



The Segregation of Opportunity: Social and Financial Resources in the Educational Contexts of Lower- and Higher-Income Children, 1990–2014

Kendra Bischoff¹ · Ann Owens²

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Abstract

This article provides a rich longitudinal portrait of the financial and social resources available in the school districts of high- and low-income students in the United States from 1990 to 2014. Combining multiple publicly available data sources for most school districts in the United States, we document levels and gaps in school district *financial* resources—total per-pupil expenditures—and *social* resources—local rates of adult educational attainment, family structure, and adult unemployment—available to the average public school student at a variety of income levels over time. In addition to using eligibility for the National School Lunch Program as a blunt measure of student income, we estimate resource inequalities between income deciles to analyze resource gaps between affluent and poor children. We then examine the relationship between income segregation and resource gaps between the school districts of high- and low-income children. In previous work, the social context of schooling has been a theoretical but unmeasured mechanism through which income segregation may operate to create unequal opportunities for children. Our results show large and, in some cases, growing social resource gaps in the districts of high- and low-income students nationally and provide evidence that these gaps are exacerbated by income segregation. Conversely, per-pupil funding became more compensatory between high- and low-income students' school districts over this period, especially in highly segregated states. However, there are early signs of reversal in this trend. The results provide evidence that school finance reforms have been somewhat effective in reducing the consequences of income segregation on funding inequities, while inequalities in the social context of schooling continue to grow.

Keywords Education · Income segregation · Social context · School finance · School districts

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✉ Kendra Bischoff
kbischoff@cornell.edu

¹ Department of Sociology, Cornell University, Ithaca, NY, USA

² Department of Sociology, University of Southern California, Los Angeles, CA, USA

Introduction

An enduring concern of education scholars and policymakers is how to provide students from all social and economic backgrounds access to equal opportunities. National studies have indicated that U.S. schools remain persistently segregated by race/ethnicity and income (Reardon and Owens 2014; U.S. Government Accountability Office (GAO) 2016) and that income segregation in particular has increased among children's neighborhoods, schools, and school districts over the past several decades (Owens 2016; Owens et al. 2016). This trend raises concerns about inequality in school environments because income segregation between schools or school districts contributes to socioeconomic achievement gaps (Owens 2018; Quillian 2014; Reardon 2016), and past research has shown that socioeconomically integrated settings can improve low-income students' achievement (Reardon 2016; Schwartz 2012).¹ However, the mechanisms through which income segregation exacerbates advantages and disadvantages are not well documented. Income segregation potentially creates an unequal distribution of two broad classes of resources: (1) education funding related to levels of local tax revenue and (2) characteristics of students and their families (e.g., parents' educational attainment) that are associated with family income. Although these mechanisms have a great deal of face validity in accounting for the consequences of income segregation, there is a dearth of evidence about the extent to which the clustering of high- and low-income families creates inequalities in these potentially influential contextual characteristics.

In this article, we provide a rich national longitudinal portrait of the resources available in the school districts of high- and low-income students in the United States from 1990 to 2014. Combining multiple publicly available data sources and using them in new ways, we document levels and gaps in school district *financial* resources—total per-pupil expenditures—and *social* resources—local rates of adult educational attainment, family structure, and adult unemployment—available to the average public school student at a variety of income levels over time. Although the social context of schooling is often cited as an important achievement mechanism, little is actually known about how familial resources are distributed in U.S. public schools. Whereas previous research on the U.S. public school system has almost exclusively relied on single poverty measures (such as eligibility for the National School Lunch Program) to assess educational inequalities by income, we provide evidence of inequality in the school district contexts of children at a range of points in the national income distribution. Understanding the experiences of the most affluent and the poorest public school children is of critical importance because it is the families at the upper tail of the income distribution that have driven increases in income inequality (Autor et al. 2006, 2008; Piketty and Saez 2003) and that have been the most segregated over the past 50 years (Reardon and Bischoff 2011). Second, we examine the relationship between residential income segregation between school districts and resource gaps in the educational contexts of high- and low-income students, and we test whether this relationship has evolved over time. For more than a century, key actors in the U.S. education system have grappled with the provision of equal opportunities for

¹ Other research did not find causal effects of school poverty on students' outcomes (e.g., Lauen and Gaddis 2013).

advantaged and disadvantaged groups in the face of persistent segregation. This article systematically documents inequalities in financial and social resources that may be critical to educational success.

Inequality in the Context of Schooling

For as long as public schools have existed in the United States, the social composition of educational contexts has been considered as a factor in children's opportunities. The crux of the argument leading to the decision in *Brown v. Board of Education of Topeka* in 1954 was that separate schooling for black and white children could never be equal. In other words, the many financial and social characteristics of schools that might matter for children's outcomes could never be equalized unless a diverse group of families attended the same schools. This discussion was reignited by the Equality of Educational Opportunity report (Coleman et al. 1966), which aimed to bring evidence to bear on the relationship between school context and student outcomes. The framework for this study laid the groundwork for an enormous body of research that has attempted to identify the effect of school contexts on individual student outcomes, with particular attention given to two contextual mechanisms: schools' financial resources and social composition. The theoretical motivation for why any given school characteristic should matter for student outcomes depends on the nature of the outcome, with different relative weights given to spending or social composition. Our goal in this article is to examine the distribution of both financial and social resources across school districts, acknowledging that the mechanisms leading to specific student outcomes may differ.

Although the social composition and financial health of schools are not completely independent characteristics, these two overarching mechanisms mirror ongoing debates about how to best remedy unequal school contexts. Because education funding is heavily derived from local tax sources in the United States, one set of efforts aims to equalize financial resources across school districts with varying revenue capacities. However, proponents of educational integration efforts might argue that redistributing funds is not enough to equalize educational contexts because it does not affect the social composition—that is, the clustering of families by race/ethnicity and social class. The second set of efforts to equalize educational environments addresses this point and has focused on manipulating student compositions through voluntary and involuntary integration programs, magnet school programs, and more recently, race- and income-conscious school assignment procedures. Indirectly, inclusionary housing policies also contribute to this effort. Although recent public opinion polls show that parents support the idea of school integration (Boser and Baffour 2017; *Phi Delta Kappan* 2017), school finance reform efforts are much more widespread in practice. Educational contexts very likely affect students through a combination of financial and social resources. We review each in turn.

Financial Resources: Education Funding and Finance Reform

School funding affects the quantity and quality of teachers and administrators that a school district can hire, facilities, course materials, and extracurricular offerings.

Despite debate about whether school spending matters for educational outcomes (Hanushek 2003), recent research has shown that higher levels of school funding increase individuals' completed years of education and adult earnings (Jackson et al. 2016). Gaps in standardized test scores between high- and low-income students are also smaller in states where funding is more equal between high- and low-income districts (Card and Payne 2002; Downes and Figlio 1997; Lafortune et al. 2018).

Local property taxes are a primary source for school district revenues, which results in unequal resources in high- and low-property wealth districts. Since the 1970s, most states have adopted some type of school finance reform to compensate lower-income districts for the larger tax base in higher-income districts. In the 1970s and 1980s, these policies resulted from legal decisions based on equal protection and education clauses of state constitutions that require equal access to public services. These redistributive policies aimed to equalize funding between high- and low-income districts (Card and Payne 2002; Corcoran and Evans 2015; Murray et al. 1998). Since 1990, state-level education reform policies have focused on adequacy requirements in state constitutions' education clauses, which emphasize all children's rights to access an adequate education and can result in compensatory spending in low-income children's districts (Corcoran and Evans 2015; Heise 1995). Forty-five states have implemented a court-mandated reform, legislative reform, or school finance formula change since 1970 (Jackson et al. 2016).

Although impacts vary by the specific funding mechanism adopted, these policies overall have been successful in narrowing or reversing the funding inequalities between high- and low-income districts. In 1967, per-pupil spending in the lowest income decile of districts was 8 % lower than in the median-income district; by 2010, per-pupil spending in the lowest income decile was 7 % higher than in the median-income district (Jackson et al. 2015). From 1990 to 2012, average per-pupil revenues in the poorest quintile of districts rose by about 50 %, while average per-pupil revenues in the richest quintile of districts rose by about 30 %, so that revenues were roughly equal by 2001 (Lafortune et al. 2018). However, some states—particularly those where funding relies heavily on local tax bases—continue to have regressive finance models, where low-income districts have lower state and local revenues than higher-income districts (Baker and Corcoran 2012). For example, in New Hampshire, Nevada, and North Carolina, the poorest districts had state and local per-pupil revenues about 65 % to 70 % as large as those in the least-poor districts in 2007–2009 (Baker and Corcoran 2012). Although the federal Title I program for low-income schools could partially offset this gap, federal funding accounts for less than 10 % of public school funding, so it has minimal impact on the distribution of funding within a state (Baker et al. 2010).²

Social Resources: Characteristics of Children and Their Families

Education finance reform initiatives do not redistribute families and the resources they contribute to educational institutions. The resources that families bring to school districts complement the resources provided by the state, and both the financial and

² Moreover, because of complex funding allocation, states with a greater share of Title I-eligible students actually receive less funding per student, on average, than smaller states with a smaller share of eligible students (Gordon 2016).

social resources present in an educational context may influence student outcomes. Peer effects theories posit that outcomes for one student depend on the attributes and behaviors of other students. Inherent in this perspective is that each student has a set of resources that he/she can share with the school community and that these resources are partly derived from the student's family. Peer effects operate through interpersonal interactions, such as with a roommate (Sacerdote 2001) or classmate (Hoxby 2000; Lauen and Gaddis 2013; Legewie and DiPrete 2012), or more diffusely in schools or school districts as parents with greater resources may advocate for curricular changes, influence personnel or budgetary decisions, undertake fundraising efforts, or broker access to exclusive curricular or extracurricular activities that benefit all children. In short, education funding is institutionally filtered economic capital available in school districts, whereas social resources derived from children and their families potentially provide human and social capital (Coleman 1988) to school district contexts.

Prior research has documented levels of exposure of children of different races/ethnicities and poverty levels to each other. On average, black and Hispanic children attend schools with many more low-income peers than non-Hispanic white children (Logan et al. 2002; Orfield and Lee 2005), and children are often racially isolated in school, although schools have become more integrated since 1970 (Logan et al. 2017). However, little is known about the social resources available in the school districts of children of different incomes in a national context. We document disparities between school districts in three social context variables: adult educational attainment, family structure, and adult unemployment.

In classic status attainment research, parent education levels were theorized to be a key factor in children's own status attainment processes, with children's educational attainment mediating their adult occupational outcomes (Blau and Duncan 1967). Later models showed that parent educational attainment affects children's educational attainment via the influence on children's educational aspirations (Sewell et al. 1969) and indirectly via socialization from teachers and friends (Haller and Portes 1973). Students with more highly educated parents have stronger norms, orientation, and information about academic achievement, which they may pass on to peers (Bozick et al. 2010; Johnson and Reynolds 2013; Lareau 2003). Parent education levels may also affect their involvement in schooling, and parent participation can benefit students regardless of their own family characteristics (McNeal 2015; Sui-Chu and Willms 1996; Sun 1999). Beyond processes related to academic achievement, highly educated adults are more likely to be politically active and to have skills for effective civic participation (Verba et al. 1995). In sum, parent education levels are influential not only within the family but also in a community context through social interaction and influence.³

The second social feature we examine is family structure. Two-parent households may have more time and resources to dedicate to their children than single-parent families (McLanahan and Sandefur 1994). Thus, educational contexts with a higher proportion of two-parent families may be collectively beneficial because parents are able to participate in more educational activities and dedicate more energy to local

³ Some research has suggested that a more educated adult population in a school district may not benefit all children equally. School personnel may placate advantaged parents and provide more resources for white or higher-income children (Lewis and Diamond 2015; Lewis-McCoy 2014), and students may be placed in different academic tracks based on race and class (Oakes 1985).

education decisions. This could manifest, for example, through higher levels of consistent parent-teacher contact or more involvement in district policy-making.

Finally, high unemployment in the school district community may affect student outcomes if it causes families to endure periods of economic hardship, creates or exacerbates mental health issues or substance abuse among adults (see, e.g., Kessler et al. 1989), or fosters an environment in which children have fewer employed role models to emulate. Joblessness is perhaps the single most challenging contextual feature of communities because it can be the cause of a host of other social problems (Wilson 1996). Employment not only generates economic benefits but also shapes individuals' self-worth and plays an important role in the formation of personal identities (Lamont 2002). In sum, high- and low-income students' school districts will have different levels of social contextual resources associated with families' income, although the magnitude of these inequalities is unknown, as is the degree to which inequalities have changed in the past 25 years.

Income Segregation and School District Resources

Income segregation between school districts leads to more extreme differences in the economic resources of families across school districts, which creates inequalities in both local tax base and income-correlated social characteristics. Inequalities in the financial and social contexts of schooling are theoretical, but unmeasured, mechanisms through which income segregation may operate to create unequal opportunities and experiences for children. In the absence of policy interventions, we would expect larger gaps in the school district social and financial resources available to high- and low-income children in more highly income-segregated states. Given the increasing correlation between family income and educational attainment (Bailey and Dynarski 2011) as well as the increasing financial returns to a college education (Autor 2014), we expect that income segregation exacerbates the spatial concentration of highly educated adults in particular school districts and may similarly create large inequalities in other social contextual characteristics, such as two-parent families and unemployment.

Education finance policies are in place in most states to offset inequalities created by differences in local tax bases, so we do not necessarily expect differences in the funding available in the districts of low-income and high-income students. Today, income segregation may have little association with the financial resources available in the districts of low- and high-income children. Highly segregated states may even have compensatory funding formulas in place that generate higher spending in low-income districts. One study that directly examined the relationship between income segregation and funding inequality across districts found a modest positive correlation in 2013–2014 between state-level poverty segregation between school districts and the progressivity of *state* funding (Chingos and Blagg 2017). We build on this study to further examine the relationship between school district income segregation and inequalities in the financial resources of districts serving high- and low-income students. In addition, we compare these results with the relationship between income segregation and social contextual resources, for which few redistributive policies exist.

In this article, we document inequalities in resources theorized to affect educational outcomes in the school districts of high- and low-income children, and we demonstrate whether one dimension of structural inequality—income segregation—exacerbates

these inequalities. We acknowledge that vast inequalities also exist in the average school districts of white and nonwhite children. To the extent that race and income are correlated, we elucidate those inequalities here, although income differentially affects the residential outcomes of people of different racial/ethnic groups (Reardon et al. 2015) such that similarly high-income white and nonwhite children may experience very different district contexts. We focus on inequalities by income because income gaps in achievement and attainment are increasing and outpacing inequalities by race/ethnicity (Bailey and Dynarski 2011; Reardon 2011b). Further, policies aimed at reducing funding inequalities typically focus on economic inequality between districts; policies aimed at reducing social inequalities increasingly focus on integration by income, rather than race, following the 2007 Parents Involved in Community Schools Supreme Court case, which limits the consideration of race in school integration plans (Potter et al. 2016).

Data and Method

In this study, we document inequalities in the average financial and social resources available in higher- and lower-income students' school districts within states, and we show whether state-level income segregation between districts exacerbates these inequalities. Although segregation between schools and neighborhoods also differentiates the contexts that high- and low-income children experience, we focus on school districts for two reasons. First, school districts are meaningful social and administrative units that shape residential choices and large-scale patterns of residential segregation (Bischoff 2008; Owens 2016). Families often consider school district boundaries when choosing where to live, and school districts—not schools—are political units within which taxes are distributed. Resources are rarely shared between districts, especially nonpecuniary resources derived from parental time and effort, for which there are few redistributive mechanisms. Moreover, although a school's composition is shaped by segregation both *between* districts and between schools *within* districts, past research has indicated that the majority of both racial/ethnic and poverty segregation between schools occurs because of segregation *between* districts (Owens et al. 2016; Stroub and Richards 2013). The second reason is practical: richer data exist to describe the social context of districts rather than individual schools. Using these data allows us to present, for the first time, a national longitudinal portrait of school contexts beyond basic demographic traits of students, such as race/ethnicity or free lunch eligibility. In addition, a district-level analysis allows us to compare social resources with financial resources.

Financial Resources in School Districts

We measure the total expenditures per pupil in a school district from all sources—local, state, and federal government—using data from the Common Core of Data (CCD) School District Finance Survey (F-33) (National Center for Education Statistics (NCES)) in 1990, 2000, 2007, 2009, 2011, and 2014. Total expenditures per pupil include instructional, support service, and other

current expenditures. We adjust the expenditure estimates to account for differences in the cost of providing education across places and over time using the education comparable wage index (ECWI), a year-specific index comparing the variations in the salaries of college graduates who are not educators across labor markets (Duncombe et al. 2015; Taylor and Fowler 2006).⁴ Adjusting by the ECWI does not take into account differences in the cost of all aspects of educational costs, but it does account for labor market differences, including cost of living, which will be reflected both in the cost of teacher salaries and in the overall cost of educating children in that labor market. We obtain ECWI data for 1997 to 2014 online (Taylor n.d.) and follow imputation procedures to obtain ECWI values for 1990 (Weber et al. 2016). Following Baker and colleagues (Baker et al. 2017; Weber et al. 2016), we then average ECWI-adjusted per-pupil expenditures over three-year periods surrounding our years of interest to account for any unusual yearly expenditures. F-33 data are not available for the full universe of school districts in 1989 or 1991, so we average the 1990 data with 1993 data. Following Murray et al. (1998), to account for data reporting issues and outliers, we discard districts with expenditure values greater than 150 % of the 95th percentile or less than 50 % of the 5th percentile of expenditures in each year.

Social Resources in School Districts

Many national studies of the U.S. education system use the CCD to describe the social composition of schools and school districts. The CCD is a census of all U.S. public schools, but it provides only basic demographic information on student populations: namely, race/ethnicity and free lunch eligibility counts. Another source of information on school districts is census and American Community Survey (ACS) data, which have been tabulated in school district boundaries for decades and are currently available through the Education Demographic and Geographic Estimates (EDGE) data system. These data provide a broader set of sociodemographic school district characteristics and are tabulated separately for public school families for some variables in more recent years.

We obtain census and ACS data in school district boundaries from EDGE for 1990, 2000, 2005–2009, 2007–2011, 2009–2013, and 2012–2016 for three social resource variables: adult educational attainment, family structure, and adult unemployment. Because the ACS replaced the long-form census after 2000, data are available only in five-year aggregations for school districts. In the remainder of this article, we refer to the five-year intervals by their middle year (e.g., 2014 for 2012–2016 data).

Educational attainment is measured as the proportion of all adults (aged 25 and over) in each district with a bachelor's degree or higher.⁵ We measure family structure as the

⁴ Duncombe et al. (2015) described several methods for adjusting for geographic variation in costs. They noted that the ECWI does not take factors into account that may shape teachers' job choices, such as student demographics and school conditions.

⁵ In some years, educational attainment is tabulated for adults with children enrolled in public schools. We do not use this measure because it is not available in all years, but the correlation between educational attainment for all adults and adults with children in public school is over .90 in the years that both tabulations are available, with similarly high correlations for unemployment rates between the two populations.

proportion of families with children enrolled in public school in each school district in which the adults are married. This measure is a proxy for parental time and resources.⁶ Our third social context variable, unemployment, is the proportion of all individuals aged 16 and older in a school district who are in the civilian labor force but not working. We provide more details about data availability in the online data appendix.

Analytic Sample

We begin with the full sample of school districts in the United States. In states with separate elementary and high school districts, we drop high school districts to avoid overcounting residential populations covered by two districts. For the same reason, we drop districts that do not draw from specific geographic boundaries, such as special education districts and juvenile corrections districts. We exclude Hawaii and Washington, D.C. because they only have one school district, and therefore we cannot compute inequality between districts. The number of districts in our sample varies over the six time points of our study (1990, 2000, 2007, 2009, 2011, and 2014) for two primary reasons. First, the number of districts fluctuates from year to year because districts sometimes merge or split.⁷ Second, data are missing for some districts in each year in the census and ACS school district files when characteristics are provided for specific subgroups, such as households with children enrolled in public school.⁸ We include districts for which information is available for all social context variables in each year, creating a stable within-year sample. The online data appendix describes the contents of the raw data files and our sample selection procedures. Our final sample of school districts consists of approximately 13,600 districts in 1990; 13,000 districts in 2000; and approximately 11,500 districts in 2007, 2009, 2011, and 2014. In our state-level analyses, we measure inequality between districts within a stable sample of 49 states across the 25 years in the study.

High- and Low-Income Students' Exposure to Resources

Our first objective is to identify differences in the resources available in the school districts that high- and low-income students attend. We begin by developing several measures of student income. First, we compare students who are free lunch-eligible (FLE) with those who are not free lunch-eligible (NFLE)

⁶ In more recent years, the census has also collected data on cohabitation, which may serve as a similar, alternative family arrangement to marriage in some cases. However, because information on cohabitation is not available in earlier years, we use married family households as a consistent measure of family structure across all years in our study, although we make no claims that marriage is normatively beneficial. Our measure may underestimate parental time and resources in communities where cohabitation is common.

⁷ Political processes, such as school district consolidation or fragmentation, are factors that affect income segregation between districts within states as well as levels of exposure to district resources. In our longitudinal descriptive framework, we acknowledge that changes in income segregation may be partly a function of changes in the underlying structure of school district boundaries.

⁸ Communications with officials at the U.S. Census Bureau and U.S. Department of Education suggest that these data are missing primarily because of data suppression practices. These practices primarily affect very small geographic units.

using district-level free lunch eligibility counts from the CCD. Students are FLE if their family income is less than 130 % of the poverty line, adjusted for family size. Second, we compare public school students whose household incomes are in the lowest, middle, and highest deciles of the national income distribution. This requires counts of public school children in each district in each income decile.

There are two challenges in obtaining this information. First, census and ACS income data are provided for families and households, not children, in each school district. Second, census and ACS income data are provided in income bins (e.g., \$10,000 to \$14,999, \$15,000 to \$19,999) that do not correspond to specific percentiles in the income distribution. To address the first issue, we expand the counts of households in income bins in each district into individual child counts, based on the average number of children per household (among households with children enrolled in public school) in each income bin from the Integrated Public Use Microdata Series (IPUMS) 5 % sample (Ruggles et al. 2015) in each year and each state. We address the second issue by estimating income decile thresholds in the census and ACS binned data based on the national income distribution of households with children in public school.⁹ We then create new bins representing national income deciles and reapportion counts of children in each school district from census bins to decile bins.¹⁰ This method allows us to extract far more information about the conditions of children across the income distribution than has been true in previous research using FLE as the sole measure of children's economic status, which is a coarse economic indicator and is measured with considerable error in the CCD (Domina et al. 2018).

Ultimately, we produce district-level counts of the number of FLE students and the number of students in each income decile in the national distribution. We then compute state-level exposure measures to districts' financial and social resources for students of varying family incomes. Exposure represents the social or financial context in the school district of the average student in that income group. For example, we estimate one exposure measure to indicate the proportion of adults with a bachelor's degree in the district of the average FLE student in each state. State exposure measures for FLE students, which are essentially weighted averages, are calculated as follows:

$$Exposure_s = \sum_{d=1}^N \left(\frac{FLE_d}{FLE_s} \right) \left(\frac{BA_d}{P_d} \right),$$

where FLE_d is the count of students eligible for free lunch in district d , FLE_s is the count of students eligible for free lunch in state s , BA_d is the count of adults with a bachelor's degree in district d , and P_d is the total adult population in district d . Exposure measures for NFLE students and those from the lowest,

⁹ To do this, we assume that family incomes are spread evenly across each bin (income range).

¹⁰ We also estimate national cut points for income deciles for children in public school using IPUMS. One advantage of the IPUMS data is that income is presented as an exact dollar amount instead of in bins, and the number of children in a household is known. Estimates from the IPUMS and EDGE data are highly correlated. We use the EDGE cut-point estimates because they are derived from the same source as our social resource data.

middle, and highest income deciles are calculated in the same way. We repeat these calculations for exposure to married-couple families and unemployed adults. For financial resources, the exposure measure indicates per-pupil expenditures in, for example, the average FLE student's district in each state.

We then estimate state-level resource gaps in exposure between students of different family incomes—for example, the difference in adults with bachelor's degrees between the average FLE and NFLE student's district. We compute gaps between FLE and NFLE students, as well as between students from the 10th and 1st, 10th and 5th, and 5th and 1st income deciles.¹¹ We measure inequality in exposure to social characteristics as the difference in the proportion of adults with each social characteristic. We measure inequality in exposure to financial characteristics as the ratio of per pupil expenditures: a \$500 gap would be large if a state spent an average of \$8,000 per student in a year, and that same gap would be much smaller if the state spent \$16,000 per student per year. Therefore, state-level financial resource inequality is measured as the ratio of average per-pupil funding between the districts of students from different family incomes.

Income Segregation Between School Districts in States

Our second objective is to describe how income segregation between districts exacerbates these contextual inequalities. To calculate state-level income segregation between districts, we use census and ACS binned household income data in school district boundaries for households with children in public schools.¹² We measure income segregation using the rank-order information theory index (H), a measure of segregation that does not confound changes in income inequality with changes in income segregation (for more information, see Reardon 2011a). This measure compares the variation in household incomes within school districts to the variation in household incomes in the state. It can range from a theoretical minimum of 0 (no segregation; all school districts have identical income distributions to the state income distribution) to a theoretical maximum of 1 (total segregation; all school districts are composed of families in only one income category, and there is no income diversity within districts). We apply a bias adjustment technique to the income segregation computations to account for the possibility of small sampling rates in school districts, which can lead to inflated state segregation estimates.¹³ In particular, the bias adjustment allows for valid comparisons in segregation levels across data years even though ACS sampling rates are lower, on average, than they were in the census (Reardon et al. 2018).

¹¹ The first decile corresponds to students in the 10th percentile and below, the 5th decile corresponds to students in the 40th to 50th percentiles, and the 10th decile corresponds to students in the 90th to 100th percentiles of the national income distribution of families with children in public school.

¹² Income segregation among all households is highly correlated with income segregation among public school households, although income segregation levels are lower among all households compared with those among households with children in public school.

¹³ We implement the bias adjustment using the Stata program *rankseg*.

Results

Resources in Low- and High-Income Students' School Districts

Financial Resources

We begin by describing the financial resources available in the districts of high- and low-income students. Panel A of Table 1 shows that total per-pupil expenditures (adjusted by the ECWI and in 2014 dollars) were higher in lower-income students' school districts, on average. In 2014, average per-pupil expenditures in a FLE student's district were about \$400 higher than in an average NFLE student's district, and per-pupil expenditures were about \$700 higher in the average poor student's district than in the average affluent student's district (comparing students from the 1st and 10th deciles of family income). Expenditures in 2014 for students of all income levels were higher than in 1990, and the differences are statistically significant.

Panel B of Table 1 shows ratios of per-pupil expenditures, comparing lower- with higher-income students, averaged across all states. Each ratio is greater than 1, indicating that expenditures are greater, on average, in lower-income than higher-income students' districts. For example, in 2014, expenditures in the average FLE student's district were about 4 % higher than in the average NFLE student's district in the same state. The 1st:10th decile ratios indicate that expenditures in poor students' districts are 4 % to 7 % higher than in affluent students' districts from 1990 to 2014. The 1st:5th decile ratio is slightly larger than the 5th:10th decile ratio in all years, indicating that there is more compensatory funding to bring poor students' districts in line with middle-income students' districts than there is to equalize funding between middle-income and affluent students' districts. Increases in school funding over time were greater in lower-income than higher-income students' districts, reflected in the larger ratios in 2014 than 1990, although only the differences in ratios over time for the 1st:10th and 5th:10th deciles are statistically significant. The exception to this trend of growing ratios is the FLE:NFLE ratio, but the quality of this indicator has declined with time. Income-verification procedures changed in 2002, and districts in which more than 40 % of students were eligible could count all students as eligible starting in 2010 (Domina et al. 2018). The trend toward more compensatory expenditures suggests that school finance reform efforts during this period were effective, although all ratios declined from 2007 to 2014. Time will tell whether this is indicative of a long-term trend reversal or a result of diminished state revenues after the onset of the Great Recession, which affected state spending for low-income districts (Evans et al. 2019).

Social Resources

Next, we describe the social resources available in high- and low-income students' school districts, beginning with adult educational attainment. In school districts nationally, the percentage of adults with a bachelor's degree or more grew from 18 to 30 from 1990 to 2014.¹⁴ However, exposure to adults with a college degree was unequally distributed among children by economic background. Panel A of Table 2 presents mean

¹⁴ These national figures are population-weighted averages of the school districts in our sample.

Table 1 Average state-level expenditure exposure levels and ratios by student income, 1990–2014

Year	NFLE	FLE	1st Decile	5th Decile	10th Decile
A. Exposure to Per-Pupil Expenditures					
1990	8,666.31	8,987.38	9,003.87	8,737.53	8,685.27
2000	9,169.92	9,615.09	9,627.71	9,297.82	9,123.26
2007	10,434.58	10,994.25	11,081.36	10,676.21	10,350.39
2009	11,183.05	11,773.11	11,862.22	11,427.50	11,081.65
2011	11,077.00	11,596.34	11,722.08	11,293.89	10,966.59
2014	10,887.06	11,288.07	11,457.03	11,086.08	10,767.35
	FLE:NFLE Ratio	1st:10th Decile Ratio	1st:5th Decile Ratio	5th:10th Decile Ratio	
B. Ratios of Per-Pupil Expenditures					
1990	1.039	1.043	1.032	1.010	
2000	1.049	1.058	1.036	1.021	
2007	1.053	1.073	1.038	1.033	
2009	1.052	1.073	1.038	1.033	
2011	1.047	1.072	1.039	1.031	
2014	1.039	1.068	1.036	1.031	

Notes: All amounts are reported in 2014 dollars (adjusted using the CPI-U-RS), adjusted for yearly ECWI. Each year represents the average of that year with the year preceding and following it, except 1990, which is the average of 1990 and 1993. NFLE = not free lunch eligible; FLE = free lunch eligible. All 2014 expenditure figures in panel A are statistically significantly larger than in 1990 ($p < .001$). The 2014 ratios only for 1st:10th decile and 5th:10th decile comparisons are significantly larger than in 1990 ($p < .05$).

levels of state-level exposure to adults with a bachelor's degree for lower- and higher-income public school students (left panel) as well as the average gaps in exposure (right panel). Increases in mean levels of exposure in the school districts of all income groups from 1990 to 2014 are statistically significant, although the magnitude of the increases varies across groups, causing some gaps to widen. In 1990, the average NFLE student attended a district in which 18.7 % of adults had a bachelor's degree or greater compared with 15.8 % for the average FLE student, a difference of about 3 percentage points. By 2014, that gap had grown to 5.4 percentage points, a statistically significant increase; NFLE students' exposure increased to 31.5 %, and FLE students' exposure increased to only 26.1 %.

Gaps in exposure to highly educated adults between poor and affluent children (10th-1st decile gap) are larger and grew more, increasing from 7.3 to 11.3 percentage points from 1990 to 2014, a statistically significant increase. Inequality between affluent and middle-income children (10th-5th decile gap) grew approximately 3 percentage points ($p < .001$), while inequality between middle- and low-income children (5th-1st decile gap) grew slightly ($p < .05$) but remained at approximately 1 percentage point. These trends show that children from families with higher incomes attend school districts with an increasing share of highly educated adults, whereas the school districts of poor children have changed more slowly.

Figure 1 summarizes the information in panel A of Table 2 by displaying average state-level social resource exposure trends from 1990 to 2014 by free lunch eligibility (solid lines) and for children in the 1st and 10th deciles of the income distribution (dashed lines). This figure clearly shows that although FLE is a decent approximation of poverty, NFLE masks variation among nonpoor children. NFLE does not measure affluence and therefore does not capture the area of the income distribution that has driven much of the growth in inequality in recent decades. The inequality created by affluence is most striking for exposure to adults with a college degree, as evidenced by the sizable gap between the NFLE and 10th decile lines.

The percentage of married-parent families among public school children declined overall between 1990 and 2014, from 73 % of households in 1990 to 63 % of households in 2014. Panel B of Table 2 presents results for trends in exposure to married-parent families among public school children. Declines in mean levels of exposure to married-parent families in the school districts of all income groups from 1990 to 2014 are statistically significant, but exposure declined slightly less in the school districts of affluent children than it did for other children. In 2014, the average NFLE student attended school in a district where approximately 67 % of public school families had married parents, compared with 60 % in the average district for FLE students. This gap has remained stable since 2000. The gaps in family structure are larger and increased more between students at the poles of the income distribution. The gap in exposure to married-parent families for students in the 1st decile compared with the 10th decile grew from 7.6 percentage points to 10.6 percentage points from 1990 to 2014 ($p < .05$). Gaps were remarkably stable between the 5th and 1st deciles, indicating that most of the rise in the gap in exposure to married-parent households is due to affluent children living in districts with a higher level and smaller decline in the proportion of married-parent households.

Finally, the unemployment rate among adults in the districts in our sample fluctuated from 1990 to 2014 in sync with the national economy. In 1990, just 6.7 % of adults

Table 2 Average state-level social resource exposure levels and gaps by student income, 1990–2014

	Levels					Gaps			
	NFLE	FLE	1st Decile	5th Decile	10th Decile	NFLE-FLE	10th-1st	10th-5th	5th-1st
A. Proportion Adults With Bachelor's Degree									
1990	.187	.158	.160	.169	.233	.028	.073	.064	.009
2000	.243	.201	.206	.217	.301	.042	.095	.084	.011
2007	.278	.232	.236	.247	.342	.046	.105	.094	.011
2009	.287	.239	.244	.255	.352	.048	.109	.097	.012
2011	.297	.247	.249	.264	.359	.050	.109	.095	.014
2014	.315	.261	.263	.279	.376	.054	.113	.097	.015
B. Proportion Married-Parent Families									
1990	.765	.705	.697	.752	.773	.061	.076	.021	.055
2000	.720	.650	.647	.699	.734	.070	.086	.034	.052
2007	.683	.612	.601	.656	.704	.071	.103	.048	.054
2009	.677	.606	.595	.648	.699	.070	.104	.052	.053
2011	.669	.601	.585	.640	.691	.068	.106	.051	.055
2014	.665	.597	.580	.633	.686	.068	.106	.052	.054
C. Proportion Unemployed Adults									
1990	.060	.076	.078	.065	.054	-.016	-.024	-.011	-.013
2000	.052	.068	.069	.057	.047	-.017	-.021	-.009	-.012
2007	.063	.078	.079	.069	.058	-.014	-.021	-.011	-.010
2009	.075	.090	.092	.081	.069	-.015	-.023	-.012	-.011
2011	.083	.099	.102	.090	.077	-.016	-.025	-.013	-.012
2014	.063	.077	.080	.069	.059	-.013	-.022	-.011	-.011

Notes: Wyoming is excluded from education exposure calculations because data are missing for 1990. Levels (left panel): All educational exposure levels in 2000 and later years are statistically significantly higher than in 1990 ($p < .001$). All married-parent household exposure levels in 2000 and later years are statistically significantly lower than in 1990 ($p < .001$). Unemployment exposure levels are statistically indistinguishable in 2014 compared with 1990 (after rising significantly during the Great Recession). Gaps (right panel): All educational exposure gaps in 2014 are statistically significantly larger than in 1990 ($p < .001$, except the 5th-1st decile gaps $p < .05$). 10th-1st ($p < .05$), and 10th-5th ($p < .001$) decile gaps in married-parent household exposure are statistically significantly larger in 2014 compared with 1990. Unemployment exposure gaps are statistically indistinguishable in 2014 compared with 1990.

were unemployed, and that figure dropped to 6.0 % by 2000. However, as the Great Recession took hold during the late 2000s, unemployment rates rose, reaching 7.3 %, 8.8 %, and 9.8 % in 2007, 2009, and 2011, respectively, before falling back to 7.5 % in 2014.¹⁵ Panel C of Table 2 presents trends in average exposure to unemployed adults in the school districts of high- and low-income children. In 1990, the average FLE child experienced a school district unemployment rate of 7.6 %, whereas the average NFLE child's exposure was 6.0 %. In 2014, the comparable figures were 7.7 % and 6.3 %, respectively. Exposure to unemployment grew for children from all economic

¹⁵ The post-2000 figures deviate from national statistics in part because they are derived from five-year ACS averages.

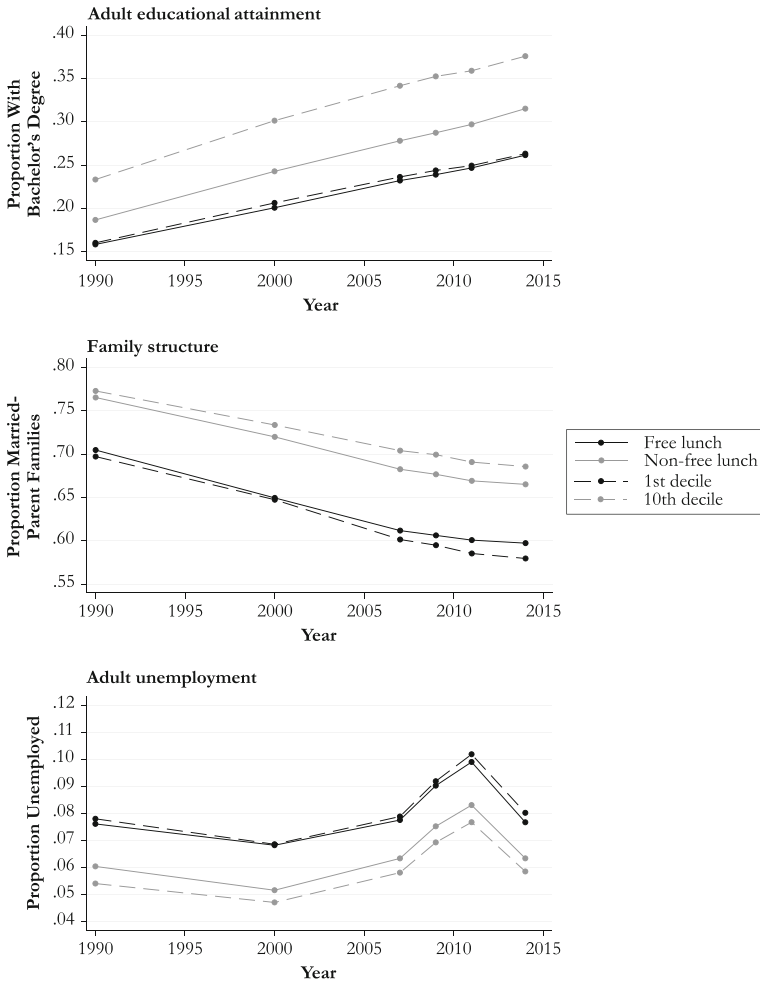


Fig. 1 Average exposure to social resources in the school districts of lower- and higher-income students, 1990–2014

backgrounds during and after the Great Recession, but the gaps in exposure remained consistent. The gap for FLE and NFLE children was approximately 1.5 percentage points in all years, whereas the gap between the poorest and most affluent children (1st vs. 10th deciles) was approximately 2.3 percentage points. These are large differences relative to the baseline, national unemployment percentages presented earlier.

Income Segregation and Resource Inequalities

Trends in School District Income Segregation

Results thus far indicate that low-income students' school districts have slightly more financial resources but considerably fewer social resources than high-

income students' districts. On both measures, inequality seems to be rising in recent years, with falling compensatory financial resources since 2007 and rising social resource gaps since 1990 (except in exposure to unemployment). We next turn to the relationship between income segregation and the unequal distribution of resources. Income segregation between school districts increased modestly from 1990 to 2014, rising in the early 2000s, slightly declining through the Great Recession, and then rising again between 2011 and 2014. Figure 2 plots state-level income segregation between school districts among households with children in public school in 1990 and 2014. This figure shows a great deal of variation in income segregation across states, with some states (such as Nevada) exhibiting almost no income segregation between its school districts, and other states (such as Connecticut and New Jersey) exhibiting levels of income segregation that are more than twice the national average. The states with high levels of income segregation also generally have higher levels of income inequality and more fragmented school systems (for example, county-wide districts in Nevada compared with many small districts in Connecticut and New Jersey), which provide more opportunities for fine-grained sorting resulting into homogenous social contexts (Bischoff 2008; Owens 2016; Owens et al. 2016).

Figure 2 also shows that although income segregation declined in some states from 1990 to 2014 (states below the diagonal line), it increased in 31 of the 49 states in our sample (states above the diagonal line). The largest increases in income segregation occurred among states in the highest quintile of income segregation in 1990. Rising income segregation means that low-income students attend districts that are increasingly homogeneously poor, and high-income students attend districts that are increasingly homogeneously affluent. Therefore, inequalities between high- and low-income children's school districts may grow as income segregation rises.

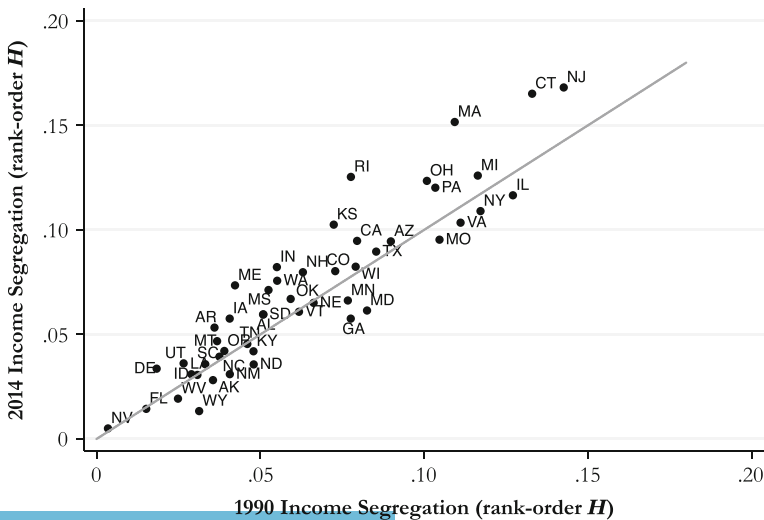


Fig. 2 State-level income segregation between school districts, 2014 versus 1990. The figure shows bias-adjusted segregation among households with children in public school.

Income Segregation and Financial Resource Inequality

Next, we investigate the relationship between income segregation and per-pupil expenditures in high- and low-income students' districts. For descriptive purposes, we categorize states into year-specific income segregation quintiles. Figure 3 depicts the spending ratios in the most and least segregated states (the first and fifth quintiles of segregation) from 1990 to 2014, including a reference line at 1 that indicates equal spending for low- and high-income students. Table A1 in the online appendix presents these ratios for all segregation quintiles.

In 1990, the expenditure ratio for the 1st:10th deciles (top right) and the 5th:10th deciles (bottom right) was below 1 in the most segregated states (gray line), indicating greater expenditures in high-income children's districts. The expenditure ratios for FLE:NFLE students (top left) and the 1st:5th deciles (bottom left) were very similar between the most and least segregated states in 1990. Income segregation between districts increased slightly, on average, from 1990 to 2014. Thus, without school finance reform, one would expect the ratios to decline—for high-income districts to outspend low-income districts—and to decline more in the most segregated states. Instead, the gray line has a positive slope across all four comparison dyads, indicating that spending in the districts of low-income students increasingly outpaces spending in high-income students' districts in the most segregated states. For each ratio except the 5th:10th decile, progressivity in the most segregated states equals or surpasses that in the least segregated states (gray lines are above black lines). Policies that aim to equalize financial resources between high- and low-income students have thus been fairly effective. However, the trend reversed after 2007: ratios declined in the most

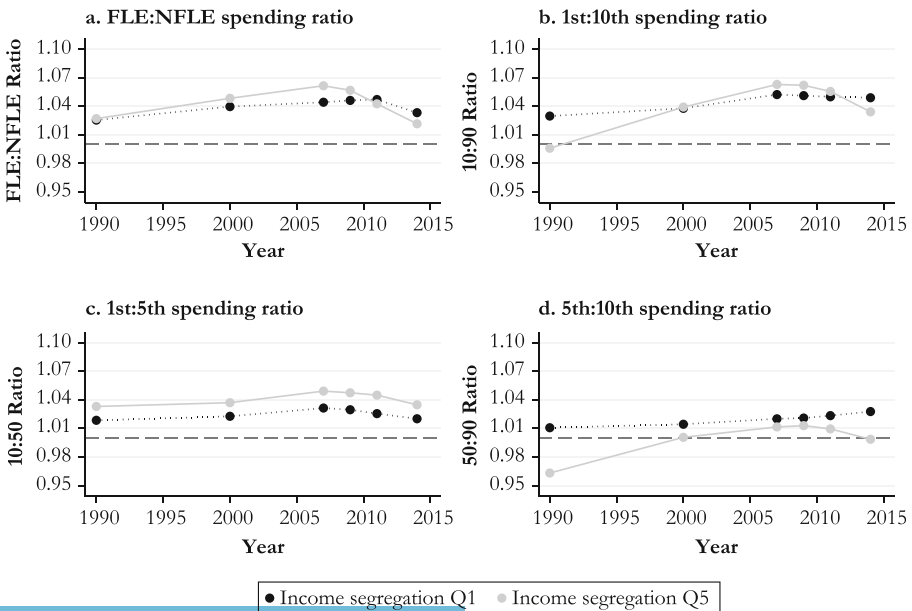


Fig. 3 Per-pupil expenditure ratios between lower- and higher-income students' school districts by top and bottom state income segregation quintiles, 1990–2014

segregated states, indicating reduced compensatory spending in low-income students' districts.

We examine the relationship between income segregation and financial resources more systematically in two ways. First, to assess whether higher segregation is associated with *more* compensatory spending, we regress the expenditure ratios between each comparison dyad on income segregation in longitudinal regression models with pooled data from 1990–2014. These models include state fixed effects and year indicators to control for time-invariant characteristics of states and global trends in expenditure ratios. Table 3 presents the coefficients on income segregation, which can be interpreted as the average within-state association between income segregation and each expenditure ratio over time. There is a positive and significant relationship between income segregation and each expenditure ratio. As income segregation between districts within a state rose, the expenditure ratios between the districts of lower- and higher-income students also rose, indicating more compensatory spending. The largest coefficient is for expenditures between school districts of children from the 1st and 10th income deciles, where the most compensatory spending may be needed. The magnitude of the coefficient implies that a 1 standard deviation increase in income segregation corresponds to nearly a 1 standard deviation increase (about 0.05) in the expenditure ratio between the 1st and 10th deciles.

Figure 3 also indicates that the relationship between income segregation and expenditure ratios may have changed after 2007. To test this, we add interaction terms between income segregation and years to our longitudinal regression models. Table A2 in the online appendix displays results for the full models. For all ratios except the 1st:5th, there are positive and significant interaction terms from 2000 to 2007, indicating a larger association between income segregation and expenditure ratios than in 1990. The interaction terms decline in magnitude after 2009 for all ratios, losing significance in 2011 or 2014 (interaction terms remain significant for the 5th:10th decile ratio). This confirms the pattern evident in Fig. 3: after 2007, the trend toward compensatory funding in highly segregated states weakens, likely because of decreases in states' budgets as a result of the Great Recession.

Despite reductions in education finance inequalities, there is no agreement on how much it costs to achieve equal outcomes between low- and high-income students. Critically, estimates of cost differences usually fail to take segregation into account and do not consider how segregation of disadvantaged students might influence the cost of educating poor students (Baker and Green 2015). High-poverty districts may require more funding not only because they enroll more poor students but also because the cost of educating one poor student is higher in a high- compared with low-poverty district as a result of the types of social inequalities that we discuss next. Education cost functions that consider student disadvantage produce widely ranging estimates, and state aid adjustments imply that educating disadvantaged students costs anywhere from 5 % to 160 % more than nonpoor students (Duncombe et al. 2015). Our estimates indicate that in 2014, the average FLE student attended school in a district where expenditures were 2 % to 5 % higher than in the district of the average NFLE student, depending on state segregation level. Current levels of compensatory spending are likely not sufficient to substantially reduce income achievement gaps, especially in more segregated states.

It is worth highlighting that highly segregated states also tend to have high levels of education spending: in 2014, 6 of the 10 states in the highest income segregation

Table 3 Estimated associations between within-state changes in bias-adjusted income segregation and changes in resource exposure inequalities, 1990–2014

	NFLE-FLE Gaps	10th-1st Decile Gaps	10th-5th Decile Gaps	5th-1st Decile Gaps	FLE-NFLE Ratios	1st-10th Decile Ratios	5th-10th Decile Ratios	1st-5th Decile Ratios
Adults With Bachelor's Degree	0.780*** (0.071)	1.230*** (0.086)	0.949*** (0.080)	0.280*** (0.044)				
Married-Parent Families	0.509*** (0.094)	1.112*** (0.092)	0.772*** (0.054)	0.340*** (0.084)				
Adult Unemployment	-0.164*** (0.030)	-0.333*** (0.039)	-0.168*** (0.020)	-0.165*** (0.027)				
Per Pupil Expenditures					0.779*** (0.180)	1.224*** (0.272)	0.454** (0.157)	0.714*** (0.178)

Notes: Each cell contains the coefficient on income segregation from a separate regression model, with the standard error in parentheses underneath. Each model contains state fixed effects and year-specific indicator variables (1990, 2000, 2007, 2009, 2011, and 2014). Wyoming is excluded from education exposure models because data are missing for 1990. *N* equals 49 unique states and 294 observations for all outcomes except education, where *N* equals 48 unique states and 288 total observations.

p* < .01; *p* < .001

quintile were also among the 10 highest-spending states (Baker et al. 2017). On one hand, low-income students have a greater *level* of financial resources in many highly segregated states than in less segregated states. On the other hand, within-state inequalities persist, so low-income students still have fewer resources than high-income students in highly segregated states.¹⁶

Income Segregation and Social Resource Inequality

We now investigate the extent to which income segregation exacerbates inequalities in the social contexts of children's school districts. Figure 4 compares levels of exposure to adults with a bachelor's degree for affluent (vertical axis) and poor children (horizontal axis) in 2014. States plotted far from the diagonal line have large gaps in exposure between affluent and poor children; those that are close have small, or even near-zero, gaps. States in the first quintile (triangles) and fifth quintile (squares) of the income segregation distribution are highlighted to show the positive relationship between levels and gaps in exposure to parental education and state-level income segregation.

We highlight two points. First, similar to the distinction between levels and inequality in funding raised earlier, many highly segregated states are also highly educated states. For example, Massachusetts has one of the most highly educated adult populations in the country, and it also has high and rising income segregation as well as a great deal of inequality between school districts.¹⁷ In 2014 in Massachusetts, the average student in the 10th decile attended a district in which 54 % of adults had at least a four-year college degree, compared with 33 % in the district of the average student in the 1st decile. This gap grew from approximately 12 to 21 percentage points from 1990 to 2014. In Louisiana (located nearly on the diagonal line), which has low income segregation, the average student in both the 1st and 10th deciles attended a district in which 23 % to 24 % of adults had at least a four-year college degree in 2014. Poor children in Massachusetts are exposed to a higher *level* of educated adults compared with both poor and affluent children in Louisiana, but they experienced much greater within-state inequality compared with affluent children. When competing for jobs in the state labor market or entry into state universities, for example, low-income children may be at more of a disadvantage in Massachusetts than in Louisiana despite their higher level of exposure to educated adults. The second point is that even within a segregation quintile, there is variation in levels of exposure. Although Massachusetts and Ohio are both highly segregated states and have similar gaps in exposure between affluent and poor children (distance from the diagonal line), Ohio has lower levels of educational exposure, meaning that poor children are relatively disadvantaged within the state as well as nationally.

Figures 5, 6, and 7 present a longitudinal perspective on average trends in the relationship between state-level income segregation (between school districts) and gaps

¹⁶ When segregated school systems are also highly fragmented, this may result in higher overall educational costs because each district must replicate basic institutional functions and staffing. Although income-segregated states spend more on education, on average, it is unclear whether those extra dollars contribute directly to student outcomes.

¹⁷ Table A3 in the online appendix presents state-level descriptive statistics for education exposure and income segregation.

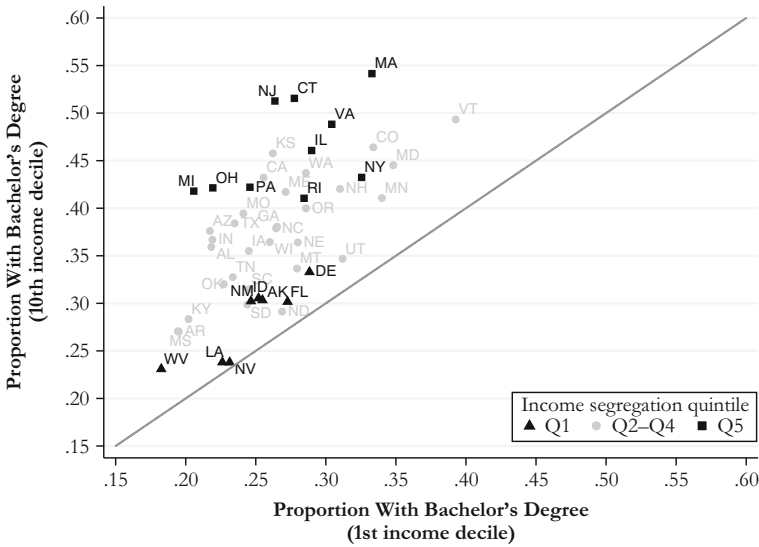


Fig. 4 Average state-level exposure to adults with a bachelor's degree in the school districts of affluent versus poor children by state income segregation quintile, 2014

in higher- and lower-income students' exposure to highly educated adults, married-parent families, and unemployment rates, respectively. Panel a of each graph presents results by income segregation quintile by year for 5th-1st decile gaps, representing inequalities between middle- and low-income students; panel b of each graph shows these results for 10th-1st decile gaps, representing inequalities between affluent and low-income students. We present only two ACS years for legibility. We do not depict NFLE-FLE gaps here because they mask inequalities between affluent and low-income students, but detailed results for all income groups are presented in Tables A4–A6 in the online appendix.

Again, we consider the relationship in two ways. First, we consider whether higher income segregation is associated with larger gaps in exposure to social resources. Comparing the height of the bars across segregation quintiles depicts this association. There are larger exposure gaps between lower- and higher-income children in more segregated states (increasing height of bars from left to right). Inequality in social contexts is exacerbated in states with a greater degree of residential sorting by income, and the relationship appears to be strongest for gaps between low-income and affluent children. For example, panel b of Fig. 5 shows that in 2014, the 10th-1st decile gap in adult education exposure was 19 percentage points in the most segregated states (Q5, right bars), compared with 4 percentage points in the least segregated states (Q1, left bars). Panel a shows that the 5th-1st decile gap was 3 percentage points in the most segregated states and nearly 0 in the least segregated states. Similarly, the gap in exposure to unemployment rates (Fig. 7) between children in the 10th and 1st deciles was nearly 3 percentage points larger in the most versus the least segregated states, twice as large as the difference in the 5th-1st gap between the most and least segregated states. Inequality between the affluent and the poor in the most segregated states represents a confluence of both individual disadvantage and structural sorting that results in large disparities in the context of schooling.

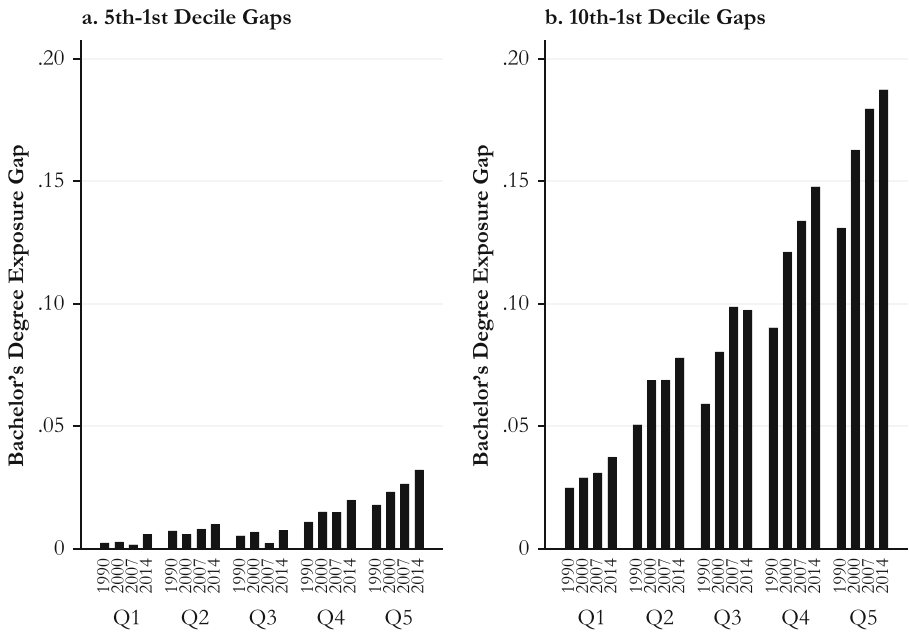


Fig. 5 Gaps in exposure to adults with a bachelor's degree between lower- and higher-income students' school districts by state income segregation quintile, 1990–2014

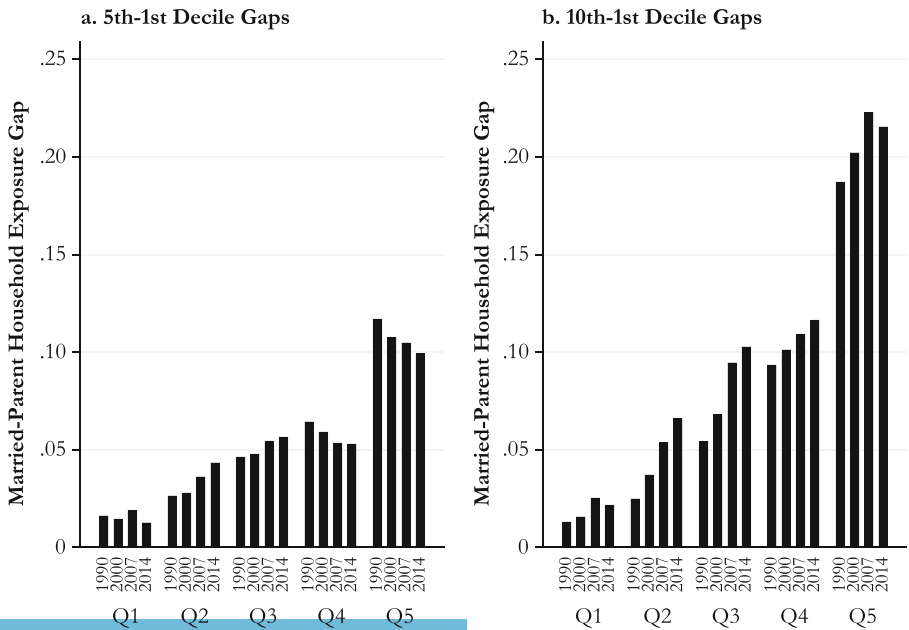


Fig. 6 Gaps in exposure to married-parent families between lower- and higher-income students' school districts by state income segregation quintile, 1990–2014

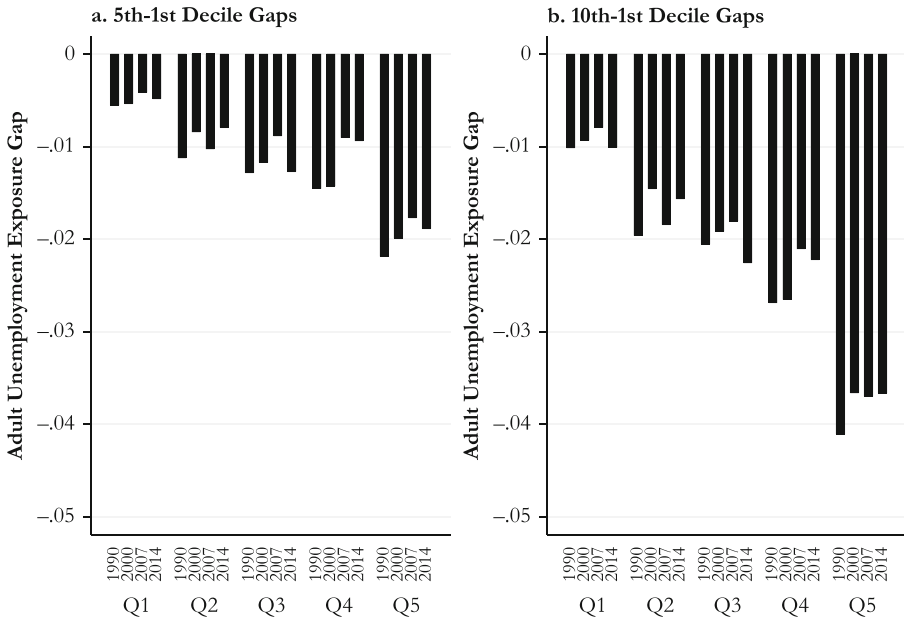


Fig. 7 Gaps in exposure to adult unemployment between lower- and higher-income students' school districts by state income segregation quintile, 1990–2014

We test whether social resource gaps are larger in more segregated states by estimating longitudinal regression models with state fixed effects and year indicators. Table 3 presents the coefficients on income segregation for each model, which can be interpreted as the average within-state association between income segregation and each social resource gap over time. Corroborating the graphic displays, the significant associations between income segregation and each social resource gap show that gaps grew more in states that experienced more growth in income segregation. The coefficients indicate that income segregation was associated with larger disparities between the affluent and poor than between the affluent and the middle class or between the middle class and the poor. The magnitudes of the coefficients for the 10th-1st decile gaps, in particular, are large. A 1 standard deviation increase in income segregation is associated with a 0.81 standard deviation increase in the 10th-1st decile education exposure gap, a 0.57 standard deviation increase in the 10th-1st decile family structure exposure gap, and a 0.89 standard deviation increase in the negative 10th-1st decile unemployment exposure gap.

Second, we consider whether the relationship between income segregation and social resource gaps has changed over time. Graphically, this relationship is depicted by changes in the height of the bars—the size of resource gaps—within segregation quintiles across years. Gaps between affluent and poor children in exposure to highly educated adults generally increased within segregation quintiles from 1990 through 2014 (Fig. 5), but unemployment gaps remained more stable within segregation quintiles over the years (and even declined in some cases) (Fig. 7).

Results for family structure (Fig. 6) are less clear because the trends in gaps are more variable across segregation quintiles. To test whether the relationship between income segregation and each social resource gap changed over time, we again regress social resource gaps on income segregation and include interaction terms between income

segregation and years as well as state fixed-effects and year indicators. Between 1990 and 2014, income segregation became significantly more strongly associated with gaps in exposure to highly educated adults between all income group comparisons. The magnitude of the relationship between income segregation and gaps in exposure to adult unemployment actually declined between 1990 and 2014 for all income group comparisons. As suggested in Fig. 6, the changing relationship between income segregation and gaps in exposure to married-parent families is less clear. The magnitude of the relationship between income segregation and gaps in exposure to family structure between children in the 10th–5th deciles increased between 1990 and 2014, but the association became less positive for all other groups (see results in Tables A7–A9, online appendix). Taken together, the results show that income segregation exacerbates contextual inequalities and that the relationship between income segregation and exposure to college-educated adults, in particular, strengthened from 1990 to 2014.

Conclusion

Unequal school contexts are among the most trenchant and stubborn threat to the promise of comparable educational opportunities for all children. How schools affect children can broadly be divided into features of the school itself and features of the students that enroll. Although oversimplified, the first component is often measured as financial resources, and the second as the racial and socioeconomic composition of the student body. Courts have decided that inequalities in education spending violate equal protection clauses in many state constitutions. Legislators, too, have enacted education finance reform policies that reallocate funds across local communities in some states. In our analyses, we find that per-pupil expenditures are, on average, slightly higher in school districts attended by low-income students, corroborating recent research on school finance (Jackson et al. 2015; Lafortune et al. 2018).¹⁸

Financial resources, however, are just one mechanism through which school context effects operate. Local social resources are also hypothesized to matter for student outcomes through the social and human capital that families contribute to educational settings. Our results show that in contrast to financial resources, social resource inequalities between high- and low-income students' school districts are substantial and, on some dimensions, have grown since 1990. Our results highlight particularly large inequalities between the educational contexts of the most affluent and poorest children. For example, our estimates indicate that in 2014, the gap in exposure to adults with a college degree between the school districts of the average child in the 10th and 1st income deciles was more than twice as large as the gap between the average NFLE and FLE student. Our results mark a significant departure from studies that rely solely on free lunch eligibility data to examine inequality in the part of the income distribution that has driven recent rises in income inequality. Although we find a great deal of social

¹⁸ Official accounts of revenues generated through governmental channels may overlook fundraising efforts by parents or local nonprofit organizations, although to our knowledge, the extent of financial inequalities created by these sources is unknown. Inequalities created through extra-governmental means would likely erode the progressivity we observe because wealthier districts likely have greater capacity to supplement tax-based revenues as a result of both differential wealth as well as vast differences in the social resources we document.

inequality between school districts, we cannot capture within-district inequalities between schools. We also do not link contextual disparities to educational or social-psychological outcomes. Future research should consider the relationship between contextual inequalities and student achievement despite substantial barriers to conducting these analyses because no district- or school-level national longitudinal data exist to address these questions.¹⁹

In the second part of our analysis, we investigate the role of residential income segregation on school resources. We find a positive relationship between progressivity of per-pupil spending and income segregation between districts, suggesting that school finance reform has effectively equalized funding for lower- and higher-income students' districts in states with vast economic inequalities. However, slightly progressive funding is likely not enough to equalize outcomes. This is especially true in segregated contexts where the cost of educating an individual student includes the depressive effect of concentrated disadvantage as well as the host of benefits generated by concentrated advantage. In addition, we find that the relationship between income segregation and spending progressivity has weakened in recent years, perhaps because states struggled to provide additional funding to low-income communities in the wake of the Great Recession (Evans et al. 2019). We also find that income segregation exacerbates social resource inequalities between higher- and lower-income students' districts and that for the gap in exposure to college-educated adults, the relationship with income segregation has grown in magnitude since 1990.

Income segregation is a structural feature of states related to income inequality, the organization of school districts, and housing policies. For instance, in 2014, Maryland, New Jersey, and Connecticut all had relatively high median household incomes (approximately \$74,000) and high average educational attainment levels, with approximately 38 % of adults holding a bachelor's degree. However, Maryland is much less economically segregated than New Jersey and Connecticut: in 2014, Maryland was slightly less segregated than the average state and had actually experienced a reduction in economic segregation since 1990. New Jersey and Connecticut were the two most segregated states in the country with values more than twice the national average, and both became more economically segregated after 1990. In 2014, the very wealthiest and poorest children in Maryland experienced a 10 percentage point difference in exposure to adults with a college education in their school districts; in New Jersey and Connecticut, that gap was approximately 24 percentage points. In addition, the exposure gap declined slightly in Maryland between 1990 and 2014 but grew considerably in these two comparable states. This means that all children in Maryland benefited from increased levels of educational attainment among adults over this period, as opposed to states where increased attainment was concentrated in the most affluent districts. Although this discrepancy may partially be explained by lower levels of income inequality in Maryland compared with New Jersey or Connecticut, one hypothesis we offer is that Maryland has county-based school districts, implying little political fragmentation. This substantially reduces homogeneity within districts and perhaps makes it easier for local communities to share their financial and social resources. Changes to the

¹⁹ Current data initiatives, such as the Stanford Education Data Archive (SEDA), may permit future links between the mechanisms we document and student outcomes, although the SEDA data are available for only recent school years.

underlying causes of income segregation will likely reduce inequalities in the social context of schooling, and perhaps in the financial context as well.

The comparison between financial and social resource inequalities in American schools is a blunt way of examining the effects of public policy. With school finance reform efforts in place across a majority of states, we generally observe improvements in funding inequalities through the late 2000s. Per-pupil funding does not capture all the financial resources available to school districts, nor is it a perfect proxy for all school-quality related factors. Nevertheless, the results point to the fact that government action is effective in curtailing the tendency for local communities to act primarily in self-interested ways. Conversely, our results also show that left largely unregulated by government action, social context gaps continue to grow, fueled by residential choices and growing associations between income and social characteristics, such as educational attainment. These gaps may be particularly relevant for educational outcomes that school finance reform cannot address, such as intergroup relations, friendship networks, and social tolerance.

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