DIFFERENTIAL EFFECTS OF AGING IN PLACE ON DISABILITY AMONG BLACK AND WHITE ELDERLY

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Abstract

The black health disadvantage, including old-age disability, is well-known and persists over the life course, although it is smaller in the older population. Both race and place of residence play a role in shaping health status and disability, and these effects are cumulative in a way that ages African Americans prematurely, resulting in greater functional limitations and disability. This paper tests a model to explain how region and migration status, metro-nonmetro residence, and selected socioeconomic factors affect disability differentials for African Americans and whites age 65 and older, using the concepts measured in the 2009 American Community Survey. The results show that, in general, elderly African Americans are substantially more likely than whites to have disabilities; both whites and blacks have more disabilities when they live in nonmetro areas as compared to metro areas; and, while elderly living in the South are more likely to experience disabilities than elderly in other regions of the United States (US), the race differential in disability is smaller in the South than the non-South. We also find that factors associated with lower risk of disability are less protective for black long-term residents of the South blacks than for black long-term residents in regions outside the south.

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Introduction

The black health disadvantage, including old-age disability, is well-known and persists over the life course, although it is smaller in the older population (Thomson et al. 2009, Adler and Rehkopf 2008). In non-metropolitan areas, as in the U.S. as a whole, health disparities between African Americans and non-Hispanic whites begin to emerge in early adulthood and continue to widen through middle age (Peek and Zsembik 2004). Both race and place of residence play a role in shaping health status and disability, and some would argue that these effects are cumulative in a way that ages African Americans prematurely, resulting in greater functional limitations and disability (Geronimus et al. 2001). The aim of this paper is to analyze the differences between African Americans and non-Hispanic whites in their functional limitations and disability for persons age 65 and older. In that analysis, we pay special attention to place in terms of metro-nonmetro and South-non-South region. Residency in these areas is important for examining race differentials in disability because arguably, the historical experience of African Americans in the United States has produced regional differences in social relations among racial groups. Also, structural opportunities in US nonmetropolitan areas differ dramatically from opportunities in the metropolitan core. Although cumulative disadvantage is more often considered in terms of age, we

examine racial differentials in the effects that place of residence and length of residency have on disability in old age within the limitations of our data source, the American Community Survey. The paper first reviews recent findings on the disability gap at the national level and related health black-white health differentials. We then link the "weathering" hypothesis to the emerging theory of cumulative disadvantage which will be our theoretical frame for the analysis of black-white differentials in disability. Third, we develop and test a model that examines effects of race and place of residence-- region and metropolitan status—on disability. The analysis builds on an earlier descriptive paper (Lee and Singelmann, forthcoming) in which we detail the importance of metro status and region for the incidence of disability of blacks and whites. Our findings are consistent with previous research that find greater onset of disability of blacks in middle age. Southern residence affects the extent to which education protects against the risk of disability, with "long-term" black residents living outside the south experiencing protective effects more on par with whites than do "long-term" southern black residents.

Literature

Over the past 20 years or so, the weathering hypothesis was developed to explain why the health gap between whites and blacks appears to increase with age. According to this hypothesis, obstacles faced by blacks to a larger extent than by whites tend to chip away at the health of individuals. As people age, the health status of disadvantaged groups deteriorates faster, thus increasing any differential that already

existed at younger ages. Although, at the oldest ages, selectivity may make the gap appear to narrow, some disparities persist.

The weathering hypothesis is part of a larger body of work which makes a case for a cumulative disadvantage for population groups that are left out of the main stream (or have large proportions of people in that category). These groups include social minorities, the less educated, and the poor. The concept of cumulative disadvantage was first formulated in relation to people with lesser human capital (Dannefer 2003) who are not competitive in the labor market, carry out strenuous work, have low income, and lack access to (appropriate) medical services. Disadvantages build up over the life span and result in inferior health status at older age. Hungerford (2007:491) showed, for example, that persons "who experience middle-age chronic hardships are significantly (statistically) more likely to experience adverse old-age outcomes." Similar cumulative-disadvantage effects have also been found for women, identifying a socioeconomic status-frailty connection (Szanton et al. 2011). A recent study by Lee (2011) examined the effect of educational attainment on disability at older ages for native-born non-Hispanic whites and foreign-born Asians in the United States. The findings showed that while education affects the rate of disability for both population groups, the strength of the effects differed by race.

Disability

The black health disadvantage, including old-age disability, is well-known and persists over the life course, although it is smaller in the older population (Thomson et al. 2009, Adler and Rehkopf 2008). In nonmetropolitan (nonmetro) areas, as in the U.S. as a

whole, health disparities between African Americans and non-Hispanic whites emerge in early adulthood and continue to widen through middle age (Peek and Zsembik 2004). Both race and place of residence play a role in shaping health status and disability, and some would argue that these effects are cumulative in a way that ages African Americans prematurely, resulting in onset of functional limitations and disability at earlier ages (Geronimus et al. 2001) and resulting in elderly African Americans, particularly those in rural areas, spending a greater proportion of their remaining life disabled (Laditka et al. 2005).

Disability in older adults is most often the result of chronic diseases and geriatric conditions. The latter include loss of mental sharpness, falls, incontinence, dizziness, and vision or hearing problems all of which general generally outside of a disease model. Chronic diseases include heart disease, chronic lung disease, diabetes, cancer, musculoskeletal conditions, stroke and psychiatric problems. Disability occurs when physical or cognitive limitations inhibit people's ability to perform essential activities such as personal care, walking short distances, or managing their medications or routine day-to-day finances. Environmental conditions and access to resources play a role both in the risk of losing physical and cognitive abilities and in determining whether physical or cognitive limitations lead to a loss of independence or social isolation.

Rural populations are generally older than urban populations (see Kirschner and Berry, Chapter 2) and, not surprisingly, they have higher rates of limitations in daily activities (Institute of Medicine Bureau of Health Care Services 2005). Difficulty in performing activities of daily living (ADLs, e.g. eating, grooming, and bathing) or more complex instrumental activities of daily living (IADLs, e.g. meal preparation, shopping,

and managing money) increases with age (Manton, Gu, and Lamb 2006). In addition, such limitations in old age tend to be the result of chronic conditions that are related to health behaviors, and rural populations tend to exhibit poorer health behaviors including higher rates of smoking and lower rates of exercise relative to most urban populations (Institute of Medicine Bureau of Health Care Services 2005). In the South, the black population tends to be more concentrated in rural areas than are blacks in other parts of the US.

Access to resources also affects health. For older Americans, the most important resources are often health insurance, availability of and access to health care[1], savings and social support. These may vary across urban and rural communities. Although Medicare coverage is nearly universal among persons age 65 and older, occupational histories affect whether older individuals have employer-based supplemental insurance coverage, and state regulations determine eligibility for non-institutionalized long-term care coverage under Medicaid.

Income level and type of employment, both components of socioeconomic status, have a significant influence on the health status of rural residents. In rural regions, predominance of lower-wage jobs, limited availability of year-round work, and lower education levels generally mean that individuals frequently go without health insurance or have little or no income to spend on health care. Urban-rural differentials in rates of health insurance coverage are related to the structure of employment associated with rural places (Institute of Medicine Bureau of Health Care Services,

[1] We distinguish between availability and access because mere availability does not assure access. For example, the availability of free health care of limited use for people if they do not have transportation to the clinic or their work hours conflict with the clinic's opening hours.

2005). Rural areas have a higher share of smaller employers than do urban areas, and smaller employers may not offer health insurance. Low-wage jobs may not pay enough to cover insurance costs, and the self-employed may forgo insurance because of high cost. For long-term elderly residents of rural areas, these factors help shape their health histories. Of course, other factors such as genetics or help-seeking behavior also influence those histories.

While some attributes of urban environments such as air pollution, traffic, and weak community (neighborhood) institutions make it more difficult for older adults to maintain and promote good health (Fried and Barron 2005), other facets of the urban environment provide needed support. For example, modifications, such as access ramps for someone with difficulty climbing stairs, medications, or social support may mitigate the effects of any limitations. In urban areas, public transportation, buildings with elevators, community transport vans, and increased density help older adults to maintain greater mobility, promoting independence and health care access. These attributes of urban areas also facilitate social engagement and mental stimulation. At the national level, the black population is more concentrated in metropolitan areas than the white population.

In rural areas, less densely populated areas and related differences in the built environment have health consequences and determine which physical limitations raise to the level of disability. Older adults in both urban and rural communities rely more on private vehicles than on public transportation for their daily transportation needs (Glasgow, 2000; Glasgow and Blakely 2000; Carp 1988; Rosenbloom 2004). However, as peripheral vision decreases and reaction times slow with aging, driving becomes

more difficult. In urban areas, public transportation and taxis are more viable alternatives to driving oneself. In rural communities, when older adults can no longer drive themselves, they have fewer alternatives. As a result, physical impairments that affect driving may be especially isolating in rural communities.

Racial and Nonmetro Disadvantage

Healthy life expectancy, or the number of years one may expect to live disability-free, varies by race and gender as well as socioeconomic status (Geronimous et al. 2001). At the end of the 20th century, individuals age 70, on average, could expect to live an additional 14 years, and about 80 percent of those years would be disability free (Crimmins et al. 2009). Residents of nonmetro areas appear to be in worse health than those living in metro areas (Braden and Beauregard 1994; LaPlante and Carlson 1996; McNeil 1993; NCHS 1984, 1994), even though rural residents also appear to have a mortality advantage (Elo and Preston 1996; Geronimus et al. 1999; Hayward et al. 1997; Kitigawa and Hauser 1973; Miller, Stokes, and Clifford 1987; Schneider and Greenberg 1992). These findings have been confirmed by Morton (2004), although her research showed that the rural mortality disadvantage does not hold in all U.S. regions and for all types. For example, infant mortality rates in the 1980s in central city counties in the Northeast and Midwest were higher than in rural counties in those two regions, but the reverse was the case in the South and West (Morton 2004:38).

Educated men and women with some college live longer, on average, and a greater proportion (over 80 percent) can expect to live their remaining years being living independently and providing for their own personal care) (Crimmins et al. 1996: S118).

At the same age, educated black men and women are more likely to need assistance with personal care and unable to live independently than even whites who dropped out before high school.

Rates of disability appear to be a major component of the growing disparity in health between older blacks and whites (Clark, 1997). Earlier analysis (Geronimous et al. 2001) of active life expectancy at age 16 among select black and white populations in the U. S. also showed that rural populations outlive urban populations, but these additional years of life in rural populations are not disability-free. In some poor African American populations in the rural South and in inner city areas in the North and Midwest, disability rates at age 55 approach those of 75-year-old whites nationwide. By age 55, black residents of poor urban or poor rural areas in the study (Geronimous et al. (2001) had more than double the rate of functional limitations—measured by limitations in work, mobility or personal care—as white residents did nationwide, although black residents of poor rural areas had a somewhat smaller rate of functional limitations than black residents of poor urban areas White residents of poor urban or poor rural areas were also more likely to have functional limitations than whites nationwide by age 55, but only white residents of rural Appalachian Kentucky had disability rates as high as black residents in poor areas. Economically better off white populations not only live longer lives, but the additional years of life are, on average, healthier ones. On the other hand, better-off black populations have substantially longer life expectancies than poor black populations, but only small gains in the number of healthy years. This research by Geronimous et al. (2001), however, does not take into account the difference in blacks' duration of residence in more affluent areas.

A recent analysis of black-white differences in old-age disability finds that most of the black-white differences in disability from age 55 to 64 can be explained by differences in income and education (Fuller-Thomson, et al. 2009). For the elderly population in general, the disadvantage of not having a college education has become increasingly important in recent decades (Freedman, et al. 2007).

Geronimus (2010) has hypothesized that “weathering” is the reason why the most pronounced differences in health between blacks and whites are observed in middle-age rather than at younger ages. According to this hypothesis, repeated efforts to cope with social and environmental stressors affect health and may make blacks biologically older than whites of the same chronological age (Geronimus 1992, 2001; Geronimus et al. 2010). By extension, blacks (or whites) living in places where they are exposed to more stressors--communities that are characterized by high levels of residential segregation and neighborhoods with limited access to education, jobs, social services, and health care are likely to exhibit poorer health and other signs of biological aging than those residing in less stress-ridden environments.

In the U. S., black-white health inequalities, including disparities in life expectancy and the prevalence of chronic diseases, persist and may be worsening (Flegal et al. 2002; Geronimus et al. 1996; Geronimous 2010). The weathering hypothesis suggests that not only might individual behavior and material deprivation contribute to premature health deterioration but so might hard work and fulfilling family obligations. Individuals exposed to persistent stresses such as chronic financial strain and overt or subtly racial remarks expend a great deal of cognitive and emotional effort on those problems and develop adverse health outcomes (James 1994). Other

mechanisms through which weathering may work include exposure to physical environmental hazards, and social stressors in residential and work environments. In addition, the early development of chronic conditions, themselves an outcome of weathering, can add to an individual's stress, further increasing weathering effects. The impact of these conditions may be exacerbated by being medically underserved, a problem that is often especially acute in rural areas (Institute of Medicine Bureau of Health Care Services 2005). Other possible mechanisms for weathering include the internalized effects of stigma, or frustration and anger at racial injustice.

Blacks are more likely than whites of a similar age to experience stressful situations. Blacks more consistently encounter interpersonal discrimination, discrimination in housing and employment, material hardship, and unpaid care giving. Rural Southern blacks in the U.S. tend to be more socio-economically disadvantaged—due to lower education rates, concentration in low-prestige occupations and low-paying jobs—and to face greater discrimination than their counterparts in the North and in more urban settings. However, the response to these environmental conditions may be mitigated by expectations and adaptation. Long-time residents might expend less energy on coping with daily stressors in the environment, and this might affect the results seen in cross-sectional comparison of groups.

DATA & METHODS

Data and Variables

We use data from the 2009 American Community Survey Public Use Microdata Sample (ACS PUMS). The ACS is a nationwide survey. The annual ACS PUMS includes respondents from all U.S. cities, counties, and metropolitan areas with a population of 65,000 or more. This study focuses on the cumulative disadvantage of residence in non-metropolitan vs. metropolitan areas and in the southern states vs. other states among the elderly. For this reason, we limit our analyses to persons 65 years of age and older who are resident in PUMAs (Public Use Microdata Areas) that had a one hundred percent metropolitan or a one hundred percent non-metropolitan population in 2000.

Disability Status. In the 2009 ACS, people are identified by as having a disability on the basis of whether or not they exhibit difficulty with specific functions. In the absence of any accommodations, difficulty with these functions may mean that an individual faces limitations in activities and restrictions on full participation at home, at work, or in the community. This definition provides information relevant to program development and implementation in federal agencies. In the 2009 ACS, the four basic functions assessed are hearing, vision, cognition, and ambulation. In addition, respondents are asked about difficulties with selected activities from the Katz Activities of Daily Living (ADL) and Lawton Instrumental Activities of Daily Living (IADL) scales: difficulty bathing and dressing, and difficulty performing errands such as shopping. See Appendix for table with definitions.

Covariates. The ACS is a cross-sectional survey that provides no information on the past history of the elderly aside from place of birth and immigrant status. We focus on disadvantage that may be associated with interaction of race and current place of residence, estimating separate regressions by race. In addition, we look at the effect of length of residence (less than one year vs. more than one year as well as residence in the region in which one was born—

south vs. elsewhere). We control for other key characteristics such as age, gender, and educational attainment.

Analytic strategy

We compare the disability status of residents in metropolitan and non-metropolitan areas (southern states and other states) by race. We look at the distribution of individual physical, mental, and instrumental difficulties in each place-race group. Using logistic regression, we test whether race and place interactions significantly increase the likelihood of any disability (measured as saying yes to having any of the six difficulties about which respondents are questioned in the ACS) net of other factors associated with disability. To estimate standard errors for all analyses, we use the ACS PUMS replicate weights, taking advantage of options in STATA 12 which allow estimation using successive difference replicate weights.

We expect that a cumulative effect of place might mean that age effects on disability are more pronounced among long-term black southern residents than among white long-term southern residents. Long-term nonmetropolitan residence in the south might also be more stressful for blacks because of the legacy of relative social position and economic power. However, we did not attempt to construct a measure of "long-term" residence in nonmetropolitan areas, but did control for nonmetro residence. The protective effects of education has not been as great for black as for whites in other studies (CITATION), and we anticipate that this would be more pronounced for long-term residents in the south.

RESULTS

Tables 1 through 3 provide descriptive results showing patterns of disability across race and place groups. Table 1 shows that there is some higher risk among recent movers that have lived in different regions (south vs. non-south) in the past year and also among the southern

born. Higher risk among recent movers making longer moves might reflect moves associated with initial events such as onset of a debilitating condition. This interpretation is supported by the high rates of ambulatory disability and inability to live independently among these groups. Table 2 looks at differentials for race-place groups. Blacks have the highest rate of disability with rates highest among southern blacks and nonmetro blacks. In Table 3, we note that in each age group, rates of disability for blacks are equivalent to rates experienced by whites in the next age group.

Table 4 shows results for regression analyses of the effect of age and place on the log-odds of having a disability at the time of the survey. As anticipated the odds of disability increases with age, with each additional year of age have a greater impact as individuals reach critical thresholds. The effect of an additional year of age is twice as large (.119 vs .057) after age 80 as between age 65 and 74. At age 80 an additional year is associated with increased risk of disability by 1.13 (exp[.119]) times, while an additional year only increases the risk of disability by 1.06 times(exp[.057]) at age 65. Although being black increases the log-odds of disability in the model that includes all races, the effect of age on the log-odds of disability for blacks is similar to the effect for all races pooled and for whites only. The change in the effect of an additional year is also similar in the black only sample and in the white only sample.[2] Region of birth and region of residence also have a statistically significant effect on the log-odds of disability, with being born in a southern state increasing the risks of disability, substantially more

[2] As a sensitivity test for the effects of limiting the sample to PUMAs with 100% metro or nonmetro, we dropped the nonmetro variable and used the full sample. Results remain largely unchanged with the exception of the variable for southern residence, which became significant, increasing probability of disability.

so for whites than blacks--1.30 (exp[. 265]) vs. 1.09(exp[.088]), all else equal. Not surprisingly, remaining in the same house in the past year is associated with increased odds of disability.

Table 5 shows effects of covariates on the log-odds of disability among "long-term" residents of Southern states. Age effects are similar to those found for U.S. residents, with an additional year of age having more impact at age 75 and age 80 than at age 65. Counter to our expectations, for southern whites born in the south and living there for the past year, the coefficient for the age variables is higher, indicating that an additional year of age at every age is associated with a greater increase in the log-odds of disability for whites than for southern blacks. At age 65, an additional year increases the riskof disability by 1.04 (exp[.039]) times for blacks and 1.06 (exp [.054) times for whites. At age 75, for blacks, another year of age increases the risk of disability by 1.09 times. The change in the effect of an additional year from age 65 to age 75 is not as great for whites, rising from 1.06 to 1.09. In analyses of the population age 50 and older (available from the authors), the effect of each additional year of age before 65 exceeds the effect of each additional year at age 65, for black "long-term" residents of the south but not for white "long-term" southern residents, suggesting that the significantly lower association of additional years with disability among blacks at age 65 is because they experience higher incidence of disability at earlier ages. This finding is consistent with previous studies (CITATIONS) showing that disability rates for blacks in middle age are at levels similar to those of whites in old ages.

Turning to the effects of other covariates on the log-odds of disability, in general, results for all U.S. residents (from Table 4) show that-- net of age, race, place of residence, military service, and poverty—being female, being married, and having at least a high school education, are each associated with lower log-odds of disability. The results are similar when looking at effects among all U.S. elderly blacks or among all U.S. elderly whites (Table 4).

However, when we confine the analysis to “long-term” southern residents (Table 5), the effects of these protective variables are not as strong among the “long-term” black southern residents as among the “long-term” white southern residents. In fact, for the “long-term” black southern resident, women are actually more likely to be disabled than men. And the coefficients representing the effect of a college and high school education, while still negative for “long-term” southern black residents, are of a smaller magnitude than the coefficients for white “long-term” southern residents. A high school education reduces the risk of disability by 32.5 percent (1-exp[-0.393]) for blacks, in comparison reducing these risks by 46.6 percent (1-exp[-0.627]) for whites.

For “long-term” residents outside the south (Table 6), the effect of an additional year of age is similar to that noted above for southern residents. The effect associated with an additional year of age is stronger at age 75 than at age 65 and stronger yet at age 80. Age effects increase rapidly from age 65 to 75, but more rapidly for blacks than for whites. From age 75 to 80, the age effect increases more rapidly for whites than for blacks. In fact, the age effect at age 75 and age 80 are essentially the same for blacks.

For long-term residents living outside the south (Table 6), nonmetropolitan residence increases the log-odds of disability for blacks more so than for whites. Being female has no effect on the log-odds of disability for blacks but decreases it for whites. Outside the south, marriage and education have as strong a protective effect for blacks as for whites. Interestingly, military service is significantly associated with the log-odds of disability only for “long-term” white residents living outside the south. It is not significantly associated with disability for “long-term” black residents living outside the south nor for black or white “long-term” residents of the south.

Conclusion

Despite data limitations, the results suggest that long-term residence in south suppresses the protective effects of education. The main data problem is that the ACS does not have duration of residence. However, we are reasonably confident that given the distances most individuals move, our construction of "long-term" variables has captured persons with much more than a year living in the south. Future research would benefit from data that had both duration of residence and psycho-social measures that might allow us to tell if the effect of southern residence is an effect of place opportunities, stress, or habit.

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Table 1. Proportion with disability among residents, All

Residency and Mobility	Any Disability	Vision	Hearing	Ambulatory	Cognitive	Independent	Self-Care
South	.38	.08	.16	.26	.10	.17	.17
Recently Migrated to South	.37	..07	.16	.25	.09	.18	.09
Recently Returned to South	.49	.11	.18	.33	.15	.21	.13
"Long-Term" Southern Resident Not Born in South	.34	.06	.15	.21	.08	.14	.08
"Long-Term" Southern Resident Born in south	.43	.09	.17	.29	.12	.19	.11
Other	.35						
Recently Migrated to Outside the South region	.54	.13	.21	.42	.25	.23	.13
Recent ly Returned to Outside the South region	.41	.08	.16	.29	.14	.20	.12
"Long-Term" Resident of Region Outside the South, Born in the South (6)	.42	.09	.15	.29	.11	.15	.11
"Long-Term" Resident of Region Outside the South, Not Born in the South	.36	.06	.15	.22	.09	.16	.08

Note: See Appendix Table for Definitions.

Table 2. Proportion Disabled within Race-Place group, noninstitutionalized age 65 and older

	Any Disability	Vision	Hearing	Ambula -tory	Cognitive	Indepen- dent	Self-Care
Black-Southern Region	.46		.11	.33	.14	.22	.13
Black-Outside South	.42		.10	.31	.13	.21	.12
White-Southern Region	.38		.17	.25	.09	.16	.09
White-Outside South	.35		.16	.22	.08	.15	.08
Black-Nonmetro	.53		.13	.39	.18	.26	.15
Black-Metro	.43		.10	.32	.13	.21	.12
White-Nonmetro	.39		.18	.25	.09	.15	.08
White-Metro	.35		.15	.22	.08	.15	.08

Note: Analyses that consider metro and nonmetro include only residents of PUMAs that are 100 percent metropolitan or 100 percent non-metropolitan.

Table 3. Proportion Disabled Within Race Group by Age, Noninstitutionalized Age 50 and older

	Black	White
Age 50-64	.25	.16
Age 65-74	.35	.24
Age 75-79	.60	.50
Age 80+	.67	.60

Table 4. Log-Odds of Disability, Noninstitutionalized Age 65 and Older

	All	**Black**	**White**
constant			
Age 65 to 74 (linear spline)	.057 (.001)***	.047 (.005)***	.060 (.002)***
Age 75 to 79 (linear spline)	.088 (.003)***	.085 (.010)***	.089 (.003)***
Age 80+ (linear spline)	.119 (.002)***	.092 (.007)***	.121 (.002)***
South	-.005 (.011)	.011 (.031)	-.017 (.012)
Southern born	.247 (.011)***	.088 (.040)**	.265 (.012)***
Nonmetropolitan (Metropolitan)	.177 (.011)***	.280 (.059)***	.167 (.012)***
Nonmover (same house last year)	.424 (.023)***	.397 (.069)***	.472 (.024)***
Black, NH	.127 (.017)***	--	--
Other race	.202 (.024)***	--	--
(White, NH)			
Hispanic	.183(.021)***		
Female	-.111 (.011)	.196 (.034)***	-.197 (.014)***
(Male)			
Married (Divorced/Separated/Single/Never)	-.367 (.010)***	-.353 (.034)***	-.364 (.010)***
College	-.904 (.014)***	-.968 (.051)***	-.939 (.018)***
High School	-.481 (.010)***	-.461 (.030)***	-.503 (.013)***
(No high school)			
Military Service (None or reserves only)	.078 (.013)***	.028 (.053)	.047 (.015)**
Poor (Not Poor)	.351 (.014)***	.321 (.040)***	.383 (.020)***
Foreign-born	.117 (.016)***	.331 (.067)***	.075 (.019)***

Note: Controls for allocation of values for any of the above variables or any of six forms of disability included as controls. ***Significant at .001 level; **Significant from .01; *Significant at the .05 level. Results are similar when analysis is not confined to PUMAs with 100 percent nonmetropolitan or metropolitan and the variable nonmetro is dropped from the analysis.

Table 5. Log-Odds of Disability Among the "Long-Term Residents" of the South, Noninstitutionalized Age 65 and Older

	All	**Black**	**White**
Constant			
Age 65 to 74 (linear spline)	. 049 (004)***	.039 (.008)***	.054 (.0041)***
Age 75 to 79 (linear spline)	.083 (.006)***	.090 (.016)***	.080 (.007)***
Age 80+ (linear spline)	.117 (.004)***	.096 (.011)***	.124 (.004)***
South	--	--	--
Southern born	--	--	--
Nonmetropolitan (Metropolitan)	.258 (.023)***	.256 (.062)***	.257 (.025)***
Nonmover (same house last year)	.511(.050)***	.480 (.094)***	.509 (.059)***
Black, NH	.108 (.028)***	--	--
Other race	.518 (.069)***	--	--
(White, NH)			
Hispanic	.135 (.051)**	--	--
Female	-.154 (.024)***	.166 (.060)**	-.264 (.031)***
(Male)			
Married (Divorced/Separated/Single/Never)	-.367 (.020)***	-.325 (.051)***	-.375 (.022)***
College	-1.01 (.029)***	-.905 (.075)***	-1.09 (.036)***
High School	-.559 (.024)***	-.393 (.042)***	-.627 (.026)***
(No high school)			
Military Service (None or reserves only)	.031 (.026)	-.034 (.079)	.000 (.033)
Poor (Not Poor)	. 308 (.034)***	.280 (.053)***	.308(.041)***

Note: "Long-Term" defined as having lived in the South for at least the last year and having been born in the South. Note: Controls for allocation of values for any of the above variables or any of six forms of disability included as controls. ***Significant at .001 level; **Significant from .01; *Significant at the .05

level. Results are similar when analysis is not confined to PUMAs with 100 percent nonmetropolitan or metropolitan and the variable nonmetro is dropped from the analysis.

Table 6. Log-Odds of Disability for "Long-Term" Residents in States Outside the South, Noninstitutionalized Age 65 and Older

	All	**Black**	**White**
Constant	-4.206 (.156)***	-2.562 (1.213)***	--4.393 (.169)***
Age 65 to 74 (linear spline)	.055 (.002)***	.033 (.017)	.057 (.002)***
Age 75 to 79 (linear spline)	.085 (.004)***	.091 (.034)**	.086 (.004)***
Age 80+ (linear spline)	.121 (.003)***	.090 (.019)***	.122 (.003)***
South	--	--	--
Southern born	--	--	--
Nonmetropolitan (Metropolitan)	.142 (.014)***	.942 (.269)***	.135 (.014)***
Nonmover (same house last year)	.494 (.032)***	.772 (.195)***	.498 (.034)***
Black, NH	.240 (.039)***	--	--
Other race	.279 (.038)***	--	--
(White, NH)			
Hispanic	.166 (.043)***	--	--
Female	-.203 (.017)***	.187 (.103)	-.221(.018)***
(Male)			
Married (Divorced/Separated/Single/Never)	-.368 (.013)***	-.398 (.095)***	-.361 (.014)***
College	-.942 (.022)***	-1.124 (.162)***	-.942(.023)***
High School	-.488 (.016)***	-.661 (.103)***	-.480 (.018)***
(No high school)			
Military Service (None or reserves only)	.041 (.019)*	.048 (.129)	.040 (.019)*
Poor (Not Poor)	.352 (.025)***	.445 (.105)***	.359 (.027)***

Note: “Long-Term” defined as having lived in the South for at least the last year and having been born in the South. Note: Controls for allocation of values for any of the above variables or any of six forms of disability included as controls. ***Significant at .001 level; **Significant at .01; *Significant at the .05 level. Results are similar when analysis is not confined to PUMAs with 100 percent nonmetropolitan or metropolitan and the variable nonmetro is dropped from the analysis.

Appendix Table 1. Residency and Mobility Definitions (all at time of survey unless otherwise noted)

Variable	Definition
Nonmover	lived in the same house 1 year ago
Southern_born	Born in the south
Mover_region	Did not live in the same region (south or other) 1 year ago
South	Resident of any state in census region 3
Recent Migrant to South	Resident of south that moved into region 3 within the last year and was not born in the south
Recent Returnee to South	Resident of south that moved into region 3 within the last year but was born in the south
"Long-Term" Southern Resident, Not Born in South	Resident of south that lived in region 3 for at least one year and was not born in the south
"Long-Term" Southern Resident, Born in the South	Resident of south that has been living in region 3 for at least one year and was born in the south
Other	Not a resident of any state in census region 3
Recent Migrant to Outside the South	Resident of other that moved into region 1, 2, 4, or 5 within the last year but was born in the south
Recent Returnee to Outside the South	Resident of other that moved into region 1, 2, 4, or 5 within the last year and was in one of these regions not in the south
"Long-Term" Resident Outside the South, born in South	Resident of other that lived in region 1,2,4, or 5 for at least one year and was not born in one of these regions, i.e. was born in the south
"Long-Term" Resident Outside the South, not born in South	Resident of other that lived in region 1,2,4, or 5 for at least one year and was born in one of these regions not in the south.
Nonmetro	resident of PUMA that was 100 percent nonmetropolitan in 2000
Metro	resident of PUMA that was 100 percent metropolitan in 2000
(Analysis featuring metro and nonmetro limited to PUMAs with 100 percent metro or 100 percent nonmetro)	

Appendix Table 2. Disability Definitions

Concept	Questions
Hearing difficulty	**"deaf or … [had] serious difficulty hearing"**
Vision difficulty	**"blind or … [had] serious difficulty seeing even when wearing glasses"**
Cognitive difficulty	**"serious difficulty concentrating, remembering, or making decisions"**
Ambulatory difficulty	**"serious difficulty walking or climbing stairs"**
Self-care difficulty	**"difficulty dressing or bathing"**
Independent living difficulty	**difficulty "doing errands alone such as visiting a doctor's office or shopping" due to physical, mental, or emotional condition**
Disability status	**For people age 15 years and older, difficulty with any one of the six items above.**