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Res Aging. 2016 April ; 38(3): 399–423. doi:10.1177/0164027515620244.**Racial Disparities in Functional Limitations Among Hispanic Women in the United States****Juanita J. Chinn, PhD** and

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Abstract

This paper assesses whether there are race differences in functional health among Hispanic women in the United States; ascertains whether the race differences in functional health vary by age; and examines the extent to which race differences in functional health are attributable to key dimensions of demographic, geographic, and socioeconomic heterogeneity. The analysis is based on 15 years of aggregated data from the National Health Interview Survey. Both U.S.- and foreign-born black and other race Hispanic women display a higher level of functional limitations than their white Hispanic counterparts. There is little evidence that such health differences widen with age. U.S.-born black Hispanic women, however, suffer from a high burden of functional limitations across the adult age range. This research speaks to the need for greater attention to racial differences in health *among* Hispanics, and particularly so within the U.S.-born segment of this rapidly aging population.

Keywords

Functional Limitations; Hispanics; Race; Nativity; Health Disparities; Weathering

Hispanics are the fastest growing racial/ethnic group in the United States. According to the 2010 Census, Hispanics accounted for 16% of the total U.S. population (Ennis et al. 2011), and by 2050, Hispanics are projected to make up over one quarter of the total population (CDC 2010). Thus, there is little doubt that Hispanics will become an even more important and influential population in the United States in the coming decades. Perhaps even more striking, the aged 65+ Hispanic population is projected to quintuple by 2050, growing from just over 3 million now to over 15 million by mid-century (Olshansky 2015). As such, understanding Hispanic health patterns has become a very important part of the demography and gerontology literatures in the past few decades and will become increasingly even more important.

At the same time, understanding Hispanic health patterns is a challenging task. Hispanics are a heterogeneous group, specifically by nativity, country of origin, and race. A number of studies show that this heterogeneity has important implications for Hispanic health and mortality patterns. For example, U.S.-born Hispanics have higher risks of all-cause mortality

when compared to their immigrant counterparts (Borrell and Crawford 2009; Hummer et al. 1999; Lariscy et al. 2015). Additionally, U.S.-born Hispanics exhibit significantly higher prevalence rates of most chronic health conditions and disability measures compared with foreign-born Hispanics (Hayward et al. 2014; Singh and Siahpush 2001, 2002). Hispanic health outcomes also differ by country of origin: for example, adult mortality rates are highest among Puerto Ricans and lower among Mexican Origin, Cuban, and Central/South American individuals (Hummer et al. 1999). More generally, the Hispanic adult health literature points to less favorable patterns among Puerto Ricans and more favorable patterns among Cuban Americans, with Mexican Origin health patterns generally falling in-between (Markides and Eschbach 2005).

Despite all of the empirical work documenting heterogeneity in Hispanic health by nativity and country of origin, relatively little research has been devoted to understanding if and why racial identification might be associated with Hispanic health outcomes. While racial differences in U.S. health and mortality are well documented, particularly when comparing non-Hispanic blacks with non-Hispanic whites (Williams and Sternthal 2010), the extent to which there are race differences in health *among Hispanics* is under-explored. That is, race – a sociocultural construct associated with historical and continued experiences of discrimination for blacks and other non-whites in the United States (Hummer and Chinn 2011; Phelan and Link 2015; Williams and Sternthal 2010) – may be important for Hispanic health, a proposition that is not accounted for when Hispanics are treated as a homogenous pan-ethnic group. Further, the Hispanic health literature commonly compares people who claim Hispanic ethnicity – a group that is comprised of multiple racial groups – with non-Hispanic whites and non-Hispanic blacks. Overall, Hispanics are usually found to have quite favorable health and mortality patterns in comparison with non-Hispanic whites and particularly non-Hispanic blacks, a pattern termed the epidemiologic (or Hispanic) paradox (Markides and Coreil 1986; Markides and Eschbach 2011). At the same time, some Hispanics may be disadvantaged by their race – particularly so if they identify as black – a point that is ignored if all Hispanics are grouped together without regard to racial identification.

Racial, ethnic, and nativity disparities in functional limitations among the general U.S. adult population are widely documented (Hayward and Heron 1999; Hayward et al. 2014; Melvin et al. 2014), with older age non-Hispanic blacks and Hispanics exhibiting significantly higher levels than non-Hispanic whites. Relative to U.S.-born non-Hispanic whites, for example, both U.S.- and foreign-born Mexicans and Other Hispanics ages 65-74 and 75-84 have significantly higher levels of disability than U.S.-born whites (Melvin et al. 2014). In fact, both U.S.-born and foreign-born Hispanics live almost twice as many years in a disabled state compared with non-Hispanic whites (Hayward et al. 2014). However, none of this work to date has examined the extent to which there are race differences in functional health within the Hispanic population.

The overall aim of this paper is to document and better understand race differences in functional health among Hispanic women in the United States. We focus on women because most related studies focus either on Hispanic men or on both women and men without specific attention to women. We use a measure of functional limitations to assess health

because it is a well-measured and important general indicator for the day-to-day wellbeing of U.S. adults. Functional limitations are restrictions in the performance of fundamental physical and mental activities used in daily life by ones age-sex group (Verbrugge and Jette 1994; Nagi 1976). A key distinction between functional limitations and disabilities is that functional limitations exist independent of social context and one's desire to perform a particular function (Verbrugge and Jette 1994). Moreover, Hispanic women experience a much greater prevalence of functional limitations than Hispanic men (Melvin et al. 2014; Read and Gorman 2006). Additionally, most previous studies of functional limitations focus solely on older aged adults. This paper includes adults aged 18 and above, to examine race differences in functional limitations throughout the adult age range, which allows us to assess whether or not there are changes in the relationship between race and functional limitations with age.

This paper addresses three specific questions: 1) Are there race differences in functional health among Hispanic women living in the United States? 2) Do race differences in the functional health of Hispanic women vary by age? And, 3) To what extent do race differences in functional health among Hispanic women withstand controls for key dimensions of demographic, geographic, and socioeconomic heterogeneity? Importantly, our analysis separately considers foreign-born and U.S.-born Hispanic women because nativity is a fundamental axis of differentiation in the Hispanic health literature.

Background

There are well-documented wide disparities in the health of U.S. adults by socioeconomic status (Herd et al. 2007; Elo 2009). Given what has been extensively documented, it seems logical that all disadvantaged population subgroups experience worse health outcomes when compared to socially advantaged groups. However, this is not the case for Hispanics (Markides and Coreil 1986; Markides and Eschbach 2005; Markides and Gerst 2011). Many studies show that Hispanics have similar SES but much favorable health and mortality outcomes compared with non-Hispanic blacks. Moreover, Hispanics display health and mortality outcomes that are similar or sometimes superior to non-Hispanic whites, despite the disadvantaged socioeconomic profile of Hispanics.

Race differences in the health of U.S. adults are also well documented (Hayward et al. 2000; Hummer and Chinn 2011; Williams and Sternthal 2010). While these disparities show modest signs of closing, they remain very wide. For example, Geronimus et al. (2010) found that middle-aged (ages 49-55) black women exhibit accelerated biological aging (by an average of 7.5 years older) when compared to non-Hispanic white women in the same age group. Such a difference indicates a far greater physiological burden experienced by black women that seems to widen during the childbearing ages and into later adulthood (Geronimus 1992). Related work has found that black-white differences in adult health are especially pronounced in older adulthood (Shuey and Willson 2008; Taylor 2008).

There is a modest-sized literature that examines skin color and health outcomes among Hispanics in the United States, most of which shows that darker-skinned Hispanics have less favorable health outcomes than lighter-skinned Hispanics. Among men living in Puerto

Rico, darker skin color has been shown to be associated with higher systolic blood pressure, in part because of the lower socioeconomic status of darker-skinned men (Costas et al. 1981; Sorlie et al. 1988). Using the same data set, Borrell et al. (2007) later found no association between skin color and all-cause mortality except when skin color was interacted with area of residence; in urban areas, men with darker skin color experienced higher mortality risks.

Another small body of literature – more directly related to the current study – examines racial self-identification and health among Hispanics. Some, but not all, of this work points to health disadvantages among black Hispanics compared to white Hispanics. While Hispanics as a group have a lower prevalence of hypertension than non-Hispanics, high SES black Hispanics have a higher prevalence of hypertension than low SES white Hispanics (Borrell 2006). Analogous research using self-rated health status as the outcome found that black Hispanics more generally exhibited worse reports of self-rated health compared to white Hispanics (Borrell and Crawford 2006; Borrell and Dallo 2008). Black Hispanics also suffer from worse mental health outcomes than white Hispanics, with discrimination being a key source of that heightened risk (Ramos et al. 2003). More recently, Henry-Sanchez and Geronimus (2013) found black-white differences in birth weight and infant mortality among the Hispanic population that were similar to those in the non-Hispanic population. They emphasized the importance of analyzing Hispanics as a racially heterogeneous group. Also of note, Elo et al. (2011) found that black Hispanics have higher levels of disability than non-Hispanic blacks. Though this research did not compare black Hispanics to white Hispanics, their findings seriously call into question the overall applicability of the Hispanic health paradox and the extent to which the unexpected favorable health patterns are experienced by Hispanics of all racial backgrounds.

Conceptual Framework and Hypotheses

Race and Its Consequences among Hispanics

Race is a sociocultural construct that reflects the common cultures, geographic origins, and social histories of groups that are defined by societies in particular temporal contexts (Saenz and Morales 2005; Williams et al. 2010). Race has been and continues to be a determining factor in the collective condition, including life course health, of racial minorities in the United States (Hummer & Chinn 2011). The United States government currently recognizes five racial groups: Asians, Blacks or African Americans, Native Americans or Alaska Natives, Native Hawaiians or Other Pacific Islanders, and Whites. Also officially recognized are two ethnic categories: Hispanics or Latinos and those who are not Hispanic or Latino. The current U.S. Office of Management and Budget's definition of Hispanic or Latino is, “a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race” (OMB 1997).

Although most Hispanics do not share a history of slavery in the United States with African Americans, black Hispanics can be physically perceived to be part of the same racial/ethnic group as African Americans and potentially suffer some of the same consequences. Furthermore, there is a long history of slavery, European colonization, and colorism throughout the Latin American countries from which many U.S. Hispanics originate (Davis 1995; Wade 1997). While the post-1965 immigrant surge from Latin America means that

many Hispanics did not experience the institutionalized and legalized racism of Jim Crow in the United States, Hispanics have clearly experienced discrimination as an ethnic group (Tienda and Mitchell 2006). For example, Mexican Americans were subjected to separate and inferior schools in the U.S. Southwest (Fischer and Tienda 2006). In addition, Hispanics have experienced discriminatory treatment relative to whites with regard to rental housing and home sales (Fischer and Tienda 2006), employment decisions (Hosoda et al. 2012), and in day-to-day interactions that affect general wellbeing (Ryff et al. 2003).

There is ample evidence of racial differences in socioeconomic and housing outcomes among Hispanics that may be relevant for health. White Hispanics earn on average \$5000 more per year and experience lower unemployment and poverty rates than black Hispanics (Fears 2003). Black Hispanics also have housing experiences similar to African Americans, in that they are more racially segregated and have lower property values than their white Hispanic counterparts (Alba et al. 2000; South et al. 2005). Residential segregation, Williams and Collins argue (2001), is a fundamental cause of racial disparities in health, operating through many social institutions (including labor markets and education) to affect health. Furthermore, using data from the 2000 Census, Logan (2003) documented that black Hispanics have more similar demographic profiles to non-Hispanic blacks than to white Hispanics. Black Hispanics have more years of education than white Hispanics but they have a lower median income, are more likely to live below the poverty line, and are more likely to be unemployed than white Hispanics.

At the same time, many Hispanics identify racially as “some other race” rather than as either white or black (U.S. Census Bureau 2010). Other race Hispanics have an SES profile that is distinct from both black and white Hispanics, with other race Hispanics falling in between the two (Logan 2003). Other race Hispanics, on average, have a higher median income than black Hispanics but lower than that of white Hispanics. This is also true for the proportion that are unemployed and living below the poverty line. The current study examines other race Hispanics in addition to black and white Hispanics to best understand how racial identity is associated with women's functional limitations.

Given what we know about race differences in education, income, and some health outcomes among Hispanics in American society, our first hypothesis is as follows:

H1: Hispanic women who identify as black or as some other race will have worse functional health than Hispanic women who identify as white.

Race, Hispanic Women's Health, and Age

As adults age, health declines. Aging is the result of biological, behavioral, soci-cultural and environmental factors on the body. A key aspect of environmental and soci-cultural factors is stress, and differential exposure to stress. A series of papers by Geronimus and colleagues proposes that black-white racial disparities in health widen with age because of the accumulation of socioeconomic disadvantages and experiences with racism among blacks as the life course unfolds (Geronimus 1992; Geronimus et al. 1996; Geronimus et al. 2010). This more rapid aging process experienced by blacks has been termed the weathering hypothesis. Among non-Hispanic blacks and whites, Taylor (2008) found strong support for

the weathering hypothesis with regard to disability. More specifically, older black adults exhibited especially high levels of disability in comparison to older white adults, particularly because disability onset occurred (much) earlier among blacks.

Some limited work has tested whether weathering also applies to Hispanics. In one such effort, Wildsmith (2002) finds worse neonatal mortality rates for infants born to older Hispanic women relative to non-Hispanic white women, supporting the weathering hypothesis. However, Wildsmith found only weak support when looking at maternal health. More recently, infant mortality rates among Mexican Origin women, both foreign- and U.S.-born, were found to be much lower than white women at young ages (e.g., 15-24), but significantly higher than white women at older childbearing ages (30 and above) (Powers 2013). Such patterns provide further support for the weathering hypothesis among Mexican Origin women relative to non-Hispanic white women. In other words, Mexican Origin women age more rapidly than their non-Hispanic counterparts. Looking at Mexican Origin adults, Kaestner et al. (2009) found that while 45–60 year old Mexican immigrants have lower allostatic load scores upon arrival than U.S.-born Mexicans, non-Hispanic blacks, and non-Hispanic whites, this health advantage decreases with increasing time in the United States. This further demonstrates evidence of the weathering hypothesis among Hispanics relative to non-Hispanic whites. However, none of these studies have taken the racial identity of Hispanic women into account.

Given the above evidence regarding race, age, and the health of Hispanic women, our second hypothesis is as follows:

H2: Race differences in Hispanic women's health will be wider among those at older ages than among those at younger ages.

Confounders of Racial Identity and Health among Hispanics

There are a number of important demographic, geographic, and socioeconomic factors associated with the overall relationships between race, age, and health that we outline above. One such factor is nativity. U.S.-born Hispanics have been exposed, presumably since birth, to racial stratification in the United States while their foreign born counterparts have more limited exposure time; thus, foreign-born black and other race Hispanics may not see or feel the full magnitude of the effects of discrimination and social disadvantage on their physical health. That is, the cumulative effects of being black in the United States may be different for U.S.-born and foreign-born Hispanics. Additionally, U.S.-born black Hispanics, being more acculturated than foreign-born Hispanics, may be more likely to be perceived to be African Americans (Candelario 2007). To account for these nativity differences, we stratify the analysis and assess the relationship between race, age, and functional health separately for U.S.-born and foreign-born Hispanics.

There are also both country of origin and socioeconomic status differences in both racial identity and health among Hispanics. For example, Puerto Ricans are more likely to identify as black than Mexican Americans and also may be more likely to report poorer health (Borrell and Crawford 2006). Thus, a portion of the race gap in functional health may be due to country of origin (or ancestry, for U.S.-born Hispanics) differences across groups.

Similarly, lower-SES Hispanics are more likely to identify as black (Logan 2003) and more likely to report poorer health than high-SES Hispanics. Thus, our third hypothesis is as follows:

H3: Race differences in functional health will be reduced by controlling for the geographic and socioeconomic confounders associated with both racial identity and health.

All told, this body of literature suggests that racial identity may be important for health outcomes among Hispanics. But it is unclear at this point in time if there are race differences in functional health among Hispanic women. Second, it is also unclear if race differences in health among Hispanics increase with age, as predicted by the weathering hypothesis. Moreover, a multivariate based analysis is needed to test these propositions because both the racial identification and health of Hispanics are correlated with nativity, country of origin, and socioeconomic status (Borrell 2005; Burchard et al. 2005). Our analysis aims to clarify race differences in Hispanic women's health, using a large, nationally representative data set.

Data and Methods

Data come from the National Health Interview Survey (NHIS) Sample Adult File respondents from 1997 to 2011. The NHIS is an annual cross-sectional household survey of a sample of the non-institutionalized U.S. population. The NHIS Sample Adult File includes one respondent from each household over the age of 17. Interviews are administered in person and are completed by the respondent.

The NHIS contains oversamples of blacks and Hispanics to facilitate analyses of race disparities in health. Because black and other race Hispanics are relatively small subsets of the Hispanic population, we aggregate 15 years of data to yield a large enough sample size for our analysis. This yields an analytic sample of 42,908 women. We choose 1997 as the earliest year in our data set because the NHIS was redesigned in 1997 and the questions on functional health have been identical since that time. We focus on women for two reasons: 1) of the few studies that examine the relationship between race and health among Hispanics, none focus solely on females (while several focus on males); 2) functional limitations disproportionately affect females.

The data are restricted to persons of Hispanic origin for three important reasons. Fundamentally, the aim of this paper is to better understand heterogeneity within the Hispanic population and not in how Hispanics compare with other non-Hispanic groups. Second, some health outcomes among Hispanics, (e.g. self-rated health [Finch et al. 2002]), do not follow patterns similar to those of the non-Hispanic U.S. population. By focusing on Hispanics, clearer inferences about the outcome variable can be made. Third, key socioeconomic status indicators, particularly education and marital status, exhibit weaker associations with health among Hispanics than they do for the non-Hispanic population (Goldman et al. 2006). By restricting the analysis to Hispanics, the results will not be masked by SES effect size differences in comparison to the non-Hispanic population; instead racial differences and covariate effects *within* the Hispanic population are estimated.

Race data are self-reported and respondents are grouped into three categories: white, black, and other. The other category consists of all responses except white or black.

The dependent variable is functional limitations. The functional limitations variable is a count measure, focusing on limitations of the body outside of the social context. It consists of the number of affirmative responses (i.e. cannot do or have difficulty with) each respondent gave to the following activities: walk ¼ mile, climb 10 steps, stand for 2 hours, sit for 2 hours, bend or kneel, reach overhead, grasp objects, carry or lift 10 pounds, and push large objects. This summary variable ranges from 0 to 9, with 0 indicating no limitations.

Key demographic, geographic, and socioeconomic confounders are included in the analysis. Age (centered at the sample mean) is controlled in all models. Geographic confounders include country of origin for the foreign-born and country of ancestry for the U.S.-born, region of U.S. residence, and duration of residence in the United States (for foreign-born Hispanics only). Region of residence is categorized as Northeast, West, South, and Midwest. Country of origin (or ancestry) is categorized as Mexico, Puerto Rico, Cuba, Dominican Republic, and all others. A separate category for the Dominican Republic was available only for survey years 1999-2011; thus, for survey years 1997 and 1998, the Dominican Republic is included in the other category. Duration of residence in the United States (for those who are foreign-born) is coded as less than ten years versus ten years or more. Socioeconomic status confounders include educational level, the family income to poverty ratio, and marital status. Education is dichotomized as 0-11 years versus 12 or more years of education. The family income to poverty ratio is grouped into 4 categories: 2.00 or higher times the family poverty line (not in poverty), 1.00-1.99 times the family poverty line (near poverty), at or below the family poverty line (in poverty), and missing. Marital status is dichotomized as married versus not married.

We use Poisson regression to estimate race differences in the number of functional limitations that women report. Our initial model controls only for age and survey year to establish baseline race differences in Hispanic women's functional health. Importantly, this baseline model, as well as subsequent models, is stratified by nativity to account for the differing health and racial identity patterns when contrasting U.S.-born and foreign-born Hispanics. To test the weathering hypothesis, our second model introduces a multiplicative interaction term between race and age. Finally, models three and four, also stratified by nativity, introduce the geographic and socioeconomic confounders, respectively. These models allow us to understand the extent to which race differences in functional health are explained by the geographic and socioeconomic confounders. Because 15 years of data are pooled, survey year is controlled in all models.

Results

Descriptive Analysis

Table 1 displays weighted descriptive statistics for Hispanic women, stratified by nativity. Black Hispanics make up 3.4% of the U.S.-born subsample and 2.6% of the foreign-born subsample. White Hispanics represent 83.6% of the U.S.-born subsample and other race

Hispanics make up the remaining 13.0%. White Hispanics represent 85.8% of the foreign-born subsample and other race Hispanics make up the remaining 11.6%. U.S.-born black Hispanics are notably younger, on average, than U.S.-born white and other race Hispanics, while black Hispanics are the oldest group among the foreign-born subsample. And while the mean number of functional limitations (or the percentage of individuals with one or more functional limitations) does not exhibit tremendous race variation within either the U.S.-born or foreign-born subsample (the means range from 1.18 to 1.31 among U.S.-born Hispanics and from 1.11 to 1.29 among foreign-born Hispanics), age structure and other important aspects of demographic and socioeconomic heterogeneity across subgroups needs to be taken into account before any conclusions about race differences are established.

Table 1 also illustrates the distinct demographic and socioeconomic characteristics of U.S.-born black, other race, and white Hispanic women. U.S.-born white and other race Hispanics are more likely to be married than black Hispanics: while 47.3% and 46.1% of white and other race Hispanics are married, respectively, only 27.2% of black Hispanic women are married. Over 80% of black Hispanic women have a high school education or more, compared with 76% of white and other race Hispanics. Yet, this educational attainment advantage does not translate into lower poverty rates for black Hispanic women. Among U.S.-born Hispanics, over 25% of black Hispanic women report living below the poverty line, while about 16% of U.S.-born white and other race Hispanics, respectively, report living in poverty.

Among the foreign-born, white and other race Hispanic women are similar to each other in terms of country of origin, time spent in the United States, poverty level, education, and marital status. However, foreign-born blacks are quite unique. A smaller portion of black Hispanic women are married; a larger percentage of them have family incomes at twice the poverty level (or greater); they are more highly educated; and a much smaller portion of them are from Mexico, while a higher percentage are from Puerto Rico and the Dominican Republic. Black Hispanic women have also been in the United States longer and they are most likely to live in the Northeastern United States than their white or other race counterparts.

Poisson Regression Models of Functional Limitations for U.S.-Born Hispanics

Table 2 shows the Poisson regression log estimates for functional limitations among U.S.-born Hispanic females ages 18 and above. The most basic model (Model 1) shows race disparities in the incident rate of reported functional limitations among Hispanic women, while controlling only for age and survey year. Consistent with our first hypothesis, U.S.-born black Hispanics and other race Hispanics have a significantly higher level of functional limitations than U.S.-born white Hispanics. Black Hispanics display a 31% higher rate and other race Hispanics have a 22% higher rate of functional limitations than their white counterparts. In Model 2, an interaction term (race by age) is added to test the weathering hypothesis. The main effects of race remain significant, strong, and nearly very similar to Model 1; however, we find no evidence of weathering among black Hispanics relative to white Hispanics. That is, the black-white difference in the rate of functional limitations does not change with age. At the same time, the disparity between other race Hispanics and white

Hispanics decreases with increasing age, which is inconsistent with the weathering hypothesis.

Geographic factors are controlled in Model 3 of Table 2. Hispanics living in the Midwest region of the United States experience a statistically significant higher level of functional limitations than Hispanics living in the South. Additionally, Cubans and Dominicans experience lower levels of functional limitations than Mexicans, while Puerto Ricans and Other Hispanics exhibit significantly higher rates of functional limitations compared with Mexican Origin Hispanic women. Race differences in functional limitations remain strong and only modestly different from Model 2 after controlling for these geographic factors. That is, among U.S.-born Hispanic women, race differences in functional health are independent of country of ancestry and U.S. region of residence.

Socioeconomic variables are added in Model 4. Those living below the poverty level exhibit 74% higher incident rate of functional limitations than people with incomes twice the poverty level. Additionally, those with less than a high school education have a 24% higher rate of functional limitations than high school graduates. However, black and other race Hispanics continue to display higher rates of functional limitations than white Hispanics even when controlling for socioeconomic factors. After controlling for SES, the interaction between race and age also becomes statistically significant. That is, the black-white disparity in functional limitations increases with age, net of SES controls, providing evidence for support of the weathering hypothesis when comparing black Hispanic women with white Hispanic women. Further, Models 3 and 4 provide modest support for the third hypothesis: that baseline race differences in functional health are reduced when controlling for geographic and SES confounders.

Foreign-Born Hispanics

Table 3 shows race differences in functional limitations for foreign-born Hispanic women. Foreign-born black Hispanic women experience a modestly higher rate of functional limitations compared with foreign-born white Hispanic women. However, there is a consistent and notable disadvantage among other race Hispanics relative to white Hispanics. This lends further support for our first hypothesis: that black and other race Hispanics have worse functional health than white Hispanic women. The other race disadvantage relative to whites changes with age, as shown by the interaction term in Models 2. However, it is in the reverse direction of what was hypothesized; indeed, the racial disparity in the rate of functional limitations decreases with age among foreign-born Hispanic females.

Geographic controls are included in Model 3. Foreign-born Hispanic women who have been in the United States for a longer period of time experience higher rates of functional limitations. Similar to U.S.-born Hispanics, those with origins in Cuba have a lower level of functional limitations than Mexicans, while Puerto Ricans have higher rates of functional limitations relative to Mexicans. Nonetheless, the addition of the geographic controls does not change the basic race differences between other race and white Hispanics in functional health in comparison to Models 1 and 2. However, with the addition of geographic controls, the observed race differences in functional health between black and white Hispanic women are no longer significant. This suggests that black-white differences in functional health

among foreign-born Hispanic women are based on country of origin and region of residence differences. More specifically, both Puerto Rican and Dominican women have higher levels of functional limitations than Mexican immigrant women; because Puerto Rican and Dominican women are also more likely to self-identify as black than Mexican immigrant women (reference group). This may explain the higher level of functional limitations among black Hispanic women shown in Models 1 and 2.

SES measures are added in Model 4. Differences by poverty, educational level, and marital status are as expected, with the socioeconomically advantaged exhibiting lower levels of functional limitations than the socioeconomic disadvantaged. However, even after controlling for age, geographic characteristics, and SES differences, the other race versus white Hispanic difference in functional health persists. That is, other race Hispanic women continue to exhibit a statistically higher rate of functional limitations than white Hispanics, even in the most complete model.

Discussion and Conclusion

The findings of this research support our first hypothesis that there are race differences in functional health among Hispanic women in the United States. Among U.S.-born women, white Hispanics have more advantageous functional health relative to both other race and black Hispanics. Among the foreign-born, white Hispanic women exhibited a health advantage relative to other race Hispanics and to black Hispanics prior to the geographic and SES controls. At the same time, we found limited support for our second hypothesis based on the idea that race disparities in functional health would be wider at older ages than at younger ages; that is, the health (dis)advantages we documented were largely consistent across the adult age range. The health (dis)advantages we documented were also largely insensitive to geographic and socioeconomic controls.

Previous studies showed higher prevalence rates of disease among black Hispanics when compared to white Hispanics (Borrell 2006; Borrell and Crawford 2006; Borrell and Dallo 2008). The current study is the first study that showed a statistically significant higher level of functional limitations among black and other race Hispanics relative to white Hispanics using a very large dataset and regression based methodology. Thus, it is not only important to document and understand black-white disparities in health among non-Hispanics; it is also important to consider that Hispanics who do not racially identify as white also have health disadvantages relative to Hispanics who identify as white.

The black-white difference in women's functional health was wide among U.S.-born Hispanics, but nonexistent among foreign-born Hispanics in the most completely specified models. Thus, racial identity – or at least the distinction between identifying as black or white – may have particular salience for the health of Hispanic adults among the second and higher generations. Why might this be the case? One strong possibility is that U.S.-born black Hispanics simply have greater exposure to the harsh reality of being black in American society than foreign-born black Hispanics. This of course does not mean that foreign-born black Hispanics do not experience racial discrimination in their countries of origin or when they migrate to the United States. But, as reviewed above, U.S.-born black

Hispanics exhibit educational, income, housing, and other social disadvantages that are much more similar to non-Hispanic blacks than to either white Hispanics or non-Hispanic whites (Logan 2003). Clearly, researchers, policymakers, and caregivers should be particularly attuned to what may be a relatively small but highly disadvantaged population: U.S.-born Hispanics who are both an ethnic (i.e., Hispanic) and racial (i.e., black) minority group.

Our results also uncovered substantial socioeconomic status differences in functional health among both U.S.-born and foreign-born Hispanic women. This finding is significant. The epidemiologic paradox posits that Hispanics have relatively favorable health despite their low socioeconomic status. This group level finding may lead some scholars and policymaker to believe that SES does not play a role in the health of Hispanics. At the individual level, however, this is not the case. Our results show that are sizable SES differences in functional health among Hispanic women, both U.S.- and foreign-born. U.S.-born Hispanic women in poverty, for example, exhibited increased over 70 percent the incident rate of functional limitations relative to women living about twice the poverty line. Clearly, then, improving the SES of Hispanic women will be important for the future health of this large and growing population.

Our findings are particularly important if placed in the broader literatures on both Hispanic population aging and individual-level aging. In terms of population aging, the next several decades will bring very rapid growth in the number (from 3 million to over 15 million) and percentage (from 7 percent to 18 percent) of Hispanic persons aged 65 and above in the United States (Olshansky 2015). Given that there are already well documented higher levels of functional limitations and disabilities among older Hispanic women compared with non-Hispanic whites (Melvin et al. 2014), the phenomena of rapid Hispanic population aging on top of an already disadvantaged health profile potentially means that there could be notable negative impacts on national health statistics and health care costs (Olshansky 2015). Our results further show that there are other, largely unrecognized specific segments of the Hispanic population – i.e., those who identify as either black or other race – who are an even higher level of concern given their functional health disadvantage. In terms of individual-level aging, recent related work has shown very rapid rates of aging-related functional decline among Hispanics, and particularly so for U.S.-born Hispanic women (Angel et al. 2014). The research conducted by Angel et al. (2014) focused on Hispanics in the southwestern United States; our current findings focus on the United States as a whole and suggest that black and other race Hispanic women are also highly vulnerable subgroups of this rapidly growing population. While our results only provided limited support for the idea that there is a widening of race disparities among Hispanics with increasing age, both black and other race Hispanic women exhibited worse health than white Hispanic women across the adult age range. Coupled with the population aging patterns mentioned above, our findings – along with related findings reported by Angel et al. (2014) and others (e.g., Hayward et al. 2014) for the Hispanic population as a whole – should help place Hispanic individual-level aging and population-level aging high on the scientific and policymaking radar screens (Hummer and Hayward 2015).

In closing, this paper showed statistically significant race differences in functional health among Hispanic women. This speaks to the need for broader analyses of health by race *within* the Hispanic population. These disparities may go unnoticed in analyses that simply compare non-Hispanic blacks and non-Hispanic whites with the racially diverse, pan-ethnic Hispanic population. This analysis is also timely in that it fills a key void in the current Hispanic health and aging literature. Indeed, it is one of only a few studies that analyzes health differences among Hispanics by race. Moreover, it focuses the analysis on health disparities solely on Hispanics in an effort to carefully understand the heterogeneity of the Hispanic population.

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Table 1
Weighted Descriptive Statistics for Female Adult Hispanics by Nativity NHIS 1997-2011

Variable	US Born				Foreign Born				Overall
	Hispanic White	Hispanic Black	Hispanic Other	Overall	Hispanic White	Hispanic Black	Hispanic Other	Overall	
Age (Mean Years)	38.8	32.6	36.7	38.3	42.1	43.2	40.1	41.9	
Ages 18-45	69.6%	84.5%	74.8%	70.7%	63.9%	58.1%	69.1%	64.3%	
Ages 46-85	30.4%	15.5%	25.2%	29.3%	36.1%	41.9%	30.9%	35.7%	
Region of US									
South	36.5%	29.8%	27.1%	35.2%	36.3%	30.5%	24.0%	34.9%	
Northeast	9.7%	38.7%	13.9%	11.2%	16.3%	50.7%	27.2%	18.3%	
West	44.9%	18.5%	48.5%	44.4%	40.4%	12.2%	37.4%	39.4%	
Midwest	8.9%	13.0%	10.5%	9.2%	7.0%	6.6%	11.4%	7.4%	
Marital Status									
Married	47.3%	27.2%	46.1%	46.5%	61.2%	42.7%	60.2%	60.6%	
Unmarried	52.7%	72.8%	53.9%	53.5%	38.8%	57.3%	39.8%	39.4%	
Education									
High Sch or More	76.7%	80.9%	76.0%	76.8%	48.6%	64.2%	49.3%	49.1%	
Less Than High Sch	23.3%	19.1%	23.9%	23.2%	51.4%	35.8%	50.7%	50.9%	
Family Income: Poverty Threshold									
2.00 or More	47.4%	42.3%	43.6%	46.8%	29.6%	35.5%	27.5%	29.5%	
1.00 - 1.99	19.0%	19.7%	20.3%	19.2%	25.6%	21.4%	25.5%	25.5%	
0.99 or Less	15.7%	25.4%	16.5%	16.1%	23.1%	25.2%	24.2%	23.3%	
Missing Poverty Info	17.8%	14.5%	19.6%	17.9%	21.7%	17.9%	22.9%	21.7%	
Country of Origin									
Mexico	68.8%	30.0%	61.8%	66.7%	55.5%	17.5%	51.3%	54.0%	
Puerto Rico	11.0%	39.2%	15.5%	12.5%	8.9%	21.7%	11.3%	9.5%	
Cuban	2.8%	4.2%	0.5%	0.9%	6.8%	7.3%	2.0%	3.2%	
Dominican Republic	1.1%	7.2%	1.4%	1.3%	3.7%	19.2%	5.9%	4.3%	
Other	16.3%	19.4%	20.8%	16.9%	25.1%	34.4%	29.5%	25.8%	
Time Spent In US									
Less than 10 Years					27.4%	24.2%	29.5%	27.5%	

Variable	US Born				Foreign Born				Overall
	Hispanic White	Hispanic Black	Hispanic Other	Overall	Hispanic White	Hispanic Black	Hispanic Other	Overall	
10 Years or More					65.3%	70.7%	58.7%	64.8%	
Missing					7.3%	5.1%	11.7%	7.7%	
Functional Limitations (Mean)	1.25	1.18	1.31	1.26	1.12	1.29	1.11	1.12	
No Functional Limitations (%)	68.7%	68.9%	64.1%	68.2%	73.2%	70.6%	71.7%	73.0%	
1-9 Functional Limitations (%)	31.3%	31.1%	35.9%	31.8%	26.8%	29.4%	28.3%	27.0%	
Weighted N	14945	620	1926	17491	22193	677	2547	25417	
UnWeighted N	14811	594	2306	17711	21624	662	2911	25197	
UnWeighted N	83.6%	3.4%	13.0%	100.0%	85.8%	2.6%	11.6%	100.0%	

Source: National Center for Health Statistics (2011)

^ Dominican Republic data available for survey years 1999-2009. Survey years 1997-1998, the Dominican Republic is considered "other"

Table 2
Poisson Regression Log Estimates of Physical Functional Limitations for US-Born Adult Hispanic Females NHIS 1997-2011

Variable	Model 1	Model 2	Model 3	Model 4
Race				
<i>White (ref.)</i>				
Black	1.310 ***	1.317 ***	1.276 ***	1.225 ***
Other	1.218 ***	1.262 ***	1.244 ***	1.223 ***
Age	1.041 ***	1.042 ***	1.042 ***	1.040 ***
Race × Age				
<i>White × Age (ref.)</i>				
Black × Age		1.000	1.001	1.004 *
Other × Age		0.995 ***	0.995 ***	0.995 ***
Region of US				
<i>South (ref.)</i>				
Northeast			0.979	0.969
West			1.028 +	1.076 ***
Midwest			1.129 ***	1.166 ***
Country of Ancestry				
<i>Mexico (ref.)</i>				
Puerto Rico			1.271 ***	1.310 ***
Cuba			0.900 *	1.022
Dominican Republic [^]			0.948 ***	0.598 ***
Other Countries			1.039 *	1.091 ***
Marital Status				
<i>Married (ref.)</i>				
Unmarried				1.045 **
Education				
<i>High Sch or More (ref.)</i>				
Less Than High Sch				1.240 ***
Family Income: Poverty Threshold				
<i>2.00 or More (ref.)</i>				
1.00 - 1.99				1.394 ***
0.99 or Less				1.736 ***
Missing Poverty Info				1.054 *
Intercept	1.071 **	1.065 **	1.018	0.752 ***
Fit Statistics (Deviance/DF)	2.742	2.741	2.732	2.643
N	17711	17711	17711	17711

+ $p < 0.1$,

*
 $p < 0.05,$

**
 $p < 0.01,$

 $p < 0.001$

Source: National Center for Health Statistics (2013)

^
Dominican Republic data available for survey years 1999-2011
Survey years 1997-1998, the Dominican Republic is considered "Other Countries".

All Models control for survey year

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Table 3
Poisson Regression Log Estimates of Physical Functional Limitations for Foreign-Born
Adult Hispanic Females NHIS 1997-2011

Variable	Model 1	Model 2	Model 3	Model 4
Race				
<i>White (ref.)</i>				
Black	1.061 ⁺	1.088 ⁺	0.972	0.977
Other	1.228 ***	1.289 ***	1.237 ***	1.225 ***
Age	1.049 ***	1.049 ***	1.047 ***	1.046 ***
Race × Age				
<i>White × Age (ref.)</i>				
Black × Age		0.998	0.998	0.997
Other × Age		0.996 ***	0.994 ***	0.993 ***
Region of US				
<i>South (ref.)</i>				
Northeast			1.244 ***	1.211 ***
West			1.091 ***	1.096 ***
Midwest			1.049 ⁺	1.071 **
Country of Origin				
<i>Mexico (ref.)</i>				
Puerto Rico			1.304 ***	1.352 ***
Cuba			0.799 ***	0.878 ***
Dominican Republic [^]			1.183 ***	1.153 ***
Other Countries			0.850 ***	0.915 ***
Time Spent in US				
<i>Less than 10 Years (ref.)</i>				
10 Years or More			1.300 ***	1.365 ***
Missing			1.178 ***	1.293 ***
Marital Status				
<i>Married (ref.)</i>				
Unmarried				1.106 ***
Education				
<i>High Sch or More (ref.)</i>				
Less Than High Sch				1.108 ***
Family Income: Poverty Threshold				
<i>2.00 or More (ref.)</i>				
1.00 - 1.99				1.167 ***
0.99 or Less				1.531 ***
Missing Poverty Info				1.103 ***

Variable	Model 1	Model 2	Model 3	Model 4
Intercept	0.878 ***	0.872 ***	0.651	0.464 ***
Fit Statistics (Deviance/DF)	2.694	2.694	2.638	2.594
N	25197	25197	25197	25197

⁺ $p < 0.1$,

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

Source: National Center for Health Statistics (2013)

[^] Dominican Republic data available for survey years 1999-2011

Survey years 1997-1998, the Dominican Republic is considered "Other Countries".

All Models control for survey year

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