

Why Are Ghettos Bad? Examining the Role of Educational Experiences

Robert Bifulco, Syracuse University
Delia Furtado, University of Connecticut
Stephen L. Ross, University of Connecticut

September 22, 2008

Preliminary and Incomplete

Abstract. Relative to whites, African-Americans that reside in highly segregated metropolitan areas have worse educational and labor market outcomes than those that reside in less segregated areas. This paper examines the extent to which cross-metropolitan differences in school environments can explain this empirical relationship. Using data from the National Education Longitudinal Study of 1988 (NELS:88) merged with the Common Core of Data (CCD), we test whether racial differences in school exposure to single-parent families, standardized test scores, African-American teachers, and ESL students can explain the negative impact of residential segregation. We find little evidence to support the idea that the negative impact of residential segregation of African-Americans operates through its effect on school environments. This suggests that segregation harms African-Americans primarily because it concentrates them into neighborhoods with low levels of income, human capital, or related endowments.

On average, African-Americans that reside in highly segregated metropolitan areas have worse outcomes relative to whites than African-Americans that reside in relatively less segregated metropolitan areas. This empirical relationship has been established for educational attainment, labor market outcomes (Cutler and Glaeser, 1997; Ananat, 2007) and standardized test scores (Card and Rothstein, 2007). Cutler and Glaeser (1997) and Ananat (2007) provide evidence of a causal impact of segregation on the relative outcomes of African-Americans by using jurisdictional fragmentation and railroad tracks as instruments, respectively. Finally, Collins and Margo (2000) find that the negative relationship between segregation and African-American outcomes arose during the 1970's and strengthened during the 1980's confirming that the fiscal and transportation based instruments clearly predate this phenomena.

Further, two of these studies find evidence that the mechanism behind the negative impact of segregation is related to the neighborhood environment created by residential segregation rather than the natural relationship between residential and school segregation. Cutler and Glaeser (1997) find a strong correlation between the residential segregation of African-Americans and their exposure to college-educated neighbors and also find that exposure to the college educated can explain almost half of the impact of residential segregation. Card and Rothstein (2007) find no impact of school segregation on the Black-White test score gap after controlling for residential segregation and find that much of the impact of residential segregation operates through neighbor's incomes. Similarly, Cutler, Glaeser, and Vigdor (2007) find that residential segregation is harmful for immigrant groups with low levels of human capital.

These findings stand in contrast with studies on the impact of school segregation and the impact of peers on student outcomes. Using variation in the timing of court ordered desegregation plans in the 1970's, Guryan (2004) finds that desegregation lowered African-American drop-out rates, while Freeman, Scafidi, and Sjoquist (2005) find that increases in school segregation in Georgia during the 1990's are associated with relative declines in teacher quality for African-American students. Both Hoxby (2000) and Kain, Hanushek, and Rivken (2002) using school administrative data from Texas examine differences in racial composition across different cohorts of students in the same school and grade and find that increases in African-American representation among peers reduces scores on standardized tests.

While the literature on residential segregation and school racial composition appear to conflict, many mechanisms exist by which residential segregation might impact the quality of educational experience encountered by African-Americans. Residential segregation has a

substantial impact on the political power of African-Americans (Ananat and Washington, 2007), and therefore might influence the allocation of financial resources to schools via the allocation of state education funding. Residential segregation may impact the behavior of school administrators who attempt to retain white students in integrated schools by a reallocation of resources within schools, e.g. the provision of and access to honors courses may be related to residential segregation (Card and Rothstein, 2007). Residential segregation may reduce the willingness of experienced well-qualified white teachers to teach in schools with substantial African-American populations. Clotfelter, Ladd, and Vigdor (2006) document for North Carolina the tendency for well qualified teachers to be matched with schools and classrooms within schools that have more white students.

This purpose of this paper is to examine the extent to which across metropolitan differences in school environment can explain the empirical relationship between residential segregation and the relative outcomes of African-Americans. We begin by replicating Cutler and Glaeser's (1997) analysis using the National Educational Longitudinal Survey (NELS). The NELS is a national survey of 8th graders based on a subsample of approximately 25 students in each of a representative sample of schools nationwide. The NELS surveyed students, one of their parents, two of their teachers, and a school administrator in the 8th grade and then followed those students through high school and into college and the labor market surveying the students last in 2000 when most of the students were 26 years of age.

We find similar results to Cutler and Glaeser (1997) using the NELS. In the OLS estimates, African-Americans are less likely to graduate high school and more likely to be idle soon after high school if they reside in segregated metropolitan areas. After instrumenting residential segregation, African-American in segregated metropolitan areas appear to be less

likely to graduate from high school, attend college, or graduate from college by age 26, more likely to be idle after high school or become an unmarried mother by age 26, and have lower annual labor earnings. Given the imprecision of our estimates, however, we are not able to detect any relationship between residential segregation and the performance of African-American students on standardized tests.

Next, we examine the impact of controlling for a series of variables that describe the educational environment experienced by African-Americans overall and relative to whites at the metropolitan level including school segregation by race and racial differences in exposure to free lunch eligible students, to students from single parent families, to average student test scores, to English as a second language students, to district per pupil spending, to school level student-teacher ratios, and to African-American teachers. In terms of the OLS findings on drop-out and idleness, the only variable that both correlates with residential segregation and appears to explain racial differences in outcomes is racial differences in exposure to free lunch students. Specifically, we find that African-American high school graduation results are higher in metropolitan areas with large racial differences in exposure to free lunch students and the effect of residential segregation on high school graduate rates falls by over 40 percent. On the other hand, when we control directly for school segregation following Card and Rothstein (2007), we find that school segregation has little impact on African-American high school graduation rates and idleness, and the effect of including school segregation on the estimated impact of residential segregation is substantially smaller.

Model Specification and Data

This analysis examines the educational and life outcomes of participants of the National Educational Longitudinal Survey (NELS) who participated in waves 1, 3 and potentially 4

conducted in 1988, 1992, and 2000, respectively, and who attended school during wave 1 in the same set of major metropolitan areas used in Cutler and Glaeser (1997). Wave 1 surveyed students in eighth grade in 1988 while waves 3 and 4 resurveyed a subsample of students in the summer following their anticipated high school graduate 1994 and six years later in 2000, respectively. The data on individual students is supplemented with metropolitan data drawn from the 1990 Decennial Census and other Census Bureau data, the 1990 Common Core of Data that contains a census of all public school districts and schools in the United States, and metropolitan level aggregations of information available in the NELS itself.

The Metropolitan Sample and Metropolitan Census Data

We draw the same sample of 209 metropolitan areas with populations of at least 100,000 people and at least 10,000 African-Americans that were used in Cutler and Glaeser (1997).¹ Our sample of NELS participants are matched to metropolitan areas using the school attended in wave 1 and a NELS provided cross reference between schools and zip codes called the QED, which was used to develop the initial sampling frame of the NELS. Once our sample of NELS students who participated in both wave 1 and wave 3 has been drawn, we have a sample of 7,709 students distributed across 155 metropolitan areas.

Panel 1 of Table 1 presents the overall samples size and means for white and African-American students on the outcomes considered from waves 3 and 4 of the NELS. The wave 3 outcomes include a test score from a standardized test administered in 12th grade, whether the student had graduated by 1994, whether the student was idle as in neither working nor attending school, and whether the student had enrolled in any college classes in 1994. The wave 4 outcomes considered are whether the individual completed college by 2000, whether the individual was idle in 2000, logarithm of annual earnings the previous year, and if female

¹ We also estimate models using all metropolitan statistical areas and results are similar.

whether the individual is an unmarried parent. On all measures, African-Americans are doing worse unconditionally than whites in both wave 3 and wave 4. Panel 1 also presents the wave 3 outcome measures for the subsample of wave 4 respondents and average outcomes are quite similar when comparing wave 4 respondents to the entire wave 3 sample.

Following Cutler and Glaeser (1997), the outcomes are regressed on individual controls for race, ethnicity, and gender, as well as a set of metropolitan controls based on 1990 metropolitan area definitions plus the interaction of those controls with race.² These variables are shown in Panel 2 of Table 1. The first metropolitan control is a measure of residential segregation by race, which is calculated as a standard dissimilarity index for blacks versus non-blacks using 1990 census tract definitions. In addition, controls are included for the logarithm of 1990 metropolitan population, the logarithm of 1989 median income, percent of population that was African-American in 1990, and the metropolitan share of employment that is in manufacturing in 1990.³

Instrumental Variable Analysis

Cutler and Glaeser (1997) raise the natural concern that racial segregation might be determined simultaneously with African-American outcomes or that both segregation and outcomes might be caused by a common third variable like the average ability of the African-American population in a metropolitan area. Specifically, Cutler and Glaeser (1997) suggest that causality may run in the opposite direction with poor outcomes of the African-American population leading to more segregation in a metropolitan area. If this hypothesis were true, OLS estimates would overstate the effect of segregation on African-American outcomes.

² Cutler and Glaeser (1997) also included age controls, which we exclude because our sample conditions on being in 8th grade in 1988. Results are generally robust to including such controls.

³ The exact set of metropolitan controls does not appear crucial. Estimates were similar in models that excluded share manufacturing, as well as models that included an additional control for the percent Hispanic in the metropolitan area in 1990.

On the other hand, the bias might run in the opposite direction with the OLS estimates understating the effect. For example, metropolitan area that have few economic options near predominantly African-American neighborhoods will likely have inferior outcomes for African-Americans and may have lower residential segregation because African-Americans have decentralized to escape these regions of the metropolitan area with limited economic outcomes.

In order to address this concern, we again follow Cutler and Glaeser (1997) by instrumenting for segregation using the logarithm of the number of governments (Municipalities and Townships) and the share of local government revenue that is not raised at the local level in 1962. The logic behind these instruments is that jurisdictional fragmentation and fiscal incentives for segregation across jurisdictions, which are influenced by the extent of intergovernmental grants, lead to higher levels of racial segregation. Further, there is a long lag associated with the variables makes it unlikely that those variables could directly influence African-American outcomes in the late 1980's and early 1990's. In fact, Collins and Margo (2000) find that the negative relationship between segregation and African-American outcomes arose during the 1970's and strengthened during the 1980's confirming that the fiscal and transportation based instruments clearly predate this phenomena.

Using our metropolitan sample of the NELS respondents and the associated 155 metropolitan areas, we find that these instruments have the expected relationship with residential segregation in 1990 and statistical significance of the instruments (F-statistic of 21.6) are consistent with instruments that have sufficient power.⁴

Metropolitan Variables based on the 1990 Common Core of Data (CCD)

⁴ Cutler and Glaeser (1997) also use rivers as an instrument, but in our metropolitan sample of the NELS, rivers are a weak instrument for residential segregation. They also estimate an instrumental variables model based on each individuals metropolitan area of residence in 1985. Our estimates are quite comparable to those later estimates because we condition on being in the metropolitan area in 8th grade.

The Common Core of Data (CCD) is collected by the National Center for Education Statistics and provides an annual census of U.S. schools collecting information on student composition information on race, ethnicity and free lunch status, as well as information on student to teacher ratios at the school level and per pupil spending at the school district level. Again, the QED is used to map schools to zip codes and thus to 1990 metropolitan areas. In order to obtain school variables that might potentially be influenced by residential segregation, the CCD is used to calculate the dissimilarity measure for school segregation of blacks versus non-blacks, as well as measures of exposure of white and African-American students to a selected set of school environments. These environments include average exposure of white or African-American students to free lunch eligible students, school level student teacher ratios, and per pupil school spending at the school district level. In a later section, we examine the correlation between the racial differences in these variables and both actual and predicted residential segregation based on our instruments in order to select candidate variables that might explain the influence of residential segregation on African-American outcomes and therefore suggest education based mechanism through which residential segregation operates.

Further, we also examine the correlation between residential segregation and the metropolitan area average of these variables across the entire student population. There are two natural mechanisms by which a metropolitan level variable like residential segregation might operate through school variables in terms of the correlation between segregation and the outcomes of individual. First, as captured by the racial difference in exposure variables, residential segregation might cause or be correlated with school environments that vary considerably by race. On the other hand, residential segregation may be correlated with the overall level of social problems and economic circumstances in a metropolitan area, and

therefore schools may have higher levels of free lunch eligible students or fewer resources overall in segregated metropolitan areas. If African American students are more sensitive to these variables, this may explain why residential segregation has harmful effects on them. We explore both possibilities in a regression context.

The means of the CCD variables are shown in Panel 3 of Table 1. African-Americans face substantial levels of school segregation even though the level of school segregation is less than the residential segregation and are also exposed to much higher shares of free lunch eligible students. Comparing the first two columns, we see that African-Americans are more likely than whites to reside in metropolitan areas with higher rates of free lunch eligibility, higher student to teacher ratios, and lower per pupil student spending. As before, the averages of the metropolitan variables do not differ across the wave 3 and wave 4 subsamples of the NELS.

Metropolitan Variables based on Wave 1 of the NELS

The National Educational Longitudinal Survey conducted detailed surveys of 8th grade students, their parents, teachers and principals in wave 1. Therefore, the NELS provides a much broader set of variables to characterize schools than information available in the CCD. We calculate overall student averages, as well as white and African-American exposure, on specific school environments for the set of NELS schools in every metropolitan area using responses from principals directly and averaging responses of students, parents, and teachers over all survey respondents. Naturally, the exposure variables measure metropolitan exposure with considerable sampling error and so are likely to have an attenuated correlation with residential segregation. However, if residential segregation is truly operating through schools, the measures of relative exposure for explaining the outcomes of students in the NELS should be based on the subset of schools in the metropolitan area that were surveyed by the NELS, and these variables

should provide good candidates for detecting a role for education as a mechanism for how residential segregation influences African-American outcomes.

The variables considered include racial differences in exposure to English as a second language students, students of parents with a college education, students in single parent families, average scores on a standardized mathematics exam, African-American teachers in the school, and tardiness problems in the school. The means of these variables are shown in Panel 4 Table 1. As with the CCD, African-Americans are exposed to less favorable environments on English as a second language students, students of parents with a college education, students in single parent families, and average scores on a standardized mathematics exam. The students are also exposed to more African-American teachers, but surprisingly have less exposure to schools with tardiness problems.

Replication Results

Table 2 presents the OLS estimates for the regression of the wave 3 and wave 4 outcomes on residential segregation and its interaction with whether the student is African-American. In this analysis, we replicate the statistically significant findings of Cutler and Glaeser (1997) on the relative impact of residential segregation on African Americans on the likelihood of graduating from high school and the likelihood of being idle following high school.⁵ Our estimates on high school graduate and idleness are -0.314 and 0.354 , respectively, very similar in magnitude to the Cutler and Glaeser's estimates of -0.323 and 0.324 . Our estimates on logarithm on annual earnings and single mother are statistically insignificant and somewhat smaller than Cutler and Glaeser's (1997) estimates, but the major reason for the lack of significance is that our estimates are substantially noisier than those of Cutler and Glaeser

⁵ The finding on college graduate is also significant because unlike the Census the NELS distinguishes from graduating from a high school and receiving a GED at a later date. We find a significant impact of segregation on racial differences in the likelihood of graduating from high school on time.

(1997). Unlike Card and Rothstein (2007), we do not find any statistically significant relationship between segregation and racial differences in test scores.

The Second Panel of Table 3 presents the instrumental variable estimates while the first panel repeats the OLS estimates for comparison purposes. In the instrumental variable estimates, segregation in metropolitan areas appears to lead to lower high school graduation rates, more idleness in 1994, lower college attendance by 1994, higher college graduation rates in 2000, lower earnings, and higher rates of single parenthood. The coefficient estimate on test scores is still insignificant, but in the right direction and substantial in magnitude. The instrumental variable coefficients are substantially larger than the OLS estimates with the effect for college graduation increasing from near zero to a large value and the other significant estimates increasing relative to OLS by between 7 and 250 percent.

The larger instrumental variable estimates could be consistent with segregation falling as African-Americans leave segregated neighborhoods in metropolitan areas where the neighborhoods in which they predominate have few opportunities. On the other hand, Cutler and Glaeser (1997) did not find any such bias in their OLS estimates. An alternative explanation is the metropolitan residential segregation measures the residential environment for the students in the NELS sample of schools with error and even though the fiscal variables are also measured at the metropolitan area they somehow contain less error in capturing the residential environment of this subset of students.

Metropolitan Descriptions of the School Environment

The next step in our analysis is to test whether racial differences in various metropolitan measures of the school environment can explain the relationship between residential segregation and African-American outcomes. Obviously, metropolitan variables that do not correlate with

residential segregation will not be able to explain the segregation effects identified in our estimates even if those variables correlate with relative African-American outcomes. Therefore, we begin by examining the correlation between residential segregation and predicted residential segregation and the various measures of school environment based on the CCD and the NELS.

Table 4 presents those correlations. Panel 1 presents the correlations for the CCD variables that are likely measured without much error. Accordingly, we set a reasonably high correlation threshold for variables to consider, 0.40, and only the school segregation variable and racial differences in exposure to free lunch eligible students have correlations above that threshold.⁶ Panel 2 presents the correlations between residential segregation and the NELS variables where we use a lower threshold of 0.25 due to the fact that these variables are not calculated for all schools in the metropolitan area. The variables that pass our threshold are racial difference in exposure to single parent families, racial differences in exposure to average mathematics test scores, racial differences in exposure to African-American teachers, and percent of students who have English as a second language.

Table 5 presents the estimates on residential segregation for a variety of specification that control for our various school environment variables. Due to concerns about multicollinearity and imprecision of our estimates, we add each of our school environment variables individually. The first panel presents the baseline results, the second panel presents results after controlling for school segregation, and the other panels present results after controlling for racial differences in exposure to free lunch eligible students, racial differences in exposure to students from single parent families, racial differences in exposure to African-American teachers, racial differences in

⁶ The next closest variable is percent of students who are African-American, which has a correlation of only 0.32. In practice, this variable cannot explain the effect of segregation. This is not surprising since the model already controls for percent African-American population in the metropolitan area.

exposure to average scores on a mathematics exam, and the percent of students with English as a second language.

Focusing on the high school graduate and post high school idleness (the two significant findings), the key variable that both correlates with residential segregation and appears to explain racial differences in outcomes is racial differences in exposure to free lunch students. The estimated effect of residential segregation on the relative likelihood of African-Americans graduating from high school falls by 40 percent and the coefficient on the interaction of race with racial differences in free lunch exposure is large in magnitude and statistically significant. It should be noted that the effect of residential segregation on the relative likelihood of idleness falls by 30 percent after including controls for school segregation, but the coefficient on the race interaction with school segregation is relatively small and not even close to being statistically significant. Thus, we attribute the reduction primarily to the multicollinearity created by including both residential and school segregation in the same model.

Table 6 repeats this exercise for the model in which we instrument for residential segregation. Again focusing on variables with significant findings in the baseline model, the adverse effect of residential segregation on African-American college attendance, college graduation, annual earnings, and single parent is never substantially attenuated (greater than 10%) by the inclusion of any school environment variables. The residential segregation effect on idleness falls by about 20 percent for high school graduate and idleness after controlling racial differences in exposure to free lunch students and the idleness effect falls by 36 percent after controlling for school segregation, but the estimates on the interaction of race and both racial differences in exposure to free lunch and school segregation never approach statistical significance. In the case of idleness where the estimate on residential segregation falls below the

standard error estimate after controlling for school segregation, one might conclude that we cannot distinguish between the effect of residential and school segregation. However, for most of our measures, the negative impact of residential segregation on relative African-American outcomes appears to operate independently of the educational environments experienced by African-American students.

Summary and Conclusions

Our study will provide the first comprehensive attempt to examine whether school environment can explain the negative impact of residential segregation on African-Americans. We find little evidence to support the idea that the negative impact of residential segregation of African-Americans might operate through its affect on school environment. This finding substantially increases the weight of evidence behind the notion that neighborhood environment is important for understanding racial differences in outcomes in the United States, and supports earlier conclusions of Cutler and Glaeser (1997) and Card and Rothstein (2007) that segregation harms African-Americans primarily because it concentrates them into neighborhoods with low levels of income, human capital, or related endowments.

References

- Ananat, Elizabeth. 2007. The Wrong Side of the Tracks: Estimating the Causal Effects of Racial Segregation on City Outcomes. NBER Working Paper #13343.
- Ananat, Elizabeth and Ebonya Washington. 2007. Segregation and Black Political Efficacy. NBER Working Paper #13606.
- Card, David and Jessie Rothstein. 2007. Racial Segregation and the Black-White Test Score Gap, *Journal of Public Economics* 91: 2158-2184.
- Charles T., Helen F. Ladd, and Jacob L. Vigdor. 2006. Teacher-Students Matching and the Assessment of Teacher Effectiveness. *Journal of Human Resources* 41: 778-820.

- Collins, William J., and Robert A. Margo. 2000. Residential Segregation and Socioeconomic Outcomes: When Did Ghettos Go Bad? *Economics Letters* 69: 239-243.
- Cutler, David M. and Edward L. Glaeser. 1997. Are Ghettos Good or Bad? *Quarterly Journal of Economics* 112: 827-872.
- Cutler, David M., Edward L. Glaeser, and Jacob Vidgor 2006. When Are Ghettos Bad? Lessons from Immigrant Segregation in the United States. NBER Working Paper #13082.
- Freeman E., B. Scafidi, and D.L. Sjoquist. 2005. Racial Segregation in Georgia Public Schools, 1994-2001: Trends, Causes, and Impact on Teacher Quality. In *Resegregation of the American South* (J.C. Boger, C. Edley, G. Orfield), Chapel Hill, NC: University of North Carolina Press.
- Guryan, Jonathan. 2004. Desegregation and Black Dropout Rates. *American Economic Review* 94: 919-943.
- Hanushek, Eric A., John F. Kain, and Steven G. Rivkin. 2002. "New Evidence about *Brown v. Board of Education*: The Complex Effects of Racial Composition on Achievement." NBER #8741.
- Hoxby, Caroline M. 2000. Peer Effects in the Classroom: Learning from Gender and Race Variation. NBER #7867.

Table 1 Descriptive Statistics

	NELS 1994 Sample		NELS 2000 Sample	
	White	Black	White	Black
Sample Size	4855	925	4153	676
Outcomes				
Test Score 12 th Grade	53.104	45.33	53.624	45.863
High School Graduate 1994	0.901	0.842	0.920	0.874
Idleness 1994	0.072	0.179	0.067	0.150
Attend College 1994	0.562	0.421	0.598	0.471
College Graduate 2000	NA	NA	0.412	0.24
Idleness 2000	NA	NA	0.074	0.12
Annual Earnings 1999 in 1000's	NA	NA	31.712	24.299
Single Mother 2000	NA	NA	0.102	0.358
Metropolitan Attributes - 1990 Decennial Census				
Residential Segregation	0.641	0.640	0.641	0.643
Number of Jurisdictions	84.63	65.768	85.222	67.676
Rev Share of Intragov't Grants	0.273	0.291	0.273	0.288
Metro Pop in 1,000,000's	1.91	2.12	1.91	2.23
Median Income in \$1,000's	32.48	31.80	32.49	31.91
Percent Black in Population	0.139	0.204	0.139	0.205
Share Manufacturing Empl.	0.176	0.159	0.177	0.160
Metropolitan Attributes - Common Core Population of Public Schools				
School Dissimilarity	0.578	0.554	0.579	0.560
White Exp Free Lunch	0.105	0.120	0.103	0.120
Black Exp Free Lunch	0.290	0.291	0.289	0.295
White Exp School Spending \$1000's	5.382	5.327	5.380	5.381
Black Exp School Spending \$1,000's	5.607	5.384	5.609	5.434
White Exp Student to Teacher Ratio	17.10	17.33	17.07	17.30
Black Exp Student to Teacher Ratio	16.74	17.01	16.71	17.01

Metropolitan Attributes – National Educational Longitudinal Survey Sample of Schools

White Exp Engl. 2 nd Lang.	0.006	0.009	0.006	0.009
Black Exp Engl. 2 nd Lang.	0.015	0.015	0.015	0.016
White Exp Parent w/ College	0.372	0.388	0.374	0.394
Black Exp Parent w/ College	0.256	0.218	0.257	0.219
White Exp Single Parent	25.799	26.63	25.707	26.368
Black Exp Single Parent	37.186	42.107	37.039	41.678
White Exp Test Score	52.143	51.442	52.192	51.553
Black Exp Test Score	48.801	47.16	48.841	47.116
White Exp Black Teachers	0.053	0.111	0.052	0.11
Black Exp Black Teachers	0.204	0.315	0.203	0.32
White Exp Tardiness Problem	0.142	0.110	0.143	0.110
Black Exp Tardiness Problem	0.085	0.071	0.085	0.070

Table 2 Cutler Glaeser Replication - Ordinary Least Squares Estimates

	NELS 1994 Sample					NELS 2000 Sample		
	Test Score 12 th Grade	High School Graduate	Idleness 1994	Attend College	College Graduate	Logarithm Earnings	Idleness 2000	Single Parent
Residential Segregation of African Americans	-0.726 (1.968)	0.075 (0.055)	-0.051 (0.037)	0.109 (0.099)	0.123 (0.118)	0.184 (0.127)	-0.079* (0.031)	-0.093 (0.074)
Race Interaction Term	0.889 (3.924)	-0.314** (0.114)	0.354** (0.101)	-0.290 (0.186)	-0.041 (0.168)	-0.624 (0.435)	0.199 (0.137)	0.339 (0.249)
Logarithm of Metropolitan Population	0.332 (0.241)	-0.005 (0.006)	-0.004 (0.005)	0.006 (0.014)	0.003 (0.017)	0.028 (0.018)	0.007 (0.004)	0.009 (0.009)
Race Interaction Term	-0.521 (0.485)	0.020 (0.014)	-0.009 (0.014)	-0.002 (0.025)	-0.017 (0.021)	0.010 (0.031)	0.002 (0.022)	0.022 (0.024)
Metropolitan Percent Black	-0.855 (2.920)	-0.053 (0.084)	-0.030 (0.077)	0.147 (0.162)	0.102 (0.186)	0.045 (0.205)	0.003 (0.051)	-0.146+ (0.083)
Race Interaction Term	1.032 (5.637)	0.064 (0.158)	-0.210 (0.157)	-0.092 (0.223)	0.020 (0.283)	0.237 (0.548)	-0.162 (0.197)	-0.341 (0.314)
Logarithm of Metropolitan Median Income	3.341* (1.404)	0.121** (0.034)	-0.035 (0.029)	0.303** (0.070)	0.317** (0.084)	0.352** (0.092)	-0.044* (0.021)	-0.056 (0.049)
Race Interaction Term	0.712 (2.220)	-0.209* (0.081)	0.086 (0.085)	-0.033 (0.131)	-0.105 (0.140)	0.056 (0.167)	-0.183* (0.092)	- (0.152)
Share of Employment in Manufacturing	9.385* (4.613)	0.113 (0.119)	-0.050 (0.086)	-0.249 (0.214)	-0.453+ (0.248)	-0.270 (0.295)	0.031 (0.061)	0.084 (0.123)
Race Interaction Term	6.385 (8.358)	-0.166 (0.247)	-0.182 (0.192)	0.119 (0.315)	0.107 (0.378)	-0.160 (0.863)	-0.012 (0.304)	0.087 (0.662)
Observations	7260	7705	7678	7706	6301	5622	6356	3290
R-squared	0.11	0.02	0.03	0.04	0.05	0.07	0.02	0.08

Notes: Standard errors are clustered by Metropolitan Statistical Area and shown in parentheses. Statistical significance is designated by ** for $p < 0.01$, * for $p < 0.05$, and + for $p < 0.1$. The sample contains all NELS students attending a school in a large metropolitan area as defined by Cutler and Glaeser and represented in wave 1 and either wave 3 (1994) or 4 (2000) depending upon the dependent variable. All regressions are weighted by the NELS wave 1 sample weights and include individual controls for gender, as well as race and ethnicity.

Table 3 Cutler Glaeser Replication – Instrumental Variables Estimates

	NELS 1994 Sample					NELS 2000 Sample		
	Test Score 12 th Grade	High School Graduate	Idleness 1994	Attend College	College Graduate	Logarithm Earnings	Idleness 2000	Single Parent
Ordinary Least Squares Estimates								
Residential Segregation of African Americans	-0.726 (1.968)	0.075 (0.055)	-0.051 (0.037)	0.109 (0.099)	0.123 (0.118)	0.184 (0.127)	-0.079* (0.031)	-0.093 (0.074)
Race Interaction Term	0.889 (3.924)	-0.314** (0.114)	0.354** (0.101)	-0.290 (0.186)	-0.041 (0.168)	-0.624 (0.435)	0.199 (0.137)	0.339 (0.249)
Instrumental Variable Estimates								
Residential Segregation of African Americans	2.045 (3.397)	0.122 (0.077)	-0.054 (0.064)	0.288+ (0.152)	0.403* (0.178)	0.391+ (0.227)	-0.112* (0.049)	0.008 (0.111)
Race Interaction Term	-9.878 (6.242)	-0.468* (0.180)	0.378* (0.179)	-0.397+ (0.233)	-0.570* (0.270)	-1.585** (0.437)	0.132 (0.213)	0.689+ (0.357)
Observations	7260	7705	7678	7706	6301	5622	6356	3290
R-squared	0.11	0.02	0.03	0.04	0.05	0.07	0.02	0.08

Notes: Standard errors are clustered by Metropolitan Statistical Area and shown in parentheses. Statistical significance is designated by ** for $p < 0.01$, * for $p < 0.05$, and + for $p < 0.1$. The sample contains all NELS students attending a school in a large metropolitan area as defined by Cutler and Glaeser and represented in wave 1 and either wave 3 (1994) or 4 (2000) depending upon the dependent variable. All regressions are weighted by the NELS wave 1 sample weights and include individual controls for gender, race and ethnicity, as well as the standard metropolitan controls and race interactions shown in Table 2.

Table 4 Correlation of Segregation with Metropolitan School Environment

	Residential Segregation	Predicted Segregation	School Segregation
Common Core Population of Public Schools			
Residential Segregation of African Americans	1		
Predicted Residential Segregation	0.761	1	
School Segregation of African Americans	0.786	0.637	1
Racial Difference in Exposure to Free Lunch Students	0.681	0.678	0.666
Racial Difference in Exposure to School Spending	0.010	0.001	0.126
Racial Difference in Exp. to Student to Teacher Ratio	0.225	0.253	0.114
Percent of Students who are African American	0.320	0.408	0.048
Percent of Students who are Free Lunch Eligible	0.060	0.076	-0.162
Average Per Student School Spending			
Average Student to Teacher Ratio	-0.3966	-0.3318	-0.2907
National Educational Longitudinal Survey Sample of Schools			
Racial Diff in Exp. English as a 2 nd Language Students	-0.227	-0.172	-0.166
Racial Diff in Exp. to Students of Parent w/ College Degree	-0.147	-0.173	-0.092
Racial Diff in Exp. to Students from Single Parent Family	0.409	0.406	0.372
Racial Diff Exp. to Average School Math Test Score	-0.262	-0.224	-0.195
Racial Diff Exp. to Fraction of African American Teachers	0.356	0.405	0.391
Racial Diff Exp. to Schools with Tardiness Problems	-0.074	-0.127	-0.011
Percent Student who have English as a 2 nd Language	-0.251	-0.154	-0.182
Percent Students whose Parents have a College Degree	-0.054	-0.053	-0.006
Percent of Students from a Single Parent Family	0.140	0.123	0.027
Average Math Test Scores	0.022	0.030	0.032
Average Exposure to African-American Teachers	0.107	0.166	0.020
Average Exposure to Tardiness Problems	0.133	0.095	0.065

Table 5 Cutler Glaeser Replication - Ordinary Least Squares Estimates

	NELS 1994 Sample				NELS 2000 Sample			
	Test Score 12 th Grade	High School Dropout	Idleness 1994	Attend College	College Graduate	Logarithm Earnings	Idleness 2000	Single Parent
Baseline Estimates								
Residential Segregation of African Americans	-0.726 (1.968)	0.075 (0.055)	-0.051 (0.037)	0.109 (0.099)	0.123 (0.118)	0.184 (0.127)	-0.079* (0.031)	-0.093 (0.074)
Race Interaction Term	0.889 (3.924)	-0.314** (0.114)	0.354** (0.101)	-0.290 (0.186)	-0.041 (0.168)	-0.624 (0.435)	0.199 (0.137)	0.339 (0.249)
School Racial Segregation								
Residential Segregation of African Americans	0.782 (2.840)	0.057 (0.071)	-0.050 (0.056)	0.288* (0.128)	0.429* (0.170)	0.556** (0.204)	-0.133** (0.047)	-0.144 (0.108)
Race Interaction Term	3.560 (6.276)	-0.294 (0.180)	0.249 (0.168)	-0.552+ (0.281)	-0.323 (0.278)	-0.794 (0.722)	0.434* (0.215)	0.137 (0.351)
School Racial Segregation	-1.596 (2.603)	0.019 (0.064)	-0.001 (0.044)	-0.191 (0.117)	-0.325* (0.158)	-0.394* (0.161)	0.058 (0.039)	0.054 (0.086)
Race Interaction Term	-2.503 (4.595)	-0.021 (0.131)	0.104 (0.128)	0.274 (0.212)	0.301 (0.223)	0.190 (0.432)	-0.238 (0.160)	0.211 (0.253)
Racial Differences in Exposure to Free Lunch Students								
Residential Segregation of African Americans	-3.170 (2.219)	0.065 (0.058)	-0.038 (0.042)	0.057 (0.111)	0.124 (0.144)	0.148 (0.163)	-0.023 (0.038)	-0.055 (0.080)
Race Interaction Term	2.449 (4.263)	-0.191 (0.118)	0.295* (0.124)	-0.374+ (0.220)	-0.184 (0.200)	-0.572 (0.503)	0.102 (0.168)	0.326 (0.273)
Racial Difference Exp. to Free Lunch Students	5.017+ (2.968)	0.021 (0.070)	-0.028 (0.043)	0.109 (0.147)	-0.003 (0.212)	0.072 (0.208)	-0.112* (0.049)	-0.076 (0.088)
Race Interaction Term	-2.918 (4.459)	-0.287+ (0.151)	0.135 (0.139)	0.211 (0.256)	0.333 (0.268)	-0.112 (0.451)	0.210 (0.191)	0.012 (0.389)

Racial Differences in Exposure to Students from Single Parent Families

Residential Segregation of African Americans	-0.905 (2.088)	0.058 (0.055)	-0.045 (0.039)	0.106 (0.103)	0.116 (0.124)	0.178 (0.125)	-0.089* (0.034)	-0.111 (0.082)
Race Interaction Term	0.528 (4.073)	-0.293** (0.112)	0.356** (0.108)	-0.274 (0.193)	-0.046 (0.179)	-0.453 (0.445)	0.232+ (0.140)	0.340 (0.268)
Racial Differences Exp to Single Parent Families	0.802 (1.631)	0.043 (0.036)	-0.019 (0.034)	-0.003 (0.078)	0.004 (0.078)	0.014 (0.107)	0.034 (0.041)	0.061 (0.075)
Race Interaction Term	0.797 (2.926)	-0.060 (0.085)	-0.003 (0.083)	-0.037 (0.137)	0.026 (0.129)	-0.463 (0.353)	-0.096 (0.135)	-0.017 (0.207)

Racial Differences in Exposure to African-American Teachers

Residential Segregation of African Americans	-0.495 (1.899)	0.074 (0.053)	-0.044 (0.035)	0.114 (0.095)	0.134 (0.110)	0.195 (0.125)	-0.078* (0.031)	-0.089 (0.076)
Race Interaction Term	0.321 (4.117)	-0.305* (0.118)	0.347** (0.107)	-0.340+ (0.186)	-0.044 (0.160)	-0.635 (0.445)	0.194 (0.147)	0.369 (0.259)
Racial Differences Exp to Black Teachers	-2.171 (1.774)	-0.019 (0.055)	-0.068+ (0.035)	-0.080 (0.096)	-0.143 (0.117)	-0.108 (0.094)	-0.007 (0.029)	0.569 (0.502)
Race Interaction Term	2.945 (3.212)	0.016 (0.072)	0.058 (0.065)	0.215+ (0.127)	0.150 (0.145)	0.116 (0.229)	0.017 (0.092)	-0.026 (0.049)

Racial Differences in Exposure to Average Student Test Scores in 8th Grade

Residential Segregation of African Americans	-0.844 (1.992)	0.070 (0.055)	-0.046 (0.036)	0.098 (0.097)	0.111 (0.117)	0.176 (0.127)	-0.081** (0.031)	-0.089 (0.074)
Race Interaction Term	0.701 (4.102)	-0.316** (0.112)	0.337** (0.099)	-0.304 (0.191)	-0.048 (0.174)	-0.505 (0.437)	0.239 (0.148)	0.342 (0.265)
Racial Differences Exp to Average Math Scores	-0.097 (0.082)	-0.002 (0.002)	0.003+ (0.002)	-0.005 (0.003)	-0.006 (0.003)	-0.002 (0.004)	-0.002 (0.001)	0.004 (0.003)
Race Interaction Term	0.019 (0.185)	0.001 (0.005)	-0.006 (0.005)	-0.000 (0.009)	0.003 (0.007)	0.026 (0.016)	0.009 (0.006)	-0.002 (0.010)

Percent Students with English as a Second Language in Metropolitan Area

Residential Segregation of African Americans	-0.749 (2.218)	0.086 (0.058)	-0.044 (0.041)	0.224* (0.105)	0.187 (0.124)	0.191 (0.141)	-0.068+ (0.035)	0.014 (0.010)
Race Interaction Term	1.643 (4.018)	-0.314* (0.124)	0.368** (0.109)	-0.356+ (0.198)	-0.163 (0.174)	-0.628 (0.443)	0.198 (0.137)	0.011 (0.028)
Percent Students with English as 2 nd Lang.	-0.224 (7.313)	0.116 (0.190)	0.077 (0.180)	1.134** (0.366)	0.662 (0.438)	0.077 (0.709)	0.113 (0.153)	-0.391 (0.376)
Race Interaction Term	14.008 (15.555)	0.066 (0.536)	0.273 (0.413)	-0.360 (0.762)	-1.598* (0.706)	-0.019 (1.316)	0.049 (0.857)	0.722 (1.001)
Observations	7260	7705	7678	7706	6301	5622	6356	3290
R-squared	0.11	0.02	0.03	0.04	0.05	0.07	0.02	0.08

Notes: Standard errors are clustered by Metropolitan Statistical Area and shown in parentheses. Statistical significance is designated by ** for $p < 0.01$, * for $p < 0.05$, and + for $p < 0.1$. The sample contains all NELS students attending a school in a large metropolitan area as defined by Cutler and Glaeser and represented in wave 1 and either wave 3 (1994) or 4 (2000) depending upon the dependent variable. All regressions are weighted by the NELS wave 1 sample weights and include individual controls for gender, as well as race and ethnicity.

Table 6 Cutler Glaeser Replication – Instrumental Variables Estimation

	NELS 1994 Sample				NELS 2000 Sample			
	Test Score 12 th Grade	High School Dropout	Idleness 1994	Attend College	College Graduate	Logarithm Earnings	Idleness 2000	Single Parent
Baseline Estimates								
Residential Segregation of African Americans	2.045 (3.397)	0.122 (0.077)	-0.054 (0.064)	0.288+ (0.152)	0.403* (0.178)	0.391+ (0.227)	-0.112* (0.049)	0.008 (0.111)
Race Interaction Term	-9.878 (6.242)	-0.468* (0.180)	0.378* (0.179)	-0.397+ (0.233)	-0.570* (0.270)	-1.585** (0.437)	0.132 (0.213)	0.689+ (0.357)
School Racial Segregation								
Residential Segregation of African Americans	10.197 (9.512)	0.196 (0.182)	-0.073 (0.170)	0.942* (0.444)	1.366* (0.561)	1.293* (0.618)	-0.241+ (0.134)	0.117 (0.263)
Race Interaction Term	-25.403 (19.942)	-0.748+ (0.436)	0.242 (0.433)	-0.965 (0.623)	-2.015* (0.890)	-3.792** (1.428)	0.358 (0.512)	0.963 (0.798)
School Racial Segregation	-7.524 (6.510)	-0.070 (0.130)	0.013 (0.114)	-0.607+ (0.314)	-0.927* (0.405)	-0.865* (0.398)	0.127 (0.092)	-0.120 (0.181)
Race Interaction Term	14.022 (12.739)	0.239 (0.255)	0.106 (0.242)	0.558 (0.409)	1.343* (0.608)	2.006* (0.986)	-0.200 (0.306)	-0.235 (0.476)
Racial Differences in Exposure to Free Lunch Students								
Residential Segregation of African Americans	-0.185 (5.012)	0.129 (0.112)	-0.028 (0.092)	0.263 (0.222)	0.499+ (0.260)	0.411 (0.310)	-0.068 (0.074)	0.148 (0.153)
Race Interaction Term	-12.236 (8.861)	-0.376 (0.228)	0.307 (0.239)	-0.523 (0.317)	-0.961* (0.388)	-1.896** (0.586)	-0.016 (0.287)	0.758+ (0.424)
Racial Difference Exp. to Free Lunch Students	3.151 (4.272)	-0.020 (0.101)	-0.035 (0.069)	-0.023 (0.206)	-0.246 (0.272)	-0.097 (0.247)	-0.083 (0.066)	-0.213+ (0.125)
Race Interaction Term	5.701 (7.780)	-0.178 (0.198)	0.128 (0.175)	0.310 (0.300)	0.807* (0.368)	0.701 (0.610)	0.275 (0.228)	-0.188 (0.431)

Racial Differences in Exposure to Students from Single Parent Families

Residential Segregation of African Americans	2.271 (3.690)	0.091 (0.081)	-0.041 (0.071)	0.300+ (0.163)	0.411* (0.190)	0.411+ (0.237)	-0.129* (0.055)	-0.015 (0.120)
Race Interaction Term	-10.941 (6.814)	-0.441* (0.184)	0.362+ (0.189)	-0.358 (0.241)	-0.604* (0.298)	-1.449** (0.480)	0.179 (0.221)	0.711+ (0.370)
Racial Differences Exp to Single Parent Families	0.158 (1.782)	0.036 (0.040)	-0.020 (0.039)	-0.044 (0.086)	-0.062 (0.091)	-0.038 (0.112)	0.043 (0.043)	0.039 (0.075)
Race Interaction Term	3.135 (3.458)	-0.032 (0.089)	-0.004 (0.085)	-0.017 (0.138)	0.142 (0.148)	-0.254 (0.347)	-0.087 (0.140)	-0.074 (0.186)

Racial Differences in Exposure to African-American Teachers

Residential Segregation of African Americans	2.039 (3.490)	0.103 (0.075)	-0.050 (0.060)	0.263+ (0.150)	0.363* (0.177)	0.377 (0.229)	-0.111* (0.049)	0.014 (0.109)
Race Interaction Term	-10.090 (6.373)	-0.446* (0.181)	0.375* (0.181)	-0.386 (0.245)	-0.527+ (0.272)	-1.595** (0.446)	0.125 (0.216)	0.688+ (0.349)
Racial Differences Exp to Black Teachers	-2.348 (1.850)	-0.021 (0.057)	-0.068+ (0.036)	-0.090 (0.100)	-0.159 (0.126)	-0.121 (0.102)	-0.005 (0.028)	-0.033 (0.050)
Race Interaction Term	4.321 (3.622)	0.034 (0.072)	0.055 (0.067)	0.209 (0.127)	0.203 (0.163)	0.250 (0.268)	0.030 (0.093)	-0.124 (0.120)

Racial Differences in Exposure to Average Student Test Scores in 8th Grade

Residential Segregation of African Americans	2.395 (3.338)	0.119 (0.076)	-0.061 (0.058)	0.284* (0.143)	0.397* (0.171)	0.367+ (0.221)	-0.102* (0.047)	-0.009 (0.110)
Race Interaction Term	-10.663+ (6.250)	-0.466* (0.179)	0.391* (0.174)	-0.419+ (0.235)	-0.587* (0.272)	-1.555** (0.464)	0.126 (0.218)	0.727* (0.356)
Racial Differences Exp to Average Math Scores	-0.091 (0.083)	-0.002 (0.002)	0.003+ (0.002)	-0.005 (0.004)	-0.005 (0.004)	-0.002 (0.005)	-0.002 (0.001)	0.004 (0.002)
Race Interaction Term	-0.045 (0.196)	-0.000 (0.005)	-0.005 (0.005)	-0.000 (0.008)	-0.000 (0.008)	0.017 (0.016)	0.008 (0.006)	0.002 (0.010)

Percent Students with English as a Second Language in Metropolitan Area

Residential Segregation of African Americans	3.606 (4.494)	0.162+ (0.094)	-0.053 (0.077)	0.585** (0.220)	0.646* (0.262)	0.508+ (0.300)	-0.103+ (0.061)	-0.042 (0.120)
Race Interaction Term	-10.482 (6.873)	-0.505* (0.202)	0.393* (0.194)	-0.566* (0.279)	-0.903** (0.332)	-1.718** (0.475)	0.145 (0.216)	0.785* (0.389)
Percent Students with English as 2 nd Lang.	7.771 (10.964)	0.252 (0.238)	0.061 (0.200)	1.786** (0.590)	1.477* (0.732)	0.640 (0.915)	0.051 (0.177)	-0.224 (0.408)
Race Interaction Term	-2.865 (17.003)	-0.206 (0.585)	0.309 (0.438)	-0.833 (0.833)	-2.734** (0.913)	-1.430 (1.465)	0.011 (0.825)	1.037 (1.163)
Observations	7260	7705	7678	7706	6301	5622	6356	3290
R-squared	0.11	0.02	0.03	0.04	0.05	0.07	0.02	0.08

Notes: Standard errors are clustered by Metropolitan Statistical Area and shown in parentheses. Statistical significance is designated by ** for $p < 0.01$, * for $p < 0.05$, and + for $p < 0.1$. The sample contains all NELS students attending a school in a large metropolitan area as defined by Cutler and Glaeser and represented in wave 1 and either wave 3 (1994) or 4 (2000) depending upon the dependent variable. All regressions are weighted by the NELS wave 1 sample weights and include individual controls for gender, as well as race and ethnicity.