What Explains Neighborhood Sorting by Income and Race?

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Abstract: Why do high-income black households live in neighborhoods with characteristics similar to those of low-income white households? This paper shows that neighborhood sorting by income and race cannot be explained by wealth but can be explained by race-specific preferences. We demonstrate the following stylized facts: (i) Neighborhood quality is independent of wealth conditional on income and race. (ii) Neighborhood racial composition is independent of wealth and income conditional on race. (iii) The racial gap in neighborhood quality can be explained at all income levels by black households sorting into black neighborhoods. (iv) When looking across metros, black residents' neighborhood quality does not depend on the overall supply of high quality neighborhoods, but does increase as the supply of high quality black neighborhoods increases.

Keywords: Neighborhood, Income, Wealth, Race Preference, Intergenerational Mobility
JEL Classification Codes: H72, J15, J18, R11, R21

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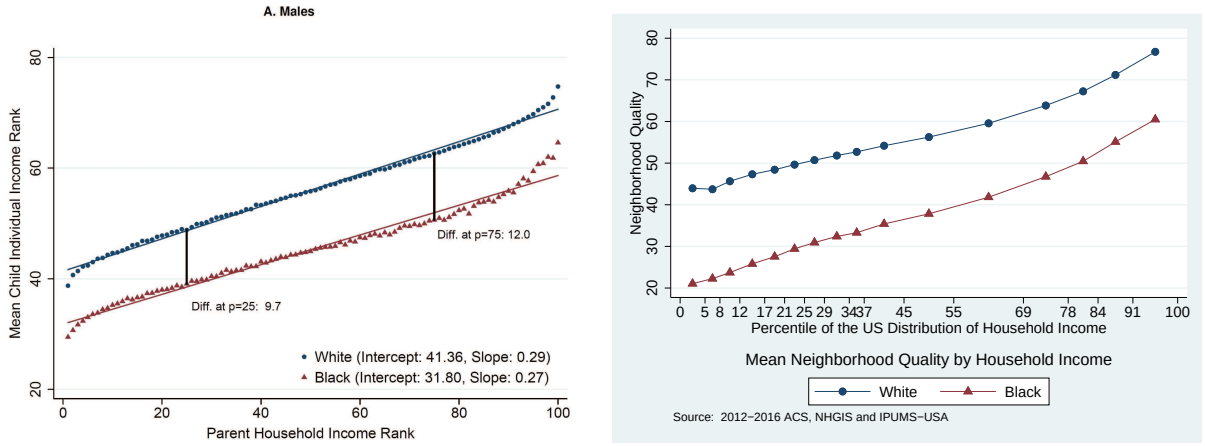
1 Introduction

Neighborhood sorting can be seen as a principal cause of racial inequality in the United States. As shown in Figure 1a, we know that black children have lower incomes than white children, even when their parents have identically high incomes (Chetty et al. (2018)). Neighborhood effects are a plausible explanation for this fact; Figure 1b shows that high-income black households live in neighborhoods similar to those of low-income white households (Pattillo (2005), Reardon et al. (2015), Intrator et al. (2016)).[1]



(a) Intergenerational Income Mobility

(b) Income and Neighborhood Quality

Figure 1: Black-White Gaps in Child's Income and Neighborhood Quality, by Income
Note: The left panel is Figure V-A in Chetty et al. (2018). The right panel uses data from the 2012-2016 American Community Survey (ACS). Our measure of neighborhood quality is defined in Section 3 in terms of percentiles of the national distribution.

If neighborhood sorting contributes to racial inequality, it suggests the following question: Why do black households with high incomes live in neighborhoods of much lower quality than white households of comparable incomes? Wealth is a natural explanation, since homeownership requires some wealth, and black households at all levels of income hold less wealth than white households (Altonji and Doraszelski (2005), Barsky et al. (2002)). Alternatively, households might have race-specific preferences over neighborhoods. Race-specific preferences could have many sources in addition to preferences over the racial composition of one's neighborhood. These include preferences over social networks, amenities, and institutions that could be correlated with race, as well as the race-specific costs to living in a neighborhood, such as those resulting from discrimination and harassment (Jensen et al. (2018)). Given the scarcity of high-quality, majority-black neighborhoods in US cities, even weak race-specific preferences could deter black households from living in a high-quality neighborhood (Bayer and McMillan (2005), Bayer and Blair (2019)).

This paper shows that wealth is not the reason black families live in lower quality neighborhoods than white families with similar incomes. After combining data from the 2015 Panel Study

[1]The imperative to understand neighborhood sorting is strengthened by evidence that the racial wealth gap is driven by the racial income gap (Aliprantis et al. (2018), Ashman and Neumuller (2018)).

of Income Dynamics (PSID) with tract-level data from the 2012-2016 American Community Survey (ACS), we estimate a simple but flexibly-specified regression of neighborhood quality on race, income, and wealth. We find that differences in wealth predict only minor differences in neighborhood quality once income and race are accounted for. High- and low-wealth whites live in neighborhoods of similar quality. The same is true for high- and low-wealth blacks, with the gap in neighborhood quality between blacks and whites being 22 percentile points.

We demonstrate the robustness of the result that black and white families live in neighborhoods of different quality even after controlling for income and wealth. We show that this result is not driven by our approaches to measuring neighborhood quality or wealth, differences in sorting driven by school-aged children, differences in within wealth×race-bin distributions of wealth or home equity, or issues related to common support and functional form assumptions. We also find similar results when combining the 1989 wave of the PSID with the 1990 decennial census.

This paper also shows that race-specific preferences can explain neighborhood sorting by income and race. We first document that the racial composition of one's neighborhood is mean independent of income and wealth conditional on race. We also document the following stylized fact: At all income levels, the racial gap in neighborhood quality can be explained by black households sorting into black neighborhoods.

We conclude with an analysis that sheds light on the relative importance of race-specific preferences by using the variation in choice sets across metros. We start by quantifying the high-quality neighborhoods in the largest metros in the US, classifying such neighborhoods as being predominantly black, white, or of any racial composition. We then convert this raw count into a measure of supply, normalizing by the number of high-income residents in each metro that are black, white, or of any race. We show that black and white households do not have comparable choice sets in terms of the high-quality, own-race neighborhoods in their metro.

We further document stylized facts across metros that are consistent with a strong role for race-specific preferences. We find that the neighborhood quality of black residents in a metro does not increase as the overall supply of high quality neighborhoods increases, but does increase as the supply of high quality black neighborhoods increases. In contrast, the neighborhood quality of white residents in a metro does increase as the overall supply of high quality neighborhoods increases. Finally, we show that the metro-level difference in neighborhood quality between high-income black and white residents increases in the metro-level difference in the supply of black and white high quality neighborhoods.

Our findings have major implications for policy.[2] Neighborhood sorting and neighborhood effects are thought to be key mechanisms driving the persistence of racial inequality in the US (Wilson (1987)). If race-specific preferences play a large role in how households select into neighborhoods, then this must be taken into account by any policy aiming to improve outcomes by improving neighborhood externalities. In terms of the largest federal housing program in the US, for example,

[2]We focus on policy implications, but our results also have implications for the vertical and horizontal sorting assumptions made in equilibrium sorting models (Kuminoff et al. (2013)).

our results should help to inform the design of new approaches to improving neighborhood quality through the Housing Choice Voucher (HCV) program. Such new approaches could include tying rental subsidies to local rents through Small Area Fair Market Rents (Collinson and Ganong (2018), Aliprantis et al. (2019)), intensive counseling, or other policy innovations (DeLuca and Rosenblatt (2017)).[3] In terms of education policy, our results have direct implications for the design of school choice and magnet school programs (Epple and Romano (2003), Ellison and Pathak (2016), Owens (2018)).

Our results also provide support for policies targeted at improving neighborhoods in addition to reducing the price of moving out of a given neighborhood. One approach would be to build the capacity of local institutions and organizations. Promise Neighborhoods take this approach through geographically- and systematically-coordinated health and social investments (Jean-Louis et al. (2010)), as well as investments in improving the technology for cognitive skill production in schools (Horsford and Sampson (2014), Dobbie and Fryer Jr (2011)), all as originally implemented by the Harlem Children's Zone (Tough (2008)).

Another approach to improving neighborhoods is through education. Examples of this approach include offering geographically-tied college scholarships (LeGower and Walsh (2017)) or universal pre-K (Horn (2019), Richard (2017)), policies attempting to improve schools (Horn (2015), Billings et al. (2018), Horn (2018)), or even the proposal for weighing high school demographics in college admissions (Scott-Railton (2017)).

A final approach to improving neighborhoods is through tax incentives. Examples of this approach include tax credits for affordable housing construction (Diamond and McQuade (2019)), tax credits for new employment or capital investment (Hanson and Rohlin (2011)), or even the proposal to link homeowners' mortgage interest deductions to local areas.

Beyond racial inequality, our results have broader implications in favor of place-making policies. While there is much to learn about what makes specific policies effective in creating long-run gains (Neumark and Simpson (2015)), differences in economic performance across regions of the United States have renewed interest in region-specific policies (Schweitzer (2017), Austin et al. (2018), Yglesias (2016)). Our results give urgency to this line of research. The existence of racial differences in mobility within cities suggest there could be similar frictions to mobility across regions unrelated to race.

The remainder of the paper is organized as follows: Section 2 specifies a simple model to illustrate how we think about the role of factors like income, wealth, and race in a household's neighborhood choice. Section 3 describes the data we use in our analysis and defines our measure of neighborhood quality. Section 4 investigates whether wealth can explain neighborhood sorting, and Section 5 investigates whether race-specific preferences can explain neighborhood sorting. Section 6 concludes.

[3]Race-specific preferences could help to explain the differences in neighborhood sorting patterns seen in the Moving to Opportunity (Aliprantis and Kolliner (2015), Aliprantis and Richter (2018), Sampson (2008)) and Gautreaux (DeLuca and Rosenbaum (2003), Rosenbaum (1995)) housing mobility programs. There is evidence that race-specific preferences are not stable over time (Darrah and DeLuca (2014), Rubinowitz and Rosenbaum (2002)).

2 Model

We guide our analysis by specifying a static, partial equilibrium model of a household's choice between neighborhoods in which to reside. We suppose that the household is buying a house and will buy the same quantity of housing services in each neighborhood. In this case we can write the household's problem as:

$$\max_{nbd \in \{1,\ldots,N_j\}} u\Big(c_i, q_{nbd}, d(race_i, race_{nbd}), \Psi_{i,nbd}\Big) \tag{1}$$

$$s.t.\ \ c_i + mort_{nbd} \leq I_i \tag{2}$$

$$mort_{nbd} = f(price_{nbd}, wealth_i). \tag{3}$$

We assume household i in city j can choose between neighborhoods in the set $\{1, \ldots, N_j\}$. The household gets utility from consumption, the quality of the neighborhood in which they reside, the distance between their own race and the racial composition of their neighborhood, and some neighborhood-specific amenity. We think of the amenity $\Psi_{i,nbd}$ as a vector of characteristics including not only consumption amenities, but also social networks, institutions, and costs to living in a neighborhood, such as those resulting from racial discrimination. We note that the amenity in a neighborhood, $\Psi_{i,nbd}$, could be highly correlated with the racial composition of the neighborhood. This is the reason we use the term "race-specific preferences" rather than "racial preferences"; it will be difficult to discern between these factors in most data sets. The household's consumption and mortgage payment are constrained by its income (Equation 2). The monthly mortgage payment of the household is a function of the price of housing in the neighborhood they choose and the household's wealth level (Equation 3).

3 Data

We use two versions of the 5 percent sample from the 2012-2016 American Community Survey (ACS) of the US Census. We obtain individual-level data from the Integrated Public Use Microdata Series (IPUMS-USA, Ruggles et al. (2018)) and tract-level data from the National Historical Geographic Information System (NHGIS, Manson et al. (2017)). We also use individual-level survey data from the Panel Study of Income Dynamics (PSID, ISR (2018))), the National Longitudinal Survey of Youth 1997 (NLSY97), and the 2017 National Household Travel Survey (NHTS, Federal Highway Administration (2017)).

3.1 Individual-Level Variables

The first part of our analysis will feature extensive use of the net worth variable provided in the PSID. The constructed net worth variable in the PSID, ER65408, is defined as the sum of total assets net of debt value plus the value of home equity. Total assets are the sum of the values of farm/businesses, checkings and savings accounts, real estate holdings other than one's main home,

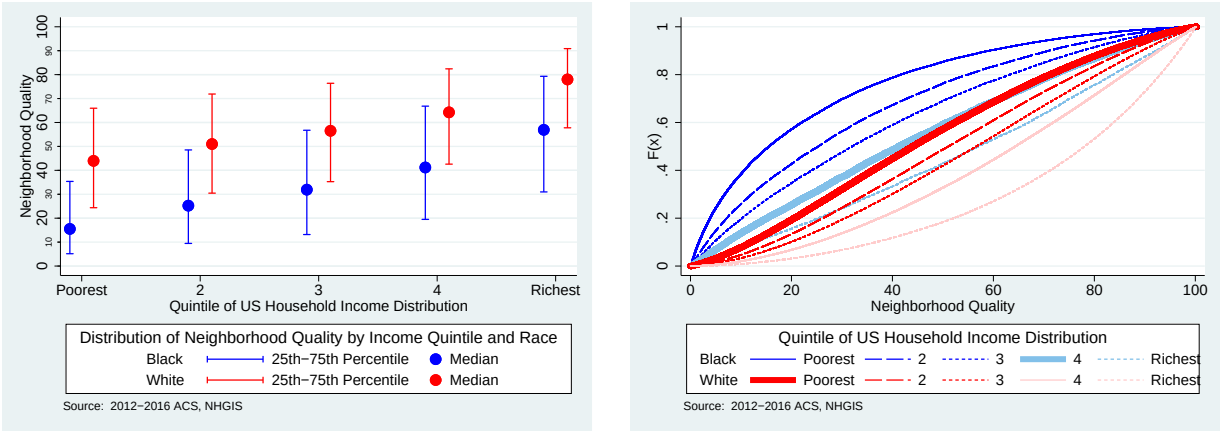
stocks, vehicles, other assets like life insurance policies or rights in a trust, and annuities/IRAs. Debt value is the sum of debt towards farm/businesses, real estate debt for holdings other than one's main home, credit card debt, student loan debt, medical debt, legal debt, loans from relatives, and other debts.

3.2 Tract-Level Variables

We treat tracts as neighborhoods and define neighborhood quality in order to capture the mechanisms described in Wilson (1987). Following Aliprantis and Richter (2018), we define neighborhood quality in terms of a neighborhood's poverty rate, employment to population ratio, unemployment rate, high school graduation rate, BA attainment rate, and the share of households with children under 18 that are single-headed. We measure these variables in terms of the percentiles of their national distributions, and then define neighborhood quality as the percentile of the first principal component of these variables. Appendix E discusses this measure of neighborhood quality in detail.

In several parts of the analysis we look at tract-level outcomes by household income quintiles. Although the tract-level NHGIS data only provide counts of households that have incomes within bins, we can obtain approximate counts of households in income quintiles by matching the NHGIS bins to the quintile cutoffs of the household income distribution in the individual-level IPUMS-USA data. The person-weighted household income quintiles in the IPUMS-USA 2012-2016 ACS data are $(-\infty, 29), [29, 53), [53, 83), [83, 132), [132, \infty)$, and we map these to the NHGIS bins as $[0, 30), [30, 50), [50, 75), [75, 125), [125, \infty)$.

Figure 2 uses the NHGIS data to replicate the result from the literature that neighborhood quality is lower for blacks than whites at all levels of income (Pattillo (2005), Reardon et al. (2015)). Note that the gap is large enough so that high-income black households live in neighborhoods with characteristics similar to those of low-income white households. Whites in the first (poorest) quintile of household income live in neighborhoods of similar quality to blacks in the fourth quintile of household income.



(a) Neighborhood Quality

(b) CDFs

Figure 2: Household Income and Neighborhood Quality in the 2012-2016 ACS, by Race

3.3 Metro-Level Variables

In the metro-level analysis, we start with the 2012-2016 ACS sample of residents in the 52 largest metropolitan statistical areas (metros) in the US in 2017, each of which has a population of at least 1 million residents. Following the Gautreaux program, we define a neighborhood as being "black" if at least 30 percent of its residents are black (Polikoff (2006)), and define "white" neighborhoods analogously. Following the Moving to Opportunity experiment, but using quality instead of poverty, we define a neighborhood as being high quality if it is above the median of the national distribution (de Souza Briggs et al. (2010)). Since we focus on high quality black neighborhoods, we drop the four metros with no black neighborhoods (Portland, Salt Lake City, San Jose, and Tucson).

We consider a resident of a metro as being high income if they are in a household with above median household income. Since Census tracts have 4,000 residents on average, we define:

$$\text{Supply of High Quality Black Neighborhoods in a Metro} \equiv \frac{\text{\# of High Quality Black Neighborhoods}}{\text{4,000 Black High-Income Residents}}.$$

We define the supply of high quality white and any-race neighborhoods in a metro analogously.

4 Can Wealth Explain Neighborhood Sorting?

Recalling the constraint facing households in Equation 3, we suspect that wealth could be a major factor determining how households sort into neighborhoods of different levels of quality. To investigate, we combine our index of neighborhood quality from the 2012-2016 ACS, as described in Section 3, with data from the 2015 wave of the PSID. We estimate the regression

$$\begin{aligned} Q_i = \quad & \alpha + \alpha^B B_i \quad + \beta_1 I_i + \beta_2 I_i^2 + \beta_1^B I_i \times B_i + \beta_2^B I_i^2 \times B_i \\ & + \gamma I_i \times W_i \quad + \delta_1 W_i + \delta_2 W_i^2 + \delta_1^B W_i \times B_i + \delta_2^B W_i^2 \times B_i + \varepsilon_i \end{aligned} \tag{4}$$

where the unit i is families, Q_i is neighborhood quality as measured at the tract level, B_i is an indicator for the head of the family being black versus non-hispanic white, I_i is total family income, and W_i is family net worth. In an attempt to impose common support, the estimation sample is restricted to families with incomes between the 10th and 90th percentiles of the income distribution within each wealth quintile×race bin. The regression is estimated on the sample of all families in the 2015 PSID with a black or non-Hispanic white head, and weights are used to obtain all of our PSID estimates.

Table 1 displays estimated regression coefficients. The coefficient on having a black head of household is –22, indicating that black families live in neighborhoods that are 22 percentile points worse than white families conditional on income and wealth. Income matters more than wealth, with the coefficient on family income more than an order of magnitude higher than the coefficient on family wealth. And finally, neighborhood quality is more strongly related to family income and wealth for blacks than for whites, although the difference for wealth is minor.

Table 1: Neighborhood Quality Regression

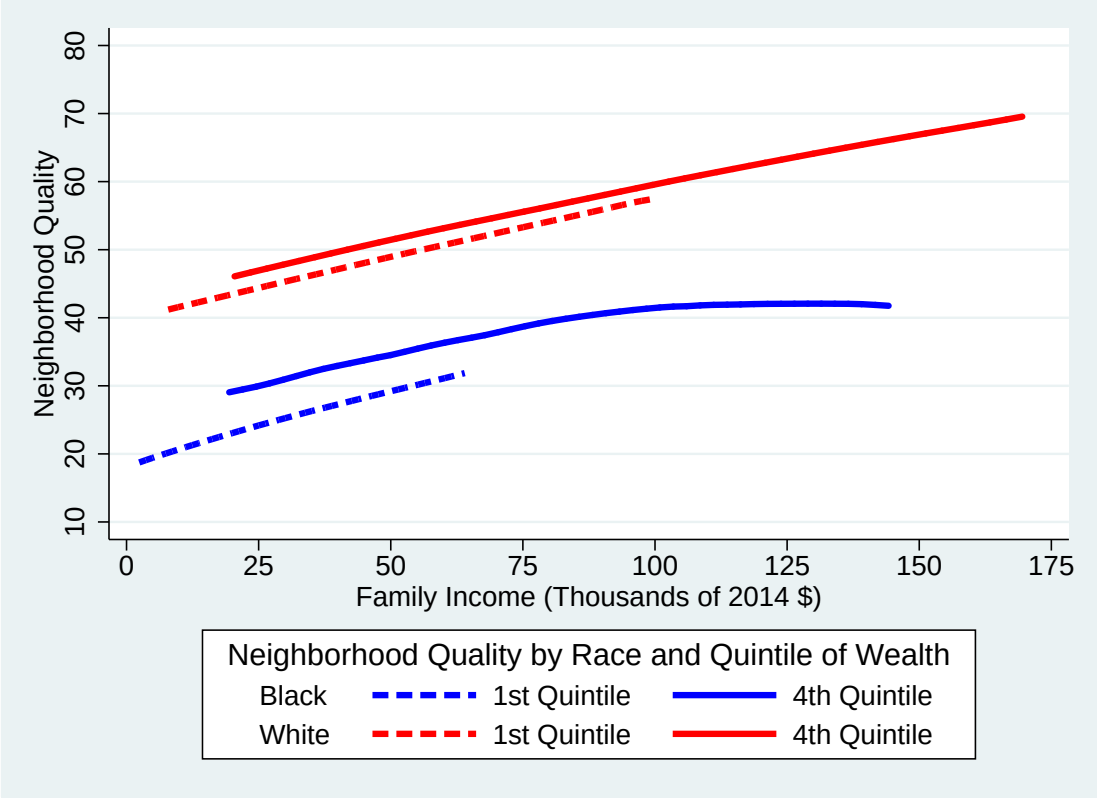
		All Households	
Constant	39.9	Black Head of Household	–21.8
	(0.9)		(2.0)
Family Income	2.0e-4	Black×Family Income	9.2e-5
	(2.4e-5)		(7.5e-5)
Family Income^2	–1.6e-10	Black×Family Income^2	-8.7e-10
	(1.2e-10)		(5.9e-10)
Family Wealth	1.2e-5	Black×Family Wealth	1.6e-6
	(1.4e-6)		(9.1e-6)
Family Wealth^2	–8.1e-13	Black×Family Wealth^2	–1.4e-12
	(1.2e-13)		(2.6e-12)
		Family Income×Family Wealth	–4.6e-11
			(8.8e-12)
R^2	0.22	N	6,600-6,700

Figure 3a illustrates just how small the differences in neighborhood quality are across wealth levels once income and race are accounted for. High- and low-wealth families, or 4th and 1st quintile families, live in neighborhoods of similar quality after accounting for income and race. If income and wealth were driving neighborhood sorting, then the dashed lines representing low-wealth families would be on top of each other. Similarly, the solid lines representing high-wealth families would be on top of each other. Instead, the lines we see on top of each other are the red lines representing white families and the blue lines representing black families.

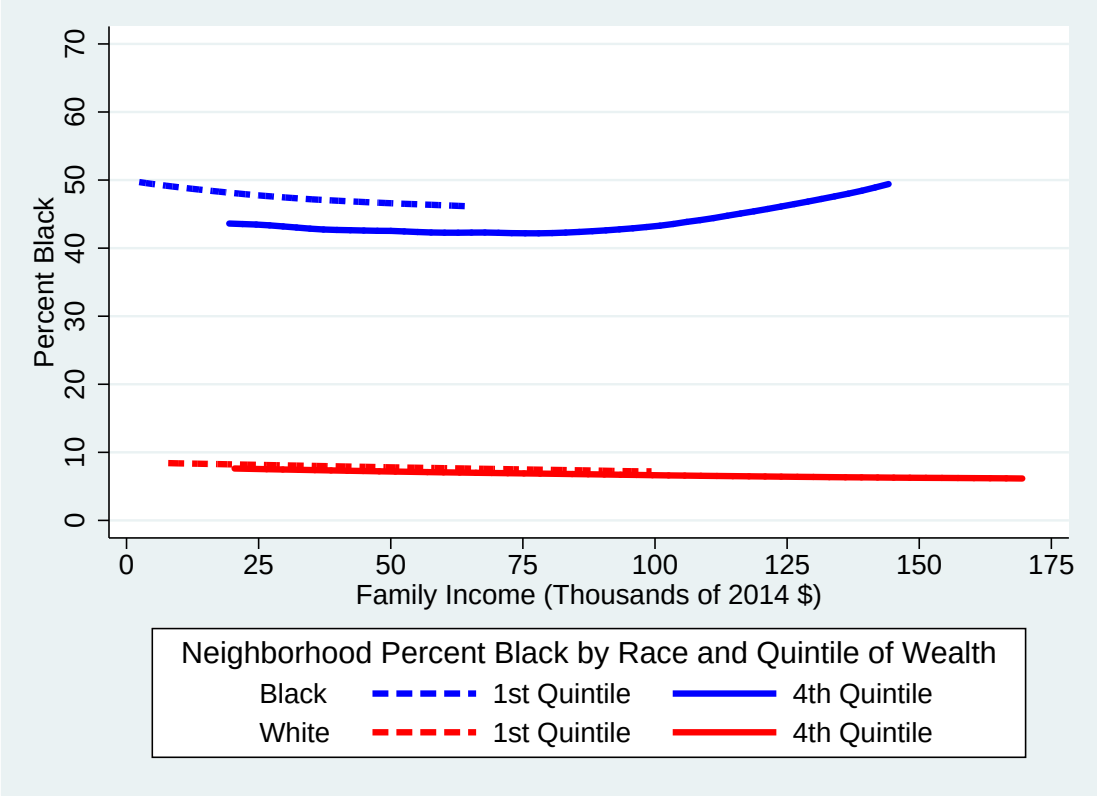
It is worth noting that even within race, wealth appears unimportant at both low levels of income and high levels of income. As a stylized fact, we might characterize these estimation results as indicating that neighborhood quality is (mean) independent of wealth conditional on income and race. If credit constraints were a barrier to accessing high quality neighborhoods, then one would expect a larger gap between high- and low-wealth groups at low levels of income.

We use the 1st and 4th quintiles of the overall wealth distribution to represent, respectively, low and high wealth for two reasons. First, there are simply not many African American households in the 5th quintile of the overall distribution of wealth. Second, the right tail of the wealth distribution is extremely long, and there are differences across race in the distribution within the 5th quintile. The mean wealth of white households in the 5th quintile of the overall distribution is $1.97 million, compared to $0.18 million for white households in the 4th quintile. In contrast, discrepancies across race within bins are not large enough to drive our results when focusing on the 1st and 4th quintiles.[4] In the 4th quintile of wealth mean white and black wealth are, respectively, $180,000 versus $155,000. In the 1st quintile of wealth mean white and black wealth are, respectively, –$51,000 and –$36,000.

[4]See Auerback and Gelman (2016) for an example of how different within-bin distributions can drive inferences. In our case, the concern would be that black families in the 4th quintile would be disproportionately near to the 3rd quintile of wealth while white families would be nearer to the 5th quintile. In such a scenario, comparing families within the 4th quintile would not be a comparison between families with similar levels of wealth.



(a) Neighborhood Quality



(b) Neighborhood Racial Composition

Figure 3: Neighborhood Sorting by Income, Race, and Wealth, 2015 PSID and 2012-2016 ACS

The result that wealth does not predict neighborhood quality after conditioning on income and race is robust. Appendix A shows that this result is not driven by the age of household heads or the absence of children in the families our sample, assumptions about how to measure neighborhood quality, or the functional form assumptions made about the relationship between quality and family characteristics. We also look at issues related to measuring wealth. Appendix B repeats this analysis with the 1990 Census and 1989 PSID and finds very similar results.

5 Can Preferences Explain Neighborhood Sorting?

5.1 Sorting by Neighborhood Racial Composition

We have shown that wealth predicts little difference in neighborhood quality conditional on race and income. This points to an alternative to wealth as an explanation for why black and white households of similar incomes live in different quality neighborhoods. Recalling the utility function in Equation 1, one such explanation has to do with the desire to live in a neighborhood whose racial composition is similar to one's own, or else that has amenities valued differently by households of different races. Such preferences, combines with the scarcity of high-quality majority black neighborhoods in American cities (Bayer and McMillan (2005), Bayer et al. (2014), Bayer and Blair (2019)), could generate differences across race in neighborhood quality even after accounting for income.

Under the hypothesis of race-specific preferences driving neighborhood sorting, we would expect to see the racial composition of a family's neighborhood appear to be independent of wealth conditional on race and income. This is in fact precisely what we observe. Figure 3b shows that high-wealth black households sort into neighborhoods with the same high share of black households as low-wealth black households. Similarly, low-wealth white households sort into neighborhoods with the same (lower) share of black households as high-wealth white households. The gap between black and white households is 42 percentage points as measured from a regression like the one in Equation 4.

If race-specific preferences drive neighborhood sorting, we would also expect to see that black households would live in neighborhoods of similar quality to those of white households when not residing in black neighborhoods. Once again, the expected pattern is the one we observe in the data. Figure 4 shows the following stylized fact: At all income levels, the racial gap in neighborhood quality can be explained by black households sorting into black neighborhoods.[5]

The neighborhood sorting counterfactuals delineated in Aliprantis and Carroll (2018) provide some context for Figure 4. That the percent of blacks in black neighborhoods is, by income quintile, 64, 59, 56, 52, and 45, suggests that the US is in the Wilson counterfactual. In the Wilson counterfactual, enough high-income African Americans leave segregated neighborhoods after the victories of the Civil Rights Movement that the externalities in black neighborhoods decline. This

[5]Differences in the number of children, home equity, and housing services across those in black and non-black neighborhoods are relatively small.

lies between the Malcolm X counterfactual, in which all African Americans would remain in black neighborhoods while working to build up the institutions in those neighborhoods, and the Martin Luther King, Jr. counterfactual, in which the US would achieve racial and economic integration.

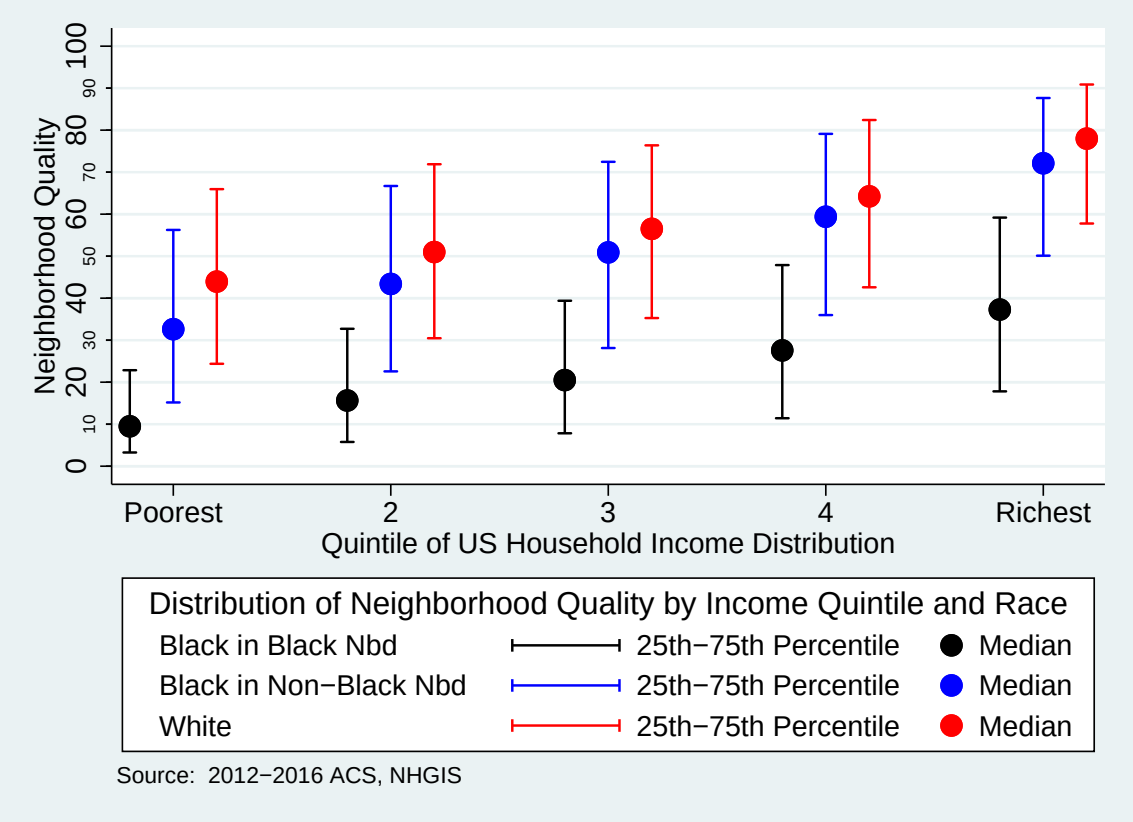


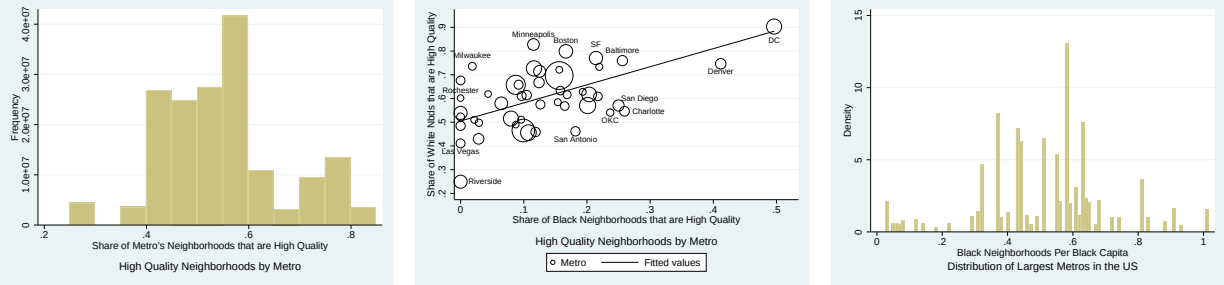
Figure 4: Neighborhood Racial Composition by Income, Race, and Wealth, 2012-2016 ACS, NHGIS

5.2 Sorting by Metro

Recalling the household's neighborhood choice problem, especially the choice set and utility function in Equation 1, we could gain some insight into the relative importance of race-specific preferences if we could observe households facing different choice sets. By observing variation across metros, we are able to observe households facing different choice sets despite being similar in terms of income.

We are able to pursue this line of investigation because there is variation in the share of neighborhoods that are high quality in a given metro (Figure 5a). Moreover, there appears to be variation in both the share of black and white neighborhoods that are high quality (Figure 5b). We proceed to measure the supply of high quality neighborhoods taking two issues into account: First, different sorting patterns across metros have led to a distribution in the number of black neighborhoods per black residents. Figure 5c displays this distribution, showing the number of black neighborhoods per 4,000 black residents in our sample of metros. Second, some cities have higher income residents than others. Thus, a metro might have many high quality black neighborhoods per black

resident, but few per high-income black resident. Likewise, a metro might have few high quality black neighborhoods per black resident, but many per high-income black resident.



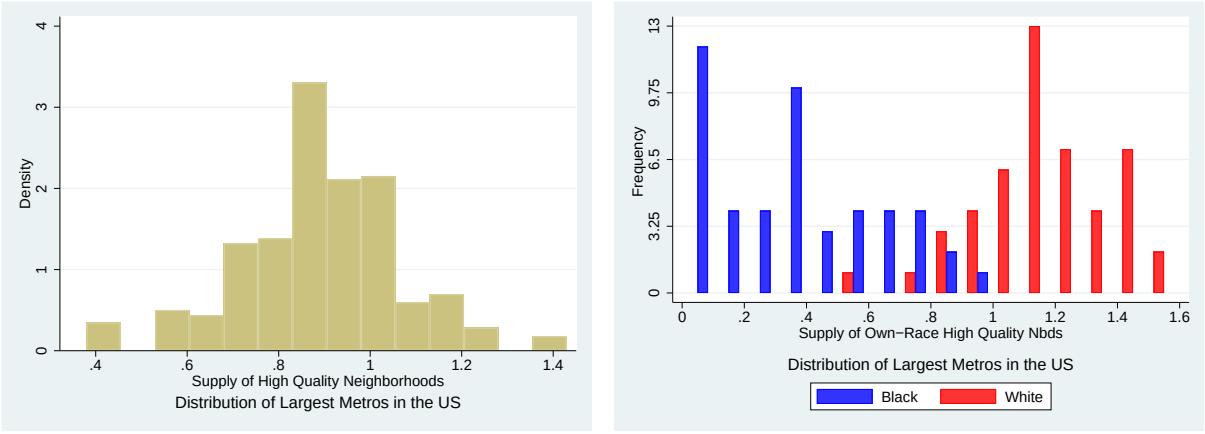
(a) Share of HQ Neighborhoods (b) Share of HQ Neighborhoods (c) Neighborhoods per Capita

Figure 5: The Supply of High Quality Neighborhoods by Metro

We these considerations in mind, we measure the supply of high quality neighborhoods in terms of the number of high quality neighborhoods normalized by the number of high-income residents. As described earlier in Section 3, we consider a resident of a metro as being high income if they are in a household with above median household income. Since Census tracts have 4,000 residents on average, we define:

$$\text{Supply of High Quality Black Neighborhoods in a Metro} \equiv \frac{\text{\# of High Quality Black Neighborhoods}}{\text{4,000 Black High-Income Residents}}.$$

We define the supply of high quality white and any-race neighborhoods in a metro analogously. Figure 6a shows that there is a distribution of the supply of high quality any-race neighborhoods centered near 1.



(a) Any Race (b) Race-Specific

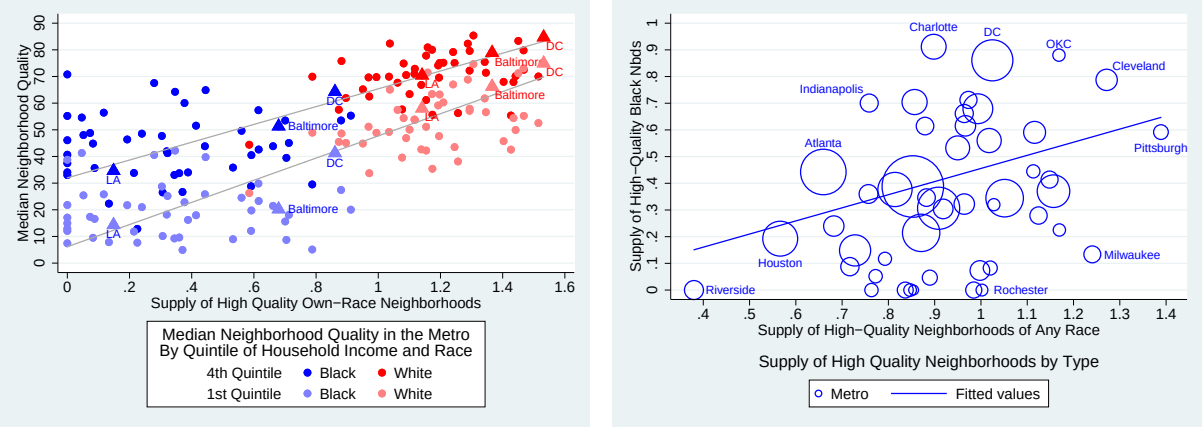
Figure 6: The Supply of High Quality Black Neighborhoods

Figure 6b shows that the supply of high quality black neighborhoods in the US is much lower than the supply of high quality white neighborhoods (Bayer et al. (2014)). Figure 7a presents one

way of measuring how a metro's supply of high quality neighborhoods is related to the neighborhood sorting in that metro. Each marker in Figure 7a represents a race×income-quintile group within a specific metro. As an example, the triangle in the very top right of the figure shows the median neighborhood quality of white households in the 4th quintile of the US household income distribution who happen to live in Washington, DC. The light-red triangle just below indicates the median neighborhood quality of white households in the 1st quintile of income who live in Washington, DC.

Turning to a more direct test of the importance of race-specific preferences, Figure 7b shows that there is quite a bit of variation in the supply of high quality black neighborhoods in a metro conditional on the supply of high quality any-race neighborhoods. While there is a positive relationship between black and any-race supply, the R^2 of a regression of the supply of high quality black neighborhoods on the supply of high quality any-race neighborhoods is 0.13. To give an example of the type of variation this allows for, consider Washington, DC and Rochester, NY. Washington, DC and Rochester have similar supplies of high quality any-race neighborhoods. However, Washington, DC has a very high supply of high quality black neighborhoods, while Rochester has an extremely low supply of high quality black neighborhoods. High income black households in these metros face quite different neighborhood choice sets.

Whether we look at Washington, DC, Baltimore, or Los Angeles, a remarkable fact from Figure 7a is that within each of these metros, high-income black households tend to live in lower quality neighborhoods than the lowest-income white households. We also see that neighborhood quality tends to increase as the supply of high-quality own-race neighborhoods increases.



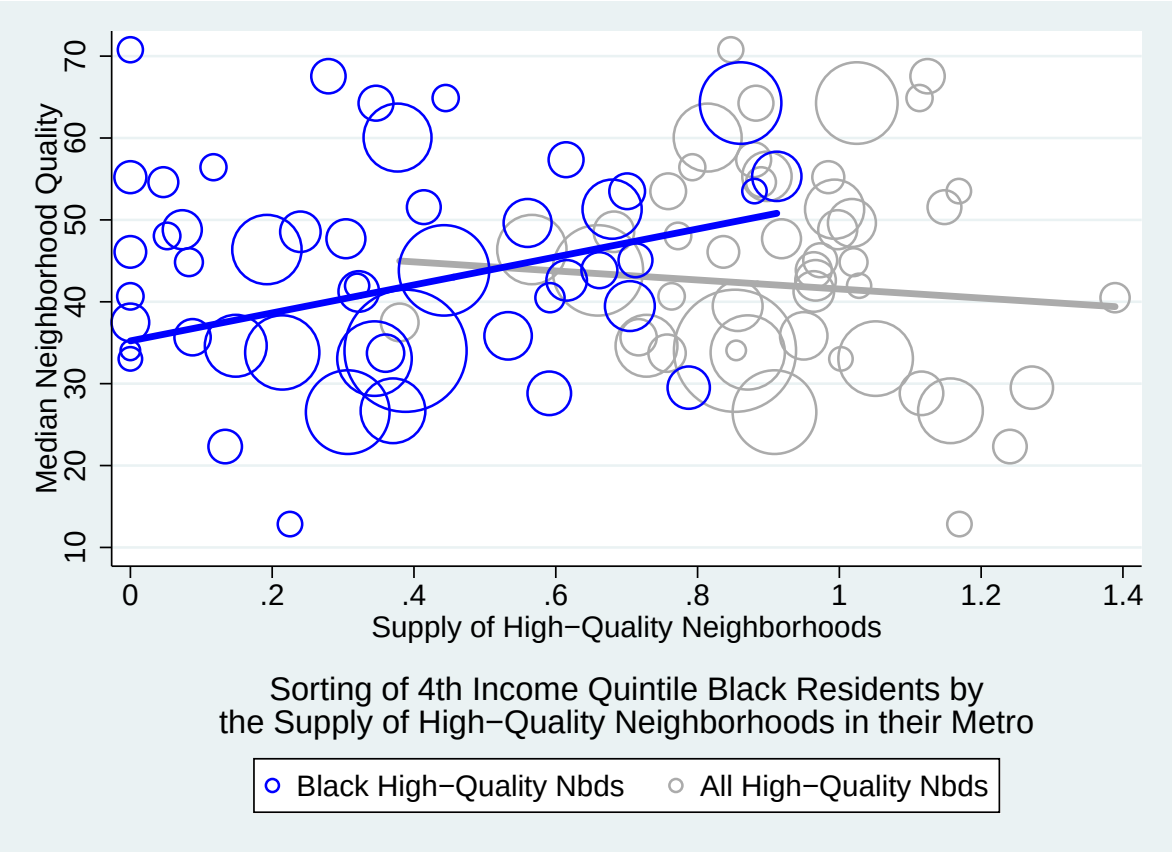
(a) Sorting by Own-Race Supply

(b) Joint Distribution of Black and Any-Race

Figure 7: Sorting and the Supply of High Quality Neighborhoods by Metro

One reason the variation shown in Figure 7b is so interesting is that it allows us to examine black households' neighborhood sorting along both the dimension of high quality any-race neighborhoods and along the dimension of high quality black neighborhoods. Looking at the grey bubbles in Figure 8, we can see that there is no correlation between the supply of high quality any-race neighborhoods and the neighborhood quality of high-income black residents. However, looking at

the blue bubbles in Figure 8, we can see that there is a positive correlation between the supply of high quality black neighborhoods and the neighborhood quality of high-income black residents. These patterns indicate that race-specific preferences play an important role in the neighborhood choices of high-income black households.



(a) Number of Neighborhoods

Figure 8: Sorting by the Supply of High Quality Black and Any-Race Neighborhoods

Table 2 presents similar results to those displayed in Figure 8, expanding to include each race×income quintile group. Looking at the first three rows of Table 2, we see that the pattern from Figure 8 extends from black households in the 4th quintile of income to black households at all incomes: Neighborhood quality is not related to the overall supply of high quality neighborhoods. The contrast with the neighborhood sorting of white households is impressive. At all incomes, white households react strongly and sort into much higher quality neighborhoods as the overall supply of high quality neighborhoods increases.

Looking at the fourth row of Table 2, we see that the response of white households to the supply of high quality white neighborhoods is even stronger than their response to the supply of high quality neighborhoods of any race. At the same time, black households do respond to an increase in the supply of high quality black neighborhoods by sorting into higher quality neighborhoods.

Returning to the household's problem in Section 2, one could imagine that sorting into metros

Table 2: Regressions of Median Neighborhood Quality

	Median Neighborhood Quality									
	Black by					White by				
Coefficient on	HH Income Quintile					HH Income Quintile				
Supply of HQ Nbds	1	2	3	4	5	1	2	3	4	5
Any-Race	-6	-8	-11	**-6**	2	23	23	20	**20**	18
t-stat p-value	0.48	0.36	0.27	**0.59**	0.83	0.01	0.00	0.00	**0.00**	0.00
R^2	0.01	0.02	0.03	**0.01**	0.00	0.15	0.18	0.18	**0.21**	0.19
Own-Race	12	13	13	**17**	16	32	30	25	**23**	17
t-stat p-value	0.04	0.05	0.08	**0.02**	0.03	0.00	0.00	0.00	**0.00**	0.00
R^2	0.09	0.08	0.07	**0.11**	0.10	0.32	0.33	0.30	**0.29**	0.19
Any-Race	-14	-16	-20	**-16**	-7	-21	-12	-8	**-0**	9
Own-Race	16	17	18	**21**	18	49	39	31	**23**	10
F-stat p-value	0.04	0.03	0.03	**0.02**	0.08	0.00	0.00	0.00	**0.00**	0.01
R^2	0.14	0.14	0.14	**0.16**	0.10	0.36	0.34	0.31	**0.29**	0.21

has resulted in differences in income across metros with different levels of neighborhood supply that correlate with racial composition. This issue appears both possible and unlikely. One way to attempt to deal with this issue is to use white households as a "control" group by looking at differences in the supply of high quality neighborhoods. Using this approach, we define the black-white difference in the supply of high quality neighborhoods as the supply of high quality white neighborhoods in a metro minus the supply of high quality black neighborhoods in the metro. Figure 9 shows that the black-white difference in the supply of high quality neighborhoods predicts the black-white difference in the median neighborhood quality of households in the 4th quintile of income.

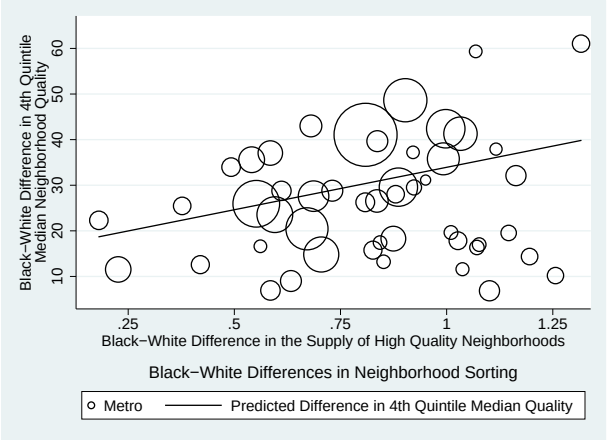


Figure 9: The Supply of High Quality Black Neighborhoods by Metro

6 Conclusion

This paper documented the following stylized facts about neighborhood sorting in the US: (i) Household wealth does not predict neighborhood quality after controlling for a household's race and income. (ii) Neither household wealth nor income predict neighborhood racial composition after controlling for a household's race. (iii) Black households sorting into black neighborhoods can explain the racial gap in neighborhood quality at all income levels. (iv) The neighborhood quality of black households is not responsive to the supply of high quality neighborhoods of any race in their metro, but increases in the supply of high quality black neighborhoods. To our knowledge, these are new results, or at least under-appreciated results.[6]

While we acknowledge the presence of continued racial discrimination in the housing market, we adopt the view that this type of discrimination is unlikely to be a main contributor to the types of sorting patterns we observe.[7] This view is partly informed by previous literature (Ross (2010)), partly informed by recent studies finding discrimination priced in terms of a one or two percent premium (Bayer et al. (2017), Early et al. (2018)), and partly informed by the existence of websites like Zillow and realtor.com.

We interpret our results in terms of recent evidence on the types of push (Harris and Yelowitz (2018)) and pull (Hanson et al. (2018)) factors that would drive race-specific preferences over neighborhoods. Our results suggest that preferences over these types of neighborhood attributes outweigh any educational, labor market, or safety benefits one might experience due to living in a higher quality neighborhood as defined in our analysis. The spatial component of public policy should be designed with this consideration in mind if the utility derived from living in specific neighborhoods is in fact as strongly driven by race as our results indicate.

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[6] The nearest related results on wealth of which we are aware are in Woldoff and Ovadia (2009), Crowder et al. (2006), and Freeman (2000), and the nearest related results on stated-race preferences are in Ihlanfeldt and Scafidi (2002) and Vigdor (2003). Bayer et al. (2014) is also related, but focused more on racial segregation than neighborhood quality.

[7] For related evidence see Edelman et al. (2017), Christensen and Timmins (2018), Nowak and Smith (2017), Ihlanfeldt and Mayock (2009), or Yinger (1986).

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A Robustness: The 2015 Wave of the PSID

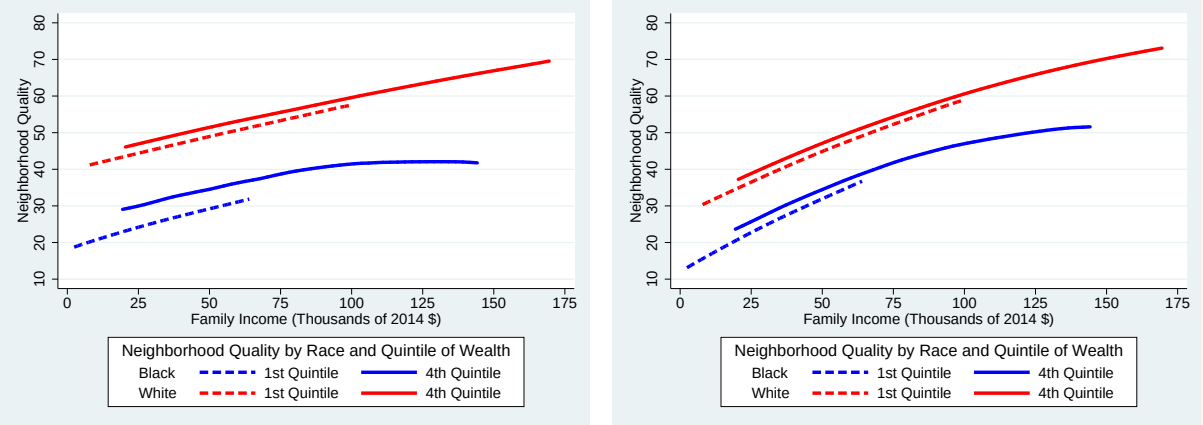
It might come as a surprise to find that wealth only weakly predicts neighborhood quality after conditioning on race and income. There are several reasons we might see such a result that are not related to the explanation that neighborhood sorting is driven by race and income.

For this reason we now consider the robustness of our result that sorting into neighborhood quality is not driven by wealth once income and race are taken into account. We first present evidence on whether our result is driven by family composition of our sample, assumptions about how to measure neighborhood quality, or the functional form assumptions made about the relationship between quality and family characteristics. We also look at issues related to measuring wealth.

A.1 Family Composition

One possibility is that black households in the 4th quintile of wealth are older and less likely to have children than their white counterparts. We test this possibility by estimating Equation 4 on our estimation sample after further restricted it to families with children 18 or under and whose head is less than 60 years old.

The second column of Table 3 shows results from estimating Equation 4 on our estimation sample that is further restricted to families with children 18 or under and whose head is less than 60 years old. Results on the sample of families with young heads and children are qualitatively similar to those from the full sample. Neighborhood quality becomes more closely related to family income, but there is almost no change in the relationship to wealth. While the magnitude of the coefficient on the black dummy decreases, it remains very large at –15 percentile points.[8] These results are displayed in Figure 10. Figure 11 shows that qualitatively similar results also obtain on this restricted sample when focused on neighborhood racial composition.



(a) All Families

(b) Families with Kids and a Young Head

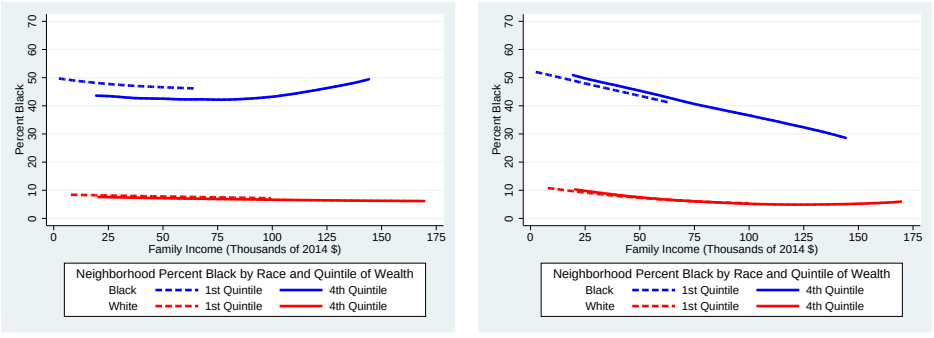
Figure 10: Neighborhood Quality by Race, Income, and Wealth, 2015 PSID

[8] Since results are qualitatively similar and the child and young head restrictions get rid of nearly two thirds of the original sample, the robustness analysis is conducted on the larger sample used to generate the estimates in the first column of Table 3 and Figure 10a.

Table 3: Neighborhood Quality Regressions

	All Households	Restricted Sample
Black Head of Household	–21.8	–15.4
	(2.0)	(3.2)
Family Income	2.0e-4	4.0e-4
	(2.4e-5)	(4.1e-5)
Family Income^2	–1.6e-10	–7.7e-10
	(1.2e-10)	(2.2e-10)
Family Wealth	1.2e-5	1.1e-5
	(1.4e-6)	(4.0e-6)
Family Wealth^2	–8.1e-13	–1.3e-12
	(1.2e-13)	(1.2e-12)
Black×Family Income	9.2e-5	8.7e-5
	(7.5e-5)	(1.1e-4)
Black×Family Income^2	-8.7e-10	-7.3e-10
	(5.9e-10)	(8.2e-10)
Black×Family Wealth	1.6e-6	4.0e-6
	(9.1e-6)	(2.5e-5)
Black×Family Wealth^2	–1.4e-12	–3.2e-12
	(2.6e-12)	(2.7e-11)
Family Income×Family Wealth	–4.6e-11	–4.4e-11
	(8.8e-12)	(3.2e-11)
Number of Kids $\leq$18		–0.4
		(0.6)
Age of Head of Household		–6.8e-4
		(6.0e-2)
Constant	39.9	27.6
	(0.9)	(3.1)
R^2	0.22	0.28
N	6,600-6,700	2,400-2,500

Note: Restricted Sample is the set of families with children 18 or under and headed by someone less than 60 years old.



(a) All Families (b) Families with Kids and a Young Head

Figure 11: Neighborhood Racial Composition by Race, Income, and Wealth, 2015 PSID

A.2 Measuring Neighborhood Quality

We also investigate whether one variable in our neighborhood quality index is by itself driving our results. Table 4 shows the coefficient on the black indicator when Equation 4 is estimated with Q_i measured as each individual component of our index.

No single variable drives our results on the relationship between neighborhood quality, race, income, and wealth. Most of the neighborhood characteristics yield results similar to the penalty of 22 percentile points in neighborhood quality for having a black family head. The coefficient on the black indicator is –20 percentile points or more for the poverty rate, unemployment, and the share of single-headed household; –16 percentile points for the employment-to-population ratio and the share of high school graduates; and smallest in magnitude for the BA attainment rate at –12 percentile points. These results are not surprising given the relatively even coefficients across characteristics under our definition of quality (Table 7).

Table 4: Neighborhood Characteristic Regressions

Coefficient on Black Household Head for Percentile of	All Households
Poverty Rate	–19.5
	(2.1)
Share of Single-Headed HHs	–25.6
	(2.1)
Unemployment Rate	–23.0
	(2.2)
Employment-to-Population Ratio	–15.8
	(2.3)
HS Attainment Rate	–16.0
	(2.1)
BA Attainment Rate	–11.9
	(2.2)

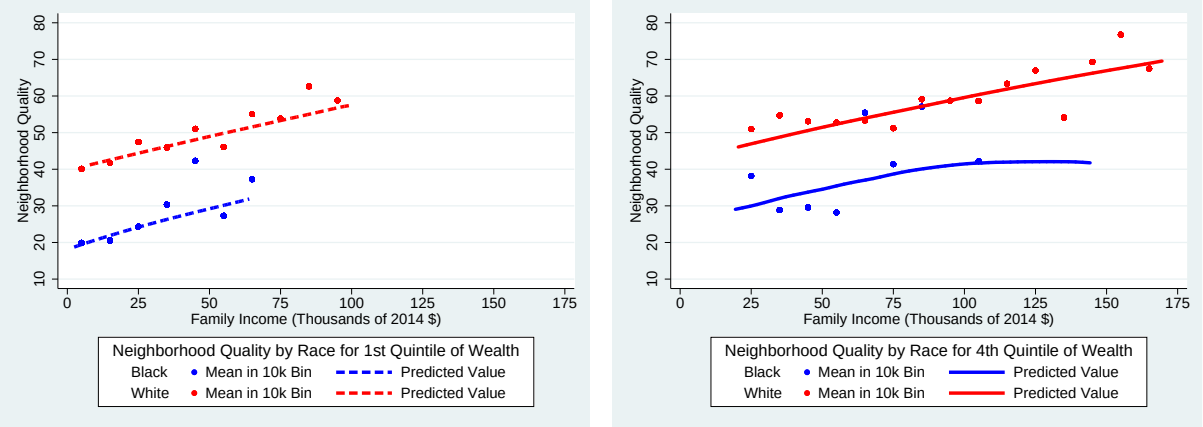
Note: Each neighborhood characteristic is measured in terms of the percentile of the national distribution of characteristic in the 2012-2016 ACS.

A.3 Functional Form Assumptions

Another possibility is that black families with high wealth actually do sort into higher quality neighborhoods than those without wealth, but that this relationship is blurred by the limited number of high income and high wealth black families we observe in the data. As highlighted in Barsky et al. (2002), this could mean that our results are being driven by functional form assumptions over the parts of the income and wealth distribution where there is not common support between black and white households.

Figure 12 presents evidence on this issue by showing means within $10,000 income bins by race

and wealth quintile. Figure 12b shows the area of concern for having a limited sample size, high income and high wealth black families. Each $10,000 income bin with a dot shown has at least 15 families to prevent indirect data disclosure. When the cell size is decreased to 10 families, which is not shown here, we see that the variance of neighborhood quality for high income, high wealth black families is higher than it is for their white counterparts. However, the relationship characterized by the curve in Figure 12b accurately characterizes the mean relationship. Most importantly, there remains a clear gap between means across black- and white-headed families that are high income and high wealth.



(a) 1st Quintile of Wealth

(b) 4th Quintile of Wealth

Figure 12: Neighborhood Quality by Income and Race, 2015 PSID

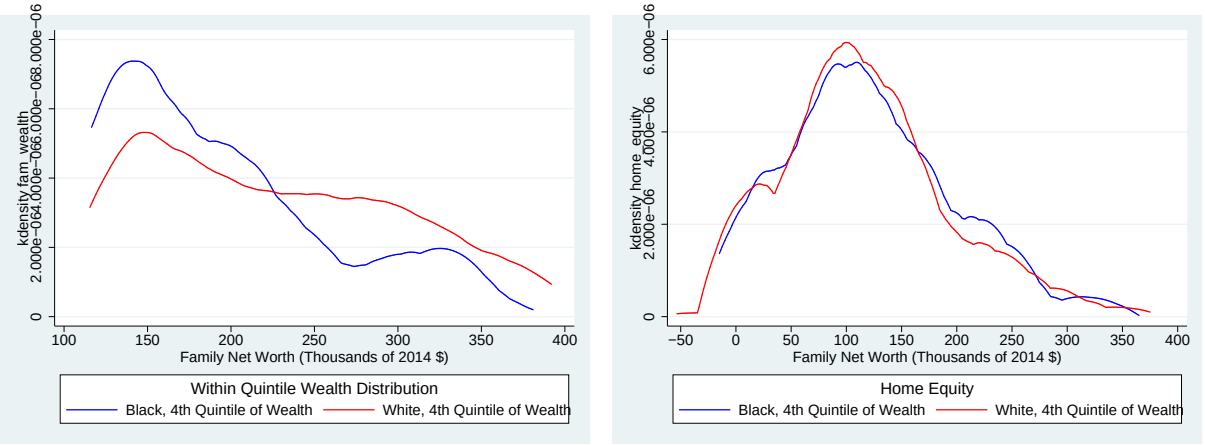
A.4 Measuring Wealth

Turning to the issue of measuring wealth, net worth might be less informative for a family's credit constraints than either total assets or liquid wealth. Two households with identical net worth but different levels of total assets, and therefore debt, might have different access to credit, just based on past access. Similarly, two households with identical net worth but different levels of liquid wealth have different needs for credit. We measure total assets as net worth plus total debt, and we measure liquid wealth as the sum of two asset classes, checkings/savings accounts and stocks. We do not show the results here, but the qualitative results are almost identical regardless of measuring wealth as net worth, total assets, or liquid wealth.

It could also be the case that families within quintiles of wealth are too heterogeneous to be compared, especially across race. Figure 13a shows the distribution of wealth across race in the 4th quintile of wealth, which we use as our high-wealth category. The means for black and white families are, respectively, $155,000 and $180,000.

One might also suspect that high wealth households of different races make different investments into home equity, and that this is somehow driving neighborhood sorting patterns. Figure 13 shows that the distribution of home equity is very similar for black- and white-headed families in the 4th wealth quintile. Homeownership rates are very high among the 4th wealth quintile, and the rates

are (statistically) identical by race.



(a) Net Worth

(b) Home Equity

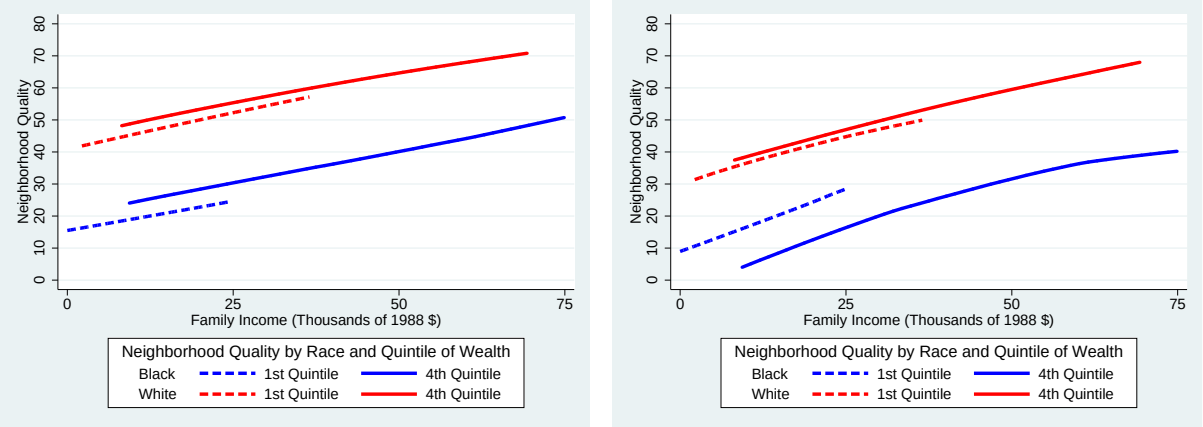
Figure 13: Net Worth and Home Equity by Income and Race, 2015 PSID

B Robustness: The 1989 Wave of the PSID

In order to test whether our result reflects a new trend in sorting due to the Great Recession, we replicate the previous analysis using the 1990 decennial Census together with the 1989 wave of the PSID. We find almost identical results to those using the 2012-2016 ACS and 2015 wave of the PSID: In the 1989 wave of the PSID wealth had little role on sorting into neighborhood quality once accounting for race and income.

The first column of Table 5 shows results from estimating Equation 4 using the 1990 decennial Census and the 1989 wave of the PSID. The first column shows coefficients estimated on the sample of all families in the 1989 PSID with a black or non-Hispanic white head. To "impose" common support, the sample is restricted to families with incomes between the 10th and 90th percentiles of the within-wealth-quintile black income distribution. The coefficient on black head of household is –25, which indicates that black families live in neighborhoods that are, on average, 25 percentile points worse than white families.

The second column of Table 3 shows results from estimating Equation 4 on this 1989 PSID sample that is further restricted to families with children 18 or under and whose head is less than 60 years old. In the 1989 PSID the coefficient changes even less due to the sample restriction, declining in magnitude only to –24. Figure 14b displays these results graphically.



(a) All Families

(b) Families with Kids and a Young Head

Figure 14: Neighborhood Quality by Race, Income, and Wealth, 1989 PSID

Table 5: Neighborhood Quality Regressions

	All Households	Restricted Sample
Black Head of Household	–25.1	–23.6
	(2.1)	(2.9)
Family Income	5.1e-4	5.0e-4
	(6.1e-5)	(9.8e-5)
Family Income^2	–1.5e-9	–2.0e-10
	(6.8e-10)	(1.1e-9)
Family Wealth	3.7e-5	5.6e-5
	(5.2e-6)	(9.1e-6)
Family Wealth^2	–5.8e-12	–8.1e-12
	(9.8e-13)	(2.2e-12)
Black×Family Income	–1.6e-4	2.8e-4
	(1.5e-4)	(2.1e-4)
Black×Family Income^2	2.2e-9	–4.1e-09
	(2.4e-9)	(2.8e-09)
Black×Family Wealth	3.3e-5	9.2e-5
	(1.9e-5)	(6.7e-5)
Black×Family Wealth^2	–5.3e-12	–3.2e-12
	(4.0e-12)	(2.7e-11)
Family Income×Family Wealth	–2.7e-10	–3.2e-10
	(6.9e-11)	(1.2e-10)
Number of Kids $\leq$18		1.2
		(0.7)
Age of Head of Household		–0.2
		(6.1e-2)
Constant	40.7	36.9
	(1.2)	(3.1)
R^2	0.29	0.37
N	4,400-4,500	2,000-2,100

Note: Results using 1990 decennial census data and the 1989 wave of the PSID. Restricted Sample is the set of households with kids 18 or under in the household and headed by someone less than 60.

Table 6 shows the coefficient on the black indicator when Equation 4 is estimated with Q_i measured as each individual component of our index. Again for the 1989 wave, just as we saw in the 2015 wave of the PSID, no single variable drives our results on the relationship between neighborhood quality, race, income, and wealth. Most of the neighborhood characteristics yield results similar to the penalty of 25 percentile points in neighborhood quality for having a black family head.

Table 6: Neighborhood Characteristic Regressions

Coefficient on Black Household Head for Percentile of	All Households
Poverty Rate	–24.4
	(2.1)
Share of Single-Headed HHs	–25.4
	(2.1)
Unemployment Rate	–27.8
	(2.1)
Employment-to-Population Ratio	–22.7
	(2.2)
HS Attainment Rate	–22.5
	(2.1)
BA Attainment Rate	–16.4
	(2.2)

Note: Percentile is of national distribution of neighborhood characteristic in the 1990 decennial census.

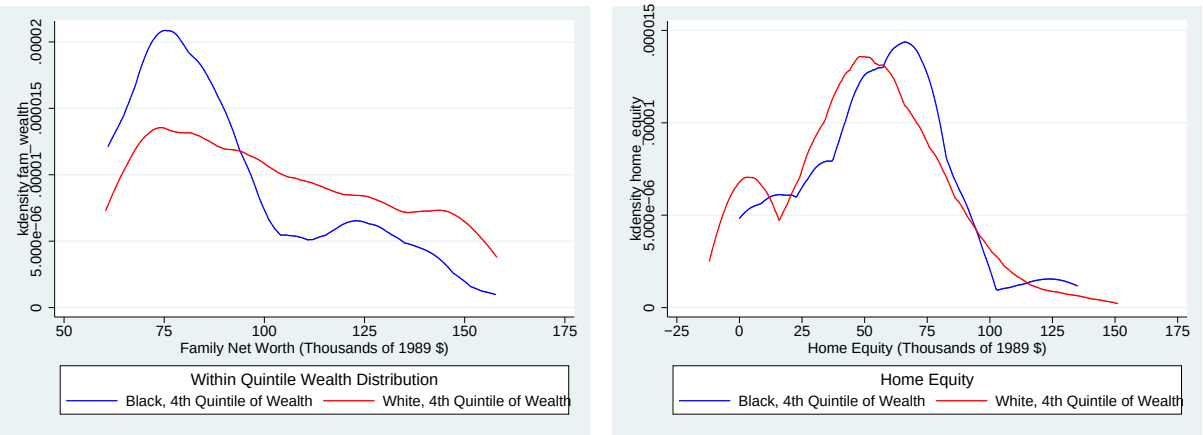
Turning to the possibility that the relationship between race, income, wealth, and neighborhood quality is blurred by the limited number of high income and high wealth black families we observe in the data, Figure 15 shows means within $10,000 income bins by race and wealth quintile. Figure 15b shows the area of concern for having a limited sample size, high income and high wealth black families. Each $10,000 income bin with a dot shown has at least 15 families to prevent indirect data disclosure. When the cell size is decreased to 10 families, which is not shown here, we see that the variance of neighborhood quality for high income, high wealth black families is higher than it is for their white counterparts. However, the relationship characterized by the curve in Figure 15b accurately characterizes the mean relationship.

(a) 1st Quintile of Wealth

(b) 4th Quintile of Wealth

Figure 15: Neighborhood Quality by Race, Income, and Wealth, 1989 PSID

Figure 16a shows again that within wealth quintile differences in wealth across race are unlikely to drive our results. Homeownership rates are very high among the 4th wealth quintile and (statistically) identical across race. Figure 16b shows that in the 1989 wave of the PSID, just as in the 2015 wave, home equity was very similar across race in the 4th quintile of wealth.



(a) Net Worth

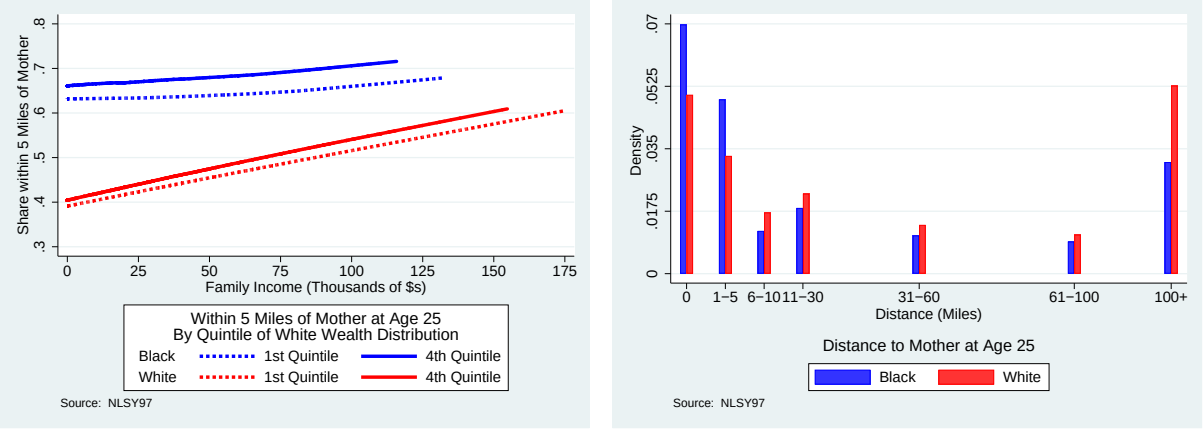
(b) Home Equity

Figure 16: Net Worth and Home Equity by Race, Income, and Wealth, 1989 PSID

C Additional Evidence on Race-Specific Location Preferences

C.1 The National Longitudinal Survey of Youth 1997 (NLSY97)

We present further evidence that conditional on income and wealth, blacks and whites have different locational preferences. We look first at data from the National Longitudinal Survey of Youth 1997 (NLSY97), a nationally-representative longitudinal survey of individuals born between 1980 and 1984. At age 25 in the NLSY97, black respondents were more likely than their white counterparts to live within five miles of their mother, conditional on both income and wealth (Figure 17a). A greater share of white respondents lived many ($\geq$ 100) miles from their mothers (Figure 17b).



(a) Shares Living within 5 Miles

(b) Distributions over Distance

Figure 17: Distance to Mother at Age 25, NLSY97

C.2 2012-2016 American Community Survey (ACS)

We next look at anonymized individual-level data from the 2012-2016 wave of the ACS drawn from IPUMS-USA. Figure 18 shows that black individuals "pay" for the locational preference, including that of being near their mothers, by spending more time traveling to work, even conditional on income. This result provides suggestive evidence that high-income households' neighborhood sorting is not driven by access to employment (Ellen et al. (2013)). The estimates in Figure 18 are precise, even for high income African Americans, since the IPUMS ACS sample has more than 15 million individuals.

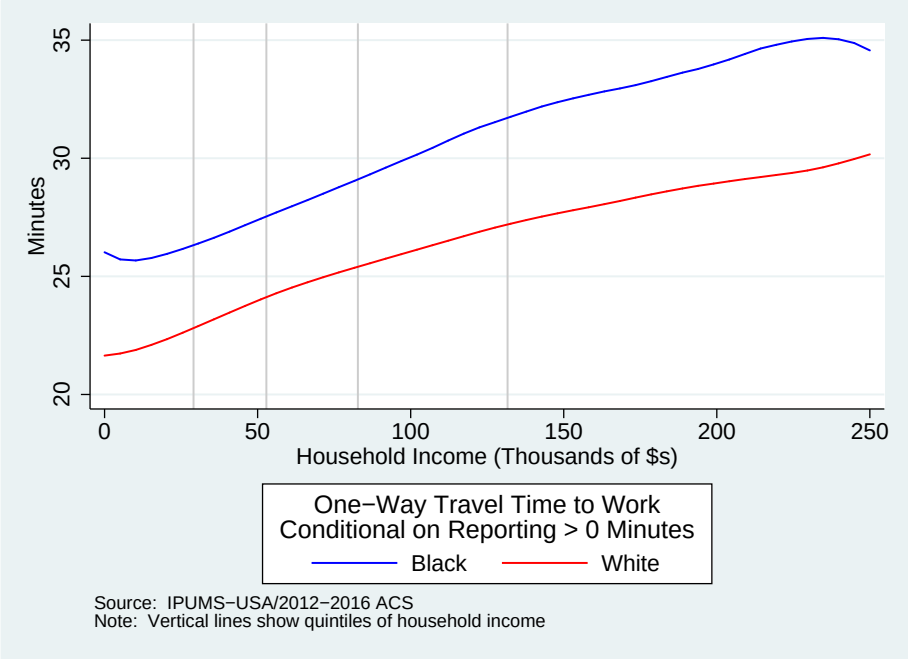
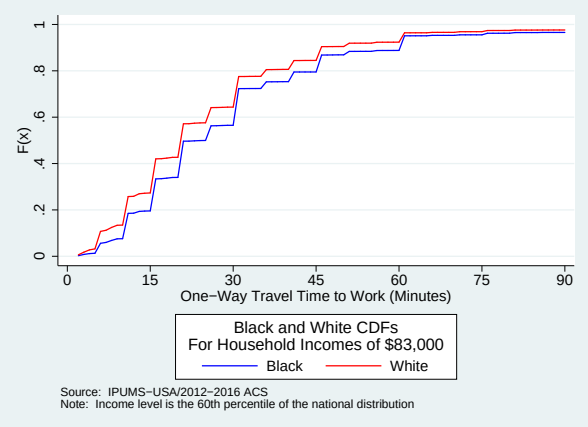


Figure 18: One-Way Travel Time to Work, 2012-2016 ACS

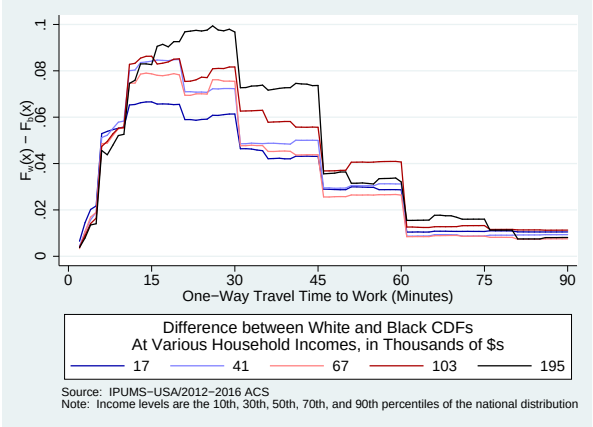
Digging into the cross section of travel to work times in Figure 18, Figure 19a shows the empirical CDFs of travel to work times for black and white households within $2,500 of the income separating 3rd and 4th quintile households, $78,000. To more clearly show where differences in black and white distributions occur, Figure 19b shows differences between the white and black CDFs in $5,000 bins centered at each of the incomes separating quintiles. This figure shows, for a given income, a value on the y-axis indicating the additional share of black households with a longer travel time than the time on the x-axis.

The qualitative patterns in Figure 19b are similar across income levels. The big increases around 5 and 10 minutes, combined with the drop-off at 30 minutes, indicate that many more African Americans than white Americans have travel times of 30 minutes rather than 5 or 10 minutes. We might interpret the drop-offs at 45 and 60 minutes similarly; many more African Americans have commutes of 45 or 60 minutes rather than 30 minutes.

The levels in Figure 19b, however, are clearly differences across income levels. The largest differences in travel time are seen for the highest income households. The highest income households are also clear exceptions between 30-60 minutes, with larger differences in CDFs than for any other income level. There is also variation in differences between 0-30 minutes that is not monotonic in income. Figure 20 shows more detail on precisely how differences in travel time are increasing in income.

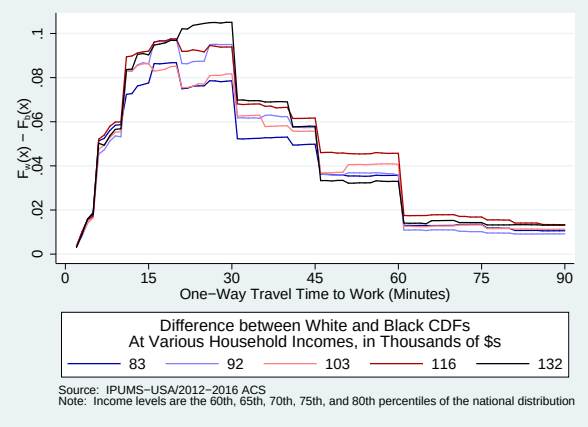


(a) CDFs

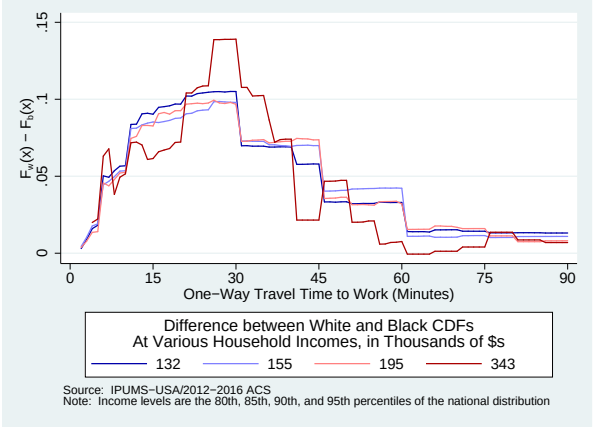


(b) Differences at Quintile Cutoffs

Figure 19: Census Data



(a) 60th-80th Percentiles of Household Income

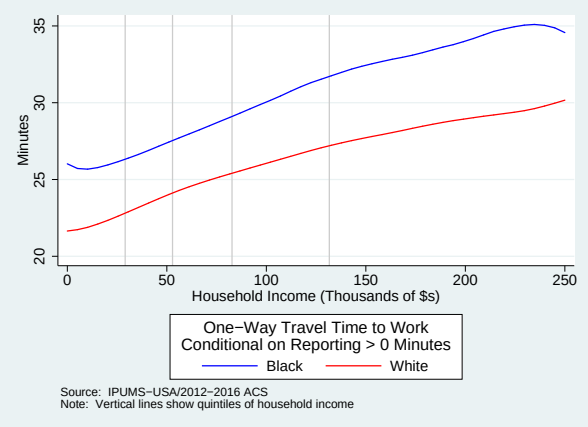


(b) 80th-95th Percentiles of Household Income

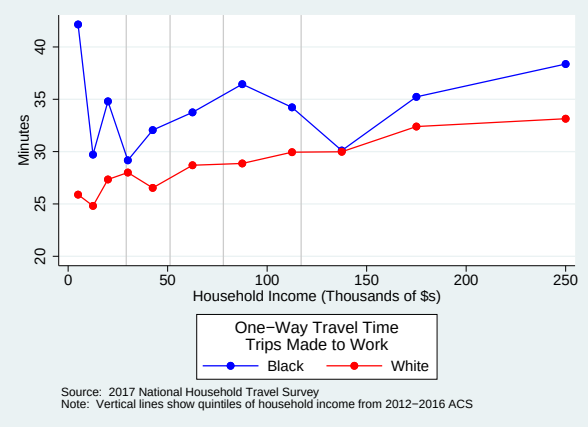
Figure 20: Census Data

C.3 2017 National Household Travel Survey (NHTS)

Finally, we look at data from the 2017 National Household Travel Survey (NHTS). The evidence from the NHTS is noisier than either the NLSY97 or the IPUMS 2012-2016 ACS, and this is one reason for the difficulty of using these data to test for the relationship between neighborhood sorting and social isolation (Wang et al. (2018)) or consumption segregation (Davis et al. (2019)). We first compare results from the 2017 NHTS with the IPUMS census data in Figure 21, and find that the NHTS is noisier but qualitatively similar. Figures 22a - 23b show that black and white respondents in the NHTS tend to spend similar amounts of time on trips made for doing household chores, picking up meals, buying goods or services, and picking someone up. This is especially true within the first 4 quintiles of income. One notable exception is that black respondents in the fifth quintile of income tend to spend much more time on trips picking someone up.

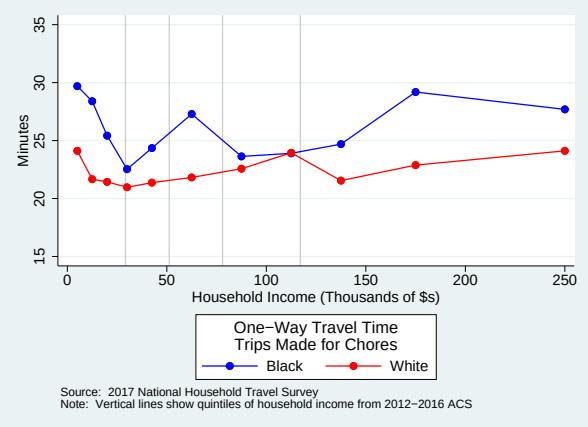


(a) IPUMS/ACS 2012-2016

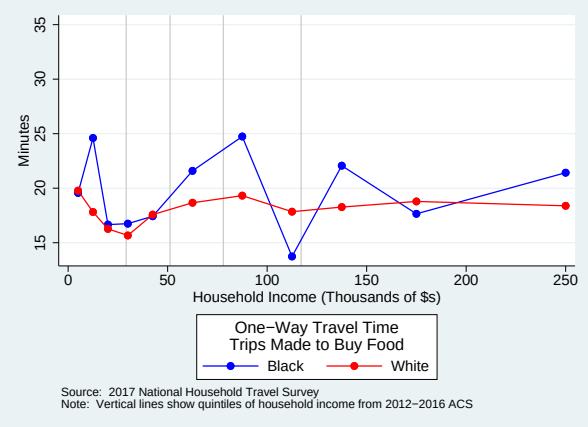


(b) NHTS

Figure 21: Travel Times to Work

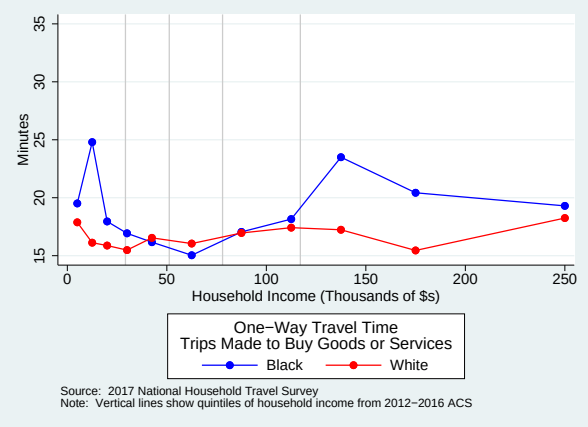


(a) Trips Made for Chores

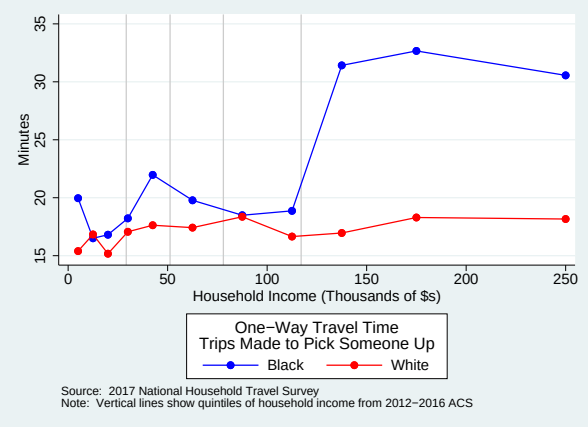


(b) Trips Made to Buy Food

Figure 22: Travel Times in the 2017 NHTS



(a) Trips Made to Buy Goods or Services



(b) Trips Made to Pick Someone Up

Figure 23: Travel Times in the 2017 NHTS

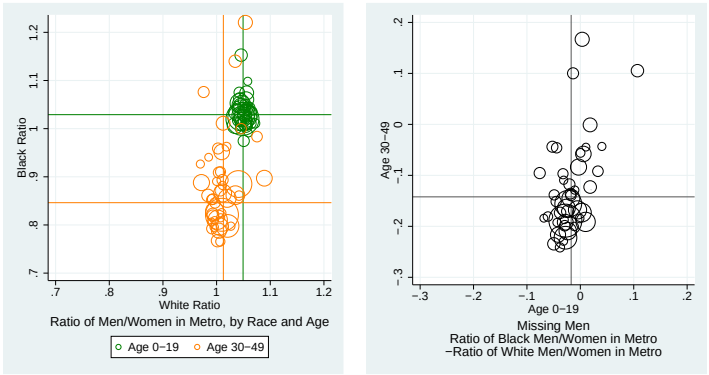
D Missing Men

A widely known empirical fact in the development literature pertains to the phenomenon of "missing women." Amartya Sen noted in 1990 that differences in sex ratios in many countries indicated that about 100 million women were missing (Sen (1990), Sen (1992)). The gap in observed and expected sex ratios of men and women are thought to be driven by son-preference and the implied greater care for male over female well-being. Specific practices along these lines include sex-selective abortions, female infanticide, and lower levels of resources devoted to the healthcare and nutrition of female children.

Bronars (2015) notes a remarkable finding of similar patterns in the US. However, Bronars (2015)'s finding pertains to the absence of prime-age black men. Bronars (2015) finds a low ratio of black men to black women in US Census data, suggesting that 18 percent of prime-age black men are "missing" in the largest metros. Bronars (2015) finds that half of prime-age black men are missing in Ferguson, Missouri.

We can imagine five reasons for observing such a low sex ratio for African Americans. The first is exposure to violence and homicide (Sharkey and Friedson (2019), Aliprantis and Chen (2016)). A second is incarceration, since the Census covers only non-institutionalized individuals. A third explanation is homelessness. The final two explanations are more innocuous; those serving in the armed forces are not included in the Census, and response rates may simply be lower for black men relative to white men.

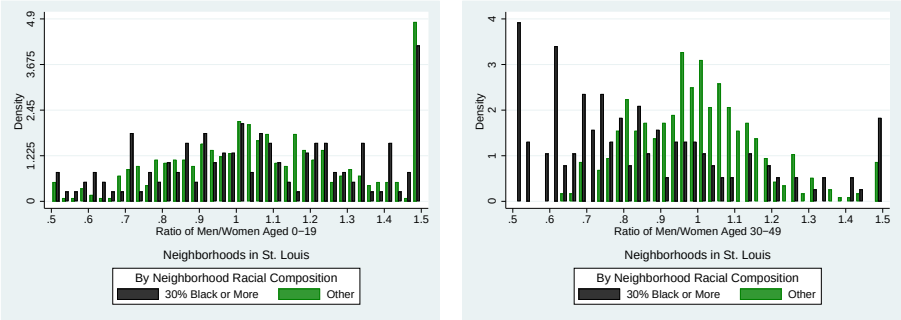
Using the individual-level 2012-2016 ACS data available from IPUMS, we can look at the phenomenon of missing men by metro. We first drop those metros in the lowest 10 percent in terms of black population, whether in absolute terms or relative to the overall metro population. Figure 24a shows that the sex ratios at ages 0-19 are broadly consistent with the sex ratios at birth documented across the world (Mathews and Hamilton (2005)). While the black and white sex ratios at age 0-19 are similar, it is worth noting that the mean ratio in our sample of 46 metros is 2 percent lower for blacks than for whites. Figure 24b shows that this difference in means grows to 14 percent for age 30-49 among the metros in our sample.



(a) Sex Ratios (b) Differences in Sex Ratios

Figure 24: Missing Men, by Metro in the 2012-2016 ACS

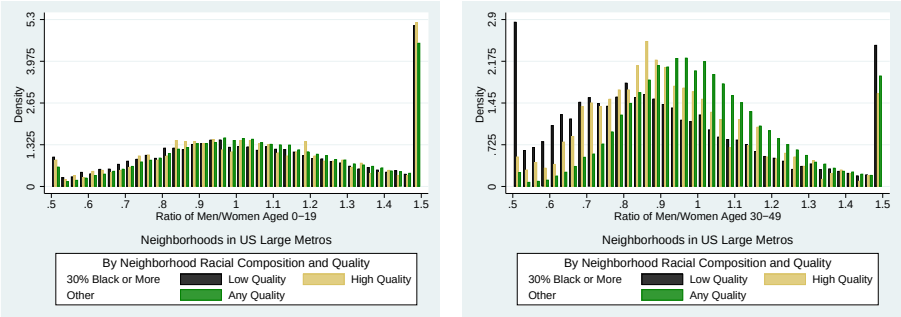
Using the tract-level 2012-2016 ACS data available from the NHGIS, we can look at the phenomenon of missing men by neighborhoods in our sample of metros. We first reproduce the results on St. Louis from Bronars (2015). Figure 25a shows that among 0-19 year olds, the sex ratios in black neighborhoods (here defined as in the text as 30 percent black or more) is similar to those observed in neighborhoods with any other type of racial composition. Figure 25b shows that in many black neighborhoods, the sex ratio of men to women for 30-49 year-olds is around 0.5. Moreover, the distribution of sex ratios in black neighborhoods in St. Louis is not centered around 0; the distribution is skewed strongly to the left.



(a) Age 0-19 Sex Ratios in St. Louis (b) Age 30-49 Sex Ratios in St. Louis

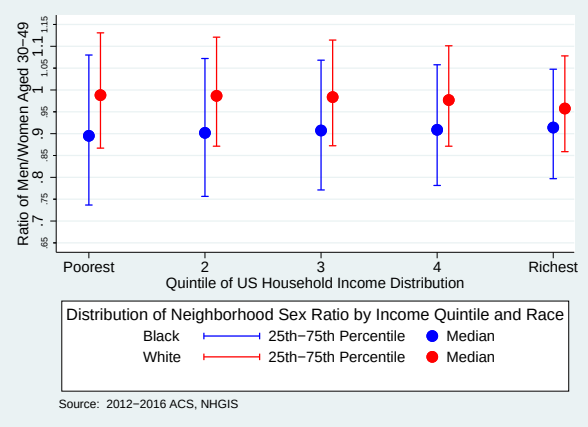
Figure 25: Missing Men, by Tract in the 2012-2016 ACS

We continue a similar analysis for the entire US in Figure 26, although now the sample of black neighborhoods is split into high- and low-quality neighborhoods based on whether they are above or below median quality. Figure 26a again shows that across all three neighborhood types, the sex ratios of men to women is similar for 0-19 year-olds. For 30-49 year-olds, in the entire US we see a pattern similar to the one documented in St. Louis: The distribution of neighborhood sex ratios is highly skewed to the left for black neighborhoods. What we notice here, however, is that high-quality black neighborhoods have sex ratios much closer to those of all other neighborhoods. This is suggestive that perhaps the difference between the green and gold distributions is driven primarily by differential response rates across race, while the further difference between the gold and black distributions is driven by the first three mechanisms discussed earlier in this section.

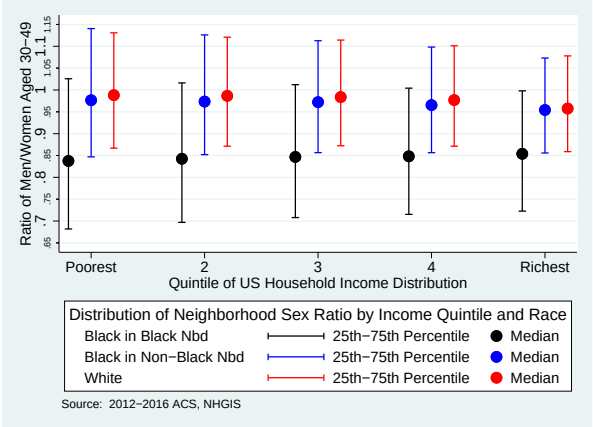


(a) Age 0-19 Sex Ratios in the US (b) Age 30-49 Sex Ratios in the US

Figure 26: Missing Men, by Tract in the 2012-2016 ACS

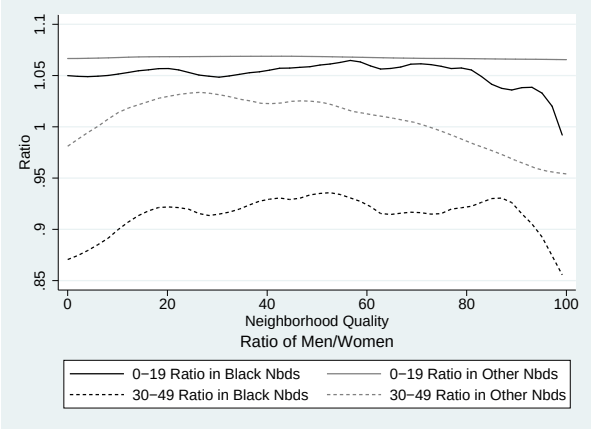


(a) Age 30-49 Sex Ratios in the US



(b) Age 30-49 Sex Ratios in the US

Figure 27: Tract-Level Exposure to Missing Men, by Household Income in the 2012-2016 ACS



(a) Age 30-49 Sex Ratios in the US

Figure 28: Missing Men, by Neighborhood Type in the 2012-2016 ACS

E Neighborhood Quality and Neighborhood Opportunity

There are reasons to exercise caution when focusing on a single dimension to characterize neighborhood quality (Aliprantis (2017), Chetty et al. (2018)).

Figure 29 shows that it is reasonable to focus on the first principal component alone, and Table 7 shows that the coefficients on the variables are relatively similar.

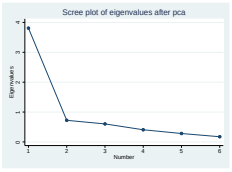


Figure 29: Scree Plot of Eigenvalues

Table 7: Coefficient for First Principal Component

Characteristic	Princ Comp	Characteristic	Princ Comp
Poverty Rate	0.45	Emp-to-Pop Ratio	0.35
HS Grad Rate	0.44	Unemp Rate	0.39
BA Attainment Rate	0.43	Share Single-Headed HHs	0.39

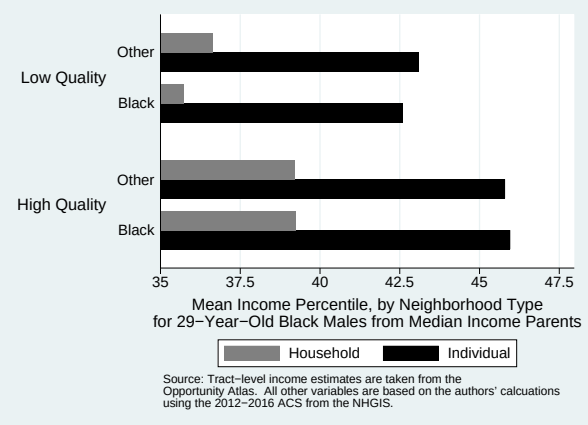
Note: See the text for further details.

Chetty et al. (2018) analyze data for children born between 1978 and 1983.

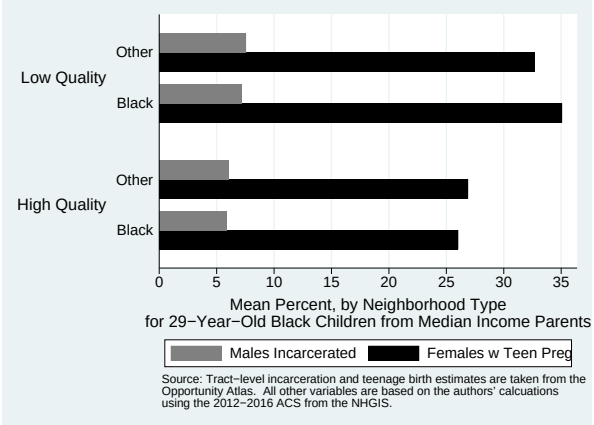
For census tracts with sufficient data, they provide estimates of mean outcomes for children of a given race, gender and with parents at a given percentile in the national household income distribution.

They are able to link Census data from 2000 forward to federal income tax returns from 1989-2015.

these estimates represent the expectation of each outcome conditional on growing up from birth in a given tract. MEASUREMENT? Weight children in each tract-level regression by fraction of childhood (up to age 23) spent in that tract

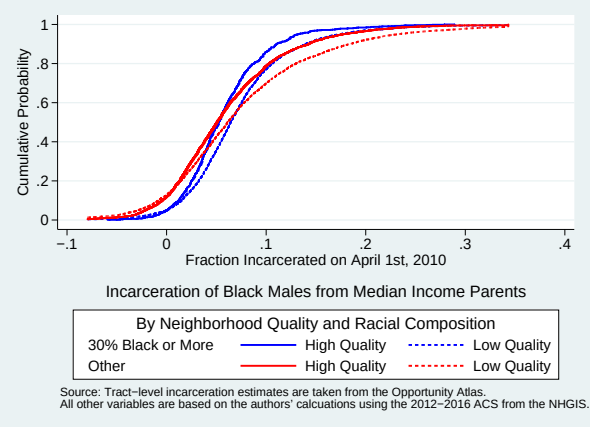


(a) Incarceration and Teen Births

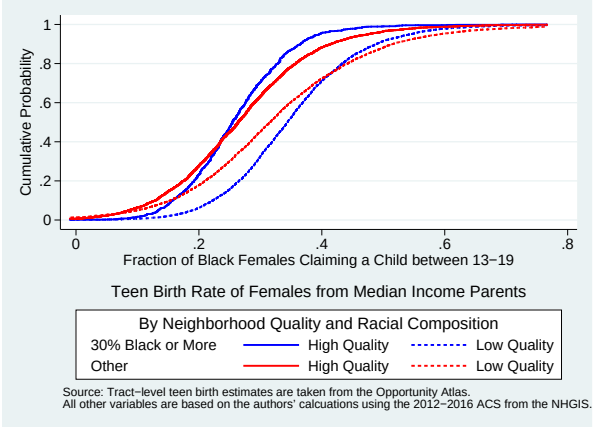


(b) Income

Figure 30: Incarceration and Teen Births

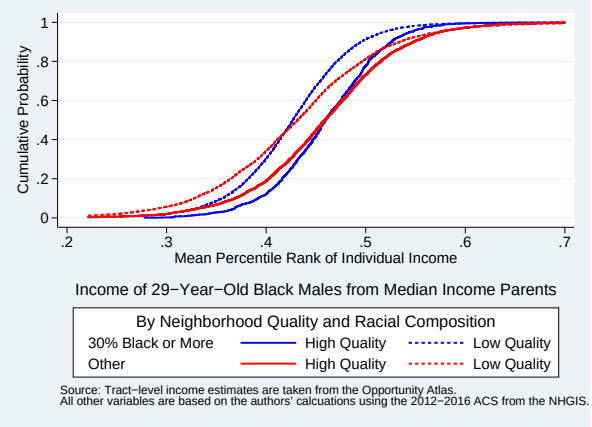


(a) Incarceration

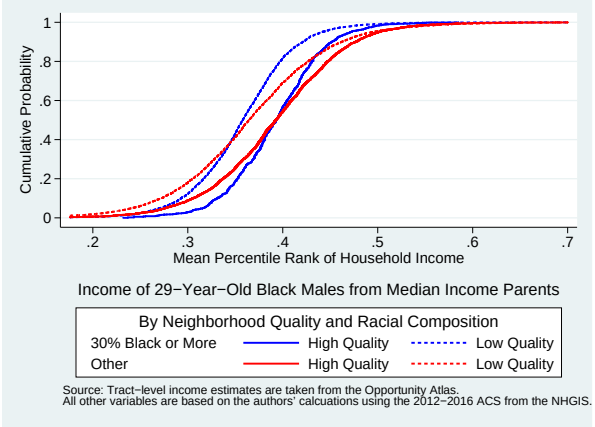


(b) Teen Births

Figure 31: Incarceration and Teen Births



(a) Individual Income



(b) Household Income

Figure 32: Labor Market Outcomes