

Racial differences in perceived daily-life discrimination by education and income in the MIDUS  
study

Short title: Daily-life racial discrimination by education and income

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## Abstract

There is growing evidence on the negative effects of perceived discrimination on health outcomes and their interactions with indicators of socioeconomic status. However, less has been studied about the role that education and income have on different discriminatory experiences depending on the race of the individual. Using data from the national survey of Midlife Development in the United States (MIDUS I) on eight measures of daily-life discrimination experiences and an overall index of discrimination, this study compares the experiences of black and white persons across educational levels and income. We applied seemingly unrelated regressions and generalized linear models to disentangle differential effects of education and income by race. We find that the disparities in daily-life discrimination of black people compared to whites in the United States are substantive and exacerbate in the top cohorts of society. Results show that black people increase their perceived discrimination as education and income increase. This situation highlights a policy conundrum; while increasing income and education is a desirable course of action to improve overall life standards, including health outcomes, racial disparities in discrimination can exacerbate. We highlight policy implications of these findings.

**Keywords:** daily-life discrimination, racism, minority diminished returns, racial disparities in health, socioeconomic status, income, education

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## **Introduction**

There is increasing evidence showing that perceived daily-life discrimination has detrimental health consequences that shape health disparities between individuals who feel discriminated and those who do not (Chou, Asnaani, and Hofmann 2012; Hudson et al. 2016; Ong, Fuller-Rowell, and Burrow 2009; R. Williams and Williams-Morris 2000; Sanders-Phillips et al. 2014; Yip 2015). There is also mounting evidence showing that the stigma and discrimination that cause health disparities are patterned across socioeconomic strata and racial lines in the United States and abroad (Dorling 2015). Differential experiences of discrimination have become an entrenched feature of American society that remain persistently correlated with health disparities over time and space despite powerful variation in population's disease and risk profiles, cultural and demographic makeup, non-governmental and public health interventions, and political and economic contexts.

Improving our understanding of the experience of objective and subjective discrimination is critical for the adequate interpretation of many stress-mediated social determinants of health. Discrimination—as an important source of stress-related physiological dysregulation—has many forms and manifestations. At the individual level, it could occur voluntarily or involuntarily (Pager and Shepherd 2008), explicitly or implicitly (Chae, Nuru-Jeter, and Adler 2012; Sabin, Rivara, and Greenwald 2008; Vanman et al. 2004). At the structural level, it could occur *de jure* (Alexander 2020), through the social construction of target populations (Schneider and Ingram 1993), due to historically embedded imbalances in political power (LaVeist 1992; LaVeist and

Isaac 2012; Rodriguez 2018, 2019), culturally or via societal practices (Bonilla-Silva 1997), or through the imposition of force and power (Alang et al. 2017), among others.

The experience of discrimination, as a structural problem, does not only gain additional salience as it selectively negates access to the social, economic, and political resources to vulnerable communities that lead to personal development, health, and wellbeing. It is also important because of its endogenous nature: The same mechanisms that reinforce discrimination in society are the ones that filter and distribute the effectiveness of the policies and interventions set forth to alleviate it (Rodriguez 2018). Not surprisingly, in the United States, research has shown that the improvement of key social determinants of health like education and income manifest weaker effects for black people than for whites at reducing poor health outcomes (Assari 2018b, 2018c; Assari and Lankarani 2016).

The relationship between socioeconomic status and health is perhaps one of the best established in public health and epidemiology literatures (Adler et al. 1994). Consequently, the prescription of policies and implementation of programs that aim to increase education and income is perhaps the preferred course of action among advocates, researchers, and policy makers to improve health outcomes among vulnerable communities. And given that discrimination confounds socioeconomic status with race, there is urgency for policies and interventions that shrink observed social inequities by socioeconomic status and race and that also attenuate the discriminatory mechanisms that link these social disparities to health.

At this point, a policy conundrum arises because, as research on the health gradient has demonstrated, higher education and income improve health within racial groups and the overall health of the population; yet, it has been shown that such desirable improvements also increase disparities in health between racial groups (Assari 2018a; Assari and Moghani Lankarani 2018b;

Park 2019). Such diminished returns of education and income for racial minorities have been observed on a great variety of health outcomes like high level of depression, hypertension, hospitalization, suicide, and mortality as well as on risk factors like obesity, drinking and smoking, and eating a healthy diet and exercising (Assari 2019b; Lee et al. 2018). Moreover, these diminishing return effects have been detected in children, adults and older adults (Assari and Bazargan 2019; Assari and Caldwell 2018; Bumpus, Umeh, and Harris 2020).

Given this situation, and the observation that increases in education and income alone have favorable overall effects but differential effects by race, this paper posits an alternative perspective: that diminishing returns of income and education is an endogenous response to the racialized experiences of disadvantage racial minorities have to go through when increasing their income and education. Higher levels of discrimination and the corresponding poorer health outcomes reported by minority groups associated with higher income and education are a consequence of the same racial disadvantages that push them down in the socioeconomic ladder and not of manifested higher socioeconomic status itself. If structural, race-induced risk factors for discrimination and poor health outcomes are the underlying causes of diminished returns of income and education, then policy implementations aiming at solely improving overall wellbeing will not mitigate the underlying processes of racialization.

A number of studies have proposed various mechanisms to explain diminished returns effects. Some are labor-related, with high education being associated with worse comparative job conditions, including lower salaries, for black people compared to whites (Assari 2019a). Others are psychosocial—e.g., the life-long psychological and socioeconomic effects of living in poverty during childhood (Haas, Krueger, and Rohlfen 2012). Other research focuses on perceptions of discrimination and how these interact with the socioeconomic status of

individuals. Some of these studies have shown that black people with high education and income tend to report high levels of perceived discrimination and that they differentially manifest negative discrimination-related health outcomes (Assari and Caldwell 2018) . These findings are not in isolation, given the bulk of evidence showing that perceived discrimination detrimentally affects a variety of health outcomes (Goosby, Cheadle, and Mitchell 2018), including cardiovascular disease (Goosby et al. 2015; Lewis et al. 2006), blood pressure (Sawyer et al. 2012) , low birthweight (Mustillo et al. 2004), oxidative stress (Szanton et al. 2012), self-reported health status as well as overall physical and mental health (Erving, Satcher, and Chen 2020; Goosby and Heidbrink 2013; Jochman et al. 2019; Priest et al. 2011), among many others.

Much less is known, however, about the effects that education and income have on different discriminatory experiences depending on race. Disentangling these effects is crucial to prescribe adequate social solutions, especially considering that racism—the discriminatory process through which physical phenotypes turn into social hierarchies—has proved to have powerful adaptable features. Black people’s daily-life experiences of discrimination have evolved—from slavery to the Jim Crow system, passing through lynching and Ku Klux Klan terrorization, to present-day mass incarceration, residential segregation, and excess black mortality—confirming the resilience of structural racism and the inefficacy of solutions proposed in different places at any given point in time. To help fill in this gap, this study has three main objectives: (1) Outline the overall main effects that race, education, and income have on eight separate types of daily-life discriminatory experiences, and (2) Determine if there is racial variation in the effects of education and income on each discriminatory experience.

## **Data**

The present study uses data from the Midlife Development in the United States (MIDUS I). Originally fielded between 1995 and 1996, MIDUS comprises a national sample with 7,108 participants. MIDUS includes a wide battery of daily-life perceived discrimination questions, originally developed for a study of racial discrimination in Detroit (Williams et al. 1997) and based on previous qualitative studies of discrimination (Essed 1991; Feagin 1991). Of the 7,108 participants, 6,082 have complete data on all daily-life discrimination questions. Once added the controls to the models and account for all methodological procedures, the final analytic sample includes 5,644 individuals.

The daily-life discrimination questions used in this study asked MIDUS participants if (1) you are treated with less courtesy, (2) you are treated with less respect, (3) people think you are not smart, (4) people are afraid of you, (5) people think you are dishonest, (6) people think you are not as good as they are, (7) people call you names, and (8) people have threatened you. All types of discrimination are coded as 1=never, 2=rarely, 3=sometimes, and 4=often. In addition to these eight variables, we also generated a reliability discrimination scale using all eight items (Cronbach's alpha = .91). The eight types of discrimination plus the overall index of discriminations are the dependent variables. Our independent variables of interest are race (1=black, 0=white), education (1=less than high school, 2=high school, 3=some college, and 4=at least bachelor's degree), and household income tertiles (1=bottom tertile, 2=middle tertile, 3=top tertile). We further controlled for age, gender, and body mass index (BMI) considering that people of different races and socioeconomic statuses can be selectively discriminated on their obesity status (Spahlholz et al. 2016).

## **Methods**



To increase the comparability between black and white individuals in MIDUS, we first generated a propensity score on being a black person (i.e., the probability of being a black person). This propensity score was estimated using a logistic regression (Austin 2011) that included separate education categories, household income tertiles, age, gender, and BMI as predictors. Subsequently, we used Automated Coarsened Exact Matching (CEM) to match black people on propensity score to white people. By using CEM, black people were matched to white people on propensity score intervals optimized by CEM's algorithm (Blackwell et al. 2009). All predictors included in the propensity score estimation were included in subsequent analyses to control for additional residual variation in our associations of interest.

We used weighted seemingly unrelated regressions (SUR) to test the hypotheses that: (1) Black and white people experience different levels of daily-life discrimination, (2) these experiences vary by educational and income levels, and (3) the effects of education and income on such discrimination experiences vary by race. Given that all discriminatory experiences tend to be correlated, and that they could be considered the components of an overall index of daily-life discrimination, SUR allows to simultaneously estimate—using discrimination-specific explanatory equations—the different independent effects of the variables of interest on each of the perceived daily-life discriminatory experiences. SUR allows to estimate coefficients for race, education, income, and their interactions while exploiting the correlation between the discrimination cross-equation disturbances (Felmlee and Hargens 1988; Zellner 1962).

Our SUR interactive model is of the following econometric form:

$$Y_{ij} = \alpha_j + \pi_j R_i + \sum_e \gamma_{je} E_{ie} + \sum_t \theta_{jt} I_{it} + \sum_e \vartheta_{je} (R_i * E_{ie}) + \sum_t \rho_{jt} (R_i * I_{it}) + \sum_{k=1}^n \delta_{jk} X_{ik} + \varepsilon_{ij} \quad (1)$$

where  $Y_{ij}$  is the value reported by individual  $i$  on type of discriminatory experience  $j$ . The SUR model also estimates an “intercept”  $\alpha_j$  for each type of discriminatory experience.  $R_i$  is the race of the individual, with coefficients  $\pi_j$  across types of discriminatory experience. The term  $\sum_e \gamma_{je} E_{ije}$  is a vector where education  $E$  of individual  $i$  varies across educational category dummies  $e$ , each category with an assigned coefficient  $\gamma_{je}$  for each type of discriminatory experience  $j$ . This same notation applies to the expression  $\sum_t \theta_{jt} I_{it}$ , where income  $I$  of individual  $i$  takes on tertile  $t$  dummies and for which a coefficient  $\theta_{jt}$  is assigned to each type of discriminatory experience  $j$ . The terms  $\sum_e \vartheta_{je} (R_i * E_{ie})$  and  $\sum_t \rho_{jt} (R_i * I_{it})$  represent the interactions between race and each education categories and income tertiles, and their respective coefficients  $\vartheta_{je}$  and  $\rho_{jt}$  for each type of discriminatory experience  $j$ . The model also includes a set of  $k$  covariates  $X_{ijk}$  (the same used in the propensity scores estimation) with their respective set of  $k$  coefficients  $\delta_{jk}$ , one for each covariate  $X_{ijk}$  and for each type of discriminatory experience  $j$ . The error terms are for each individual  $i$  for each of the types of discriminatory experience equations  $j$ , and they are allowed to correlate across equations. All parameters are estimated simultaneously.

In addition to estimate the associations between race, education, income, and their respective race-interactions with each of the perceived daily-life discriminatory experiences, we also tested the hypothesis that these associations hold using an overall index of daily-life discrimination. To test this hypothesis, we used a weighted Generalized Linear Model (GLM) with a log link. The econometric specification of this model is of the following form:

$$\log\{E(y_i)\} = \beta_0 + \beta_1 R_i + \sum_e \varphi_e E_{ie} + \sum_t \omega_t I_{it} + \sum_e \sigma_e (R_i * E_{ie}) + \sum_t \mu_{jt} (R_i * I_{it}) + \sum_{k=1}^n \lambda_k X_{ik} + \varepsilon_i, y \sim F \quad (2)$$

where  $\log\{E(y_i)\}$  denotes the log link for our overall daily-life discrimination index. All variables in the right side of the equation are the same variables implemented in the SUR model. The notation  $y \sim F$  demotes the distributional family of our discrimination index  $y_i$  (in our case, Gamma, which was determined using a Park test (Park 1966)). All coefficients were estimated using robust estimation.

## Results

Table 1 outlines the summary statistics for our analytic sample. The eight types of discrimination vary from an average of 1.25 (people have threatened you) to an average of 1.57 (people think you are not as good as they are). The overall index of discrimination has an average of 1.42. Overall, the sample shows a low average of discriminatory experiences. Yet, these experiences vary widely by race. The average for the overall index of discrimination is 1.39 for whites and 2.06 for black people (Table 1).

Table 1 also shows that the sample is predominantly non-black (95%), with an average age of 47 years, and with a slightly higher fraction of females (52%). The MIDUS I sample is also known for showing higher income and education averages compared to the rest of the population (Dienberg Love et al. 2010). Accordingly, the average income of households located at the bottom, middle, and top tertiles of the household income distribution are \$27,380, \$73,311, and \$185,659, respectively. Similarly, 63.4% of the sample has an educational level of at least some college. The average body mass index of the sample is 26.7, suggesting a rather healthy sample of individuals.

[Table 1 about here]

Our matching procedure successfully matched 99.9% of our original sample, with no loss of black participants. Importantly, Table 1 shows that differences across all covariates between white and black participants were drastically diminished after our propensity scores matching procedure, with none of these differences reaching statistical significance after matching. The reduction of covariate imbalance after matching also contracted the differences between whites and blacks in daily-life discrimination experiences across all types of discrimination. On average, differences in discrimination experiences diminished by 11% after matching, indicating that the factors that differ between the races are also related to the different experiences of discrimination between them.

Table 2 summarizes our SUR parameter estimates for the eight types of daily-life discrimination equations. Table 2 also shows four panels: (1) Main effects model, (2) Interactive model (our model for results interpretation), (3) Main effects for white people, and (4) Main effects for black people. In all models, the educational category of reference is those with less than a high school education; the income tertile of reference is the bottom tertile. The main effects model shows that black people experience higher levels of daily-life discrimination; all these differences are substantial and statistically significant ( $p < .001$ ). Relative to individuals without a high school degree, higher levels of education manifest heterogeneity in the magnitude, sign, and precision of the coefficient estimates across types of discrimination.

[Table 2 about here]

Results for education from the interactive model show similar frequency levels of discrimination among whites across all levels of education and types of daily-life discrimination experience; black people show higher dispersion. Racial differences for individuals with less

than high school, high school, and some levels of college follow parallel patterns, displaying monotonic inequality in educational discrimination between the races. However, this is not the case for high-education whites and blacks, which tend to manifest the lowest and highest frequency levels of discrimination, respectively. Our interactive estimates across equations shows significant differences almost exclusively for those with at least a bachelor's degree and those at the top tertile of the household income distribution (Table 2). These black diminishing returns of education and income on discrimination are corroborated by our GLM estimates (Table 3).

[Table 3 about here]

Race-specific models 3 and 4 in Table 2 (for whites and black people, respectively) illustrate how heterogeneous are variable associations across discriminatory experiences among the races. As to household income, higher tertiles show protective effects relative to the bottom tertile across all types of discrimination. However, our stratified models by race (models 3 and 4, Table 2) show that the protective effects of education and income vary widely by race, a situation captured by our interactive model (model 2, Table 2).

Figures 1, 2, and 3 show a complete visualization of our findings. Figure 1 illustrates that, across all types of discrimination, white people experience less discrimination at all levels of education. However, compared to white people, black people increase their perceived discrimination as education increases. Racial differences in discrimination exacerbate most drastically for those with at least a bachelor's degree. These within- and between-race diminished returns patterns are also present in a remarkably similar fashion across income tertiles. Figure 2 shows that the most drastic racial differences in discrimination are greatest among those located in the top tertile. Figure 3 shows that black people's diminished returns of

education and income also hold when using an overall index of discrimination, and that their inequality effects are very similar for those with at least a bachelor's degree and those located at the top tertile of the household income distribution.

[Figure 1 about here]

[Figure 2 about here]

[Figure 3 about here]

## **Discussion**

Our examination of eight different types of daily-life discrimination experiences and an overall index of daily-life discrimination reveals consistent, powerful racial differences depending on the educational and income levels of individuals. Black people with higher education (with at least a BA degree) or high income (belonging to the top tertile of the overall household income distribution) report discrimination experiences more often than those of lower education and income. Patterns are different for white people, with discriminatory experiences reported with moderately less frequency among those of higher education and income. This situation exacerbates discrimination inequality between the races, with low frequencies of discrimination being reported among high-education and high-income white people and the highest frequencies being reported among high-education and high-income black people.

Comparing the predicted values from our interactive model for white and black people within the highest cohort of education, black people showed wide discriminatory disadvantage, from 0.35 units (people threaten you) to 1.02 units (people think you are dishonest) higher than white people. The predicted educational difference in discrimination experiences for high-education individuals was 0.85 units higher for black people in our overall index of discrimination (Appendix C). The sizes of these racial differences in discrimination experiences

are striking considering that there was no overlapping in the predicted discrimination distributions between the races in the majority of types of discrimination (Appendix E and Appendix F).

No white individual in our sample, irrespective of education, shows an equal or higher level of predicted discrimination experiences than the lowest level predicted for a black person in our sample for five of the eight types of discrimination: “treated with less courtesy,” “not as smart,” “afraid of you,” “think you are dishonest,” and “think you are not as good”. Among all white participants in our sample, 99.9%, 98%, and 98% show lower predicted discrimination than the lowest level of discrimination predicted for black people in our sample for “treated with less respect,” “call you names,” and “threat you” (Appendix E). For high-education individuals, the average predicted discrimination level of black people across all types of discrimination experiences was on average almost seven white-standard-deviations above the average of high-education white’s predicted level of discrimination. Given that our discrimination scales start at “1,” highly-educated black people’s predicted experiences of discrimination go from about three (people threaten you) to about six times (people think you are dishonest) those of highly-educated white people (Appendix A and Appendix E).

Racial differential effects by income reaffirm these educational effects as we detect higher discrimination differences between white and black people located at the top-tertile of the overall household income distribution. The patterns and the magnitude of these differences are very similar to educational ones, with top-income black people showing from 0.32 (people threaten you) to 1.13 units (people think you are dishonest) higher than top-income white people (Appendix B and Appendix F). Similarly, the top income predicted difference in discrimination experiences was 0.83 units higher for black people than for whites in our overall index of

discrimination (Appendix D). These racial differences are also striking as they are almost identical to those reported for top-education individuals, with high-income black people's predicted experiences of discrimination showing between three (people threaten you) and six times (people think you are dishonest) those of high-income white people. The differential effects of race interacting with education and income are confirmed by results using our overall index of discrimination (Appendix C and Appendix D).

Our findings bring to light powerful implications for public health, health policy, and the design of effective social interventions. This is especially true as the experience of discriminatory treatment on a daily basis is intimately related to how social structures, culture and social behavior, political institutions, and our legal and economic systems interact with the biopsychosocial coping mechanisms that individuals implement to deal with environmental stressors (Rodriguez 2018, 2019). Considering that racism—the discriminatory process through which physical phenotypes turn into social hierarchies—continues to adapt in the U.S. throughout time, geography, and the sociopolitical structures that shape human behavior. Policies should not be implemented as single-policy issues; research on how discrimination affects health needs to evolve into a multidisciplinary, complex-systems agenda (Jones et al. 2019). Policies and interventions to increase income and education are not enough, for instance, to improve health outcomes while shrinking racial disparities. They need to be triangulated with simultaneous policies and programs that reduce discrimination across a great variety of social contexts and situations. Otherwise, as our findings show, the favorable effects of longstanding key policy instruments and social determinants of health like education and income can become part of the problem, not the solution, to resilient racial disparities in health.



Key contexts in which daily discriminatory practices are entrenched are the labor and housing environments, and their social intersections. For example, in a study fielded in Washington, D.C., middle-class black participants described elaborate schemes used to construct “public identities” to signal their middle-class status to whites and revendicate that they belong in the settings they frequent, such as upscale retail stores or seeking housing in more-affluent, predominantly white neighborhoods. Black respondents manifested the psychological harm imparted by the construction and practice of such subtle racial and class interactions (Lacy 2007). Without close supervision of social practices and effective legislation to track down the behavioral intersections of stigma and social exclusion, as black Americans gain access to labor and housing privileged settings through higher income and education, they are doomed to experience higher levels of discrimination.

While practices for social exclusion against achieving black Americans are silently incorporated into daily social interactions, there are reports of a simultaneous social pressure to be a “strong black person” that affects their physical and mental health. For example, Ward et al. (2009) found that the normalization of challenging life conditions in a community pressures black women to be a “strong black woman,” therefore decreasing black people’s awareness of their need for treatment and their willingness to receive it (Ward and Heidrich 2009). Given this situation, social workers have been identified as key personnel to educate patients and vulnerable communities on mental health stigmatization (Mishra et al. 2009). Such educational programs should be put in concert with interventions attempting to integrate family and other sources of support (Schwartz et al. 2014). Educating patients and their support systems can serve to address potential barriers to treatment imparted by stigmatization and discriminatory practices (Gaston et al. 2016). Concurrently, companies could incorporate training schedules on diversity and social

inclusion for their achieving white workforce, as they may be or become part of their black coworkers' support systems.

The stress and coping model points that the detrimental health effects of being exposed to a stressor like racial discrimination is mediated by the coping response to the stressor (Erving, Satcher, and Chen 2020; Geronimus et al. 2006; McEwen and Seeman 1999; Rodriguez et al. 2019), which in turn is moderated by the resource arsenal of the individual—of which education and income are important components (Bound et al. 2015; Bound et al. 2018). In an early study of the relationship between racial discrimination among black men with manifested job success, James et al. 1984 reported their health disadvantage compared to those who did not report discrimination (James et al. 1984). Subsequent analyses of the discrimination-stress-health connection brought to light the cushion effects of social support at minimizing the use of high-effort coping strategies (Bronder et al. 2014; Hudson et al. 2016; Rayburn et al. 2005). In a more recent study, Assari et al. 2018 reports that both secular and religious social support successfully mitigate detrimental discrimination health effects like depression among black individuals (Assari and Moghani Lankarani 2018a). Given the promising role that social support systems play in diminishing socioeconomic differences in health by race, public-private partnerships involving the non-profit sector should be put in place to facilitate motivational activities and space for social integration, emotional network development, institutional and informational support, and the encouragement of healthy choices and behaviors.

In addition to identifying psychosocial resources supportive of social ties, sense of control, and self-esteem—which indirectly address the depression and anxiety resulting from discriminatory experiences—research also shows the benefits of proper sleep hygiene. In a recent study, Yip (2015) reports the increasing ability of black adolescents with proper sleep

hygiene to cope with the emotional load generated by racial discrimination. High-quality sleep consistently decreased black adolescents' depressive symptoms ignited by racist experiences (Yip 2015). Adequate sleep hygiene represents a simple, low-cost potential avenue to mitigate at home some of the detrimental health effects acquired in societal environments. Sleep quality interventions for adolescents are particularly promising considering that the onset of chronic diseases sparks early in life, and that proper sleep hygiene can be easily incorporated into the lifelong habits of individuals.

None of the above, of course, can be achieved without confronting the fundamental historical, institutional, legal and sociopolitical structures that manufacture the social determinants of health (Cottrell et al. 2019; Rodriguez 2019; Rodriguez et al. 2015). Observed racial diminishing returns of income and education on equal treatment in society are a reflection of racial imbalances in sociopolitical power—i.e., the disadvantage of black Americans at materializing institutional, policy, and structural resources into community benefits. The most notable manifestations of racism shaping racial disparities in health—i.e., excess black segregation, mass incarceration, and premature mortality—are therefore a function of the power invested in governments. This is because governments manufacture and validate through legislation the social identities and the ideologies of supremacy and subordination people use to interact on a daily basis. Through the construction of culture and social psychology, governments thread the norms that dictate social desirability and stigmatization, and the belief systems that thread human relations between social groups—i.e., the underlying factors that shape the mental and emotional health of discriminated communities (Geronimus et al. 2019; Rodriguez 2018, 2019; Rodriguez, Bound, and Geronimus 2013; Rodriguez, Bound, and Geronimus 2014).

Some limitations of the present study should be noted. First, our subsample of black individuals is small, thus increasing uncertainty in our estimates. In spite of some lack of statistical power to detect meaningful differences between the races, our results show remarkable consistency across types of discrimination and clear patterns already reported in existing literature. Second, a good portion of the black subsample included in MIDUS comes from Milwaukee, reminding us that generalizability of results to the overall population of the U.S. should be taken with caution. However, the overall characteristics of the black subsample resemble those in the general U.S. population. Third, the subsample of white individuals in MIDUS is skewed toward higher socioeconomic status; yet, the subsample manifests a great deal of variation across variables thus covering the underlying range of values detected in the overall population. Additionally, we applied a propensity scores matching technique which successfully improved the statistical comparability between the black and white participants. And finally, given the cross-sectional nature of the data, we could not analyze the evolution of the identified black diminished returns of income and education on daily-life discrimination, and determine how such disadvantage affects black people throughout different stages of their lives.

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### **Conflicts of interest**

The authors declare that they have no conflict of interest related to the research design, the analysis of the data, and the findings of this article.

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## Tables

Table 1. Summary statistics of the analytic sample (N=5,644)

|                              | Unweighted statistics |         |        | Before Matching |         |        |         | After Matching |         |        |         |
|------------------------------|-----------------------|---------|--------|-----------------|---------|--------|---------|----------------|---------|--------|---------|
|                              | Percent               | Mean    | SD     | Whites          | Blacks  | Diff.  | P-value | Whites         | Blacks  | Diff.  | P-value |
| <b><i>Discrimination</i></b> |                       |         |        |                 |         |        |         |                |         |        |         |
| Less courtesy                |                       | 1.54    | 0.70   | 1.50            | 2.28    | -.78   | .000    | 1.57           | 2.28    | -.71   | .000    |
| Less respect                 |                       | 1.54    | 0.71   | 1.50            | 2.22    | -.72   | .000    | 1.58           | 2.22    | -.64   | .000    |
| Not as smart                 |                       | 1.51    | 0.73   | 1.47            | 2.24    | -.76   | .000    | 1.56           | 2.24    | -.68   | .000    |
| Afraid of you                |                       | 1.38    | 0.67   | 1.34            | 2.09    | -.75   | .000    | 1.37           | 2.09    | -.72   | .000    |
| Dishonest                    |                       | 1.29    | 0.56   | 1.25            | 2.05    | -.80   | .000    | 1.29           | 2.05    | -.76   | .000    |
| Not as good                  |                       | 1.57    | 0.76   | 1.53            | 2.40    | -.87   | .000    | 1.63           | 2.40    | -.77   | .000    |
| Call your name               |                       | 1.32    | 0.59   | 1.30            | 1.72    | -.42   | .000    | 1.37           | 1.72    | -.35   | .000    |
| Threat you                   |                       | 1.25    | 0.51   | 1.23            | 1.49    | -.26   | .000    | 1.27           | 1.49    | -.22   | .000    |
| Overall Index                |                       | 1.42    | 0.52   | 1.39            | 2.06    | -.67   | .000    | 1.46           | 2.06    | -.60   | .000    |
| <b><i>Demographics</i></b>   |                       |         |        |                 |         |        |         |                |         |        |         |
| Black                        | 4.8                   |         |        |                 |         |        |         |                |         |        |         |
| Age                          |                       | 46.6    | 12.8   | 46.7            | 44.2    | 2.5    | .002    | 44.9           | 44.2    | .64    | .790    |
| Female                       | 51.8                  |         |        | .51             | .62     | -.11   | .001    | .61            | .62     | -.01   | .687    |
| <b><i>Income</i></b>         |                       |         |        |                 |         |        |         |                |         |        |         |
| Bottom tertile               |                       | 27,380  | 14,877 | 27,787          | 22,578  | 5209   | .000    | 24,820         | 22,578  | 2243   | .135    |
| Middle tertile               |                       | 73,311  | 14,547 | 73,521          | 67,453  | 6068   | .001    | 69,988         | 67,453  | 2535   | .107    |
| Top tertile                  |                       | 185,659 | 77,096 | 185,966         | 175,908 | 10,059 | .328    | 186,574        | 175,908 | 10,666 | .180    |
| <b><i>Education</i></b>      |                       |         |        |                 |         |        |         |                |         |        |         |
| < High School                | 8.1                   |         |        | .08             | .15     | -.07   | .000    | .16            | .15     | .01    | .753    |
| High school                  | 28.5                  |         |        | .29             | .29     | -.00   | .976    | .28            | .29     | -.01   | .889    |
| Some college                 | 30.7                  |         |        | .31             | .34     | -.03   | .310    | .33            | .34     | -.01   | .846    |
| At least BA                  | 32.7                  |         |        | .33             | .23     | .10    | .001    | .23            | .23     | .00    | .925    |
| Body mass index              |                       | 26.7    | 5.2    | 26.5            | 28.6    | -2.1   | .000    | 28.5           | 28.6    | .15    | .713    |

Note: This table shows results for mean differences across all variables used in the analyses before and after matching. The procedure was a propensity scores matching, where the propensity scores were estimated using a logistic regression and the matching technique was Automated Coarsened Exact Matching (see text). The resulting weights are for the subsample of whites whereas variables of the subsample of black people are used as the calibrating distributions.



Table 2. Seemingly unrelated regressions parameter estimates for types of daily-life discrimination

|                              | Less courtesy |        | Less respect |        | Not as smart |        | Afraid of you |        | Dishonest |        | Not as good |        | Call you names |        | Threaten of you |        |
|------------------------------|---------------|--------|--------------|--------|--------------|--------|---------------|--------|-----------|--------|-------------|--------|----------------|--------|-----------------|--------|
|                              | Coeff         | (SE)   | Coeff        | (SE)   | Coeff        | (SE)   | Coeff         | (SE)   | Coeff     | (SE)   | Coeff       | (SE)   | Coeff          | (SE)   | Coeff           | (SE)   |
| <b>Model 1: Main effects</b> |               |        |              |        |              |        |               |        |           |        |             |        |                |        |                 |        |
| Black                        | .708***       | (.045) | .628***      | (.046) | .665***      | (.047) | .712***       | (.041) | .753***   | (.036) | .759***     | (.049) | .345***        | (.040) | .210***         | (.034) |
| High school                  | -.068*        | (.030) | -.114***     | (.031) | -.119***     | (.032) | -.035         | (.028) | -.085***  | (.025) | -.145***    | (.033) | -.095***       | (.027) | -.033           | (.023) |
| Some college                 | -.019         | (.030) | -.036        | (.031) | -.093**      | (.032) | .032          | (.028) | -.051*    | (.024) | -.122***    | (.033) | -.042          | (.027) | -.001           | (.023) |
| At least Bachelor's          | .026          | (.033) | .045         | (.034) | -.095**      | (.035) | -.007         | (.030) | -.078**   | (.027) | -.132***    | (.036) | -.038          | (.030) | -.002           | (.025) |
| Mid tertile                  | -.072**       | (.023) | -.104***     | (.024) | -.101***     | (.025) | -.076***      | (.021) | -.057**   | (.019) | -.095***    | (.025) | -.101***       | (.021) | -.083***        | (.018) |
| Top tertile                  | -.083**       | (.026) | -.118***     | (.027) | -.129***     | (.028) | -.050*        | (.024) | -.064**   | (.021) | -.145***    | (.029) | -.091***       | (.023) | -.068***        | (.020) |
| Constant                     | 1.599***      | (.061) | 1.523***     | (.062) | 1.778***     | (.065) | 1.651***      | (.056) | 1.482***  | (.049) | 1.795***    | (.067) | 1.287***       | (.055) | 1.339***        | (.047) |
| <b>Model 2: Interactive</b>  |               |        |              |        |              |        |               |        |           |        |             |        |                |        |                 |        |
| Black                        | .538***       | (.118) | .406***      | (.120) | .530***      | (.125) | .299**        | (.108) | .508***   | (.095) | .381**      | (.128) | .201           | (.106) | .054            | (.090) |
| High school                  | -.068*        | (.031) | -.115***     | (.032) | -.120***     | (.033) | -.047         | (.028) | -.093***  | (.025) | -.156***    | (.034) | -.095***       | (.028) | -.039           | (.024) |
| Some college                 | -.025         | (.031) | -.043        | (.031) | -.097**      | (.033) | .014          | (.028) | -.057*    | (.025) | -.137***    | (.033) | -.047          | (.028) | -.006           | (.023) |
| At least Bachelor's          | .006          | (.034) | .025         | (.034) | -.108**      | (.036) | -.031         | (.031) | -.099***  | (.027) | -.157***    | (.037) | -.055          | (.030) | -.015           | (.026) |
| Mid tertile                  | -.069**       | (.024) | -.106***     | (.024) | -.098***     | (.025) | -.079***      | (.022) | -.052**   | (.019) | -.096***    | (.026) | -.101***       | (.021) | -.083***        | (.018) |
| Top tertile                  | -.094***      | (.027) | -.134***     | (.027) | -.144***     | (.028) | -.065**       | (.025) | -.084***  | (.022) | -.164***    | (.029) | -.097***       | (.024) | -.074***        | (.021) |
| Black X High school          | .011          | (.143) | .014         | (.146) | .023         | (.152) | .269*         | (.131) | .164      | (.115) | .236        | (.156) | .008           | (.128) | .112            | (.110) |
| Black X Some college         | .106          | (.141) | .129         | (.144) | .053         | (.150) | .381**        | (.130) | .085      | (.114) | .290        | (.154) | .098           | (.127) | .088            | (.108) |
| Black X At least B           | .428**        | (.154) | .426**       | (.157) | .277         | (.163) | .533***       | (.141) | .458***   | (.124) | .549**      | (.167) | .356**         | (.138) | .270*           | (.118) |
| Black X Mid tertile          | -.077         | (.110) | .023         | (.112) | -.069        | (.117) | .074          | (.101) | -.113     | (.088) | .018        | (.120) | -.013          | (.099) | .009            | (.084) |
| Black X Top tertile          | .235*         | (.119) | .329**       | (.121) | .294*        | (.126) | .312**        | (.109) | .424***   | (.095) | .384**      | (.129) | .137           | (.106) | .138            | (.091) |
| Constant                     | 1.614***      | (.061) | 1.539***     | (.062) | 1.790***     | (.065) | 1.674***      | (.056) | 1.502***  | (.049) | 1.818***    | (.067) | 1.299***       | (.055) | 1.349***        | (.047) |
| <b>Model 3: White people</b> |               |        |              |        |              |        |               |        |           |        |             |        |                |        |                 |        |
| High school                  | -.069*        | (.031) | -.117***     | (.031) | -.122***     | (.033) | -.047         | (.028) | -.093***  | (.024) | -.158***    | (.033) | -.096***       | (.028) | -.040           | (.024) |

|                     |          |        |          |        |          |        |          |        |          |        |          |        |          |        |          |        |
|---------------------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|
| Some college        | -.027    | (.030) | -.046    | (.031) | -.099**  | (.032) | .014     | (.028) | -.059*   | (.024) | -.140*** | (.033) | -.049    | (.027) | -.008    | (.023) |
| At least Bachelor's | .006     | (.033) | .024     | (.034) | -.108**  | (.035) | -.028    | (.030) | -.099*** | (.026) | -.158*** | (.036) | -.056    | (.030) | -.016    | (.026) |
| Mid tertile         | -.068**  | (.023) | -.105*** | (.024) | -.097*** | (.025) | -.077*** | (.021) | -.051**  | (.018) | -.095*** | (.025) | -.100*** | (.021) | -.083*** | (.018) |
| Top tertile         | -.092*** | (.027) | -.130*** | (.027) | -.140*** | (.028) | -.062*   | (.024) | -.082*** | (.021) | -.161*** | (.029) | -.095*** | (.024) | -.072*** | (.020) |
| Constant            | 1.609*** | (.062) | 1.532*** | (.063) | 1.783*** | (.065) | 1.653*** | (.056) | 1.499*** | (.048) | 1.821*** | (.067) | 1.298*** | (.055) | 1.352*** | (.047) |

**Model 4: Black people**

|                     |          |        |          |        |          |        |          |        |          |        |          |        |          |        |          |        |
|---------------------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|
| High school         | .035     | (.170) | .061     | (.168) | .012     | (.191) | .222     | (.178) | .119     | (.187) | .184     | (.186) | .012     | (.149) | .164     | (.125) |
| Some college        | .166     | (.167) | .235     | (.165) | .061     | (.188) | .406*    | (.175) | .081     | (.184) | .260     | (.183) | .144     | (.146) | .171     | (.123) |
| At least Bachelor's | .498**   | (.179) | .562**   | (.176) | .252     | (.200) | .532**   | (.187) | .409*    | (.197) | .482*    | (.196) | .371*    | (.156) | .324*    | (.131) |
| Mid tertile         | -.173    | (.129) | -.129    | (.128) | -.211    | (.145) | -.099    | (.136) | -.202    | (.142) | -.111    | (.142) | -.135    | (.113) | -.091    | (.095) |
| Top tertile         | .077     | (.143) | .086     | (.141) | .045     | (.160) | .076     | (.149) | .245     | (.157) | .110     | (.156) | -.024    | (.125) | -.002    | (.105) |
| Constant            | 2.207*** | (.348) | 2.027*** | (.343) | 2.417*** | (.390) | 2.500*** | (.364) | 2.066*** | (.383) | 2.114*** | (.381) | 1.471*** | (.304) | 1.303*** | (.256) |

|                | Model 1 | Model 2 | Model 3 | Model 4 |
|----------------|---------|---------|---------|---------|
| R <sup>2</sup> | .076    | .079    | .039    | .061    |
| RMSE           | .715    | .714    | .706    | .836    |
| Observations   | 5,644   | 5,644   | 5,375   | 269     |

Statistical significance code: \* p<.05, \*\* p<.01, \*\*\* p<.001, two-tailed tests.

Table 3. Generalized linear model parameter estimates for overall index of discrimination

|                      | <b>Coeff.</b> | <b>SE</b> |
|----------------------|---------------|-----------|
| Black                | .236***       | (.071)    |
| High school          | -.056*        | (.029)    |
| Some college         | -.029         | (.028)    |
| At least BA          | -.035         | (.028)    |
| Black X High school  | .049          | (.083)    |
| Black X Some college | .060          | (.079)    |
| Black X At least BA  | .195*         | (.080)    |
| Mid tertile          | -.054***      | (.015)    |
| Top tertile          | -.071***      | (.014)    |
| Black X Mid tertile  | -.003         | (.053)    |
| Black X Top tertile  | .147**        | (.049)    |
| Constant             | .467***       | (.052)    |
| AIC                  | 2.779         |           |
| BIC                  | -48007        |           |
| Loglikelihood        | -7828         |           |
| Observations         | 5,644         |           |

Statistical significance code: \* p<.05, \*\* p<.01, \*\*\* p<.001, two-tailed tests.

## Figures

Figure 1. Education effects on different experiences of discrimination by race

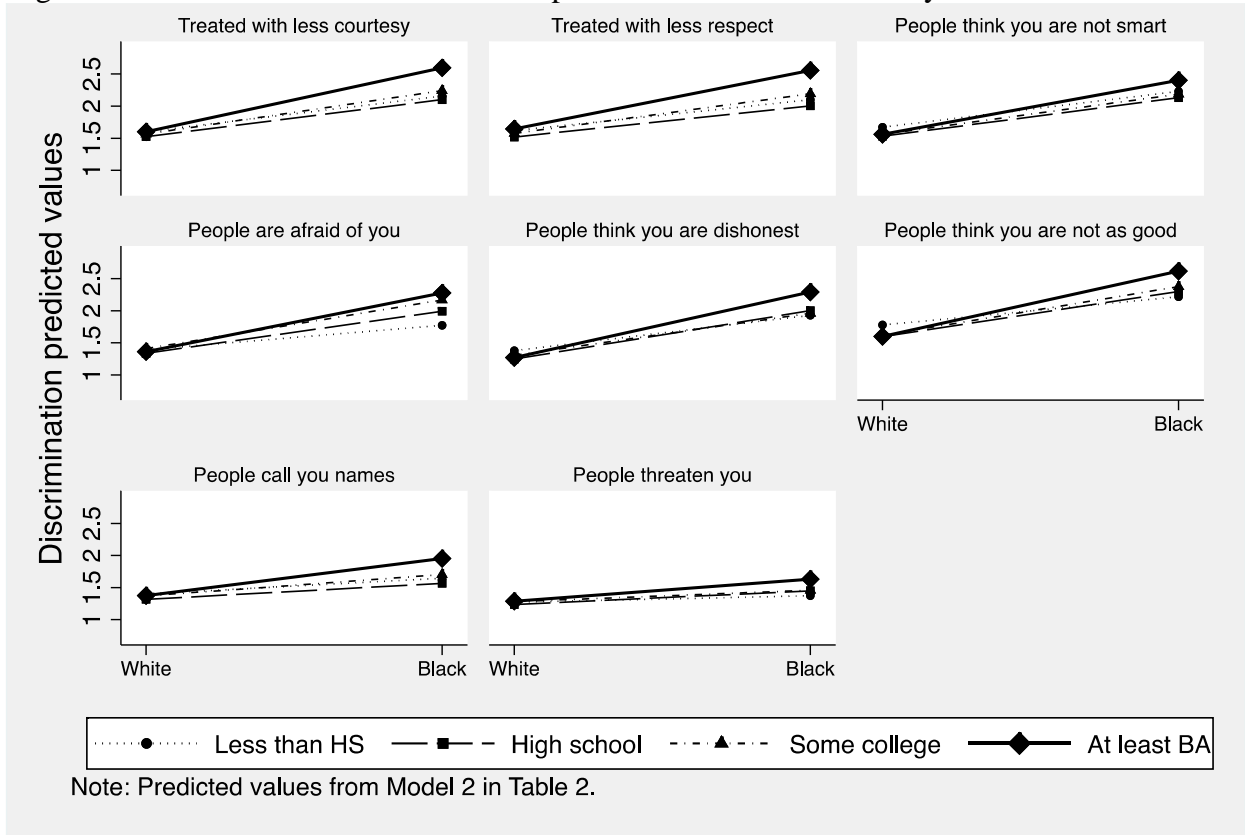


Figure 2. Income effects on different experiences of discrimination by race

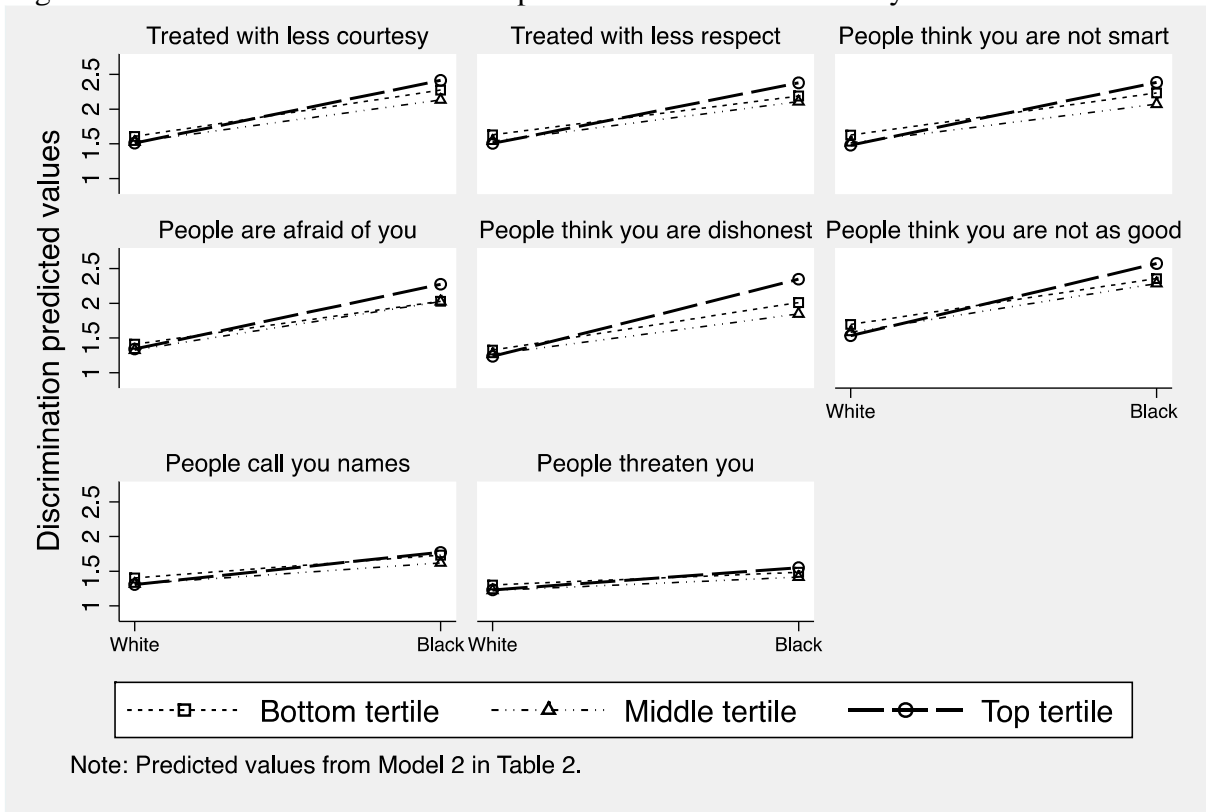
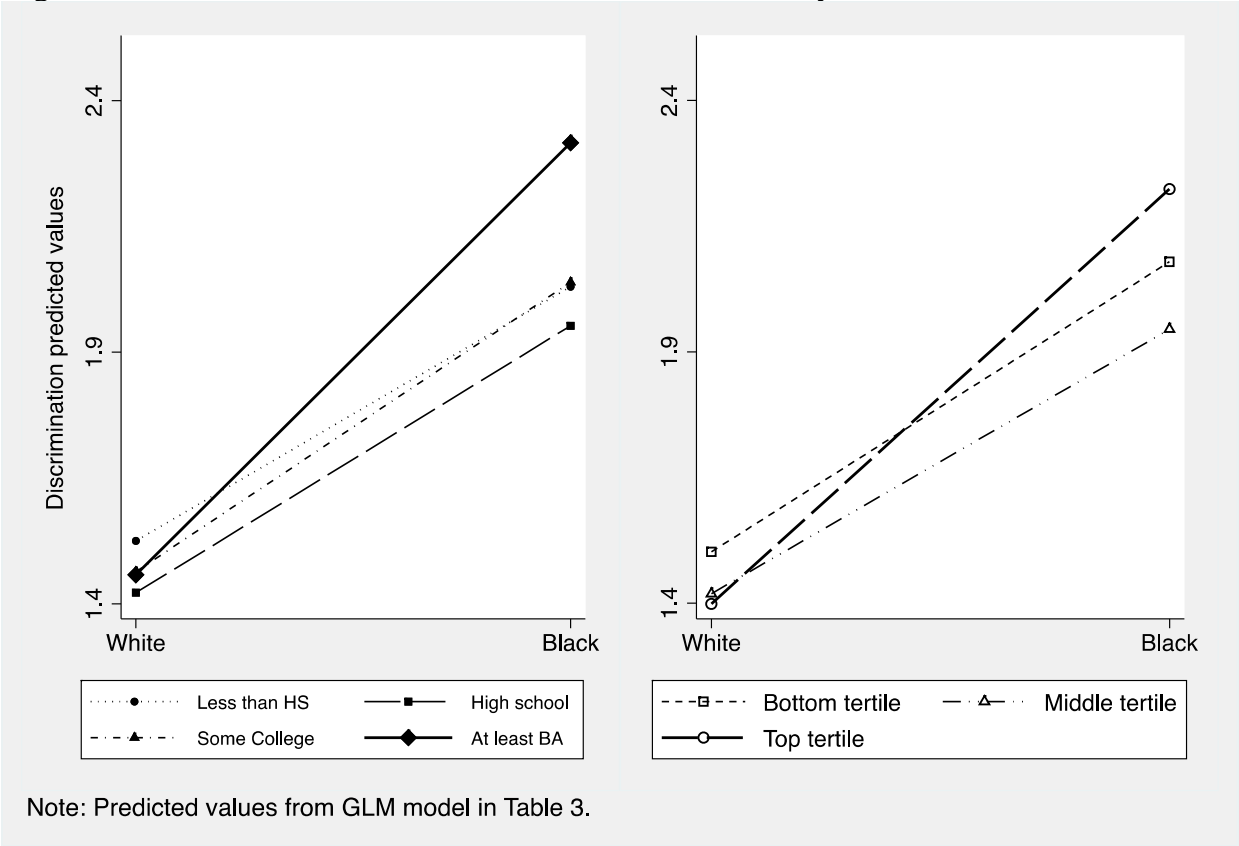


Figure 3. Education and income effects on overall index of daily-life discrimination



## Appendices

Appendix A. Predicted values (education) from interactive model in Table 2

| <b>DV-race-education</b> | <b>Predicted value</b> | <b>SE</b> | <b>Z</b> | <b>P&gt; z </b> | <b>[95% Conf. Interval]</b> |          |
|--------------------------|------------------------|-----------|----------|-----------------|-----------------------------|----------|
| <b>1 0 1</b>             | 1.589986               | 0.0253775 | 62.65    | 0.000           | 1.540248                    | 1.639725 |
| <b>1 0 2</b>             | 1.521827               | 0.0184311 | 82.57    | 0.000           | 1.485702                    | 1.557951 |
| <b>1 0 3</b>             | 1.564569               | 0.0170421 | 91.81    | 0.000           | 1.531167                    | 1.597971 |
| <b>1 0 4</b>             | 1.595871               | 0.0210056 | 75.97    | 0.000           | 1.554701                    | 1.637041 |
| <b>1 1 1</b>             | 2.156926               | 0.1149782 | 18.76    | 0.000           | 1.931573                    | 2.382279 |
| <b>1 1 2</b>             | 2.099352               | 0.0818937 | 25.64    | 0.000           | 1.938843                    | 2.25986  |
| <b>1 1 3</b>             | 2.237816               | 0.0756223 | 29.59    | 0.000           | 2.089599                    | 2.386033 |
| <b>1 1 4</b>             | 2.591221               | 0.0925172 | 28.01    | 0.000           | 2.40989                     | 2.772551 |
| <b>2 0 1</b>             | 1.623072               | 0.0258396 | 62.81    | 0.000           | 1.572427                    | 1.673716 |
| <b>2 0 2</b>             | 1.508197               | 0.0187668 | 80.37    | 0.000           | 1.471415                    | 1.54498  |
| <b>2 0 3</b>             | 1.580131               | 0.0173524 | 91.06    | 0.000           | 1.546121                    | 1.614141 |
| <b>2 0 4</b>             | 1.648093               | 0.0213881 | 77.06    | 0.000           | 1.606173                    | 1.690013 |
| <b>2 1 1</b>             | 2.103408               | 0.1170719 | 17.97    | 0.000           | 1.873951                    | 2.332865 |
| <b>2 1 2</b>             | 2.002461               | 0.083385  | 24.01    | 0.000           | 1.839029                    | 2.165892 |
| <b>2 1 3</b>             | 2.189788               | 0.0769994 | 28.44    | 0.000           | 2.038872                    | 2.340704 |
| <b>2 1 4</b>             | 2.553975               | 0.0942019 | 27.11    | 0.000           | 2.369343                    | 2.738607 |
| <b>3 0 1</b>             | 1.654363               | 0.0269536 | 61.38    | 0.000           | 1.601535                    | 1.707191 |
| <b>3 0 2</b>             | 1.534003               | 0.0195758 | 78.36    | 0.000           | 1.495635                    | 1.57237  |
| <b>3 0 3</b>             | 1.557435               | 0.0181005 | 86.04    | 0.000           | 1.521959                    | 1.592911 |
| <b>3 0 4</b>             | 1.546317               | 0.0223102 | 69.31    | 0.000           | 1.50259                     | 1.590044 |
| <b>3 1 1</b>             | 2.22779                | 0.122119  | 18.24    | 0.000           | 1.988441                    | 2.467139 |
| <b>3 1 2</b>             | 2.12998                | 0.0869798 | 24.49    | 0.000           | 1.959503                    | 2.300458 |
| <b>3 1 3</b>             | 2.183698               | 0.0803189 | 27.19    | 0.000           | 2.026276                    | 2.34112  |
| <b>3 1 4</b>             | 2.396785               | 0.098263  | 24.39    | 0.000           | 2.204193                    | 2.589377 |
| <b>4 0 1</b>             | 1.389467               | 0.023263  | 59.73    | 0.000           | 1.343872                    | 1.435061 |
| <b>4 0 2</b>             | 1.342382               | 0.0168954 | 79.45    | 0.000           | 1.309267                    | 1.375496 |
| <b>4 0 3</b>             | 1.403052               | 0.0156221 | 89.81    | 0.000           | 1.372433                    | 1.433671 |
| <b>4 0 4</b>             | 1.358527               | 0.0192554 | 70.55    | 0.000           | 1.320787                    | 1.396267 |
| <b>4 1 1</b>             | 1.772599               | 0.105398  | 16.82    | 0.000           | 1.566023                    | 1.979175 |
| <b>4 1 2</b>             | 1.994343               | 0.0750702 | 26.57    | 0.000           | 1.847208                    | 2.141478 |
| <b>4 1 3</b>             | 2.167469               | 0.0693213 | 31.27    | 0.000           | 2.031602                    | 2.303336 |
| <b>4 1 4</b>             | 2.274196               | 0.0848084 | 26.82    | 0.000           | 2.107974                    | 2.440417 |
| <b>5 0 1</b>             | 1.359096               | 0.0203812 | 66.68    | 0.000           | 1.31915                     | 1.399043 |
| <b>5 0 2</b>             | 1.266493               | 0.0148025 | 85.56    | 0.000           | 1.237481                    | 1.295506 |
| <b>5 0 3</b>             | 1.301754               | 0.0136869 | 95.11    | 0.000           | 1.274929                    | 1.32858  |

|       |          |           |       |       |          |          |
|-------|----------|-----------|-------|-------|----------|----------|
| 5 0 4 | 1.260279 | 0.0168701 | 74.7  | 0.000 | 1.227214 | 1.293344 |
| 5 1 1 | 1.926008 | 0.0923417 | 20.86 | 0.000 | 1.745022 | 2.106995 |
| 5 1 2 | 1.99694  | 0.0657708 | 30.36 | 0.000 | 1.868032 | 2.125849 |
| 5 1 3 | 1.953847 | 0.0607341 | 32.17 | 0.000 | 1.834811 | 2.072884 |
| 5 1 4 | 2.284718 | 0.0743027 | 30.75 | 0.000 | 2.139087 | 2.430348 |
| 6 0 1 | 1.755261 | 0.0276001 | 63.6  | 0.000 | 1.701166 | 1.809356 |
| 6 0 2 | 1.599293 | 0.0200454 | 79.78 | 0.000 | 1.560005 | 1.638581 |
| 6 0 3 | 1.618552 | 0.0185346 | 87.33 | 0.000 | 1.582225 | 1.65488  |
| 6 0 4 | 1.598407 | 0.0228453 | 69.97 | 0.000 | 1.553631 | 1.643183 |
| 6 1 1 | 2.220606 | 0.1250481 | 17.76 | 0.000 | 1.975516 | 2.465696 |
| 6 1 2 | 2.300995 | 0.0890661 | 25.83 | 0.000 | 2.126429 | 2.475562 |
| 6 1 3 | 2.373765 | 0.0822454 | 28.86 | 0.000 | 2.212567 | 2.534963 |
| 6 1 4 | 2.613069 | 0.1006199 | 25.97 | 0.000 | 2.415858 | 2.810281 |
| 7 0 1 | 1.423454 | 0.0227391 | 62.6  | 0.000 | 1.378886 | 1.468021 |
| 7 0 2 | 1.328605 | 0.0165149 | 80.45 | 0.000 | 1.296237 | 1.360974 |
| 7 0 3 | 1.376557 | 0.0152703 | 90.15 | 0.000 | 1.346628 | 1.406487 |
| 7 0 4 | 1.368072 | 0.0188217 | 72.69 | 0.000 | 1.331183 | 1.404962 |
| 7 1 1 | 1.650022 | 0.1030243 | 16.02 | 0.000 | 1.448098 | 1.851946 |
| 7 1 2 | 1.562798 | 0.0733795 | 21.3  | 0.000 | 1.418977 | 1.70662  |
| 7 1 3 | 1.700745 | 0.0677601 | 25.1  | 0.000 | 1.567938 | 1.833553 |
| 7 1 4 | 1.951051 | 0.0828985 | 23.54 | 0.000 | 1.788573 | 2.113529 |
| 8 0 1 | 1.288935 | 0.0194075 | 66.41 | 0.000 | 1.250897 | 1.326973 |
| 8 0 2 | 1.25034  | 0.0140953 | 88.71 | 0.000 | 1.222714 | 1.277967 |
| 8 0 3 | 1.283012 | 0.013033  | 98.44 | 0.000 | 1.257468 | 1.308556 |
| 8 0 4 | 1.274232 | 0.0160641 | 79.32 | 0.000 | 1.242747 | 1.305717 |
| 8 1 1 | 1.374166 | 0.0879301 | 15.63 | 0.000 | 1.201826 | 1.546506 |
| 8 1 2 | 1.447743 | 0.0626286 | 23.12 | 0.000 | 1.324993 | 1.570492 |
| 8 1 3 | 1.456391 | 0.0578325 | 25.18 | 0.000 | 1.343041 | 1.56974  |
| 8 1 4 | 1.628988 | 0.0707529 | 23.02 | 0.000 | 1.490315 | 1.767662 |

Note: In the first column of the table, the first digit states the eight *types of discrimination*: “1” less courtesy; “2” less respect; “3” not as smart; “4” afraid of you; “5” dishonest; “6” not as good; “7” call your names; “8” threat you. The second digit designates *race*: “1” for Black; “0” for White. The third digit states *education*: “1” less than high school; “2” high school; “3” some college; “4” at least Bachelor’s.



Appendix B. Predicted values (income) from interactive model in Table 2

| <b>DV-race-education</b> | <b>Predicted value</b> | <b>SE</b> | <b>Z</b> | <b>P&gt; z </b> | <b>[95% Conf. Interval]</b> |          |
|--------------------------|------------------------|-----------|----------|-----------------|-----------------------------|----------|
| <b>1 0 1</b>             | 1.601166               | 0.013652  | 117.28   | 0.000           | 1.574409                    | 1.627924 |
| <b>1 0 2</b>             | 1.532404               | 0.0191573 | 79.99    | 0.000           | 1.494856                    | 1.569951 |
| <b>1 0 3</b>             | 1.506717               | 0.0223139 | 67.52    | 0.000           | 1.462983                    | 1.550452 |
| <b>1 1 1</b>             | 2.277206               | 0.0600497 | 37.92    | 0.000           | 2.159511                    | 2.394901 |
| <b>1 1 2</b>             | 2.130961               | 0.0888311 | 23.99    | 0.000           | 1.956855                    | 2.305067 |
| <b>1 1 3</b>             | 2.418207               | 0.0966461 | 25.02    | 0.000           | 2.228784                    | 2.607629 |
| <b>2 0 1</b>             | 1.63756                | 0.0139006 | 117.8    | 0.000           | 1.610315                    | 1.664804 |
| <b>2 0 2</b>             | 1.531793               | 0.0195061 | 78.53    | 0.000           | 1.493562                    | 1.570025 |
| <b>2 0 3</b>             | 1.503514               | 0.0227202 | 66.18    | 0.000           | 1.458983                    | 1.548045 |
| <b>2 1 1</b>             | 2.189391               | 0.0611432 | 35.81    | 0.000           | 2.069553                    | 2.309229 |
| <b>2 1 2</b>             | 2.106162               | 0.0904487 | 23.29    | 0.000           | 1.928886                    | 2.283438 |
| <b>2 1 3</b>             | 2.38478                | 0.098406  | 24.23    | 0.000           | 2.191908                    | 2.577652 |
| <b>3 0 1</b>             | 1.618514               | 0.0144999 | 111.62   | 0.000           | 1.590095                    | 1.646933 |
| <b>3 0 2</b>             | 1.520427               | 0.020347  | 74.72    | 0.000           | 1.480548                    | 1.560307 |
| <b>3 0 3</b>             | 1.474989               | 0.0236997 | 62.24    | 0.000           | 1.428539                    | 1.52144  |
| <b>3 1 1</b>             | 2.237187               | 0.0637791 | 35.08    | 0.000           | 2.112182                    | 2.362191 |
| <b>3 1 2</b>             | 2.070245               | 0.094348  | 21.94    | 0.000           | 1.885326                    | 2.255164 |
| <b>3 1 3</b>             | 2.387749               | 0.1026484 | 23.26    | 0.000           | 2.186562                    | 2.588937 |
| <b>4 0 1</b>             | 1.407587               | 0.0125145 | 112.48   | 0.000           | 1.383059                    | 1.432115 |
| <b>4 0 2</b>             | 1.328107               | 0.017561  | 75.63    | 0.000           | 1.293688                    | 1.362526 |
| <b>4 0 3</b>             | 1.342398               | 0.0204546 | 65.63    | 0.000           | 1.302308                    | 1.382489 |
| <b>4 1 1</b>             | 2.032399               | 0.0550462 | 36.92    | 0.000           | 1.92451                     | 2.140288 |
| <b>4 1 2</b>             | 2.02644                | 0.0814295 | 24.89    | 0.000           | 1.866841                    | 2.186039 |
| <b>4 1 3</b>             | 2.279391               | 0.0885934 | 25.73    | 0.000           | 2.105751                    | 2.453031 |
| <b>5 0 1</b>             | 1.322123               | 0.0109643 | 120.58   | 0.000           | 1.300633                    | 1.343612 |
| <b>5 0 2</b>             | 1.269869               | 0.0153857 | 82.54    | 0.000           | 1.239713                    | 1.300024 |
| <b>5 0 3</b>             | 1.237667               | 0.0179208 | 69.06    | 0.000           | 1.202543                    | 1.272791 |
| <b>5 1 1</b>             | 2.011347               | 0.0482273 | 41.71    | 0.000           | 1.916824                    | 2.105871 |
| <b>5 1 2</b>             | 1.846148               | 0.0713424 | 25.88    | 0.000           | 1.70632                     | 1.985977 |
| <b>5 1 3</b>             | 2.350806               | 0.0776188 | 30.29    | 0.000           | 2.198676                    | 2.502936 |
| <b>6 0 1</b>             | 1.688578               | 0.0148477 | 113.73   | 0.000           | 1.659477                    | 1.717679 |
| <b>6 0 2</b>             | 1.592446               | 0.0208351 | 76.43    | 0.000           | 1.55161                     | 1.633282 |
| <b>6 0 3</b>             | 1.524815               | 0.0242682 | 62.83    | 0.000           | 1.47725                     | 1.572379 |
| <b>6 1 1</b>             | 2.359746               | 0.0653089 | 36.13    | 0.000           | 2.231743                    | 2.487749 |
| <b>6 1 2</b>             | 2.281774               | 0.096611  | 23.62    | 0.000           | 2.09242                     | 2.471128 |
| <b>6 1 3</b>             | 2.580031               | 0.1051105 | 24.55    | 0.000           | 2.374018                    | 2.786044 |
| <b>7 0 1</b>             | 1.414651               | 0.0122327 | 115.65   | 0.000           | 1.390675                    | 1.438627 |
| <b>7 0 2</b>             | 1.313868               | 0.0171656 | 76.54    | 0.000           | 1.280225                    | 1.347512 |

|              |          |           |        |       |          |          |
|--------------|----------|-----------|--------|-------|----------|----------|
| <b>7 0 3</b> | 1.317435 | 0.019994  | 65.89  | 0.000 | 1.278248 | 1.356622 |
| <b>7 1 1</b> | 1.733399 | 0.0538065 | 32.22  | 0.000 | 1.62794  | 1.838857 |
| <b>7 1 2</b> | 1.619877 | 0.0795957 | 20.35  | 0.000 | 1.463872 | 1.775881 |
| <b>7 1 3</b> | 1.773326 | 0.0865982 | 20.48  | 0.000 | 1.603597 | 1.943056 |
| <b>8 0 1</b> | 1.309748 | 0.0104405 | 125.45 | 0.000 | 1.289285 | 1.330211 |
| <b>8 0 2</b> | 1.226368 | 0.0146506 | 83.71  | 0.000 | 1.197654 | 1.255083 |
| <b>8 0 3</b> | 1.235284 | 0.0170646 | 72.39  | 0.000 | 1.201838 | 1.26873  |
| <b>8 1 1</b> | 1.48759  | 0.0459233 | 32.39  | 0.000 | 1.397582 | 1.577598 |
| <b>8 1 2</b> | 1.413275 | 0.067934  | 20.8   | 0.000 | 1.280127 | 1.546423 |
| <b>8 1 3</b> | 1.550700 | 0.0739106 | 20.98  | 0.000 | 1.405838 | 1.695562 |

Note: In the first column of the table, the first digit states the eight *types of discrimination*: “1” less courtesy; “2” less respect; “3” not as smart; “4” afraid of you; “5” dishonest; “6” not as good; “7” call your names; “8” threat you. The second digit designates *race*: “1” for Black; “0” for White. The third digit states *income*: “1” bottom tertile; “2” middle tertile; “3” top tertile.

Appendix C. Predicted values (education) from GLM model in Table 3

| <b><i>Race-<br/>Education</i></b> | <b><i>Predicted<br/>value</i></b> | <b><i>Std. Err.</i></b> | <b><i>Z</i></b> | <b><i>P&gt;z</i></b> | <b><i>[95%<br/>Conf.</i></b> | <b><i>Interval]</i></b> |
|-----------------------------------|-----------------------------------|-------------------------|-----------------|----------------------|------------------------------|-------------------------|
| <b>0 1</b>                        | 1.504618                          | 0.0379119               | 39.69           | 0.000                | 1.430312                     | 1.578924                |
| <b>0 2</b>                        | 1.422262                          | 0.0187269               | 75.95           | 0.000                | 1.385558                     | 1.458966                |
| <b>0 3</b>                        | 1.461156                          | 0.0168218               | 86.86           | 0.000                | 1.428186                     | 1.494127                |
| <b>0 4</b>                        | 1.452767                          | 0.0171935               | 84.5            | 0.000                | 1.419069                     | 1.486466                |
| <b>1 1</b>                        | 1.963802                          | 0.1301961               | 15.08           | 0.000                | 1.708623                     | 2.218982                |
| <b>1 2</b>                        | 1.949553                          | 0.0818927               | 23.81           | 0.000                | 1.789046                     | 2.11006                 |
| <b>1 3</b>                        | 2.025221                          | 0.0626809               | 32.31           | 0.000                | 1.902369                     | 2.148073                |
| <b>1 4</b>                        | 2.303378                          | 0.0787808               | 29.24           | 0.000                | 2.148971                     | 2.457786                |

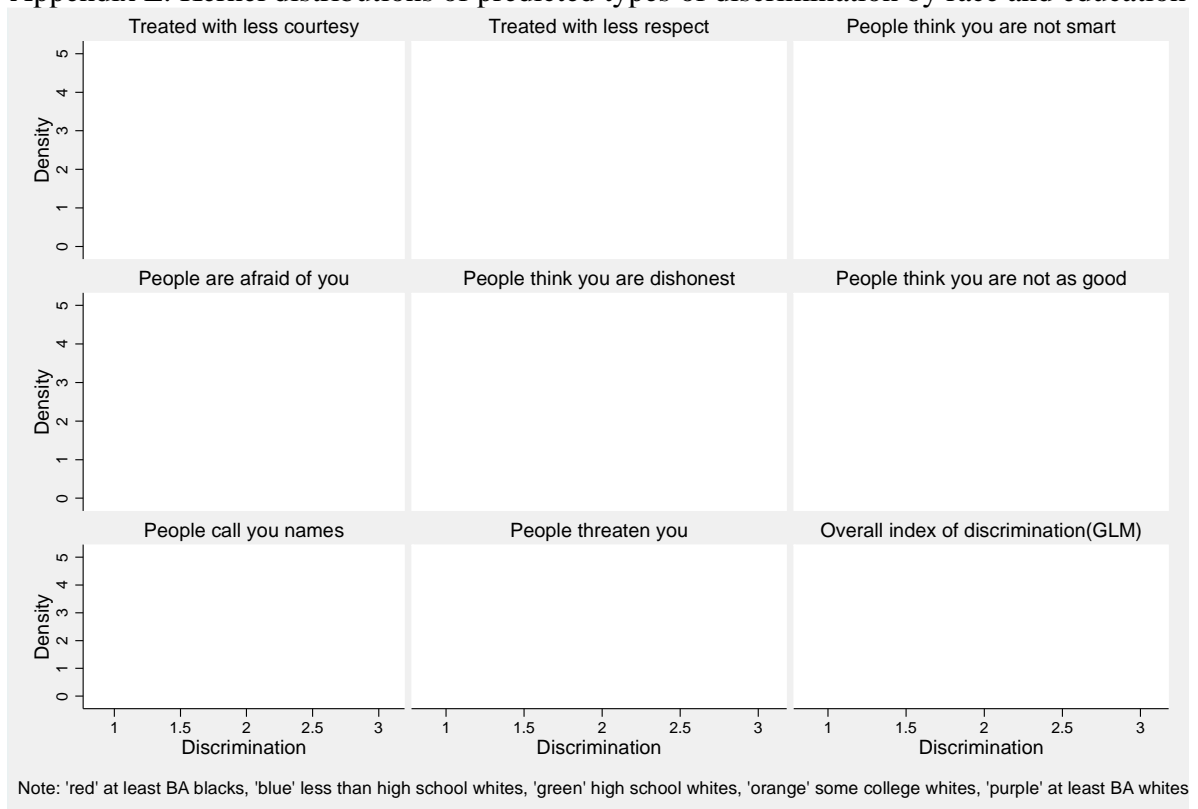
Note: In the first column of the table, the first digit states *race*: “1” for Black; “0” for White. The second digit designates *education*: “1” less than high school; “2” high school; “3” some college; “4” at least Bachelor’s.

Appendix D. Predicted values (income) from GLM model in Table 3

| <i>Race-<br/>Income</i> | <i>Predicted<br/>value</i> | <i>Std. Err.</i> | <i>Z</i> | <i>P&gt;z</i> | <i>[95%<br/>Conf.</i> | <i>Interval]</i> |
|-------------------------|----------------------------|------------------|----------|---------------|-----------------------|------------------|
| <b>0 1</b>              | 1.496448                   | 0.0173003        | 86.50    | 0.000         | 1.46254               | 1.530356         |
| <b>0 2</b>              | 1.417517                   | 0.0139318        | 101.75   | 0.000         | 1.390211              | 1.444822         |
| <b>0 3</b>              | 1.394451                   | 0.0137166        | 101.66   | 0.000         | 1.367567              | 1.421335         |
| <b>1 1</b>              | 2.055593                   | 0.0593979        | 34.61    | 0.000         | 1.939175              | 2.172011         |
| <b>1 2</b>              | 1.940660                   | 0.0769806        | 25.21    | 0.000         | 1.789781              | 2.091539         |
| <b>1 3</b>              | 2.219557                   | 0.0823731        | 26.95    | 0.000         | 2.058109              | 2.381005         |

Note: In the first column of the table, the first digit states *race*: “1” for Black; “0” for White. The second digit designates *income*: “1” bottom tertile; “2” middle tertile; “3” top tertile.

### Appendix E. Kernel distributions of predicted types of discrimination by race and education



## Appendix F. Kernel distributions of predicted types of discrimination by race and income

