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*Original Paper*

# Understanding America: Unequal Economic Returns of Years of Schooling in Whites and Blacks Race, Years of Schooling, and Economic Wellbeing

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***Abstract***

*Background: Higher schooling is associated with higher economic wellbeing. Marginalization-related Diminished Returns (MDRs) framework, however, refers to smaller returns of schooling for non-Hispanic Blacks (NHBs) compared to non-Hispanic Whites (NHWs).*

*Aim: Using a national sample of American adults, the current study compared NHBs and NHWs for the effects of each incremental increase in the years of schooling (gradient of educational level) among American adults.*

*Methods: Data came from the Understanding America Study (UAS), a national online survey with a nationally representative sample. A total of 5715 adults (18+ years old) were included. From this number, 4,826 (84.4%) were NHWs, and 889 (15.6%) were NHBs. Years of schooling was the independent variable. Economic wellbeing was the main outcome. Age and gender were the covariates. Race was the moderator.*

*Results: Overall, each additional year of schooling was associated with higher economic wellbeing, net of age, and gender. A statistically significant interaction was found between race and years of schooling on the outcome, indicating a smaller boosting effect of any incremental increase in the years of education on the economic wellbeing of NHBs compared to NHWs.*

*Conclusion: In line with MDRs, highly educated Black people experience low economic wellbeing. The MDRs of education on economic wellbeing may be why highly educated, and middle-class Black*

*Americans still report poor health. Policy solutions should address multi-level causes of MDR-related health disparities.*

***Keywords***

*educational attainment, ethnic groups, population groups, socioeconomic status*

## 1. Introduction

Educational attainment is one of the main Socioeconomic Status (SES) indicators that improve population health through improving income, employment, occupation, and living conditions (M. Marmot, 2001; 2004; 2005). Educational attainment is one of the strongest social determinants of health (SDOH) with strong protective effects over the life course (Mirowsky & Ross, 2015; Ross & Mirowsky, 1999; 2011). Individuals with higher educational attainment remain at a lower risk of morbidity and mortality (S. Assari & Lankarani, 2017; Farmer & Ferraro, 2005; Kunst, Groenhof, Mackenbach, & Health, 1998; Mackenbach et al., 2003; M. Marmot, 2005; Moghani Lankarani & Assari, 2017; Phelan, Link, Diez-Roux, Kawachi, & Levin, 2004; Remes, Martikainen, & Valkonen, 2010). Similarly, higher educational attainment predicts better overall (Kestila et al., 2006), mental (Patten et al., 1997), and physical health (Backholer et al., 2012; White, Rehkopf, & Mortensen, 2016; Zhang & Wang, 2012).

The health effects of educational attainment (Lee, Kawachi, Berkman, & Grodstein, 2003; Montez et al., 2019; Sisco et al., 2015) are due to two complementary mechanisms. First, gaining higher educational credentials improves individuals' chances in the job market. Highly educated individuals experience better health because they have greater access to goods, resources, support systems, and experience lower stress. Second, each additional year of schooling enhances emotion regulation and cognitive control. Individuals with a higher number of years of schooling make better decisions, better solve problems, take fewer risk behaviors, and are more likely to seek pro-health behaviors (Contador, Bermejo-Pareja, Del Ser, & Benito-Leon, 2015; Mirowsky & Ross, 2015; Ross & Mirowsky, 1999; Sattler, Toro, Schonknecht, & Schroder, 2012). As a result of the combined effects of education credentials and years of schooling, there are social gradient and threshold effects of education on health (Mirowsky & Ross, 2015; Ross & Mirowsky, 1999). Demographic and social groups, however, may differ in how their education increases their income, and occupational prestige, meaning that the gradient effect of educational attainment on economic wellbeing may differ across diverse racial groups.

According to the Marginalization-related Diminished Returns (MDRs) framework (Assari, 2017d; Shervin Assari, 2018a), years of schooling and educational credentials both have weaker effects on the risk of chronic disease (Assari, 2018a), disability (Shervin Assari & Bazargan, 2019b), hospitalization (Shervin Assari & Bazargan, 2019c), and early mortality (Assari & Lankarani, 2016) for Non-Hispanic Blacks (NHBs) than Non-Hispanic Whites (NHWs).

A high prevalence of health problems among highly educated NHBs may have a behavioral

explanation. High education is shown to have a diminishing return in terms of enhancing diet (S Assari & Lankarani, 2018), health service use (Assari S, 2019a; S. Assari & Hani, 2018), exercise (Shervin Assari, 2019a), and reducing vaping (Shervin Assari, Mistry, & Bazargan, 2020), smoking (Shervin & Ritesh, 2019), and drinking (S. Assari, Farokhnia, & Mistry, 2019) for NHBs than NHWs. Similarly, years of schooling and educational credentials are shown to have weaker effects on depressive symptoms (S. Assari, 2018c; 2018e) and suicide (S. Assari, Schatten et al., 2019) for NHBs than NHWs. As a result, NHBs with high education still experience poor well-being (S. Assari, 2018f; S. Assari, Preiser, & Kelly, 2018), SRH (S. Assari, 2018b; S. Assari, Lapeyrouse, & Neighbors, 2018), and BMI (S. Assari, Thomas, Caldwell, & Mincy, 2018), suggesting that equalizing education is not enough for eliminating racial disparities in health (Shervin Assari, 2018a; S. Assari, 2018h). If this theory is true, the major policy implication would be we need to not only close the SES gap but make sure that resources are similarly translated to outcomes for diverse racial groups (Shervin Assari, 2018a; S. Assari, 2018h).

One possible explanation for the observation that higher years of schooling and high education credentials do not sufficiently protect NHBs against health problems is an economic theory (S. Assari, 2018b; Shervin Assari, 2018b; S. Assari, Preiser et al., 2018). As racial minorities, particularly NHBs, spend most of their early childhood at the lower end of the SES strata, their health may suffer despite if they access to SES during adulthood (Johnson-Lawrence, Zajacova, & Sneed, 2017; Lawrence, Rogers, & Zajacova, 2016; Zajacova, Goldman, & Rodriguez, 2009; Zajacova & Lawrence, 2018; Zajacova, Rogers, & Johnson-Lawrence, 2012). This is in line with three previous studies that have proposed that income is why highly educated NHBs remain at risk of poor health(S. Assari, 2018b; Shervin Assari, 2018b; S. Assari, Preiser et al., 2018).

At least some of the racial inequalities in health can be explained by the SES differences between social groups (Assari, 2017b). These are racial disparities that are due to differential exposures (S. Assari, 2016; Lantz, House, Mero, & Williams, 2005; Zahodne, Manly, Smith, Seeman, & Lachman, 2017). Populations subgroups, however, not only differ in their (exposure to) SES but also how much each SES indicator generates health outcomes (S. Assari, 2014, 2015; S. Assari & Lankarani, 2015; S. Assari, Lankarani, & Lankarani, 2014). NHBs (S. Assari, 2018a, 2018d; S. Assari & Caldwell, 2019) gain less health improvement from SES indicators such as education compared to NHWs, a pattern referred to asMDRs (S. Assari, 2017d; Shervin Assari, 2018a),

*1.1 Aim*

This study compared NHBs to NHWs for the effects of years of schooling (gradient effect of educational attainment)on economic wellbeing. Applying a national sample of adults in the U.S., the main hypothesis in this study was that higher educational attainment would be associated with higher economic wellbeing, however, this boosting effect of years of schooling on economic wellbeing is diminished for NHBs than NHWs. That means NHBs will experience low economic wellbeing, despite high years of education (years of schooling). This is in line with the MDRs theory (Shervin Assari,

2018a; S. Assari, 2018h).

## 2. Method

*2.1 Design and Settings*

We used data from the Understanding America Study (UAS) (Angrisani, Kapteyn, Meijer, & Wah, 2019). The UAS survey is an internet panel of civilian non-institutional U.S. adults (Angrisani et al., 2019). The UAS is one of the richest sources of panel data available in the United States (Angrisani et al., 2019). This study was administered by the University of Southern California (USC). The study was funded by the Social Security Administration (SSA) and the National Institute on Aging through a cooperative agreement.

*Sample, Sampling, and Sampling Framework*

The UAS participants were adults (age 18 and over) who were selected from 50 states and D.C. (Angrisani et al., 2019). Although it consists of a number of subpanels that are drawn from different sampling frames, the current study used the main sampling frame/panel that applied nationally representative weights to generate results generalizable to the population of U.S. adults (Angrisani et al., 2019).

In contrast to several national surveys that have traditionally recruited their participants using random-digit dialing and face-to-face area sampling methods, the UAS has used an address-based sampling. This is primarily to avoid serious bias due to under-coverage of landlines in the U.S. The U.S. has experienced a declining trend in % population with a landline phone. In addition, respondents who do not have a landline are systematically different from respondents with a landline. Participants for this analysis were eligible if they were adults (age 18 years or more), and U.S. residents. We did not limit our eligibility criteria to any specific health conditions.

*2.2 Data Collection*

The sample recruitment and data collection started in 2014 and is ongoing. When needed, respondents are provided with a tablet computer and internet access to complete the surveys. Thus, data were directly entered into the computers.

*2.3 Variables*

Many of the UAS measures and models have followed the University of Michigan's Health and Retirement Study (HRS) (Angrisani et al., 2019). The independent variable was education (years of schooling), the outcome was economic wellbeing, age and gender were confounders, and race was the moderator.

2.3.1 Predictor

*Educational Attainment.* Education was treated as a continuous variable ranging from1to16. Participants reported their years of schooling. A higher score reflected a higher education.

*Outcome*

2.3.2 Covariates

Demographic data including gender and age were the study covariates. Gender was dichotomous: male =1, female = 0. Age (years) was a continuous measure ranging from18 to 90.

2.3.3 Moderator

*Race.* Participants reported their self-identified race. Race was NHB / Non-Hispanic African American = 1 and NHW = 0.

*2.4 Statistical Analysis*

To perform data analyses, we applied SPSS 23.0 (IBM Inc, NY). Sampling weights were applied to generate a nationally representative sample of adults. To describe the sample, we used mean and proportion (frequencies) of our continuous and categorical variables, respectively. We described the sample overall and by race. For multivariable analysis, we ran two multivariable linear regression models. *Model 1* (Main Effect Model) did not include the race by educational attainment interaction term. *Model 2* (Interaction Model) included the race by educational attainment interaction term. Adjusted b, SE, 95% Confidence Intervals (CI), and *p*-values were reported.

*2.5 Ethics*

According to the NIH guidelines, however, this analysis was a "Non-human Subject Research". As a result, our study is exempt from an IRB review. An NIH decision tool was applied to determine whether our analysis is exempt from an IRB review (NIH). According to this IRB decision tool, any secondary analysis of fully de-identified data is exempt from an IRB review if no individual was involved as a part of the data, data are de-identified, data are publicly available, and there would be no attempt to contact with any research participants. Such research is deemed as non-human research. The original UAS study protocol, however, was approved by the University of Southern California (USC) Institutional Review Board (IRB). All participants signed fully informed consent forms. Participants were compensated for their participation.

## 3. Results

*3.1 Descriptive Statistics*

A total number of 5715 individuals entered this analysis. Table 1 summarizes the descriptive statistics of the participants overall and by race. Most of our sample was NHW (84.4%), and a smaller proportion was NHB (15.6%). Most participants were female (52.2%), and 47.8% were male. On average, our participants were 50 (SD=16) years old (**Table 1**).

**Table 1. Descriptive Statistics of the Participants Overall and by Race**

| | **All** | | **NHWs** | | **NHBs** | |
|---|---|---|---|---|---|---|
| | **n** | **%** | **N** | **%** | **n** | **%** |
| Race | | | | | | |
| NHW | 4826 | 84.4 | 4826 | 100.00 | 0 | 0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| NHB | 889 | 15.6 | 0 | 0 | 889 | 100.00 |
| Gender* | | | | | | |
| Female | 2983 | 52.2 | 2427 | 50.3 | 556 | 62.5 |
| Male | 2732 | 47.8 | 2399 | 49.7 | 333 | 37.5 |
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** |
| Age (Years)* | 49.79 | 16.49 | 50.64 | 16.68 | 45.21 | 14.60 |
| Education (Years)* | 10.66 | 2.38 | 10.76 | 2.40 | 10.12 | 2.18 |
| Wellbeing* | 54.11 | 13.23 | 54.80 | 13.46 | 50.37 | 11.16 |

Non-Hispanic Black (NHB); Non-Hispanic White (NHW)

P < 0.05 for comparison ofNHBs and NHWs

*3.2 Linear Regressions*

**Table 2** presents the results of two pooled sample linear regression models. Both models were statistically significant at the 0.001 level. *Model 1* and *Model 2* differ in that *Model 1* only included the main effects, and *Model 2* also included the race by education interaction term. *Model 1* showed that high educational attainment was associated with better wellbeing (b = 1.75, 95% CI= 1.62-1.88).

*Model 2*documented significant interactions between the effects of race and educational attainment on all outcomes suggesting that the associations between educational attainment with economic wellbeing (b = 0.20, 95% CI = -1.21- -0.43), suggesting that the effect of education on economic wellbeing is significantly smaller for NHB than for NHW individuals (**Table 2**).

**Table 2. Association between Educational Attainment and Economic Wellbeing**

| | **B** | **SE** | **B** | **95% CI** | | **t** | **p** | **B** | **SE** | **b** | **95% CI** | | **t** | **p** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Model 1** | | | | | | | **Model 2** | | | | | | |
| Race (NHB) | -0.05 | -1.89 | 0.44 | -2.76 | -1.01 | -4.24 | < .001 | 0.18 | 6.48 | 2.09 | 2.39 | 10.58 | 3.10 | .002 |
| Gender (Male) | 0.10 | 2.76 | 0.32 | 2.13 | 3.40 | 8.58 | < .001 | 0.10 | 2.73 | 0.32 | 2.10 | 3.36 | 8.47 | < .001 |
| Age (Years) | 0.26 | 0.21 | 0.01 | 0.19 | 0.23 | 21.16 | < .001 | 0.26 | 0.21 | 0.01 | 0.19 | 0.23 | 21.30 | < .001 |
| Educational Attainment (Years) | 0.31 | 1.75 | 0.07 | 1.62 | 1.88 | 25.86 | < .001 | 0.33 | 1.86 | 0.07 | 1.71 | 2.00 | 25.62 | < .001 |
| Race (NHB) × Educational Attainment (Years) | - | - | - | - | - | - | - | -0.23 | -0.82 | 0.20 | -1.21 | -0.43 | -4.10 | < .001 |
| Constant | | 24.17 | 0.89 | 22.43 | 25.90 | 27.25 | < .001 | | 22.96 | 0.93 | 21.13 | 24.79 | 24.61 | < .001 |

Confidence Interval (CI); Standard Error (SE); Confidence Interval (CI); Non-Hispanic Black (NHB)

## 4. Discussion

In a nationally representative sample of American adults, each additional year of schooling was associated with fewer economic returns for NHBs than NHWs. The weaker economic return of educational attainment for NHB than NHW people is in line with MDRs and proposes an economic explanation for MDRs of education on the health of NHBs.

We found a smaller gradient effect of educational attainment on the economic wellbeing of NHBs than NHWs. As shown before, education and economic status are among major social determinants of health (Adler, Glymour, & Fielding, 2016; Albala, Sanchez, Lera, Angel, & Cea, 2011; Lantz et al., 1998). Both education and economic status that follows educational attainment are seen as fundamental causes(Link & Phelan, 1995, 2009; Phelan et al., 2004) and social determinants (M. Marmot, 2001; M. Marmot, 2004; M. Marmot, 2005; M. G. Marmot & Bell, 2009) of health. As discussed by Mirowsky and Ross, economic wellbeing is one of the reasons education enhances health (Mirowsky & Ross, 2015; Ross & Mirowsky, 1999, 2011). Higher economic wellbeing also enhances health through altering senses of control over life, mastery, stress exposure, and healthy behaviors (Lantz et al., 1998; Woszidlo & Segrin, 2013). Higher economic stability may also mediate the effect of educational credentials on health (Montez, Hummer, & Hayward, 2012; Ross & Mirowsky, 1999). Thus, we can expect that the effect of education on health would be smaller for NHBs than NHWs. However, these may differ for gradient and threshold effects of education (Assari, 2017a; Ross & Mirowsky, 1999).

Although overall, as people's education increases, and spend more years for schooling and education, people's economic wellbeing improves; However, this gradient effect of education as a result of an incremental increase in years of schooling, is less steep for NHBs than NHWs. Our finding is in line with previous reports on MDRs of SES indicators, particularly educational attainment, on various economic, behavioral, and health outcomes.

When a group is marginalized and discriminated against, their economic wellbeing declines, even in the presence of human capital and educational attainment. The U.S. society tends to discriminate against NHBs. Thus, NHBs and NHWs with the same level of education do not get access to the same level of opportunities. The U.S. social system, through social stratification, overvalues the education of NHWs and undervalues the education of NHBs (Assari, 2017d; Shervin Assari, 2018a). The low economic wellbeing of highly educated NHBs is a function of society rather than the cultural or behavioral characteristics of NHBs. The U.S. society has historically marginalized NHBs. U.S. society is built and functions around certain strong and hard-to-change social structures such as segregation, which place NHBs in a relative and systemic disadvantage. NHBs face major difficulties in navigating a social system that is friendly and trained for NHWs. As a result, highly educated NHBs need to put extra effort, fight an uphill battle, and compete with NHWs to actualize their potentials and secure outcomes. Without help by the system, human resources may result in fewer tangible economic outcomes for NHBs, which is in part due to the context in which NHBs live and work (Assari, 2017d; Shervin Assari, 2018a).

Educational attainment (Assari, 2018b), but also income (Assari, 2018a), occupation (Assari & Lankarani, 2016), and marital status (S. Assari, Caldwell, & Zimmerman, 2018) generate fewer health outcomes for NHBs than NHWs. As a result of the MDRs of education on economic wellbeing, highly educated NHBs remain at risk of CVDs (Assari, 2018a), COPD (Assari, Chalian, & Bazargan, 2019), asthma (Assari & Moghani Lankarani, 2018), obesity (Assari, 2018d; Assari, Thomas, et al., 2018), ADHD (S. Assari & Caldwell, 2019), depression (S. Assari, 2017c, 2018e; S. Assari, Lankarani, & Caldwell, 2018), and anxiety (S. Assari, Caldwell, & Zimmerman, 2018). As a result of all these economic and health adversities, highly educated NHBs would die earlier than highly educated NHWs (Assari & Lankarani, 2016).

These observed patterns, however, are not specific to NHBs and also seen for Hispanics (Assari, 2018g; Shervin Assari, 2019b; Assari, Farokhnia et al., 2019; Shervin & Ritesh, 2019), Native Americans (Shervin Assari & Bazargan, 2019d), sexual minorities (S. Assari, 2019; Shervin Assari & Bazargan, 2019a), and even marginalized NHWs in poor neighborhoods (Shervin Assari, Boyce, Bazargan, Caldwell, & Zimmerman, 2020). Commonly referred to as MDRs, these diminishing returns can be seen for all marginalized groups, broadly defined. Although all minorities and marginalized people show MDRs (Shervin Assari, 2019a; Assari S, 2019b; S. Assari, Caldwell, & Mincy, 2018; S. Assari, Preiser, et al., 2018), these patterns seem to be most pronounced for NHBs who seem to remain at risk of health problems at all levels of SES (Assari, 2018f).

Our study is with some methodological limitations. Our cross-sectional study suggests association rather than causation. Our study failed to control for a wide range of potential covariates and confounders such as income, wealth, employment. All study variables were measured at the individual level. Higher SES may help explain why individual-level SES has smaller effects for NBHs. Structural factors such as segregation job availability and job quality are a function of neighborhood SES.

## 5. Conclusion

The boosting effect of each additional year of schooling in terms of economic well being is diminished for NHBs than NHWs. This finding suggests that racial health disparities are not all due to the racial gap in education. We should expect health disparities to remain across all levels of schooling. Thus, a solution to racial health disparities is economical and labor market policies that help NHBs with education secure high paying, low stress, jobs. Such a notion emphasizes the need for policies targeting economic inequities rather than health inequalities. To achieve this goal, we need more than traditional policies that mainly focus on equalizing SES across racial groups. To prevent MDR-related racial health disparities, there is a need for policies and programs that go above merely focusing on quality in access, but also aim for equal health outcomes. In the absence of such programs, equal access would never result in equal outcomes. Bold and innovative economic, public, and social policies may help NHB communities to leverage their available resources. There is also a need to enhance the quality of education in Black communities. Such interventions may help NHBs gain tangible health outcomes

from their schooling.

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**Conflicts of Interest**

The authors have no competing interests to report.

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