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Life course determinants of racial and ethnic disparities in functional health trajectories☆

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ABSTRACT

Previous research has documented racial/ethnic disparities in functional health trajectories in old age, though little work has investigated the relative contribution of early and later life insults in their genesis. This paper uses two-part latent curve models to investigate the life course determinants of racial/ethnic disparities in functional health trajectories in the USA. We find that blacks and Hispanics have both a greater probability of having any limitation at baseline and more limitations on average among those who have any. Over time, there is convergence in trajectories between Hispanics and non-Hispanic whites, though the black-white gap remains constant. In addition, we find that disparities result from differential exposure to poor childhood health, early life socioeconomic deprivation, as well as adult health and socioeconomic attainment. However, the impact of childhood insults is largely mediated by more contemporaneous factors. We also find little evidence that the impact of life course factors varies across groups.

Introduction

In this paper, we examine the life course determinants of racial/ethnic disparities in functional health trajectories among older Americans. An enduring aspect of population health in the USA is that African Americans suffer disproportionately from disease, illness, and premature mortality at all ages compared to non-Hispanic whites (Fingerhut & Makuc, 1992; Rogers, 1992). The black/white health gap must be juxtaposed against the broader landscape of substantial racial/ethnic heterogeneity in health (Franzini, Ribble, & Keddie, 2002). Specifically, racial/ethnic disparities in functional health measured by disability or its antecedent functional/mobility limitation are well documented (Cho, Frisbie, Hummer, & Rogers, 2004; Ferraro, Farmer, & Wybraniec, 1997; Hayward & Herron, 1999; Jette, Crawford, & Tennstedt, 1996; Kington & Smith, 1997; Ostchega, Harris, Hirsch, Parsons, & Kington, 2000). Significant differences in functional health trajectories have been noted both in terms of aggregate age-related patterns (Clark & Maddox, 1992; Clark, Maddox, & Steinhauser, 1993) and individual-level trajectories (Dunlop, Song, Manheim, Daviglus, & Chang, 2007; Taylor, 2008). Increasingly, social scientists are interested in the degree to which this racial/ethnic heterogeneity may be rooted in developmental processes and exposures that occur over the life course.

Background

Explanations for racial/ethnic disparities in functional health

Several explanations have been offered for racial/ethnic inequalities in functional health status. First, group differences in the prevalence of chronic disease may lead to elevated functional impairment among racial/ethnic minorities given the important role of conditions like diabetes and stroke in the disablement process (Ferraro et al., 1997). However, rather than explain disparities, this simply shifts the focus to earlier points in the disablement process. Others have highlighted racial disparities in upstream antecedent lifestyle factors such as obesity (Ferraro & Kelley-Moore, 2003). The explanation that has garnered the most attention is the systematic differences in socioeconomic status (SES) experienced by racial/ethnic minorities.

A consistent finding is that racial/ethnic differentials in functional health are reduced, and sometimes eliminated, after adjustment for adult socioeconomic position (Kington & Smith, 1997; Rogers, 1992). Thus a substantial portion of the racial/ethnic

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inequality may be due to the larger racialized nature of socioeconomic disadvantage in the USA. However, studies have been mixed as to whether socioeconomic inequality can completely account for disparities (Clark & Maddox, 1992; Kelley-Moore & Ferraro, 2004). Unfortunately, prior work has typical examined only adult socioeconomic circumstances. This narrow focus on adult factors obscures the marked racial differences in physical and social conditions that exist from conception, and persist throughout the life course. These structural disadvantages likely impact health later in life either as direct (though perhaps latent) insults or by increasing the probability of subsequent exposure to material and psychosocial disadvantage. Life histories of disadvantage cannot adequately be captured by a few measures of adult socioeconomic attainment. Indeed, recent empirical analyses have shed light on the importance of accounting for early life factors such as childhood health in understanding the genesis of socioeconomic disparities in adult health (Case, Lubotsky, & Paxson, 2002; Haas, 2007; Luo & Waite, 2005). Early life factors likely play a similarly important role in generating racial/ethnic inequality in health at older ages.

Life course influences on racial/ethnic disparities in health

There is growing interest in developmental/life course processes as determinants of adult health. This work suggests that there may be developmentally *critical* or *sensitive* periods during which negative events may permanently alter the trajectory of health over the life course, manifesting in disease decades later (Kuh & Ben-Shlomo, 1997). For example, Barker (1994) hypothesizes that poor maternal nutrition during gestation results in fetal growth retardation, which alters the structure and function of tissues associated with insulin, blood pressure, and lipid regulation, increasing the risk of adult cardiovascular disease and diabetes.

Alternatively, early life insults may add to the cumulative risk exposure over the life course and it may be this lifetime accumulation that is most important. The *cumulative insults* approach thus posits that there are social, environmental, and behavioral exposures over the life course which alters an individual's risk of disease in addition to any critical/sensitive period effects (Kuh & Ben-Shlomo, 1997). Poor health and socioeconomic disadvantage in childhood represent two potentially important insults, the effects of which may be either compounded by continued social, economic, and physical deprivation or partially ameliorated by upward social mobility and or healthy adult lifestyle. Thus there may be a cumulative effect of socioeconomic disadvantage not explained by SES at any particular point in the life course (O'Rand, 1996; Ross & Wu, 1996). Though they hypothesize different mechanisms, both perspectives emphasize the importance of investigating early life determinants of health.

Empirically, those experiencing socioeconomic disadvantage in childhood have worse adult health outcomes including increased risk of various disabling chronic diseases (Wannamethee, Whincup, Sharper, & Walker, 1996) and higher mortality rates (Davey Smith, Hart, Blane, Gillis, & Hawthorne, 1997). Childhood SES is also associated with low physical functioning at midlife (Guralnik, Butterworth, Wadsworth, & Kuh, 2006) as well as functional health trajectories (Haas, 2008). There is debate as to the relative influence of early life and adult SES. Some researchers suggest that the impact of childhood SES is limited to that of a determinant of more proximal adult SES (Marmot, Shipley, Brunner, & Hemingway, 2001). Others suggest that the impact of childhood and adult SES varies by underlying disease process (Davey Smith, Hart, Blane, & Hole, 1998).

There is also a growing body of research documenting the lingering impact of poor childhood health. Those who experience poor childhood health have increased risk of chronic disease and work-limiting disability (Blackwell, Hayward, & Crimmins, 2001; Colley, Douglas, & Reid, 1973; Haas, 2007; Kuh & Wadsworth, 1993; Luo & Waite, 2005). Evidence from the 1946 British cohort study links birth weight, physical growth, and cognitive development to physical performance in midlife (Kuh et al., 2002; Kuh et al., 2006). Childhood health has been shown to have significant impacts on trajectories of functional limitation in the USA (Haas, 2008).

Given the detrimental impact of poor childhood health and SES on adult health and large and persistent racial/ethnic disparities in exposure to early life socioeconomic disadvantage (Eggebeen & Lichter, 1991) and health insults (Hummer et al., 1999; Singh & Yu, 1995), there is substantial reason to suspect that early life inequalities may play an important role in generating racial/ethnic differentials in the onset and progression of functional limitation. Taylor (2008) draws on the concept of weathering from Geronimus, Bound, Waidmann, Colen, and Steffick (2001) and Geronimus, Hicken, Keene, and Bound (2006) to propose racial/ethnic minorities experience premature onset of chronic illness and more rapid deterioration of functional health due to their prolonged exposure to structural and material disadvantage. However, it is unclear how much of the impact of early life insults may be mediated by later life health and SES as little research in racial/ethnic disparities has examined the extent to which factors across the life course contribute to group differences in functional health trajectories. By exploring a wide array of early and later life influences on health, the current study seeks to provide a more robust understanding of the genesis of racial/ethnic differentials in functional health trajectories.

Research questions

Based on the preceding discussion we pose the following research questions. First, to what extent do racial/ethnic differences in functional health trajectories result from differences in childhood versus later life health and socioeconomic insults? Second, do racial/ethnic differences in functional health trajectories derive more from differential risk of onset of functional limitation or from differences in the rate of accumulation of additional limitations? Finally, do group differences in functional health trajectories result from differential exposure to various life course factors or from differences in the impact of those factors across groups?

Methods

Data

This analysis utilizes the RAND version of the Health and Retirement Study (HRS) (RAND, 2007). The HRS is an ongoing panel study of Americans begun in 1992 and designed to investigate economic and health transitions associated with retirement (Juster & Suzman, 1995). The original HRS cohort was composed of 12,652 individuals selected from a sample of housing units generated using a multi-stage, clustered area probability sample. In-home interviews were conducted at baseline and follow-up telephone interviews occur every second year. The HRS includes over-samples of Hispanics, Blacks, and Florida residents. We limit our analysis to the 10,843 respondents who were alive and participated in the 1998 wave during which information on childhood health and SES was collected. In addition, we excluded 649 cases that were not age-eligible in 1992 (not born 1931–1941), 120 cases that were missing information on racial/ethnic identification, and due to their small number 214 cases that were of other ethnicity. The final