



Digital Commons@

Loyola Marymount University
LMU Loyola Law School

Honors Thesis

Honors Program

12-14-2020

Race, Income, or School Quality? Determining the Most Influential Factor in High School Graduation Rates in Times of Economic Hardship

Elsa Wilson
ewilso34@lion.lmu.edu

Follow this and additional works at: <https://digitalcommons.lmu.edu/honors-thesis>



Part of the [Education Economics Commons](#)

Recommended Citation

Wilson, Elsa, "Race, Income, or School Quality? Determining the Most Influential Factor in High School Graduation Rates in Times of Economic Hardship" (2020). *Honors Thesis*. 399.
<https://digitalcommons.lmu.edu/honors-thesis/399>

This Honors Thesis is brought to you for free and open access by the Honors Program at Digital Commons @ Loyola Marymount University and Loyola Law School. It has been accepted for inclusion in Honors Thesis by an authorized administrator of Digital Commons@Loyola Marymount University and Loyola Law School. For more information, please contact digitalcommons@lmu.edu.



Loyola Marymount University
University Honors
Program

Race, Income, or School Quality? Determining the Most Influential Factor in High School Graduation Rates in Times of Economic Hardship

A thesis submitted in partial satisfaction
of the requirements of the University Honors Program
of Loyola Marymount University

by

Elsa Wilson

December 15, 2020

Introduction

As an extensively studied topic, previous research shows that educational attainment levels can be affected by many different factors ranging from disproportionate school resources, familial circumstances, and the current economic state of the nation. In fact, many of these things often go hand in hand, with race being another important factor. Regardless of the fact that the legal integration of schools occurred almost 70 years ago, many schools are still struggling to prevent student bodies that are segregated by race or parental wealth. Often times, segregation in one sense will automatically lead to segregation by the other parameter. Some critics set forth the notion that, since legal integration took place in the 1950s, everyone has access to the same quality education; however, I contend that there is a lack of equity in educational attainment across races. My argument is that Black individuals are substantially under paid and under supported in both schools and the workplace, and that the data will show race as being the most statistically significant factor, over income and school quality, in high school graduation rates due to the fact that Black individuals are not treated equally in the rest of our society.

Disproportionate access to quality education across races has been researched extensively. In order to take the research one step further, and to view the information at an even closer lens, I will be analyzing data from all 50 states during the years 2010 and 2018. The reason for choosing these particular years is that 2010 is the first year immediately following the Great Recession. 2018 is a short ten years later. Using this data, and also taking into account the average family income and per pupil amounts for current spending of public elementary-secondary school systems, I found that, of the three variables, race is the

consistently statistically significant variable that affects high school graduation rates during times of economic hardship.

Previous Research

Although progress has been made since initial integration of schools back in 1954, there is still data that proves there is still more work to do to create an equitable system. Research published by McDaniel et al. in 2011 outlines the differences in racial educational attainment status. Between the years of 2005-2007, only 12% of Black men and 17% of Black women obtained a bachelor's degree, whereas 24% of white men and 33% of white women completed their undergraduate education (McDaniel et al. 2011, 908). Morgan found that between the years of 1982 and 1992, entry and graduation rates increased significantly for both white and Black students (Morgan 2005, 7); however, there is still significant work to be done as additional research by McDaniel et al. shows that Black men are lagging further behind Black women than white men are behind white women, and that Black students are still less likely than white students to achieve a certain level of educational attainment. A majority of students don't attend schools that are representative of the United States population. This is an additional factor that plays into the unequal levels of educational attainment for Black students as compared to white students.

Substantial research has been done on the role that race has historically played in educational attainment. Much of that research demonstrates that a lack of progress has been made in creating an equitable schooling system, thus leading to disproportionate educational attainment levels across races. For instance, Goldsmith showed that much of integration appears to be one sided as 72% of Blacks, but only 11% of white students attend schools where

50% or more of the student body are not white (Goldsmith 2009, 1913). His research also cited data that showed that racial segregation in schools does impact educational attainment.

Studies show that student bodies that have a higher percentage of Black or Latino students are less likely to send students to college and post graduate schools (Goldsmith 2009, 1914). These segregation levels may explain the gap in educational attainment that clearly exists between Black and white students.

Although racial segregation in the United States has been illegal for a number of decades, there is research that shows that segregation still exists in many forms. The United States is becoming increasingly more segregated by income. The rich are getting richer while the middle class and the poor are remaining static in their wealth. The data shows that in the United States, between the years 1970 and 1990, households became more geographically separated by income (Meyer 2002, 153). With research showing that there has been little to no change in the income inequality gap among whites and Blacks, it is safe to conclude that Black families are disproportionately suffering due to the increasing wealth gap. Between the years of 1972 and 2009, income inequality between white and Black Americans remained constant. During those years, Black Americans earned, on average, only between 50-60% of the white median income (Storer et al 2012, 18). This income inequality is crucial as previous research shows that income and educational attainment levels are related.

Over the past fifty years, the wealth gap has been widening. Previous scholarship by Bloome and Western has shown that both income inequality and income inequality by education has increased in the past five decades. Educational mobility has declined with rising income inequality (Bloome and Western 2011, 375). That increased divide has a

disproportionate effect on Black individuals and families, as class has been racialized (Yeskel 2008, 9). Not only that, but the idea of “the affordability crisis” is one that is increasingly relevant to people of color. This is the idea that even if students are admitted to college, they can’t afford it (Storer et al 2012, 22). This may lead to less motivation to finish their high school education. Research shows that income inequality has increased, significantly affecting Black Americans, since the mid-late 20th century. Along with that, there has yet to be a constant state of equality in educational attainment levels for Black American students as compared to white students.

Regardless of the cause, there is no doubt that educational attainment levels is still not equal in the United States. However, there has been general progress made in high school graduation rates. According to the National Center for Educational Statistics, US schools now graduate nearly 88% of their students. Black students still have high school dropout rates that are disproportionately higher than white Americans (Caldwell and Siwatu 2003, 31). As of the mid 2000s, only around 65% of Black students leave school with a high school diploma (Heckman and LaFontaine 2010, 244-245). Progress is being made, but it is slower than many would expect since it has been almost 70 years since schools were legally mandated to integrate. Data from the 2000 census confirms that racial gaps in graduation rates have not substantially changed since that initial 1950s cohort, as there are still low graduation rates for many minority students (Heckman and LaFontaine 2010, 253-255). There are many reasons as to why these disproportionate numbers have not substantially changed in the past 70 years, but one likely reason is school quality.

There has been significant scholarship done on the quality of American public schools and whether or not schools that lack resources and the proper funding are disproportionately made up of primarily minority students. Research shows that, as of 2006, 90% of high school students attended a public school. Yet only 20% of those students attended a school that accurately reflected the diverse makeup of the national population. However, in cities such as Chicago and Atlanta, where the wealth is more substantial, more than 50% of white students attend a private high school (Balfanz 2009, 18-21). There is significant support in the literature to come to the conclusion that race and class play a role in education inequality.

The research shows that students are not actually in integrated schools that are representative of our country's diversity, and that has been shown to have negative effects on educational attainment levels. In school districts with larger numbers of Black students, there are lower high school graduation rates (Storer et al 2012, 36). Scholarship shows that the experiences of most high school students are still separate and unequal, regardless of what the law says. The primary exception to that is in low wealth rural districts, usually in the South, where many white students do attend high schools with a large number of low-income students. Otherwise, Black students are 3-4 times more likely than white students to attend schools with a low graduation rate (Balfanz 2009, 22-24). The research is clear in saying that race does affect high school graduation rates. However, in order to narrow down the scope of research, this paper specifically looks at data from 2010, a year of economic hardship immediately following the official end of the Great Recession, to see what factors most impact educational attainment during times of economic collapse.

Although the Great Recession occurred just a little over 10 years ago, there has already been an influx of information on the effects that came from those years of economic suffering in the United States. Occurring officially between 2007 and 2009, the Great Recession was the largest “economic upheaval” in the United States since the Great Depression almost 100 years ago (Kalleberg and von Wachter 2017, 1). The Great Recession had a substantially negative impact on family income and wealth, as jobs were lost all across the country. Parental job loss is proven to have a significant effect on a child’s educational attainment level, even when controlling for greater family background characteristics (Kalil 2013, 235-237). However, there are conflicting data on the effects the Great Recession had on education.

Scholarship varies on what kind of effects come from catastrophic economic events. Research from Barr and Turner in 2013 reports that the demand for higher education typically increases during times of economic downturn. There was a substantial increase in Black students graduating and enrolling in college between 2007 – 2010 (Barr and Turner 2013, 170). However, additional research illustrates the notion that men, specifically Black men, were hit hardest by the Great Recession. Many of those workers had to offset their lost earnings by increasing the labor supply of younger family members (Kalleberg and von Wachter 2017, 2-7), implying that school was not a feasible option for many young adults. Although there is data that shows that economic circumstances changed significantly during the Great Recession, there is little data that shows what factors played the most crucial role in instigating these changes.

As many states were suffering financially during the Great Recession, it is safe to assume that there may have been consequences of the lack of financial stability that extended to the

public school system. Research shows that the years immediately following the Great Recession brought about the largest and most sustained declines in national per-pupil spending in more than a century, as there was a 7% decrease in the average amount spent on each student (Jackson et al. 2020, 64). These data are conflicting with some of the previously reported scholarship.

It's unclear exactly what has the most substantial effect on educational attainment levels, specifically high school graduation rates, both in times of economic downturn and times of economic prosperity. Some argue that in parts of the country where there are greater concentrations of Black students, socioeconomic factors such as income may be the most substantial indicator of high school graduation rates (Storer et al 2012, 37). Due to the fact that Black individuals are not treated equally in the rest of society, my data and analysis, as presented below, will show that these inequalities transfer over to educational attainment levels as race is the most important factor in determining whether or not a student will graduate from high school, particularly in times of an economic crisis.

Methods and Data

In order to test my hypotheses that argue that race had the most statistically significant impact on graduation rates in both 2010 and 2018, as compared to the effects of average family income (in the previous 12 months) and per pupil amounts for current spending of public elementary-secondary school systems, I set up a multiple regression model that included each of these variables.

$$\text{High School Graduation Rate} = B_0 + B_1\text{Race} + B_2\text{Income} + B_3\text{PerPupilSpending} + u_i$$

As a way to test my hypotheses on a nationwide scale, each state is used as a unit of observation for this test, with each state being utilized twice, once for the data for Black students and again for white students. Race is a dummy variable in this regression with “Black =1” and “white = 0.” That leads to there being 100 observations in this regression – enough to be able to make conclusions based on the presented regression results.

The data is primarily taken from the Census Bureau’s American Community Survey (ACS) Public Use Microdata Sample (PUMS) File. Through these data sets, I am able to calculate high school graduation rates for Black and white students in 2010 and 2018, and access average family income values, in the past 12 months, for both Black and white families for all fifty states. The data for per pupil amounts for current spending of public elementary-secondary school systems is taken from the Annual Survey of School System Finances. These data are constant regardless of whether the unit of observation is specifically for white students or Black students, as schools are not legally segregated, even though this may often occur in practice. For this reason, school quality may not end up being a significant variable as there is no variation across races, even though in reality schools that are primarily minority are often underfunded. However, I still wanted to include the data to see if there was any major significance reported.

Each new regression adds a variable to be held constant in order to test the hypotheses that race will have the largest effect on high school graduation rates, regardless of the fact that 2010 was the year immediately following the Great Recession and a time of significant economic recovery across the country.

Results

The data in both Table 1 and Table 2 show that race has a negative effect on graduation rate and is statistically significant at the 0.05 level in both the years 2010 and 2018, regardless of other variables held constant. The null hypothesis is that race has no effect on graduation rate ($\beta_1 = 0$), whereas I hypothesized the alternative that race would have a negative effect on graduation rate, i.e., $\beta_1 < 0$. The results show that in both years it is safe to reject the null hypotheses and conclude that there is a negative relationship between race and graduation rate. In 2010, the data produces a p-value of 0.00, which is less than the critical p-value of 0.05, and in 2018 the p-value is equal to 0.006, which is slightly greater than in 2010 but still less than the critical p-value. This means we can safely reject the null hypothesis.

Not only does the data tell us that there is some negative relationship between race and graduation rate in 2010 and 2018, but it also tells us more details regarding the difference in graduation rate between Black students and white students. According to the raw data, in 2010, the national average graduation rate for Black students was 91.4% and 94.4% for white students. For the 2010 data, $\beta_1 = -0.029$. Due to the fact that race is a dummy variable with Black = 1 and white = 0, we are able to interpret this coefficient value to say: on average, Black students in 2010 have a graduation rate that is 2.9% lower than white students. The raw data for 2018 shows the national average graduation rate for Black students was 92.4% and 94.0% for white students. For the 2018 data, $\beta_1 = -0.015$, which means that, on average, Black students in 2018 have a graduation rate that is 1.5% lower than white students. The data from this regression clearly shows that inequalities in educational attainment were worse for Black students in 2010, one of the harshest years following the Great Recession.

There is more data given by the regression results that signify that Black students were even less likely to graduate high school during the year immediately following the Great Recession. The 2010 R² data shows that 16.93% of the variation in graduation rate can be explained by the variation in race. In 2018, although significant, that variation is lower as only 7.4% of the variation in graduation rate can be explained by race.

Table 1: Determinants of the Graduation Rate in 2010				
	Grad Rate	Grad Rate	Grad Rate	Grad Rate
Race	-0.0293*** (0.000)		-0.0216** (0.027)	-0.0226** (0.027)
ln(income)		0.0334*** (0.000)	0.0132 (0.280)	0.0116 (0.381)
Spending				4.37e-07 (0.727)
# of Observations	100		100	100
R ²	0.1693	0.1288	0.1791	0.1801
In each column, the dependent variable is the high school graduation rate by state and race. P-values are shown in parentheses. ***-p<0.01, **-p<0.05				

However, those data outputs account only for race and does not control for any additional variables, so it cannot be taken as the most accurate way to understand the data. Economic factors are also important when considering what affects educational attainment levels. The data tells us that although income is statistically significant in both 2010 and 2018, it

is not an accurate measure as each state accounts for two separate observations – one with data from white families and one with data from black families – and black individuals often times do not receive equal compensation as their white counterpart. However, the next column over controls for the natural log of average family income (past 12 months) as well as race. It is necessary to make this analysis using the natural log of income, instead of just income, in order to account for the fact that income has a diminishing marginal utility. In 2010, when controlling for average family income over the past 12 months, the effects of race are not as substantial as when there were no control variables. The new coefficient tells us that, in 2010, Black students, on average, had a graduation rate that was 2.2% lower than white students. Although the effects of race are less in 2010 when income is held as a control variable, it is still substantial enough to be considered significant at the 0.05 level. However, this is where things are no longer consistent across both years.

In 2018, ten years after the end of the Great Recession, the average graduation rate of Black students was only 1.5% lower than white students as compared to 2.9% in 2010. This could safely be assumed that Black families, and thus Black students, felt the effects of the Great Recession more than white families, but in 2018 as both groups began to recover the margin also began to decrease. Each table, one for 2010 and one for 2018, controls for the natural log of income, allowing us to see whether the racial differences in education are purely a function of racial differences in income.

The data relative to the natural log of income confirms the hypothesis that race had the most statistically significant impact on graduation rates in both 2010 and 2018 as compared to

income and per pupil amounts for current spending of public elementary-secondary school systems.

Table 2: Determinants of the Graduation Rate in 2018				
	Grad Rate	Grad Rate	Grad Rate	Grad Rate
Race	-0.0152*** (0.006)		-0.0200*** (0.013)	-0.0279*** (0.001)
ln(income)		0.0103 (0.143)	-0.0083 (0.409)	-0.0219** (0.050)
Spending				2.05e-06* (0.010)
# of Observations	100	100	100	100
R ²	0.0740	0.0213	0.0803	0.1413
In each column, the dependent variable is the high school graduation rate by state and race. P-values are shown in parentheses. ***-p<0.01, **-p<0.05, *-p<0.1				

Average income only appears to be statistically significant, except when there are no additional controls (which is not an accurate measure), at the 5% level when controlling for both race and per pupil spending in 2018; however, income cannot be deemed a statistically significant factor at all in 2010 when race is included as a control, as income is not equitable across races. When accounting for race during times of economic crises, as was the case in 2010, income does play a partial role in the variation seen in graduation rates across races (as seen in the coefficients), but it cannot be deemed a statistically significant factor.

The same can be said in regard to per pupil amounts for current spending of public elementary-secondary school systems. It is not statistically significant until 2018, with all other variables (race and income) held constant. This data is important in understanding many things. My findings show that race is the most consistently statistically significant variable, especially in times of economic crisis. During times of normal economic growth there are many factors that help determine whether or not a student will graduate from high school: race, income, and school spending have all proven to be statistically significant at the 5% level. However, when a dire situation arises and there are fewer students graduating due to the economic severity of the crisis, this data proves that race is the most significant factor in determining whether or not a student will graduate from high school.

Although the p-values show that neither income nor per pupil spending were statistically significant during the year immediately following the Great Recession, the coefficients show that they did still play a role in determining graduation rates, even if not statistically significant. As seen across tables, the coefficient on $\ln(\text{income})$ decreased from 1.3% to 0.83% from 2010 to 2018 when controlling for race. This tells us that a larger percentage, yet still insignificant, of the variation in graduation rates can be explained by the variation in income during 2010 than it can in 2018. The same can be said for per pupil spending as there is a decrease in the coefficient values. This is not unexpected.

Conclusion

Previous research shows that both income and school quality have an effect on graduation rates. However, the data presented above shows that race still has the most statistically significant impact on graduation rates throughout the United States. The 2018 data

tells us that race does in fact play a more substantial role in high school graduation rates during times of economic growth and prosperity. This is seen as the 2010 data before income is considered has a coefficient of -0.0293 and it decreases to -0.0216 when income is held constant. In 2018, that number goes from a -0.0152 to -0.0348. This increase to -0.0348 tells us that in times of economic prosperity race is a more prominent factor in determining educational attainment levels even when income is held constant. Although these findings do show that my alternative hypothesis is true, I aimed at narrowing in specifically in times of economic hardship.

During 2010, a year of economic struggling and rebuilding as it immediately followed the Great Recession, race was the only variable that had a statistically significant impact on high school graduation rates. Although income can be used to explain some of the variation, the per pupil spending coefficients were so small they barely explained any of the differences in graduation rates between Black and white students. Regardless of the fact that income did explain some variation, it was not statistically significant and thus race is the only statistically significant factor when it comes to graduation rates in times of economic downturn.

There could be many reasons as to why race has a more significant impact on graduation rates than income and school spending during times of economic downturn. I speculate that it is because inequalities are still so present in all aspects of our society and thus Black Americans are already behind in terms of wages and living in affluent areas. This means that race would be the determining factor, not income or school quality, as there is a lack of fair treatment in all other aspects of society. Income and school quality are not fair measures because they are not equal indicators for all people in the United States. There is still a bias that

exists towards Black Americans. This, inherently, puts Black students behind their white counterparts when it comes to achieving high levels of education. The society of the United States still sets up Black Americans to be less successful, in economic terms, than their white counterparts. This inequality transfers over to the school systems and that is why race is the most statistically significant factor in determining high school graduation rates both in times of economic struggling and economic prosperity.

Resources

Balfanz, Robert. "Can the American High School Become an Avenue of Advancement for All?" *The Future of Children* 19, no. 1 (2009): 17-36.

Bloome, Deirdre and Bruce Western. "Cohort Change and Racial Differences in Educational and Income Mobility," *Social Forces* 90, no. 2 (2011): 375-395.

Caldwell, Leon D. and Kamau O. Siwatu. "Promoting Academic Persistence in African American and Latino High School Students: The Educational Navigation Skills Seminar," *The High School Journal* 87, no. 1 (2003): 30 – 38.

Goldsmith, Pat Rubio. "Schools or Neighborhoods or Both? Race and Ethnic Segregation and Educational Attainment," *Social Forces* 87, no. 4 (2009): 1913 – 1941.

Heckman, James J. and Paul A. LaFontaine. "The American High School Graduation Rate: Trends and Levels," *The Review of Economics and Statistics* 92, no. 2 (2010): 244 – 262.

Jackson, C. Kirabo, Cora Wigger, and Heyu Xiong. "The Costs of Cutting School Spending Lessons from the Great Recession," *Education Next* 20, no. 4 (2020): 64 – 71.

Kalil, Ariel. "Effects of the Great Recession on Child Development," *The Annals of the American Academy of Political and Social Science* 650, (2013): 232 – 249.

Kalleberg, Arne L. and Till M. von Wachter. "The U.S. Labor Market During and After the Great Recession: Continuities and Transformations," *The Russell Sage Foundation Journal of the Social Science* 3, no. 3 (2017): 1 – 19.

Mayer, Susan E. "How Economic Segregation Affects Children's Educational Attainment," *Social Forces* 81, no. 1 (2002): 153 – 176.

McDaniel, Anne, Thomas A. DiPrete, Claudia Buchmann, and Uri Shwed. "The Black Gender Gap in Educational Attainment: Historical Trends and Racial Comparisons," *Demography* 48, no. 3 (2011): 889 – 914.

Morgan, Stephen L. *On the Edge of Commitment: Educational Attainment and Race in the United States*. Palo Alto: Stanford University Press, 2005.

Storer, Heather L., Joseph A. Minko, Yu-Ling Chang, Ji Young Kang, Christina Miyawaki, and Katie Schultz. "Moving Beyond Dichotomies: How the Intersection of Race, Class, and Place Impacts High School Graduation Rates for African American Students," *Journal of Sociology and Social Welfare* 39, no. 1 (2012): 17 – 44.

Yeskel, Felice. "Coming to Class: Looking at Education through the Lens of Class: Introduction to the Class and Education Special Issues," *Equity & Excellence in Education* 41, no. 1 (2008): 1 –