Title: When is Hope Enough?: Hopefulness, Discrimination and Racial Disparities in Biological Risk

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Introduction

Increasingly faced with more severe and frequent life stressors, older adults must rely on psychosocial resources, such as hope, in addition to other support. Although a growing body of research has documented biopsychosocial pathways that influence health, few have examined the protective effects of hopefulness on biological risk. Even more scarce is research evaluating race differences in this relationship. This study examined race differences in the association between baseline hopefulness and future biological risk.

Data and Methods

The data come from the Health and Retirement Study (HRS), a biennial survey of a nationally-representative sample of adults 51 and older. Beginning in 2006, half of the HRS sample completed supplemental psychosocial and biomarker assessments, while the other half-sample completed them in 2008. Both cohorts were followed up four years later in 2010 and 2012, respectively. The half-samples for each wave of the psychosocial and biomarker assessment are combined to increase the sample size and statistical power of the current study. Individuals whose racial/ethnic background was classified as "other" were excluded from the study due to small cell sizes and high racial/ethnic heterogeneity within this classification. Individuals missing on any study variable were also excluded, resulting in a final analytic sample of 7,207 persons.

Biological risk was measured by counting the number of biomarkers with measured values in a "high-risk" range based on established guidelines. The seven biomarkers included were: pulse pressure, heart rate, hemoglobin A1c, low high-density lipoprotein (HDL) cholesterol, total cholesterol, C-reactive protein (CRP), and waist circumference. Hopelessness at baseline (2006/2008) and follow-up (2010/2012) was assessed using the following four items: "I feel it is impossible for me to reach the goals that I would like to strive for", "The future seems hopeless to me and I can't believe that things are changing for the better", "I don't expect to get what I really want" and "There's no use in really trying to get something I want because I probably won't get it". Possible response options ranged from 1=strongly disagree to 6=strongly agree. All items were reverse-coded to indicate lower levels of *hopelessness* and higher levels of *hopefulness*. Other covariates included in regression models include age in years at baseline, gender, foreign-born status and educational attainment (i.e., less than high school, high school, some college, college or more).

Race differences in all variables were tested with a Wald Test. Linear regression was used to determine the association between baseline hopefulness on biological risk at follow-up, net of covariates and hopelessness at follow-up (sensitivity analyses show that using Poisson regression resulted in no substantive difference in preliminary findings). A main effects model was estimated as was a conditional model including interaction terms between race/ethnicity and baseline hopefulness. All analyses were conducted using STATA® and using statistical procedures and weights that account for the complex sample design of the HRS.

Preliminary Findings

Characteristics of the sample by race/ethnicity are presented in Table 1. Differences by race/ethnicity existed for all variables except age. Blacks and Hispanics had higher biological risk than whites in 2010/2012 and whites had the highest levels of hopefulness at both timepoints. There were significantly greater proportion of women among blacks (66.7%) compared to whites (57.4%) and Hispanics (60%), and nearly 50% of Hispanics were foreign born. Respectively, whites were two and three times more likely than blacks and Hispanics to have a college degree or higher.

Table 1. Weighted Sample Characteristics by Race/Ethnicity, HRS (n=7,207)

	White (n=5,957)	Black (n=749)	Hispanic (n=501)	p-value
	Mean or %	Mean or %	Mean or %	
Biological Risk 2010/2012	1.6	2.0	2.0	<0.001
Hopefulness 2006/2008	4.8	4.6	4.4	<0.001
Hopefulness 2010/2012	4.8	4.5	4.3	<0.001
Age 2006/2008	65.0	65.2	64.1	0.393
Female	57.4	66.7	60.0	<0.001
Foreign	3.7	4.1	49.3	<0.001
Less than High School	8.7	29.1	42.5	<0.001
High School	36.5	35.9	28.0	
Some College	25.6	20.6	19.5	
College or More	29.2	14.5	10.1	

Note. P-value test significance of race difference for each variable.

Table 2 presents a main effects (Model 1) and conditional model (Model 2) for the regression of biological risk on hopefulness. Model 1 shows that hopefulness at baseline and follow-up were inversely associated with biological risk, such that higher levels of hopefulness were associated with lower biological risk in 2010/2012. Blacks and Hispanics had higher biological risk compared to whites, and age was associated with higher risk levels while increasing levels of educational attainment were associated with lower biological risk levels. Model 2 shows that the association between baseline hopefulness and biological risk at follow-up varies by race/ethnicity (Adjusted Wald Test for Race-x-Hopefulness Interaction: $F_{(2,55)} = 6.65$, p=0.003).

Table 2. Regression of Biological Risk (2010/2012) on Hopelessness, HRS (n=7,207)

	Model 1		Model 2	
	b	SE	b	SE
Hopefulness 2006/2008	-0.061***	0.016	-0.073***	0.016
Hopefulness 2010/2012	-0.050**	0.017	-0.049**	0.017
Black[a]	0.340***	0.045	-0.253	0.177
Hispanic[a]	0.267***	0.068	0.096	0.255
Black-x-Hopefulness 2006/2008			0.129**	0.036
Hispanic-x-Hopefulness 2006/2010			0.037	0.053
Age 2006/2008	0.007***	0.002	0.007***	0.002
Female[b]	-0.002	0.026	-0.002	0.026
Foreign[c]	-0.088	0.068	-0.089	0.068
High School[d]	-0.103*	0.048	-0.108*	0.048
Some College[d]	-0.133**	0.049	-0.137**	0.049
College or More[d]	-0.414***	0.050	-0.416***	0.050
Constant	1.861***	0.172	1.923***	0.180

Note. *p<0.05, **p<0.10, ***p<0.001; [a]ref=whites, [b]ref=males, [c]ref=U.S.-born, [d]ref=Less than High School

Figure 1 depicts the interaction between baseline hopefulness and biological risk in 2010/2012 by race/ethnicity. While increasing levels of baseline hopefulness are associated with lower biological risk at follow-up for whites, hopefulness increases risk among blacks and has no effect on the subsequent biological risk of Hispanics.

Figure 1. Association Between Hopefulness and Biological Risk by Race/Ethnicity
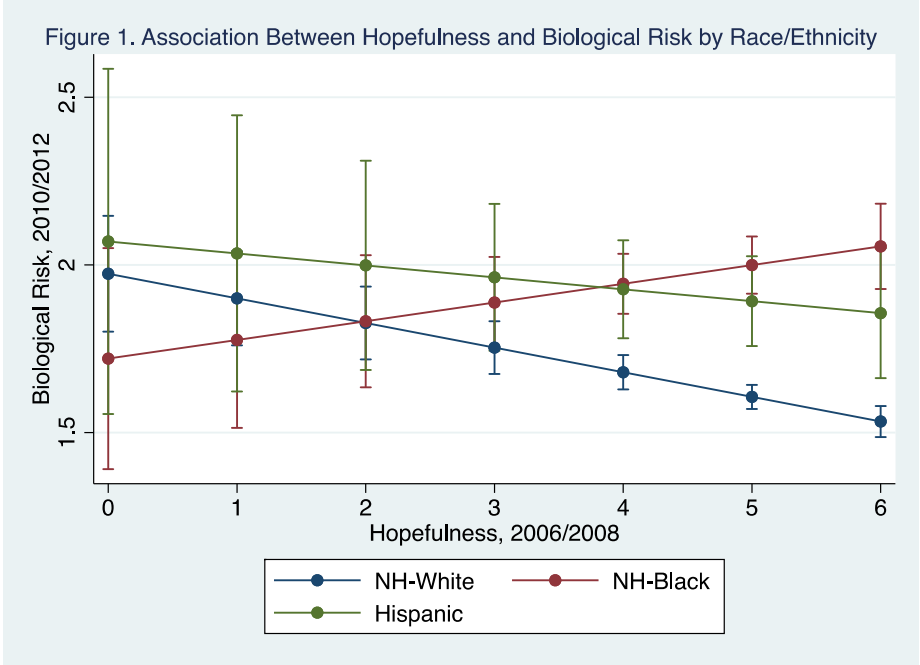
Conclusions

These preliminary analyses suggest that being hopeful is protective against increasing biological risk for whites, but not for blacks or Hispanics. Subsequent analyses will use race-stratified models to better understand why hopefulness operated differently for whites, blacks and Hispanics. The stress of discrimination and its association with hopefulness will be the focus of these subsequent analyses.