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Is Discrimination an Equal Opportunity Risk? Racial Experiences, Socioeconomic Status, and Health Status among Black and White Adults

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Abstract

Using the 2004 Behavioral Risk Factor Surveillance System, we explore the relationship between racial awareness, perceived discrimination, and self-rated health among black ($n = 5{,}902$) and white ($n = 28{,}451$) adults. We find that adjusting for group differences in racial awareness and discrimination, in addition to socioeconomic status, explains the black-white gap in self-rated health. However, logistic regression models also find evidence for differential vulnerability among black and whites adults, based on socioeconomic status. While both groups are equally harmed by emotional and/or physical reactions to race-based treatment, the negative consequences of discriminatory experiences for black adults are exacerbated by their poorer socioeconomic standing. In contrast, the association between racial awareness and self-rated health is more sensitive to socioeconomic standing among whites. Poorer health is more likely to occur among whites when they reflect at least daily on their own racial status—but only when it happens in tandem with mid-range educational achievement, or among homemakers.

Keywords

discrimination, race, self-rated health, socioeconomic status

In the United States, racial and ethnic health disparities are long-standing and persistent, even in the face of dramatic improvements in medical, social, and environmental conditions over time. Consequently, eliminating disparities in health and mortality remains of paramount importance to public health officials and is a primary objective of the Healthy People 2010 agenda (U.S. Department of Health and Human Services 2000). However, while emblematic of social inequality at many levels, these patterns typically cannot be explained with simple adjustment for differences in the socioeconomic status position of blacks relative to whites. This leaves scholars searching for other ways to better capture the implications of minority status for health and well-being. This task includes understanding how discriminatory experiences shape health outcomes and disease patterns (Paradies 2006; Williams, Neighbors, and Jackson 2003), with a growing appreciation of their influence, to yield a better understanding of how group

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differences in health arise (Institute of Medicine [IOM] 2003; National Research Council 2004).

To better grasp the implications of minority status, our paper explores how experiences of interpersonal discrimination connect to disparities in self-rated health for black and white adults, using data drawn from the 2004 wave of the Behavioral Risk Factor Surveillance System. Black adults are exposed to more racially discriminatory treatment than whites, and this difference can play an important role in shaping group differences in health outcomes (e.g., Fujishiro 2009; Williams and Neighbors 2001). However, a substantial number of white adults also report racially discriminatory experiences (Kessler, Mickelson, and Williams 1999). Furthermore, while relatively small in comparison to blacks, whites who report racial bias may differ from blacks in ways that impact whether adjusting for these experiences can explain racial gaps in health. Given the centrality of socioeconomic status for health (Link and Phelan 1995) and the degree to which blacks and whites differ on this dimension, we also consider how socioeconomic status is related to reports of discrimination for blacks and whites, as whites who report bias appear to differ from blacks in their socioeconomic standing (Morris 2005; Moody-Ayers et al. 2005; Ren, Amick, and Williams 1999; Wray 2006).

Specifically, we investigate three research questions. First, can interpersonal discrimination, in addition to other health-related characteristics, explain the black-white gap in self-rated health? We introduce a model-building strategy that examines whether adjusting for discrimination explains differences in self-rated health between blacks and whites, independent of other conditions and behaviors that have well-established links to health, including socioeconomic status. Second, is the impact of interpersonal discrimination on health a race-specific phenomenon? Here we test whether reports of racial discrimination are equally harmful to self-rated health among white and black adults. Third, we explore whether the impact of discrimination on self-rated health varies by socioeconomic status by testing interactions between measures of both discrimination and socioeconomic status for predicting self-rated health, separately for black and white adults.

BACKGROUND

Self-rated health refers to an individual's general assessment of his/her own health status; it is a subjective measure, as no medical diagnosis is needed. However, self-rated health status, like many health measures, varies by race. In 2005, 14.3 percent of black adults reported that their health was fair or poor, compared to just 8.6 percent of white adults (National Center for Health Statistics 2007). While self-rated health does not measure a specific mental or physical health ailment, its global nature captures aspects of health that go beyond objective measures (e.g., personal knowledge of health symptoms and behaviors, outside of a physician's diagnosis or advice; past health problems; and beliefs regarding future likelihood of accessing medical care and advice, if needed). Studies consistently find self-rated health to be a strong, independent predictor of morbidity and mortality (see Idler and Benyamini 1997 for further discussion), highlighting the importance of understanding and reducing racial disparities in self-rated health among adults.

Past studies have examined a variety of potential explanations for the black-white gap in health status, especially socioeconomic status, which is often viewed as a "fundamental cause" of health outcomes (Link and Phelan 1995; Phelan et al. 2004). Racial groups in the United States tend to be strongly stratified along socioeconomic lines (DeNavas-Walt, Proctor, and Smith 2007), although studies show that while adjusting for socioeconomic status is important, it typically does not explain away the relationship between race and self-rated health (Borrell and Dallo 2008; Read and Gorman 2006; Ren and Amick 1996). Indeed, further adjustment for demographic characteristics, health behaviors, and physical health conditions often does not fully account for racial disparities in self-rated health status either (see discussion by Crimmins, Hayward, and Seeman 2004).

An emerging literature explores the health consequences of perceiving micro-level interactions as racially discriminatory (e.g., Brondolo et al. 2003; Krieger 2000; Paradies 2006; Schultz et al. 2000; Williams and Neighbors 2001; Williams et al. 1997), and several scholars argue that racial discrimination's impact on health can explain racial differences in health that socioeconomic status cannot (Krieger 2000; Williams and Neighbors 2001). Ultimately, perceiving interactions as racially charged or racially discriminatory may be the "missing link" in understanding race-based health disparities.

Race, Perceived Racial Discrimination, and Health

Many argue that interpersonal racial discrimination plays an important role in shaping health outcomes (e.g., Brondolo et al. 2003; Williams and

Williams-Morris 2000). According to Krieger (2000:40), "[Discrimination] refers to all means of expressing and institutionalizing social relationships of dominance and oppression," while Williams and Neighbors (2001:801) argue that racism, a form of oppression, refers to "an organized system based on an ideology of inferiority that disadvantages groups to be inferior compared to those presumed to be superior." Pager and Shepherd (2008) distinguish between these two terms, arguing that "discrimination" is distinctly behavioral, as opposed to "racism," which refers to ideologies of racial oppression. Following their logic, we apply the term "racial discrimination" to characterize racially charged encounters. In health disparities research, racial discrimination is conceptualized at both the macro- and micro-levels (e.g. Gee 2002). Macro-level or institutional-level bias results in limited access to social and economic resources (Krieger 2000), while micro-level or individual-level bias pertains to the quality of interpersonal interactions.

Studies tracking interpersonal discrimination based on race often rely on perceptions of unfair treatment (e.g., Feagin and Sykes 1994) in light of the precipitous decline in attitudes advocating overtly racist principles among Americans (Bobo 2001; Bonilla-Silva 2006). Perceptions of discriminatory treatment, particularly in organized settings, can influence one's health status through several pathways, the most prominent of which may be through restricted access to health-related resources (Brondolo et al. 2003; Jackson et al. 1996; Williams and Neighbors 2001). Racially discriminatory treatment while seeking health care can lead to lower quality (and perhaps even lower quantity) medical care (IOM 2003; Jackson et al. 1996; LaVeist, Rolley, and Diala 2003), and workplace discrimination has been shown to have a negative influence on health (Pavalko, Mossakowski, and Hamilton 2003).

Additionally, discrimination may harm health by operating as a stressor (Brondolo et al. 2003; Schnittker and McLeod 2005). The "weathering hypothesis" asserts that the stress caused by experiencing various forms of racial bias can weaken the body over time (Geronimus 1996; Geronimus et al. 2006), and Thoits (1991) argues that the relationship between disadvantaged status and poor mental health reflects the stress of heightened exposure to discrimination. Therefore, racialized treatment and the experience of race-based stress, either emotional or physical, are important components in understanding discrimination's health consequences. In addition, and following the stigma literature, understanding an encounter as discriminatory reflects awareness of a particular identity as socially stigmatized (see Link and Phelan 2001). Therefore, tracking exposure to the stress of racial discrimination relies on subjective or perceptual reports of experiences believed to be both "unfair" and reflective of race bias (National Research Council 2004).[1] Empirical evidence supports this connection, as perceived unfair treatment due to one's race is associated with health indicators that are stress sensitive, especially among African Americans, including psychological distress (Jackson et al. 1996; Kessler et al. 1999; Paradies 2006; Williams and Williams-Morris 2000), hypertension (Brondolo et al. 2003), and self-rated health (Harris et al. 2006; Paradies 2006; Ren et al. 1999; Schultz et al. 2000; Williams et al. 1997).

Racial Discrimination: The Key to Racial Gaps in Health?

Can accounting for perceived racial discrimination close race-based gaps in self-rated health? If so, this likely occurs through two routes. Discrimination may shape racial disparities in health because of differential exposure to discriminatory experiences, wherein heightened exposure among minorities depresses their health status relative to whites. Krieger and Sidney (1996) found that over half of black adults reported racial discrimination at work across a seven-year period, compared to less than 10 percent of whites. Similarly, Kessler et al. (1999) estimate that nearly 90 percent of black adults report racial discrimination during their lifetime, compared to only 20 percent of white adults. Indeed, research consistently shows that blacks report more racial bias than whites (Kessler et al. 1999; Krieger et al. 2005; Williams et al. 1997); however, it is not clear if adjusting for this exposure fully explains the observed health disparities.

Several studies of perceived racial discrimination focus exclusively on black samples, thereby providing no racial comparison (e.g., Williams and Williams-Morris 2000; Williams and Neighbors 2001); however, Krieger and Sidney (1996) report narrower racial differences in blood pressure once socioeconomic status and exposure to unfair treatment are considered. Meanwhile, Williams et al. (1997) and Kessler et al. (1999) find that racial differences in psychological well-being remain (and in some cases increase) with adjustment for discrimination. Findings are similarly inconclusive for global health indicators, such as self-rated health. Williams and colleagues (1997), using data from the Detroit Area Study, find that simultaneous adjustment for discrimination and measures of socioeconomic status closes the black-white gap in self-rated health. However, focusing on an exclusively female sample,

Schultz et al. (2000) find that reports of unfair treatment, while associated with lower levels of self-rated health, only partially explain the black-white gap.

In addition, discrimination may influence health disparities because of differential vulnerability, whereby perceived discrimination is more detrimental to the health of certain minorities due to their heightened vulnerability to poor health on other health-related dimensions (e.g., lower socioeconomic status, higher general stress levels). While less tested than the differential exposure argument, there are reasons to suspect that differential vulnerability may also be operating. Although substantially lower than the rate for blacks, estimates of lifetime prevalence of unfair treatment due to one's race for whites are not trivial, ranging from 20 to 30 percent (Kessler et al. 1999; Krieger et al. 2005). However, findings to date are mixed regarding any race-specific health effects for discrimination. Pavalko and colleagues (2003) find that discrimination taxes the physical health of white and black females, with no evidence that the influence is exceptionally greater for blacks. Similarly, Fujishiro (2009) finds that among working adults, irrespective of racial group, reporting worse treatment than other races at work is associated with poorer health; however, reporting better treatment than other races at work also corresponds to worse health among whites. In addition, Williams and colleagues (1997) show a stronger negative impact of racial discrimination on mental health for whites than for blacks. Thus, while adjustment for discrimination may narrow the black-white health gap, the associated health costs for the relatively small number of whites who report bias may be equivalent, or even greater, than those which are experienced by blacks.

While the influence of unfair treatment on health is fairly well-documented, there has been virtually no attention paid to how awareness or sensitivity to race and racial identity may impact health. Given the difference in reports of discrimination between blacks and whites, awareness of race may affect the likelihood of understanding an interaction as reflective of racial dynamics. Theorists of the social construction of race argue that what distinguishes whites from blacks is not only their experience with racial bias but also the capacity to understand race as central to their experience (Frankenberg 1993). Core to the notion of "white privilege" is the freedom to not understand one's race as important to one's personal experiences (Bonilla-Silva 2006; Frankenberg 1993; Hartmann, Gerteis, and Croll 2009). By contrast, non-whites remain highly conscious of their racial background, both as an identity and as a stigmatizing characteristic (Feagin and Sykes 1994). Therefore, we argue that assessing the relationship between discrimination and health for blacks and whites requires attention not only to reports of unfair treatment and reactions to race-based treatment but also to awareness of their own race as an important facet of racial identity.

Racial Experiences and Socioeconomic Status

We also explore whether the relationship between discrimination and health operates independently of socioeconomic status for both black and white adults. This focus is appropriate since discrimination is often manifested through the withholding of some financial resource, thereby intertwining it with class status and poverty. We might expect that the effects of perceived discrimination will be mediated by socioeconomic position, but this would presume a heightened frequency of perceived racist treatment among those at the lower end of the economic ladder. However, in-depth investigations of prejudice have focused on blacks in professional settings—settings that would seemingly be free of "unfair treatment" (Feagin and Sykes 1994). In turn, several health studies report that minorities of higher incomes and education report more racist treatment than their working-class counterparts (Kessler et al. 1999; Moody-Ayers et al. 2005; Ren et al. 1999). While this may reflect a higher propensity toward reporting racist treatment among those of higher socioeconomic status as opposed to actual frequency (Krieger 2000; Krieger and Sidney 1996), it also strongly suggests that experiences of racial prejudice do not end because one has moved up the socioeconomic ladder. Among whites, research has explored how racial stigma is a class-dependent phenomenon, as the notion of "poor white trash" draws on a long history of viewing whiteness as antithetical to poverty. Authors such as Wray (2006) and Morris (2005) examine the development of this perception over time and interpret it as an example of race-based treatment that is similar to biases that racial minorities face.

The implications for health are such that perceived discrimination may dampen the protective benefits conferred by economic advantage, particularly if perceived discrimination is actually more common among those of higher socioeconomic standing—as it appears to be among blacks. For whites, discriminatory experiences may be most prominent among those of lower socioeconomic standing, suggesting that perceived discrimination may exacerbate the negative health effects of poverty and economic distress for whites. Subsequently, the notion that accounting for experiences of unfair treatment can simply close residual racial disparities in health requires that researchers examine whether and how perceived discrimination interacts with socioeconomic status.

DATA AND METHODS

Data

Our analysis of racial background, racial experiences and discrimination, and self-rated health is based on data from the 2004 wave of the Behavioral Risk Factor Surveillance System, an ongoing collaborative project between U.S. states and territories and the U.S. Centers for Disease Control and Prevention. The Behavioral Risk Factor Surveillance System is designed to assess behavioral risk factors and preventive health practices that are linked to chronic diseases, injuries, and preventable infectious diseases in the adult population (aged 18 and older). Households with telephones in each state were selected via a disproportionate stratified sample design, based on areas with a high or low density of telephone numbers. Respondents were then selected based on a random sample of one adult per household.

We utilized information from two parts of the Behavioral Risk Factor Surveillance System questionnaire: the core component and optional modules. The core component asks a standard set of questions to respondents in all U.S. states and territories and includes demographic measures in addition to current health-related perceptions, conditions, and behaviors. The optional modules are sets of questions focused on specific topics that states can elect to use in their questionnaires. Twenty optional modules were included in the 2004 Behavioral Risk Factor Surveillance System, and we utilize information from the "reactions to race" module. We draw on questions regarding treatment in the workplace, treatment in a health care setting, and whether respondents have had physical or emotional reactions due to race-based treatment. Seven states and one city asked these questions in 2004—including Arkansas, Colorado, Delaware, Mississippi, Rhode Island, South Carolina, Wisconsin, and Washington, D.C.—totaling 37,985 respondents. This geographic coverage limits the generalizability of our findings as five of these areas exist in the South and have black populations that proportionately exceed the national average of 12.1 percent (ranging from 15 percent in Arkansas to 53 percent in Washington, D.C.),[2] while the data do not include respondents from cities with high concentrations of black populations (e.g., Los Angeles, Detroit). Readers need to keep this geographic limitation in mind when interpreting our study findings, and we elaborate on its potential meaning in the conclusion of the paper.

We limited this sample based on two criteria. First, we restricted the sample to non-Hispanic white and black adults ($n = 34{,}446$), since these were the two racial groups large enough to support a stratified analysis.[3] Second, we deleted a small number of missing cases on our outcome measure, self-rated health ($n = 34{,}353$).[4] We ran all analyses using the STATA software package. We utilized Taylor-series-approximate methods with SVY commands to adjust for the complex sample design of the data. All analyses in this paper are also weighted with the final sampling weight, and regression models control for state of residence, given that this analysis includes respondents living in only seven U.S. states and one large city.

Measures

Our main outcome measure in this paper is self-rated health. All respondents were asked to rate their general health on a five-point scale, where 1 = *poor*, 2 = *fair*, 3 = *good*, 4 = *very good*, and 5 = *excellent*. We recode this measure into two categories that contrast bad health (1 = *poor or fair self-rated health*) against good health (0 = *good, very good, or excellent health*). We utilize this dichotomous version so we can examine the conditions that result in the most problematic outcome from a health standpoint—and this is especially relevant for understanding racial disparities, given the higher burden of health problems and conditions among black adults in the United States.

Our main independent measures of interest are a dichotomous measure of racial identity (where 1 = *black* and 0 = *white*), along with three measures that tap aspects of respondents' experiences with discrimination and racial awareness. To capture perceptions of discriminatory treatment, we construct a dichotomous measure that captures whether respondents feel they have been treated worse than members of other racial groups at work or when seeking health care (1 = *yes*, 0 = *no*) in the past 30 days. To capture reactions to discrimination, we create a dichotomous measure of respondents' emotional and physical reactions to race-based treatment during the last 30 days, based on whether they felt emotionally upset because of how they were treated or whether they experienced any physical symptoms (e.g., headache, upset stomach, pounding heart) as a result of how they were treated, based on their race (1 = *yes*, 0 = *no*). We also include one measure of how often respondents think about their own race, where 1 = *at least once a day* and 0 = *less than once a day*. While this does not tap exposure to unfair treatment per se, it is an indicator of consciousness or self-awareness of race and thus provides a rough approximation of how frequently the respondent reflects on his/her racial identity.[5]

Our control measures are clustered into four groups (see Table 1 for detailed categories): demographic characteristics (gender, age, household composition, and marital status), socioeconomic status (completed education, annual household income, employment status, and medical care access[6]), health behaviors (smoking and drinking status, body mass index, and frequency of physical exercise), and two measures of health problems (asthma and diabetes) that vary strongly between black and white adults and likely contribute to racial disparities in self-rated health.

RESULTS

Descriptive Statistics

Table 1 presents sample characteristics, stratified by race. Looking at the first row, we see that significantly fewer white than black adults report poor-to-fair self-rated health (14.0 percent vs. 22.7 percent, respectively). Although these rates are somewhat higher than estimates derived from national samples (see National Center for Health Statistics 2007), the racial disparity in self-rated health is similar to what occurs nationwide.

In terms of racial awareness and discrimination, Table 1 shows strong differences between black and white adults. Not surprisingly, blacks report that they think about their race significantly more often than do whites, and a greater proportion believes they have been treated more poorly than other racial groups. Overall, 3.7 percent of white adults report that they have been treated worse when seeking health care or at work, compared to 18.5 percent of black adults. A similar proportion of black (18.4 percent) and white (3.9 percent) adults report that they had a physical and/or emotional reaction to race-based treatment last month.

For the remaining measures in Table 1, the patterns reflect known disparities between blacks and whites. White adults are significantly more likely to be married, but a lower proportion report having children living in their household. Whites are also on firmer economic footing, as they report significantly higher education levels and greater household income, and about half as many whites as blacks report that they both lacked medical insurance and had skipped a medical visit in the last year because of the cost (4.8 percent vs. 9.7 percent, respectively). While blacks report higher rates of health problems, the pattern of health behaviors is more mixed. White adults report significantly more exercise and low levels of obesity, but black adults report significantly less heavy drinking and daily smoking.

Self-Rated Health Models, Pooled Black and White Sample

In Table 2, we examine whether adjusting for racial awareness and discriminatory experiences can reduce racial disparities in poor-to-fair self-rated health. Model 1 shows that, after adjusting for the different age and gender structures of the two groups (see Table 1), black adults are 1.96 times as likely to report poor-to-fair self-rated health compared to white adults. In Model 2, we add measures of racial discrimination and awareness and show that perceiving worse treatment at a doctor's office and/or at work (odds ratio [OR] = 1.47) and having a negative emotional and/or physical reaction to perceived race-based treatment (OR = 2.02) significantly increase the odds of reporting poor-to-fair self-rated health. Despite this, self-rated health is not sensitive to how often one thinks about his or her own race (OR = 1.05). However, while somewhat reduced, the odds ratio for blacks remains significant (OR =

Table 1. Sample Characteristics, Percentages, and Means (Standard Deviations)

	White	Black
Dependent measure		
Poor-to-fair self-rated health	14.0	22.7***
Racial awareness and discrimination		
Thinks about own race at least once a day	4.9	29.9***
Compared to other races, treated worse at doctor office and/or work	3.7	18.5***
Any emotional upset and/or physical symptoms due to race-based treatment	3.9	18.4***
Demographic measures		
Age, mean (*SD*)	50.9 (16.9)	46.5 (16.3)***
Female	52.2	56.4***
Marital status		
Married	64.5	37.2***
Divorced or separated	10.2	17.2***
Widowed	7.0	8.4**
Never married	18.3	37.0***
Other adults in household		
None	17.2	25.2 ***
One	62.5	45.1***
Two or more	20.2	29.7***
Any children in household	37.3	49.1***
Socioeconomic measures		
Completed education		
<High school	7.7	18.4***
High school graduate	31.5	36.9***
Some college	26.9	25.4
College graduate	33.9	19.2***
Annual household income		
<$25,000	20.0	52.4***
$25,000–$49,999	40.5	32.5***
$50,000–$74,999	17.6	8.4***
$75,000 and above	21.9	6.7***
Employment status		
Employed	62.3	56.2***
Unemployed	5.0	9.7***
Homemaker	6.1	3.6***
Student	3.6	6.2***
Retired	18.2	13.2***
Unable to work	4.8	11.1***
Medical care access		
Uninsured and missed doctor visit last year because of financial cost	4.8	9.7***
Either uninsured or missed doctor last year visit because of cost	12.9	24.3***
Insured and never missed doctor visit last year because of cost	82.3	66.0***
Has one person regarded as their personal doctor	84.2	77.6***

(continued)

Table 1. (continued)

	White	Black
Health behaviors		
Smoking status		
Non-smoker	51.9	63.6***
Former smoker	26.1	14.3***
Smokes on some days	5.3	7.6***
Smokes every day	16.7	14.5***
Heavy drinker[a]	5.8	3.2***
Body Mass Index[b]		
Normal	41.0	27.8***
Overweight	39.0	37.4
Obese	20.1	34.8***
Any exercise last month	80.1	67.7***
Health problems		
Asthma	7.9	9.5*
Diabetes	7.2	12.4***
Sample Size	28,451	5,902

[a]Defined as men who drink more than two drinks per day and women who drink more than one drink per day.
[b]Distinguishes individuals who are neither overweight nor obese (which we refer to as "normal" weight) from adults who are overweight and adults who are obese (see World Health Organization 1995).
*$p < .05$. **$p < .01$. ***$p < .001$ (two-tailed *t*-test, relative to white adults).

1.68). In Model 3, we evaluate the mediating role of socioeconomic status by adding these measures to Model 1. As a result, the odds ratio for blacks decreases to 1.15, though the differential is still statistically significant from whites at $p < .05$.

Model 4, however, shows that adjusting for socioeconomic status, in addition to racial discrimination, explains away the remaining racial disparity in self-rated health, as the odds ratio for race loses significance and drops to near one (OR = 1.04). Model 4 also shows that adjusting for socioeconomic status results in only a modest reduction in the odds ratios for both discrimination measures, indicating mostly independent effects of these measures with socioeconomic status. Finally, in Model 5, we adjust for demographic characteristics, health behaviors, and health problems, all of which have little influence on the effect of race, discrimination, or socioeconomic status on poor-to-fair self-rated health. Overall, Table 2 shows that the black-white difference in self-rated health is due to group differences in both discriminatory experiences and socioeconomic status. It also demonstrates that even with adjustments for control measures, adults who perceive worse treatment on the basis of race at their doctor's office and/or at their place of employment remain 44 percent more likely to report poor-to-fair health, while those who report being emotionally and/or physically upset because of race-based treatment remain 64 percent more likely to report poor-to-fair health.

Race-Stratified Self-Rated Health Models

Table 3 estimates logistic regression models that regress poor-to-fair self-rated health on measures of racial awareness and discrimination, separately for black and white adults. Because of space considerations, we do not replicate the full model-building sequence detailed in Table 2, and we do not present findings for control measures (although they operate in a similar manner to the patterns seen in Table 2; findings available from the authors upon request). In Model 1, each measure of racial awareness and discrimination significantly predicts poor-to-fair self-rated health among whites, while the only measure to significantly predict poor-to-fair self-rated health among blacks is whether they report feeling upset and/or experiencing physical symptoms due to poor treatment because of their race. In order to confirm differences between black and white adults, we conducted additional testing of the equality of

Table 2. Odds Ratios from Logistic Regression Models: Poor-to-Fair Self-Rated Health among Adults (n = 34,353)

	Model 1	Model 2	Model 3	Model 4	Model 5
Age	1.04***	1.04***	1.04***	1.04***	1.04***
Female	1.12***	1.13**	.89*	.90*	.97
Black	1.96***	1.68***	1.15*	1.04	.96
Racial awareness and discrimination					
Thinks about own race at least once a day		1.05		.99	1.00
Treated worse than other races at doctor office and/or work		1.47***		1.55***	1.44***
Emotional upset and/or physical symptoms due to race treatment		2.02***		1.64***	1.66***
Socioeconomic measures					
Completed education (reference: <HS)					
High school graduate			.64***	.63***	.68***
Some college			.55***	.55***	.63***
College graduate			.34***	.34***	.45***
Annual household income (reference: <$25,000)					
$25,000–$49,999			.64***	.64***	.68***
$50,000–$74,999			.51***	.51***	.57***
$75,000 and above			.37***	.37***	.44***
Employment status (reference: employed)					.
Unemployed			1.54***	1.52***	1.53***
Homemaker			1.36**	1.40***	1.61***
Student			2.54***	2.58***	2.59***
Retired			1.27***	1.31**	1.42***
Unable to work			8.82***	8.93***	7.56***
Medical care access (reference: insured + never missed)					
Either uninsured or missed doc because of cost			.73**	.76**	.77*
Uninsured and missed doctor because of cost			.40***	.44***	.49***
Has a personal doctor			1.44***	1.44***	1.31**
Demographic Measures					
Marital status (reference: married)					
Divorced or separated					1.17
Widowed					.99
Never married					1.09
Other adults in household (reference: none)					
One					1.06
Two or more					1.13
Any children in household					.86*
Health behaviors					
Smoking status (reference: non-smoker)					
Former smoker					1.24***
Smokes on some days					1.41**
Smokes every day					1.82***

(continued)

Table 2. (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5
Heavy drinker					.93
Body Mass Index (reference: normal)					
Overweight					1.10
Obese					1.70***
Any exercise					.52***
Health problems					
Asthma					1.93***
Diabetes					3.15***
Pseudo R^2	.09	.10	.21	.22	.27

Note: All models adjust for state of residence.
*$p < .05$. **$p < .01$. ***$p < .001$ (two-tailed *t*-test).

Table 3. Odds Ratios from Logistic Regression Models: Poor-to-Fair Self-Rated Health, by Race

	Model 1		Model 2	
	Black	White	Black	White
Racial experiences and discrimination				
Thinks about own race at least once a day	.87	1.35**[a]	.89	1.13
Treated worse than other races at doctor office and/or work	1.11	1.89***[a]	1.19	1.63***[a]
Emotional upset and/or physical symptoms due to race treatment	1.88***	2.16***	1.70***	1.60**
Pseudo R^2	.11	.09	.24	.28

Notes: Model 1 is equivalent to Model 2 in Table 2 (minus racial identity). Model 2 is equivalent to Model 5 in Table 2 (minus racial identity). Sample size: black = 5,902; white = 28,451.
[a]Odds ratio in the corresponding model for black adults differs significantly from the odds ratio for white adults, $p < .05$.
*$p < .05$. **$p < .01$. ***$p < .001$ (two-tailed *t*-test).

coefficients across models (Clogg, Petkova, and Haritou 1995). These tests indicate that for two measures—thinking about one's race daily and perceiving worse treatment than other races at a doctor's office and/or at work—the odds ratios for whites are significantly greater than for blacks.

Model 1 shows that thinking about one's race at least daily is significantly associated with the health of whites (OR = 1.35) but has a null relationship to the health of blacks (OR = 0.87). Perceiving worse treatment at work and/or a doctor's office relative to other races is even more strongly associated with poor-to-fair self-rated health for whites (OR = 1.89) but has no significant relationship to self-rated health among blacks (OR = 1.10). However, additional testing (not shown) indicates that this measure was a significant, positive predictor of poor-to-fair self-rated health among blacks prior to adjustment for emotional/physical reactions to race-based treatment. Indeed, Table 3 illustrates that strong health consequences are associated with reporting an emotional or physical reaction to perceived discrimination, which significantly heightens the odds of reporting poor-to-fair self-rated health for both white and black adults (OR = 2.16 and 1.88, respectively).

In Model 2, we control for all measures listed in Table 1, and we see substantial reductions in the significance of racial experiences for poor-to-fair self-rated health among white adults. Additional modeling (not shown) indicates that adjustment for socioeconomic status measures is primarily responsible for the reductions we see when comparing Model 2

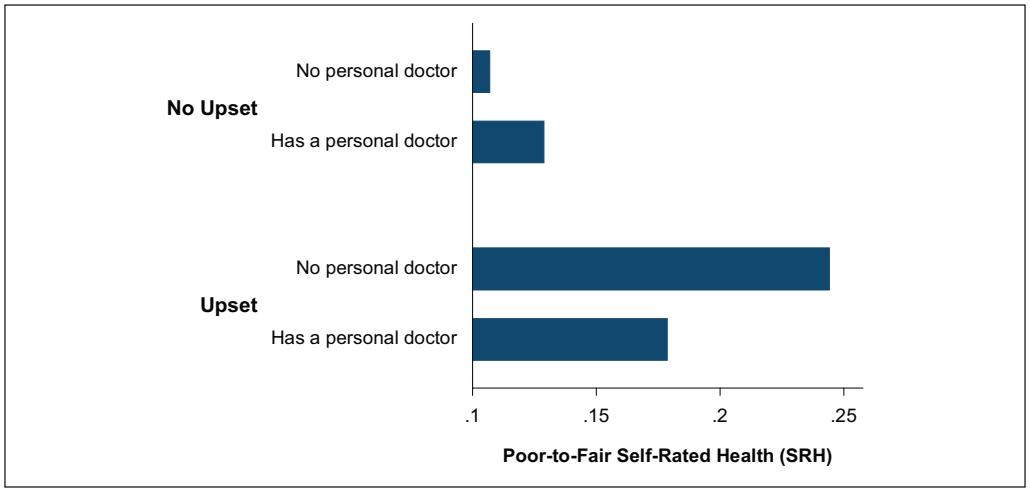

Figure 1. Probability of Poor-to-Fair SRH among Blacks by Emotional/Physical Upset to Race Treatment and Has a Personal Doctor
Note: Adjusted for all measures listed in Table 1.

to Model 1. For white adults, racial awareness is no longer significantly related to self-rated health (OR = 1.13), and the odds ratio for perceiving worse treatment at work and/or a doctor's office declines in size but remains a significant predictor of self-rated health (OR = 1.63)—and additional testing shows that this effect is still significantly greater than the nonsignificant effect for blacks. In addition, for both white and black adults, reports of being emotionally upset and/or experiencing physical symptoms because of race-based treatment remain significantly associated with poor-to-fair self-rated health in Model 2 (OR = 1.70 and 1.60 for black and white adults, respectively). These patterns highlight both the similar and differing manners in which perceived racial discrimination may shape self-rated health among blacks and whites, and the role that socioeconomic status plays in this process, especially for whites.

Interactions between Racial Discrimination/Awareness and Socioeconomic Status

Thus far, we have established that the relationship between race, racial discrimination, and health is a complex one, shaped strongly by socioeconomic status. As a final step, we aim to unpack the role of socioeconomic status by investigating whether the influence of racial awareness and discrimination on self-rated health differs by socioeconomic status, separately for black and white adults. In models not shown, we tested for significant interaction terms between each measure of racial discrimination/awareness and each measure of socioeconomic status by first adding each interaction term, one at a time, to Model 2 in Table 3. We added all significant interaction terms to the model as a group, and we discuss those that remained statistically significant and improved the model fit (see Hosmer and Lemeshow 2000). Testing revealed one significant interaction for black adults (between reporting an emotional and/or physical reaction to race-based treatment and whether they have a personal doctor) and two for white adults (between thinking about one's race daily and education level, and also with employment status). Due to space limitations, we do not present these models in tabular form (analyses available upon request); instead, we graph interactions with predicted probabilities in Figures 1, 2, and 3. Overall, they reveal a pattern that is consistent with the findings described in our additive models.

For black adults, Figure 1 shows that lacking a personal medical doctor is associated with heightened odds of reporting poor-to-fair self-rated health—but only among adults who became emotionally upset and/or experienced physical symptoms because of race-based treatment during the last month. After adjusting for controls and other aspects of discrimination and socioeconomic status, Figure 1 shows that nearly 1 in 4 blacks who report emotional and/

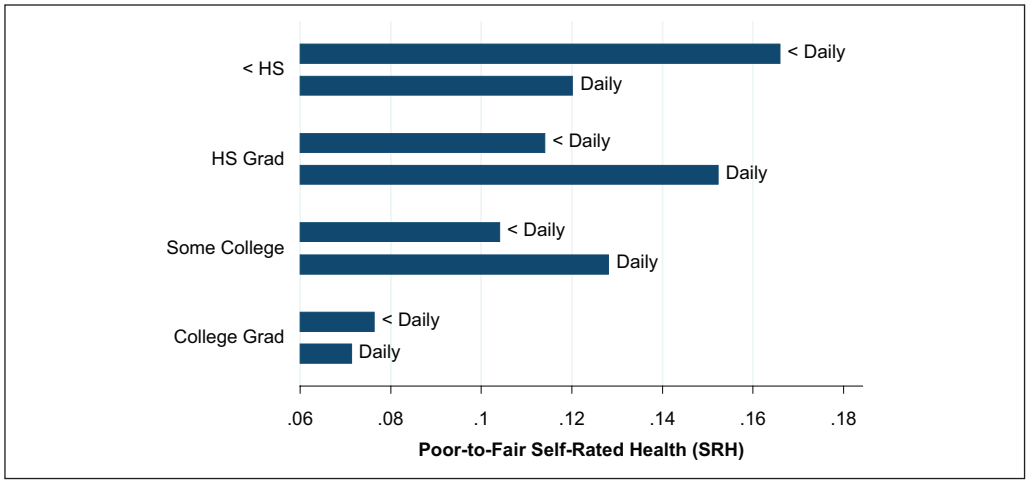

Figure 2. Probability of Poor-to-Fair SRH among Whites by Frequency of Thinking about Own Race and Education Level
Note: Adjusted for all measures listed in Table 1.

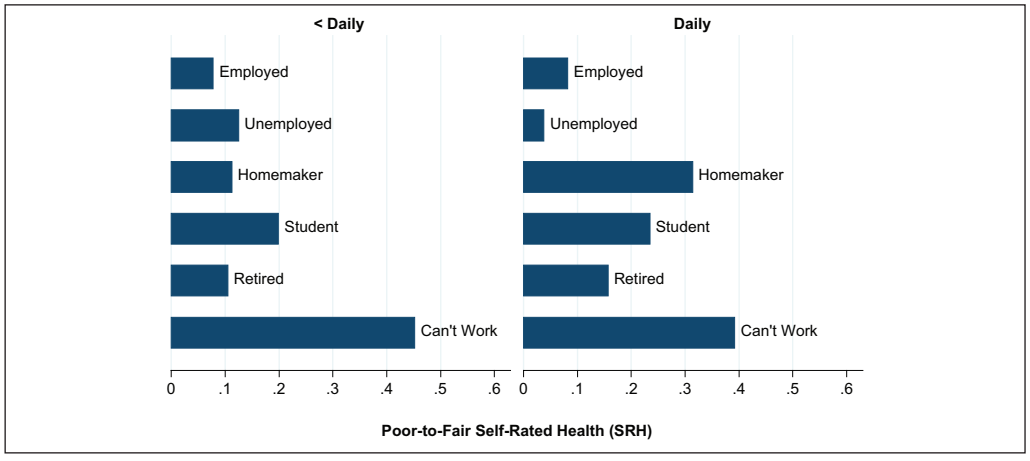

Figure 3. Probability of Poor-to-Fair SRH among Whites by Frequency of Thinking About Own Race and Employment Status
Note: Adjusted for all measures listed in Table 1.

or physical upset report their health as poor-to-fair if they have no personal doctor, compared to only 18 percent of those with a personal doctor. However, among black adults who report not having been emotionally or physically upset in the last 30 days, less than 15 percent report that their health is poor-to-fair, regardless of having a personal doctor. Self-rated health appears less sensitive to whether or not they have a personal doctor (although interestingly, the probability of reporting poor-to-fair self-rated health is slightly higher among adults with a personal doctor than those without).

In Figure 2, we see how the relationship between racial self-awareness and poor-to-fair self-rated health differs by education level among white adults, after adjusting for control measures. We find that socio-economic status shapes the effect of racial self-awareness. Among white adults who did not graduate from high school, the probability of reporting poor-to-fair health is almost 17 percent if respondents also report that they think about their own race less than once a day, compared to 12 percent of similar adults who think about their race more often. However, for adults who only graduated from high school or who

also have some college experience, we see the opposite relationship: The probability of reporting poor-to-fair health is higher among adults who also report that they think about their race at least daily. Yet, among white adults with at least a Bachelor's degree, racial awareness does not significantly differentiate self-rated health status, as both groups of adults experience only a 7 to 8 percent adjusted probability of reporting poor-to-fair health.

Last, Figure 3 indicates that the association between employment status and poor-to-fair self-rated health differs significantly by the frequency with which white adults think about their racial identity. For only two groups—the unemployed and homemakers—self-rated health status varies by racial awareness, but the direction of effect differs. Among the unemployed, thinking about one's race daily results in half the probability of poor self-rated health, compared to unemployed whites who think about their race less than daily. However, among homemakers, thinking about one's race daily corresponds to worse health, as the probability of reporting poor-to-fair health is about three times higher among adults who report that they think about their race at least daily, compared to less. Taken together, these findings suggest that racial awareness for whites is neither consistently damaging nor protective for self-assessments of physical health across the socioeconomic status spectrum, as some statuses show improved health, and others worse, with daily self-reflection on race. For blacks, on the other hand, the only significant interaction does show that racial discrimination corresponds to far worse health for those without resources. We discuss potential interpretations of this and other findings in the concluding section below.

CONCLUSIONS

In this study, we explored the relationship between racial awareness, perceived discrimination, and self-rated health for black and white adults. The results reveal several notable patterns. First, measures of perceived discrimination show independent associations to self-rated health, adding support to other studies that argue for its relevance, independent of social class position, for assessing racial gaps in health between blacks and whites (Paradies 2006; Ren et al. 1999; Schultz et al. 2000; Williams et al. 1997). That said, our findings also illustrate the prominent role that socioeconomic status plays in shaping the relationship between race-based treatment and self-rated health status; indeed, the influence of race on health is reduced more with adjustment for socioeconomic status than for measures of racial awareness and discrimination. However, it is only by adjusting for socioeconomic status and perceived discrimination that black-white gaps in self-rated health are reduced to non-significance. Apparently, racial disparities in health are shaped in part by the differential exposure of minorities to the harmful effects of racial discrimination.

Second, we find that racial disparities in health are also shaped by differential vulnerability to poor health status, based on socioeconomic status. In Table 3, we show that the health burden of reporting physical or emotional symptoms due to race-based treatment is statistically equivalent for whites and blacks, holding socioeconomic status constant. However, further analyses revealed that among blacks, this link is strongest for those lacking a personal doctor (see Figure 1). Furthermore, and notably, reporting these symptoms corresponds to such poor health status that those with a personal doctor who also report symptoms actually rate their health worse than those who report no symptoms and have no personal doctor. In other words, black adults report poorer self-rated health as a result of lacking a personal doctor only when it occurs in tandem with recently experiencing an emotional and/or physical reaction to perceived race-based treatment—indicating that perceiving discrimination exacerbates some of the socioeconomic status-based health risks for black adults in our sample.

For white adults, our additive models show that exposure to unfair treatment in an organized setting (i.e., workplace or healthcare environments) exacts a greater health tax on the small number of whites who report this experience, relative to blacks and independent of social class position. However, for racial awareness, we find substantial evidence of a moderating effect of socioeconomic status for whites, with null effects for blacks. While the main effect of racial awareness on self-rated health for whites was removed with adjustment for socioeconomic status in Table 3, Figures 2 and 3 indicate that its effect on the perceived health of white adults actually varies, depending on a respondent's education and employment status.

These findings have several important implications. First, they highlight the need to focus on a

variety of measures of racial discrimination when examining racial health disparities (National Research Council 2004). While research has documented the health consequences of unfair treatment at work (Kessler et al. 1999; Pavalko et al. 2003) and in health care settings (Malat and Hamilton 2006; Stepanikova et al. 2006), our models highlight the negative health impact of physical symptoms or feeling emotionally upset because of race-based treatment. The influence of symptoms linked to discrimination may point to the absence of coping resources that otherwise manage the stress of unfair treatment (Thoits 1991). For example, Krieger and Sidney (1996) find that African American women who react actively to discrimination, as opposed to passively accepting or denying the experience, have lower rates of hypertension. Physical or emotional upset may also reflect the health consequences of cumulative experiences of discrimination, which has been conceptualized as creating a slow deterioration in health that shapes the more disadvantaged health trajectory of blacks when compared to whites (Geronimus 1996). Longitudinal study designs are needed to fully test this process across an array of measures of discrimination.

Another implication is the need to examine how the relationship between racial self-awareness and perceived discrimination, and health emerges for whites, while furthering our understanding of perceived discrimination for blacks. In an analysis of unfair treatment at work, also using the 2004 Behavioral Risk Factor Surveillance System, Fujishiro (2009) shows that perceived racial privilege (i.e., better treatment than other races) and racial discrimination are associated with poor health among employed white adults, while only the latter impacts health for employed blacks and Hispanics. Our findings (gleaned from a sample of working and non-working adults) suggest that racial awareness among whites, in addition to poor treatment, corresponds to worse health, with racial awareness being more costly at certain levels of education and employment (i.e., having a high school or some college [no degree] education, being a homemaker) and protective for health at other levels (i.e., having less than high school degree, being unemployed).

Unpacking this relationship is difficult as we can only speculate the substance of thoughts about race or interactions that are perceived as discriminatory. For blacks, thoughts about race show a null relationship to health because they may constitute both the benefits of being a part of a community as well as the costs of racism (Broman, Neighbors, and Jackson 1988). Whites, by contrast, likely do not draw on notions of "culture" and "history" when thinking of their race (Perry 2002) and instead may equate thoughts about race with being marginalized. Similarly, perceiving discrimination for whites may arise in the face of heightened interracial contact where interactions that reflect class disadvantages may also be understood as racially charged. Morris (2005) argues that the unique status of poor whites as "trailer trash" has implications for how whites and blacks perceive this population. Racial awareness may enhance the stress of these class disadvantages (e.g., having less than a college education) or buffer against their impact if it allows these adults to externalize their locus of control by attributing certain disadvantages, like being unemployed, to the notion that one is discriminated against because one is white as opposed to unemployable.

The limited geographic scope of our seven states plus one city study raises some important questions on how a more nationally representative sample might influence the patterns we find. Geographic characteristics that shape racial attitudes, such as proportionate size of the black population (Fossett and Kielcolt 1989) and region of the country (Bobo 2001), may be meaningful to analyses of the health consequences of racial discrimination as well. As stated above, this survey does cover parts of the nation with sizable black populations, particularly those living within the South, where racial antagonisms are historically present (Bobo 2001). However, other areas, particularly those with large concentrations of African Americans in persistently racially segregated metropolitan areas (e.g., New York, Detroit), may show that we have underestimated reported levels of unfair treatment to some extent. While these data provide important insight into racial health disparities, they need replication at the national level.

Finally, future research should consider how other social dimensions might influence the health costs of racial discrimination. Future investigations may explore whether vulnerability or exposure to racial discrimination varies by gender or age. Gender stands as one of the most powerful stratifying elements in health experiences, regardless of racial/ethnic group (e.g., Read and Gorman 2006). Several studies on discrimination have focused on women-only samples (e.g., Krieger and Sidney 1996; Pavalko et al. 2003;

Schultz et al. 2000), but few studies have examined either the "double burden" of race and gender bias or explored whether the health costs of racial discrimination are intensified depending on gender. Similarly, shifts in racial attitudes across time (Bobo 2001) may produce a heightened health burden for those who came of age during the civil rights era (i.e., 1950s–1960s), as they bear the brunt of a culmination of discriminatory experiences that compound the age-related deterioration of health.

In sum, we find support for the argument that racial awareness and discrimination are relevant for health disparities because of the differential exposure of black adults to these experiences, as well as the differential vulnerability of blacks to unfair treatment, and the differential vulnerability of whites to both racial awareness and unfair treatment, based on socioeconomic status. In particular, the sensitivity of these relationships to socioeconomic status differences between black and white adults shows that the health consequences of racial discrimination and awareness can be understood only with simultaneous consideration of how these experiences can also be shaped, sometimes differently, by the socioeconomic circumstances of black and white adults. While both groups are equally harmed, health-wise, when they experience an emotional and/or physical reaction to race-based treatment, our findings show that socioeconomic status shapes the health consequences of discriminatory experiences for black adults through the "double" health disadvantage brought on by stresses related to both socioeconomic and racial discrimination. In contrast, for white adults, poorer health is more likely to occur when they reflect at least daily on only their own racial status but only when it occurs in tandem with mid-range educational achievement (completing high school or having some college experience, but no degree) or among homemakers (nearly all of whom are women). However, among the least educated and unemployed white adults, self-rated health scores are more likely to be higher when they report thinking of their own race at least daily. Given the small number of white respondents who report discriminatory experiences and heightened levels of racial awareness in our sample (see Table 1), these findings should be interpreted with caution but nonetheless indicate that the effect of racial awareness on health is more sensitive to socioeconomic status standing among whites than blacks. Additional research, with larger, more nationally representative samples, is needed to replicate and elucidate these findings in more specific detail.

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NOTES

1. The impact of perceived discrimination comes from both experimental and laboratory research designed to tap reactions to racist stimuli as well as survey data that track retrospective reports of unfair treatment due to racial bias (see National Research Council 2004; Schnittker and McLeod 2005; Williams et al. 2003).
2. Based on tabulations of the American Community Survey 2006–2008 (three-year estimates), Summary File 3, conducted by the authors.
3. While there are enough cases to also include Hispanic adults, research indicates that the manner in which they evaluate their self-rated health differs by acculturation level (see Finch et al. 2002). Since this information is not included in the Behavioral Risk Factor Surveillance System, we regretfully removed Hispanic adults from our analysis.
4. Item non-response is low (under 1 percent), but for selected measures (household income and measures of perceived discrimination), rates of item non-response were substantially higher (between 7 and 19 percent). Rather than exclude cases with missing values, for this and every other measure with missing values (excluding self-rated health) we impute missing cases using a regression-based prediction, based on age, race, gender, and state of residence.
5. In earlier work not shown in this paper, we tested whether a count measure of the total number of discriminatory experiences was a useful predictor of self-rated health status. However, this measure was only weakly supported by tests of scale reliability (Cronbach's alpha = .62), likely because it masks important conceptual distinctions across these measures.
6. After exploring the utility of making a three-item index that would also include the measure "has a personal doctor" (which was not supported in tests of scale reliability), we found that a both-either-neither measure, based on two questions regarding medical insurance status and whether they skipped medical care last year

because of the cost, is preferable. Not only does it make the most use of available information on health care access, it also demonstrates a dose-response type of relationship with self-rated health (see Table 2).

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Bios

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