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Race/ethnic differences in adult mortality: The role of perceived stress and health behaviors

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ABSTRACT

We examine the role of perceived stress and health behaviors (i.e., cigarette smoking, alcohol consumption, physical inactivity, sleep duration) in shaping differential mortality among whites, blacks, and Hispanics. We use data from the 1990 National Health Interview Survey ($N = 38{,}891$), a nationally representative sample of United States adults, to model prospective mortality through 2006. Our first aim examines whether unhealthy behaviors and perceived stress mediate race/ethnic disparities in mortality. The black disadvantage in mortality, relative to whites, closes after adjusting for socioeconomic status (SES), but re-emerges after adjusting for the lower smoking levels among blacks. After adjusting for SES, Hispanics have slightly lower mortality than whites; that advantage increases after adjusting for the greater physical inactivity among Hispanics, but closes after adjusting for their lower smoking levels. Perceived stress, sleep duration, and alcohol consumption do not mediate race/ethnic disparities in mortality. Our second aim tests competing hypotheses about race/ethnic differences in the relationships among unhealthy behaviors, perceived stress, and mortality. The social vulnerability hypothesis predicts that unhealthy behaviors and high stress levels will be more harmful for race/ethnic minorities. In contrast, the Blaxter (1990) hypothesis predicts that unhealthy lifestyles will be less harmful for disadvantaged groups. Consistent with the social vulnerability perspective, smoking is more harmful for blacks than for whites. But consistent with the Blaxter hypothesis, compared to whites, current smoking has a weaker relationship with mortality for Hispanics, and low or high levels of alcohol consumption, high levels of physical inactivity, and short or long sleep hours have weaker relationships with mortality for blacks.

Introduction

There are persistent race/ethnic differences in mortality in the U.S. Non-Hispanic whites (henceforth "whites") average longer lives than non-Hispanic blacks (henceforth "blacks"), and Hispanics have life expectancies that fall between those of blacks and whites (Hayward & Heron, 1999). Prior research emphasizes the importance of socioeconomic status (SES) for driving race/ethnic disparities in health (Bond Huie, Krueger, Rogers, & Hummer, 2003; Hayward, Crimmins, Miles, & Yang, 2000; Kahn & Fazio, 2005; Sudano & Baker, 2006), but has not systematically examined the role of perceived stress and health behaviors for shaping mortality disparities. Given that unhealthy behaviors account for about 40% of deaths each year (Mokdad, Marks, Stroup, & Gerberding, 2004) and perceived stress shapes the practice of health behaviors and is linked to mortality (Krueger & Chang, 2008; Nielsen, Kristensen, Schnohr, & Gronbaek, 2008), we examine the role of perceived stress and unhealthy behaviors in shaping race/ethnic disparities in mortality among U.S. adults.

Race/ethnicity, stress, and health behaviors

Our first aim is to examine whether perceived stress and health behaviors mediate race/ethnic differences in overall mortality. Race/ethnic differences in the distribution of perceived stress and health behaviors may partially explain mortality disparities. However, if some unhealthy behaviors or high perceived stress are

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more prevalent among whites, then adjusting for those variables could increase the observed mortality differences between blacks and Hispanics, compared to whites.

Some studies show that, compared to whites, non-whites report greater exposure to stressful life events (e.g., death of a parent, incarceration), chronic stressors, discrimination, and perceived stress (Cohen & Williamson, 1988; Kessler, Mickelson, & Williams, 1999; Turner & Avison, 2003). In contrast, Williams, Yu, Jackson, and Anderson (1997) find that blacks report fewer chronic stressors than whites, but higher levels of financial stress and stressful life events. But many studies of race/ethnic differences in stress do not generalize to the U.S. population because they use small, regional samples, or include restricted age ranges (e.g., Kessler et al., 1999; Turner & Avison, 2003; Williams et al., 1997).

Cigarette smoking accounts for over 300,000 deaths each year in the U.S. (Rogers, Hummer, Krueger, & Pampel, 2005). Throughout the 1970s and 1980s, blacks were less likely to smoke than whites, and when they did smoke, they typically smoked at lower levels and, among women, started at older ages (Geronimus, Neidert, & Bound, 1993; Sterling & Weinkam, 1989). By 1998, blacks and whites had similar rates of cigarette smoking, although Hispanics remained less likely than whites or blacks to smoke throughout that period (U.S. Department of Health and Human Services, 2000).

Physical inactivity is associated with increased risks of overall and cardiovascular disease mortality (Blair, Kohl, Gordon, & Paffenbarger, 1992). In 1997, 38% of whites undertook no leisure time physical activity, compared to over 50% of blacks and Hispanics, and only 15% of whites, 10% of blacks, and 11% of Hispanics attained the recommended levels of exercise (U.S. Department of Health and Human Services, 2000).

Alcohol consumption has a J-shaped relationship with mortality, with the lowest mortality among moderate drinkers, and increased mortality among those who abstain or drink heavily (Thun et al., 1997). The increased mortality among those who abstain persists even after adjusting for those who stopped drinking for health reasons (Krueger & Chang, 2008; Rogers, Hummer, & Nam, 2000). Moderate levels of alcohol consumption have been linked to reduced risks of stroke and coronary heart disease (Reynolds et al., 2003), although high levels of drinking have been linked to elevated mortality from external causes, cardiovascular disease, cirrhosis, and some cancers (Thun et al., 1997). Compared to whites, blacks and Hispanics are more likely to abstain, although blacks have the highest frequency of heavy drinking and Hispanics consume more alcohol than whites on days that they drink (Dawson, 1998).

Sleep duration has a U-shaped relationship with mortality; those who sleep 7–8 h per 24 h period have lower risks of death than those who sleep longer or shorter hours (Ferrie et al., 2007). Compared to whites, blacks and Hispanics are less likely to sleep 7–8 h, and are more likely to sleep longer or shorter hours (Krueger & Friedman, 2009).

Social vulnerability and Blaxter hypotheses: the role of race/ethnicity

Our second aim is to examine whether the relationships among perceived stress, health behaviors, and prospective mortality differ across race/ethnic groups. Compared to whites, blacks and Hispanics experience more discrimination, limited socioeconomic opportunities, and residence in segregated communities that are marked by high levels of poverty and crime (Kessler et al., 1999; Massey, 2004), more liquor stores and advertising for alcohol and tobacco, and less access to exercise facilities (Moore, Williams, & Qualls, 1996; Powell, Slater, Chaloupka, & Harper, 2006). Based on these differences in social disadvantage, we test competing hypotheses about race/ethnic differences in the relationships among unhealthy behaviors, perceived stress, and mortality.

The *social vulnerability hypothesis* predicts that that socially disadvantaged groups will be most vulnerable to the harms associated with unhealthy lifestyles (Krueger & Chang, 2008; Williams, 1997). Like those with low SES (Farmer & Ferraro, 2005; Pampel & Rogers, 2004), blacks and Hispanics experience numerous disadvantages that may threaten health, increase vulnerability to disease, and exacerbate the harms of unhealthy behaviors and high stress. The social vulnerability hypothesis predicts that the increased mortality associated with high perceived stress levels, current and former smoking, and physical inactivity will be more positive, and the convex relationships between mortality and alcohol consumption or sleep hours will be stronger for blacks and Hispanics than for whites.

The social vulnerability hypothesis also predicts that the combination of high stress and unhealthy behaviors will be particularly harmful for blacks and Hispanics. High stress levels and unhealthy behaviors can create a pernicious cycle; stress encourages unhealthy but soothing behaviors (Ng & Jeffery, 2003), while smoking, drinking, inadequate sleep, and physical inactivity can increase inflammation, anxiety, and other stress indicators (Friedman et al., 2005; Parrott, 1999; Salmon, 2001). This cycle may be especially harmful for blacks and Hispanics who might experience more numerous or severe stressors than whites (Kessler et al., 1999; Turner & Avison, 2003), but have fewer means for mitigating their stress (Thoits, 1995).

In contrast, the *Blaxter (1990) hypothesis* predicts that disadvantaged groups may have worse health than advantaged groups, but might be less vulnerable to the harms of unhealthy lifestyles. Although Blaxter (1990) focuses on socioeconomic disadvantage, her ideas may apply to race/ethnic disadvantage for four reasons. First, disadvantages including limited socioeconomic opportunities, segregation, discrimination, and few community resources for health promotion may have such a strong influence on mortality among blacks and Hispanics that unhealthy behaviors or high stress have little room to further diminish their survival. Second, to mitigate their disadvantage, some minority groups may be more likely than whites to access religious involvement, family support, or psychosocial resources that buffer them from the harms associated with unhealthy behaviors or stress (Williams, 1997).

Third, if blacks and Hispanics experience more stress than whites, they may habituate to that stress and ultimately be less affected than whites who experience stress only intermittently (Williams, 1997). Fourth, exposure to severe stressors (which may be most common among blacks and Hispanics) can encourage personal growth and positive psychosocial orientations, thereby buffering individuals from the harms of more routine stressors (Kessler, Galea, Jones, & Parker, 2006). The Blaxter hypothesis predicts that the relationship between mortality and perceived stress, current and former smoking, and physical inactivity will be less positive, and the convex relationships between mortality and alcohol consumption or sleep hours will be weaker (or even concave) for blacks and Hispanics than for whites.

The Blaxter hypothesis further predicts that the combination of stress and unhealthy behaviors will be less harmful for blacks and Hispanics than whites. Unhealthy behaviors undertaken in response to stress might allow some individuals to effectively cope with that stress (Salmon, 2001; Warburton, 1992). This might be especially true for race/ethnic minorities who face numerous insults to their health and have less to lose by participating in otherwise unhealthy behaviors, especially if they have few resources for directly addressing the sources of their stress (Thoits, 1995). In contrast, whites may occupy social positions that allow