

The Perils of Privilege: Manufacturing Wages, Educational Attainment, and the Populist Response to Industrial Decline*

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We explore an under-examined source of the populist backlash to globalization: discriminatory hiring practices in the manufacturing sector during the middle of the 20th Century. Consistent with the theory of dual labor markets and the efficiency-wage hypothesis, a sizeable manufacturing wage premium existed in the second half of the twentieth century. We conjecture that rationing of jobs in the manufacturing sector was done on the basis of race, gender, and national origin in a way that favored white males. If this was the case, then white males ought to have had a smaller college wage premium than other groups and, therefore, would have had reasons to invest less in their own human capital development than members of other groups. Consequently, white males were relatively ill-equipped to respond when import competition and automation led to a decline in the demand for industrial workers. Consequently, less-educated white males found nationalist, sexist, racist, xenophobic, and protectionist explanations for their having been “left-behind” compelling. As a result, they were more likely to vote for candidates emphasizing such narratives. We use both individual and aggregate data at the state, county, and commuting-zone levels to examine occupational, educational, attitudinal, and electoral trends to evaluate a number of hypothesis derived from our argument.

Keywords: Globalization, Backlash, Industrial Decline, Educational Attainment, Wages

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Introduction

The American political economy has experienced tectonic shifts in the last few decades. Unlike populations in other advanced industrial countries, mortality rates for non-Hispanic Whites in the US stopped declining in the late 1990s. There has been an epidemic of mortality related to drugs, alcohol, and suicide since the late 1990s (Case and Deaton, 2020) and these “deaths of despair” are concentrated among white men without college degrees. There has also been a large increase in income inequality in the United States. At the same time, electoral support for the Democratic party has been steadily declining among low income/union voters since the 1970’s - especially in the South (Teixeira and Abramowitz, 2008). White working class males appear to be increasingly responsive to xenophobic, racist, and sexist narratives offered by radio and internet pundits and extremist candidates.

What has caused these deaths of despair? Why did working class white males leave the Democratic Party in droves and why did it happen when it did? Why are explicitly racist, xenophobic, and sexist appeals, once considered to be beyond agreed upon standards of decency, now common place in American politics? And what, if anything, does this all have to do with inequality?

Our answer is that all of these developments can be traced, in part, to a single phenomenon, which when combined with declining employment in manufacturing, constitute an under appreciated source of right wing populism in the United States: discriminatory hiring policies in the middle of the last century.

Our argument is straightforward, and it begins with an observation: there was a sizeable wage premium in the United States beginning in the middle of the twentieth century.(Broz, Frieden and Weymouth, 2021) This rise in manufacturing wages was sustained, in part, by hiring practices that restricted access for women, people of color, and immigrants to high wage jobs that did not require a college education. As a result of privileged access

to high paying jobs that required little education, white men, had a lower college wage premium than white women and both men and women of color. When, decades later, declines in manufacturing jobs due to import competition, automation, and off-shoring led to stagnating wages and high levels of unemployment for workers without a college education, there was a set of voters ready to be mobilized in support of right-wing populist appeals.

What explains the manufacturing wage premium?

Across the political spectrum, politicians and pundits have waxed nostalgic for the post-war period when a single income could provide a family with a “middle class” life-style. While it is not clear how the “middle class life style” of the 1950s compares with today’s level of consumer comfort, there is widespread belief that a working class salary went further back then. There is less consensus about why that was the case: was it shared largess of American geopolitical hegemony? newly found union bargaining strength? the decline of international capital mobility dating from the inter-war period? Advances in skill-replacing technology in the first half of century? cultural restrictions on female workforce participation?

We believe that all of the above may have been at work in leading to a general rise in living standards for the working class, but none of these is precise enough to explain the rise in the wage premium for workers in the manufacturing sector. The standard argument offered by economists has been referred to as the “dual-labor market” or “efficiency-wage hypothesis”.

According to [Doeringer and Piore \(1971\)](#) the American labor market is comprised of a primary sector where jobs offered high wages, job security, and ladders for internal promotion. Because jobs in the secondary sector possess none of these characteristics, workers in the latter envy those in the former. Since attempts to demonstrate differences in human capital between workers in these sectors were unsuccessful, the existence of these differences were considered puzzling in light of theories of labor market competition. Similarly, there is

considerable evidence about the persistence of discriminatory labor market practices that, at first blush, should be expected to be eliminated by competitive practices (Arrow, 1973)

The efficiency-wage hypothesis has been offered as a solution to both of these puzzles. Shapiro and Stiglitz (1984) argued that employers who find it costly to monitor workers will pay wages that are “above the going rate” to primary sector workers that are identical (with respect to productivity) to secondary sector workers in order to deter shirking. Yellen (1984) argued that the efficiency-wage hypothesis explains discrimination among workers with different observable characteristics (such as race and gender). Since identical workers (from the standpoint of productivity) exist in both the primary and secondary labor pools, “the employer can indulge his taste for discrimination at zero cost” (p.201).

Bulow and Summers (1986) argue, however, that Yellen’s claim is incorrect because if the workers were identical in every relevant way, employers without a taste for discrimination could offer members of discriminated groups wages that are lower than the efficiency-wage for favored group members, but high enough to deter shirking (i.e. sufficiently higher than what they would earn in the secondary sector). Thus, competitive pressures would either drive bigoted employers out of the market or induce them to act in a way contrary to their prejudices: either way competition drives out discriminatory practices, even in an economy with a dual labor market. Instead, Bulow and Summers explain the persistence of discrimination by pointing out that the primary sector wages sufficient to deter shirking is increasing in the worker’s “separation” or “turnover rate” (in this case, the probability that they would leave a primary sector job to either leave the workforce or take a job in the secondary sector) and there is evidence that members of groups that are discriminated against in the labor market have higher separation rates (Poterba and Summers, 1986; Marston, Feldstein and Hymans, 1976). Consequently, if the goal is to deter shirking, members of such groups would be the most costly to employ in primary sector jobs and will, in the absence of policy interventions aimed at changing the relative cost of hiring them, be relegated to

secondary sector jobs.¹

Was there Racial and Gender Discrimination in Hiring for High Paying Jobs?

As we have seen, the efficiency wage approach is the standard explanation for why firms might pay non-competitive wages and how wage inequalities could persist. It is even possible to explain why these wages “above the going rate” might be used to discriminate between employees of different groups - members of those groups may have high separation rates, requiring higher salaries to deter shirking. We are somewhat catholic as to whether the modified efficiency wage logic or more explicit racism on the part of imperfectly monitored hiring agents explains widespread discriminatory behavior. What is important for our argument is whether such behavior took place and whether it was extensive and intensive enough to shrink the college wage premium for white workers enough to lead them to substitute out of higher education and into blue-collar jobs.

Whatever its cause, there is plenty of evidence of discrimination against women and persons of color in hiring practices in the post-war period. It is more explicit in some places, sectors, and times than others, but there is little question that such discrimination was widespread after the war and that it was only with the Civil Rights Act of 1964 that the Federal Government became involved in any consistent manner in limiting such offences.

It is useful to begin with the period before widespread unionization as a historical

¹Note, by the way, that this doesn't really solve the problem. Employers are still acting inefficiently. While there may be between group differences in separation rates, there is likely to be within group variance as well. If employers could know, with certainty, the separation rate of individual workers, they could offer each individual the wage that would deter them, in particular, from shirking. It is at least logically possible that some members of high separation rate groups have individual separation rates that are below the average separation rate of the low separation groups. In which case employers passed up the opportunity to hire a lower cost non-shirking employee. Similarly, there may be some high separation rate individuals in the low separation rate groups who, in fact, will shirk despite being paid the group wide efficiency wage. From a moral standpoint, there is not much difference between assuming that members of some groups will have low human capital and assuming that they have a high separation rate. In either case, the failure to treat the individual as an individual runs the risk of their getting a wage that is not consistent with their opportunity cost

baseline.² In the nineteenth century the labor market was segmented along the lines of race and national origin. Native born whites occupied the top of the labor hierarchy. Prior to emancipation the vast majority of blacks lived in the south as slaves - working mostly in agriculture but also “in coal mines, blast furnaces, rolling mills, and a fleet of canal boats” - particularly when free white labor became scarce during the Civil War (Nelson, 2001, p.160). After emancipation black men overwhelmingly worked in agriculture as share croppers or landless laborers while black women were predominantly employed as domestic servants. While the wages and working conditions improved during the Reconstruction period, the legalized segregation of Jim Crow reversed many of these gains.

Since the second quarter of the 19th century, waves of European immigrants fought to get a foothold in the maritime trades, mining, railroads, pig iron, and other manufacturing positions. Chain migration led to geographic concentrations of immigrant groups with recent immigrants attempting to overcome the discriminatory hiring, apprenticeship, promotion and retention practices foremen and other gatekeepers used to favor fellow countrymen. From the beginning, immigrants compared themselves with, and were compared to native born blacks. Irish immigrants were depicted as black or referred to as “black on the inside” and struggled for decades to be seen as “white” like the English and Germans immigrants that preceded them (Roediger, 1999; Nelson, 2001). The Irish were followed by southern and eastern European immigrants who also struggled to be seen as “real” (that is to say “white”) Americans. By the first few decades of the 20th century, the Great Migration had led to substantial black populations in Northern and Western cities, where they could earn substantially more than in the South. While segregation was legal in the South, *de facto* segregation was the norm outside of the South and extended into the work place.

Before the widespread adoption of unions, labor markets were deeply stratified. Nelson (2001), for example, characterizes the steel industry as being divided between “English

²Our discussion of this period leans heavily on Nelson’s (2001) discussion of the steel industry (chapter 4)

speakers” (German, Irish, English, Scots, and Welsh) in skilled positions, “Hunkies” (a term of derision referring to immigrants from the Austro-Hungarian Empire but applied to wide array of Southern and Eastern European immigrants) in most semi-skilled positions, while black migrants were restricted to unskilled positions.

The evidence of widespread discrimination that suppressed the wages and limited the career paths of black workers in the pre-union era is unambiguous. The question is, did the rise in the strength and density of labor unions alter this situation?

Katznelson (2005) and Frymer (2011) argue that race shaped the American labor movement since before the creation of the Wagner Act (The National Labor Relations Act of 1935). There is evidence that agricultural and domestic workers were included in the original version of the bill (which granted workers the right to organize, bargain collectively, and strike), but were dropped by the time the bill was considered by the legislature where segregationist southerners made up a sizeable share of the Democratic majority and dominated the leadership of committees in both the House and the Senate. And though the Wagner Act granted new access to unionized jobs, civil rights leaders viewed other aspects of the Act as harmful to African Americans (Frymer, 2011, p.28). Of particular concern was “the potential impact of Section 9 which empowered unions to create closed shops and be the exclusive bargaining agents based on a determination by the majority of workers in a company. Consequently, the NAACP complained that unions were using the Act to ‘organize a union for all the white workers, and to either agree with the employers to push Negroes out of the industry or, having effected an agreement with the employer, to proceed to make a union lily-white.’”³

At the behest of segregationist members of congress, the Wagner Act made segregation in the union movement legal but the interplay of labor market dynamics on the one hand and conflicts between the interests of union leadership and the white majority of rank and

³The NAACP quote is from Raymond Wolters *Negroes and the Great Depression: The Problem of Economic Recovery*(Westport:Conn: Greenwood,1970) page 179).

file members produced a complex combination of levels of discrimination that varied by occupation and region and by the extent to which discrimination was *de jure* or *de facto*. An explanation of these differences in discrimination is beyond the scope of this paper, but we register our agreement with Ashenfelter (2015, p.93) that the answer is not likely to be found in the extent of prejudice among white rank and file members alone. Rather, if such variation exists and is of explanatory import, it is certainly filtered through situational factors like local demographics, skill differentials, and, perhaps most important, employer hiring practices (Ashenfelter, 1972). Ashenfelter argues, for example, that the effect of high levels of racial animosity in the populace will depend on demographics before unions are formed. Where blacks make up a relative small share of the local workforce, high levels of animosity will produce racially segregated unions, but where blacks make up a large share of the workforce, high levels of animosity may deter the formation of unions in the first place. In contrast, where blacks made up a large share of the workforce and racial animosity is more muted, the result was likely to be integrated unions. This argument seems consistent with many stylized facts including the relatively low rates of unionization in the south, differences in levels of discrimination between bricklayers, plasterers, and cement finishers on the one hand, and plumbers, pipe-fitters, and electrical workers on the other (Ashenfelter 2015 p. 95).

Ashenfelter also argues that the demographic mix could also explain the relatively egalitarian policies of industrial unions, though the difference in the racial policies of industrial unions (typically associated with the American Federation of Labor) and craft unions (associated with the Congress of Industrial Organizations) is typically explained by differences in hiring practices. Industrial unions were “forced to organize workers hired by the employer, while craft unions determine in many cases whom” the employer hires (Marshall, 1972, p.378). Union officials in craft unions could influence access to employment through the “hiring hall” and the “shape-up” (Larowe, 1955). In both cases, employers told the union, often on a daily basis, how many workers were needed and for which positions. Union

officials then selected from workers who had indicated their availability. Because the number of workers available typically exceeded the quantity requested by the employer, union officials determined who worked and where. Regardless of the degree of commitment to racial equality on the part of union leadership, limits on monitoring meant that (racially determined) network connections and the ability to pay kickbacks played an important role in determining who had access to work.

While craft unions used their ability to control referrals as the main instrument of discrimination, occupational or divisional seniority rules were the main mechanism of discrimination in industrial unions. First, black men tended to be hired into dangerous, low skill, and physically demanding positions while white skilled positions were reserved for white men. When they were hired at all, white women were often were hired into semi-skilled positions (black women were all but excluded from industrial jobs). Then promotion ladders and seniority rules that required workers to give up their seniority (and risk being the first laid off in a downturn) if they were able to succeed in being transferred to more desirable departments. (Nelson, 2001; Boyle, 1997) And while industrial unions under the CIO made vocal commitments to racial equality, the discriminatory practices just mentioned were often “codified in collective bargaining contracts....(so that) ...in some mass production industries, the job mobility of black workers became even more limited after union organization. (Hill, 2015, p.122). Indeed, according the former NAACP Labor Director Herbert Hill:

By the late 1940's the majority of labor unions affiliated with the American Federation of Labor had settled into a policy of racial exclusion or segregation. In various industries, organized labor established segregated locals or all-black auxiliary units, excluded black workers from certain job classification, and created separate racial seniority and promotional lines in union contractes. And finally, in many crafts they refused to organize black labor. (2015, p. 119)

Marshall (1963) argues that while there was a secular decline in the number unions

with formal racial restrictions since 1930, “because of local variations from official policies”, it did not follow that “discrimination declined by the same degree.” (p. 376)⁴

Among the drivers of these “local variations from official policies” was the fact that while *de jure* segregation in unions was declining in the post-war period, the embrace by union leadership of racial equality and the landmark Supreme Court ruling in *Brown v. The Board of Education* in 1954 engendered a backlash in many working class communities as rank and file white workers feared that “civil rights” would mean the end of the advantages they had procured for themselves. For example, when, in 1953, the Chicago Housing Authority moved several black families into the Trumbull Park Homes in an area previously dominated by Eastern European immigrants, the result was “recurring waves of violent protest (that) lasted for a decade. Black tenants were compelled to barricade themselves in their apartments, as mobs gathered night to hurl bricks, stones, and fireworks through their windows” (Nelson, 2001, p.231). Similarly, in the Polish dominated city of Hamtramck, Michigan (which is completely surrounded by Detroit), black workers at the Dodge Main plant “were intimidated or assaulted until they quit, or whites laid down their tools until company officials removed the black workers from semiskilled departments.” (Boyle, 1997 p.504).

The unskilled laborers that toiled in the divisions where black workers could procure jobs were also the most likely to be replaced by mechanization. And when those jobs were mechanized, whites frequently swept in to claim the small number of less arduous, high-paying jobs that remained. “Veteran black workers recalled,” according to Nelson, “that there had been approximately sixty-five Negroes employed in Bethlehem’s Wheel Plant in 1925. Over the years, however, the jobs they held were mechanized, with the result that where scores of Negroes used to work only five remained by the mid-1950s, and all of them were above the age of fifty.” Nelson quotes Ben Cashaw, an NAACP active and long-time veteran of Bethlehem Steel as saying “there are generations of Negroes born within the

⁴The number of segregated unions declined from a high of 22 in 1930 to 9 in 1949 to just a few after the AFL-CIO merger in 1955 to zero as of 1963 (Marshall, 1972, p.375)

shadow of these Mills and educated in the Johnstown Schools [who will] never have an opportunity to work at the jobs where their fathers have been worn out.”(Nelson, 2001, p.229). While the only jobs traditionally made available to black workers were drying up, migration from the South continued and the result was skyrocketing black employment in the 25 to 44 age brackets where unemployment rates were about three times as high as they were for white men. (Nelson, 2001, p.230).

Orley Ashenfelter (1972, 2015) used a survey from 1967 to estimate the effect of unionism on the black-white wage differential. He found that unions raised the black-white wage differential among males in industrial unions, but decreased it in craft unions.⁵ With respect to sex differentials, unionism “reduced the ratio of white female wages by 1.9 percent and...the ratio of black female wages to white males wages by 2.8 percent.” So unionism increased, rather than decreased, the wage advantages white men enjoyed compared to white and, especially, black women. Overall, “the combined effect of unions on the wages of males and females implies that the ratio of black to white wages of all workers might have been 1.7 percent higher in 1967 than it would have been in the absence of all unionism” (p.109)⁶ Thus, Ashenfelter concludes that the findings in his paper suggest,

that the presence of trade unionism is not a major factor affecting wage differentials between black and white workers or between male and female workers. For example, the hourly wage of black male workers was a little greater than 70 percent of the hourly wage of white male workers in 1967. Thus, the male black/white wage ratio would have to be increased by roughly 45% to bring black

⁵Note that the fact that black workers were kept in unskilled low wage jobs, ironically, maybe one reason why unions raised black wages more than white wages. Unions tend to compress wages differences between skilled and unskilled workers across, as a result, the gap between union wages and non-union wages would have a tendency to be larger at the bottom of the pay scale where most black workers were kept. Thus, the (admittedly small) reduction in the gap between white and black wages associated with industrial unions may be a reflection of discriminatory practices rather than a sign of any mitigating effects unions may have had.

⁶Note that this survey is particularly relevant for our argument because it is from precisely the time when the 1950 age cohort we discuss below would be making decisions that would influence their ability to attend college after high school.

and white wages into equality. According to our results above, the presence of unionism may have increased the male black/white wage ratio by as much as 4 percent, which is less than one-tenth the change that would be required for complete equality” (Ashenfelter, 2015, p.110).

In other words, unions may have - at the margins - reduced wage differences between white and black workers, but this effect amounted to a tiny share of the large wage differences between them. Ashenfelter notes that while his results support the widespread belief that craft unions are more discriminatory than industrial unions, “it is important to stress that none of our findings implies that most, or indeed any, American trade unions do not discriminate against black workers” (p.109) In fact, in his comment on Ashenfelter’s paper at a 1971 conference at Princeton University, Herbert Hill argues that findings from the Equal Employment Opportunity Commission and court decisions “reveal that the policies of craft unions which exclude black and or industrial unions which discriminate after membership has been granted to black workers constitute a difference of form rather than of substance.” (Hill, 2015, p.119).

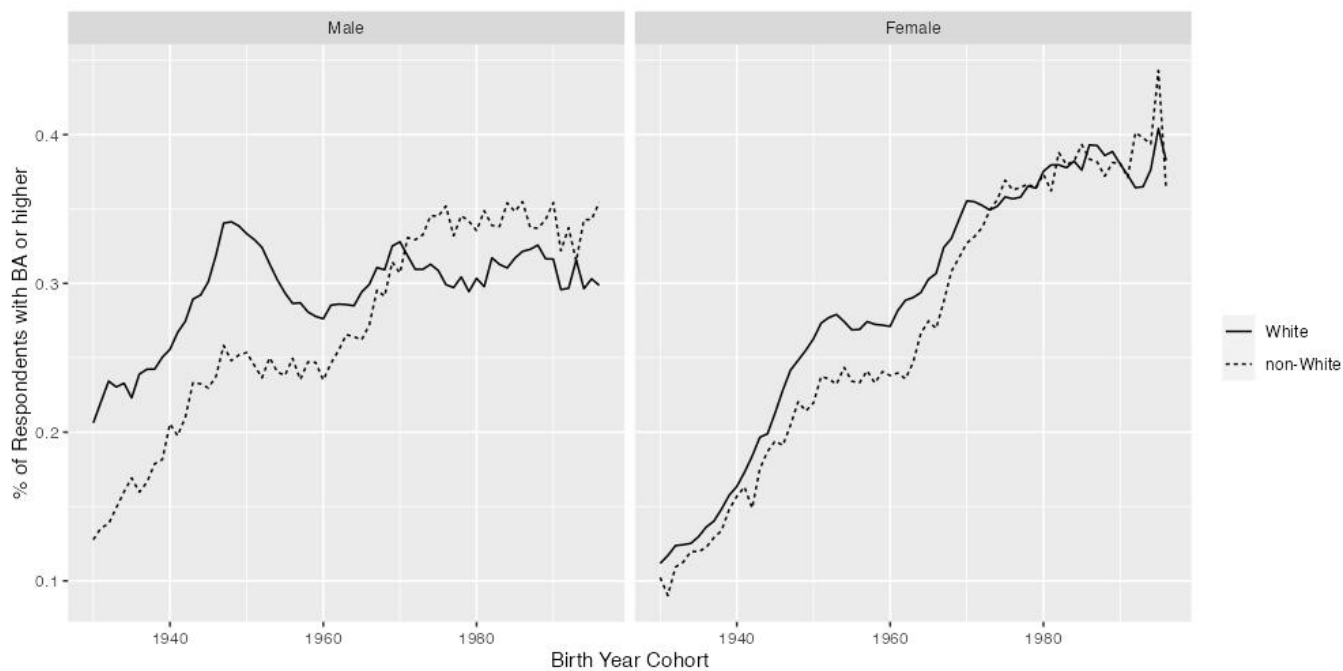
In sum, while there is evidence that racial discrimination was certainly more explicit and probably more consequential in craft unions than in the industrial unions that organized most workers in the manufacturing sector, there is ample evidence that white men had privileged access to semi-skilled and skilled manufacturing jobs that were, by the middle of the 20th century, largely unavailable to white women and almost completely unavailable to either black men or black women. Further, there is little evidence that the civil rights movements of the 1950’s and 60’s did very much to remove the advantages that white workers enjoyed. In the next section, we will examine evidence for the hypothesized effect these discriminatory practices had on education decisions.

Preliminary Evidence

The Effect of Manufacturing Wages on Educational Attainment

Goldin and Katz (2008) show that there was a secular rise in college graduate rates for successive birth cohorts until 1950 at which point male cohorts experienced a steep decline in graduates which were not recovered from until the 1970 birth cohort. The graduation rates of female cohorts stalled in 1950 before continuing their rise again with cohorts born around 1960. In Figure 1 we use information from the Current Population Survey to show see that the decline in male graduation rates beginning with the 1950 cohort identified by Goldin and Katz was entirely a white male phenomenon: the increase in graduation rates among white females, and both male and female non-white males paused until the mid-sixties at which point all three groups continued to rise. By the 1970 birth cohort all three groups had graduation rates higher than white males⁷.

Figure 1: College Graduate Rates by Cohort, Race, and Gender



⁷The effect of this increased competition on white males with college degrees will be examined in future work

The relative decline in white male graduation rates is consistent with our story, but to determine whether differential access to high paying manufacturing jobs, and therefore, a lower college wage premium for white men, is behind this relative decline we adopt an approach Goldin and Katz (2008) used to demonstrate that in the early 20th century where manufacturing wages were high and manufacturing jobs were sufficiently abundant, the opportunity cost of education was high enough to deter some from pursuing secondary education.

By the second half of the twentieth century, however, secondary education was common place and the American economy had changed so that productivity gains exhibited a pronounced “skill bias” Acemoglu (2002). We, therefore, believe that the rising manufacturing wage premium would reduce the college wage premium and lead to a reduction in college, rather than the high school, graduation rates. As a result, we replicate Goldin and Katz’ analysis (table 6.1 in 2008) using data from the second half of the 20th century, but using the college, rather than high school, graduate rate as the dependent variable.

Table 1 reports our results. Like Goldin and Katz we regress graduation rates on the share of employment in manufacturing, the manufacturing wage, and their interaction and control for income at the country and state levels and include regional dummy variables.

Note that in column (1) the coefficient on *Manufacturing Wage* is positive and statistically significant, indicating that where manufacturing jobs are scarce, educational attainment is actually positively correlated with manufacturing wages. Note, however, that the coefficient on the interaction terms is negative and more than twice the magnitude of the coefficient on manufacturing wages. Consequently, the effect of manufacturing wages would be negative if manufacturing jobs were sufficiently abundant. Figure 2 shows that this happens where manufacturing makes up about 40% of a county’s employment, though none of the negative coefficients are statistically significant.

Like Goldin and Katz, the sign and significance of the coefficients on the manufactur-

Table 1: Relationship between County-level Graduation Rates and Manufacturing Wages

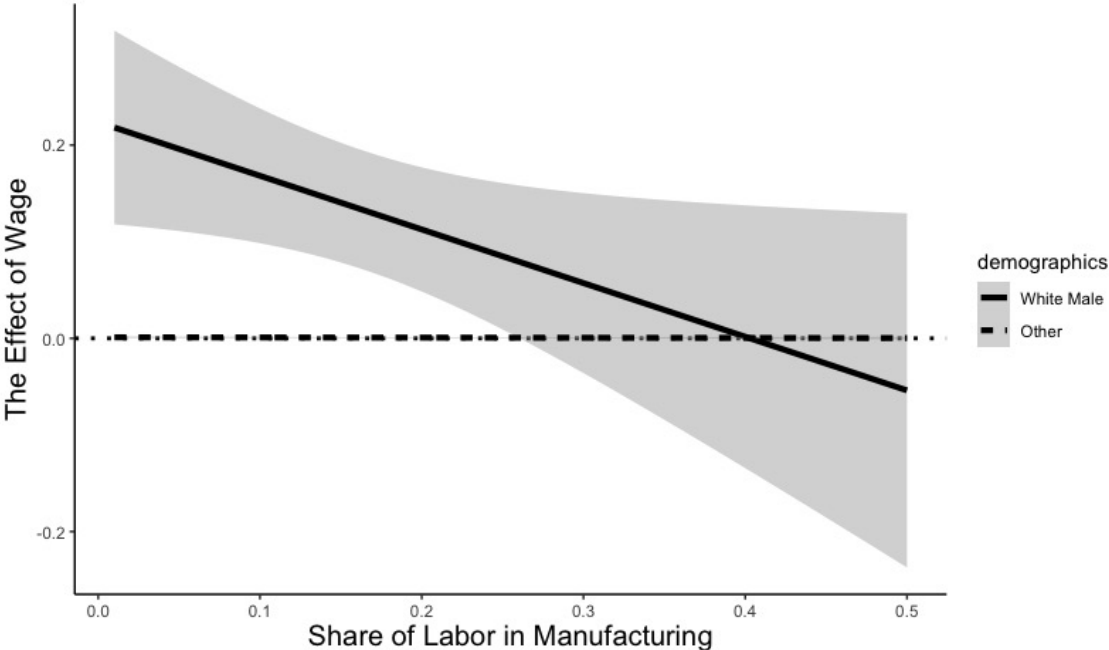
	County-level Graduation Rate (BA)			
	White Male ('12)	Other ('12)	White Male ('16)	Other ('16)
	(1)	(2)	(3)	(4)
% Employed in Mftg.	-13.069 (13.505)	-0.097 (0.112)	-25.588* (13.845)	-0.241** (0.119)
Mftg. Wage (thousands)	0.224*** (0.041)	0.001*** (0.0003)	0.142*** (0.036)	0.001* (0.0003)
% Emp. x Mftg Wage (thousands)	-0.555** (0.253)	-0.002 (0.002)	-0.260 (0.245)	0.001 (0.002)
Avg. Cty. Income (in thousands)	0.502*** (0.034)	0.005*** (0.0003)	0.526*** (0.031)	0.005*** (0.0003)
South	0.068 (0.642)	-0.022*** (0.005)	0.781 (0.634)	-0.016*** (0.005)
New England	-2.119 (1.452)	0.021* (0.012)	-1.873 (1.429)	0.025** (0.012)
Middle Atlantic	-3.578*** (0.944)	-0.017** (0.008)	-3.101*** (0.929)	-0.014* (0.008)
County GDP	0.00000*** (0.000)	-0.000** (0.000)	0.00000*** (0.000)	-0.000*** (0.000)
Constant	2.726 (2.145)	0.030* (0.018)	4.208** (2.006)	0.054*** (0.017)
Observations	794	794	797	797
Adjusted R ²	0.555	0.489	0.588	0.516

Note:

*p<0.1; **p<0.05; ***p<0.01

ing and interaction variables are consistent with the opportunity cost argument, but their relative magnitudes do not produce the negative association between manufacturing wages and graduation rates as we hypothesized. As we predicted, however, there is evidence that white men respond differently to rising manufacturing wages than others. Figure 2 shows that the estimated effect of manufacturing on the graduation rates of people other than white males is close to zero regardless of the share employed in manufacturing (based on Model 2 of Table 1).

Figure 2: The Estimated Effect of Rising Manufacturing Wages on College Graduate Rates



We also examined the relationship between educational attainment and manufacturing wages at the individual level. Our hypothesis is that an increase in manufacturing wages ought to induce workers to substitute out of college if manufacturing jobs are locally abundant and the individual is not excluded from employment on the basis of race or gender. Thus, we would want to see if the effect of wages on degree attainment is conditioned by the local availability of jobs and membership in the privileged group. To that end, we estimated a Linear Probability Model where the dependent variable equals one if the individual received

a bachelor's degree:

$$prob(College) = \beta_0 + \beta_1 w + \beta_2 s + \beta_3 p + \beta_4 ws + \beta_5 wp + \beta_6 sp + \beta_7 wsp + \dots \epsilon$$

where w is the country manufacturing wage, s is the share of the country work force in employed in manufacturing, and p indicates whether the Current Population Survey respondent is a member of the group hypothesized to have privileged access to manufacturing jobs. The effect of wages on the probability of attaining a college degree, then, is:

$$\frac{\partial prob(College)}{\partial w} = \beta_1 + \beta_4 s + \beta_5 p + \beta_7 sp$$

,

and if this is negative it would suggest that education is a substitute for manufacturing wages. We argue that because high wage manufacturing jobs are rationed to white males, women and non-white males do not have the option of substituting out of education and into high wage employment. The relationship between wages and educational attainment will, therefore be different for white males than others.

Note that the effect of wages on white male behavior is

$$\frac{\partial prob(College)}{\partial w | (p = 0)} = [\beta_1 + \beta_5] + (\beta_4 + \beta_7)s \tag{1}$$

while the estimated effect on all other is:

$$\frac{\partial prob(College)}{\partial w | (p = 1)} = \beta_1 + \beta_4 s. \tag{2}$$

Our expectation is that privileged access to high paying manufacturing jobs means

that the educational decisions of white males ought to be more responsive to the wage rate than the decisions of others. Also, white males' responsiveness to the wage rate ought to be strongest when manufacturing makes up a larger share of the local economy.

Consequently,

1. the line described (1) ought to be less than zero when s is sufficiently large.
2. the line described (1) ought to slope downward ($\beta_4 + \beta_7 < 0$)
3. the line described by (2) ought to be greater than the former ($\beta_5 + \beta_7 < 0$)

Table 2 reports both linear probability and logistic regression results for a model a model similar to the one just described but also including controls for respondent Age, Region, and their county's average personal income and taxable income (not reported).

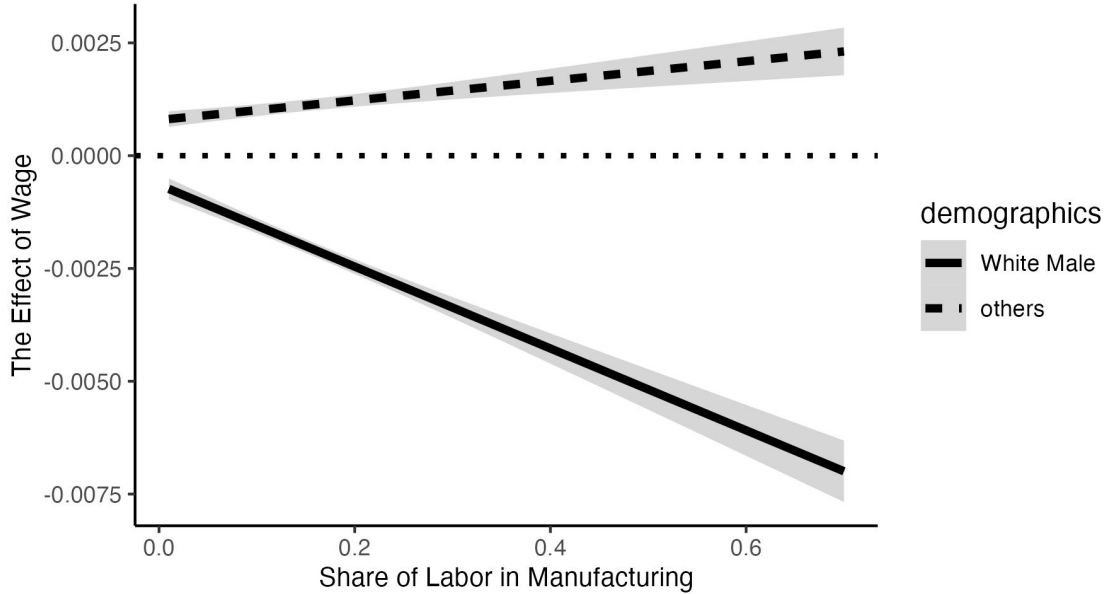
Table 2: Relationship between Respondent Graduation Status and Manufacturing Wages

	<i>Dependent variable:</i>	
	Bachelor's degree (binary)	
	LPM	Logistic
	(1)	(2)
Mftg Wage	0.001*** (0.0001)	0.003*** (0.0004)
Size of Mftg	-0.038*** (0.011)	-0.241*** (0.054)
White Male	0.055*** (0.004)	0.214*** (0.020)
Mftg Wage x Size of Mftg	0.002*** (0.0005)	0.014*** (0.002)
Mftg Wage x White Male	-0.001*** (0.0001)	-0.006*** (0.001)
Size of Mftg x White Male	0.090*** (0.017)	0.430*** (0.087)
Mftg Wage x Size of Mftg x White Male	-0.011*** (0.001)	-0.057*** (0.004)
Constant	0.180*** (0.004)	-1.488*** (0.021)
Observations	946,333	946,333
Adjusted R ²	0.092	
Akaike Inf. Crit.		1,094,206.000
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

We will, for the moment, focus on the linear probability model (column 1). Note that consistent with our second implication $\beta_4 + \beta_7 = -.009 < 0$ (and a Wald test shows that this is statistically significant). Similarly, consistent with implication three, $\beta_5 + \beta_7 = -.012 < 0$ (also statistically significant). Evidence for implication 1 is most clearly seen in a picture. Figure 3 plots the estimated effect of an increase in the manufacturing wage on the propensity for the respondent to report having a Bachelor's degree for both White Males and Others. As implication 1 predicts, the line describing the link between real wages and the propensity to receive a bachelor's degrees for white males is negative - in fact it is negative for observed values of manufacturing's share of local employment. As predicted by implication 3, the line for "others" is above the line for white males.

As expected, an increase in manufacturing wages reduces the propensity of white males to earn a Bachelors degree and this effect gets bigger the more the county's employment depends on manufacturing. In sharp contrast, an increase in the average manufacturing wage does not seem to raise the opportunity cost of education for individuals who are not white males. In fact, an increase in the manufacturing wage makes individuals who are not white males *more* likely to obtain a Bachelor's degree. This differential response to an increase in manufacturing wages is particularly pronounced in county's where employment is dominated by manufacturing. The local abundance of manufacturing employment enhances the sensitivity of both members of the privileged group and those who we expect to be excluded from access to high paying manufacturing jobs - but the direction of this sensitivity differs. Local abundance of manufacturing jobs leads white males to be more likely to substitute employment for education (the white male line slopes upward - that is, $\beta_4 + \beta_5$ is negative and statistically significant) and it causes others to substitute education for employment (β_4 is positive and significant). We did not anticipate this later result, but it makes sense. If individuals see the wages of jobs they are excluded from go up, it will encourage them to look for alternatives. This is particularly likely to be true if the jobs they are excluded from make up a large share of the local labor marker.

Figure 3: The Estimated Effect of Rising Manufacturing Wages on Propensity to Earn a Bachelor's Degree



In sum, the evidence suggest that an increase in manufacturing wages raises the opportunity cost of a college education, but only for white males. This is consistent with our argument that individuals who are not white males did not have an equal opportunity to earn high wages in the manufacturing sector.

The Effect of Manufacturing Employment Losses on The Vote For Trump

At the start of this paper we argued that the fact that white males had privileged access to high paying jobs in the middle of the last century would have led them, rationally, to invest less in their own human capital development than individuals without that privilege. In effect, we are arguing that the existence of widespread racial prejudice in hiring practices in the last century perturbed the informational signals individuals received about the relative returns on educational investments. When subsequent changes to the economy occurred it left those who invested less in education in difficult positions. We have provided

some suggestive evidence that it did lead them to be less likely to earn a college degree. But we also argued that, coupled with a decline in the demand for relatively low-skilled manufacturing jobs, the reduced propensity for white men to go to college would have wide ranging effects for themselves, and for society. We believe these consequences included declining life expectancy, increased drug and alcohol addiction, suicide, (Case and Deaton, 2020) an increased propensity identify with white nationalist identity (Jardina, 2019) and the propensity to vote for right-wing populist political candidates.

Much work remains to fully evaluate our argument, but in the current context we will attempt to gauge the consequences of (at least when viewed with the benefit of hindsight) under-investment in education on the propensity to vote for Donald Trump in the 2016 presidential election. To do so, we merged data from the Cooperative Congressional Election Study with David Autor’s (2013) data on decadal declines in manufacturing employment to evaluate the way educational attainment modifies the effect of economic change on vote choice (Autor, Dorn and Hanson, 2013*b*).

Specifically, we regressed respondents’ declared vote for Trump on decadal declines in manufacturing employment (Autor’s ΔL inverted so that it reflects declines in employment in the manufacturing sector) conditioned by educational attainment. We control for respondent age and ideology and their county’s average personal income.

We conducted two sets of tests in order to try to determine whether the effects of educational attainment are egocentric or sociotropic. We included job losses from all three decades because we are somewhat catholic with respect to the question of whether only relatively recent job losses matter, whether historical losses are also important, or whether it is the cumulative losses that have mounted over decades that matter.

Column 1 in Table 3 shows that recent manufacturing job losses (2000 to 2007) are associated with an increased propensity to report having voted for Donald Trump in 2016. There is a much smaller positive effect from job losses in the 1980s. In contrast,

Table 3: The Effect of Manufacturing Decline on the Vote for Trump, conditioned by Education

	<i>Dependent variable:</i>		
	Vote for Trump		
	(1)	(2)	(3)
Job Loss ('80s)	0.087* (0.048)	0.013 (0.059)	-1.274*** (0.185)
Job Loss ('90s)	-0.446*** (0.062)	-0.609*** (0.077)	-1.812*** (0.239)
Job Loss ('00s)	0.422*** (0.054)	0.478*** (0.066)	2.020*** (0.187)
BA		-0.045*** (0.004)	
Pct BA ('10)			-0.172*** (0.025)
Job Loss ('80s) x BA		0.187* (0.098)	
Job Loss ('90s) x BA		0.514*** (0.131)	
Job Loss ('00s) x BA		-0.224** (0.112)	
Job Loss ('80s) x Pct BA ('10)			4.726*** (0.608)
Job Loss ('90s) x Pct BA ('10)			5.406*** (0.822)
Job Loss ('00s) x Pct BA ('10)			-6.082*** (0.671)
Constant	0.075*** (0.004)	0.088*** (0.005)	0.084*** (0.007)
Observations	180,072	180,072	153,824
Adjusted R ²	0.376	0.378	0.375

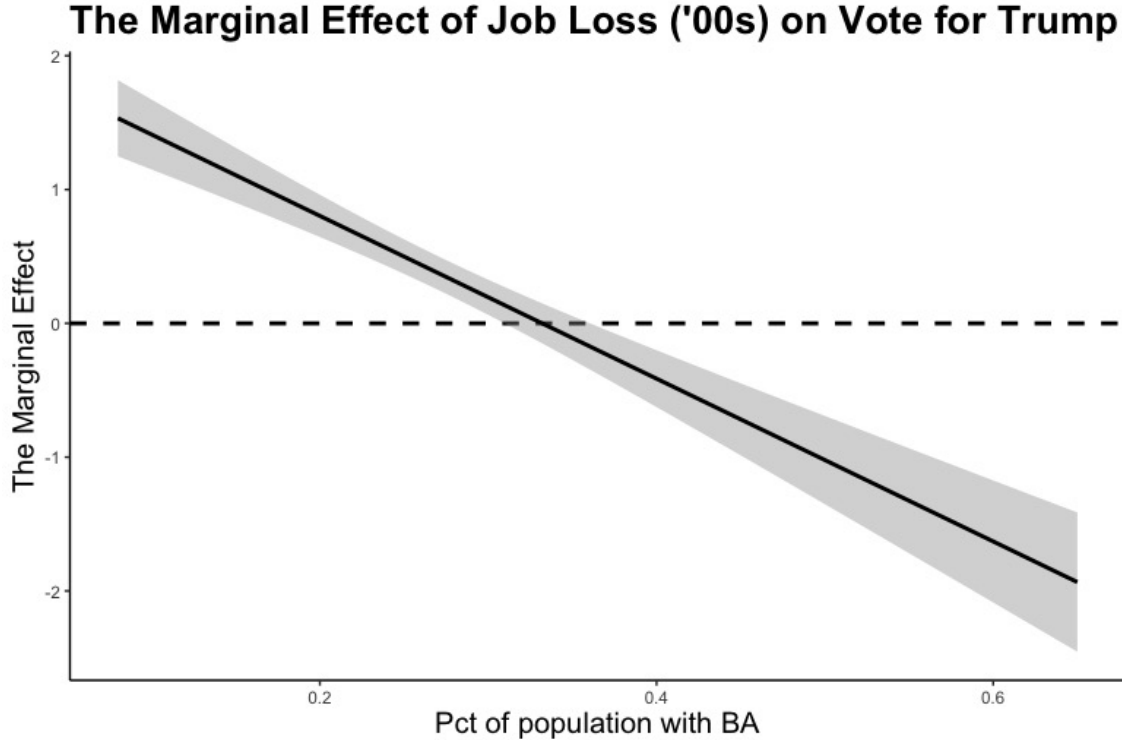
Note:

manufacturing job losses in the 1990s are associated with a decreased propensity to vote for Trump that is roughly the same magnitude as the positive effect from more recent losses. When interpreting this result it is important to remember that from the standpoint of job losses in the 1990's, job losses in the beginning of the current century are "post treatment." In other words, the coefficient on job losses for the 1990's should be interpreted as "holding constant subsequent losses," what is the effect of losses during the 1990's? One would expect losses in manufacturing to be auto-correlated. That is, locations that experienced losses in one period are more likely to experience similar losses in the future. From this perspective, we might interpret the coefficient on job losses in the '90s to mean, "what is the effect of job losses in the 90's on support for Trump, other than through the propensity to produce further losses in the subsequent decade?"

Our central concern, however, is whether manufacturing job losses are modified by educational attainment. First, the coefficient on *Job Losses('00)* is positive and statistically significant, suggesting that individuals without Bachelor's degrees responded to local job losses by voting for Trump in greater numbers. Next, the coefficient on the interaction term between BA and job losses in the 00's in Column 2 of Table 3 is negative and roughly half the size of the positive coefficient on job losses in the 00's. This suggests that while having a bachelors degree does not erase the effect of recent job losses on the propensity to vote for Trump, it does reduce the effect of recent job losses by about half. Note that having bachelors degree also modifies the effects of more temporally distant job losses as well.

Finally, Column 3 of Table 3 looks at the modifying effects of the educational attainment of the respondents' county in 2010, rather than their personal situation. Once again, the coefficient on recent job losses is positive and statistically significant. The coefficient on the interaction term between recent job losses (00's) and percent with BA is negative, statistically significant, and large relative to the coefficient on job losses. This suggests that the share of the population with bachelor's degrees mitigates the effect of manufacturing job losses on the propensity to vote for Trump.

Figure 4



To demonstrate the magnitude of this mitigating effect, Figure 4 plots the marginal effect of recent job losses on the propensity to vote for Trump, conditional upon the percentage of people in the respondent's county who hold at least a Bachelor's degree. In counties where educational attainment is low (about .30 of the population has a Bachelors degree or more in the average county in 2010), recent losses in manufacturing employment are associated with an increased propensity to vote for Trump. In contrast, in highly educated counties, manufacturing job losses are actually associated with a decreased propensity to vote for Trump.

In this section we have presented preliminary evidence that individuals living in locations experiencing substantial manufacturing job losses in the early twenty-first century had an increased propensity to vote for Donald Trump in 2016.⁸ Many, though certainly not

⁸Many, though certainly not all, of these job losses were the result of import competition from China, which was a newly admitted member of the World Trade Organization (Autor, Dorn and Hanson, 2013a). But the effect of those relatively recent job losses were modified both by educational decision, many of which were made decades before - both by the voter and the voter's neighbors.

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Conclusion

We have argued that the educational decisions that were consequential in the election of 2016 had their roots in practices taking place decades earlier. Beginning with a cohort of voters born in 1950, white men began going to college less frequently. We have argued that this reduced enrollment in college is explained, at least in part, by the post-war abundance of high paying jobs that did not require a college education. We have also argued that the privileged access that discriminatory hiring practices afforded them, was one of the reasons why the availability of such jobs affected white men's educational investment decisions more than others. In future work we plan to trace many more consequences of those discriminatory practices.

Data Sources and Descriptive Statistics

Determinants of County-Level Graduation Rates

County-level graduation rate among “white male” “other” in 2012/2016.

Unit: Percent (range: [0,100])

Source: American Community Survey.

% Employed in Mftg.

Unit: Percent (range: [0,1])

Source: Quarterly Census of Employment and Wages (Bureau of Labor Statistics)

Mftg. wage (thousands)

Unit: USD (in thousands. unadjusted)

Source: Quarterly Census of Employment and Wages (BUREAU OF LABOR STATISTICS)

Avg. Cty. Income

Unit: USD (in thousands. unadjusted)

Source: Bureau of Economic Analysis

County GDP

Unit: USD (in 2012 USD)

Source: Bureau of Economic Analysis

Table 4: Descriptive Statistics

Statistic	N	Mean	Min	Max
Pct of White Male with a BA or higher	7,358	31.667	7.280	92.650
Pct of Other with a BA or higher	7,358	0.270	0.056	0.714
Mftg. Wage (thousands)	25,033	47.205	7.641	315.474
Avg. Cty. Income (in thousands)	27,783	39.632	14.929	225.987
County GDP	27,783	5,400,464.000	6,311.000	681,549,961.000

‘Other’ includes white female and non-whites.

Determinants of Respondent Graduation Rates

Bachelor’s Degree

Unit: (dichotomous)

Source: Current Population Survey

% Employed in Mftg.

unit: Percent (range: [0,1])

Source: Quarterly Census of Employment and Wages (Bureau of Labor Statistics)

Mftg. wage

Unit: USD (in thousands. unadjusted)

Source: Quarterly Census of Employment and Wages (Bureau of Labor Statistics)

white male

Unit: dichotomous.

Source: Current Population Survey

taxable income

Unit: USD (unadjusted)

Source: Current Population Survey

Avg. Cty. Income

Unit: USD (in thousands. unadjusted)

Source: Bureau of Economic Analysis

Age

Unit: year

Source: Current Population Survey

Table 5

Statistic	N	Mean	Min	Max
BA	5,828,192	0.233	0.000	1.000
Mftg. wage (thousands)	1,002,537	23.497	5.258	171.419
White Male	5,871,134	0.401	0	1
Taxable Income (thousands)	3,426,481	22,559.730	0.000	2,967,999.000
Avg. Cty. Income (thousands)	2,914,020	42,065.950	12,088.000	191,220.000
Age	5,871,134	48.331	25	80

Determinants of Vote for Trump

Vote for Trump in 2016 presidential election Source: CCES

Job loss ('80s).('90's)('00s)

Unit: Percent (range: [0,1])

Source: County Business Patterns data

Bachelor's Degree

Source: Cooperative Congressional Election Study.

Unit: NA (dichotomous)

Pct of those with a BA degree or higher.

Unit: Percent (range: [0,1])

Source: American Community Survey.

Avg. Cty. Income (in thousands)

Unit: USD (in thousands. unadjusted)

Source: Bureau of Economic Analysis

Conservative.

Unit: NA (dichotomous)

Source: Cooperative Congressional Election Study.

Age

Unit: Year

Source: Cooperative Congressional Election Study.

Table 6

Statistic	N	Mean	Min	Max
Voted for Trump (2016)	184,811	0.364	0.000	1.000
Job loss ('80s)	524,670	0.019	-0.069	0.104
Job loss ('90s)	524,670	0.020	-0.064	0.192
Job loss ('00s)	524,670	0.028	-0.046	0.144
BA	531,291	0.350	0.000	1.000
Pct College ('10)	452,133	0.304	0.079	0.699
Avg. Cty. Income (thousands)	525,217	47.486	16.347	220.645
Conservative	529,549	0.341	0.000	1.000
Age	531,358	49.458	18	109

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