers in Table 2 are virtually the same as those for RSAs.

Tables 1 and 2 also demonstrate that foreign-born Hispanics differ in several respects from native-born whites or Hispanics: they are much more likely to speak and be interviewed in Spanish, they have considerably lower levels of schooling and income, and they are much more likely to lack health insurance. Ethnic differences in health status vary across our measures. For example, whereas persons of Mexican origin are more often overweight than whites, they are less likely to smoke, to experience problems that interfere with their work, or to report a serious health condition.

Tables 3 and 4 present the odds ratios from a nested series of five logit models for the samples of RSAs and PCGs respectively. As suggested by the results shown in Tables 1 and 2, estimates from Model 1 for both samples indicate that, in the presence of only demographic control variables, the odds of reporting poor health are about four times as high among the three Hispanic foreign-born groups as for whites, and about twice as high as those for the two Hispanic native-born groups. Contrary to expectation, the differences between Mexicans who immigrated as children and those who immigrated as adults are small and not statistically significant.

The odds ratios become substantially *larger* in the presence of controls for health status and health-related behaviors (Model 2), suggesting that, for a given set of health problems, the odds of reporting poor health for foreign-born Hispanics are about seven times as high as for whites. The increase in the odds ratio arises primarily because foreign-born Hispanics have favorable health profiles with regard to work-related limitations and serious health conditions; both of these health measures are strongly associated with SRH. In general, the estimates for the health variables are in the expected direction, but some of the associations are not significant (e.g., smoking and drinking).

For both samples, language of interview (Model 3) is significantly associated with the likelihood of reporting poor health, whereas an indicator of whether the household speaks only Spanish is not. Respondents who are interviewed in Spanish are more likely to report poor health than those who are interviewed in English (an odds ratio of 1.8 for the RSA sample and 2.4 for the PCG sample). These findings support the conjecture that translation issues, such as differences in meaning between the adjectives used to describe the various health states in Spanish vs. English, may underlie some of the ethnic differences in reporting of SRH. Inclusion

of the language variables in Model 3 results in a substantial decrease in the odds ratios for foreign-born Hispanics.

In line with previous research, the estimates from Model 4 indicate that ethnic variation in the likelihood of reporting poor health is reduced considerably by the inclusion of controls for SES. For example, in Model 4, the odds of reporting poor health lie between 2.5 and 3 for foreign-born Hispanic groups in the adult sample – values that are still quite high, but are considerably lower than those from earlier models. Among the various measures of SES, level of schooling is most strongly associated with reports of poor health, suggesting that the low levels of education among Hispanics, particularly the foreign-born, account partly for their poorer reports of health. Surprisingly, neither employment nor health insurance status is significantly associated with SRH. In preliminary models, we included interaction terms between ethnicity and schooling, because a recent study suggests that education differentials in measures of health are weaker among Hispanics than among whites (Goldman, Turra, Kimbro & Pebley, forthcoming). Although the coefficient is only marginally significant ( $p < 0.10$ ), the direction of effect is consistent with the notion that education gradients in health are more modest among Hispanics.

The inclusion of measures of depression in Model 5 – whether the respondent reported having been diagnosed with depression (RSA sample) or the degree to which the respondent exhibits symptoms of depression (PCG sample) – permits us to address the somatization hypothesis. We evaluate two components of this argument, each of which could result in ethnic disparities in reports of SRH: (1) that Hispanics are more likely than whites to experience depressive symptoms; and (2) that Hispanics are more likely to construe a given level of depressive symptoms as poor overall health. The estimates in Tables 1 and 2 suggest that, based

on the two measures of depression available in L.A.FANS, most Hispanic groups are *less* likely to be depressed than whites. Similarly, the odds ratios in Tables 3 and 4 for Hispanic groups are slightly larger in Model 5 than in Model 4, reinforcing the finding that the poorer health reports of Hispanics do not appear to be due to their experiencing a higher prevalence of depressive symptoms. In models not shown here, we examined an interaction term between Hispanic ethnicity and the depression variables, but these terms were not significant in either the RSA or PCG samples. Thus, although the depression measures are significantly associated with SRH (the odds ratios are equal to about two), we have no evidence that Hispanics are more likely than whites to either experience or somatize mental distress.

We examined several additional variables related to immigration status in an effort to further explore the effects of acculturation on SRH and to examine the robustness of our findings to an alternative specification of age at immigration. Because the sample size of Mexican immigrants is too small to consider more than one sub-division, we replaced the age at immigration variable in Tables 3 and 4 (by age 17 vs. after age 17) with three alternative formulations of immigration status for foreign-born Mexicans, each introduced one at a time into model 5: immigration by age 35 (vs. after age 35), immigration before 1990 (vs. 1990 or later), and documented immigrant (vs. undocumented immigrant). The remaining four categories of the ethnicity/immigration variable remained unchanged. Undocumented status among Hispanic foreign-born individuals was determined by identifying individuals who are foreign-born but report that they are not citizens, do not have a green card, have not been granted asylum, and do not have a visa or have an expired visa. The results from these additional models (not shown here) are very similar to those presented in Tables 3 and 4: the differences in the odds ratios of reporting poor health between Mexicans who immigrated at younger vs. older ages, who

immigrated less or more than 10 years prior to interview, or who were documented vs. undocumented immigrants were small and not statistically significant.

Despite the extensive set of control and explanatory variables included in this analysis, we have not been able to account entirely for the more frequent reports of poor health among the Hispanic population, particularly among Hispanic immigrants. For example, our final model (Model 5) for the adult sample indicates that Mexican immigrants have odds ratios of reporting poor health between 2.6 and 2.8 times as high as whites.

Although the results of the statistical analysis are generally similar for the RSA and PCG samples, in part because of the overlap between them, there are several notable differences. First, the odds ratios associated with foreign-born Hispanics are smaller for the mother sample (Table 4) than for the adult sample (Table 3) and, in the case of mothers, the odds of reporting poor health for Hispanics are not significantly different ( $p < 0.05$ ) from those for whites once SES measures are introduced into the model. Second, whereas foreign-born and U.S.-born Hispanics have approximately the same odds ratios of reporting poor health among mothers (Table 4), Hispanic immigrants in the adult sample (Table 3) are substantially more likely to report poor health than their native-born counterparts (the differences are significant at  $p < 0.05$  for Mexicans and marginally significant at  $p < 0.10$  for other Hispanics) in the final model. Third, the association between being interviewed in Spanish and poor SRH becomes insignificant in the adult sample once SES controls are added, but remains significant for the mother sample. We have no clear-cut explanations for these discrepancies, particularly since the statistical models include controls for age, sex, and number of children. We speculate that these differences arise from additional sources of variation in the adult sample (e.g., health-related behaviors not

measured here, family roles and responsibilities, occupational status) that are not present in the more homogeneous sample of mothers.

## **Discussion**

Using detailed data on immigrant status, health, and SES from L.A.FANS, we evaluated four hypotheses proposed in the literature as explanations for poorer self-reports of health among Hispanics. Our results provide new insights into the validity of these explanations and suggest avenues for future research.

Our finding that language of interview, but not household language, is significantly associated with SRH supports the notion that translation issues between the Spanish and English versions of the SRH question give rise to some of the discrepancies. In particular, the Spanish version appears to bias responses toward reports of poorer health. Although numerous studies have documented associations between language and SRH (e.g., Angel & Guarnaccia, 1989; Shetterly et al., 1996; Franzini & Fernandez-Esquer, 2004), these studies have been unable to distinguish between linguistic artifacts and cultural aspects of language.

The somatization hypothesis has received considerable attention in research pertaining to self-rated health among Hispanics (see, for example, Angel & Guarnaccia, 1989; Franzini et al., 2001; Katon, Kleinman & Rosen, 1982; Shetterley et al., 1996), yet this hypothesis has also not been addressed adequately. In particular, some of the most frequently cited studies (Angel & Guarnaccia, 1989; Franzini & Fernandez-Esquer, 2004; Arcia, 1998) are restricted to Hispanic samples, rendering it impossible to determine the extent to which mental distress accounts for discrepancies in SRH between Hispanics and other ethnic groups. Our study demonstrates that,

to the extent that mental well-being is reflected by the presence of depressive symptoms, there is no evidence to support this hypothesis. Although respondents who experience depression are significantly more likely than others to report poor health, Hispanics are not more likely than whites to either experience depression or give excessive weight to their psychological problems in their self-assessments of overall health.

Several scholars have proposed that ethnic differences in SRH should diminish as Hispanics become more acculturated into U.S. society (Shetterly et al., 1996; Franzini et al., 2001). This supposition has not been substantiated with empirical findings. Rather, results vary considerably across studies, presumably because of the broad nature of measures used to evaluate acculturation (e.g., language, nativity, age at immigration, and duration in the U.S.), because of confounding between the impact of acculturation and translation issues (described earlier), and because respondents may change their reference group for self-assessments of health as they spend more time in the U.S. In this study, we evaluate more dimensions of acculturation than in previous research and find that none of our measures— household language, age of immigration, duration of residence in the U.S., and documented status – is significantly associated with reports of poor health. This unexpected finding appears to refute previous research suggesting that cultural factors have profound influences on the perception and acknowledgment of health problems. We speculate that this result may be the consequence of two counteracting processes that underlie immigrants' adaptation to life in the U.S.: (1) changing cultural values that render Hispanics more likely to assess and report their health as good (i.e., as whites do); and (2) deterioration in actual health status, resulting from the adoption of negative health behaviors in U.S. society, such as smoking and drinking, and from stress associated with perceived racism and lack of social and economic opportunity in the U.S. (Lara, Gamboa,

Kahramanian, Morales & Hayes Bautista, 2005; Franzini & Fernandez-Esquer, 2004; Finch et al., 2000).

In addition to exploring these three specific hypotheses, we examined a broad array of measures of socioeconomic status and health problems and confirmed findings from earlier studies that both sets of variables are strongly associated with SRH. For example, we found that work limitations and the existence of serious health conditions have significant and substantial associations with SRH, although the associations between health-related *behaviors* and SRH are typically modest. Consistent with previous research indicating that Hispanics are in better health than whites (Escarce, Morales, & Rumbaut, 2006), we determined that controlling for specific health conditions exacerbates, rather than reduces, the discrepancies in SRH between these ethnic groups. We also found that higher SES, especially schooling, is associated with poorer SRH, and that adjustment for SES substantially reduces the gap between Hispanics and whites in reports of poor health.

Although this analysis is based on an extensive array of explanatory variables, we are unable to account fully for the greater frequency of reports of poor health among Hispanics. Similar results have been obtained in other studies. For example, Shetterly et al. (1996) found that, after adjustment for SES, mental and physical health, health behaviors, and acculturation scores, Mexican Americans were more than twice as likely as whites to report poor health. Our finding that poor SRH remains particularly high among foreign-born Hispanics, despite the lack of importance of acculturation measures, suggests that some of the ethnic differences may come from culturally-influenced understanding and expressions of health as well as choices of reference groups that are not captured by the measures in this analysis.

The first wave of L.A.FANS has several advantages over other data sets for examining ethnic disparities in SRH including a large Hispanic and non-Hispanic sample and a rich set of variables on immigrant status, language, SES, and health. Nevertheless, this survey also has several limitations for the analysis. First, because L.A.FANS-1 is cross-sectional, the associations examined here could be bi-directional: individuals' assessments of their health status may not only be influenced by the explanatory variables, but may influence them as well (e.g., depression, employment status, and health-related behaviors). Second, although LAFANS-1 includes more extensive information on immigrant characteristics than most comparable surveys, it lacks detailed data pertaining to respondents' linguistic and social adaptation to life in the U.S. Third, because health information in L.A.FANS-1 is entirely self-reported, these data almost certainly reflect reporting biases that are associated with language and culture. Of particular concern is our inability to control for the presence of a broad range of diseases and conditions, because reports of these illnesses depend upon the respondents having consulted a health provider. L.A.FANS-1 also did not collect risk factor variables for common chronic conditions (e.g., hypertension and hyperglycemia), information that is likely to affect self-assessments of health.

A second round of data collection of L.A.FANS (L.A.FANS-2), scheduled for completion in 2008, is now underway. The combined data set based on both waves will permit a longitudinal investigation of the correlates of SRH for whites and Hispanics that is less likely to reflect reverse causality. In addition, L.A.FANS-2 is collecting the following types of data that were not included in the first wave: a modified Marin acculturation scale on language use in a range of settings and the ethnicity of people whom the respondent interacts with on a regular basis (Marín, Sabogal, Marín, Otero-Sabogal, & Perez-Stable, 1987); questions pertaining to

discrimination and racism; clinical measurements of risk factors for chronic illness, such as blood pressure and blood glucose levels; and vignette measures of perceived health status that attempt to measure and adjust for systematic differences among social groups in response anchoring and cutoff points. Future analyses based on data from the two waves of L.A.FANS are likely to provide new insights into the mechanisms that underlie ethnic disparities in self-rated health.

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**Table 1. Descriptive Characteristics for Sample of Randomly Selected Adults (RSAs), by Race and Immigrant Status**

	Total	a) White NB	b) MX FB, Imm as child	c) MX FB, Imm as adult	d) MX NB	e) Other Hisp, FB	f) Other Hisp, NB
<b>N</b>	1,708	510	241	419	238	256	44
<b>% of total sample</b>	100.0	29.9	14.1	24.5	13.9	15.0	2.6
<b>Fair/poor SRH (%)</b>	22.7	10.8 <sup>b,c,d,e</sup>	28.6 <sup>a,d,f</sup>	32.9 <sup>a,d,f</sup>	14.7 <sup>a,b,c,e</sup>	32.8 <sup>a,d,f</sup>	13.6 <sup>b,c,e</sup>
<b>Demographic characteristics</b>							
Male (%)	43.9	47.7	43.6	48.7	39.5	34.8	31.8
Mean age (years)	39.1	45.6	31.3	40.3	34.2	37.2	32.7
(SD)	14.5	16.3	10.0	12.4	14.8	11.2	12.9
<b>Health status and behaviors</b>							
Overweight/obese (%)	64.6	53.9	68.5	72.3	67.7	65.2	72.7
Heavy drinker (%)	16.6	17.7	18.7	17.0	19.3	9.8	15.9
Current smoker (%)	15.1	16.9	12.0	13.6	16.4	12.5	34.1
Health problem that limits work (%)	12.9	16.7	9.5	11.0	12.6	11.7	13.6
Reports Dr-diagnosed serious condition (%) <sup>g</sup>	8.4	14.3	7.1	3.8	5.5	7.8	11.4
Mean self-reported height (inches)	65.6	67.6	64.7	64.8	65.6	63.8	64.9
(SD)	4.1	4.2	3.7	4.0	3.8	3.4	3.7
<b>Household speaks only Spanish (%)</b>	29.2	0.0	39.4	64.0	3.8	48.8	4.6
<b>Interviewed in Spanish (%)</b>	46.1	0.0	69.7	92.8	9.2	79.3	13.6
<b>Socioeconomic status</b>							
Educational attainment							
Less than secondary (%)	39.5	6.5	60.2	69.2	24.0	54.3	22.7
Secondary only (%)	18.8	14.3	20.3	20.8	21.4	19.5	25.0
Some post-secondary (%)	41.7	79.2	19.5	10.0	54.6	26.2	52.3
Currently employed (%)	67.1	68.8	67.2	63.0	74.4	62.5	72.7
Mean family income (thousands of \$)	48.9	98.4	25.5	21.7	43.4	24.2	35.6
(SD)	67.5	98.7	23.2	22.2	43.2	20.2	46.0
Currently uninsured (%)	37.3	10.4	51.5	60.4	17.2	59.8	29.6
<b>Reports Dr-diagnosed major depression (%)</b>	5.9	8.8	4.2	2.6	5.9	5.1	15.9

<sup>a</sup> Significantly different from white non-H native (p<.05); <sup>b</sup> Significantly different from Mexican FB immigrated as child (p<.05); <sup>c</sup> Significantly different from Mexican FB immigrated as adult (p<.05);

<sup>d</sup> Significantly different from Mexican NB (p<.05); <sup>e</sup> Significantly different from other Hispanic FB (p<.05); <sup>f</sup> Significantly different from other Hispanic NB (p<.05)

<sup>g</sup> Includes heart attack, cancer/malignancy, chronic heart disease and chronic lung disease

Estimates are unweighted

**Table 2. Descriptive Characteristics for Sample of Mothers (PCGs), by Race and Immigrant Status**

	Total	a) White NB	b) MX FB, Imm as child	c) MX FB, Imm as adult	d) MX NB	e) Other Hisp, FB	f) Other Hisp, NB
<b>N</b>	1,161	258	187	345	146	200	25
<b>% of total sample</b>	100.0	22.2	16.1	29.7	12.6	17.2	2.2
<b>Fair/poor SRH (%)</b>	24.1	8.9 <sup>b,c,d,e</sup>	26.2 <sup>a,d,f</sup>	33.6 <sup>a,d,f</sup>	15.8 <sup>a,b,c,e</sup>	33.0 <sup>a,d,f</sup>	12.0 <sup>b,c,e</sup>
<b>Demographic characteristics</b>							
Mean age (years)	35.2	39.5	31.1	36.2	31.8	35.0	30.2
(SD)	8.4	8.2	7.0	7.7	8.6	7.9	6.8
<b>Health status and behaviors</b>							
Overweight/obese (%)	63.2	42.3	73.3	73.3	63.0	63.0	68.0
Heavy drinker (%)	6.3	7.8	5.9	4.4	10.3	4.5	12.0
Current smoker (%)	9.0	17.8	7.5	5.8	10.3	1.0	32.0
Health problem that limits work (%)	8.3	10.5	5.4	6.7	9.6	10.5	4.0
Reports Dr-diagnosed serious condition (%) <sup>g</sup>	6.3	10.1	6.4	4.1	4.8	6.5	4.0
Mean self-reported height (inches)	63.3	64.8	62.7	62.8	63.4	62.5	63.2
(SD)	2.9	2.6	2.6	3.1	2.5	2.8	2.2
<b>Household speaks only Spanish (%)</b>	32.6	0.4	34.8	64.1	2.7	44.0	0.0
<b>Interviewed in Spanish (%)</b>	54.7	0.0	69.0	95.1	11.0	80.5	4.0
<b>Socioeconomic status</b>							
Educational attainment							
Less than secondary (%)	43.3	6.6	62.0	66.1	20.6	53.5	20.0
Secondary only (%)	19.6	11.2	21.9	23.5	21.9	19.0	24.0
Some post-secondary (%)	37.1	82.2	16.0	10.4	57.5	27.5	56.0
Currently employed (%)	54.2	64.3	47.6	42.3	71.9	53.0	68.0
Mean family income (thousands of \$)	49.50	116.60	26.60	23.30	55.60	27.10	31.30
(SD)	68.70	106.90	28.90	22.60	58.50	21.60	20.00
Currently uninsured (%)	38.4	6.6	47.1	61.2	10.3	53.0	36.0
<b>Exhibits symptoms of depression (%)</b>	15.4	17.4	14.4	13.0	14.4	19.0	12.0

<sup>a</sup> Significantly different from white non-H native (p<.05); <sup>b</sup> Significantly different from Mexican FB immigrated as child (p<.05); <sup>c</sup> Significantly different from Mexican FB immigrated as adult (p<.05); <sup>d</sup> Significantly different from Mexican NB (p<.05); <sup>e</sup> Significantly different from other Hispanic FB (p<.05); <sup>f</sup> Significantly different from other Hispanic NB (p<.05)

<sup>g</sup> Includes heart attack, cancer/malignancy, chronic heart disease and chronic lung disease

Estimates are unweighted

**Table 3. Odds Ratios for Logistic Regression for Fair/Poor Self-Reported Health Status, Sample of Randomly Selected Adults (RSAs)**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
<b>Ethnicity/ Immigration</b>					
(White native-born omitted)					
Mexican FB, imm. as child	4.80 **	6.72 **	4.51 **	2.70 **	2.80 **
Mexican FB, imm. as adult	4.14 **	7.45 **	4.33 **	2.53 **	2.62 **
Mexican native-born	1.89 *	2.23 **	2.17 *	1.65	1.75 ^
Other Hispanic FB	4.29 **	7.02 **	4.42 **	2.89 **	3.00 **
Other Hispanic NB	1.70	1.31	1.26	0.95	0.85
<b>Demographic characteristics</b>					
Male	0.61 **	0.72 ^	0.69 *	0.66 *	0.69 ^
Age (years)	1.04 **	1.02 **	1.02 **	1.02 **	1.02 **
<b>Health status and behaviors</b>					
Overweight/obese	-	1.29 ^	1.28 ^	1.37 *	1.33 ^
Heavy drinker	-	1.38	1.40 ^	1.39	1.38
Current smoker	-	1.08	1.11	1.04	0.99
Health problem that limits work	-	10.00 **	9.92 **	9.09 **	7.84 **
Told by Dr. has serious condition	-	4.03 **	3.91 **	3.72 **	3.61 **
Self-reported height (inches)	-	0.95 *	0.95 *	0.97	0.97
<b>Household speaks only Spanish</b>	-	-	1.11	0.98	0.99
<b>Interviewed in Spanish</b>	-	-	1.77 *	1.43	1.45
<b>Socioeconomic status</b>					
Educational attainment (less than secondary omitted)					
Secondary only	-	-	-	0.53 **	0.53 **
Some post-secondary	-	-	-	0.44 **	0.42 **
Currently employed	-	-	-	0.98	0.98
Family income (bottom quartile omitted)					
Second quartile	-	-	-	0.87	0.87
Third quartile	-	-	-	0.80	0.83
Top quartile	-	-	-	0.42 **	0.43 **
Currently uninsured	-	-	-	1.26	1.28
<b>Diagnosed major depression</b>	-	-	-	-	2.32 **
<b>N</b>	1,708	1,708	1,708	1,708	1,708
<b>Log likelihood</b>	-805.13	-692.73	-688.66	-667.41	-663.7

\*\* p<0.01; \*p<0.05; ^ p<0.10 two-tailed

All models control for the number of persons and the number of children in the household, whether or not the household has children, tract size and tract poverty. All models also include a random effect to control for neighborhood-level clustering.

**Table 4. Odds Ratios for Logistic Regression for Fair/Poor Self-Reported Health Status, Sample of Mothers (PCGs)**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
<b>Ethnicity/ Immigration</b>					
(White native-born omitted)					
Mexican FB, imm. as child	3.43 **	4.25 **	2.53 *	1.58	1.73
Mexican FB, imm. as adult	3.89 **	5.70 **	2.82 *	1.86	2.01
Mexican native-born	1.93 ^	2.11 ^	2.02 ^	1.80	1.97
Other Hispanic FB	4.07 **	5.46 **	2.97 **	2.10 ^	2.18 ^
Other Hispanic NB	1.51	1.86	1.94	1.48	1.61
<b>Demographic characteristics</b>					
Age (years)	1.04 **	1.02 *	1.02 *	1.02 *	1.02 *
<b>Health status and behaviors</b>					
Overweight/obese	-	1.49 *	1.51 *	1.66 **	1.59 *
Heavy drinker	-	0.75	0.73	0.78	0.71
Current smoker	-	1.36	1.41	1.39	1.29
Health problem that limits work	-	13.45 **	13.87 **	14.94 **	14.28 **
Told by Dr. has serious condition	-	3.21 **	3.13 **	3.41 **	3.27 **
Self-reported height (inches)	-	0.94 *	0.95 *	0.95 ^	0.95 ^
<b>Household speaks only Spanish</b>	-	-	0.94	0.82	0.83
<b>Interviewed in Spanish</b>	-	-	2.43 **	1.94 *	1.94 *
<b>Socioeconomic status</b>					
Educational attainment (less than secondary omitted)					
Secondary only	-	-	-	0.38 **	0.39 **
Some post-secondary	-	-	-	0.33 **	0.34 **
Currently employed	-	-	-	1.03	1.00
Family income (bottom quartile omitted)					
Second quartile	-	-	-	0.93	0.97
Third quartile	-	-	-	1.04	1.02
Top quartile	-	-	-	0.74	0.76
Currently uninsured	-	-	-	1.14	1.15
<b>Exhibit symptoms of depression</b>	-	-	-	-	1.92 **
<b>N</b>	1,161	1,161	1,161	1,161	1,161
<b>Log likelihood</b>	-591.8	-518.9	-513.5	-496.4	-491.8

\*\* p<0.01; \*p<0.05; ^ p<0.10 two-tailed

All models control for the number of persons and the number of children in the household, whether or not the household has children, tract size and tract poverty. All models also include a random effect to control for neighborhood-level clustering.