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Racial Disparities in Occupational Distribution Among Black and White Adults with Similar Educational Levels: Analysis of Middle-Aged and Older Individuals in the Health and Retirement Study

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Abstract

Background: Occupational classes play a significant role in influencing both individual and population health, serving as a vital conduit through which higher education can lead to better health outcomes. However, the pathway from education to corresponding occupational classes does not apply uniformly across different racial and ethnic groups, hindered by factors such as social stratification, labor market discrimination, and job segregation.

Aims: This study seeks to investigate the relationship between educational attainment and occupational classes among Black, Latino, and White middle-aged and older adults, with a focus on their transition into retirement.

Methods: Using cross-sectional data from the Health and Retirement Study (HRS), this research examines the impact of race/ethnicity, educational attainment, occupational classes, and timing of retirement among middle-aged and older adults. The analysis includes a sample of 7,096 individuals identified as White, Black, or Latino. Through logistic regression, we assess the additive and multiplicative effects of race/ethnicity and education on six defined occupational classes: 1. Managerial and specialty operations, 2. Professional Specialty, 3. Sales, 4. Clerical/administrative support, 5. Services, and 6. Manual labor.

Results: Participants were Black (n = 1,143) or White (n =5,953). This included Latino (N =459) or non-Latino (n = 6,634). Our analysis reveals a skewed distribution of Black and Latino adults in manual and service occupations, in stark contrast to White adults who were more commonly found in clerical/administrative and managerial positions. Educational attainment did not equate to similar occupational outcomes across racial groups. Key findings include: Firstly, Black individuals with a college degree or higher were less likely to occupy clerical and administrative positions compared to their White counterparts. Secondly, holding a General Educational Development (GED) credential or some college education was generally linked to reduced likelihood of being in managerial roles; however, this inverse relationship was less evident among Black middle-aged and older adults than White ones. Thirdly, having a GED reduced the chances of working in sales roles, while having a college degree increased such chances. An interaction between race and some college education revealed that the impact of some college education on sales roles was more significant for Black adults than for White ones. We did not observe any interaction between ethnicity (Latino) and educational attainment on occupational classes. Given the stability of occupational classes, these findings could also apply to the last occupation held prior to retirement.

Conclusion: This study highlights significant racial disparities in occupational classes among individuals with comparable levels of education, underscoring

the profound implications for health and wellbeing disparities. Future research should explore strategies to alleviate labor market discrimination and job segregation as ways to close these occupational gaps. Additionally, the influence of social stratification, job segregation, and historical legacies, such as the repercussions of the Jim Crow era, on these disparities merits further investigation. Addressing these issues is crucial for enhancing the health and wellbeing of all populations.

Background

Occupation stands as a pivotal social determinant of health[1], exerting a profound influence on individuals' well-being and a wide range of health outcomes[2]. Occupation serves as a mechanism through which education safeguards individual health[3]. Individuals with higher education often find employment in high-paying, low-stress occupations, making occupation a conduit through which the benefits of education extend to health outcomes[4]. Higher educational attainment typically opens doors to occupations characterized by greater job control, financial stability, and access to health-promoting resources[5-7]. Professionals with advanced education levels are more likely to secure jobs offering comprehensive healthcare benefits, safer working conditions, and opportunities for career growth[8]. The nature of one's occupation not only determines exposure to various physical and psychosocial stressors[9] but also significantly influences access to resources, income, benefits, and health insurance, collectively influencing the ability to maintain good health[10]. Thus, understanding the intricate relationship between occupation, education, and health is paramount for developing targeted interventions that address health disparities and promote equitable access to optimal health outcomes across diverse populations[11].

Significant and persistent racial disparities in occupational opportunities are deeply entrenched in US society, with racial and ethnic minority individuals consistently finding themselves consigned to occupations characterized by challenging conditions and limited upward mobility.[12, 13] This phenomenon is particularly pronounced among Black and Latino populations, who, despite significant investments in the fight against racial discrimination, such as anti-discriminatory laws, continue to face disproportionately adverse circumstances in the US labor market[12, 14, 15]. Fifty years after Martin Luther King Jr.'s "I have a dream" speech[16], a web of factors still contributes to the persistence of racialized occupations in the United States[17], due to the interplay of labor market discrimination, residential segregation, social stratification, and job segregation[18]. The result is known to be differential effects of education on income and financial wellbeing by race and ethnicity[19].

Centuries after the abolition of slavery, legal segregation continues[20-24]. Jim Crow and segregation continued to differentially provide opportunities for racial and ethnic groups[25-29]. Still, centuries later, the United States grapples with the legacy of systemic racism, and its effects persist in structural and institutional racism in the labor market[30-34]. These aspects of racism alter employment benefits for racial and ethnic groups[35]. Black and Latino individuals often find themselves clustered in occupations that offer lower wages and simultaneously subject them to harsher working conditions[36-38]. The origins of this phenomenon can be traced back to the legacy of slavery and the subsequent Jim Crow era, where discriminatory practices were deeply embedded in the fabric of society[25, 26, 28]. While significant strides have been made in dismantling overtly discriminatory policies, subtle yet pervasive barriers persist, perpetuating the unequal distribution of opportunities across racial lines[29].

Key contributors to racialized occupations are the enduring issues of residential and job segregation[39-42]. Despite enforcing anti-discriminatory laws, the legacy of Jim Crow and redlining has shaped the value of the housing market and has remained in a United States that is largely divided along racial lines[43]. This spatial separation has profound implications for access to employment opportunities[44-46]. Such segregation creates an environment where certain communities have access to subpar jobs, setting the stage for living in a disadvantaged life for Black and Latino people despite having education and employment[47, 48].

The phenomenon of social stratification, which has continued for centuries in the US, still amplifies the disparities in the outcomes of being in the job market for racial and ethnic groups, even when they have the same educational credentials[49-51]. Societal structures also contribute to the perpetuation of stereotypes and prejudiced beliefs that, in turn, influence hiring decisions and career advancement opportunities[52-55]. The impact of these biases is particularly maximum in sectors where traditionally White individuals have been in power, creating a challenging environment for Black and Latino individuals to break through the glass ceiling[4, 56].

Job segregation, a well-described phenomenon in the US, has resulted in the unequal concentration of specific occupations for certain racial or ethnic groups[12, 13]. This segregation results in low-paying jobs being available for Black and Latino individuals and limited job benefits and career advancement opportunities for them[12, 13]. Due to such segregation, Black and Latino individuals frequently find themselves confined to occupation sectors that offer limited upward mobility and financial stability, perpetuating a cycle of inequality[57-59].

Aims

The primary aim of this study is to explore the

connection between educational attainment and occupational classifications among middle-aged and older adults from various racial and ethnic backgrounds, drawing on data from the Health and Retirement Study (HRS)[60-64]. Specifically, we aim to examine how educational attainment differently influences occupational outcomes across racial and ethnic groups. We hypothesize that the benefits of education on occupational status are less pronounced for Black and Latino individuals when compared to their non-Latino White peers. By analyzing longitudinal data from the HRS, which provides detailed accounts of middle-aged adults moving into retirement, we seek to uncover trends that shed light on how racialized job markets affect the advantages usually linked with higher education. Our findings could offer further understanding of the intricate dynamics between race, ethnicity, education, and occupational class, both generally and in the context of retirement. This investigation is intended to lay the groundwork for policy suggestions aimed at mitigating racial and ethnic inequities in the workforce.

Methods

Design and Setting

Data were obtained from the first 15 waves of the Health and Retirement Study (HRS)[61] conducted from 1992 to 2020. We used the RAND HRS data 2020[65] that were publicly released in March 2023. The HRS is a state-of-the-art longitudinal study of retirement transitions in the United States, with biannual repeated measurements. The study recruited and followed a nationally representative sample of middle-aged and older adults (aged 50–59 years at baseline). The HRS study collected extensive data on various aspects of participants, including demographic, socioeconomic, social, psychological, economic, employment, and health data, as well as health behaviors and health service utilization. HRS data has also measured a wide range of data related to retirement including time of retirement[64]. Data was collected through telephone or face-to-face interviews, and proxy interviews were used for participants who were unavailable. Detailed information on the HRS design, measures, sample, and sampling can be found elsewhere, and a brief overview is provided here.

Sample and Sampling

The HRS used a national area probability sample to recruit participants aged 50 to 59 at baseline. For the current analysis, only the core (primary) sample recruited in 1992 was included to offer the longest follow-up period. All our HRS participants were born between 1931 and 1941, and the sample reflects all middle-aged and older adults aged 50–59 residing in US households in the year 1992 (baseline = wave 1).

Inclusion & Exclusion (Analytical Sample)

The analytical sample for this study comprised HRS participants who identified as non-Latino White, Latino White, or Black, excluding individuals from other racial groups from the analysis. Eligibility for the analysis extended to all participants from the HRS core sample who were not retired at the start of the study, without consideration of follow-up duration, mortality timing, or retirement status. Participants were aged between 51 and 61 years at the initial recruitment in 1992, resulting in a sample of 7,096 working middle-aged and older adults. Although the HRS collected data from both participants and their partners or spouses, this study solely utilized data from the participants.

Measures

Predictors

Educational attainment. We used a 5-level categorical variable: (a) less than high school graduate, (b) high-school graduate, (c) General Educational Development (GED) (d) some college, and (e) college graduate or more. Educational attainment was self-reported at baseline in 1992.

Outcomes

Occupational classes. Using Census 1980, the HRS has generated 17 occupational classes that are as follows: 01. managerial specialty operators, 02. professional specialty operations/technical support, 03. sales, 04. clerical/administrative support, 05. service: private household/cleaning/building svc, 06. service: protection, 07. service: food preparation, 08. health services, 09. personal services, 10. farming/forestry/fishing, 11. mechanics/repair, 12. Construction trade/extractors, 13. precision production, 14. operators: machine, 15. operators: transport, etc., 16. operators: handlers, etc., and 17. member of the armed forces. We reduced these classes to the six following groups: 1. managerial and specialty operations, 2. professional specialty, 3. sales, 4. clerical/admin supp, 5. services, and 6. manual, as shown in Box 1.

Retirement Time (Time of Transition to Retirement). In this study, we determined the transition to retirement using the variable retirement status measured at each wave. Participants were asked to indicate their retirement status as not retired, completely retired, or partly retired[66, 67]. By comparing the retirement status across waves, we calculated the year of transition to retirement for those who transitioned from being employed to being retired. This variable was utilized in a sensitivity analysis concerning the final occupation held before retirement.

Controls

Age was measured in years (continuous variable). Gender was treated as a dichotomous variable.

Box 1. Six occupational classes used as outcomes in this study

		New Occupational Class Used in this Analysis						
		Managerial and specialty operations	**Professional Specialty**	**Sales**	**Clerical/ admin supp**	**Services**	**Manual**	All
Original Occupational Class with 17 Categories Based on 1980 Census	01. managerial specialty operators	1,079	0	0	0	0	0	1,079
	02. professional specialty operations/technical support	0	1,087	0	0	0	0	1,087
	03. sales	0	0	719	0	0	0	719
	04. clerical/administrative support	0	0	0	1,067	0	0	1,067
	05. service: private household/cleaning/building svc	0	0	0	0	106	0	106
	06. service: protection	0	0	0	0	126	0	126
	07. service: food preparation	0	0	0	0	207	0	207
	08. health services	0	0	0	0	159	0	159
	09. personal services	0	0	0	0	455	0	455
	10. farming/forestry/fishing	0	0	0	0	0	235	235
	11. mechanics/repair	0	0	0	0	0	284	284
	12. Construction trade/extractors	0	0	0	0	0	268	268
	13. precision production	0	0	0	0	0	252	252
	14. operators: machine	0	0	0	0	0	470	470
	15. operators: transport, etc	0	0	0	0	0	396	396
	16. operators: handlers, etc.,	0	0	0	0	0	186	186
	17. member of the armed forces	NA	NA	NA	NA	NA	NA	NA
	All	1,079	1,087	719	1,067	1,053	2,091	7,096

Note: Due to low sample size, we did not include 6 HRS participants whose occupational class was “Member of Armed forces”

Data Analysis

Data were analyzed using SPSS 25.0 (IBM Corporation, Armonk, NY, US). Univariate analyses included reporting means (standard deviation [SD]) and frequencies/ relative frequencies (n and %). Racial and ethnic groups were compared using chi-square or Analysis of Variance (ANOVA). We also used Pearson correlation to investigate the association between all study variables. Multivariable models involved logistic regression analysis with educational attainment as the predictor variable, occupational class as the outcome, and race and ethnicity as moderators, while controlling for factors gender as a confounder. Models were tested without and with interaction terms. Model 1 did not include education x race or ethnicity interaction terms. Model 2 included such interactions to assess the significance of racial and ethnic differences in the relationships between educational attainment and occupational classes. Several models were examined, one for each occupational class. Given the stability of occupational classes over the follow up period, our sensitivity analysis showed similar findings for the last occupation held prior to retirement.

Ethics statement

The HRS study protocol was approved by the University of Michigan Institutional Review Board. All HRS participants signed written consent. The data were collected, restored, managed, and analyzed in a fully anonymous fashion. As we used fully de-identified publicly available data, this study was non-human subject research, according to the National Institute of Health (NIH) definition.

Results

As shown by **Table 1**, 7,096 individuals entered our analysis from which 55.0% were male and 45% were female. From this number, 16.1% (n = 1,143) were Black and 83.9% (n = 5,953) were White. Also, 6.5% (n =459) were Latino and 93.5% (n = 6,634) were non-Latino. Using the Census 1980 variable, the highest frequency of occupation classes was managerial specialty operator (n = 1079; 15.2%) and professional specialty operator/ technical support (n= 1087; 15.3%). This table also shows that Black and Latino middle-age and older adults are more represented in operator and service occupational classes and White middle-age and older adults are more represented in clerical admin and managerial occupational classes.

Table 2 shows that higher education was associated with lower odds of working in managerial occupational class, however, a significant interaction between Some college x Black suggested that the inverse association between some college and working in managerial occupational class is weaker for Black than White middle-age and older adults.

Table 3 shows that higher education was associated with lower odds of working in professional specialty class.

Table 1. Demographic characteristics of our participants overall and by race and ethnicity (n = 7,096)

	All		White n =5,953		Black n =1,143		Non-Latino n =6,634		Latino n =459	
	n	%	N	%	n	%	n	%	N	%
Sex										
Female	3,196	45.0	2,572	43.2	624	54.6	3,003	45.3	192	41.8
Male	3,900	55.0	3,381	56.8	519	45.4	3,631	54.7	267	58.2
Race										
White	5,953	83.9	4251	71.4	754	66.0	5502	82.9	448	97.6
Black	1,143	16.1	1702	28.6	389	34.0	1132	17.1	11	2.4
Latino										
No	6,634	93.5	5502	92.4	1132	99.0				
Yes	459	6.5	448	7.5	11	1.0				
Education										
1.Less than high-school	1,515	21.4	1088	18.3	427	37.4	1268	19.1	244	53.2
2.General Educational Development (GED)	362	5.1	315	5.3	47	4.1	339	5.1	23	5.0
3.High-school graduate	2,353	33.2	2030	34.1	323	28.3	2264	34.1	89	19.4
4.Some college	1,440	20.3	1238	20.8	202	17.7	1369	20.6	71	15.5
5.College and above	1,426	20.1	1282	21.5	144	12.6	1394	21.0	32	7.0
Census Occupational Classes										
01.Managerial specialty operator	1,079	15.2	995	16.7	84	7.3	1042	15.7	37	8.1
02.Prof specialty operator/tech sup	1,087	15.3	947	15.9	140	12.2	1057	15.9	30	6.5
03.Sales	719	10.1	669	11.2	50	4.4	680	10.3	38	8.3
04.Clerical/admin supp	1,067	15.0	946	15.9	121	10.6	1014	15.3	53	11.5
05.Services:prv/clean/building svc	106	1.5	46	.8	60	5.2	93	1.4	13	2.8
06. Services protection	126	1.8	94	1.6	32	2.8	122	1.8	4	.9
07. Services food prep	207	2.9	157	2.6	50	4.4	187	2.8	19	4.1
08.Health Services	159	2.2	83	1.4	76	6.6	149	2.2	10	2.2
09.Personal Services	455	6.4	314	5.3	141	12.3	406	6.1	49	10.7
10.Farming/forestry/fishing	235	3.3	197	3.3	38	3.3	205	3.1	29	6.3
11.Mechanics/repair	284	4.0	256	4.3	28	2.4	266	4.0	18	3.9
12.Constr trade/extractors	268	3.8	225	3.8	43	3.8	248	3.7	20	4.4
13.Precision production	252	3.6	218	3.7	34	3.0	230	3.5	22	4.8
14.Operators: machine	470	6.6	360	6.0	110	9.6	411	6.2	59	12.9
15.Operators: transport, etc	396	5.6	317	5.3	79	6.9	358	5.4	38	8.3
16.Operators: handlers, etc	186	2.6	129	2.2	57	5.0	166	2.5	20	4.4
Managerial										
No	6017	84.8	4958	83.3	1059	92.7	5592	84.3	422	91.9
Yes	1079	15.2	995	16.7	84	7.3	1042	15.7	37	8.1
Occupation Professional Specialty										
No	6009	84.7	5006	84.1	1003	87.8	5577	84.1	429	93.5
Yes	1087	15.3	947	15.9	140	12.2	1057	15.9	30	6.5
Sales										
No	6377	89.9	5284	88.8	1093	95.6	5954	89.7	421	91.7
Yes	719	10.1	669	11.2	50	4.4	680	10.3	38	8.3
Clerical Admin										
No	6029	85.0	5007	84.1	1022	89.4	5620	84.7	406	88.5
Yes	1067	15.0	946	15.9	121	10.6	1014	15.3	53	11.5
Service										
No	6043	85.2	5259	88.3	784	68.6	5677	85.6	364	79.3
Yes	1053	14.8	694	11.7	359	31.4	957	14.4	95	20.7
Operator										
No	5005	70.5	4251	71.4	754	66.0	4750	71.6	253	55.1
Yes	2091	29.5	1702	28.6	389	34.0	1884	28.4	206	44.9

Table 2. Logistic regression between educational attainment and managerial occupational class overall and by race/ethnicity

Model 1	OR	95% CI		*p*
Age Baseline	.994	.977	1.011	.507
Male	1.793	1.555	2.068	.000
Black	1.976	1.555	2.509	.000
Latino	.636	.446	.907	.013
Education (Ref = Some High School)				
2. General Educational Development (GED)	.175	.135	.228	.000
3.High-school graduate	.330	.232	.471	.000
4.Some college	.390	.328	.464	.000
5.College and above	.731	.613	.872	.001
Model 2				
Age Baseline	.994	.977	1.011	.472
Male	1.808	1.567	2.085	.000
Black	1.346	.876	2.068	.175
Latino	.879	.389	1.986	.756
Education (Ref = Some High School)				**.000**
2.GED	.078	.036	.170	.000
3.High-school graduate	.186	.043	.817	.026
4.Some college	.173	.088	.341	.000
5.College and above	.674	.382	1.187	.171
Education x Race				**.036**
2.GED x Black	2.534	1.105	5.813	.028
3.High-school graduate x Black	1.848	.403	8.484	.430
4.Some college x Black	2.424	1.205	4.880	.013
5.College and above x Black	1.099	.606	1.995	.755
Education x Ethnicity				**.905**
2.GED x Latino	.708	.248	2.022	.519
3.High-school graduate x Latino	.822	.149	4.524	.822
4.Some college x Latino	.620	.200	1.924	.408
5.College and above x Latino	.602	.203	1.782	.360

Table 3. Logistic regression between educational attainment and professional specialty class overall and by race/ethnicity

Model 1	OR	95% CI		*p*
Age Baseline	1.003	.984	1.023	.746
Male	.539	.461	.630	<.001
Black	.962	.767	1.206	.735
Latino	.752	.492	1.151	.189
Education (Ref = Some High School)				
2.GED	.018	.012	.027	<.001
3.High-school graduate	.031	.017	.056	<.001
4.Some college	.041	.033	.052	<.001
5.College and above	.197	.166	.236	<.001
Model 2				
Age Baseline	1.003	.984	1.023	.741
Male	.542	.464	.635	<.001
Black	.743	.521	1.061	.102
Latino	1.186	.583	2.416	.638
Education (Ref = Some High School)				<.001
2.GED	.007	.002	.019	<.001
3.High-school graduate	.000	.000	.	.997
4.Some college	.033	.018	.061	<.001
5.College and above	.150	.092	.246	<.001
Education x Race				.186
2.GED x Black	3.936	1.273	12.175	.017
3.High-school graduate x Black	NA			
4.Some college x Black	1.285	.660	2.501	.461
5.College and above x Black	1.382	.814	2.345	.231
Education x Ethnicity				.424
2.GED x Latino	.132	.016	1.114	.063
3.High-school graduate x Latino	.000	.000	.	.998
4.Some college x Latino	.679	.172	2.678	.581
5.College and above x Latino	.581	.211	1.595	.292

Table 4 shows that GED reduced and college and above increased the odds of working in sales occupational class. Some college x Black was significant suggesting that the association between Some college and working in sales occupational class was stronger for Black than White middle-age and older adults.

As shown by **Table 5**, there was a positive association between educational attainment and clerical and admin occupational class, meaning that highly educated people were more likely to work in clerical and admin occupational class. However, a statistical interaction between educational level of college and above x Black suggested that the effect of college and above on clerical and admin occupational class was weaker for Black than White middle-age and older adults. No interaction was found for Latino ethnicity.

As shown by **Table 6**, there was a positive association between educational attainment and service occupational class, meaning that highly educated people were more likely to work in service occupational class. No interaction was found for Latino ethnicity or Black race.

As shown by **Table 7**, there was a positive association between educational attainment and operator occupational class, meaning that highly educated people were more likely to work in operator occupational class. No interaction was found for Latino ethnicity or Black race.

Discussion

The findings from our analysis of nationally representative data from the Health and Retirement Study (HRS) provide compelling evidence of pervasive racialized effects of educational attainment on occupational classes in the United States. Contrary to the expectation that higher education universally improves occupational outcomes, our study reveals distinct racial disparities, shedding light on the enduring impact of social stratification, racism in the labor market, and historical legacies such as the Jim Crow era on occupational classes of highly educated Black individuals. Given the stability of occupational classes, similar racial variation in the effects of educational attainment applied to the last occupation held prior to retirement.

Table 4. Logistic regression between educational attainment and sales occupational class overall and by race/ethnicity

Model 1	OR	95% CI		*p*
Age Baseline	1.034	1.014	1.054	.001
Male	1.108	.943	1.300	.213
Black	2.530	1.876	3.411	<.001
Latino	.852	.599	1.212	.374
Education (Ref = Some High School)				<.001
2.GED	.683	.517	.902	.007
3.High-school graduate	.732	.477	1.125	.155
4.Some college	1.197	.964	1.486	.103
5.College and above	1.385	1.097	1.749	.006
Model 2				
Age Baseline	1.034	1.014	1.054	.001
Male	1.116	.950	1.311	.181
Black	1.209	.650	2.248	.548
Latino	1.275	.440	3.699	.655
Education (Ref = Some High School)				.010
2.GED	.335	.149	.753	.008
3.High-school graduate	.243	.031	1.922	.180
4.Some college	.320	.131	.777	.012
5.College and above	.884	.401	1.952	.761
Education x Race				.040
2.GED x Black	2.248	.946	5.343	.067
3.High-school graduate x Black	3.199	.385	26.588	.282
4.Some college x Black	4.118	1.647	10.300	.002
5.College and above x Black	1.615	.705	3.701	.257
Education x Ethnicity				.873
2.GED x Latino	.554	.164	1.874	.342
3.High-school graduate x Latino	.875	.138	5.556	.888
4.Some college x Latino	.623	.174	2.232	.467
5.College and above x Latino	.765	.212	2.766	.683

Table 5. Logistic regression between educational attainment and clerical and admin occupational class overall and by race/ethnicity

Model 1	OR	95% CI		*p*
Age Baseline	1.000	.980	1.020	.997
Male	.139	.117	.164	<.001
Black	1.784	1.438	2.215	<.001
Latino	.971	.700	1.345	.858
Education (Ref = Some High School)				<.001
2.GED	.759	.547	1.053	.099
3.High-school graduate	2.105	1.420	3.121	<.001
4.Some college	4.018	3.158	5.114	<.001
5.College and above	3.685	2.850	4.765	<.001
Model 2				
Age Baseline	1.000	.980	1.020	.986
Male	.139	.117	.164	<.001
Black	3.198	1.265	8.080	.014
Latino	.855	.194	3.770	.836
Education (Ref = Some High School)				<.001
2.GED	.987	.339	2.875	.981
3.High-school graduate	5.158	1.570	16.947	.007
4.Some college	5.837	2.256	15.105	<.001
5.College and above	9.463	3.606	24.834	<.001
Education x Race				.021
2.GED x Black	.846	.274	2.613	.771
3.High-school graduate x Black	.350	.099	1.247	.105
4.Some college x Black	.671	.251	1.793	.426
5.College and above x Black	.343	.126	.936	.037
Education x Ethnicity				.662
2.GED x Latino	.755	.146	3.897	.737
3.High-school graduate x Latino	1.735	.256	11.753	.572
4.Some college x Latino	1.139	.234	5.539	.872
5.College and above x Latino	1.444	.291	7.177	.653

Operator and service occupational classes saw an overrepresentation of Black and Latino middle-aged and older adults, whereas clerical/administrative and managerial occupational classes were more prevalent among their White counterparts. Our analysis brought to light significant racialized effects of educational attainment on occupational distribution. Despite achieving similar education levels, Black and Latino individuals were placed in distinct occupational classes compared to White individuals. To illustrate, a higher level of education was linked to lower odds of working in managerial occupational classes. Nevertheless, a noteworthy interaction between individuals with some college education and Black ethnicity indicated that the inverse correlation between some college education and employment in managerial occupational classes was less pronounced for Black middle-aged and older adults than their White counterparts. Furthermore, holding a GED decreased the likelihood of working in sales occupational classes, while possessing a college degree or above increased these odds. A significant interaction between individuals with some college education and Black ethnicity suggested a stronger association between some college education and employment in sales occupational classes for Black middle-aged and older adults compared to their White counterparts. Additionally, a statistical interaction between individuals with a college degree or above and Black ethnicity hinted at a weaker effect of having a college degree or above on clerical and administrative occupational classes for Black middle-aged and older adults in comparison to their White counterparts.

The observed disparities underscore a troubling pattern wherein educational attainment does not uniformly translate into improved occupational status for all racial and ethnic groups[68-70]. Black and Latino individuals, despite achieving comparable levels of education to their White counterparts, experience a distinct lack of upward mobility in occupational classes[71]. This phenomenon is indicative of deeply rooted systemic issues, including job segregation and discriminatory practices within the labor market[72]. The historical context of Jim Crow, with its entrenched racial biases, continues to cast a long shadow over contemporary employment dynamics, perpetuating an environment where racial and ethnic minorities face unique and persistent barriers to occupational advancement[26, 28, 29].

Table 6. Logistic regression between educational attainment and service occupational class overall and by race/ethnicity

Model 1	**OR**	**95% CI**		***p***
Age Baseline	1.024	1.005	1.044	.013
Male	.270	.232	.315	<.001
Black	.345	.293	.406	<.001
Latino	1.441	1.110	1.872	.006
Education (Ref = Some High School)				<.001
2.GED	12.698	8.873	18.171	<.001
3.High-school graduate	9.391	6.082	14.500	<.001
4.Some college	7.062	4.961	10.053	<.001
5.College and above	3.498	2.388	5.123	<.001
Model 2				
Age Baseline	1.025	1.006	1.045	.010
Male	.268	.230	.312	<.001
Black	.623	.266	1.458	.275
Latino	.000	.000	.	.998
Education (Ref = Some High School)				<.001
2.GED	19.117	8.658	42.208	<.001
3.High-school graduate	16.816	6.381	44.314	<.001
4.Some college	12.571	5.644	28.000	<.001
5.College and above	4.099	1.744	9.633	.001
Education x Race				.168
2.GED x Black	.568	.233	1.384	.213
3.High-school graduate x Black	.502	.170	1.488	.214
4.Some college x Black	.447	.183	1.091	.077
5.College and above x Black	.765	.294	1.990	.583
Education x Ethnicity				.289
2.GED x Latino	NA			
3.High-school graduate x Latino	NA			
4.Some college x Latino	NA			
5.College and above x Latino	NA			

Table 7. Logistic regression between educational attainment and operator occupational class overall and by race/ethnicity

	OR	**95% CI**		***P***
Model 1				
Age Baseline	.966	.951	.981	<.001
Male	8.592	7.481	9.869	<.001
Black	.854	.722	1.011	.066
Latino	1.252	.989	1.585	.061
Education (Ref = Some High School)				<.001
2.GED	38.936	29.241	51.847	<.001
3.High-school graduate	27.326	19.338	38.613	<.001
4.Some college	15.675	11.931	20.592	<.001
5.College and above	6.461	4.838	8.629	<.001
Model 2				
Age Baseline	.966	.951	.981	<.001
Male	8.625	7.507	9.909	<.001
Black	.723	.301	1.735	.468
Latino	.718	.095	5.435	.748
Education (Ref = Some High School)				<.001
2.GED	26.400	11.153	62.490	<.001
3.High-school graduate	17.683	5.940	52.640	<.001
4.Some college	17.289	7.223	41.382	<.001
5.College and above	6.631	2.668	16.477	<.001
Education x Race				.017
2.GED x Black	1.643	.659	4.099	.287
3.High-school graduate x Black	1.545	.489	4.883	.459
4.Some college x Black	.881	.352	2.206	.786
5.College and above x Black	.945	.361	2.469	.908
Education x Race				.697
2.GED x Latino	1.631	.210	12.674	.640
3.High-school graduate x Latino	3.129	.327	29.906	.322
4.Some college x Latino	1.449	.180	11.644	.727
5.College and above x Latino	1.852	.224	15.325	.568

Social stratification might be the root cause of our findings[49-51]. The stratified nature of US society means differential access to the same jobs across racial and ethnic groups who have attained the same educational attainment[19]. These differential access to opportunity structures are usually added to the ingrained biases and discriminatory practices of the labor market and those who have the hiring decision. All these contribute to the perpetuation of occupational disparities to the disadvantage of highly educated Black and Latino individuals[49-51]. The lingering effects would be seen as differential returns of educational attainment by race/ethnicity[68-70].

The implications of our study extend beyond the immediate occupational sphere, resonating with broader US societal issues[73-75]. The observed racialized effects on educational attainment and occupational classes have far-reaching consequences for wealth accumulation, retirement planning, and overall well-being, particularly among middle-aged and older adults[19, 72, 76, 77]. Addressing these disparities requires a multifaceted approach that considers historical context, institutional reform, and targeted policies aimed at dismantling systemic inequities[78].

Surprisingly, our study did not uncover any ethnic variations in how educational attainment influences occupational classes. This finding is particularly noteworthy considering the prevalent belief that labor market discrimination disproportionately impacts Black individuals more than Latino individuals. Therefore, while factors such as segregation undoubtedly contribute to these dynamics, it suggests that additional obstacles may hinder the employability of highly educated Black individuals into high-paying, low-stress jobs. Nonetheless, our bivariate analysis did reveal significant main effects of ethnicity on occupational classes, which can primarily be attributed to differences in educational levels. This observation underscores the complex interplay between education, ethnicity, and occupational outcomes, highlighting the need for further exploration into the multifaceted barriers that contribute to disparities in the labor market.

Future research in this domain should delve deeper into the underlying mechanisms perpetuating racialized effects on educational attainment and occupational classes.

Exploring the role of intersectionality[79], considering factors such as gender, age, and geographic location, will provide a more nuanced understanding of the complexities at play. Longitudinal studies that follow individuals from diverse racial and ethnic backgrounds over extended periods can help uncover dynamic patterns and identify critical points for intervention. Additionally, investigations into the impact of specific policies and interventions on mitigating occupational disparities should be a priority[80]. A comprehensive examination of the evolving landscape of the labor market and its response to changing societal norms will contribute to the development of targeted strategies aimed at dismantling systemic barriers and fostering greater equity. Lastly, expanding the scope of research to include the perspectives and experiences of individuals within non-traditional and emerging occupational sectors will provide a more comprehensive understanding of the contemporary challenges faced by different racial and ethnic groups in the workforce.

Limitations

Despite the insights gained from our study, several limitations warrant consideration. First, while the HRS is a nationally representative dataset, we only included Black, White, and Latino individuals. As such, the generalizability of our findings may be limited by these factors. The dataset's reliance on self-reported measures of educational attainment and occupational classes may also introduce the possibility of recall bias and misclassification. This study overlooked the experiences of other minority populations such as Native American individuals. The study did not have data on segregation or discrimination. Finally, multiple factors may influence occupational choices such as preferences and culture. Thus, we invite readers to take caution in attributing the observed disparities solely to racialized effects, warranting further exploration of omitted variables. Acknowledging these limitations, our study makes a unique contribution to the existing knowledge on the intricate dynamic links between race/ethnicity, education, and occupation in the United States.

Conclusion

In conclusion, our study adds to the growing body of evidence highlighting racialized occupations in the United States that go beyond education levels. The differential returns of education on occupation classes among Black, Latino, and White individuals may be due to social stratification, job segregation, and discriminatory practices within the labor market. The US has introduced legislations to confront these issues head-on; however, we still see racial and ethnic disparities in the occupation of Black and Latino elites in the US when compared to their White counterparts.

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