Analyzing the effects of residential segregation on socioeconomic outcomes among minorities.

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Abstract: Residential segregation is the spatial sorting of individuals into different neighborhoods based on differences in race, ethnicity or class. The detrimental effects of such segregation on socioeconomic outcomes experienced by minorities have been widely documented. Following Cutler and Glaeser (1997) and Flaherty (2012) I use measurements of residential segregation via dissimilarity indices to determine whether, in 2010, individuals in Metropolitan Statistical Areas with higher degrees of segregation fare better or worse with regard to income, employment, educational attainment and unmarried motherhood than those in MSAs with lower segregation. Results obtained using Probit, OLS and 2SLS regressions reaffirm the continuing and detrimental effects of segregation on minorities, as previously observed by Cutler & Glaeser and Flaherty. I find that (1) segregation could be beneficial to non-Hispanic Whites in some cases and (2) relative to Whites, non-Hispanic Blacks and Hispanics fare worse off in areas with higher segregation.

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Introduction

Residential segregation is the spatial sorting of individuals into different neighborhoods based on differences in race, ethnicity or class. Segregation has greatly influenced residential patterns in urban America and is most visibly manifest in the form of the ghetto. Residential segregation concentrates deleterious neighborhood conditions such as high poverty and crime into predominantly minority neighborhoods in inner cities, subsequently producing adverse effects on the incomes, educational attainment, and health of minority residents. Segregation also works to isolate minority groups both politically and culturally, which further limits their ability to escape such detrimental socioeconomic environments (Massey and Denton 1993). The detrimental effects of such segregation on socioeconomic outcomes experienced by minorities have been widely documented. Census data analyzed by Cutler and Glaeser indicated that, all else equal, Blacks living in more segregated metropolitan areas in 1990 had on average lower incomes, lower rates of employment, lower educational attainment, and higher rates of single motherhood (Cutler & Glaeser 1997). Adopting a similar empirical approach while using data from the 2000 Census, Flaherty found that segregation generated similar adverse effects on both non-Hispanic Blacks and Hispanics (Flaherty 2012). Furthermore, the adverse effects of segregation on individual health outcomes as well as metropolitan-level inequality have also been documented (Do 2008; Ananat 2011). This paper seeks to examine whether such detrimental effects of segregation continue to be observed using American Community Survey data from 2006 through 2010.

The remainder of this paper is organized as follows: Part I offers a brief outline of the development of residential segregation in the United States. Part II explains how segregation is measured. Parts III & IV present the methodology and results of my empirical study of the

effects of segregation on individuals' socioeconomic outcomes, including educational attainment, income, idleness and single motherhood[1]. Finally Part VI offers some concluding notes on residential segregation.

I. History of Segregation

Historical studies reveal that spatial isolation of Blacks was not the norm in American cities prior to the 1900s. Massey and Denton (1993) argue that if the disadvantaged conditions of Blacks in the nineteenth century can be attributed to segregation, it is not to residential segregation but to segregation in employment, which translated to lower incomes and subsequently poorer housing for Blacks. In the North a small number of Blacks were scattered among white neighborhoods, and Blacks who were able to overcome obstacles in obtaining employment were generally able to acquire a residence befitting their status. Prior to the Emancipation Proclamation, urban slaves in the South had been intentionally dispersed by Whites in order to prevent the formation of a cohesive African American society (Massey and Denton 1993). Table 1 shows the levels of segregation in various U.S. cities, as measured by the dissimilarity index. The dissimilarity index represents the proportion of the minority population in a city that would need to move in order to achieve a uniform ratio of Whites to minorities across all neighborhoods in that city.[2] In 1860, black-white dissimilarity indices averaged 45.7 in the North, and a mere 29.0 in the South (Massey and Denton 1993).

Massey and Denton attribute the emergence and persistence of segregation to a combination of structural transformation of the inner city and racist attitudes prevalent among white individuals and within institutions. At the turn of the century, rapid industrialization in the

[1] Idleness is defined as being neither employed nor enrolled in school.
[2] The exact specification of the dissimilarity index is provided in the second section.

North and unprecedented levels of black migration from South to North dramatically altered the urban environment, setting the stage for the rise of residential segregation. Industrialization brought about new urban residential patterns, as housing for workers clustered around factories and plants in inner cities. European immigrants in the working class viewed Blacks as economic competitors, and the subsequent enmity that emerged between the two groups severely limited the integration of Blacks into labor organizations as well as in broader society (Massey and Denton 1993).

Table 1 Trends in segregation in major metropolitan areas.

	Dissimilarity						
City	1860	1910	1940	1950	1960	1970	1980
North							
Boston	61.3	64.1	86.3	86.5	83.9	79.9	77.6
Chicago	50	66.8	95	89.5	86.5	84.2	87.8
Indianapolis	57.2		90.4	91.4	91.6	88.3	76.2
New York	40.06		86.8	87.3	79.3	73	82
Philadelphia	47.1	46	88.8	89	87.1	83.2	78.8
St. Louis	39.1	54.3	92.6	92.9	90.5	89.3	81.3
Average	45.7	59.2	87	88.4	85.6	81.7	80.1
South							
Baltimore	22.1		90.1	91.3	93.6	91.5	74.7
Charleston	23.2	168	60.1				
Jacksonville		39.4	94.3				
Nashville	43.1		86.5				
New Orleans	35.7		81	84.9	86.3	83.1	68.3
Average	29	38.3	81	90.1	91.9	89.1	68.3

Source: Massey & Denton, *American Apartheid* 1993

The collapse of the cotton industry between 1913 and 1916 fueled an unprecedented black migration to the North, while increased demand for production during the First World War further increased the demand for black laborers. Increasing racial tensions burst into a wave of racial violence in the late 1910s, leading well-off northern Blacks who had previously resided in affluent, integrated neighborhoods to seek safety by migrating to predominantly black areas in

inner cities. At the same time Whites residing in neighborhoods with significant black populations increasingly moved to predominantly white areas. Although Whites largely abandoned violent means of subjugation by 1920, racial prejudice in local and federal institutional practices facilitated the persistence of discrimination in the housing market. Blacks' access to housing in white neighborhoods was now constrained by neighborhood improvement associations and restrictive covenants enforced by white controlled real estate boards.

Even the federal government lent its power and prestige to the promotion of segregation. The Homeowners Loan Corporation (HOLC), established in 1933 to help Americans refinance home mortgages, systematically and invariably redlined black neighborhoods by deeming ghetto residences "within such a low price or rent range to attract an undesirable element." Neighborhood ratings produced by HOLC were adopted by private banks and financial institutions, as well as in subsequent federal programs administered by the Federal Housing Administration (FHA) and Veteran Affairs (VA). Consequently Blacks were deprived of resources that would enable them to secure better housing. The color line in residential patterns solidified, and the homogeneous black ghetto emerged. By the 1930s, Blacks were less than half as likely to come in contact with Whites as they were in 1860. By 1940 the average dissimilarity index had soared to 87, almost doubling the 1860 value of 45.7 (Ira Berlin, 1974, Taeuber and Taeuber; cited in Massey and Denton 1993).

The advent of the Second World War further increased the demand for labor in the North, and intensified black migration to northern cities. The FHA and VA pumped millions of dollars into the housing industry after the Second World War. However, suburbs and predominantly white areas received up to sixty times more credit per capita than inner cities and predominantly black areas, facilitating rapid white flight into the suburbs and the simultaneous downward spiral

of black communities. By 1950, the average black-white dissimilarity in northern cities averaged 88.4 while in southern cities they averaged 90.1 (Sorensen, Taeuber & Hollingsworth, 1975; cited in Massey and Denton 1993).

Average levels of residential segregation among northern cities peaked in 1950and in 1960 for southern cities. Dissatisfaction with white prejudice and the disadvantaged position of Blacks in society led to a series of violent urban riots across the United States in the 1960s. The subsequent passage of the Fair Housing Act in 1968 initially provided hope for desegregation of urban communities, but fundamental weaknesses in the legislation, combined with persistent prejudiced attitudes among Whites severely limited racial progress in the following decades.

The average dissimilarity score declined after the 1970s, but has persisted at moderate to high levels. In 1990 it averaged 66 across the United States, and in 2000 it averaged 62. This decline in segregation resulted from the integration of formerly all-white census tracts, rather than the integration of overwhelmingly black urban areas (Cutler, Glaeser and Vigdor 2001). Data obtained from the University of Michigan's Population Studies Center website indicate that across the 101 largest metropolitan areas in the United States, black-white dissimilarity averaged 60.7 in 2010.

II. Measuring Segregation

Segregation is measured at the MSA level using a dissimilarity index, which measures the extent to which Blacks and Whites are unevenly distributed across neighborhoods in a city.[3] It is formulated as follows:

[3] MSAs are named for their central cities but also include surrounding areas; for example, the Lancaster MSA covers Lancaster County. For the purposes of this paper, I use Metropolitan Statistical Areas (MSAs) and cities interchangeably

$$Black - White\ Dissimilarity = \frac{1}{2}\sum_{i=1}^{n}\left|\frac{Black(i)}{Black} - \frac{White(i)}{White}\right|$$

Source: Cutler & Glaeser "Are Ghettos Good or Bad" 1997

When measuring Black-White segregation, *Black(i)* in the equation represents the number of non-Hispanic Black individuals in tract *i*, and *White(i)* represents the number of non-Hispanic Whites in in tract *i*. *Black* represents the total number of non-Hispanic Blacks in the city or MSA, while *White* represents the total number of Non-Hispanic Whites. The index ranges from 0 to 1, and its value represents the proportion of the minority population that would have to move in order to achieve identical ratios of Whites to non-Whites in each neighborhood in the city. For example, a value of .6 (written as 60) would indicate that 60% of the black population would have to move for the black-white ratio in to be equal in each neighborhood. Higher levels of unevenness yield higher values on the dissimilarity index. Complete segregation would yield a value of 1, while perfect integration would yield a value of 0.

The figures below represent four hypothetical cities, with four neighborhoods each. Each city contains 180 Whites and 60 Blacks for a total of 240 residents, and the distribution of Blacks and Whites into neighborhoods varies in each city. City 1, which has 15 Blacks and 45 Whites in each neighborhood, is an example of perfect integration. Such a distribution yields a value of 0 on the dissimilarity index as the ratio of the black population to the white population in each neighborhood is the same.

City 1
d= 0

45W **15B**	45W **15B**
45W **15B**	45W **15B**

Perfect Integration

City 2
d= 0.33

60W	40W **20B**
40W **20B**	40W **20B**

Low Segregation

City 3
d= 0.66

60W	60W
30W **30B**	30W **30B**

High segregation

City 4
d= 1

60W	60W
60W	**60B**

Complete Segregation

City 2 has 20 Blacks and 40 Whites each in three neighborhoods, and 60 Whites and 0 Blacks in one neighborhood. The dissimilarity index here is 0.33, meaning that a third of the black population would have to move to achieve identical ratios of Blacks to Whites in all neighborhoods. Similarly the dissimilarity indices for City 3 and City 4 are 0.66 and 1, respectively.

We can simulate the effect of segregation on neighborhood poverty rates. Assuming a city-wide poverty rate of 20% among Blacks and of 10% among Whites, a calculation of neighborhood poverty rates in each neighborhood of City 1 yields a value of 12.5%. Since the proportion of Blacks and Whites are the same in each neighborhood, each individual in the city experiences the same overall poverty rate in his or her neighborhood. In City 2, the neighborhood poverty rate in the three neighborhoods where Blacks reside is 13.33%, while the neighborhood poverty rate in the exclusively white neighborhood is 10%. The average neighborhood poverty rate experienced by Whites in City 2 is 12.22. Similar calculations for City 3 yield average neighborhood poverty rates of 15% for Blacks and 11.66% for Whites. In City 4 the respective rates are 20% and 10%.

Clearly residential segregation exposes Blacks and Whites to very different neighborhood environments. Given that Blacks and Whites experience disparate outcomes to being with, residential segregation works to exacerbate that disparity. The greater the degree of residential

segregation by race, the greater is the disparity between neighborhood environments experienced by Blacks and Whites, such as neighborhood poverty rates. In the next section, I attempt to empirically measure the extent to which segregation affects such disparities.

III. Empirical approach

In examining whether segregation exhibits adverse effects on the social and economic outcomes of minorities, I have adopted an empirical strategy similar to that of Cutler and Glaeser (1997) and Flaherty (2012). I seek to determine whether variations in the socioeconomic outcomes experienced by minority individuals can be explained by the level of segregation in the city in which they reside. Thus the dependent variables are measured at the individual level, while the explanatory variables include metropolitan characteristics as well as dummy variables pertaining to the individual's demographic characteristics. The minority groups in question are non-Hispanic Blacks and Hispanics, and for the remainder of this paper I shall use Blacks to mean non-Hispanic Blacks, and Whites to mean non-Hispanic Whites. Outcomes measured include high school graduation, college graduation, unmarried motherhood, idleness and (log of) earnings. The regression equation is given by

$$Individual\ Outcome = X\beta_0 + \beta_1\ segregation + \beta_2\ segregation * minority + \varepsilon, \qquad (1)$$

The coefficient β_1 measures the effect of segregation on outcomes experienced by all individuals in an MSA. If β_1 is positive and significant, it indicates that on average individuals living in cities with higher segregation are more likely to experience the given outcome, ceteris paribus. The coefficient β_2 represents the specific effects of segregation on Blacks and/or Hispanics. If β_2 is positive and significant, it indicates that on average, minorities in cities with higher segregation are more likely to experience the given outcome. X is a vector of control

variables that includes metropolitan characteristics (log of MSA population, log of median earnings, percent minority in MSA population, percent in MSA employed in manufacturing, fiscal instruments) as well as demographic characteristics (Black=1/Hispanic=1, female=1).

Two difficulties arise when attempting to determine the effect of segregation on outcomes. First, it is possible that segregation itself is a result of poor outcomes among minority residents, which raises the possibility of endogeneity in the above model. Second, it is also possible that individuals have preferences for cities with higher or lower segregation and migrate in accordance with those preferences. This would cause the coefficient estimates to be biased. To correct for the problem of inter-city migration I have limited my population sample to young individuals between 18 and 30 years old, for whom the effects of inter-city migration based on segregation are likely to be minimal.

To deal with the problem of endogeneity, I use two-stage least squares, employing two city-level instruments that can influence segregation, but are unlikely be influenced by poor minority outcomes. I have followed Cutler and Glaeser's as well as Flaherty's rationale behind using the following instruments. The first instrument is the number of local governments within a given MSA. The number of local governments may affect variations in tax rates and service provision within a city, thus increasing the likelihood of individuals selectively migrating within the city. The number of local governments is expected to be positively correlated with segregation. The second instrument is the share of local revenues coming from intergovernmental sources. Local governments with lower share of intergovernmental revenue are more likely to impose higher taxes on their residents, increasing the likelihood of individuals selectively migrating within the city to take advantage of tax differentials. The share of intergovernmental revenue is expected to be negatively correlated with segregation. To further

reduce the possibility of endogeneity, I use fiscal data from 1962 to obtain these instruments. I use these instruments along with other controls for metropolitan characteristics to first obtain estimates for segregation, as shown below:

$$\textit{Segregation score} = \alpha_0 Y + \alpha_1 \textit{Number of Governments in the MSA} + \alpha_2 \textit{Percent intergovernmental revenue} \quad (2)$$

Y is a vector of control variables that includes metropolitan characteristics (log of MSA population, log of median earnings, percent minority in MSA population, percent in MSA employed in manufacturing). The predicted estimates for segregation are then used in the model given in equation 1. This instrumental variable approach corrects for possible endogeneity in the model.

IV. Results

Individual-level outcomes such as high school graduation, employment status, school enrollment status, single motherhood, and earnings are obtained from the Census Bureau's 5-year Public Use Microdata sample (2006 through 2010) available at the Census Bureau's website. Data for Metropolitan characteristics are obtained from the American Community Survey 2010 5-year data selected economic characteristics, and include the 101 largest MSAs in the United States in 2010. Segregation scores for MSAs in 2010 are obtained from the University of Michigan Population Studies Center website, and then matched to the ACS data using MSA-PUMA crosswalk codes available at the same website.[4] Data on the number of local governments in 1962 and the share of local revenues from intergovernmental sources in 1962 are obtained from the 1962 Census of Governments. Summary statistics are presented in Tables 2 through 5.

[4] PUMAs are Public Use Microdata Areas that are used in the Census Public Use Microdata, containing at least 100,000 individuals. An MSA typically contains several PUMAs.

Table 2 Average Outcomes of the Sample

	18-24			25-30		
Variable	**Black**	**White**	**Hispanic**	**Black**	**White**	**Hispanic**
High school graduation	76.6%	88.4%	76.1%	85.3%	94.6%	82.4%
College graduation	5.2%	39.8%	14.3%	20.5%	44.3%	16.2%
Earnings	7,604.28	11,507.3	9,859.39	21,623.99	34,672.68	25,281.32
Idle	27.4%	11.3%	20.9%	29.6%	14.7%	23.4%
Unmarried Mother	9.4%	2.2%	5.9%	17.9%	2.9%	8.3%

Table 3 Demographic Characteristics of the sample

Demographics	**18-24**	**25-30**
Black	16.34%	14.62%
White	73.36%	77.67%
Hispanic	6.14%	4.80%
Female	49.56%	51.40%
N	589,470	479,294

Table 4 The Most and Least Segregated Cities in 2010

Most segregated cities

Black-White Dissimilarity		Hispanic-White Dissimilarity	
Milwaukee-Waukesha-West Allis, WI	81.52	Springfield, MA	63.40
New York-Northern New Jersey-Long Island, NY-NJ-PA	78.04	Los Angeles-Long Beach-Santa Ana, CA	62.15
Chicago-Naperville-Joliet, IL-IN-WI	76.43	New York-Northern New Jersey-Long Island, NY-NJ-PA	62.00
Detroit-Warren-Livonia, MI	75.25	Providence-New Bedford-Fall River, RI-MA	60.11
Cleveland-Elyria-Mentor, OH	74.14	Boston-Cambridge-Quincy, MA-NH	59.58
Buffalo-Niagara Falls, NY	73.24	Bridgeport-Stamford-Norwalk, CT	59.15
St. Louis, MO-IL	72.30	Hartford-West Hartford-East Hartford, CT	58.36
Cincinnati-Middletown, OH-KY-IN	69.42	Miami-Fort Lauderdale-Pompano Beach, FL	57.36
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	68.41	Milwaukee-Waukesha-West Allis, WI	57.03
Los Angeles-Long Beach-Santa Ana, CA	67.84	Chicago-Naperville-Joliet, IL-IN-WI	56.32

Least segregated Cities

Black-White Dissimilarity		Hispanic-White Dissimilarity	
Colorado Springs, CO	39.26	Provo-Orem, UT	30.85
Las Vegas-Paradise, NV	37.59	St. Louis, MO-IL	30.65
Honolulu, HI	36.93	Colorado Springs, CO	30.26
Tucson, AZ	36.90	Augusta-Richmond County, GA-SC	29.88
Modesto, CA	32.72	Pittsburgh, PA	28.56
Ogden-Clearfield, UT	31.96	Jacksonville, FL	27.59
Albuquerque, NM	30.94	Dayton, OH	27.26
El Paso, TX	30.68	Akron, OH	24.98
Boise City-Nampa, ID	30.16	Palm Bay-Melbourne-Titusville, FL	24.96
Provo-Orem, UT	21.91	Portland-South Portland-Biddeford, ME	23.77

Variable	**Black-White segregation**	**Hispanic-White segregation**
Mean	60.73	47.08
Standard deviation	11.11	9.98
Minimum	30.68	24.96
Maximum	81.52	63.40
Number of MSAs	101	

I use probit regressions for dichotomous outcomes such as high school graduation, college graduation, idleness and single motherhood. Earnings regressions are ordinary least squares. Outcomes are regressed on segregation scores and other metropolitan characteristics separately for Whites versus Blacks and Whites versus Hispanics. Table 6 presents the results of the single stage regressions for individuals aged 18 through 24; Table 7 shows results for individuals aged 25-30. The coefficients in first row represent the effect of segregation on outcomes for all MSA residents. The coefficients in the second row are of particular interest, as they represent the differential effect of segregation on minority outcomes. The total effect of segregation on Blacks and Hispanics is given by the sum of the coefficients in the first and second rows.

Although segregation is not beneficial to minorities, segregation may have positive effects for Whites, as shown in the first row of each table. All else equal, Whites in the younger age group in cities with higher levels of Hispanic-white segregation are on average more likely to have graduated high school, less likely to be idle, less likely to be an unmarried mother and also earn more. A unit increase in Hispanic-White segregation is associated with a 0.43% increase in the likelihood that a white individual has graduated high school. Similarly the likelihood of idleness decreases by 0.52%, the likelihood of single motherhood decreases by 0.545%, and on average leads incomes to increase by 0.103%.

Among Blacks in both age groups, segregation has significantly adverse effects on every single outcome. The higher the degree of segregation in a city, the greater is the likelihood that Blacks suffer an adverse effect on each outcome compared to Whites. For the younger age group, a unit increase in Black-White segregation leads to a 0.66% decrease in the likelihood that a black individual has graduated college, relative to Whites. Similarly the likelihood for college

graduation decreases by 0.929%, likelihood for idleness increases by 0.855% and for single motherhood it increases by 0.227%. On average a unit increase in segregation leads incomes to decrease by 0.6% relative to whites. Similar effects are observed among the second age group in high school graduation (-0.798%), college graduation (-1.139%), idleness (0.72%), unmarried motherhood (0.415%) and income (-0.65%) for this age group.

Segregation has similar effects on the socioeconomic outcomes experienced by Hispanics. A unit increase in Hispanic-White segregation leads to a decrease in the likelihoods of high school graduation (-0.5%) and college graduation (-0.67%), to an increase in the likelihoods of idleness (0.48%) and a decrease of 0.218% in earnings among Hispanics. However one exception is evident in the case of unmarried motherhood among the younger age group; Hispanic females aged 18-24 in cities with higher segregation are less likely (0.545% less than Whites) to be an unmarried mother. Among 25-30 year olds, however, unmarried motherhood among Hispanic females is positively and significantly correlated with Hispanic-white segregation (1.3% more than whites). Another exception is observed among Hispanics in the older age group in that segregation has no significant differential effect on idleness. In this age group, a unit increase in Hispanic-White segregation is also associated with a decrease in the likelihoods of high school graduation (-0.85%) and college graduation (-1.127%), and a decrease of 0.65% in earnings among Hispanics.

Table 6 Single Stage Regressions for 18-24 year olds.

	High School Graduate		College graduate		Idle		Single Mother		Ln(Earnings)	
	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White
Segregation Score [Segb/Segh]	0.025 (0.025)	**0.434 (0.031)**	**0.582 (0.026)**	0.347 (3.46)	**-0.296 (0.025)**	**-0.526 (0.031)**	**0.226 (0.047)**	**-0.545 (0.057)**	**-0.122 (0.027)**	**0.103 (0.032)**
Segb*blk / Segh*hsp	**-0.661 (0.049)**	**-0.502 (0.082)**	**-0.929 (0.069)**	**-0.673 (0.134)**	**0.855 (0.047)**	**0.482 (0.084)**	**0.227 (0.078)**	**-0.545 (0.142)**	**-0.604 (0.064)**	**-0.218 (0.099)**
blk=1/hsp=1	**-7.883 (3.067)**	**-25.471 (4.28)**	-2.447 (4.412)	**-38.002 (7.152)**	**8.48 (2.98)**	**14.987 (4.371)**	**71.082 (4.907)**	10.006 (7.353)	1.768 (3.963)	-8.211 (5.117)
Female=1	**23.329 (0.434)**	**20.324 (0.468)**	**28.389 (0.449)**	**27.688 (0.466)**	**-12.052 (0.43)**	**-4.975 (0.469)**			**-13.294 (0.472)**	**-14.913 (0.484)**
ln(Population)	**2.41 (0.319)**	-0.147 (0.357)	**2.632 (0.334)**	**4.101 (0.35)**	0.496 (0.317)	**1.453 (0.36)**	**-7.14 (0.564)**	**-2.831 (0.672)**	**2.82 (0.351)**	**1.108 (0.373)**
ln(Median Income)	**38.182 (2.036)**	**31.248 (2.098)**	**68.792 (2.033)**	**76.229 (2.058)**	**-47.971 (2.015)**	**-49.598 (2.104)**	**-30.627 (3.7)**	**-14.859 (3.951)**	**44.494 (2.213)**	**40.289 (2.182)**
Percent Manufacturing	**-0.373 (0.071)**	**-0.483 (0.071)**	**-0.728 (0.074)**	**-0.348 (0.073)**	-0.023 (0.07)	**-0.371 (0.072)**	**0.645 (0.126)**	**0.706 (0.132)**	**-0.694 (0.078)**	**-0.675 (0.075)**
Percent Minority	**0.149 (0.025)**	**0.162 (0.028)**	**0.324 (0.026)**	**0.291 (0.027)**	0.005 (0.025)	0.035 (0.028)	**-0.322 (0.045)**	**-0.387 (0.052)**	**0.201 (0.027)**	**0.24 (0.028)**
N	542992	483363	542992	483363	542992	483363	269188	239355	171587	158704
Pseudo R-squared	0.0287	0.0192	0.0416	0.0346	0.0372	0.011	0.0771	0.0226	0.0283	0.0168

Statistically significant estimates at p=0.05(t > 1.96) are in bold. College graduation entails the completion of a four-year program. Single motherhood regression includes only females, and is defined as having at least one child and not having been married. Earnings regressions do not include those who are idle or are enrolled in school. The coefficients and standard errors are multiplied by 100 for purposes of presentation.

Table 7 Single Stage Regressions for 25-30 year olds

	High School Graduate		College graduate		Idle		Single Mother		Ln(Earnings)	
	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White
Segregation Score [Segb/Segh]	**-0.091** **(0.035)**	**0.352** **(0.043)**	**0.51** **(0.022)**	**0.643** **(0.027)**	**-0.246** **(0.026)**	**-0.207** **(0.032)**	**0.578** **(0.047)**	-0.017 (0.057)	-0.019 (0.017)	**0.259** **(0.021)**
Segb*blk / Segh*hsp	**-0.798** **(0.065)**	**-0.85** **(0.11)**	**-1.139** **(0.057)**	**-1.127** **(0.109)**	**0.72** **(0.054)**	0.101 (0.1)	**0.415** **(0.079)**	**1.346** **(0.159)**	**-0.447** **(0.045)**	**-0.65** **(0.076)**
blk=1/hsp=1	**-10.113** **(4.083)**	**-30.082** **(0.11)**	-5.29 (3.572)	**-33.238** **(5.701)**	**8.441** **(3.379)**	**26.861** **(5.172)**	**93.418** **(4.991)**	-2.613 (8.293)	**-9.179** **(2.828)**	6.153 (3.946)
Female=1	**25.382** **(0.588)**	**21.689** **(0.639)**	**27.471** **(0.386)**	**26.198** **(0.404)**	**14.286** **(0.448)**	**26.159** **(0.485)**			**-22.964** **(0.301)**	**-24.492** **(0.31)**
ln(Population)	**9.962** **(0.431)**	**7.183** **(0.493)**	**5.979** **(0.288)**	**5.188** **(0.313)**	0.383 (0.332)	0.162 (0.376)	**-7.507** **(0.565)**	**-3.652** **(0.681)**	**5.837** **(0.226)**	**3.844** **(0.241)**
ln(Median Income)	**45.737** **(2.805)**	**38.642** **(2.885)**	**82.232** **(1.788)**	**86.387** **(1.826)**	**-54.056** **(2.109)**	**-55.329** **(2.19)**	**-6.235** **(3.677)**	**10.87** **(3.992)**	**50.397** **(1.407)**	**47.235** **(1.408)**
Percent Manufacturing	0.098 (0.096)	**-0.249** **(0.096)**	**-0.559** **(0.064)**	**-0.275** **(0.063)**	0.094 (0.074)	**-0.129** **(0.074)**	**0.581** **(0.127)**	**0.967** **(0.133)**	**-0.425** **(0.05)**	**-0.397** **(0.048)**
Percent Minority	0.012 (0.034)	-0.011 (0.037)	**0.522** **(0.023)**	**0.488** **(0.024)**	**-0.138** **(0.026)**	**-0.098** **(0.029)**	**-0.599** **(0.045)**	**-0.731** **(0.053)**	**0.391** **(0.018)**	**0.422** **(0.018)**
N	453046	406403	453046	406403	453046	406403	232949	207221	302059	279260
Pseudo R-squared	0.046	0.0369	0.0533	0.0439	0.026	0.0153	0.1343	0.0221	0.0616	0.0518

The third row of each table presents the coefficients for the minority dummy, which indicate the extent to which outcomes vary based solely on the minority status of the individual. Minorities fare worse than Whites on most of the outcomes measured. Blacks are generally less likely to have graduated high school (-7.883% in the younger age group; -10.113% in the older age group), more likely to be idle (0.85%; 8.44%), more likely to be an unmarried mother (71.1%; 93.42%) , and earn less on average (-9.18% in the older age group) compared to Whites. Similarly Hispanics are on average less likely to have graduated high school (-25.47%; -30.1%) and/or college (-38%; -33.23%), and are more likely to be idle (+15%; +26.16%)

The coefficients in the fourth row represent the extent to which outcomes may vary based on whether the individual is female. Females in both age groups are generally more likely to have graduated high school and/or college than males, but on average earn less. Among the younger age group, females are more likely to be employed or enrolled in school compared to men, as indicated in the "idle" column. For females in the older age group, however, the likelihood of being employed or enrolled in school is lower than that for men. These results may be a reflection of higher enrollment in school at a younger age, and of childrearing and homemaking roles in later years.

As these estimates are using single stage regressions, they are likely to be biased due to the above discussed possibility of reverse causality. The estimates obtained from the first stage regression are given in table 8.

Table 8 First stage regression results

	Black-white Segregation	Hispanic-White Segregation
Ln(population)	68.43 (0.122)	60.045 (0.119)
ln(median income)	41.001 (0.643)	27.382 (0.629)
Percent Manufacturing	7.299 (0.022)	2.037 (0.022)
Percent Minority	2.061 (0.009)	1.243 (0.009)
Number of governments	0.348 (0.001)	-0.097 (0.001)
Percent intergovernmental revenue	-487.272 (1.428)	-302.476 (1.397)
Adjusted R-squared	0.5637	0.0492

A joint F-test of the instruments in the first stage yields a value greater than $2.3 * 10^5$ for black-white segregation, and 24,437.99 for Hispanic-white segregation. Both coefficients are statistically significant beyond $\alpha = 0.001$ in each case. Such a high level of significance may follow from the large sample size used in the regression.

The estimates obtained from the two-stage regression are given in table 9 for the younger age group and in table 10 for the older group. The effects of segregation (not interacted) on individuals aged 25-30 are similar in both single-stage and two-stage regressions, with greater Hispanic-white segregation in a city often entailing beneficial outcomes for Whites. Coefficients for the demographic controls also remain essentially the same.

Table 9 Two Stage Regressions for 18-24 year olds

	High School Graduate		College graduate		Idle		Single Mother		Ln(Earnings)	
	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White
Segregation Score [Segb/Segh]	0.03 (0.05)	**1.17 (0.14)**	**0.49 (0.04)**	**1.29 (0.13)**	**-0.31 (0.05)**	**-1.06 (0.12)**	-0.12 (0.09)	**-0.84 (0.19)**	**-0.28 (0.05)**	**0.56 (0.05)**
Segb*blk / Segh*hsp	**-0.7 (0.06)**	**-0.31 (0.11)**	**-0.72 (0.09)**	**-0.5 (0.2)**	**0.76 (0.06)**	**0.23 (0.11)**	**0.46 (0.12)**	**0.85 (0.16)**	**-0.62 (0.09)**	**-0.21 (0.05)**
blk=1/hsp=1	-5.19 (3.61)	**-35.13 (5.42)**	**-14.69 (5.16)**	**-47.14 (10.58)**	**13.89 (3.59)**	**27.49 (5.64)**	**56.64 (7.22)**	14.61 (7.97)	2.6 (5.38)	**-8.62 (2.63)**
Female=1	**23.3 (0.45)**	**20.22 (0.48)**	**28.2 (0.44)**	**27.48 (0.48)**	**-12.22 (0.44)**	**-4.88 (0.48)**			**-12.87 (0.51)**	**-14.45 (0.14)**
ln(Population)	**2.85 (0.36)**	**-5.05 (0.98)**	**3.42 (0.38)**	**-1.69 (0.82)**	0.37 (0.43)	**5.19 (0.81)**	**-6.63 (0.72)**	-0.82 (1.29)	**4.15 (0.43)**	**-1.66 (0.31)**
ln(Median Income)	**43.46 (2.23)**	**39.38 (2.21)**	**73.13 (2.36)**	**77.7 (2.1)**	**-50.22 (1.99)**	**-53.77 (2.56)**	**-33.45 (3.63)**	**-28.26 (3.71)**	**42.52 (2.34)**	**37.45 (0.68)**
Percent Manufacturing	**-0.18 (0.08)**	**-0.35 (0.07)**	**-0.6 (0.08)**	**-0.36 (0.07)**	-0.09 (0.08)	**-0.39 (0.09)**	**0.73 (0.14)**	**0.57 (0.11)**	**-0.63 (0.1)**	**-0.8 (0.02)**
Percent Minority	**0.16 (0.03)**	**0.12 (0.02)**	**0.29 (0.03)**	**0.16 (0.02)**	0 (0.03)	**0.08 (0.03)**	**-0.39 (0.05)**	**-0.47 (0.04)**	**0.18 (0.04)**	**0.2 (0.01)**
N	517385	457941	517385	457941	517385	457941	256476	226714	163273	150361
Pseudo R-squared	0.03010	0.02000	0.04120	0.03430	0.03820	0.01060	0.07980	0.02410	0.029	0.01640

Statistically significant estimates at p=0.05(t > 1.96) are in bold. College graduation entails the completion of a four-year program. Single motherhood regression includes only females, and is defined as having at least one child and not having been married. Earnings regressions do not include those who are idle or are enrolled in school. The coefficients and standard errors are multiplied by 100 for purposes of presentation. Standard errors were adjusted using the bootstrap command in stata with 100 repititions and seed=1 for each regression.

Table 10 Two Stage Regressions for 25-30 year olds

	High School Graduate		College graduate		Idle		Single Mother		Ln(Earnings)	
	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White	Black-White	Hispanic-White
Segregation Score [Segb/Segh]	0.02 (0.07)	**1.46 (0.22)**	**0.3 (0.04)**	**1.49 (0.13)**	0.03 (0.05)	**-0.86 (0.16)**	**0.55 (0.08)**	-0.34 (0.33)	**-0.16 (0.03)**	**0.9 (0.02)**
Segb*blk / Segh*hsp	**-0.92 (0.08)**	**-0.75 (0.15)**	**-0.94 (0.07)**	**-0.78 (0.15)**	**0.57 (0.06)**	-0.03 (0.13)	**0.7 (0.1)**	**1.47 (0.23)**	**-0.43 (0.06)**	**-0.56 (0.04)**
blk=1/hsp=1	-2.59 (4.97)	**-34.76 (7.54)**	**-16.65 (4.28)**	**-51.28 (7.53)**	**17.01 (3.87)**	**33.74 (6.31)**	**75.89 (6.46)**	-9.2 (11.73)	**-10.18 (3.72)**	1.61 (1.82)
Female=1	**25.62 (0.57)**	**21.87 (0.54)**	**27.66 (0.46)**	**26.3 (0.43)**	**12.79 (0.41)**	**24.77 (0.55)**			**-22.09 (0.33)**	**-23.54 (0.09)**
ln(Population)	**9.87 (0.48)**	-0.18 (1.48)	**7.95 (0.33)**	0.06 (0.85)	**-1.09 (0.42)**	**4.47 (1.07)**	**-8.86 (0.61)**	-2.04 (2.22)	**7.32 (0.28)**	**0 (0.16)**
ln(Median Income)	**51.36 (2.52)**	**46.53 (3.07)**	**90.2 (2.02)**	**92.36 (1.85)**	**-57.46 (2.17)**	**-55.26 (2.03)**	**-8.64 (3.46)**	3.66 (4.51)	**50.21 (1.66)**	**46.29 (0.39)**
Percent Manufacturing	0.23 (0.12)	**-0.14 (0.11)**	**-0.18 (0.07)**	**-0.18 (0.07)**	-0.16 (0.1)	-0.08 (0.08)	**0.47 (0.13)**	**0.85 (0.15)**	**-0.3 (0.05)**	**-0.45 (0.01)**
Percent Minority	0.03 (0.04)	-0.05 (0.04)	**0.51 (0.02)**	**0.39 (0.03)**	**-0.11 (0.03)**	0 (0.03)	**-0.6 (0.04)**	**-0.78 (0.06)**	**0.37 (0.02)**	**0.37 (0.01)**
N	433917	387331	433917	387331	433917	387331	223247	197569	289719	266851
Pseudo R-squared	0.048	0.0381	0.054	0.0434	0.0261	0.0143	0.1358	0.0238	0.0614	0.0494

Looking at the second row of each table, we see that the coefficients of the interacted term *Segb*blk / Segh*hsp* have signs and statistical significance largely unchanged from the single stage regression for most outcomes. However, the magnitude of some coefficients has changed. For Blacks in the younger age group, the adverse effect of segregation on single motherhood is observably larger in the two stage regression (.46) compared to the single stage

result (0.227), while for most other outcomes the effects are smaller. Among Blacks in the older age group, the differential effect of segregation on most outcomes is still adverse and statistically significant albeit via coefficients of smaller magnitude.

Similarly, the results for the interacted term *Segh*hsp* remain largely the same for most outcomes. An exception is the case of single motherhood among Hispanics in the younger age group. Single motherhood was initially negatively correlated with the interacted term in the single stage regression (-0.545), but the two stage regression yields a positive and significant relationship (0.85). Thus, all else equal, Hispanic females in the younger age group living in cities with higher segregation are more likely to experience unmarried motherhood than White females. The interacted term coefficients for 25-30 year olds remain essentially the same with slight decreases in the size of most coefficients.

V. Conclusion

These findings reaffirm the continuing and detrimental effects of segregation on minorities, as previously observed by Cutler & Glaeser and Flaherty. In cities with higher segregation, both Blacks and Hispancs experience unfavorable outcomes compared to Whites. Similar results are seen for Hispanics (versus Whites), with the exception of idleness among the older age group, for which no statistically significant relationship was obtained. Nonetheless the total effect of segregation on Hispanics as well as on Blacks is decidedly negative for most outcomes. While minorities fare worse in segregated cities, these findings indicate that segregation may be beneficial to Whites in some cases.

Segregation could affect the outcomes measured in this study through a variety of factors, such as a lack of successful role models, parental characteristics that lead to better or worse outcomes for children or a lack of proximal employment opportunities. This study did not

address these possibilities, however Cutler and Glaeser found using 1990 census data that the abovementioned factors could account for about a third of the disparity in [Black-White] outcomes. This points to the existence of other unexplained channels through which segregation may affect outcomes. An examination of educational and cultural spillover effects, including other measures of segregation such as isolation, clustering, centralization and concentration, as well as other outcomes such as health could be undertaken in future research.

If educational attainment, income and employment are indicators of success or social mobility, then desegregation can be instrumental in uplifting the socioeconomic status of Blacks and Hispanics in urban metropolitan areas. Segregation disproportionately creates unfavorable socioeconomic environments in predominantly minority communities, and thus limits the opportunities available to their residents. It is essential to recognize the role of historical discrimination, by both public and private agents, in creating segregated communities and consequently concentrating negative environmental characteristics onto Black and Hispanic communities. Although federal legislation such as the Civil Rights Act has done much to reduce segregation since the 1970's, segregation continues to adversely affect the socioeconomic outcomes of minorities today. Unless policy makers face up to the task of desegregating inner-city and urban areas, the detrimental effects of residential segregation may make the proposition of equal opportunity unattainable in American society.

Appendix

Table A1 Summary of metropolitan characteristics

Variable	Black-White segregation	Hispanic-White segregation	ln(MSA population)	ln (MSA median income)	Percent Minority	Percent Manufacturing	Number of Governments	Percent of revenue from inter-governmental sources
Mean	60.73	47.08	14.88	10.40	27.81	10.25	126.0525	0.2681849
Standard deviation	11.11	9.98	1.01	0.13	10.75	3.52	135.6447	0.0655155
Minimum	30.68	24.96	13.13	10.02	3.00	3.30	1	0.1232719
Maximum	81.52	63.40	16.75	10.73	63.20	21.40	442	0.4943579
Number of MSAs	101							

Table A2 Correlations for metropolitan characteristics

Correlations	Black-White segregation	Hispanic-White segregation	ln(MSA population)	ln(MSA median income)	Percent Minority	Percent Manufacturing	Number of Governments	Percent of revenue from inter-governmental sources
Black-White Segregation	1							
Hispanic-White Segregation	0.494	1						
ln(MSA Population)	0.5414	0.6881	1					
ln(MSA median income)	0.3041	0.3457	0.4892	1				
Percent Minority	0.206	0.4151	0.5362	0.2942	1			
Percent Manufacturing	0.1102	-0.1406	-0.2301	-0.3038	-0.316	1		
Number of Governments	0.6717	0.3655	0.6009	0.3793	0.1131	-0.0026	1	
Percent of revenue from intergovernmental sources	-0.5316	-0.4059	-0.4785	-0.2471	0.0638	0.1122	-0.5449	1

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