Exit or Invest: How segregation still shapes public education

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Abstract

Does segregation help or hurt support for public education? Previous literature has identified diversity, and more recently segregation, as key predictors for spending less on public goods. Because of schools' historical legacy with segregation, segregation could play a very different role in funding public education. To test this, I have collected data on the 11,000 plus school district in the United States from 1995 to 2011. Using multi-level models with a state-school district nested design, I find that white-black segregation leads to more investment in public education while white-Hispanic segregation, as well as segregation by income, has no effect. This result is robust across a broad array of alternative specifications, including a natural experiment using the overturning of court desegregation orders. The results imply that segregation is still shaping public education.

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1 Introduction

Many scholars have found that diversity is associated with decreases in public investment and social capital (i.e., Alesina, Baqir and Easterly 1999; Putnam 2007)[1] and funding for education is no exception (Poterba 1996; Hoxby 2000). But while some diverse cities struggle to provide basic services, other cities thrive in providing a wide range of public goods. To explain this puzzle, Alesina and Zhuravskaya (2011) and Trounstine (2015*b*) point to segregation. Political polarization in segregated places prevents groups from coming together to agree upon the appropriate level of taxation and spending, and ultimately driving down investment (Trounstine 2015*b*).

But does this finding translate to all contexts of local government, particularly funding for public education? A typical school district contains school catchment areas in which a child's residents determines which school she attends. Therefore, if a school district is residentially segregated, then the schools themselves are likely to be segregated. But in an integrated setting, students from different racial groups are much more likely to attend the same school, and have increased contact with different groups. While contact theory posits that increased, regular contact with members from a different group can reduce prejudice (Allport 1954), it is only likely to do so under certain conditions, i.e. when there is equal status and repeated interactions (Pettigrew 1998). Race is still a factor some parents, particularly white parents, use as a proxy for school quality (Holme 2002; Johnson and Shapiro 2003; Krysan and Farley 2002), suggesting that equal status has not yet been met. In addition, there has been a strong resistance to integration in public schools, with over 700 school districts under court order to desegregate since the passage of *Brown v. Board of Education* (ProPublica 2014). Instead of integration making collective action easier as it does with other types of public goods, integration decreases support for investment in public education. Segregation allows parents to send children to homogeneous schools, which can effect the likelihood of a parent

[1] Costa and Kahn (2003); Glaser (2002); Habyarimana et al. (2007); Harris, Evans and Schwab (2001); Hero (2003); Luttmer et al. (2001); Poterba (1994)

choosing between private and public education, whether to support or oppose tax increases for public education, and possibly effect local property values themselves.

This paper uses an originally compiled data set of over 11,000 school districts from 1995 to 2011, which allows the observation of demographic changes and then the subsequent response in local investment. It is supplemented with two additional analyses. This paper takes seriously concerns of endogeneity, particularly self-selection into neighborhoods. For example, it is likely that individuals who are more tolerant of diversity are more likely to select neighborhoods that are integrated. The first supplemental analysis is a natural experiment that exploits quasi-random variation in school segregation using court desegregation orders. While the districts that have been placed under a court desegregation order are not random, the timing of when the order is lifted is quasi-random. This release from a court order creates exogenous variation in school segregation and allows comparison of districts that have had their order lifted to districts still under a court order. Timing in placement under a court desegregation order and release from orders as a strategy for causal identification has been applied in other settings as well, including education, criminal activity, and mixed-race births (i.e. Gordon and Reber 2016; Johnson 2011; Weiner, Lutz and Ludwig 2009). The second analysis, a direct comparison to cities and city expenditures from Trounstine (2015*b*), helps establish the difference between education and other types of goods, such as spending on police or roads.

This paper contributes to the existing research on diversity in several ways. First, not all public goods are the same. While integration helps communities invest more in roads and sewers, it does not cause an increase in school finances. White-black integration leads to *less* investment in public education. Going from the 75th to 25th percentile in white-black segregation within a district, i.e. becoming more integrated, results in $112.74 less per student. With the average district enrolling 3,887 students in 2010, this is a $438,220.38 difference. Second, not all groups react to each other the same way. Prior work on diversity and segregation often include all races and ethnicity into one measure, which can mask differences in response to different out-groups. By looking at white-black and white-Hispanic segregation separately, I find that investment in public education is not related to white-Hispanic segregation. And while race and income are often correlated, investment is not related to income segregation. The pattern holds, but with increased magnitude, when I focus on districts with court desegregation orders using an instrumental variable analysis. These results are robust to limiting the sample to cities studied by Trounstine (2015*b*). In exploring possible mechanisms, I test the effect of segregation on enrollment in public schools. While segregation is not related to public school enrollment in the full sample, in districts that have a court desegregation order lifted, the percent of children attending public schools increases.

2 Interaction and Investment

Race and ethnicity have been found to be prominent factors in determining an individual's political attitudes and policy preferences (Dawson 1994; Enos 2016; Federico and Luks 2005; Kinder and Kam 2010; Kinder and Winter 2001). But what is it about diversity and the interaction among different races that cause lower levels of public investment? Racial threat theory posits that individuals living in close proximity to different racial groups feel threatened, economically and socially, through increased competition over scarce resources (described by Key (1949), built upon by Blumer (1958), Blalock (1967), and Bobo (1988)). This occurs through two mechanisms: diverging preferences and decreased utility of a public good. As a city diversifies, different racial or ethnic groups might have different preferences over the appropriate level of taxes and services (Alesina, Baqir and Easterly 1999; Tiebout 1956). The second mechanism deals with the utility of a public good; a groups' utility level for a given public good is reduced if other groups also use that good (Kruse 2005; Luttmer et al. 2001).

One of the challenges and weaknesses in many studies of racial tolerance is the failure to specify what type of contact is taking place (Oliver 2010). Perhaps it is not the level of diversity that is driving these findings. Alternatively, it is the way in which a community is arranged. Neighborhoods in the United States are highly segregated along racial lines (Oliver 2010). Segregated communities, both residential and professional, by definition are less likely to encounter out-groups on a daily basis and therefore less likely to form ties needed to facilitate collective action. Instead of diverging preferences between groups, it is the lack of communication that drives negative investment. Trounstine (2015*b*) offers evidence of this, finding that segregated cities are more politically polarized and that is why segregated cities are associated with less spending on public goods (specifically police, roads, parks, sewers, and housing/welfare). Residential integration, on the other hand, has been offered as a way to overcome the negative effects of racial diversity (Welch 2001) because integrated communities that have increased communication flows and ties to other groups are better off than segregated ones (Habyarimana et al. 2007).

At the same time, residential integration does not guarantee the type of social ties that facilitate increased corporation and mutual trust. The four conditions outlined by Allport (1954) needed to overcome racial prejudice are equal group status within a situation, common goals, intergroup cooperation, and authority support. In reality, Oliver (2010) finds that integrated neighborhoods do not imply that residents are civically and socially engaged. Instead, integration for minorities, can mean facing threats and intimidation (Bobo and Zubrinsky 1996; Krysan and Farley 2002), and for whites, integration can mean less trust in neighbors, weaker sense of community and being less active civically (Oliver 2010).

Public goods that demand shared space, like public schools, result in a different kind of contact among groups. The decreased utility mechanism is more likely to come into play with public education than other types of goods. People in segregated communities understand that they will not have to share these spaces and therefore might be more willing to invest. But in an integrated setting, they can exit to private schools or move to a more homogeneous school district. "White-flight" is a well-studied phenomena where whites respond to desegregation by exiting to alternative, more homogeneous options (Lutz 2011). In addition, adults who do not have children might be less supportive of education funding if children attending the school are of a different race than their own (Poterba 1996). If people are resistant to the contact that is required of an integrated school, residential integration is likely to have the opposite effect on investing in public schools. I, therefore, hypothesize that communities that become more residentially integrated will invest *less* in their schools than areas that become more segregated.

While the empirical strategy in this article does not allow me to distinguish the specific mechanism, I briefly discuss some of the potential mechanisms that would lead to a decrease in public investment in an integrated environment. First, school budgets are linked to local property taxes because the majority of local revenue for public education is supplied through property taxes (Berkman and Plutzer 2005). Highly rated schools can create higher housing values, and therefore more money collected from property taxes. While not an academic analysis, the real estate firm Redfin put a number on it- homes in areas with highly rated schools cost approximately $50 more per square foot more compared to homes in areas with average rated schools (Unger 2013). But research has continually shown a relationship between the race of students and the perception of school quality (i.e. Holme 2002). And when choosing where to live, school quality is used as a proxy for the racial composition of a neighborhood (National Fair Housing Alliance 2006). In an integrated setting, schools could be perceived to be of a lower quality. This reinforcing link between the users of the good and the quality of the good could effect home values resulting changes in property tax and school budgets.

Beyond housing values, integration could impact the private/public school balance. In a segregated setting, this would mean to a homogeneous public school, perhaps increasing the likelihood of sending their child to a public school over a private school. In an analysis of schools that were required to desegregate, Baum-Snow and Lutz (2011) found that there was an average six to twelve percent decline in white public school enrollment. Lastly, citizens often have a role in the school budget process, either through voting directly on the school budget or voting on a tax increase. In an integrated setting, citizens might be less supportive of an increase in budgets if children are attending private school and if the students are of a different race than themselves.

While the focus of this article is on changes *within* a school district, this does not imply that an increase in investment at the school district level is applied equally to all schools within the district. While it is very difficult to obtain budgets at a school level, a few case studies have revealed that variation in spending exists within school districts. In a study of 89 elementary schools in one urban district in Ohio, Condron and Roscigno (2003) find considerable disparities in spending within a district. These disparities are linked to racial and class cleavages within the district. In addition, this article does not directly speak to the quality of public education in these segregated environments. While I offer a more detailed response in the conclusion, it is important to note that increased revenue within a district does not imply that the revenue is flowing evenly to all groups within a district or that increased revenue is correlated with increased quality.

A second component of this paper is also to move beyond simple measures of diversity. If people respond to different types of public goods in different ways, do all groups respond to the same out-group in the same way? Research often uses one measure to talk about changes in diversity- the Herfindahl index (i.e. Alesina, Baqir and Easterly 1999; Putnam 2007). It is interpreted as the probability that two randomly selected individuals are from the same group. There are many ways to get the exact same Herfindahl index for very different communities. For example, a community that is 30 percent white and 70 percent black would have the same index as a community that is 70 percent white and 30 percent black or 70 percent Hispanic and 30 percent black. But the mix of people is likely to matter. Many of the early theories of racial threat focus on the response of whites to African Americans. By grouping everyone into one measure, it is difficult to know what is driving the results.

There have been two distinctive processes for diversity in the United States- the African slave trade and the immigration of Latinos and Asians in the 20th and 21st century (Putnam 2007). And even more importantly,the ways in which groups have been treated historically differ. Massey and Denton (1993) showed just how different the construction of African American neighborhoods was than any other racial or ethnic group. The ghettos, as they referred to them, were purposefully created to keep this group isolated. The historical context requires that the effect of diversity or segregation on public investment be looked at in more nuanced ways. Segregation concentrates poverty in black neighborhoods (Massey and Denton 1993)

While I do not hypothesize how whites would react to integration with different groups, I do look at White-Black and White-Hispanic segregation separately. It is possible that the reaction would be different for each group. Although busing and court orders are less likely today, tension within communities over education is still high and often related to white-black relations. White-Hispanic segregation might not have the same effect because the process through which white-Hispanic segregation occurred is fundamentally different than white-Black segregation and not marked by the same institutional racism.

3 Constructing the Data: Public School Districts

In order to test these hypotheses, I have collected data from a variety of sources that combines school budget information, student demographic information, and community demographic information from 1995-2011. The Public Elementary-Secondary Education Finance Data provided by the U.S. Census Bureau has school district budgets each year from 1995 to 2011(US Census Bureau 1993-2011). This data set breaks apart revenue by local, state, and federal governments and separates out capital projects from the operating budget. The Local Education Agency (School District) Universe Survey, provided by the National Center of Education Statistics, collects student demographic information like the racial and ethnic breakdown of the students and percent of students receiving free and reduced lunch yearly(NCES 1993-2012). I include community level information about the school districts from the 1990, 2000 and the 2007-2011 American Community Survey (US Census Bureau (1990); US Census Bureau (2000); US Census Bureau (2010)). Because the Census data is not yearly, I interpolate data between the three Censuses.

I also use tract level information from the Census to calculate segregation measures, discussed below.[2]. Because the geographic area that is included in a census tract can change over time, I re-weight the 1990 and 2000 tracts to reflect 2010 tract boundaries according to Logan, Xu and Stults (2014).[3] Census tracts are then mapped on to school districts using the 2013 School District Geographic Relationship Files created by the National Center for Education Statistics (National Center for Education Statistics 2013). In addition, to these main data sources, I also added presidential vote by county (CQ Pres 2016), city expenditure data for a comparison from Trounstine (2015*b*), mapped private school information onto public school districts (National Center for Education Statistics 2000-2010), and information regarding court desegregation orders in a district (ProPublica 2014).

For this data set, I focus only on Elementary School Districts, Secondary School Districts, and Elementary-Secondary School Districts. I exclude vocational, special needs districts, non-operating districts, state-run districts, charter districts, and educational service agencies. This yields approximately 12,000 school districts. I also limit the analysis to districts that have more than one census tract and have at least one year that has percent African American greater than zero. This requirement is necessary to calculate segregation measures.[4] Because some districts merge, open, or close during this time-frame, the exact number varies from year to year but is stable over time for the vast majority.[5]

[2]For the 1990 and the 2000 Census, tract level data was downloaded directly from the American Fact Finder US Census Website for each state. The 2010 tract level data was downloaded using USCensustract2010 package in R (Almquist 2010)

[3]The US2010 program at Brown University has created STATA code to re-weight tracts in the 1990 and 2000 Census to reflect changes in boundaries from the 2010 Census. This code was written by Brian Stults.

[4]I also excluded outliers in terms of per child local revenue (top and bottom 1% of data). Districts that have small numbers of students can have very large per child spending.

[5]There is a small amount of missing in some of the variables early on in the data set. I re-ran models with imputed data as well as on the districts that had no missing data. Results do not change and are available on request.

In order to test the effects of a changing community and segregation, I use the *Per Child Local Revenue* raised for schools as the primary dependent variable, which includes taxes (property, utility, and sales), charges, and miscellaneous revenue that is used by the school district and collected at the local level. I focus specifically on the local amount raised instead of total per child spending because this is what local citizens and school boards have control over. In 2010, local revenue was approximately 42 percent of the total revenue raised for the average district. State funds are determined mostly through funding formulas (46 percent of total revenue) and federal dollars are mostly doled out through grants (12 percent of total revenue). In order to control for differing sizes of school districts, I calculate this as a per child measure by dividing by school enrollment. All dollar amounts are in 2013 constant dollars. Table 1 shows the mean and N for 1995, 2000, and 2010 for all variables.

The most common measure used for segregation is the dissimilarity index, which calculates the percentage of a groups population that would have to change residence for each neighborhood to have the same percentage of that group as the overall area. However, it does not control for the relative size of one group to another group. The Theil H index (1972) calculates a segregation measure that controls for both evenness of the distribution of a group and the relative size. The H index varies between 0 and 1, where 0 indicates that each sub-unit (census tract or school) has the same composition as the entire unit (school district). I use this measure in most models, and the dissimilarity index as well as an isolation index as a robustness check.

I calculate the measure in several ways: white-nonwhite, white-black, and white-Hispanic segregation. This is calculated using both census tracts and schools for each district to create measures for residential segregation and school segregation. For schools, the focus is on segregation in elementary schools because many districts only have one high school. Appendix A contains additional information about the measure. Throughout the paper, *White-Black Segregation, Residential* refers to the segregation measure between white and black residents calculated using the H index and using Census tracts as the sub-unit. *White-*

Black Segregation, School indicates that schools are the sub-unit within the district.

For segregation by income, I use the same method as Massey et al. (2003).Using census data, I define households to be either at or below the poverty level, middle class, or affluent (defined as four times the poverty level). I then calculate segregation between poverty households and affluent households. For income segregation at the school level, I use the number of children receiving free lunch compared to the number of children paying for lunch within each school compared to the overall population of the district.

There are many other factors that are likely to affect the amount of revenue raised beyond segregation. Diversity of residents has consistently been highlighted as an important predictor. Diversity can be measured in different ways, but I am using *% Black* and *% Hispanic* to capture the diversity of the district. Beyond the level, the change in diversity can be important (Hopkins 2009). I have also included the five year change in percent African American, *5 yr Δ % Black*, and change in percent Hispanic,*5 yr Δ % Hispanic*.

Economic conditions within each district are also different. Wealthier areas will be able to raise more revenue than cash-strapped districts. I include *Median Household Income* in thousands of dollars as a measure for district wealth. I include the percent of residents with a bachelor degree or higher, *% Bachelor or higher*, as a proxy for education support and percent of Democratic vote in the previous election, *% Democrat President Vote*, as a proxy for support for government spending. I also include percent of residents who own their home, *% Own Home*. Because property taxes are a large part of investment in local revenue, home owners might have stronger views on changes in taxes. States and the federal government contribute at different rates as well. I include controls for *Per Child State* level funding and *Per Child Federal* level funding. Districts vary in size, which can impact per child costs. To combat this, I include the number of students in a district, *Student Enrollment*, the log of the population, *Log Pop*, and the land area size of the district *Land Area*.

In addition to these variables that are included in all models, I have also collected additional school district information, which was not reliable reported until the 2000s. This

Table 1: Summary Statistics of data for 1995, 2000, and 2010

	1995		2000		2010	
	Mean	N	Mean	N	Mean	N
Per Child Local (in thous)	4.57	11,091	4.73	11,123	5.74	11,425
Per Child State (in thous)	4.59	11,108	5.55	11,136	6.06	11,458
Per Child Fed (in thous)	.53	11,108	.67	11,136	1.52	11,458
White-Black Seg., Resident (H Index)	0.09	11,108	0.08	11,136	0.07	11,458
White-Hispanic Seg., Resident (H Index)	0.04	11,108	0.04	11,136	0.04	11,458
White-Nonwhite Seg., Resident (H Index)	0.06	11.108	0.06	11,136	0.05	11,458
White-Black Seg., Resident (Dissimilarity)	0.34	11,108	0.32	11,136	0.30	11,458
Income Segregation	0.19	11,108	0.19	11,136	0.22	11,458
White-Black Seg., School[a] (H Index)	0.08	5,441	0.07	5,385	0.07	5,755
White-Hispanic Seg., School[a] (H Index)	0.06	5,888	0.06	5,881	0.06	5,976
Free-Paid Lunch Seg., School[a] (H Index)	0.05	4,409	0.04	4,865	0.04	5,650
% Black	5.22	11,108	5.38	11,136	6.03	11,458
% Hispanic	6.03	11,108	7.06	11,136	9.81	11,458
5 yr Δ % Black	0.15	11,108	0.14	11,136	0.40	11,458
5 yr Δ % Hispanic	0.98	11,108	0.97	11,136	1.31	11,458
Med. Household Income (in thous)	55.34	11,108	57.08	11,136	52.70	11,458
Log Population	9.05	11,108	9.10	11,136	9.19	11,458
% Bachelor or higher	16.53	11,108	18.39	11,136	21.88	11,458
% Democrat President Vote	45.83	11,108	43.29	11,136	43.39	11,458
% Own Home	74.70	11,108	75.39	11,136	76.26	11,458
Land Area of School District (in thous)	574,342	11,108	578,043	11,136	599,958	11,458
Student Enrollment	3,672	11,108	3,889	11,136	3,980	11,458
Num. Private Schools			2.40	11,136	2.02	11,458
Num. Charter Schools			0.06	11,136	0.19	11,458
% SPED	9.85	11,108	12.61	11,136	13.69	11,458
% Free Lunch	27.01	8,727	25.37	9,137	35.93	11,174

[a]Approximately half of the districts have more than one elementary school. No measure was calculated for districts with only one school.

includes percent of students receiving free lunch (*% Free Lunch*), percent enrolled in Special Education (*% SPED*), and number of charter schools (*Num. Charter Schools*) and private schools (*Num. Private Schools*) in the area.[6] During this time period, the average school district grew in size, per child amounts at all three levels of government increased, percent of the community with a bachelor degree increased, more students received free and reduced lunch, and percent of the community that is Hispanic and African American increased. In addition, the average school district became less white, has a lower median household income, and has become slightly less segregated.

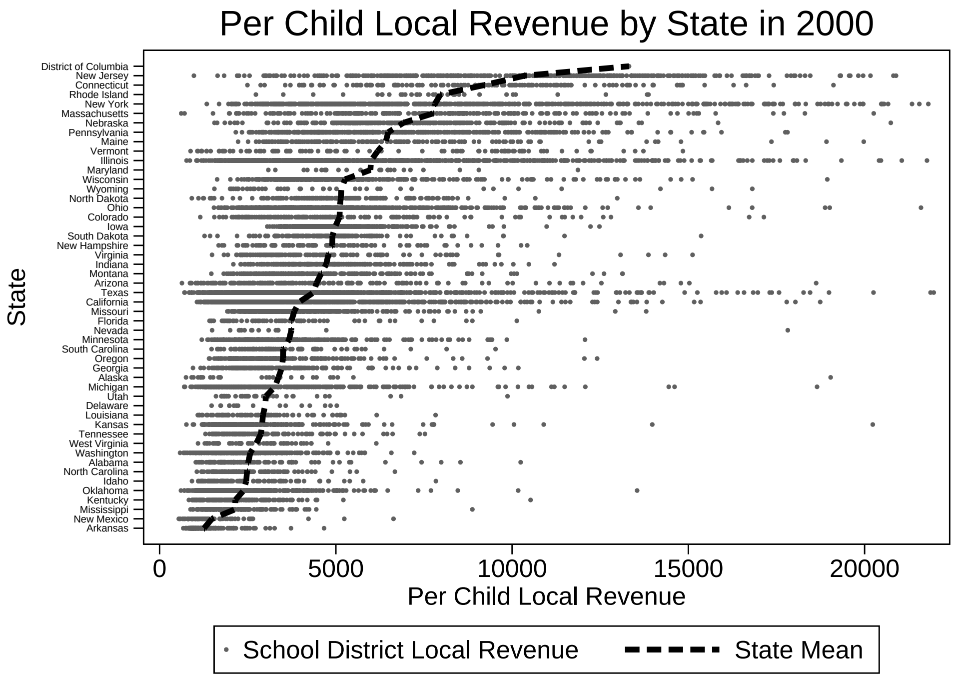
3.1 Model Specification

Understanding the impact of changes at the local level is challenging. Local governments are not independent entities from the state (Morgan and Watson 1995), and school districts are no different. States fund education at different levels and set the rules that districts must follow in generating education funds. Some states, such as California and New Jersey, have set tax caps on property tax rate increase. Other states require citizens to vote on school district budgets (for example, New York). Figure 1 illustrates the variation by state by plotting per child local revenue by state. Each dot represents the revenue by district, while the state mean is represented by the black dotted line. In some states, such as New Mexico, very little funding comes from local school districts. In other states, such as Connecticut, local districts collect significant revenue from local sources. The intra-class correlation (ICC) also shows that a large part of the variation in per child local revenue occurs between states-39 percent.

In order to account for this state-level variation, I use multi-level modeling which is more flexible than Ordinary Least Squares (OLS). This approach allows the inclusion of state and district level random intercepts to account for this variation and allows for partial pooling of

[6] Private schools were geocoded and given a 10 mile buffer radius around for an "attendance" zone. These zones were overlaid with public school district boarders. If they overlapped, then the children in the public school were said to have access to that private school.

Figure 1: Differences by State



Note: This graph reflects the variation in per child local revenue by state in 2000. Each black dot represents a school district and the dashed line represents the mean per child local revenue in each state.

group indicators (Gelman and Hill 2007). Multi-level modeling allows a nested design, with district intercepts nested within state-level intercepts. I use a three-level model. The model has two random-effects equations. The first is a random intercept at the state level (level three) and the second is a random intercept at the school district level(level two). Because this data is over time, level one is the district at each point in time. The model is given by the following equation:

$$Per\ Child\ Local\ Revenue_{jk,t} = \beta_1 Segregation_{jk,t-1} + \beta_c X_{jk,t-1} + f_t^{year} + u_k^{state} + u_{jk}^{district} + \epsilon_{jk,t-1}$$

for $i = 1; ...; n_{jk}$ first-level observations nested within $j = 1; ...; M_k$ second-level groups (districts), which are nested within $k = 1; ...; M$ third-level groups (states). The third-level random intercept for state intercepts is u^{state} and the second- level random intercept of district is given by $u_{jk}^{district}$ where:

$$u_k^{state} \sim N(0, \Sigma^{state});\ u_{jk}^{district} \sim N(0, \Sigma^{district});\ \text{and}\ \epsilon_{jk} \sim N(0, \sigma_{jk}^2 I)$$

and that u_k^{state},$u_{jk}^{district}$, and ϵ_{jk} are independent. β_1 is the coefficient on *Segregation*, and X is the design matrix for the fixed effects for β_c (where c references controls: percent black, percent Hispanic, change in black, change in Hispanic, median household income, students enrolled, log population, per child state, per child federal, percent bachelor degree, and percent vote for Democrat president). Because it is over time, t references the year of observation where t=1995....2010. The dependent variable is per child local revenue for district j in state k at time *t+1*. When robust is specified, error terms are clustered at the highest level. Therefore, when state and district random effects are both included in the model, the error term is clustered at the state level.

4 Large-N Analysis Results

The first set of results tests how segregation within the school district impacts per child local revenue (in thousands of dollars) for all school districts in the United States. I estimate both multilevel models with state and district random effects and a district fixed effect models of per child local revenue where the independent variables are from the year prior. Table 2 shows the results with associated p-values in parentheses. Column 1 through 4 are multi-level models with random intercepts for state and school district, include year fixed effects, and robust standard errors. As an additional model check, column 5 contains the results with district fixed effects and year fixed effects and clustering standard errors by district. State fixed effects are not necessary in this model because the state effect is captured within the district fixed effect. The key coefficients of interest are *White-Nonwhite Segregation, Residential*, *White-Black segregation, Residential*, and *White-Hispanic Segregation, Residential*, as measured by Theil's H index. With each segregation coefficient, the coefficient represents the change from complete integration (segregation=0) to complete segregation (segregation=1).

In all models, segregation predicts increased local revenue. But not all segregation measures respond in the same way. While the *White-Nonwhite Segregation* coefficient is very similar in magnitude to *White-Black Segregation*, *White-Hispanic Segregation* is not predictive. When both *White-Black Segregation* and *White-Hispanic Segregation* are in the model as shown in Column 4 in Table 2, *White-Black segregation* is the main driver of this relationship. Figure 2 plots the marginal change of going from no segregation to complete segregation for both white-black and white-Hispanic segregation (based on column 4). Substantively, going from the 75th to the 25th percentile in *White-Black Segregation, Residential* (0.10 to 0.02; i.e. becoming less segregated) would result in $112.74 less dollars per child. With the average district enrolling 3,887 students in 2010, this is a $438,220.38 difference.

In terms of diversity, the level of African American or Hispanic residents is not directly related to per child revenue, but a change is, a finding consistent with Hopkins (2009). But as with segregation, the response is not uniform to different out-groups. While a five year change in percent Hispanic results in an increase in revenue, a five year change in African American residents predicts a decrease in revenue. Economic factors also matter. Districts with higher median household incomes and a higher percentage of residents with bachelor's degrees collect more in local revenue.

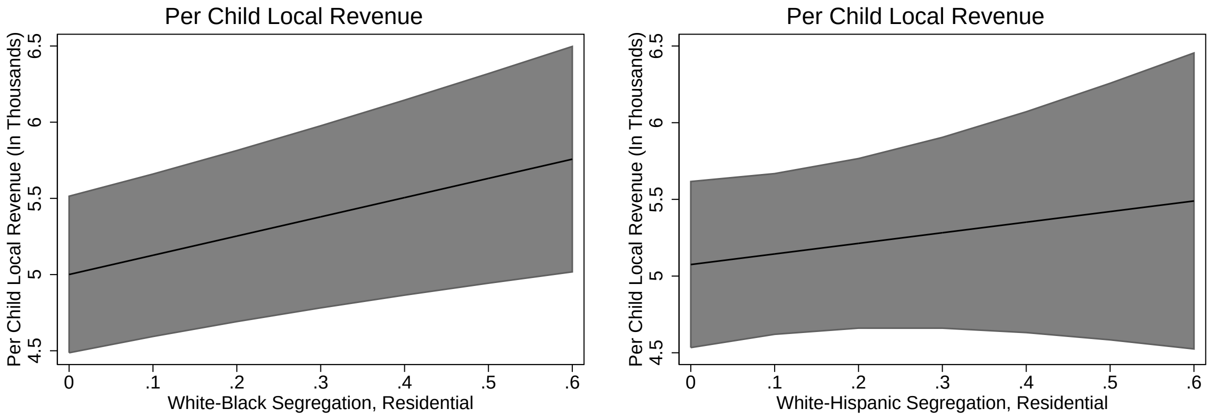
The positive effect of segregation is true across a wide variety of model specifications. Figure 3 shows the 95 percent confidence interval for the *White-Black Segregation, Residential* coefficient across twelve different model specifications. "Original Model" plots the coefficient from the multi-level model in Table 2 Column 2. The set of models under "Vary Time Frames" show the coefficient when: 2) predicting per child lcoal revenue two years into the future, 3) per child local revenue ten years into the future (that is, crosses a census), and 4) only using five years of data (1995, 1997, 2002, 2007, and 2010). The next set of reported coefficients change or add variables to the model: 5) added percent of students receiving free lunch, special education services, percent of children in the district attending public schools, percent of adults unemployed, and number of charter schools (the data on most of these

Table 2: Effect of Segregation on Per Pupil Local Revenue

	Per Child Local Revenue				
	State & District Random Effects				Dist FE
White-Nonwhite Segregation, Residential	1.40				
	(0.005)				
White-Black Segregation, Residential		1.37		1.26	0.73
		(0.000)		(0.001)	(0.039)
White-Hispanic Segregation, Residential			1.26	0.69	-0.13
			(0.095)	(0.392)	(0.819)
% Black	-0.01	-0.01	-0.01	-0.01	-0.03
	(0.169)	(0.146)	(0.191)	(0.141)	(0.000)
% Hispanic	-0.01	-0.01	-0.01	-0.01	-0.02
	(0.331)	(0.362)	(0.291)	(0.340)	(0.000)
5 yr Δ % Black	-0.02	-0.02	-0.02	-0.02	-0.02
	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)
5 yr Δ % Hispanic	0.03	0.03	0.03	0.03	0.02
	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)
Students Enrolled	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.057)	(0.051)	(0.056)	(0.049)	(0.001)
Med. Household Income	0.02	0.02	0.02	0.02	0.02
	(0.022)	(0.023)	(0.022)	(0.022)	(0.000)
Log Pop	-0.46	-0.47	-0.46	-0.48	-0.71
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
% Bachelor or higher	0.11	0.11	0.11	0.11	0.09
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
% Dem Pres Vote	0.01	0.01	0.01	0.01	0.01
	(0.125)	(0.125)	(0.120)	(0.124)	(0.000)
% Own Home	0.01	0.01	0.01	0.01	0.03
	(0.027)	(0.028)	(0.028)	(0.026)	(0.000)
Land Area	0.00	0.00	0.00	0.00	0.00
	(0.016)	(0.014)	(0.015)	(0.015)	(.)
Per Child State	-0.14	-0.14	-0.14	-0.14	-0.12
	(0.035)	(0.035)	(0.035)	(0.035)	(0.000)
Per Child Federal	0.07	0.07	0.07	0.07	0.07
	(0.032)	(0.029)	(0.031)	(0.031)	(0.000)
Constant	4.50	4.55	4.49	4.56	6.51
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
State/District RE	X	X	X	X	
District FE					X
Number of Districts	11,751	11,751	11,751	11,751	11,751
Observations	177,479	177,479	177,479	177,479	177,479

Note: The dependent variable in all models is the *Per Child Local Revenue* in thousands of dollars. P-values are in parentheses. The first four columns provide the results from multi-level model with state and district random effects covering years 1995 to 2011. Standard errors are clustered at state level. The fifth column includes district fixed effects and clusters errors by district.

Figure 2: Marginal Effect of Segregation



Note: This is the effect of a marginal change in white-black segregation on per child local revenue. This result is from Table 2 Column 3. *White-Black Segregation* is measured using the H index (White-Black) residential.

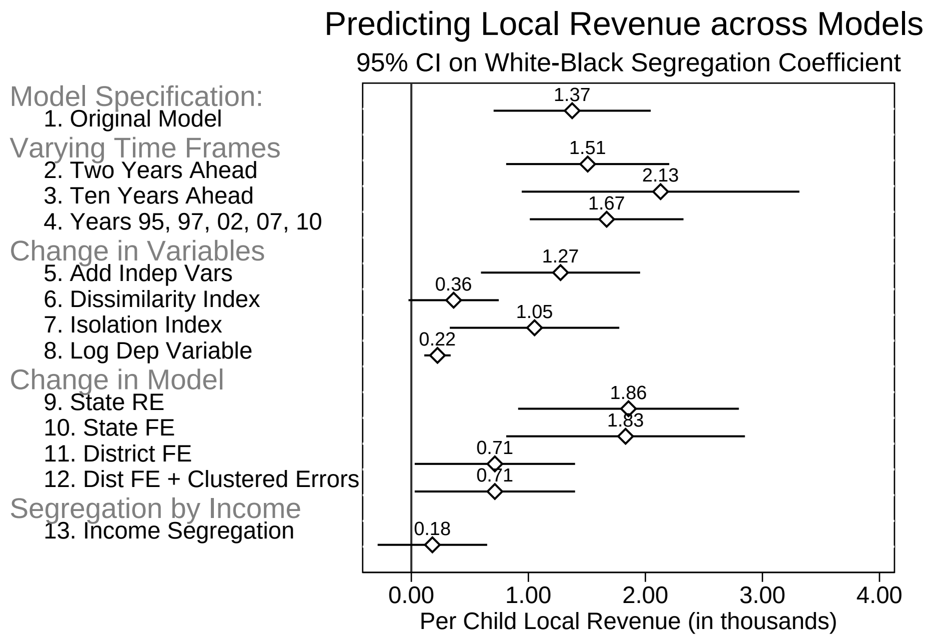
variables was not available or inconsistently collected until 2000, so they are not included in the original model) 6) replacing Theil's H index with the dissimilarity index, and 7) replacing Theil's H Index with an index of Black Isolation, 8) logging per child local revenue.

The fourth set changes the structure of the model: 9) random effects for states only, 10) state fixed effects only, 11) district fixed effects, and 12) district fixed effects with standard errors clustered by district (this is the same as Table 2 Col. 5).[7] The story is consistent across all models- white-black segregation increases local revenue for public education. Figure B.1 in the appendix looks at different dependent variables: per capita local expenditures, per child total expenditures, per child current expenditures, per child revenue for instructional purposes, and per child revenue for capital outlay. With the exception of capital projects, all these categories show the same pattern: more segregated places spend more per child. Residential segregation has no effect on capital projects.

The last model in Figure 3 under "Segregation by Income" replaces the measure of residential segregation with a measure of income segregation. This measure captures the

[7]In the appendix, Figure B.2 provides additional robustness checks by looking at the data cross-sectionally for each year.

Figure 3: Robustness Checks when Changing the Model



Note: The graph plots the 95% confidence interval for the segregation coefficient across 12 different models with *per child local revenue* as the dependent variable. Each row is a new model with changes in either time, independent variables, or model structure.

degree to which families in poverty and affluent families are residentially segregated (affluent is defined as four times the poverty level for a family of four). Because race is often correlated with income, it is possible that it is actually segregation based on income inequalities that is driving this finding. However, segregation by income does not generate the same results. The coefficient is not statistically different from zero. Therefore, race and not income are driving these findings.[8]

In addition to financial dependent variables, enrollment in public schools is also of interest. If people are willing to invest more in schools that see an increase in segregation, is that because more students are going to public school instead of private? Table B.1 in the

[8]Using simulations to compare the coefficient from the original model to income segregation, the one-sided p-value is 0.007. These results indicate that the income segregation coefficient, while not statistically different from zero, is statistically different from the coefficient on *White-Blakc Segregation* from the original model.

Appendix includes results from regressions with percent of children attending public school out of total students enrolled in public and private school and total number of students enrolled in public school as dependent variables. These models do not meet the threshold of statistical significance.

5 A Natural Experiment: Court Desegregation Orders

While these results are robust to model specifications, there is still concern over endogeniety. Individuals can and do select where to live based on the demographics of their neighbors (Tam Cho, Gimpel and Hui 2013; Chen and Rodden 2009). Jurisdictions represent different levels of taxes and public goods, and people can sort themselves into their desired location (Tiebout 1956). It is therefore difficult to separate out preexisting attitudes on neighborhood choice and funding for education with changes in behavior in response to a current demographic change. While tracking the same districts over time help to mitigate this problem, this section takes it one step further by focusing on a quasi-random event: the overturning of a court desegregation order. Stanford University, U.S. Department of Justice, and ProPublica collected data on which districts have been under court order and if that order has been overturned from 1954 to 2014 (ProPublica 2014). I use this data set to identify the universe of schools under court order.[9]Since *Brown versus Board of Education*, 760 number of schools have been under court order with 323 still under a court order in 2014.[10]

In an analysis of these districts, Reardon et al. (2012) find that districts that are released from court order are very similar to those not released in terms of racial composition, segregation levels and community characteristics. They, as does Lutz (2011), treat the release of a

[9] I made two adjustments to the data set when comparing it to the Reardon et al. (2012) data. Two cases in Arkansas were identified as overturned in the Reardon but not in the ProPublica data base. Checking an additional source, these cases had in fact been overturned. A third case in Indiana had been overturned but was not going to go into full effect until 2017. This was coded as overturned in Reardon et al. (2012) but not in Probublica. Because it has not gone into full effect yet, I kept it as still under desegregation orders.

[10] To see a discussion of the process for placing a court order and subsequent dismissal of a case, see Reardon et al. (2012)

district as a quasi-random event; "Randomness stems from unequal caseloads across district courts, the varying and somewhat unpredictable duration of the release process, varying judicial approaches to desegregation, and the possibility of appeals from interested stakeholders, among other factors" (Reardon et al. (2012), pg. 879). They use this randomness in timing to estimate the effects of release from court oversight on segregation patterns within schools, finding that once a district is released from a court order, racial segregation within the district gradually increases over time.

I, too, exploit this natural experiment in the over-turning of a court order in an instrumental variable model to test how this "random" increase in segregation effects public investment by focusing on a subset of schools that have been placed under a court desegregation order. In these districts that have a court order overturned, the citizens remain fairly constant. Instead, the ability to send your child to a more homogeneous school changes as the order is lifted. As an example, a district might switch from busing children to different schools to achieve a racial balance to neighborhood based schools. Because the change in court order has shown to affect segregation levels within a district, I use this as an instrument for the level of segregation of students within a school district. I focus on segregation between elementary schools. While a majority of districts have more than one elementary school per district, making it possible to calculate segregation measures at the school level, a majority of school districts only have one high school.[11]

To be included in this analysis, a district must have been placed under a court order to desegregate, have more than one elementary school so that school-level segregation can be calculated, and if they have a court order overturned, it has to occur in 1995 or after. This ensures that I have data collected on the school district prior to courts overturning the orders. This leaves 503 school districts for the analysis, with 254 districts still under a court order and 249 districts that have had that order overturned. Table 3 compares district characteristics between these two types of districts in 1995, before any orders have

[11] Two school districts in LA are excluded from this analysis. They have dramatic changes to budget and student population post-Katrina

Table 3: Comparison of 1995 School Districts under Desegregation Orders

	Not Overturned		Overturned after 1995		
	Mean	Std Dev	Mean	Std Dev	P-Value
Per Child Local (in thous)	3.08	1.93	2.90	2.39	0.360
Per Child State (in thous)	4.56	1.34	4.41	1.20	0.172
Per Child Fed (in thous)	0.75	0.35	0.81	0.32	0.054
White-Black Seg., Residential (H Index)	0.19	0.16	0.17	0.14	0.155
White-Black Seg., Residential (Dissim.)	0.41	0.18	0.39	0.17	0.171
White-Black Seg., School (H Index)	0.12	0.13	0.12	0.14	0.909
% Black	27.23	18.88	28.73	18.36	0.367
% Hispanic	3.99	7.48	4.23	9.46	0.743
5 yr Δ % Black	0.75	2.20	0.62	2.04	0.480
5 yr Δ % Black	1.16	1.60	1.00	1.41	0.261
Med HH Income (in thous)	48.19	16.42	45.63	14.31	0.063
Log Pop	10.62	1.27	10.52	1.15	0.347
% Bach Degree	16.80	10.98	15.71	9.49	0.237
% Pres Dem Vote	48.66	9.87	48.95	10.00	0.749
Student Enrollment	17,460.3	37,753.6	18,092.4	77,600.8	0.907
N	254		249		

Note: This table compares 1995 district characteristics for districts who do not have their desegregation order overturned to districts that do have the order overturned in 1995 or after. The p-value is from a t-test comparing the means.

been overturned. The last column contains the p-value from a t-test comparing the means. Districts are very similar across all categories.

5.1 Instrumental Variable Model

I first confirm the relationship between overturned orders and increased school segregation using a similar model to Reardon et al. (2012) using a difference-in-difference approach. With their model, the assumption is that the average within-district trend in segregation would have changed by the same amount in dismissed districts as it did in non-dismissed districts in the same state and year if the court orders had not been overturned.[12] There are two key variables of interest: pre-dismissal trend and post dismissal trend in segrega-

[12] Reardon et al. (2012) had one additional layer of data. They looked at segregation by grade instead of the overall school and therefore included grade fixed effects in their analysis.

tion. The pre-dismissal trend is the year of observation centered at the year of dismissal ($Pre\_Dismissal_{jk,t}$). Districts that are still under desegregation orders are therefore coded zero. The post-dismissal trend is the number of years since dismissal ($Post\_Dismissal_{jk,t}$). It is set to zero for years prior to dismissal.

State-year fixed effects are included to capture average state-specific trends in a particular year. I also include school district fixed effects. The coefficients on these two variables will give the pre- and post-trends in school level segregation. State-by-year fixed effects ($f_i^{state-year}$) are included to capture state-specific trends as are district fixed effects ($f_i^{district}$). The same set of covariates ($X_{i,t}$) are included as in previous models. The first stage is given by:

$$School\ Seg_{jk,t} = \beta_1 Post\_Dismiss_{jk,t} + \beta_2 Pre\_Dismiss_{jk,t} + \beta_c X_{jk,t} + f_{j,t}^{state-year} + f_k^{district} + \epsilon_{jk,t}$$

Here, k references district, j references state, and t is for the year of observation.[13] The second stage, predicting the local revenue per child, is then:

$$Per\ Child\ Local\ Revenue_{jk,t} = \beta_3 \widehat{School\_Seg}_{jk,t} + \beta_c X_{jk,t} + f_{j,t}^{state-year} + f_k^{district} + \epsilon_{jk,t}$$

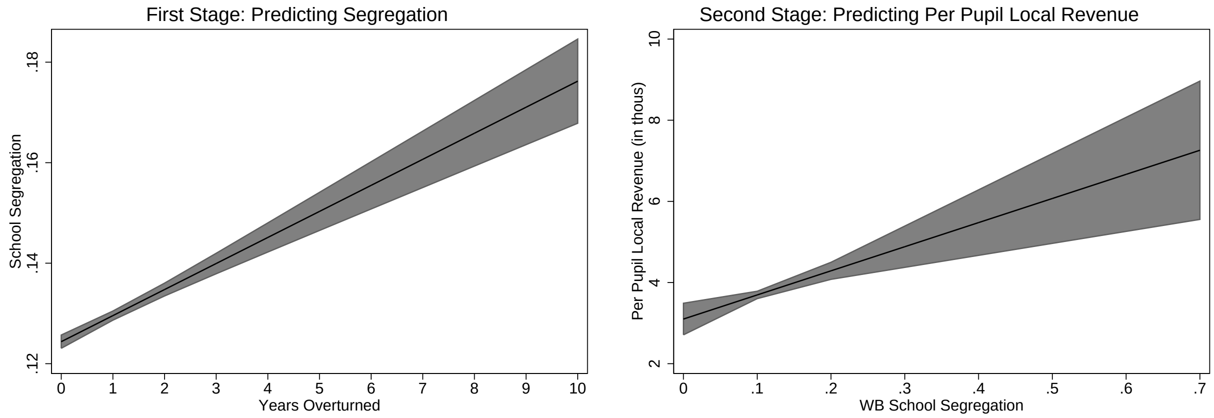
where $\widehat{seg_{jk,t}}$ is the predicted level of segregation based on the time since the release of court order from the first stage. State-year fixed effects and district fixed effects are included in the model. Standard errors are adjusted based on the instrumental variable analysis, but are not adjusted for the correlated structure of the error terms.

5.2 Instrumental Variable Results

Figure plots the marginal effects for the key variables of interest from each stage. Full results from the two-stage regression are in Table B.2 in the appendix. The figure on the left in Figure shows the *Post-Dismissal trend.* It is statistically significant, indicating that with each year post-dismissal, segregation within the school district increases. The F-statistic on

[13]The first and second stage are estimated using *xtivreg* in STATA.

Figure 4: Instrumental Variable Analysis



Note: The figure on the left plots the marginal effect and 95% confidence interval for number of years since a court order has been overturned predicting the white-black segregation from the first stage of the IV. The figure on the right plots the marginal effect and 95% confidence interval for the predicted segregation from the first stage on per child local revenue.

the excluded instruments is 61.82, higher than the target threshold of 10. The t-statistic for the post-dismissal trend is 10.76. The figure on the right displays the results from the second stage of the regression with *per child local revenue* as the dependent variable. The coefficient on *White-Black Segregation, School* is in the expected direction and statistically significant (p-value<0.01).[14] As these districts are no longer required to desegregate, they become more segregated, which results in an increase in local revenue.

One assumption is that people are willing to invest more in schools when they are able to send their children to more homogeneous schools. One way to test this is to see if changes in segregation result in a change how many people are attending public schools. Using the same instrumental variable model, column 3 in Table B.2 shows how a change in segregation predicts a change in the percent of children attending public school. Going from the 25th to 75th percentile in school segregation, i.e. becoming more segregated, results in 1.77

[14] If robust standard errors are specified on the full model, then results are very similar. The standard error on *School WB Segregation* in the second stage increases from 1.525 to 1.91 (then the associated p-value is 0.002). However, when robust standard errors are specified, a warning message is displayed that the estimated covariance matrix of moment conditions not of full rank and standard errors and model tests should be interpreted with caution.

percentage points more attending public school (an increase from 86.75% to 88.52%).

It is important to note that these results are not directly analogous tot he large-n analysis. These districts that have been placed under a court order at one point in time are different from districts that have never been placed under a court order. Comparing Table 3 with Table 1, we see that the average district is less black than one under court-order (5.22 compared to 27.23 percent black), with less White-Black residential segregation (0.09 compared to 0.19), and less White-Black school segregation (0.08 compared to 0.12). Beyond differing in demographics, the very act of being under a court order is likely to have an impact. When courts intervene in a district, public opinion in support for education often declines regardless of the outcome because it circumvents local control of a district (Reed 2001). Therefore, this analysis serves as a robustness check, but estimates between the overall model and the instrumental variable analysis cannot be directly compared.

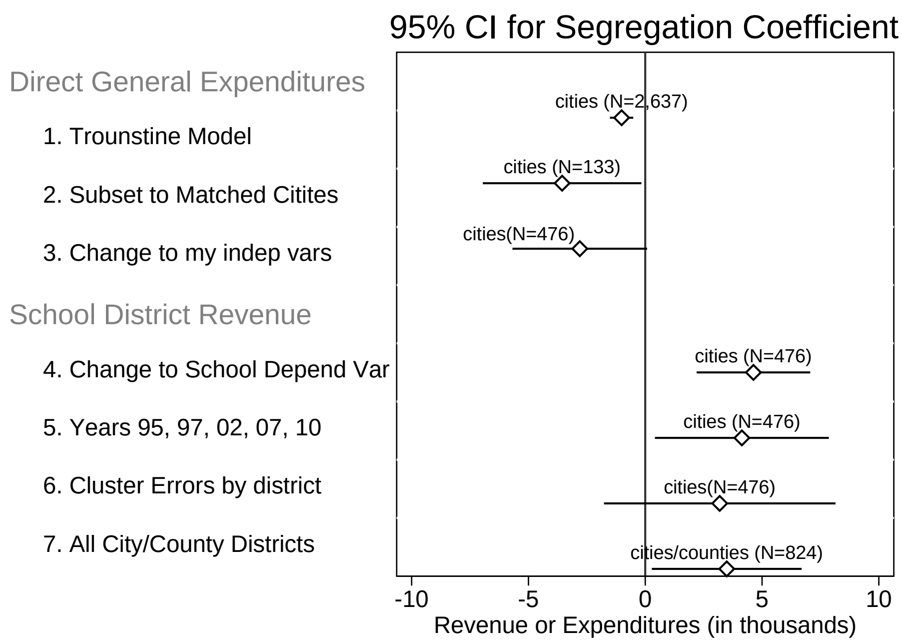
6 School District Revenue Compared to City Revenue

In this last analysis, I test the relationship between segregation and different types of public goods. I compare school district revenue to city revenue for the city or town-dependent school districts in the data set using the data in Trounstine (2015*b*). Trounstine (2015*b*) tests how residential segregation within a city impacts city revenue (direct general expenditures) and finds that an increase in segregation results in a decline in public investment. She finds that segregated cities are more likely to be racially polarized in elections, and therefore less likely to have policy consensus. I obtained the data set used in Trounstine (2015*b*) and matched cities and city-dependent school districts between the two data sets (Trounstine 2015*a*). I include only city or town-dependent school districts in this comparison because these districts will cover the exact same citizens in Trounstine's data set. This results in 476 school districts.[15] In cities and years that we have the same data, our measure of

[15]There are 688 city or town-based school districts in the United States, but not all of the cities are included in the Trounstine data set.

white-nonwhite segregation is correlated at 0.986.

Figure 5: Comparing the Coefficient Across City versus School Revenue Models



Note: This graph plots the 95% confidence interval from 8 different models to show how the independent variable *White-Black Segregation* changes when predicted *Direct General Expenditures per capita* for city spending and *Local Revenue per child* for school district revenue.

Figure 5 shows how the coefficient on segregation changes across Trounstine's data and my own.[16] Troustine also uses the H index as a measure of white-nonwhite segregation. Table B.3 in the appendix shows the full regression results. All models include city fixed effects. The first three models use per capita direct general expenditures as the dependent variable, the same used in Trounstine (2015*b*). The first model, Trounstine Model, is identical to one of the regressions presented in Table 2 of the paper and includes 2,637 cities. The second model subsets to cities that have city-based school districts, are in both of our data sets, and has a segregation measure calculated in Trounstine. There are 133 cities in this model. The third model keeps Trounstine's dependent variable but uses the independent variables

[16] To keep the comparison consistent, all models use district/city fixed effects and models 1, 2, 6, and 7 cluster standard errors by district/city.

that I have collected. There are 476 cities in this model because I calculated the H index for a larger number of cities. All three models reach the same conclusion: segregation is associated with a decrease in direct general revenue.

The next set of regressions changes from per capita direct general revenue (revenue for cities) to per child local revenue (revenue for schools) for the dependent variable. The only change in model three to model four (Change to School Depend Var) is the dependent variable. The segregation coefficient switches from negative to positive. The next two models vary the model specification to show that the effect is not dependent on changes in model structure. The last run includes both city and county dependent school districts. These are the most analogous because they are city or county financially dependent. While one of the models does fail to reach statistical significance at the 0.05 level, the overall pattern is clear: investment in schools is different than other types in response to increased segregation.

7 Discussion and Conclusion

Research has continually pointed to the level of diversity, but the ways in which neighborhoods are arranged, the type of public good, and the users of the good are all important in understanding when communities will choose to invest or when they may exit the public system in favor of private options. When a shared space is involved, integration can result in lower levels of revenue for schools. But this does not mean that integration shouldn't be the goal or that more money in these segregated districts is better. After the desegregation order was lifted in Charlotte-Mecklenburg school district in North Carolina in 2001, the reshuffling of students back to neighborhood schools led to a reshuffling of teachers, and black students in these neighborhood schools saw a decline in teacher quality (Jackson 2009). In addition, in Charlotte-Mecklenburg school district, there was a decrease in test scores for both white and minority students who were assigned to schools with more minority students, lower graduation rates for whites, and an increase in crime for minority males after the desegregation order was lifted and children returned to more segregated neighborhood schools (Billings, Deming and Rockoff 2014).

Therefore, even if segregated communities are raising more revenue, it does not follow that every one will benefit. Inequality in teacher quality or per child spending could lead to lower school district quality overall. One way to measure quality is through standardized tests. While test scores are limited in what they measure, they are one way to compare proficiency in math and reading. The George W. Bush Institute compiled Global Report Cards from 2004 to 2009, which create comparable test scores across the United States at the district level (Green and McGee 2011).[17] Using the same model specifications with a multi-level model as in Table 2, I use the mean test score of a district as the dependent variable. Because there is only five years of data and it is observational in nature, interpretation of results are limited. The results are in Table B.4 in Appendix B. In line with the findings in Charlotte, I find that white-black school-level segregation is associated with lower test scores in both math and reading for a district on a whole. In terms of residential segregation, white-Hispanic segregation is associated with lower math and reading scores. Increased spending in areas that are becoming more segregated does not translate into greater quality, as measured by test scores. In fact, increased segregation is likely concentrating needs which can increase inequality.

In 2013, the majority of students in public schools came from low-income families (Suitts 2015), and in 2014, public school enrollment became a majority-minority for the first time (Maxwll 2014). The demographics are changing rapidly, but if we pay attention only to diversity or think that integration will solve all problems, we will miss areas that will struggle to provide an education for the next generation.

[17]They use the National Assessment of Educational Progress (NAEP) exam to estimate the distribution of state education quality, which they use to shift distributions of district quality data within each state. These scores are based on tests from a random sample of 4th through 8th graders.

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A Measures

A.1 Theil's H Index

Theil's H Index is a measure that captures the difference between the diversity of a school district and the weighted average of a census tract. It is built from Theil's entropy score:

$$E = \sum_{r=1}^{n} Q_r ln \frac{1}{Q_r}$$

where $Q_r = \frac{1}{r}$ is the proportion of the population of racial group r. Entropy is calculated for each tract and for the district as a whole. The H Index, then measures the degree to which the diversity in each tract differs from the district. It is expressed as a fraction of the district's total diversity and weighted by tract's share of the population. It is calculated as:

$$H = \sum_{n=1}^{k} \frac{\frac{t_i}{T} E - Ei}{E}$$

where T represents the total population of the district and t_i is the population of tract i. E is the entropy of the district and E_i of tract i. The measure varies between 0 and 1, where 0 indicates that all tracts have the same composition as the overall district and 1 indicates that all tracts contain only one group.

A.2 Dissimilarity Index

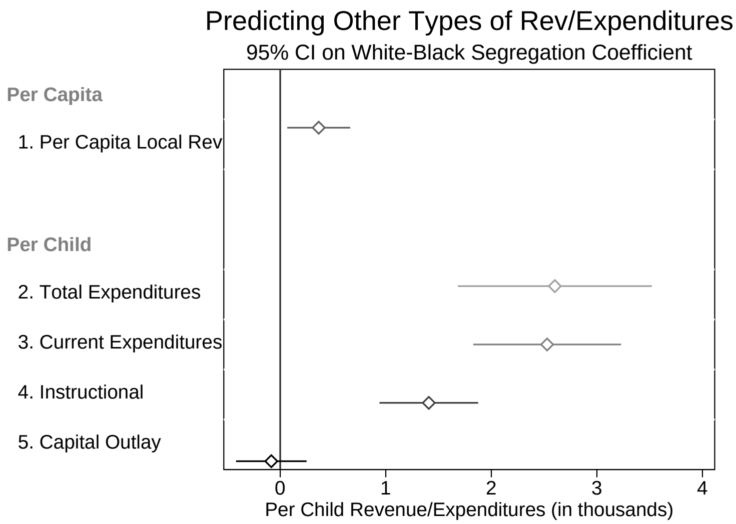
The dissimilarity index is one of the most popular measures of segregation. It represents the proportion of minority members that would have to move to achieve even distribution between tracts to have equal distribution throughout the district (Jakubs, 1977). It is calculated by:

$$D = \frac{1}{2} \sum_{i=1}^{n} \mid \frac{b_i}{B} - \frac{w_i}{W} \mid$$

where b_i is the number of black residents (or other minority group) in a tract and **B** is the total number of black residents in the district. In addition, w_i is the number of white residents in a tract and **W** is the total number of white residents in the district. Massey and Denton (1988) describe these measures in more detail.

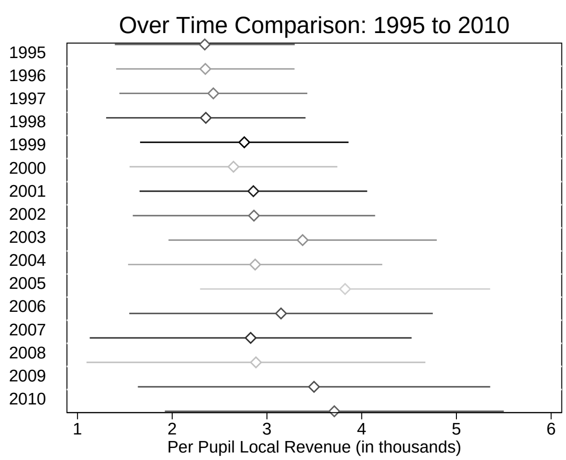
B Additional Tables and Graphs

Figure B.1: Robustness Checks Changing the Dependent Variable



Note: Each 95% confidence interval is a new model with a change in dependent variable to reflect different revenue and spending categories, but with the same independent variables and model structure. With the exception of the first measure, which is per capita, these are adjusted to per child measures.

Figure B.2: Robustness Continued



Note: This figure plots the 95% confidence interval for the *White-Black Segregation, Residential* coefficient for each model subset to one year of data. It is equivalent in specification to the model in 2 Column 2. The effect is consistent in magnitude and direction across all years.

Table B.1: The Effect of Segregation on Public School Attendance

	% Public School Residential	% Public School School	Total Enrolled School
White-Black Segregation, Resident	-2.03		
	(0.07)		
White-Hispanic Segregation, Resident	-2.25		
	(0.19)		
White-Black Segregation, School		-0.05	0.04
		(0.86)	(0.03)
White-Hispanic Segregation, School		0.26	0.02
		(0.28)	(0.38)
court_order	-1.77	-1.96	0.04
	(0.04)	(0.03)	(0.57)
% Black	0.04	0.04	0.00
	(0.00)	(0.00)	(0.05)
% Hispanic	0.15	0.15	0.01
	(0.00)	(0.00)	(0.00)
5 yr Δ % Black	0.03	0.03	0.01
	(0.14)	(0.13)	(0.07)
5 yr Δ % Hispanic	0.06	0.05	0.01
	(0.13)	(0.14)	(0.11)
% Free Lunch	-0.02	-0.02	-0.00
	(0.00)	(0.00)	(0.00)
% Own Home	0.05	0.05*	0.01
	(0.01)	(0.01)	(0.00)
Land Area	0.00	0.00	0.00
	(0.00)	(0.00)	(0.59)
Median HH Income	-0.07	-0.07	-0.00
	(0.00)	(0.00)	(0.00)
Log Pop	-2.03	-2.10	0.88
	(0.00)	(0.00)	(0.00)
% Bachelor or Higher	-0.05	-0.05	0.01
	(0.02)	(0.01)	(0.00)
% Dem Pres Vote	0.01	0.01	-0.00
	(0.46)	(0.45)	(0.11)
Per Child Expenditure	-0.03	-0.03	-0.01
	(0.01)	(0.00)	(0.00)
% Catholic	-7.94	-8.04	-0.05
	(0.00)	(0.00)	(0.54)
Constant	112.68	113.14	-0.83
	(0.00)	(0.00)	(0.08)
Number of Districts	6,310	6,319	6,607
Observations	69,737	69,813	76,012

Note: P-values are in parentheses. The dependent variable in Column 1 and Column 2 is the percent of children attending public school that reside in that school district. The dependent variable in Column 3 is the number children enrolled in public school in that district.

Table B.2: Overturned Court Order as Instrument for Segregation

	First Stage	Second Stage	Second Stage
	White-Black Segregation, School	Per Child Local Revenue	Percent Children Public School
Years Overturned	0.005		
	(0.000)		
Time	-0.002		
	(0.000)		
White-Black Segregation, School		6.037	10.032
		(0.000)	(0.000)
% Black	0.000	-0.042	0.11
	(0.869)	(0.000)	(0.000)
% Hispanic	0.001	-0.017	0.164
	(0.018)	(0.074)	(0.000)
5 yr Δ % Black	-0.004	0.019	-0.093
	(0.000)	(0.121)	(0.000)
5 yr Δ % Hispanic	-0.000	0.022	0.008
	(0.849)	(0.248)	(0.829)
Num Elem Schools	0.001	-0.008	0.011
	(0.002)	(0.038)	(0.139)
Students Enrolled	0.000	-0.000	0.000
	(0.252)	(0.012)	(0.000)
Median HH Income	-0.001	0.053	0.010
	(0.000)	(0.000)	(0.433)
Log Pop	0.013	-0.580	-2.960
	(0.180)	(0.001)	(0.000)
% Bachelor or Higher	-0.002	0.156	0.002
	(0.018)	(0.000)	(0.908)
% Dem Pres Vote	0.001	0.014	0.050
	(0.000)	(0.000)	(0.000)
% Own Home	0.001	-0.008	-0.024
	(0.170)	(0.224)	(0.059)
Land Area	-0.000	0.000	-0.000
	(0.072)	(0.000)	(0.000)
Per Child State	-0.001	-0.122	-0.022
	(0.140)	(0.000)	(0.412)
Per Child Federal	-0.005	0.258	-0.343
	(0.030)	(0.000)	(0.000)
Constant	0.335	4.619	152.143
	(0.154)	(0.005)	(0.000)
State-Year & District FE	X	X	X
School Districts; Observations	503; 8,086	503; 8,086	503; 8,103

Note: P-values are in parentheses. Column 1 contains the results from the first-stage of the IV analysis with *White-Black Segregation, School* as the dependent variable. Column 2 is the second stage of the IV analysis, with *Per Child Local Revenue* as the dependent variable. Column 3 is an additional IV analysis with the percent of children attending public school out of children enrolled in a public or private school.

Table B.3: Comparison to Trounstine (2015) City Revenue

	City	City	City	School	School	School	School
Trounstine Seg	-1.01	-3.56					
	(0.000)	(0.040)					
White-Black Segregation, Res			-2.80	4.63	4.14	3.19	3.49
			(0.057)	(0.000)	(0.029)	(0.207)	(0.033)
% Black	0.74	1.83	-0.04	-0.06	-0.03	-0.02	-0.01
	(0.000)	(0.535)	(0.136)	(0.003)	(0.321)	(0.713)	(0.695)
% Asian	-0.85	-4.65					
	(0.015)	(0.347)					
% Hispanic	1.58	5.54	0.02	-0.07	-0.05	-0.02	-0.04
	(0.000)	(0.004)	(0.187)	(0.000)	(0.015)	(0.541)	(0.089)
5 yr Δ % Black	-1.78	2.76	0.07	0.07	0.06	0.06	0.01
	(0.006)	(0.589)	(0.065)	(0.060)	(0.339)	(0.583)	(0.751)
5 yr Δ % Hispanic	-2.05	-6.53	0.02	0.04	0.05	0.05	0.01
	(0.013)	(0.152)	(0.442)	(0.208)	(0.373)	(0.511)	(0.853)
5 yr Δ % Asian	-0.80	-14.78					
	(0.464)	(0.200)					
Median HH Income	0.00	0.00	0.06	0.03	0.02	0.01	0.01
	(0.675)	(0.150)	(0.019)	(0.000)	(0.064)	(0.815)	(0.614)
% Rent (City); % Own (School)	0.55	7.62	0.00	0.08	0.09	0.10	0.09
	(0.155)	(0.008)	(0.887)	(0.000)	(0.000)	(0.001)	(0.000)
% Local Gov Worker	0.01	-0.22					
	(0.763)	(0.157)					
% Over 65	0.49	-0.57					
	(0.280)	(0.899)					
% Bachelor or Higher	6.26	14.01	0.04	0.16	0.14	0.29	0.19
	(0.000)	(0.000)	(0.023)	(0.000)	(0.000)	(0.000)	(0.000)
Log Pop	-0.29	-0.51	-0.43	-2.01	-2.09	-0.60	-2.36
	(0.000)	(0.248)	(0.365)	(0.000)	(0.003)	(0.645)	(0.000)
Students Enrolled			0.00	-0.00	-0.00*	-0.00	-0.00
			(0.811)	(0.007)	(0.035)	(0.091)	(0.409)
% Dem Pres Vote			0.02	0.06	0.05	0.05	0.05
			(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Land Area			0.00	0.00	0.00	0.00	0.00
			(.)	(.)	(.)	(.)	(.)
Per Child State			0.08	-0.07	-0.05	-0.04	-0.06
			(0.000)	(0.000)	(0.007)	(0.039)	(0.001)
Per Child Federal			0.28	-0.04	-0.33	0.20	-0.05
			(0.115)	(0.579)	(0.005)	(0.069)	(0.569)
Constant	2.73	1.30	0.15	12.47	13.57	-5.01	15.93
	(0.000)	(0.798)	(0.976)	(0.007)	(0.057)	(0.696)	(0.019)
Observations	11,194	631	14,15	7,432	2,326	7,432	12,845

Table B.4: Global Report Cards from 2004 to 2009

	Math	Math	Reading	Reading
White-Black Seg., School	-2.86		-2.24	
	(0.001)		(0.016)	
White-Hispanic Seg., School	-0.98		-0.48	
	(0.321)		(0.443)	
White-Black Seg., Residential		-1.54		0.46
		(0.398)		(0.780)
White-Hispanic Seg., Residential		-9.28		-10.52
		(0.001)		(0.000)
Ever Under Court Order	0.32	-0.16	0.15	-0.17
	(0.622)	(0.809)	(0.775)	(0.757)
% Black Students	-0.24	-0.22	-0.23	-0.21
	(0.000)	(0.000)	(0.000)	(0.000)
% Hispanic Students	-0.14	-0.09	-0.16	-0.12
	(0.000)	(0.000)	(0.000)	(0.000)
% Free Lunch	-0.07	-0.09	-0.09	-0.11
	(0.000)	(0.000)	(0.000)	(0.000)
% SPED	-0.02	-0.02	-0.02	-0.02
	(0.464)	(0.479)	(0.412)	(0.549)
% Own Home	0.08	0.06	0.08	0.09
	(0.013)	(0.051)	(0.002)	(0.001)
Land Area	-0.00	-0.00	-0.00	-0.00
	(0.032)	(0.018)	(0.010)	(0.016)
Students Enrolled	-0.00	-0.00	-0.00	-0.00
	(0.594)	(0.385)	(0.270)	(0.103)
Median HH Income	0.11	0.10	0.08	0.07
	(0.000)	(0.000)	(0.000)	(0.001)
Log Pop	-0.16	0.10	-0.40	0.03
	(0.572)	(0.544)	(0.041)	(0.889)
% Bachelor or Higher	0.35	0.37	0.38	0.40
	(0.000)	(0.000)	(0.000)	(0.000)
% Dem Pres Vote	-0.06	-0.08	-0.02	-0.03
	(0.080)	(0.012)	(0.595)	(0.298)
Per Pupil Expenditures	-0.01	-0.01	0.01	0.01
	(0.831)	(0.762)	(0.701)	(0.573)
Constant	44.74	44.99	46.72	43.84
	(0.000)	(0.000)	(0.000)	(0.000)
School Districts	5,997	11,005	5,997	11,005
Observations	29,768	56,312	29,903	56,956

Note: P-values are in parentheses.