

## Research Article

# Educational Attainment Better Reduces Perceived Economic Hardship for White than Black Americans

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**Background:** Lower levels of stress are one of many plausible mechanisms that may explain the health effects of educational attainment. Minorities' Diminished Returns, however, are defined as systemically weaker health effects of educational attainment for Blacks compared to Whites. We are, however, unaware of previous studies on the differential effects of educational attainment on perceived economic hardship across racial groups.

**Purpose:** The aim was to compare Blacks and Whites for the association between educational attainment and perceived economic hardship in a national sample of American adults.

**Methods:** This study analyzed cross-sectional data of 24,874 adults who had participated in the National Health Interview Survey (NHIS 2015). Educational attainment was the predictor variable. Perceived economic hardship was the outcome. Race was the moderator. Age, gender, marital status, employment, and income were the covariates.

**Results:** Overall, higher educational attainment was associated with lower levels of perceived economic hardship. Race interacted with educational attainment, suggesting that the protective effect of educational attainment on reducing perceived economic hardship is smaller for Blacks than Whites. **Conclusions:** Educational attainment is not similarly protective against perceived economic hardship across all racial groups. Thus, perceived economic hardship may be one mechanism by which Black people receive fewer health benefits from their educational attainment than White people.

**Keywords:** Stress; Perceived economic hardship; Population groups; Race; Socioeconomic position; Socioeconomic status; Education

## Introduction

According to the Minorities' Diminished Returns theory (MDRs) [1-5], racial disparities are partially due to "weaker than expected" real life effects of Socioeconomic Position (SEP) indicators [1,6-8]. The MDRs framework suggests that: (a) not all racial disparities are due to lower SEP of Blacks but also because of lower impact of available SEP resources for Black populations, (b) the racial health inequalities may widen rather than narrow at high SEP levels, and (c) health disparities should be addressed across all SEP levels [1-3].

Empirical evidence has documented MDRs for a wide range of SEP and health indicators. MDRs are similarly shown for economic outcomes [1,7,9]. Physical health [10-13], health behaviors [14-16], and mental health [17,18]. outcomes. That means high SEP Blacks report worse health outcomes, across domains, compared to high SEP Whites [14,17,19,20]. In other studies, educational attainment better reduced environmental exposures to environmental pollutants for Whites than for Blacks [21]. Very few investigations, however, have ever explored MDRs of educational attainment on perceived stress. In a recent study, education better reduced work-related stress for Whites than Blacks [22]. In another study, educational mobility altered exposure to stress for Whites but not Blacks [9]. Other studies have shown high levels of perceived discrimination in high SEP

Blacks [5,23-27].

The U.S. labor market, being a dual system, may be one reason why highly educated Black people have high stress. In the U.S. labor market, one tier of jobs are low-stress, high-pay, and prestigious. Another tier of jobs are stressful, low-paying, and in high demand. The US labor market, similar to other sectors of U.S. society, discriminates against racial minorities, particularly Blacks. As a result, Blacks are employed in the lower-tier jobs that are low-pay and have more stress. The U.S. labor market, similar to U.S. sectors and institutions, tends to discriminate against Blacks [11,28]. This is supported by the literature showing that identical resumes generate unequal outcomes for Black and White job applicants simply because of the racial names of the applicants [29]. As a result, highly educated Black people will likely fight an uphill battle and have more difficulties enhancing their living conditions. Consequently, highly educated Blacks continue to work in lower-quality jobs that are high in stress and environmental exposures and have low benefits [21,28]. In addition to the systemic discrimination by the labor market, job proximity and variability are low for Blacks due to residential segregation. Blacks are more likely to reside in neighborhoods that have limited resources and poor job opportunities. Thus, Blacks with high educational attainment have a lower likelihood of accessing occupational opportunities, even when the labor market does not discriminate against them [21,28].

Finally, as education is lower quality in urban areas, racial minority groups, particularly Blacks, receive lower-quality education. All these differences may alter the effects of educational attainment on occupation quality for Blacks with high educational attainment. All these potentially explain why educational attainment generates less health outcomes for Blacks than Whites [1,6,7,21,30].

Some research suggests that stress may be a mechanism which shows that educational attainment and SEP do not generate the same level of health for Blacks and Whites. In a few studies, perceived discrimination is shown to increase in Blacks who have higher educational attainment, simply because they live in closer proximity to Whites [23,31-33]. High SEP increases not only exposure but also sensitivity to race-related stress [24]. These studies, however, have focused on race-related stress, which makes it more challenging to compare Blacks and Whites. As a result, there is a need to study how other forms of stress, such as perceived economic hardship, changes as a function of SEP in Blacks and Whites.

To extend what is already known on the contribution of various forms of stress to explain MDRs, we performed a secondary analysis of existing data to explore Black/White differences in how educational attainment is associated with perceived economic hardship in the U.S. We expected an inverse association between educational attainment and perceived economic hardship overall (Hypothesis #1), however, we also expected this association to be smaller for Blacks than Whites (Hypothesis #2).

## Method

### Design and settings

A secondary analysis of the 2015 NHIS data, which is one of the main national health surveys of American residents. The NHIS is funded and performed by the CDC [34].

### NHIS ethics

The NHIS study protocol received approval from the Institutional Review Board (IRB) of the National Center for Health Statistics, CDC. All NHIS participants signed and provided written informed consent.

### NHIS sample

The NHIS sample was composed of American adults who were civilian, non-institutionalized, US resident, and at least 18 years old. The NHIS sampling strategy was a multistage sampling that involved clustering and stratification to generate a probability sample of U.S. households. Although the NHIS 2015 included 33,672 American adults, this analysis was limited to 24,874 adults who were either White or Black.

### Study variables

Variables included demographic characteristics, race, educational attainment (SEP), region, marital status, income, employment, and perceived economic hardship, all measured at an individual level. Race was self-identified and included Blacks versus Whites. Demographic Characteristics included age (years) and gender (male 1 female 0). Number of jobs was a continuous variable. Participants were asked if they were working on more than one job. Educational Attainment, a continuous measure ranging between 0 and 24 years, was the independent variable. Marital Status was 1) married versus non-married. Region of the country was coded as: 1) northeast, 2)

Midwest, 3) south, and 4) west (reference group).

The outcome in this study was perceived economic hardship, measured using the following items: "How worried are you about..." 1) money for retirement, 2) medical costs of illness/accident, 3) maintaining standard of living, 4) costs of healthcare, 5) paying for children's college, 6) paying monthly bills, 7) paying rent/mortgage/housing costs, and 8) credit card payments. Item responses were on a 1 to 5 scale, with 5 showing worse stress on each item. We calculated an average of all above items. Our overall perceived economic hardship score ranged from 1 to 5, with a score of 5 meaning highest possible perceived economic hardship and a score of 1 meaning no perceived economic hardship in any domain (Cronbach alpha = .925).

### Data analytical plan

Applying SPSS 23.0 enabled us to accommodate the NHIS survey weights. After we examined the distribution of our variables and used the Pearson correlation test to measure unadjusted correlations across the variables, we tested the assumptions and requirements of multivariable modeling. Since our data met the requirements such as near to normal distribution of errors and lack of collinearity between our independent variable and our confounders, we fit four linear regression models. We ran two of our models in the pooled sample with and without interaction terms between race and educational attainment. We ran two other models specific to Blacks and Whites.

## Results

### Descriptive statistics

Table 1 provides a descriptive summary of the participants' characteristics. From 24,874 American adults who participated, most were White (n = 20,507, 82.4%). Only a minority were Black (n = 4,367, 17.6%). The average age of our participants was 51.8 (SD = 18.4) years. The mean educational attainment of the participants was 15.5 years (Standard Deviation = 2.8 years) (Table 1).

### Bivariate associations

Table 2 provides a summary of unadjusted bivariate correlations between all the study variables. There were positive correlations between race (Blacks) with perceived economic hardship. Age, educational attainment, and income were negatively correlated with perceived economic hardship (Table 2).

### Multivariable analysis

Table 3 shows the results of two regression models with educational attainment as the independent (predictor) variable and perceived economic hardship as the dependent variable. These models were run in all participants (the pooled sample). Model 1 estimated the main effect of educational attainment, race, and covariates. Model 2 also had the interaction term between race and educational attainment. Based on Model 1, high educational attainment reduced perceived economic hardship, however, as shown by Model 2, this effect was weaker for Black than White participants (Table 3).

### Multivariable analysis

Table 4 shows the summary of the results of two linear regression models specific to each racial group. Both models had educational attainment as the independent variable and perceived economic hardship as the dependent variable. These models were identical to each other. Model 3 and Model 2 showed protective effects of

**Table 1:** Descriptive statistics.

	N	%
Race		
White	20507	82.4
Black	4367	17.6
Gender		
Female	13728	55.2
Male	11146	44.8
Region		
Northeast	4281	17.2
Midwest	6111	24.6
South	8855	35.6
Married		
Female	14045	56.5
Male	10829	43.5
Employed		
No	11565	46.5
Yes	13309	53.5
More than one job		
No	12751	90.6
Yes	1328	9.4
	<b>Mean</b>	<b>SD</b>
Age	51.81	18.4
Educational Attainment	15.49	2.82
Income	6.67	3.1
Perceived economic hardship	1.97	0.86

educational attainment on perceived economic hardship, however, this effect was weaker for Blacks than Whites (Table 3).

## Discussion

In general, high educational attainment was associated with lower levels of perceived economic hardship. This association, however,

was weaker for Blacks than for Whites. That means race alters the protective effect of educational attainment against perceived economic hardship.

High stress in highly educated Blacks may explain why educational attainment, employment, and income show smaller protective effects on the health of Blacks than Whites. The MDRs studies have shown that educational attainment and income show weaker impact on reducing the risk of poor health, depression, anxiety, smoking, alcohol use, obesity, chronic disease, and mortality for Blacks compared to Whites [14,17,35,36]. That is, highly educated Blacks are more depressed [18,37], more anxious [38], more suicidal [39], and use more substances such as tobacco [14]. And alcohol [35]. They are also more likely to be obese [10], have more CMCs [40], report worse health [28,41], and die earlier [42] compared to Whites with high education. According to the current results, at least some of these MDRs in education may be because educated Black people have higher perceived economic hardship than Whites. Accordingly, Black people with high education still deal with stressors that are expected to be less common for them.

Several sociological studies have shown that high educational attainment is more likely to be a generational feature among Whites than among Blacks [43]. The lack of protective effect of educational attainment among Blacks may be generational, a factor that cannot be measured individually. For instance, some studies have suggested that compared to White Veterans, Black veterans are far less likely to be able to use GI benefits for SEP mobility. The GI Bill, for example, disproportionately benefitted Whites. This bill was intended to help veterans with readjustment to civilian life following service after returning to their country. Although the goal was to encourage motivated people to volunteer for military duty and help them build a life after they returned, this service was predominately reserved for Whites.

This finding is similar to the observation that Blacks reported worse mental health across all income levels [41]. Another relevant observation was that Blacks were experiencing high levels of stress regardless of social mobility. For Whites, however, stress was a function of upward social mobility (e.g., attaining additional

**Table 2:** Bivariate correlations.

	1	2	3	4	5	6	7	8	9	10	11	12
1 Race (Blacks)	1	-.06**	-.05**	0	-.04**	-.08**	.24**	-.17**	0	-.13**	-.11**	.12**
2 Gender Male		1	-.04**	-.08**	.04**	-.01*	-.02*	.05**	-.03**	-.12**	.15**	-.18**
3 Age			1	-0.01	-0.01	.01*	-.04**	.07**	-0.02	0	.20**	-.08**
4 LGBT				1	0.01	-.02*	0	-.09**	0.01	.04**	-.02*	.02**
5 Region - Northeast					1	-.26**	-.34**	0	0.01	.03**	.04**	.02**
6 Region - Midwest						1	-.42**	0	.03**	-.02**	-.04**	-.03**
7 Region - South							1	-.02**	-.03**	-.06**	-.03**	.02**
8 Married								1	-.04**	.14**	.20**	-.06**
9 Has one job									1	.06**	-.02*	.02**
10 Educational attainment										1	.35**	-.10**
11 Income											1	-.17**
12 Perceived economic hardship												1

\*p < 0.05, \*\*p < 0.01

**Table 3:** Regression models with perceived economic hardship as the outcome.

	Beta	B	SE	95% CI		p
<b>Model 1 (Main Effects)</b>						
Race (Blacks)	0.15	0.02	0.07	0.11	0.19	<.001
Gender Male	-0.16	0.01	-0.1	-0.19	-0.13	<.001
LGBT	0.06	0.04	0.02	-0.01	0.14	0.094
Region						
Northeast	0.09	0.02	0.04	0.05	0.14	<.001
Midwest	-0.03	0.02	-0.02	-0.07	0.01	0.09
South	0.00	0.02	0.00	-0.04	0.04	0.918
Married	-0.03	0.01	-0.02	-0.06	0.00	0.044
Have more than one job	0.08	0.02	0.03	0.04	0.13	<.001
Age	0.00	0.00	0.03	0.00	0.00	0.001
Highest level of school completed	-0.04	0.00	-0.12	-0.05	-0.04	<.001
Income	-0.03	0.00	-0.11	-0.04	-0.03	<.001
Constant	2.91	0.06		2.79	3.02	<.001
<b>Model 2 (M1 + Interactions)</b>						
Race (Blacks)	-0.31	0.12	-0.14	-0.54	-0.07	0.012
Gender Male	-0.16	0.01	-0.1	-0.19	-0.13	<.001
LGBT	0.07	0.04	0.02	-0.01	0.14	0.081
Region						
Northeast	0.09	0.02	0.04	0.05	0.14	<.001
Midwest	-0.04	0.02	-0.02	-0.08	0.00	0.084
South	0.00	0.02	0.00	-0.04	0.04	0.881
Married	-0.03	0.01	-0.02	-0.06	0.00	0.049
Have more than one job	0.09	0.02	0.03	0.04	0.13	<.001
Age	0.00	0.00	0.03	0.00	0.00	<.001
Highest level of school completed	-0.05	0.00	-0.14	-0.06	-0.04	<.001
Income	-0.03	0.00	-0.11	-0.03	-0.02	<.001
Race (Blacks) * educational attainment	0.03	0.01	0.24	0.02	0.05	<.001
Race (Blacks) *Income	-0.01	0.01	-0.04	-0.03	0.00	0.142
Constant	2.99	0.06		2.87	3.12	<.001

CI: Confidence Interval; SE: Standard Error.

education or getting better jobs compared to their parents) [9].

The MDRs can be seen in the context of the findings by other scholars. For example, Farmer and Ferraro published on MDRs of education on self-rated health [4]. In this investigation, White people gained more outcomes than Black people from an increase in their educational attainment. Shapiro and Oliver have published on the inequalities in wealth distribution as a consequence of unfair social policies such as Jim Crow and Redlining [44,45]. In the same line, Hamilton and Darity have repeatedly documented the enormous wealth gap in the United States [46]. Other scholars have also published on MDRs [47]. For example, Hudson et al., have shown a reduced gain of SEP in the lives of Blacks [5,26,48]. In a recent study, income was found to differently reduce discrimination for Whites and Blacks [49]. Navarro has mentioned that health outcomes and life conditions are not a function of race or class (SEP), but race and class [50-52].

**Table 4:** Two race- specific linear regressions with perceived economic hardship as the outcome.

	Beta	B	SE	95% CI		p
<b>Model 1 (Whites)</b>						
Gender Male	-0.16	0.02	-0.10	-0.19	-0.13	<.001
LGBT	0.06	0.04	0.01	-0.02	0.13	0.161
Region						
Northeast	0.08	0.02	0.04	0.03	0.12	0.001
Midwest	-0.04	0.02	-0.03	-0.08	0.00	0.036
South	0.02	0.02	0.01	-0.02	0.06	0.288
Married	-0.04	0.02	-0.02	-0.07	-0.01	0.014
Has one job	0.09	0.03	0.04	0.04	0.14	<.001
Age	0.00	0.00	0.03	0.00	0.00	0.002
Education attainment	-0.05	0.00	-0.14	-0.06	-0.04	<.001
Income	-0.03	0.00	-0.11	-0.03	-0.02	<.001
Constant	3.01	0.06		2.89	3.13	<.001
<b>Model 2 (Blacks)</b>						
Gender Male	-0.16	0.04	-0.09	-0.24	-0.08	<.001
LGBT	0.13	0.11	0.03	-0.10	0.35	0.269
Region						
Northeast	0.21	0.09	0.08	0.04	0.38	0.015
Midwest	0.03	0.08	0.01	-0.13	0.19	0.728
South	-0.05	0.07	-0.03	-0.19	0.09	0.489
Married	0.03	0.05	0.01	-0.06	0.12	0.562
Has one job	0.05	0.07	0.02	-0.08	0.19	0.423
Age	0.00	0.00	0.05	0.00	0.01	0.06
Education attainment	-0.01	0.01	-0.04	-0.03	0.00	0.119
Income	-0.04	0.01	-0.14	-0.06	-0.03	<.001
Constant	2.64	0.16		2.33	2.95	<.001

CI: Confidence Interval; SE: Standard Error.

We do not make the argument or the assumption that all educational attainment levels are in low-stress jobs, or all Blacks are working in stressful jobs. Of course, job stress has a distribution across both races. At the same time, social distribution of jobs means that both Blacks and Whites are employed in jobs with various stress levels. However, we observed that, for Whites, job stress is a function of educational attainment. The same pattern could not be found for Blacks. Although, on average, high educational attainment jobs are lower in stress, this pattern is less true for Blacks than Whites.

In a study, educational attainment better helped Whites than Blacks to escape poverty. That meant, highly educated Blacks were still at risk of poverty, something that was not the case for highly educated Whites [53]. In another study, educational income impacted future positive and negative emotions for Whites but not for Blacks [54]. In this study, education did not predict an increase in the income of Blacks; however, education did predict an increase in the income for Whites [54]. In another study, education was associated with a high level of happiness for Whites but not for Blacks [55]. Finally, in one study, for Black men, education was positively linked to an increase in depressive symptoms, while for White men, White women, and Black

women, this connection was insignificant [56].

A part of the differential effects of educational attainment may be due to labor market discrimination. In a recent study, educational attainment better reduced the second-hand smoke exposure at work for Whites than for Blacks [21]. In another study, for Blacks, an increase in educational attainment meant a higher likelihood of working in a predominantly White workplace and having more Whites as coworkers. This increase of exposure of Black people to White coworkers in the workplace was associated with an increase in received discrimination. Thus, high stress may be one of the mechanisms by which educational attainment shows fewer health effects for Blacks than Whites, as shown by past research [1,7,8,14,21,30,39]. Furthermore, higher stress in highly educated Blacks rather than Whites may also explain why employment increases life expectancy for Whites (both men and women) and shows almost no increase in life expectancy for Black males. We can now understand why educational attainment [1,7,8,14,21,30,39], generated income [10,18,57], and employment [11,16], bring vastly different health effects to Whites and Blacks.

Educational attainment does not lower perceived economic hardship for Blacks. That means, highly educated Blacks still have high levels of stress. As a result, high SEP Blacks, as described by the MDRs theory [1-3], would show undesirable health outcomes [1,7,8,14,21,30,39]. Obesity [13], depression [18], anxiety [38], self-rated health [41], and chronic disease [40] are all worse than expected in highly educated Blacks than in Whites. Similarity and commonality in these observed patterns, regardless of SES indicators, health outcomes, and cohorts, suggest that more upstream processes are at play that reduce the impact of most resources for almost all health outcomes of non-White people. As a result, given that education generates employment, income, neighborhood quality, and health insurance, we should expect smaller effects of educational attainment on all these domains for Blacks than for Whites. At least some of the mechanism by which race becomes health disparities is due to racial socialization that happens in a race-aware society. In this view, race, as a social factor, becomes a source of disparity. Inasmuch as the cause is societal, the solution must be social rather than health policy [58-62].

High perceived economic hardship of Blacks with high educational attainment may be due to several factors. Given the tremendous residential segregation, highly educated Blacks do not live in safe areas and do not have access to high-paying occupations that are low in stress and high in benefits and occupational advancement. Separate from job segregation, educated Blacks enter inferior, lower-quality jobs that pay less and have more stress due to labor market discrimination. Residential segregation also reduces the quality of education in Black communities. As education quality is a determinant of occupational prestige, Blacks enter worse jobs than Whites.

A remaining challenge is that we do not know how to reduce MDRs, or which policies are most effective in this regard. Not only do we need to equalize SEP such as educational attainment, we also need to qualitatively reduce the gap between the lives of highly educated Blacks and Whites. With regard to the multifaceted nature of this issue, policy solutions must be accordingly layered and complex.

Research should study the social and structural causes of high perceived economic hardship in the lives of highly educated Blacks. Simultaneously, Black individuals should have assistance in securing higher-paying, low-stress jobs. Such a solution to MDRs may be needed to eliminate health disparities.

## Implications

To address health disparities, the structural and institutional barriers, among other stressors faced by Black Americans must be considered. There is a need for bold, innovative public, economic, and social policies and programs that go beyond equalizing SEP and address diminished SEP returns in Blacks. Policymakers should be aware that universal enhancement of SEP may have unintended effects on disparities, given that educational attainment better reduces stress for Whites than for Blacks. Policymakers should continuously monitor the effects of their social and economic policies on the overall population but also disparities.

## Future Direction for Research

There is a need for more research on the solutions to perceived economic hardship in Black communities. A wide range of health problems, both mental and physical, are caused by stress in the Black community. We do not know the most effective ways to reduce perceived economic hardship of Blacks, particularly in those who have high education.

The returns of educational attainment in society and in the workplace vary based on race, simply because race matters both in society and in the workplace. That said, mechanisms other than race and racism may also be involved in explaining our findings. More research is necessary on race-related and race-unrelated reasons that highly educated Blacks still experience high-stress levels at work. Matching the working conditions of Whites and Blacks using propensity score and matching work skills and experiences of Whites and Blacks may be one strategy to decompose race-related from skills-related mechanisms that make employment differently stressful for Whites and Blacks.

Using the NHIS, this study suggested that high educational attainment may reduce occupational stress for Whites but not Blacks. There is a need for replication of this finding in other independent data sets. There is also a need to explore other constructs such as the number of hours, years in the occupation, racial composition of the workplace, social environment, workplace harassment, discrimination, and other psychosocial and economic factors that may explain why highly educated Blacks experience high levels of stress at work. Regional differences should also be investigated in future research.

Finally, this study did not differentiate between White and Black men and women. Some sociological studies suggest that Black women face more workplace hostility than Black men in contemporary society [63]. Some other literature shows that Black men may be more vulnerable to the same amount of discrimination compared to Black women [19,64]. Therefore, there is a need for intersectional studies compare racial groups and race by gender groups [65].

## Limitations

This study had some methodological limitations. Similar to other

cross-sectional studies, our design does not allow causal inferences. Thus, we can only discuss the association rather than causation between educational attainment and perceived economic hardship. Furthermore, the sample size was not balanced across racial groups, and many SEP indicators such as wealth and occupation type were missing. This study did not measure any health outcomes such as physical disability or depression. This study was limited because it only included individual-level SEP indicators, and future research could also include higher-level SEP measures. Job segregation may have a role in explaining the finding observed here. More research is needed on the geographic distribution of jobs and their availability for White and Black individuals. We should also note another limitation of our data. The NHIS study was conducted in 2015, just after the Great Recession. Several sociological studies have shown that the economic ramifications of the Great Recession were substantially worse for Blacks than Whites. The discrepancy in the experiences of the economic downturn is relevant because some of the SEP data may be responsive to that particular economic moment. Although these limitations exist, our study still extends the current literature on social determinants of stress.

## Conclusions

In the United States, high educational attainment reduces financial distress; however, this protective effect of educational attainment against perceived economic hardship depends on Race. While highly educational attainment Whites experience the lowest levels of economic stress, highly educated Blacks still experience a higher level of perceived economic hardship. This may suggest why Blacks with high educational attainment and high SEP still report poor health outcomes.

## Declaration

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