

Language of Interview: Importance for Hispanic Mothers' Self-Rated Health and Reports of
Their Children's Health

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Maren Andrea Jiménez¹
Xiuhong Helen You²
Yolanda C. Padilla³
Daniel A. Powers²

¹ Population Division-CELADE, UN Economic Commission for Latin America and the Caribbean.

² Department of Sociology and the Population Research Center, University of Texas at Austin.

³ School of Social Work and the Population Research Center, University of Texas at Austin.

Direct correspondence to Maren Andrea Jiménez, maren.jimenez@gmail.com. The authors gratefully acknowledge the comments of Erin Hamilton, Robert Hummer and Kelly Mikelson on previous drafts. The contents of this paper, however, and any errors contained within, are the sole responsibility of the authors.

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Abstract

Hispanics tend to be as healthy as non-Hispanic whites across a number of indicators, yet they consistently rate their health as worse than do non-Hispanic whites. This incongruous finding has been tied both to levels of acculturation and Spanish-language use, questioning the validity of self-reported health for Spanish speakers in the U.S. Furthermore, in the same way that Hispanic adults interviewed in Spanish have worse self-rated health, when asked in Spanish mothers rate their children's health as worse than do those mothers who answer in English. The exact reasons for this relationship, though, are unclear. Frequently this language effect has been taken as an indicator of acculturation; as such, the assumption is that over time Hispanics become more acculturated and answer questions regarding their health more similarly to non-Hispanic whites.

However, until now there has been no longitudinal research examining the relationship between rated health and language of interview. Using three waves of data on Hispanic mothers and their children from the Fragile Families and Child Well-being Study, this paper addresses the following questions: 1. Is Spanish language interview predictive of worse rated health for both mothers and children, and do these relationships change over time? 2. Does the effect of language on rated health persist after controlling for potential mediators? By employing two-level generalized linear mixed models, we find that on average, those interviewed in Spanish are more likely to rate their and their children's health as worse than are those who answered in English. The effect of language of interview on reported health persists over time, even after controlling for measures of acculturation, physical and mental health, and access to health care. Contrary to what some have proposed, we see no discernable change over time in the way women rate their own health or that of their children.

Introduction

The health of the Hispanic population in the United States is often described as paradoxical. In spite of their relatively low socio-economic status and low utilization of health services, Hispanics tend to be as healthy as or healthier than non-Hispanic whites on a range of health indicators (Markides & Eschbach 2005). This salubrity is often attributed to the demographic profile of Hispanics, in that they tend to be younger and have a higher proportion of immigrants than does the non-Hispanic white population (Guendelman 1998).

The data on how Hispanics globally rate their health, however, do not conform to this pattern. When examining differences by racial/ethnic group, Hispanics rate their health as worse than non-Hispanic whites, even when controlling for physical conditions (Ren & Amick, 1996; Shetterly, Baxter, Mason & Hamman, 1996; also Hummer, Benjamins & Rogers, 2004, for the specific case of Mexicans). Within the Hispanic population, researchers have found differences in self-rated health according to what language the question was asked (i.e., English versus Spanish) and by levels of acculturation. Those who answer the self-rated health question in Spanish tend to rate their health as worse than those who answer in English, and immigrants who exhibit lower levels of acculturation are more likely to report worse health than those who are more acculturated or U.S. born co-ethnics (Angel, Buckley & Finch, 2001; Cho, Frisbie, Hummer & Rogers, 2004; Franzini & Fernandez-Esquer, 2004; Wilkinson, Hernández-Valero, Etzel, Barcenas, Spitz, Bondy and Strom, 2006)

This incongruous finding with regards to self-rated health in the Hispanic population is of concern considering that this measure is consistently used as an indicator of population health in the social sciences literature. Although self-rated health is highly predictive of subsequent mortality (Idler & Angel, 1990; Idler & Benyamini, 1997; Mackenbach, Simon, Looman &

Joung, 2002), it is a weaker predictor for less acculturated Hispanics (Finch, Hummer, Reindl & Vega, 2002). Yet, why this is so is unclear. Moreover, even less is known about patterns of maternal ratings of children's health in the Hispanic population. Given that Hispanic immigrant women generally experience better birth outcomes than their U.S. born counterparts (Hummer, Biegler, de Turk, Peter, Forbes, Frisbie, et al., 1999; Landale, Oropesa & Gorman, 2000), it is important to understand how they rate the health of their children in early childhood and beyond. Thus, disentangling the relationship between rated health, language, and acculturation among Hispanics becomes all the more salient to comprehending the overall health and well-being of this population.

Using three waves of data on Hispanic mothers and their children from the Fragile Families and Child Well-being Study, we examine the self-rated health trajectories of women and the trajectories of their reports on their children's health. Our intent is to: 1) establish the relationship between language of interview and rated health; 2) determine whether this association changes over time, and 3) explore the role of three potential mediating sets of variables—acculturation, physical and mental health, and access to health care—in better understanding these relationships.

Previous Research

Self-rated Health and Spanish Language Interview

When interviewed in Spanish, Mexican Americans and Puerto Ricans are much more likely to report their health as fair/poor than those who answered in English, even when a physician has rated their health as excellent (Angel & Guarnaccia, 1989). Spanish-language interviews can exert an influence on assessments of health through the possible incompatibility of how the question is asked in the two languages; the vocabulary used to refer to health may

differ between Spanish and English. Among a sample of Mexican-origin women, both U.S. born and immigrant women who speak English were more likely to rate their health as favorable compared to foreign-born Spanish speakers. Spanish speaking U.S. born respondents, however, rated their health no differently than did immigrant Spanish speakers (Franzini & Fernandez-Esquer, 2004). Thus, research shows that when Hispanics rate health in English, their health assessments are more similar to others who have answered in the same language.

As opposed to exerting an independent influence on reports of health, however, the effect of Spanish language interviews could instead be mediated by several different hypothesized mechanisms, three of which we explore below.

Proposed Mediators of the Effect of Language on Self-Rated Health

Acculturation. Answering interviews in Spanish could be strongly associated with a respondent's level of acculturation to the U.S., in that less acculturated Hispanics, in particular those with short lengths of stay in the U.S., tend to choose to be interviewed in Spanish. Indeed, more acculturated Hispanics in the San Luis Valley Health and Aging Study rated their health more similarly to non-Hispanic whites than less acculturated Hispanics, even after controlling for objective health measures (Shetterly et al., 1996). Language proficiency appears to make a difference and could be related to acculturation to the extent that those who have been in the U.S. longer may have higher language proficiency. In a nationally-representative sample of Hispanics, Mulvaney-Day, Alegria & Sribney (2006) found effects of language proficiency on self-rated physical and mental health, independent of language of interview. As an interesting counterpart, in a study of Polish, Iranian and Turkish immigrants living in Sweden, immigrants with only a low or medium knowledge of Swedish were significantly more likely to rate their health as fair or poor, regardless of nationality (Wiking, Johansson & Sundquist, 2004), thus suggesting that

levels of acculturation can affect reports of health regardless of country or origin or destination.

There are several hypotheses as to why acculturation should matter for reports of health. Context matters; when recent immigrants to the U.S. rate their own health, they may be comparing themselves to those of their country of origin or to the native U.S. population (Jasso, Massey, Rosenweig & Smith, 2004). Furthermore, immigration and acculturation to a new country is a stressful process; thus, more recent immigrants experience higher levels of stress than earlier immigrants or the U.S. born. Increased stress could further depress reports of health, as we shall see below.

Physical and Mental Health. Hispanics are more likely to incorporate their current mental status and/or personal problems in global health assessments, a process referred to as somatization (Angel & Guarnaccia, 1989). Spanish-language interview is not only associated with poorer self-rated health but also higher levels of depression (as measured with the Center for Epidemiologic Studies Depression Scale, CES-D). For example, Hispanics from the Latino and Asian American Study who answered in Spanish were more likely to assess their mental health as worse than those who answered in English (Mulvaney-Day et al., 2006). Accordingly, it could be that Hispanics who rate health in Spanish are more prone to depression and somatization, thus rating their health as worse. However, over time stress and discrimination associated with adapting to a new culture may decrease, as does the tendency to somatize, thus resulting in better global assessments of health.

Access to Health Care. By speaking English, Hispanics can gain greater access to information on health related services and more contact with health care providers. Several studies show that Hispanics identify language as a key barrier to seeking health care both for themselves and their children (for example, Clemans-Cope & Kenney, 2007 and Flores, 2006).

Thus, it may be that persons who are interviewed in Spanish have lower English proficiency, resulting in less medical attention and the presence of more untreated health conditions, ultimately resulting in less favorable ratings of health.

Mother's Rating of Their Child's Health

The relationship between language of interview and how mothers rate their children's health is somewhat different than that described above. As with their own health, Hispanic mothers tend to rate the health of their children as worse than do non-Hispanic white or black mothers (Flores, Olsen, & Tomany-Korman, 2005). Within this population, Mexican and Puerto Rican mothers who answered interviews in Spanish rated their children's health as slightly worse in the Hispanic Health and Nutrition Examination Survey (Arcia, 1998).

Independent of language of interview, Mexican American mothers who rated higher on a U.S. acculturation scale rated their child's health as better than did those mothers who rated lower on the scale (Angel & Worobey, 1988). Indeed, although the children of migrant households living in the U.S. have better rated health than children of non-migrant households in Mexico, among the respondents currently residing in the U.S., parents with more years of U.S. experience rate their children's health as better than parents with fewer years spent in the U.S. (Donato et al. 2003).

Mothers' own self-rated health affects their children's health, in that mothers who rate their health as worse are more likely to rate their children's health as worse, independent of the child's health (Angel & Worobey, 1988). The same is true for mothers who have more depressive symptoms. However, once controlling for Spanish language interview and measures of access to and quality of health care received, Flores et al. (2005) found no differences between the rated health of non-Hispanic white and Hispanic children. Indeed, according to these authors,

“Hispanic parents cite language problems as the greatest barrier to health care for their children” (Flores et al., 2005).

With all three of these mediators, the inference is that the longer immigrants stay in the U.S., the more they use English and become acculturated to U.S. society, the better they rate their own health as well as their children’s. Evidence for this, however, has only been demonstrated using cross-sectional data comparing some combination of language of interview, groups with different lengths of duration in the U.S., and differing levels of language proficiency and measures of acculturation. Moreover, with regard to the results of cross-sectional studies, it is unclear whether Hispanics who chose to be interviewed in English are more acculturated and indicate better health as a result of subjective changes in how they view their and their children’s health (e.g., change in reference group, decreased somatization) or objective improvements in health over time (e.g., decreased stress associated with a recent move, or through increased contact with a health provider). Additionally, this difference could be a reflection of an effect of Spanish language independent of levels of acculturation, objective health, or access to health care.

As of yet there has been no research examining changes in rated health, language of interview, and acculturation over time using longitudinal data. With this in mind, this paper addresses the following two questions:

1. Is Spanish language interview predictive of worse rated health for both mother and children, and do these relationships change over time?
2. Does the effect of language on rated health persist after controlling for potential mediators?

Based on the literature cited above, we anticipate that mothers rating their health and their child’s health in Spanish will tend to indicate worse health than those responding to the

same question in English. In both cases, it is expected that the differences between those interviewed in English and in Spanish will decrease over time or with greater acculturation of Hispanics to the U.S. It is unclear whether these relationships will be completely explained by introducing measures of acculturation and indicators of objective health status, and measures of access to health care. These sets of mediators, however, should help determine if the influences of language of interview are independent of or at least partially due to these mediating influences.

Data and Methods

We test these hypotheses through analysis of data from the Fragile Families and Child Wellbeing Study, a longitudinal survey of predominately non-marital births in 20 U.S. cities with populations over 200,000 (see <http://www.fragilefamilies.princeton.edu>). The study purposefully oversampled unmarried mothers because of its specific interest in this vulnerable and policy-relevant population. Between 1998 and 2000 the study collected data on approximately 4,700 births at the time these children were born. Follow-up interviews with the children's mothers and fathers were conducted when the children were 1, 3 and 5 years old. In addition to collecting data on the health and development of these children, mothers also answered questions regarding their own demographic characteristics, socio-economic status, health characteristics and health behaviors (Reichman, Teitler, Garfinkle & McLanahan, 2001). Interviews were conducted in both English and Spanish.

This study mainly makes use of the second, third, and fourth waves of the mothers' survey. We include in our sample only mothers who participated in all four waves of data collection.¹ Respondents whose information is missing on any variable are excluded (the exception here is for total household income, see below). Since our primary interest is in

explaining differences in health assessments according to language of interview, we only include in our analysis mothers who identified themselves as Hispanics, and their children. We drop the few cases of multiple births in order to limit the biasing effect of the health complications associated with multiple births. Our final sample size is 801 Hispanic mothers and their focal child. Although we exclude non-Hispanic whites and non-Hispanic blacks from our multivariate analysis, their descriptive characteristics are presented here for comparative purposes only. The results for these two groups are also limited to mothers who participated in all four waves of the Study.

Measures

Our key dependent variables are mothers' self-rated health and mother's report of the focal child's health. Both the questions on mothers' self-rated and children's reported health were asked in all follow-up interviews (waves 2-4). Mothers were asked to evaluate health according to a five-point scale, ranging from "excellent" to "poor". In our analysis, we dichotomize these two indicators at each wave by collapsing "excellent/very good" into one category, with "good/fair/poor" as the reference category (Cho et al. 2004).

Our independent variables are measured at the time of the year 1 follow-up (wave 2), except for the low birth weight variable in the children's model, which was measured at the time the child was born (wave 1). Our key independent variable in both the mother's and the children's models is whether the mother was interviewed in Spanish or English.²

In the mother's models, we introduce three sets of variables to evaluate the possible mediators of the relationship between language and self-rated health. The first set of variables measures acculturation. The nativity/duration variable categorizes mothers into the following three categories: foreign-born who have been in the U.S. five years or less, foreign-born who

have been in the U.S. more than five years, and U.S. born (reference category). Additionally, mothers were asked to rate two statements regarding their cultural attachment and participation in cultural practices. The first is, “I feel an attachment towards my own racial or ethnic heritage,” and the other is “I participate in cultural practices of my own group, such as special food, music, or customs”. Responses were given according to a 4-point scale, which we collapse into “strongly agree/somewhat agree” and “somewhat disagree/strongly disagree”; the latter serves as the reference category. The last acculturation indicator measures frequency of religious services attendance, where those who attend services once a week or more are given a value of “1”.

The next set of variables in the mother’s model includes indicators of the physical and mental health, as well as the health behaviors, of the mothers. Mothers were asked whether they had a serious health problem that limits their ability to work, whether they smoked cigarettes in the past month, and whether they drank any alcohol in the past month. We create a separate dummy variable for each of these indicators (yes=1). Additionally, the data includes essential items from the World Health Organization Composite International Diagnostic Interview Short-Form (CIDI-SF) to diagnose major depressive episodes, which we code into a dichotomous measure of depression (yes=1), following the guidelines provided by the Fragile Families website (<http://www.fragilefamilies.princeton.edu/documentation.asp>). Krause & Jay (1994) find that, among other items, people consider physical functioning, mental health, and health behaviors (primarily smoking and drinking) when asked to report on their health.

The last set of variables in the mother’s model contains two indicators of access to health care. Health insurance variables indicate those mothers with private insurance or public insurance coverage, as compared to uninsured women. The medical hardship variable indicates whether anyone in the household needed to see a doctor or receive medical attention in the past

year but could not because of the cost (yes=1).

The mediators used in the mothers' models are also included in the children's models, with some adjustments. The four acculturation measures remain the same in the children's model as in the mothers' models. Low birth weight (<2,500g at birth) and presence of a physical disability are used as objective health measures for the child. In addition, mother's self-rated health and a dichotomous measure indicating mother's depression are also included in the models. As in the mothers' model, indicators of children's health insurance coverage and household medical hardship are used.

We use mothers' age, marital status, education, employment and household income as standard demographic and socioeconomic measures. Due to the high number of cases with missing values for household income, we include an additional dichotomous measure to control for whether or not the mother reported any income. Furthermore, the child's sex is included as an additional control variable in the children's models.

Methods

Because the health of the mothers and children were assessed at all three waves, we employ two-level generalized linear mixed models (logit). This modeling strategy also accounts for the correlation between the repeated measurements of reported health from the same mother and provides parameter estimates that condition on, or control for, unobserved mother-specific factors that influence reported health. The GLLMM (Rabe-Hesketh, Skrondal & Pickles, 2004) procedure in Stata is used to conduct the analysis. The odds ratios for reporting very good or excellent health are presented.

We run separate sets of models for the mothers and the children. The baseline model which contains only the wave and the language of interview variable. We then add each set of

the variables described above—acculturation, physical and mental health, and access to health care—to determine their roles in explaining the relationship between language and self-rated health. The final model contains all the variables we use for our analyses to determine their independent effects on reported health. In all models, we control for the basic demographic and socio-economic characteristics of the mothers described above, and for the clustering of cases by city due to the sample design of the Study (results not shown). These models allow for mother-specific variability in the intercept (initial logit) and change in the logit over time. As such, estimates of covariate effects should be interpreted as being conditional on unobserved mother-specific characteristics that might impact initial level and change in outcomes.

Results

We begin by providing a comparative analysis of health reports, demographic characteristics, and our proposed mediators by race, ethnicity and language of interview (see Tables 1, 2, and 3).

Noticeable differences in self-rated health and child's rated health exist between racial and ethnic groups (Table 1). In all follow-up interviews, non-Hispanic whites had the highest self-rated health score, followed by non-Hispanic black mothers, Hispanic mothers interviewed in English, and Hispanics interviewed in Spanish. This pattern held true for reports of children's health—in all three waves the highest percentage of mothers rating their children's health as excellent or very good were non-Hispanic white (ranging from 93 to 95 percent), while the lowest percentage of mothers classifying their child's health in this category were Hispanics interviewed in Spanish (between 67 and 68 percent). The gap between how mothers of different racial/ethnic groups rate health is larger for mother's reports of her child's health than for self-rated health. However, descriptive analyses reveal that both mother's self-rated health and

child's rated health exhibit little discernable aggregate change during the four-year period of our study.

Within the Hispanic group, Table 1 only stratified reports of health by language of interview at wave 2. To examine the relationship between rated health and the language of interview at the time the respondent answered questions about health, we present cross-tabulations for self-rated health and mothers' reports of children's health in Table 2. Again, at all points of time a higher percentage of mothers who answered in English reported excellent or very good health, in comparison to mothers interviewed in Spanish. However, again it is difficult to distinguish any clear pattern in the trajectories of self-rated health and child's rated health across waves.

Table 3 provides descriptive data on mothers' and children's characteristics by race/ethnicity and language of interview. Hispanic mothers interviewed in English are slightly younger, with a mean age of about 25, as compared to a mean age of 28 for Hispanic mothers interviewed in Spanish. A much higher percentage of Hispanic mothers interviewed in Spanish are married, compared to their co-ethnics interviewed in English (41 percent versus 29 percent). Hispanics are noticeably disadvantaged in terms of social economic status. This is especially true for Hispanic mothers interviewed in Spanish, who by far exhibit a lower rate of high school completion (28 percent), and a higher percentage belonging to households with a yearly income of less than \$15,000 (49 percent), than do those interviewed in English.

As can be expected, most Hispanic mothers interviewed in English were born in the United States (87 percent) and of the foreign born, very few women in the sample (less than 1 percent) had been in the U.S. for five years or less. The majority (93 percent) of Hispanic mothers interviewed in Spanish were born outside United States, with about half of these women

only having spent five years or less in the U.S. Not surprisingly, a higher percentage of foreign-born mothers felt an attachment toward their racial/ethnic heritage (81 percent), participated in cultural practices (88 percent) and attended religious services at least once a week (47 percent) .

Hispanic mothers interviewed in Spanish are more likely than those interviewed in English to report a health problem that limits their ability to work. However, they fare better in other health and behavior measures—they have a lower percentage reporting depression (8 percent) and significantly lower percentages of cigarette and alcohol use (5 percent and 11 percent, respectively). Finally, the disadvantage of the Hispanic mothers, especially those interviewed in Spanish, with regards to access to health care is apparent. Both groups have high percentages of uninsured (38 percent for English interviewees and 63 percent for Spanish interviewees).

Children's characteristics can be found in the bottom panel of Table 3. Consistent with national statistics, Hispanics have a low incidence of low birth weight infants. However, Hispanic children whose mothers were interviewed in English are more likely to have a physical disability (3 percent) than are those interviewed in Spanish. Although rates of being uninsured are not as high among children as they are among their mothers, high percentages Hispanic children are uninsured.

Table 4 reports odds ratios predicting mothers' global assessment of their own health as excellent/very good. In Model 1 mother's reported health is not significantly different across waves, as evidenced by the coefficient for wave in our model. Conditional on unmeasured mother-level (level-2) traits, those who answered the questionnaire in Spanish at the year 1 follow-up exhibited 36 percent lower odds of reporting their health as excellent or very good

than did those who answered in English.

Acculturation variables are added in Model 2. The effect of the language variable remains significant, and the difference widens (from O.R.=0.64 in Model 1 versus O.R. = 0.50 in Model 2). None of the acculturation and cultural practice variables are significant predictors of self-rated maternal health.

In Model 3, the measures of physical and mental health and health behaviors are added to baseline model. Mothers who report health problems that limit their ability to work, those who smoke and those who are depressed are less likely to report their health as excellent/very good, although those who drink are not significantly different from those who do not. The effect of the language variable, on the other hand, remains significant.

Mother's health insurance and the household medical hardship variables are included in Model 4 in addition to wave and language of interview. The effect of the language variable is still significant but the difference between Spanish and English speakers is somewhat smaller compared to Model 1. The odds of assessing health as excellent or very good among mothers covered by private health insurance is over twice that of those who do not have any insurance, while those mothers with public health insurance are not significantly different from the uninsured. Moreover, those who experienced a medical hardship in the household are less likely to report their health as excellent or very good.

Model 5 includes all the variables used to evaluate mother's self-rated health. In the full model, the coefficient for language of interview reduces to marginal significance (O.R = 0.54, $p < 0.069$), but the difference between Spanish and English speakers remains wide and, in fact, is somewhat larger than it is in the baseline model. Presence of health problems and depression, private health insurance and medical hardship are significant predictors for mother's

self-reported health. Absent from these results, however, is any effect of our acculturation measures, including nativity/duration. It is also apparent from this analysis (see, e.g., the bottom panel of Table 4) that there is no evidence of variation in mother-specific factors relating to global assessments of self-rated health. In this case, estimates from a standard logit model would be expected to yield identical predictions as the models above.

Table 5 reports the odds ratios for the five models predicting maternal-rated child health. In the base model, mothers who answered the questionnaire in Spanish at the year 1 follow-up exhibited 77 percent lower odds of reporting their children's health as excellent/very good compared to mothers who were interviewed in English. Nevertheless, identical to the models predicting mother's self-rated health, mothers do not differ in their reports of their children's health across waves.

In Model 2, the same acculturation variables used in the mother's model are included. The language variable remains significant but inches closer to 1 with the inclusion of acculturation measures. Similar to mother's model, cultural attachment, cultural practices and attendance of religious service variables are not significant predictors of maternal reported child health. Those who have lived in the U.S. for less than five years, however, show 67 percent lower odds of reporting their children's health as excellent/very good than do those who were born in the U.S.

In Model 3, the effect of language of interview remains strong and significant. Furthermore, mother's self-rated health significantly and strongly predicts how she reports her child's health. Among women who rate their own health as excellent/very good, the odds of reporting their child's health as excellent/very are more than twice that of those mothers who assessed their health as worse. Children's health status also significantly predicts how mothers

report their children's health. Mothers are less likely to report their children's health as excellent/very good if their children were low birth weight babies or if they have any type of physical disability.

Neither children's health insurance nor medical hardship in the household are significant predictors of reported child health, as seen in Model 4. Again, the language variable remains almost unchanged from the baseline model.

Model 5 includes all the variables used for the children's analyses. The effect of the language variable remains significant but is somewhat weaker, in that mothers who were interviewed in Spanish exhibit 45 percent lower odds of assessing their child's health as excellent/very good, compared to mothers who answered in English, net of the complete set of variables. Mother's self-rated health is still a very strong predictor of reported child health and other significant predictors include child's low birth weight status and whether the child has a physical disability.

As opposed to the results for mothers' self-rated health, mother's nativity and duration in the U.S. has an effect on assessments of children's health. Among foreign born mothers, those who at wave 2 were in the U.S. for 5 years or less show 70 percent lower odds of rating their child's health as excellent/very good; mothers who were in the U.S. for more than 5 years exhibit 53 percent lower odds of doing the same. Both of these figures are as compared to U.S. born mothers. In other words then, independent of language of interview, foreign born mothers were less likely than were U.S. born mothers to rate their child's health as excellent/very good, with the magnitude of the discrepancy larger for more recent immigrants.

For this set of models there is evidence of variation in mother-specific random effects associated with mother's reports of child health. These models are predictive of the variation in

initial level of reported child health. On the other hand, just as there is no evidence of change in self-reported health over time, there is little variation to explain in changes in reports of children's health.

If we compare the reduction in the level-2 (i.e., mother-specific) variance in the random intercept associated with adding physical and mental health indicators (i.e., Model 1 vs. Model 3), we explain 50 percent of the initial level-2 variation. In models that control for acculturation, we can explain about 49 percent of percent of the variance in the level-2 intercept (Model 2) through the addition of physical and mental health and access to health care measures (Model 5). Due to this large reduction in the level-2 variance in the intercept, results from standard logit models that include health behaviors would not be expected to be too different from those reported here.

Conclusions

The purpose of this paper was to explore several dimensions of the relationship between language of interview and reports of health from Hispanic mothers in the U.S. and their children. We find that the negative effect of Spanish language on mothers' self-rated health and maternal reports of child health persists through the 4 years of the study. Additionally, among this group, we see no change over time in reports of either maternal or child health, as theoretically these women—namely the foreign born—are becoming more acculturated to the U.S.

When introducing our proposed mediators into the models, acculturation does not completely explain the effect of language of interview on health reports among Hispanics. Thus, language of interview has an effect on reports of health independent of mothers' acculturation levels. Interestingly enough, although maternal nativity and duration in the U.S. has no effect on how mothers rate their own health, it is a significant determinant of how mothers rate their

children's health. On the other hand, measures of physical and mental health are strong and significant predictors of reports of both maternal and child health, as are measures of access to health care (for mothers). Still, the effect of Spanish language stands in the complete models we estimated.

There are two limitations to our study that could have possibly affected these results. The first regards the lack of change in health reports over time. Although we utilize three waves of the Fragile Families Study data, in all this covers a time span of about 4 years, which arguably may not be a large enough period to witness any significant changes in health status. This could be especially true for the case of children, who are generally healthy at this age. A longer follow-up is urged for future research, which will be possible with these data when the 9 year child and maternal follow-up is released.

The second limitation regards the "effect" of Spanish language itself. The negative effect of Spanish on health reports could reflect actual differences in health according to language of interview that we do not pick up with our models. Although a physician's assessment of health status, or additional measures of health conditions for mothers and children would be ideal, neither are included in the survey. Thus we may not be controlling for the complete set of differences in medical conditions across groups of mothers and children. However, the health conditions that we do control for are highly significant predictors of self-reported health and reports of children's health, indicating that although our measures may not be ideal, we are picking up very strong dimensions of rated health status.

This leads us to conclude that, among Hispanics, there is something about asking about health in Spanish that is different than asking in English, at least in the United States. This effect could be simply a language artifact, in that the language used to refer to health differs between

English and Spanish (Angel & Guarnaccia, 1989). Franzini & Fernandez-Esquer (2004) additionally propose that when Hispanics assess their health they may also include what the authors refer to as “social health.” That is, when rating their health, Hispanics may include their *perceived* social standing, which includes, as our sample characteristics demonstrate, higher poverty rates and lower educational attainment than the majority group in the U.S., non-Hispanic whites.

The persistent effect that language has on both self-rated health and on mothers’ reports of their children’s health leads us to ask what is driving these differences in subjectively rated health among Hispanics. Although these health reports reflect at least some dimensions of objective health status for all groups, they also clearly mean different things for different people. The persistent effect of language of interview on global assessments of health indicate that understanding the effect that this variable has is essential to understanding differences in reported health among Hispanics. Surveys including more detailed questions regarding health conditions, in addition to self-rated health and parents’ reports of children’s health, will help us come closer to understanding the role of language in influencing health reports.

¹ Logistic regressions conducted to test for sample attrition (results not show) demonstrate that the only significant predictor of being lost to follow-up by wave 4 (5 year follow-up) is Spanish language interview, in that those mothers who were interviewed in Spanish at wave 2 had a higher odds of being lost to follow-up than those mothers interviewed in English.

² Although it would be possible to include a time-variant measure of language of interview, we found that an overwhelming proportion of respondents answered in the same language for all three follow-up waves. Those few who did switch languages between waves did so in no discernable pattern. As such, language of interview is measured at wave 2 only.

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Table 1. Mother's Rating of Health by Race/Ethnicity and Language of Interview^a, Waves 2, 3, and 4.

Percent rating their own health as excellent/very good	U.S. Born Non-Hispanic White	U.S. Born Non-Hispanic Black	Hispanic Interviewed in English	Hispanic Interviewed in Spanish	Total
1 Year Follow-up (Wave 2)	68.75	63.19	61.69	43.53	62.79
3 Year Follow-up (Wave 3)	67.80	61.07	60.81	51.29	61.90
5 Year Follow-up (Wave 4)	62.36	55.71	58.70	48.71	57.32
Percent rating their child's health as excellent/very good	U.S. Born Non-Hispanic White	U.S. Born Non-Hispanic Black	Hispanic Interviewed in English	Hispanic Interviewed in Spanish	
1 Year Follow-up (Wave 2)	94.70	87.90	86.29	68.53	87.75
3 Year Follow-up (Wave 3)	92.93	89.27	88.75	66.81	88.39
5 Year Follow-up (Wave 4)	93.48	89.08	91.04	68.53	88.93
N	736	1,603	569	232	3,144

Source: Fragile Families and Child Wellbeing Study, Waves 2, 3 and 4.

^a Language of interview as measured at Wave 2 (i.e., year 1 follow-up interview).

Table 2. Hispanic Mother's Rating of Health by Language of Interview^a (n sizes in parentheses).

Percent of Hispanics rating their own health as excellent/very good	Interviewed in English	Interviewed in Spanish
1 Year Follow-up (Wave 2)	61.69 (569)	43.53 (232)
3 Year Follow-up (Wave 3)	61.21 (575)	50.00 (226)
5 Year Follow-up (Wave 4)	58.60 (587)	48.13 (214)
Percent of Hispanics rating their child's health as excellent/very good	Interviewed in English	Interviewed in Spanish
1 Year Follow-up (Wave 2)	86.29 (569)	68.53 (232)
3 Year Follow-up (Wave 3)	89.04 (575)	65.49 (226)
5 Year Follow-up (Wave 4)	91.65 (587)	64.95 (214)

Source: Fragile Families and Child Wellbeing Study, Waves 2, 3 and 4.

^a Language of interview as measured at time of interview.

Table 3. Unweighted Descriptive Characteristics of Hispanic Mothers and Children by Language of Interview^a, Year 1 Follow-up Interview (Wave 2).

	Hispanic Interviewed in English	Hispanic Interviewed in Spanish
MOTHER'S CHARACTERISTICS		
Demographic and Socio-economic Status		
Age in years	24.98	27.69
Married (%)	29.17	41.38
Has at least a high school diploma/GED (%)	60.98	28.88
Employed during the previous week (%)	54.31	28.45
Total household income < \$15,000 (%)	31.28	48.71
Refused or don't know HH income (%)	7.91	11.64
Language of Interview, Nativity/Duration, Measures of Acculturation		
Mexican Origin (%)		
Nativity (%)		
U.S. Born	86.65	6.90
≤ 5 years in U.S. at year 1 follow-up	0.70	37.50
> 5 years in U.S. at year 1 follow-up	12.65	55.60
Feels an attachment toward racial/eth heritage (%)	76.10	81.47
Participates in cultural practices (%)	72.93	87.50
Attends religious services at least once a week (%)	24.96	46.55
Physical and Mental Health		
Has health problem that limits ability to work (%)	6.15	8.19
Depression (%)	10.72	7.76
Smoked cigarettes in the past month (%)	25.13	5.17
Drank alcohol in the past month (%)	30.58	10.78
Access to Health Care		
Mother covered by private health insurance (%)	29.35	15.09
Mother covered by public health insurance (%)	32.16	21.98
Mother uninsured (%)	38.49	62.93
Household member did not seek medical attention when needed due to cost (in the past 12 months) (%)	5.80	6.47
CHILDREN'S CHARACTERISTICS		
Female (%)	47.98	49.14
Physical Health		
Low birth weight (<2500g) baby (%)	7.91	8.19
Child has physical disability (%)	2.81	1.72
Access to Health Care		
Child covered by private health insurance (%)	31.81	16.81
Child covered by public health insurance (%)	54.83	65.52
Uninsured	13.36	17.67

Source: Fragile Families and Child Wellbeing Study, Wave 2.

^a Language of interview as measured at Wave 2 (i.e., year 1 follow-up interview).

Table 4. Generalized Linear Mixed Models^a Predicting Odds of Hispanic Mothers Rating Their Own Health as Excellent/Very Good, Waves 2-4.

Independent variable ^b	Model 1	Model 2	Model 3	Model 4	Model 5
Wave	0.00	0.01	0.17	0.01	0.02
Spanish interview (ref cat = English)	0.64 **	0.50 *	0.55 *	0.69 *	0.54 †
Acculturation					
Nativity (ref cat = U.S. born)					
≤ 5 years in U.S.		1.46			1.26
> 5 years in U.S.		1.33			1.16
Attachment to culture		1.17			1.15
Cultural practices		0.87			0.84
Religious services ≥ 1/wk		1.02			1.10
Physical and Mental Health and Health Behaviors					
Health problem that limits work			0.38 ***		0.41 ***
Smoked in past month			0.64		0.67
Drank in past month			1.04		1.04
Mother's depression			0.29 ***		0.34 ***
Access to Health Care					
Insurance (ref cat = none)					
Mother has private insurance				2.29 ***	2.39 ***
Mother has public insurance				1.10	1.30
Medical hardship in past year				0.28 ***	0.46 ***
Log likelihood	-1489.25	-1488.12	-1469.31	-1473.56	-1457.25

Variances and covariance of random effects, mothers' model (standard errors in parentheses).

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept variance	2.28 (1.59)	2.20 (1.50)	1.53 (1.46)	1.58 (1.25)	1.03 (1.18)
Covariance between intercept and slope	-0.06 (0.40)	-0.05 (0.38)	0.05 (0.38)	0.06 (0.32)	0.14 (0.33)
Correlation between intercept and slope	-0.09	-0.07	0.10	0.10	0.30
Slope variance	0.18 (0.21)	0.19 (0.21)	0.21 (0.21)	0.19 (0.20)	0.21 (0.21)

Source: Fragile Families and Child Wellbeing Study, Waves 2, 3 and 4.

^a All models control for the following: mother's age, relationship to child's father, educational attainment, employment, and household income.

^b Independent variables all measured at Wave 2 (i.e., year 1 follow-up interview).

† p<0.10; * p<0.05; ** p<0.01; ***p<0.001.

Table 5. Generalized Linear Mixed Models^a Predicting Odds of Hispanic Mothers Rating Their Child's Health as Excellent/Very Good, Waves 2-4.

Independent variable ^b	Model 1	Model 2	Model 3	Model 4	Model 5
Wave	1.05	1.07	1.30	1.03	1.29
Spanish interview (ref cat = English)	0.23 ***	0.43 *	0.26 ***	0.24 ***	0.55 *
Acculturation					
Nativity (ref cat = U.S. born)					
≤ 5 years in U.S.		0.33 **			0.30 **
> 5 years in U.S.		0.58			0.47 *
Attachment to culture		1.21			1.17
Cultural practices		1.15			1.14
Religious services ≥ 1/wk		1.00			0.99
Physical and Mental Health and Health Behaviors					
Mother's self-rated health (ref cat = poor/fair/good)			2.40 ***		2.27 ***
Mother's depression			1.34		1.30
Low birth weight (<2500g)			0.38 **		0.36 ***
Physical disability			0.08 ***		0.09 ***
Access to Health Care					
Insurance (ref cat = none)					
Child has private insurance				1.53	1.11
Child has public insurance				0.62	0.66
Medical hardship in past year				0.64	0.68
Log likelihood	-962.22	-957.96	-933.16	-955.17	-924.06

Variances and covariance of random effects, children's model (standard errors in parentheses).

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept variance	5.73 (3.32)	5.52 (3.01)	2.79 (2.41)	5.96 (3.53)	2.81 (2.36)
Covariance between intercept and slope	-1.14 (0.91)	-1.11 (0.83)	-0.53 (0.68)	-1.24 (0.97)	-0.57 (0.67)
Correlation between intercept and slope	-0.76	-0.75	-0.52	-0.79	-0.55
Slope variance	0.39 (0.25)	0.40 (0.25)	0.38 (0.22)	0.41 (0.27)	0.39 (0.23)

Source: Fragile Families and Child Wellbeing Study, Waves 2, 3 and 4.

^a All models control for the following: child's sex, mother's age, relationship to child's father, educational attainment, employment, and household income.

^b Independent variables all measured at Wave 2 (i.e., year 1 follow-up interview).

† p<0.10; * p<0.05; ** p<0.01; ***p<0.001.