

An Exploration of the Black/White Earnings Gap

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Abstract

This paper investigates the Black–White earnings gap in the United States using nationally representative data from the Current Population Survey (1976–2019). Employing log-linear wage regressions with controls for education, potential experience, and additional labor market characteristics, the analysis decomposes the role of human capital in explaining racial wage differentials. Results indicate a significant narrowing of the earnings gap over time, with increased labor market experience among Black workers emerging as the primary explanatory factor post-2003. However, a persistent residual gap remains after accounting for observable characteristics, suggesting continued influence of structural factors or labor market discrimination beyond human capital differences.

Introduction

This study investigates the extent to which human capital variables—specifically, years of education, work experience, and their nonlinear effects—explain the earnings gap between Black and White workers. The persistence of this gap, even as significant social and economic reforms have taken place, suggests that factors beyond institutional discrimination may be at work. Yet, many scholars argue that differences in educational attainment and labor market experience contribute importantly to observed disparities. By focusing on these human capital factors, this study aims to isolate their specific contribution to the wage gap, providing insights that can inform both theoretical debates and policy interventions.

Utilizing data from the Current Population Survey (CPS) covering 1976 to 2019, this analysis will leverage multiple regression techniques to control for a broad range of demographic and labor market characteristics. This dataset's rich detail ensures the ability to capture both point-in-time measures and long-term trends in the labor market. Ultimately, the goal is to

answer whether differences in educational attainment and work experience can statistically account for a significant portion of the observed earnings disadvantage faced by Black workers.

In addressing this question, this research contributes to the broader literature on wage formation and labor market inequality. By examining a long time horizon, assessments can be done on whether the influence of human capital has remained stable or evolved in the context of broader social and economic changes—such as deindustrialization, and the financial crises of recent decades. The findings of this study are expected to offer both a replication of established results and fresh insights into the mechanisms that drive racial wage disparities.

Literature Review

The literature on the Black–White earnings gap highlights the complex interaction between historical discrimination, structural barriers, and labor market biases, contributing to persistent inequality. Leonhardt discusses how systemic inequities in education and employment continue to disadvantage Black workers, despite overall societal progress.¹ The Chicago Booth Review notes that while racial bias accounts for a portion of the wage gap, employer perceptions regarding skill differences exacerbate these disparities.² Further, Wilson and Darity show that wage disparities persist even after controlling for human capital factors such as education and experience, suggesting that structural racism still influences earnings.³ Bayer and Charles

¹ Leonhardt, David. “The Racial Wage Gap Is Shrinking.” *The New York Times*, The New York Times, 19 June 2023, www.nytimes.com/2023/06/19/briefing/juneteenth-racial-wage-gap.html.

² Economics, Chicago Booth Review. “Minding the Racial Wage Gap.” *The University of Chicago Booth School of Business*, 2009, www.chicagobooth.edu/review/minding-racial-wage-gap.

³ Wilson, Valerie, and William Darity. “Understanding Black-White Disparities in Labor Market Outcomes Requires Models That Account for Persistent Discrimination and Unequal Bargaining Power.” *Economic Policy Institute*, 25 Mar. 2022, www.epi.org/unequalpower/publications/understanding-black-white-disparities-in-labor-market-outcomes/.

emphasize the role of lifetime work experience in the wage differential, highlighting that disparities in years worked contribute significantly to the overall inequality.⁴ Glover et al. argue that standard earnings measures underestimate the full extent of wage disparities, particularly when differences in work duration are considered.⁵ Recent studies, like Gubbay and McKay, indicate that although there were periods of narrowing wage disparities, the gap has widened in recent decades, particularly for lower-income Black workers.⁶

This study builds on these findings by focusing on how human capital factors—specifically education and work experience—contribute to the Black-White earnings gap, using updated CPS data spanning four decades. By examining these human capital measures across time, we seek to replicate past findings while offering a more nuanced understanding of how education and experience influence racial wage disparities, particularly in light of evolving economic contexts such as the rise of affirmative action and changes in labor market dynamics.

Data

This analysis employs data from the Current Population Survey (CPS), a large, nationally representative survey administered by the U.S. Census Bureau and the Bureau of Labor Statistics. The CPS collects detailed information on employment, earnings, and demographic characteristics from households across the United States. Covering the period from 1976 to 2019,

⁴ Bayer, Patrick, and Kerwin Kofi Charles. “Divergent Paths: Structural Change, Economic Rank, and the Evolution of Black-White Earnings Differences, 1940-2014.” *NBER*, Nov. 2016, www.nber.org/system/files/working_papers/w22797/w22797.pdf.

⁵ Glover, Andrew, et al. *Lifetime Earnings Differences across Black and White Individuals: Years Worked Matter*, 2023, www.kansascityfed.org/Economic%20Review/documents/9276/EconomicReviewV108N1GloverMustredelRioPollard.pdf.

⁶ Gubbay, Natalie, and Lisa Camner McKay. “The Growing Income Gap for Black Workers.” *Federal Reserve Bank of Minneapolis: Pursuing an Economy That Works for All of Us.*, 24 July 2024, www.minneapolisfed.org/article/2024/the-growing-income-gap-for-black-workers.

the CPS offers a robust panel of cross-sectional data that enables the study of long-term trends in the labor market and the persistence of wage disparities.

Key variables in this study include incwage (as a measure of income from labor market work), years of education, work experience (derived from age, education, and other factors), and their corresponding squared terms to capture potential nonlinear effects. Additional demographic variables such as race (with dummies for Black and White workers), gender, and marital status are included, along with labor market characteristics such as hours worked per week, weeks worked per year, occupation, and industry. This dataset is widely used for its comprehensive coverage and reliability in capturing the economic conditions of U.S. households.

Below are summary statistics to provide an overview of the sample's demographic profile and key labor market outcomes. These statistics will help contextualize the regression analyses by highlighting trends and variations in both general demographics and specific human capital measures.

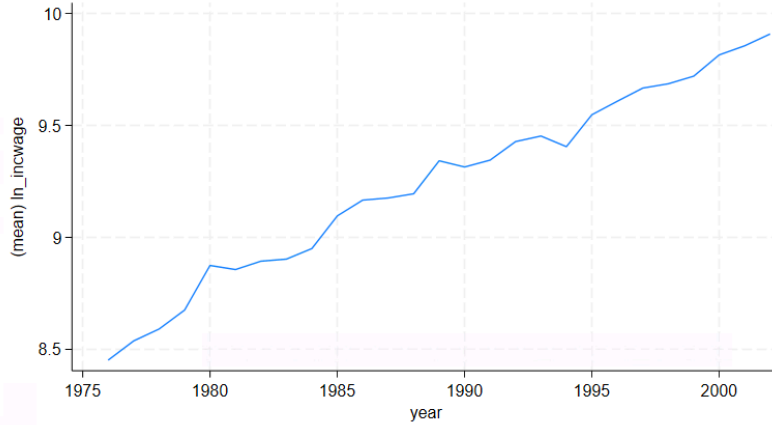
Summary Statistics of Key Variables

| (1) | | | | |
|------------------------|----------|----------|-----|------|
| | mean | sd | min | max |
| Age of person | 40.01056 | 11.29952 | 20 | 60 |
| num_in_hh | 3.378662 | 1.579898 | 1 | 16 |
| Years of education | 13.69257 | 2.705632 | 4 | 20 |
| yrs_of_edu_sq | 194.8068 | 71.85527 | 16 | 400 |
| exp | 20.31799 | 11.52606 | -5 | 50 |
| exp_sq | 545.6703 | 492.3737 | 0 | 2500 |
| Hours worked last week | 28.73227 | 20.71368 | 0 | 99 |
| Weeks worked last year | 38.44898 | 21.07249 | 0 | 52 |
| Observations | 367600 | | | |

Figure 1: Summary Statistics of Key Variables

In addition to Summary Statistics, below are the income trends for both Black and White workers, split into pre-2003 and post-2003 year graphs.

Actual Income Over Time for Black Workers Pre-2003

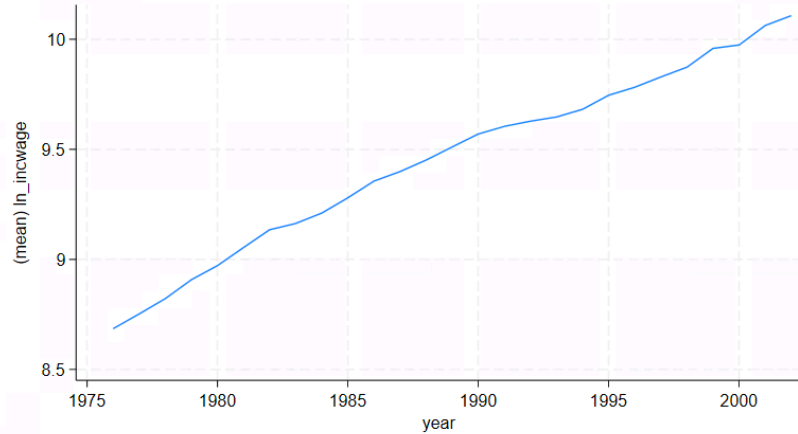


Actual Income Over Time for Black Workers Post-2003



Figure 2: Income Over Time for Black Workers, Pre and Post 2003

Actual Income Over Time for White Workers Pre-2003



Actual Income Over Time for White Workers Post-2003



Figure 3: Income Over Time for White Workers, Pre and Post 2003

In Figures 2 and 3, we can see that the income for white workers has been steadily rising since 1976, with the most significant drop in 2008 due to the financial crisis. Black workers have experienced somewhat steady growth, although income rates have been slightly more volatile. Moreover, the shock from the 2008 financial crisis impacted black workers' income way more than white workers. While white workers' income recovered from the shock by 2011, black workers' income was still very volatile; it partially recovered in 2011 only for it to drop again in 2012. It did not fully begin recovery until 2014.

Empirical Methodology

To assess whether human capital factors account for the Black–White earnings gap, multiple regression analyses are employed. The baseline model estimates the logarithm of annual earnings as a function of race, human capital factors (years of education and work experience, including squared terms to capture nonlinear effects), and additional controls such as gender, marital status, and labor market variables (hours and weeks worked). The basic estimating equation can be expressed as:

$$\ln(\text{incwage}) = \beta_0 + \beta_1 \text{Black} + \beta_2 \text{Black_year} + \beta_3 \text{edu_Black} + \beta_4 \text{Age} + \beta_5 \text{Education}^2 + \beta_6 \text{Experience} + \beta_7 \text{Experience}^2 + \beta_8 \text{Female} + \beta_9 \text{Married} + \beta_{10} \text{Hours} + \beta_{11} \text{Wkslyr} + \beta_{12} \text{i.year} + \beta_{13} \text{i.unified_state} + \beta_{14} \text{i.o} \\ \text{cc2d} + \epsilon$$

Note: to make the interpretation easier, the year variable is centered around the year 1976
(year_c = year-1976)

In this formulation, the coefficient β_1 on the Black dummy captures the baseline earnings differential between Black and White workers, holding constant human capital and other characteristics. The model incorporates additional controls for occupation, industry, and

geographic location (state), to account for labor market segmentation and regional effects. Given that there are dummy variables for both Black and White workers, only the Black dummy is included (with White as the reference group) in the interaction term to avoid multicollinearity.

This model is specifically for pre-2003 due to the difference in occupation variables from the CPS data. In the data source, occ2d is for occupation pre-2003 and occup is for occupation post-2003. Therefore, whenever we analyze educational attainment over time and experience over time, they will also be analyzed by these two categories. The regression for post-2003 is below:

$$\ln(\text{incwage}) = \beta_0 + \beta_1 \text{Black} + \beta_2 \text{Black_year} + \beta_3 \text{edu_Black} + \beta_4 \text{Age} + \beta_5 \text{Education}^2 + \beta_6 \text{Experience} + \beta_7 \text{Experience}^2 + \beta_8 \text{Female} + \beta_9 \text{Married} + \beta_{10} \text{Hours} + \beta_{11} \text{Wkslyr} + \beta_{12} \text{i.year} + \beta_{13} \text{i.unified_state} + \beta_{14} \text{i.occup} + \epsilon$$

The same is true for state variables, with state referring to pre-2003 and statename referring to post 2003. To circumvent this issue, the two variables are merged into one unified_state variable. However, since the statename variable is a categorical variable and cannot be merged as is, it is first encoded into a new state_num variable to assign numerical values to each state before merging. Since the variable is merged, the unified_state variable is the same in both regressions.

The interaction terms allows the model to capture changes in the racial wage gap over time as well as the education attainment gap over time, providing insights into whether racial disparities in earnings have improved or worsened across different economic periods. It will also show how educational attainment has changed over time between the two groups. These dynamic components are essential for understanding the evolving nature of racial inequality in the labor market.

To better visualize the human capital variables being used for discriminatory practices, educational attainment over time and work experience over time for both Black and White workers will be modeled.. If educational attainment is decreasing or stagnant for black workers, this may be part of the cause of the earnings gap. A similar conclusion can be drawn if educational attainment for Black workers has decreased or stagnated. To analyze these, the base model above will still be used. However, since the data is split for some variables between 1976-2003 and 2003-2019 (state/statename and occ2d/occup), two models will be used for each group. One will be for pre 2003 and the other for post 2003

Results

| VARIABLES | (1) ln_incwage | VARIABLES | (1) ln_incwage |
|---------------|----------------------------|---------------|----------------------------|
| black | -0.230*** (0.0236) | black | 0.130*** (0.0366) |
| black_year | -0.00156*** (0.000536) | black_year | -0.00284*** (0.000819) |
| edu_black | 0.0175*** (0.00183) | edu_black | -0.00437** (0.00188) |
| age | 0.0119*** (0.00280) | age | -0.0387*** (0.00324) |
| yrs_of_edu_sq | 0.00203*** (0.000110) | yrs_of_edu_sq | 0.00397*** (0.000125) |
| exp | 0.0234*** (0.00286) | exp | 0.0709*** (0.00329) |
| exp_sq | -0.000608*** (1.06e-05) | exp_sq | -0.000545*** (1.10e-05) |
| female | -0.502*** (0.00306) | female | -0.240*** (0.00331) |
| married | 0.0241*** (0.00283) | married | 0.0777*** (0.00283) |
| hours | 0.00672*** (9.95e-05) | hours | 0.00787*** (0.000101) |
| wkslyr | 0.0443*** (0.000177) | wkslyr | 0.0422*** (0.000206) |

Figure 4: Regression Results Illustrating Effects on Wage Over Time, Pre and Post 2003

In Figure 4, the coefficient of -0.230 on black pre-2003 illustrates that holding all other variables constant, Black workers earn approximately 20.5% less than their White counterparts on average. This interpretation is due to the log form of the coefficient, so the calculation for percent change in income is $(e^{-0.230}-1) \times 100$. Conversely, post-2003, the coefficient of 0.130 illustrates that holding all other variables constant, Black workers are now predicted to earn 13.9% more than their White counterparts. However, this does not explicitly mean Black workers are earning more. Rather, this means that the earnings gap is narrowing. To search for potential causes of this narrowing, we look to both educational attainment and experience.

Educational Attainment Over Time for Black and White Workers

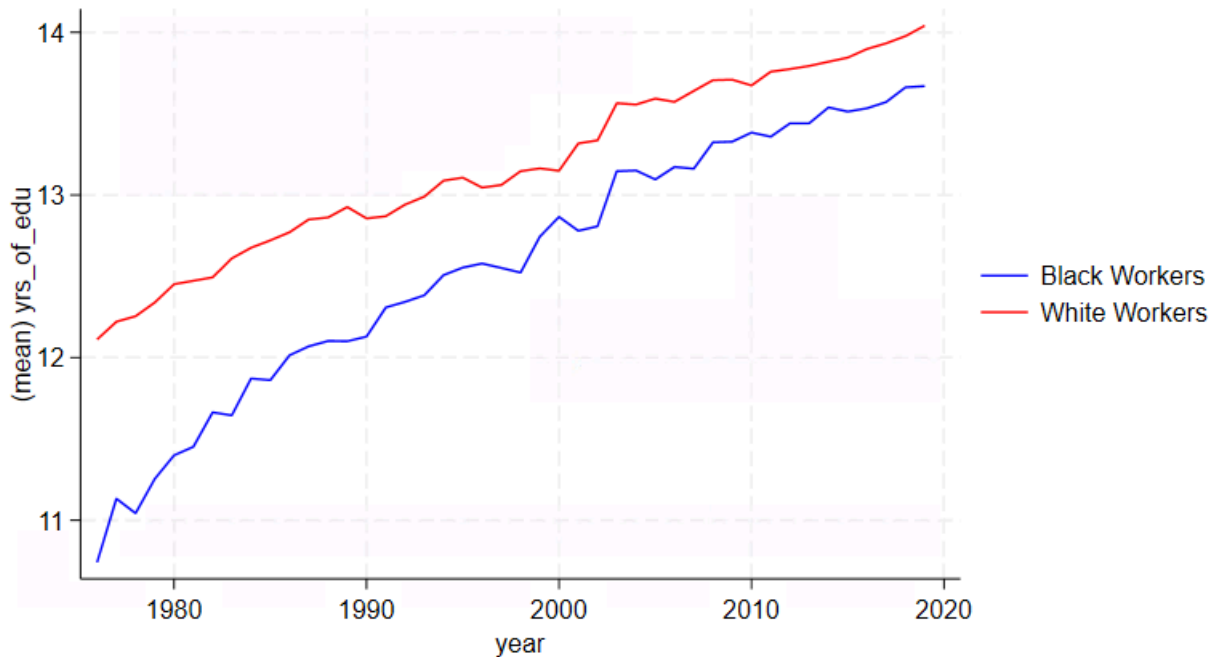


Figure 5: Educational Attainment over Time for Black and White Workers

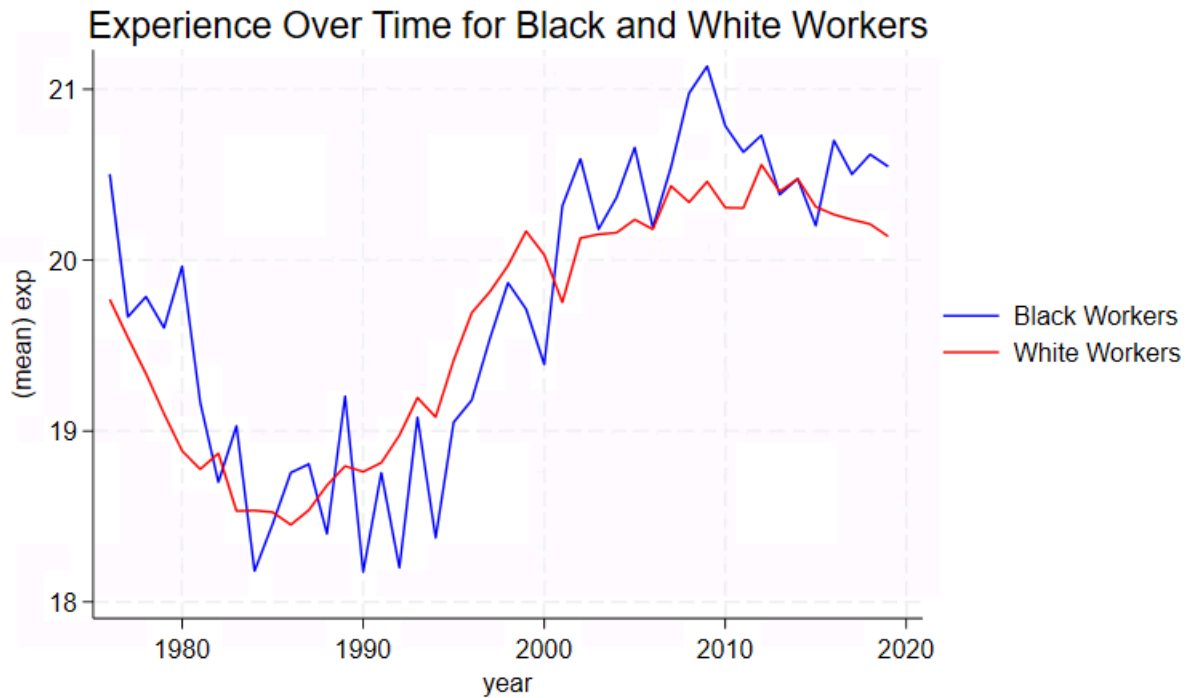


Figure 6: Average Years of Experience over Time for Black and White Workers

In Figure 5, we see that educational attainment for Black workers is growing at a faster rate than their White counterparts, narrowing the educational attainment gap. The gap narrowed drastically between 1976 and 2003. This is confirmed by the coefficient in Figure 4 for `edu_black pre-2003` (interaction term between `yrs_of_edu` and `black`) being positive at 0.0175. Post 2003, the gap has been pretty stable, as confirmed by the coefficient in Figure 4 for `edu_black post-2003` being -0.00437. This essentially means that educational attainment for Black and White Workers is growing at the same rate, with a difference of about 0.4 years between them. Since the gap has not significantly shifted post-2003, this may not be a suitable explanation for the narrowing earnings gap. Because of this, we then look to experience over time.

In Figure 6, we can see a decline in experience for both Black and White workers between the 80s and 90s. Some explanations for this decline are:

- Baby Boomers aging out of the workforce⁷
- Increased College Enrollment⁸
- Deindustrialization⁹

However, we see a steady increase for both groups after the 90s, with Black workers surpassing White workers in experience after 2008. This increase in experience for Black workers may provide an explanation for the narrowing earnings gap between Black and White workers.

Nevertheless, while the earnings gap has narrowed over time, Black workers are still earning less than their white counterparts, even with similar educational attainment and more experience.

Further studies with data sets capturing more systemic factors like employer perception may be needed as education and experience are not able to account for the fact that the gap has still not closed.

Conclusion

This study looked at the role of human capital (education and work experience) in the persistent earnings gap between Black and White workers. Current Population Survey (CPS) from 1976 to 2019 was used with multiple regression to control for a range of demographic, educational and

⁷ U.S. Bureau of Labor Statistics. "Tenure of Wage and Salary Workers." U.S. Department of Labor, 13 Jan. 1997, https://www.bls.gov/news.release/history/tenure_013097.txt?utm_source.

⁸ National Center for Education Statistics. "Status and Trends in the Education of Racial and Ethnic Minorities." U.S. Department of Education, 2010, https://nces.ed.gov/pubs2010/2010015/indicator6_23.asp?utm_source.

⁹ National Bureau of Economic Research. "Are Lifetime Jobs Disappearing? Job Duration in the United States, 1973-1993." 1998, https://www.nber.org/system/files/chapters/c8360/c8360.pdf?utm_source.

labor market variables. The goal was to see if differences in education and work experience could explain the racial gap and how these factors have changed over time.

The results show an interesting trend. Pre-2003 the coefficient for Black workers was -0.230 which means Black workers earned about 20.5% less than White workers even when controlling for education, experience and occupation. However, post 2003 the coefficient for Black workers flipped to 0.130 which means the gap has narrowed and Black workers now earn 13.9% more than White workers, holding other things constant. This means that while Black workers are still behind White workers in terms of earnings, the gap is reducing over time.

In terms of human capital the results show the narrowing of the gap was mostly driven by increases in work experience for Black workers. Between the 1980s and 1990s both Black and White workers decreased in average years of experience potentially due to increased college enrollment and deindustrialization. Nevertheless, post-2000s, Black workers gained more experience and surpassed White workers by 2008 which could explain the narrowing of the gap. Black workers' education also grew, with the growth slowing significantly after 2003 which means education alone can't explain the narrowing of the gap.

This study adds to the existing literature by highlighting the importance of work experience in reducing the racial wage gap, a factor that has been neglected in previous research. As noted by the Economic Policy Institute, racial wage gaps persist even when controlling for education and experience. But experience is not given enough credit in these analyses. The results in this paper show while education is still significant, accumulation of work experience has had a bigger impact, especially post 2003. As noted by the Chicago Booth Review, racial wage gaps are not just due to education disparities but also due to employer biases and systemic barriers to career

advancement. Additionally, research from the Kansas City Fed and New York Times shows that while Black workers have made gains in education, those gains are not always reflected in equal wage progression.

The cause of the decline of the wage gap, especially in the more recent decades, can be significantly contributed to increased work experience for Black workers, which has become the most decisive factor in formulating their earnings potential. Despite these positive findings, these results underscore the need to address educational and experience-based obstacles experienced by minority workers. Programs aimed at upgrading the quality of education and continuous professional development of Black workers would also contribute to the closing of the inequality gap as biases in hiring practices allow for employers to discriminate against Black workers due to differing perceptions of skill. The refashioning of policies to deal with the structural barriers to career progression like employer biases and market segmentation is also indispensable if Black workers are to utilize their work experience to the fullest.

Subsequent studies might focus on the analysis of employer discrimination as well as labor market prejudices, which contribute to the size of the racial wage gap. More comprehensive statistical data on employer attitudes and labor market segregation could explain the non-human factors that still have an influence on wage gaps. Moreover, broadening the research to include data on Black and White workers in different industries and occupations (not just summary statistics) should result in a clear view of the factors causing the wage gap.

To summarize, I believe that while education and work experience are factors that contribute to the wage gap explanation, work experience has significantly contributed to the narrowing of the earnings gap between Black and White workers. However, by themselves, these human capital

variables are not enough to reveal the earnings disadvantage of Black workers. As the gap continues to shrink, more detailed investigation into non-human capital factors will be of utmost importance in developing successful policy responses and gaining a full picture of the racial wage gap dynamic in the United States.

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