Education inequities at the school starting gate: gaps, trends, and strategies to address them

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DRAFT-March 3 2017

Prepared for the Strong Foundations: The Economic Futures of Kids and Communities, Federal Reserve System Community Development Research Conference (Washington, D.C., March 23-24, 2017)

Abstract

As economic inequities in the United States endure and, in some instances, grow, and the large achievement gaps they help drive persist, calls for policy strategies to address the gaps increase as well. It is increasingly apparent that performance gaps take root in the earliest years of children's lives and do not vanish. It is thus critical that we assess the various aspects of early inequities in both the home and paid care/school contexts. This three-part study combines a statistical analysis of current early gaps and changes over time in them with a qualitative study of multifaceted strategies to narrow them. Altogether, the report provides a strong evidentiary base for identifying promising strategies and for informing research and policies to tackle skills gaps.

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1. Introduction: Facts about income inequality and its growth over time

One of today's most pressing economic issues is the worrisome level of income inequality. Since 1979, the total share of income claimed by the bottom 90 percent of Americans has steadily decreased (Bivens 2016). Around 1979, that 90 percent received about 67 percent of cash, market-based income. By 2015, their share had decreased to about 52 percent of pretax income. The majority of these income gains in this time went to the top 1 percent (EPI 2013; Mishel and Schieder 2016; Saez 2016). Polls reflect widespread concern about income and wage inequalities and associated trends, and the desire for policies to address these inequalities (New York Times 2015).

This high level of inequality might not be such a major concern if our education, economic, and social protection systems acted as compensatory mechanisms, helping individuals, and especially children, rise above their birth circumstances and improve their mobility. But that is hardly the case. Rather, the fraction of children who earn more than their parents (absolute mobility) has fallen from approximately 90 percent for children born in 1940 to 50 percent for children born in the 1980s (Chetty et al. 2016). Children of certain ethnic and racial minorities who are disproportionately likely to live in concentrated poverty are also more likely to do so over prolonged periods of time (Sharkey 2013). And the close connections between education inequalities and economic inequalities cast doubt on assertions that America provides "equality of opportunities" that promote social mobility (Mishel 2015).

The influence of income inequality affects multiple aspects of society's functioning, from health outcomes and even life expectancy (Schanzenbach et al. 2016; Stringhini et al. 2017) to democratic ideals (Obama 2017).[1] In the education arena, children's socioeconomic status, of which income is a key component, is considered one of the most significant predictors—if not the single most significant predictor—of education success. A number of studies show the strong relationship between socioeconomic status (SES) and test scores, educational attainment, and college attendance and completion (see Duncan, Morris, and Rodriguez 2011; Garcia and Weiss 2015; Garcia 2015; Lee and Burkam 2002; Mishel et al. 2012; Putnam 2015; among others).

As a result of these trends and associations, achievement gaps by social class have grown substantially since the 1960s, especially between children at the top of the income distribution and all of the others (Reardon 2011). Some researchers have identified a large increase in parental investment in education among high-SES parents as one driver of the divergence in education outcomes (Duncan and Murnane 2011), but studies have also found other contributing factors, such as time parents spent with their children and time parents devote to education-enhancing activities (Van Voorhis et al. 2013; Rothstein et al. 2015). In fact, spending on education-enhancing activities by parents in the top income fifth nearly tripled between the 1970s and the 2000s (from $3,500 in 1972 to $8,900 in 2006), while spending by parents in the bottom income fifth remained low and changed much less (from $800 in 1972 to $1,300 in 2006) (Duncan and Murnane 2011).[2] More time can mean more frequent interactions

[1] During his farewell speech, President Obama said: "[…] Stark inequality is also corrosive to our democratic ideals. While the top 1 percent has amassed a bigger share of wealth and income, too many of our families in inner cities and in rural counties have been left behind" (Obama 2017)

[2] Values are in 2008 dollars.

during playtime, more time spent reading to children, and other parenting practices that contribute to children's learning and development (Barbarin et al. 2010). In general, more leisure and educational time with children can promote their development and school readiness (Van Voorhis et al. 2013; Waldfogel 2006; Rothstein 2004; Phillips 2011; Brooks-Gunn and Markman 2005; Phillips 2011; Hart and Risley 1995). Given the evidence that parental engagement and spending directly and continuously translate into improvements in children's achievement and preparation, the presence of the various achievement gaps are not surprising.

Education researchers and policymakers have long been attentive to issues related to equity—by race/ethnicity, SES, gender, and other characteristics. The "Coleman report," by sociologist James S. Coleman and coauthors in 1966 is one early and seminal publication in this area (Coleman et al. 1966). Educational inequities remain a problem. Rigorous research demonstrates that inequalities in both opportunity and outcomes along the lines of race and social class begin early and often persist throughout students' K-12 years and beyond, and that they are much larger in the United States than in comparable countries (Putnam 2015; Bradbury et al. 2015).[3] Some of the research carefully describes the unique contexts and challenges that minority and lower social class students face and how these challenges create early education gaps. Other studies illustrate the consequences of these gaps for children's later learning and development (Duncan et al. 2007; Duncan and Magnuson 2011).[4] And though this body of research is smaller, a few studies have looked at trends in inequities across cohorts (Carnoy and Garcia 2017; Magnuson and Duncan 2016; Reardon 2011; Reardon et al. 2016). These studies across cohorts, however, do not address causes that could drive changes in the gaps over time. As such, there is a need both for a better understanding of these causes and for strategies to counter them.

In this paper, we describe recent trends in education gaps by social class, as measured by socioeconomic status (SES); analyze some of the major factors driving the gaps, and explore a set of diverse school district-level initiatives that are helping to narrow gaps. The paper is structured in 3 sections.

[3] Recent research by Bassok et al. (2016) and Reardon and Portilla (2016) points at a possible tipping point in the acceptance of the argument that achievement gaps by income increase over time, as their findings show narrower achievement gaps at kindergarten entry. Research by Carnoy and Garcia (2017) show persistent gaps, but no solid evidence on their trend is found: their findings for students in fourth and eighth grade, in math and reading, show that achievement gaps don't shrink or grow consistently (they are a function of the social-class indicator, the grade level, or the subject).

[4] And early investments in education strongly predict adolescent and adult development (Heckman 2008; Heckman and Kautz 2012; Cunha and Heckman 2007). For instance, students with higher levels of behavioral skills learn more in school than peers whose attitudinal skills are less developed (Jennings and DiPrete 2010). In general, as Heckman asserted, "skills beget skills," meaning that creating basic, foundational knowledge makes it easier to acquire skills in the future (Heckman 2008). Conversely, children who fail to acquire this early foundational knowledge may experience some permanent loss of opportunities to achieve to their full potential. Indeed, scholars have documented a correlation between lack of kindergarten readiness and not reading well at third grade, which is a key point at which failing to read well greatly reduces a child's odds of completing high school (Fiester 2010; Hernandez 2011).

- First, we examine social class-based gaps at kindergarten entry among the most recently surveyed kindergarten cohort. We study how gaps manifest in both cognitive and so-called noncognitive skills, as both skill types are important components of children's development.
- Next we compare these gaps with those of an earlier kindergarten cohort. We look at changes from 1998 to 2010 in the skills gaps between children in the top and bottom social-class quintiles. We also analyze how sensitive gaps are to the inclusion of several key determinants of student performance, such as family composition, children's own characteristics, and parental and education practices at home.
- Then we review a set of case studies of school districts that have employed comprehensive educational strategies to provide more children (especially low-income children) with strong early academic and life foundations, and to sustain and build on early gains throughout the K-12 school years. Based on the examples from diverse communities, we discuss implications: strategies that districts can employ and district and state policy changes to make those strategies easier to adopt and more sustainable.

For the first two analyses, we use two nationally representative studies from the National Center of Education Statistics: the Early Childhood Longitudinal Study of the Kindergarten Classes of 1998–1999 and 2010–2011. These data provide information about the children, such as their race/ethnicity, socioeconomic status, language spoken at home, etc. The data also provide information on their experiences in their early years, such as how actively their parents engaged them in enriching activities, whether they attended prekindergarten care, and the number of books the child has (see Appendix). This information allows us to test the associations between children's characteristics and their educational outcomes at school entry. For the second analysis, we draw on 12 case studies of community and school districts employing comprehensive educational strategies (Weiss 2016a-h). We explore the qualitative information they provide on investments these districts have made in early childhood education, on both within-school and broader K-12 supports for children, and on evidence that these investments are delivering both improved academic achievement and broader gains for children. Based on this evidence, the report ends with conclusions and recommendations for further research, practice, and policy. An appendix provides detailed discussions of the data and methodology used in this paper.

2. How large are recent performance gaps at kindergarten entry?

This section documents inequalities among the most recently tracked cohort of students as they entered kindergarten in 2010. It provides us with an up-to-date view of the various aspects of inequities and gaps at the school starting gate, all of which are critically important for understanding the implications of those gaps. The findings below draw upon the Early Childhood Longitudinal Study of the Kindergarten Class of 2010–2011, and we use data from the fall measurement in the kindergarten year (this section partly builds on our previous work, see Garcia 2015 and Garcia and Weiss 2015. See the Appendix for details on the variables and methodology used).

Our decision to examine performance in both cognitive and noncognitive skills builds on growing acceptance that children's development is a complex process in which each skill type builds on and interacts with the other, and on evidence of the roles both types of skills play in the education process and adulthood outcomes (see Garcia and Weiss 2016; Garcia 2015; Levin 2012a and 2012b). Traits and skills such as critical thinking, creativity, problem-solving, persistence, and self-control are vitally important to children's full development, and are nurtured through life and school experiences. These skills, sometimes referred to as noncognitive or social and emotional skills, tend to develop—or lag—in tandem with cognitive skills. Noncognitive or social and emotional skills are thus linked to academic achievement, and also to outcomes in adult life, such as productivity and collegiality at work, good health, and civic participation.

For these analyses, we use a measure of socioeconomic status that has three components: the educational attainment of parents or guardians, parents' occupational prestige (determined by a score), and household income (see more details about the SES construct in Tourangeau et al. 2013, 7-56 to 7-60). We divide children of the 2010–2011 kindergarten class into five groups based on SES quintile (see Appendix). To measure the gaps in performance by socioeconomic status, we compare the average performance of children in the top fifth of the SES distribution with the average performance of children in the bottom fifth. This provides an estimate of the relative advantage of a child in the top fifth of the SES distribution (referred to in this report as "high SES") with respect to a child in the bottom fifth ("low SES"). According to our analyses, children are not equally prepared for school when they enter kindergarten, with students' social class strongly determining their relative position in the performance distribution. Most socioeconomically disadvantaged children lag substantially in both reading and math skills, and these skills levels rise along with socioeconomic status. Children in the highest socioeconomic group score significantly higher in reading and math than children in the lowest socioeconomic group. As **Figure A** shows, the relative unadjusted gaps in reading and math, i.e., the unadjusted advantages of high-SES children relative to low-SES children, are 1.17 and 1.25 sd respectively (or 0.94 and 0.91 sd after controlling for clustered data, see Appendix and **Table 2**). Reading and math skill advantages of children in the middle of the SES distribution relative to the lowest SES group are roughly half as large as the advantages of high-SES children to the lowest SES group.[5]

Children in the lowest socioeconomic quintile also lag substantially in noncognitive skills, based on assessments of both parents and teachers, although these gaps are smaller than those in reading and math. Socioeconomic–based gaps in self-control and approaches to learning as reported by teachers and parents are approximately one-quarter to one-half as large as gaps in reading and math.[6] In 2010, children in the high-SES quintile scored 0.38 sd and 0.51 higher in self-control and approaches to learning as reported by teachers (0.36 and 56 sd after clustering) than children at the low-SES quintile

[5] Results available upon request. See Garcia (2015) for results for all SES-quintiles (the baseline or unadjusted gaps in that report correspond with Model 2 in this paper).

[6] The Early Childhood Longitudinal Study asks both parents and teachers to rate children's abilities across a range of these skills. The specific skills measured may vary between the home and classroom setting. Teachers likely evaluate their students' skills levels relative to those of other children they teach. Parents, on the other hand, may be basing their expectations on family, community, culture, or other factors.

(see **Table 3** and **Figure B**). Using parents' assessments of the same skills, the gaps are 0.39 and 0.56 sd respectively (0.33 and 0.46 sd after clustering).

Our analyses also document stark socioeconomic disparities in inputs, child and family characteristics and other factors that can affect school readiness (**Table 1**). Here too we find a correlation between socioeconomic status and other factors that impede educational development. Low-SES students are more likely than their high-SES peers to be immigrants and less likely to speak English at home, to live with two parents, to have participated in center-based pre-K care activities in the previous year, and to have engaged in early literacy practices at home. Among children in the low-SES group, half (50.4 percent) are Hispanic, 23.1 percent are white, 19.6 percent are black, and 2.5 percent are Asian.[7]

Though these gaps are troubling and call for policy recommendations, better policy solutions can be designed if we understand how these gaps have changed over time and what factors have played a role in those changes. Education outcomes are the product of a combination of multiple factors, which can reinforce or mitigate relative advantages or disadvantages in a dynamic fashion. We examine these issues in the rest of the paper.

3. How do the performance gaps in the 2010–2011 kindergarten class compare with the gaps in the prior generation?

The analyses presented in this section compare the inequities in inputs and the performance gaps between low-SES and high-SES students who began kindergarten in 2010 with the gaps among low SES–high SES schoolchildren in the prior generation, the 1998 cohort. We also analyze factors that have had major influences on the changes in performance of kindergartners, and briefly discuss the research and policy implications of our findings.

How have the characteristics of the children in the lowest and highest SES groups changed in a generation?

We first analyze children's characteristics by SES quintiles in the two cohorts. This enables us to identify differences in the characteristics of low-social class kindergartners in 1998 versus in 2010. These changes may explain why the performance gaps we are studying grow or shrink (for example, if children in the lowest social class quintile in 2010 were less likely than their 1998 peers to have access to public programs such as pre-K, they might be less prepared for kindergarten).[8]

Table 1 shows the student and family characteristics of the kindergarten classes of 1998–1999 and of 2010–2011, by SES quintile. The table also includes pre-K care arrangements, and two indices of

[7] See Garcia (2015) for a discussion of which factors in children's early lives and their individual and family characteristics drive the gaps (on top of social-class) among children of the 2010 kindergarten class.

[8] Note that the SES quintiles are constructed using each year's distribution, and that changes in the overall and relative distribution may affect the characteristics of children in the different quintiles each year (i.e., there may be some groups who are relatively overrepresented in one or another quintile if changes in the SES components changed over time).

developmental activities parents undertake with their children—indices of "literacy/reading activities" and "other activities").[9] The table also summarizes parents' expectations regarding their children's educational attainment. To some extent, expectations are based on hope, but they can also respond to behavioral patterns children are exhibiting that hint at their future success. Expectations can also influence outcomes by representing how motivated parents are for their children's education. The ECLS-K survey does not ask parents how their expectations (and changes in their expectations) affect the educational activities or support they provide, but the answers to the expectations question can be used it as a reasonable proxy of the degree to which parents are aware of their children's education and of how willing are parents to support their children's education.

The most significant changes in children's characteristics by SES quintile are for children in the bottom of the distribution. In 2010, a greater share of children in this group are Hispanic (50.4 percent, an increase of 10.6 percentage points relative to the 1998 share of 39.8 percent), are in homes where the main language is not English (40.3 percent, an increase of 9.1 percentage points from 31.2 percent in 1998), and are immigrants (49.8 percent, an increase of 19.5 percentage points from 30.3 percent in 1998). In 2010, a greater share of children do not live with two parents (54.9 percent, an increase of 9.3 percentage points from 45.6 percent in 1998), and live in poverty (84.6 percent, an increase of 13.3 percentage points from 71.3 percent in 1998).

These children's likelihood of attending center-based pre-K did not change significantly (about 44 percent for both cohorts), but they were more likely to be looked after by parents or relatives (with the share increasing from 46.4 percent in 1998 to 50.9 percent in 2010). These children's parents also reported having a somewhat larger number of books at home for the children, and their index of educational and engagement activities other than reading/literacy improved. Their parents' expectations about their educational attainment also changed significantly: the share of parents who expected their children to attain no more than a high-school diploma decreased by more than half (from 24.1 percent in 1998 to 11.4 percent in 2010), and the shares of parents who expected their children to attain at least a bachelor's degree increased, markedly for those expecting their children to obtain a Ph.D. or an M.D.

Among children in the high SES quintile, the group in 2010 includes a lower share of white children (falling from 78.8 percent in 1998 to 71.3 percent) and a larger share of Asian children (increasing from 4.7 percent in 1998 to 8.7 percent). Children in the high SES group became slightly more likely to live with their two parents (the share of children who lived with one parent decreased from 11.1 percent in 1998 to 9.6 percent), and to have attended center-based pre-K (65.8 percent in 1998 versus 69.9 percent in 2010). We only see a small increase in the reported number of books at home (thought this may be affected by the difference in the cap of the variable used to report number of books at home in the two surveys. The share of homes reporting having more than 200 books (the maximum) slightly increased in 2010, across all SES quintiles except for the middle quintile). A larger proportion of high-SES children in the 2010 cohort were expected by their parents to attain a master's

[9] The detailed frequency with which parents develop or practice some activities with their children at home and others is available upon request.

degree or more education than by high-SES children's parents in 1998 (while a lower share of high-SES parents expected their children to attain a bachelor's degree only in 2010). In summary, parental expectations for their children's educational attainment increased at both the bottom and top of the SES distribution from 1998 to 2010.

How have the performance gaps between the children in the lowest and highest SES groups changed in a generation?

Changes over time in the input factors by socioeconomic status (child and family characteristics, early-education practices, and parents' expectations) explored above can be expected to affect the outcomes (test scores on reading and math, and measures of noncognitive skills) explored in this section. In other words, we would expect that changes in the unadjusted skills gaps (gap measures that do not include controls for child and family characteristics, early-education practices, and parent's expectations) would partially reflect the compositional differences of the class of 2010–2011 and the class of 1998–1999. For example, we would expect that if the more recent generation's low-SES parents have engaged more frequently in reading to children or helping them do arts and crafts, or have higher expectations for their children, these factors would correlate with narrowing skills gaps. Also, we would expect that the adjusted skills gaps (gap measures that are net of the influence of child and family characteristics, early-education practices, and parent's expectations, and thus reflect the SES-gaps) would be different for the two cohorts, if the correlations between inputs and outcomes have changed over time, or if the share of children's outcomes the adjustments account for has changed over time. To understand these factors' potential influence on gaps, we examine both unadjusted and adjusted gaps in the tables in this section. We also examine gaps by some of the components of the SES index, such as income or parents' (mothers') educational attainment, and by some variables that are sometimes used as proxies of the child's socioeconomic background, such as number of books in the home. If the gaps by SES components and proxies somewhat differ, this tells us that researchers' choices of how to divide children into groups and compare them matters—both for their findings and for their policy recommendations.

First we compare the standardized scores (in reading, math, approaches to learning, and self-control) of children in the top SES quintile relative to the bottom SES quintile in 1998 and 2010.[10] The score gap between high- and low-SES children in 1998, and the change in the gap by 2010, is shown in **Table 2** (cognitive skills). Second, as shown in **Table 3**, we perform the same analysis for gaps in measured noncognitive skills. The tables show two somewhat perplexing patterns. On the one hand, the cognitive and noncognitive skills gaps between high-SES and low-SES children are large and statistically significant in both cohorts (for separate analyses by cohort, see previous section for the 2010 cohort analysis, and Lee and Burkam 2002 for the 1998 cohort analysis). But while significant social-class-based performance gaps persist from one kindergarten generation to the next, there is not the same consistency in how the high- to low-SES gaps change. For some cognitive and noncognitive skills, the

[10] Models include all quintiles in their specification. Tables that offer a comparison for all quintiles relative to the first quintile are available upon request. We focus the discussion on the gap between the top and bottom.

performance gaps grow, for others the gaps shrink, or remain the same from one generation to the next (which may complicate the process of understanding "why" performance gaps have changed over time).

Beginning with our unadjusted models (data column one), the only substantial increase in the gap between high- and low-SES children from 1998 to 2010 was in reading skills, which increased by one-tenth of a standard deviation. The gaps in mathematics and in approaches to learning as reported by parents and self-control by teachers did not change significantly, and gaps in approaches to learning by teachers and in self-control by parents shrank by roughly the same amount (about 0.12 and 0.08 sd).[11] Figure A provides a graphic illustration of the unadjusted gaps in cognitive and noncognitive skills of high- and low-SES children across the two cohorts.

The additional three models estimated for each outcome and shown in Tables 2 and 3 offer other key findings. In Model 1, we used the full samples for the two cohorts but did not include any controls that capture characteristics of children or their parents or the early education practices in which families engage. Model 2 partitions the data into schools and classes, or clusters, so that the subjects in the clusters are more similar to each other than to those in other groups. Under this adjustment, the gaps shrink substantially, by between 15 and 25 percent across the skills, and the regression fit improves significantly (see increased adjusted R-squared, i.e., this model explains more of the total variation in the outcomes than the first model). The purpose of this clustering is to account for school segregation. In the real world, children are not randomly distributed but tend to concentrate in schools or classrooms with children of the same race, social class, etc. Clustered estimates provide comparison of the skills gaps of peer students, those in the same schools and classrooms, rather than comparison across schools (Garcia 2015; and Magnuson and Duncan 2016 offer these estimates too).

How do child and family characteristics, activities, and expectations affect SES-based performance and performance gaps?

We next examine the contribution of the certain variables of interest to SES-based performance gaps. We approach this in two ways. First, we examine the changes in the gaps (Tables 2 and 3), and the overall reduction in the gaps that results from controlling for children and their family characteristics, early literacy practices, and parental expectations of educational achievement (Table 4). Second, we assess the influence of selected early educational practices on performance and how it has changed over time by looking at the associations between these inputs and performance (Table 5).

Models 3 and 4 in Tables 2 and 3 use the samples that result from removing observations without full information for the controls of interest.[12] Adding controls is important because performance gaps based on socioeconomic status may be explained by differences in variables other than the child's socioeconomic status. In other words, we aim to determine which part of the gap is attributable to

[11] The relative performance of low-SES children in approaches to learning by teachers and self-control by parents, improved by approximately 0.07 sd. We detected no changes in any of the other noncognitive, nor in any of the cognitive skills, for low-SES children.

[12] As a result, sample sizes become smaller (see Appendix Table 2). Assuming missingness is completely at random, the findings are representative of the original sample and of the populations they represent. Analytic samples once missingness is accounted for are normally called the complete case sample.

children's SES, net of other factors that matter for performance. Thus, in the third data column (model 3), we add controls for individual and family composition (gender, race/ethnicity, whether English is the primary language spoken at home, disability, age, whether children live with two parents), early educational and play activities (center-based pre-K care, indices for literacy/reading activities other activities, and total number of books the child has). Model 3 also includes the interactions between the early education variables with time.[13] In the fourth data column (model 4), we control for the same factors as in model 3 but add controls for parental expectations of children's educational attainment (whether they expect their children's highest level of education attained will be high school diploma or less, some college or vocational studies, bachelor's degree, or master's degree or more) and their interaction with time.[14] We describe these results in the next section.

Including covariates changes the estimates of SES-based skills gaps in various ways. First, the top-to-bottom-SES-quintile gaps shrink, showing that SES-based gaps are partially explained by the variation in the controls (not visible in the tables).[15] Second, controls do not significantly change the SES-based gaps over time, in general; i.e., the coefficients associated with changes in the gaps between high- and low-SES children remain almost the same, or change slightly, depending on the skill measured. The statistical significance of the SES-based skills gaps in 1998 is not affected by the inclusion of the controls, but the statistical significance of the changes in the gaps between 1998 and 2010 is somewhat affected by the inclusion of the controls (note that the sizes of the coefficients measuring gaps in 1998 change after the inclusion of the controls, and that the sizes of the coefficients measuring changes in them between 1998 and 2010 do not change significantly). In reading, the change in the gap between 1998 and 2010 diminishes and becomes statistically insignificant in the last model (the relative gap increases by 0.08 sd but this change is not statistically significant), meaning that adding parental expectations of education accounts for some of the increase in the gap detected in models 1 to 3. The only SES-based skills gap that shows a statistically significant increase from 1998 to 2010 once parental expectations are controlled for is the gap associated with parents' assessment of approaches to learning, which increases by 0.11 sd. Gaps between high- and low-SES children in cognitive and noncognitive skills after adjustments are made are shown in Figure B.

As mentioned above, the fact that the skills gaps decrease after controls are taken into consideration affirms that SES-based gaps are due in part to inequities or variation in the controls among high- versus low-SES children. With respect to cognitive skills, the gaps shrink by 46 to 53 percent in 1998 after the inclusion of the covariates. About half of the gaps are thus due to other factors that are associated both with SES status and with the outcomes themselves. The reduction in the gaps for noncognitive skills varies from 28 percent (approaches to learning by teachers) to 74 percent

[13] These interactions between inputs and time test for whether the influence of inputs in 2010 is smaller, the same, or larger, than their influence in 1998.

[14] The interactions between parental expectations of children's educational attainment and the time variable test for whether the influence of expectations in 2010 is smaller, the same, or larger, than their influence in 1998.

[15] The change in the skills gaps by SES in 2010 due to the inclusion of the controls is not directly visible in the tables in this report. To see this, see Garcia (2015), comparison of estimates of models MS1-MS3. The change in the skills gaps by SES in 1998 is directly observable in Tables 2 and 3 and discussed below.

(approaches to learning by parents). (For self-control by teachers, the reduction is 51 percent; versus 35 percent when reported by parents).

In all cases, while the gaps are persistent, the gaps in 2010 are less sensitive to the inclusion of the covariates than they were in 1998. This trend can be seen in Table 4, which shows the overall reduction in the gaps that results from controlling for children and family characteristics, early literacy practices, and parental expectations of educational achievement.[16] Declining values from 1998 to 2010 indicate that factors such as early literacy activities and other controls are not, as a group, exerting as much ability to explain SES-based gaps as they used to.

This trend should make policymakers and researchers examining the resistance of gaps concerned because it means that the factors we are controlling for are less effective in shrinking skills gaps. The waning influence of these controls means that less of the SES-gap is explainable, and thus is either more "permanent" or is due to other factors that we are not accounting for.

Finally, we examine the association of performance outcomes (not performance gaps) with selected educational practices, including having attended center-based pre-K care, literacy/reading activities and other activities, and total number of books in the home (**Table 5**).[17] We are mainly interested in two potential patterns: whether these factors are associated with outcomes (and, if so, how intense the associations are), and whether the relationships have changed over time.

In keeping with established research, having attended center-based preschool care is positively associated with children's reading and math skills. For 1998, the estimated coefficients are 0.11 sd for reading skills and 0.10 sd for math skills, substantial associations that do not change significantly over time. In other words, attending pre-K in 1998 improved kindergartners reading by 0.11 sd and improved kindergartners math by 0.10 sd relative to not attending pre-K. However, while center-based preschool care continues to reduce self-control as reported by teachers in 2010, the effect is less negative in 2010 (the 0.06 improvement from 1998 to 2010 shown in the bottom panel of the table shows us that the effect in 2010 was -0.07 (-0.13 plus 0.06), compared with -0.13 sd in 1998). We find no independent effect of center-based prekindergarten schooling (i.e., no effect on top of SES, on top of other individual

[16] The numbers in the second column (showing the shares of the SES-based skills gaps that are accounted for by controls) are always higher for 1998 than for 2010.

[17] Please note that until this point in the report we have been concerned with SES-gaps and not with performance directly (though SES-gaps are the result of the influence of SES on performance, which leads to differential performance of children by SES and hence to a performance gap). The paragraphs above emphasize how controls mediate or explain some of the skills gaps by SES, so, in a way, controls inform our analysis of gaps because they reveal how changes in gaps may have been affected by changes in various factors' capacity to influence performance. Now the focus is on exploring the independent effect of the covariates of interest on performance. In this report, because we address whether the education and selected practices affect outcomes, the main effect is measured for the 1998 cohort, and we measure how it changed between 1998 and 2010. The detailed discussion for the correlation between covariates and outcomes in 2010 is provided in Garcia (2015) (see Table 3).

and family characteristics, and on top of other SES-mediated factors), on approaches to learning, and on self-control as reported by parents.[18]

The number of books children have at home likewise supports their skills at the beginning of kindergarten. Indeed, this factor is positively associated with all outcomes but self-control reported by parents. The coefficients are small, of about 0.01 to 0.02 sd (associated with changes in outcomes for each ten additional/fewer books the child has, as expressed by the continuous scale with which number of books in the home is measured which is divided by ten for the analyses, see Appendix), and these relationships do not change over the time period.

The two types of parenting activities that are summarized by the indices "reading/literacy activities" and "other activities" show interesting correlations with performance and patterns over time. On the one hand, the "reading/literacy activities" index (a composite of how frequently parents read books to their child, tell stories, sing songs, and talk about nature and how frequently the child reads picture books and read outside of school) is strongly and positively associated with all outcomes other than children's self-control as reported by the teacher. The associations with cognitive skills, especially with reading, are strong—0.17 sd for reading performance and 0.07 sd for math—and these associations did not change significantly between 1998 and 2010. For noncognitive skills, the relationships are strong for those assessed by parents, though they shrink by about half over time: self-control is 0.14 sd in 1998 and decreases by 0.08 sd in 2010; approaches to learning is 0.32 sd in 1998 and decreases by 0.17 sd in 2010). The relationship is much weaker, though still statistically significant, for teachers' assessed approaches to learning (it is 0.03 sd in 1998 and does not change significantly by 2010).

On the other hand, the index that measures the other enrichment activities that parents do with their children (a composite of how frequently parents and children play games, do sports, build things and puzzles, do arts and crafts, and do chores), shows significant correlations with all of the skills, but in the opposite directions. For cognitive skills, the associations are statistically significant and negative, though stronger or more meaningful with reading achievement (0.12 sd in 1998) than with math achievement (-0.04 sd). These associations did not intensify nor weaken over time. For noncognitive skills the associations are highly positive and statistically significant, and very strong for parents'

[18] We remind the readers that this variable indicates whether the child was cared for in a center-based setting during the year prior to the kindergarten year, compared with other options (as Garcia 2015 explains, these alternatives include no nonparental care arrangements; being looked after by a relative, a nonrelative, at home or outside; or a combination of options. Any finding associated with this variable may be interpreted as the association between attending prekindergarten programs, compared with other options, but must be interpreted with caution. In other words, the child may have attended a high-quality prekindergarten program, which could have been either private or public, or a low-quality one, which would have different impacts. He or she might have been placed in (non-educational) child care, either private or public, high- or low-quality, for few or many hours per day, with very different implications for his or her development (Barnett 2011; Nores and Barnett 2010; Barnett 2008; Magnuson, Ruhm, and Waldfogel 2007; Magnuson et al. 2004). For the extensive literature explaining the benefits of pre-K schooling see Camilli et al. (2010) and for a meta-analysis of results, see Duncan and Magnuson (2013). Thus, more detailed information on the characteristics of the nonparental care arrangements (type, quality, and quantity) would help researchers further disentangle the importance of this variable. This additional information would provide a much clearer picture of the effects of early childhood education on the different educational outcomes.

assessment of approaches to learning (0.29 sd in 1998). As explained by Garcia (2015), these correlations between "other activities" and noncognitive skills as assessed by parents could be bidirectional: engaging children in enrichment activities might enhance their noncognitive skills, but, at the same time, parents who are more inclined to participate in their children's early play and educational time are probably more likely to perceive or judge that their engagement has an impact on their children's skills. But the fact that both the frequency with which parents engage in most of these activities and the importance of this index for parent-assessed skills increased noticeably from 1998 to 2010 (by 0.22 sd for self-control and 0.27 sd for approaches to learning) suggests that parents are truly more informed and involved in their children's early education than they were in the past and that this involvement will continue to grow, albeit potentially with decreasing marginal returns to investing time and resources on children. The association between "other activities" and teachers' assessments of children's noncognitive skills is also positive but weaker than that of parents' assessments (about 0.03 sd for approaches to learning and 0.05 sd for self-control), and remained unchanged during the time period.

Finally, we find a strong association between parental expectations for their children's educational attainment and all measured skills In other words, net of socioeconomic status, the higher the expectations, the higher cognitive skills children have, and the higher the assessments by parents and teachers of children's noncognitive skills. The parental expectations portion of the table measures children's performance relative to children whose parents' expectations are the lowest (high-school degree or less).While the expectation that a child will pursue some vocational education or complete college has a statistically positive effect on all skills measures except for reading, the effect is stronger when parents expect that their children will complete a bachelors' degree or more education: between 0.11 to 0.16 sd higher in reading and between 0.17 to 0.22 sd higher in math in 1998. High expectations for children's educational attainment also have a statistically positive effect on noncognitive skills. When the expectation is for a master's degree or more, coefficients vary from 0.12 sd in self-control by teachers to 0.38 sd in approaches to learning by parents in 1998. In addition, most of these associations—particularly the cognitive gradients—grow in 2010. Relative to children whose parents have low expectations, children whose parents have the highest expectations for their children's attainment (graduate studies) perform much better in reading and math than in 1998 (relative gaps grow by 0.19 and 0.12 sd respectively). A similarly stronger association is noted for noncognitive skills assessed by teachers (though not for parents' assessments of their children's skills).

Do performance gaps vary based on which proxy measure of socioeconomic status is used?

Part of the challenge to making conclusive statements about trends in education gaps by social class is the existence of multiple valid proxies for measuring children's social class or socioeconomic status. Although researchers treat these proxies as equivalent, and even interchangeable, the lack of a comparison of results obtained using various indicators limits our capacity to extract major conclusions on social-class trends and their drivers, and hence hinders the plausibility and effectiveness of the policy recommendations that build on any specific indicator's findings.[19]

[19] Net of other methodological and instrumental differences that may exist across studies.

We thus conduct analyses using several of the main proxies employed to measure socioeconomic status. The purpose of these analyses is twofold. The first purpose is to test the sensitivity of the estimated relative gaps, and of trends in them, to changes in the measurement of this key predictor of education performance. (In other words, if all the indicators are reliable proxies of SES, gaps and trends obtained using the various metrics should be similar.) The second purpose is to increase the comparability of the results of studies addressing trends in education inequities that use various metrics of social class. This is an important issue; in addition to helping reconcile diverse results found in the literature, these analyses may reveal why patterns differ, and have significant policy implications.

As such, instead of the SES composite measure we use to estimate SES-based gaps in this report, we use three alternative indicators to run our regression analyses: mother's educational attainment, household income, and number of books the child has in the home. Unlike the SES composite measure, two of these measures offer the advantage of being directly comparable over time. Both mothers' educational attainment and number of books the child has are objective categories. (For income adjustments to ensure comparability over time are explained in the Appendix.)

We create five categories with these indicators, maintaining the structure of top quintile versus bottom quintile comparison of the tables and discussions reported above. For simplicity, tables 6 to 8 only show the results from two models: one without covariates (model 1, baseline estimates) and one with all covariates (model 4, fully adjusted estimates). We focus on the findings for the baseline relative gaps in 1998 and 2010 first (Figures C-E). The overall patterns found in the results suggest that all social-class gaps are statistically significant and sizable. However, the exact sizes of the gaps vary depending on the social-class indicator and the outcome being assessed. Also, the changes in the gaps over time vary depending on the indicator used to capture children's social class.

In addition to these general findings, we note some more detailed ones. For 1998, gaps by mother's educational attainment are the largest across all indicators (with the only exception of gaps in approaches to learning as assessed by teachers, which is slightly smaller than the gaps for household income and number of books the child has). Again, according to the 1998 data, these coefficients are as much as 2.3 times larger than those obtained using income or number of books in the home as the indicator of social class (for example, the relative gap in reading is 1.29 and 1.46 sd in math when mother's education is the SES proxy, compared with gaps of 0.58 and 0.69 sd in reading and in math when using income, or with gaps by number of books in the home of 0.74 or 0.97 sd).

It is also important to note that gaps by mother's educational attainment are very close to the ones obtained by SES, of which mother's education is one of the five components (20 percent larger than by-SES gaps in math, reading, and approaches to learning as assessed by parents; 20 percent smaller for the self-control relative score assessed by teachers, and essentially equal for the two remaining outcomes: parents' assessed self-control and teachers' assessed approaches to learning).

In terms of changes in the performance gaps over time (unadjusted), the findings vary depending on which indicator of social class are used, with mothers' education being the indicator associated with the largest gaps, and income showing gaps that are the most different from the SES

gaps.[20] Changes in the performance gaps in cognitive skills between 1998 and 2010 by SES and books are similar: an increase in the reading gap between children in the top and bottom social-class quintiles of 0.1 sd (0.09 sd if social-class is proxied with SES, 0.08 sd if it is proxied with books), and no change in mathematics (there are some differences in the noncognitive outcomes). However, by mothers' educational attainment, there are no changes in relative reading and approaches to learning gaps reported by parents over time, and a significant reduction in the gaps in the remaining outcomes. Meanwhile, income-based gaps for the two cognitive skills—reading and math—increased by 0.39 sd, and for the two noncognitive skills reported by teachers—self-control and approaches to learning—increased by 0.31 sd and 0.20 sd respectively.

What can we learn from these analyses?

The multiple factors and relationships examined in this section can now be examined from a policy perspective. If the aim is to increase equity, to improve children's development across the board, and to improve our understanding of children's development, there are two major policy recommendations:

1) Directly support less-resourced families so that they have greater access to educational resources and to economic resources (for the latter, see the "Conclusions" section). All the early educational and playing activities, which include center-based pre-K care, literacy/reading activities, and other activities, and the early educational indicator of total number of books a child has, are positively associated with children's readiness, and in part account for social-class gaps, but are much less accessible to children of lower socioeconomic status. Virtually all of the associations between these factors and outcomes were strong and positive (with a handful of exceptions), and some even grew over time. Of particular interest would be to examine whether the intensity of these activities or practices has any turning point (after which they are no longer impacting children's development).[21] Also, it would be informative to understand why parental expectations of their children's educational attainment increased so much over time and how this has directly (and/or indirectly) affected children's development (for example, are children performing better because their parents expect more, or are they performing better because parents who expect more are also delivering more in the form of activities that influence children's development?).

2) Indirectly support less-resourced children by promoting and implementing interventions and practices that compensate for their lack of access to educational resources (and economic resources, when necessary). Promising initiatives across the country can constitute a valid starting point for expanding practical strategies. The next section of this report presents the results of an analysis based on qualitative data on promising initiatives in 12 school districts across the country (Weiss 2016a-h).

[20] Further research is in progress to understand these disparate trends and to make conclusions of them.

[21] With certain activities that are already so provided to high-SES children, there may be little room for doing more for them. For example, there are only 24 hours per day to read to your child, so there is a cap on reading from a cap on time. But perhaps there is still room to improve the influence of reading, if, for example, the way reading is done changes.

4. What are pioneering school districts doing to combat these inequities and resulting gaps?

This section of the report draws on a set of case studies published by the Broader, Bolder Approach to Education (BBA), a national campaign that advances evidence-based strategies to mitigate the impacts of poverty-related disadvantages on teaching and learning.[22] The case studies feature school districts that have employed comprehensive educational strategies to ensure that more children, especially low-income children have strong early academic and life foundations, and that early gains are sustained and built on through children's K–12 years. (These strategies are often referred to as "whole-child" approaches to education, in reflection of their holistic nature.) We assert, and explore the premise, that school districts that take a whole-child approach to education and a whole-community approach to delivering it are likely to enjoy larger gains in academic achievement and narrower race- and income-based achievement gaps. In doing so, we are building on evidence suggesting that consistent, strong supports for children and their families both in and out of school can avoid the "fade-out" seen among graduates of many pre-K programs and even enhance their early benefits.

This discussion is thus divided into four parts: how the case study districts invest in early childhood care and education; how the schools districts invest in K–12 strategies that sustain and boost early childhood investments; how academic gains and narrowing achievement gaps indicate that the investments are paying off; and, finally, implications—strategies that other districts can use and local and state policy changes that can support those strategies. **Table 9** provides information on key characteristics of the 12 school districts/communities studied.[23]

Table 9: Key characteristics of 12 school districts with a whole-child approach to education

District,[1] (type/name of whole-child strategy(ies)	Size: # of students, schools in district	Type: rural/ suburban/ urban	Poverty/FRPL[2] English Learner Special Ed	Racial/ethnic breakdown	Whole district strategy?[3]
Austin, TX* (parent organizing, social and emotional learning, community schools)	84,000 130 schools	Urban	60% FRPL 28% ELL 10.6% Special Ed	58% Hispanic 27% White 8% Black 7% Other	No (in process)
Berea, KY* (Partners for Education, Promise Neighborhood)	35,318 22 schools (4 counties)	Rural	80% FRPL[4]	97% white	Yes (more intensive in some)
Boston, MA* (City Connects)	56,000 125 schools	Urban	70% low-income 30% ELL 20% Special Ed	42% Hispanic 35% white 14% Black 9 % Asian	No

[22] Eight of the twelve districts explored in this paper have published studies. The other four are in progress and will be published later this year. As such, when citing information from the former, we reference them on the BBA website, www.boldapproach.org/casestudies/, except when citing data from a specific study. For the four that are not yet published, we refer to the original source being used in the study.

[23] Missing or incomplete cells indicate that data were not available on that aspect of student demographics or other characteristics. As per the source note, most data came either from the district website or NCES.

District,[2] (type/name of whole-child strategy(ies)	Size: # of students, schools in district	Type: rural/ suburban/ urban	Poverty/FRPL[3] English Learner Special Ed	Racial/ethnic breakdown	Whole district strategy?[4]
Durham, NC* (East Durham Children's Initiative)	33,501 53 schools	Urban	66% FRPL	29% Hispanic 48% Black 18% white 2% Asian	No (one section of city)
Joplin, MO * ***(***Bright Futures)	7,874 17 schools	Rural and suburban	61% FRPL 3% ELL 16% Special Ed		Yes
Kalamazoo, MI** (Communities In Schools, Promise)	12,216 25 schools	Urban and suburban	70%+ FRPL 7% ELL 12% Special Ed		Yes
Minneapolis, MN* (Promise Neighborhood/North Side Achievement Zone)	35,717 75 schools	Urban	63% FRPL 22% ELL 18% Special Ed	18% Hispanic 34% White 38% Black 6% Asian	No (one section of city)
Montgomery County, MD* (Linkages to Learning/community schools, pre-k, social & emotional learning)	159,000 204 schools	Urban, suburban, and rural	35% FRPL[5] 14% ELL 12% Special Ed	30% Hispanic 29% White 22% Black 14% Asian	Yes (in some aspects)
New York City* (Children's Aid Society Community Schools)	1.04 million 1,665 schools	Urban and suburban (across 5 boroughs)	77% FRPL 13 ELL 19% Special Ed	41% Hispanic 15% White 27% Black 16% Asian	No
Omaha, NE** (racial integration plan, early childhood education)	52,000	Urban (and suburban?)	74% FRPL 15% ELL	35% Hispanic 28% White 25% Black 6% Asian	Yes (some/ limited aspects)
Pea Ridge, AR* (Bright Futures USA)	850 6 schools	Small town/ rural			Yes
Vancouver, WA* (full-service community schools)	24,000 32 schools	Urban and suburban	50% FRPL 13% ELL 13% Special Ed		Yes

Source: National Center for Education Statistics District Directory Information, district websites, others
Note 1: * indicates published study, ** indicates study in progress
Note 2: School districts use the percentage of student eligible for free- and-reduced-price lunch (FRPL) as a proxy/measure for poverty. 185% or below qualifies for reduced-price, 100% or less for free meals
Note 3: For the majority of districts in which the strategies are not applied universally, the statistics refer to the district as a whole, rather than only the particular schools in which the initiative is active.
Note 4: Only limited statistics on student demographics were available for Knox County, the largest of the four served under the Promise Neighborhood grant.
Note 5: 43% of MCPS students have received subsidized meals at some point in their academic lives.

As the characteristics in the above table indicate, each of these whole-child district-level initiatives got its start and operates in different ways. Some employ community school strategies, which focus on partnerships at the core. Two that employ federal Promise Neighborhood grants work within the guidelines of that initiative. All began in one or a handful of schools and have since grown, some to encompass the entire district, while others, like City Connects and Children's Aid Society, operate in a minority of schools including some of their cities' highest-poverty schools. In Austin, Texas, the process has unfolded over two decades and involves three consecutive initiatives: parent organizing in so-called Alliance schools, embedding social and emotional learning in another set of schools (some of which are the same), and, most recently, the creation of a growing number of community schools. In Kalamazoo, a generous gift from an anonymous group of philanthropists of essentially unlimited college "Promise" scholarships for all high school graduates has spurred the community to offer a variety of support and enrichment activities that enable more students to leverage the Promise, leading to a more whole-child approach. As they have grown, these district-level initiatives have also generally evolved from loose coalitions to more formal ones, with the two Bright Futures districts studied a prime example: a three-part agenda that began as a district-level "turnaround" plan for Joplin, Missouri, has evolved into a national network of 50 district affiliates that continues to add new affiliates.

The sections below describe commonalities across these different approaches in terms of investments in children's earliest years (before school starts), their K-12 years (both in and out of school), and the gains students and schools enjoy as a result of those investments.

How the case study districts invest in early childhood care and education

In keeping with their whole-child approaches to education policy and practice, every one of the dozen districts highlighted as a BBA case study has made investments in early childhood care and education, many of them substantial. Moreover, these districts have begun before children enter school and looked beyond pre-K programs to equip parents in the effort to ensure their children's readiness for school.

One-on-one engagement with new parents

Investing in babies by engaging parents can include providing new parents with key information about child development and how to keep children healthy and safe. In Joplin, Missouri, Bright Futures Joplin partners with two of the area's hospitals to deliver new baby "kits" with child development and early literacy information and is trying to raise funds to sustain the project long term and to expand it to reach every new parent (Weiss 2016a). In Vancouver, Washington, 6000 "literacy packets" are delivered annually to families with children up to age 5, providing child-development activities and lessons that families can complete at home (Weiss 2016b).

The districts leverage partnerships to connect parents to a range of school and community resources that support children from birth through kindergarten entry. In Berea, Kentucky, the whole-child program called Partners for Education works with Community Early Childhood Councils to host events such as Week of the Young Child, the Dolly Parton Imagination Library, and Kindergarten Transition Programs (Weiss 2016c). In Montgomery County, Maryland, "Judy Centers," which are early child care and family education centers, leverage partnerships with social service agencies and local

community nonprofits to increase parents' access to mental health, nutrition, and other key services (MD State Department of Education).

Educating and engaging parents early on helps prepare children for school both academically and more broadly for healthy development. Those are the twin goals of the Minneapolis Northside Achievement Zone, where currently only one in four preschoolers in the zone is ready for kindergarten based on standardized tests (Weiss 2016d). To improve those odds, the zone has a team of "NAZ Navigators" who work with families to set and track progress toward goals in early childhood and to link this area of family support to goals in academics, housing, career and finance, and behavioral health as well.

Parenting classes

Parents are children's first and most important teachers. As is true of one-on-one strategies, classes for parents provide information on child development, early literacy, health, and constructive disciplinary practices, and offer more specific guidance tailored to specific parents' needs. Almost every district studied provides new-parent classes. 1-2-3 Grow and Learn is a weekly 90-minute literacy-rich program for young children and their parents offered at 12 elementary schools in high-poverty Vancouver neighborhoods. It lays the foundations for school readiness through social and education experiences. In addition, the district's Family and Community Resource Centers offer parent workshops, groups, and courses to help parents support their children's learning, while empowerment and skill-enhancement programs—such as job preparation, housing assistance, and parent leadership advisory groups,—strengthen parents' basic skills. Family Academy classes in the North Minneapolis Northside Achievement Zone include "Foundations" (to support parent empowerment) and "College Bound Babies" for children up to 3 years old that teach early literacy, numeracy, and positive discipline skills).

In many cases, districts employ a combination of one-on-one and group supports, along the lines of Early Head Start.[24] The East Durham Children's Initiative, a private program modeled loosely after the Harlem Children's Zone, includes Durham Connects, a home visiting program that supports zone families with children up to age 3, and is followed by weekly or biweekly in-home parent education and support provided by two nonprofit social service providers, Healthy Families Durham and/or Jumpstart (Weiss 2016e). In Montgomery County, Maryland, family social workers collaborate with classroom teachers to help them develop Family Partnership Agreements, which are based on the strengths, needs, and personal goals of each family. A social worker-led team follows up by phone and with visits. In two of the district's highest-poverty schools, these supports are complemented by early child care and family education centers, or Judy Centers, which provide comprehensive early childhood education and support to children from birth to age five and their families.

These districts understand that school improvement strategies grounded in family and community engagement are most effective. In keeping with that understanding, these school improvement strategies are also tailored to each community's unique needs and assets. Omaha, for

[24] The federal Early Head Start (EHS) program includes both a home visiting and a center-based component, with many of the low-income infants and toddlers served benefitting from a combination of the two. Studies of EHS find improved cognitive, behavioral, and emotional skills for children as well as enhanced parenting behaviors.

example, works toward complementary dual goals of closing achievement gaps by giving at-risk children a strong early start and enhancing the area's early childhood workforce. Early childhood efforts there are centered in two community learning centers in high-poverty neighborhoods, which provide quality early education and family engagement, while clinical sites act as observation and training settings for future early childhood teachers.[25]

Big investments in prekindergarten programs

Almost every state in the country now invests at least minimally in pre-K programs for disadvantaged children and a growing share make them widely available.[26] Most of the districts studied, however, have gone far beyond state programs through one or more strategies and funding mechanisms.

A few of these districts benefit from high-quality state pre-K programs that serve a large share of children, freeing them to invest in other aspects of early childhood enrichment. The Partners for Education initiative in Berea, Kentucky, can leverage the state program, which serves all 3- and 4-year olds who are either low income or have other risk factors. This enables Partners for Education to use Promise Neighborhood grant funds to place early childhood specialists in pre-K classrooms throughout the four-county region (the region is a Promise Neighborhood region, which means that federal funds are available for a variety of education- and health-related investments). The specialists also provide coaching, professional development, and support for Head Start classrooms, as well as in-home tutoring over the summer.

In East Durham, North Carolina, strong state early education programs are supplemented by partner-led low-cost half-day preschool and a summer kindergarten readiness program, and home visits by parent advocates provide a range of supports, such as connections to state pre-K. In Kalamazoo, Michigan, the Pre-Kindergarten Early Education Program (PEEP) offers half- or full-day pre-K classes in elementary schools for 4-year-olds at or below 250 percent of the federal poverty level, per state law, and adds transportation and meals. PEEP also works with other programs such as Head Start to provide families who are ineligible for PEEP with options for low- or no-cost quality early education.

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[25] In May 2013, the Nebraska Legislature unanimously passed a bill that increased property taxes by half a cent per $100 of assessed value to fund the Superintendents' birth-to-8 Early Childhood Plan. In the summer of 2013, the Early Childhood Partnership launched in North Omaha with eight preschool classrooms. The birth-to-8 model is supported by a partnership and pooling of resources among Metropolitan Community College, Educare, and Omaha Public Schools. And in November 2013, the Learning Community started trainings for community childcare providers in North Omaha. The Coordinating Council also voiced unanimous support for the Superintendents' Early Childhood Plan and used reserves to fund its first year.www.learningcommunityds.org/about/staff

[26] According to one important source for data on access to and quality of state pre-k programs, the State of Preschool Yearbook produced annually by the National Institute for Early Education Research (NIEER) at Rutgers University, as of 2015, the most recent year for which data are available, 42 states and the District of Columbia were funding 57 programs. Moreover, programs continued to recover from cuts during the big recession; enrollment, quality, and per-pupil spending were all up, on average, compared to the year before, albeit with the important caveat that two major states – Texas and Florida – lost ground, and that "(f)or the nation as a whole, … access to a high-quality preschool program remained highly unequal, and this situation is unlikely to change in the foreseeable future unless many more states follow the leaders." *State of Preschool Yearbook 2015*. NIEER. http://nieer.org/wp-content/uploads/2016/05/Executive_Summary_2015_rev1.pdf.

Other districts with less comprehensive state support use federal resources to expand local options. For example, Vancouver draws on both state and federally funded early learning programs to provide pre-K in seven schools, along with district-supported programs for children in Title I schools. As of fall 2015, Vancouver's new early learning center serves up to 100 additional children or more, with hot meals and playground space from an adjacent elementary school. Montgomery County also enhances state and federal programs with district-level investments: it provides the same literacy-rich curriculum in Head Start classrooms as in district pre-K. And Montgomery County uses a blend of federal Title I and Head Start dollars to offer full-day Head Start in 18 of the poorest schools, serving 460 children (Marietta 2010). The Northside Achievement Zone in North Minneapolis uses federal Race to the Top Early Learning Fund money for scholarships for 3- and 4-year-olds to attend high-quality pre-K, serving 127 children in 2012–13 and 156 in 2013–14.

Local programs can also fill in where state programs are weak. Austin, Texas uses local funds to provide enriching, hands-on full-day programs for the 4-year-olds who would otherwise participate in lower-quality half-day state programs. Austin also provides a half-day program for 3-year-olds who aren't served by the state. Families who qualify for both state pre-K and Head Start also receive nutrition, health, and other services (Austin Independent School District).

Pea Ridge is another community using local resources to supplant state resources. A lack of available seats for children who are eligible for the state's high-quality Arkansas Better Chance (ABC) pre-K program prompted Pea Ridge to seek a grant to open its own program, which serves 40 children: 20 at-risk children and 20 others whose parents can pay tuition (Weiss 2016f). Missouri's pre-K program also has too few slots, so Bright Futures Joplin is building a new early childhood learning center that will be funded jointly by the district and the state.

Strengthening the transition to kindergarten

Featured districts also build on pre-K gains and help narrow school readiness gaps with such programs as full-day kindergarten. Montgomery County Public Schools first started full-day kindergarten in "red zone schools," those deemed to be most affected by high rates of student poverty, in 2000. Full-day kindergarten has since expanded to every school in the district. And Vancouver offers Kindergarten Jump Start, a school readiness program, at all 21 elementary schools, and full-day kindergarten; both programs seek to enhance the transition from pre-K into formal schooling.

Other investments in young children and their families

In addition to the above range of supports for infants, toddlers, and preschoolers and their parents, several of the districts studied by BBA have made additional investments in young children and their families. The Community Storywalk in Clay County, Kentucky and the Born Learning Trail in Joplin, Missouri, provide opportunities for parents to learn with their children in a hands-on way through outdoor and physical activities. In Berea, Partners for Education's Promise Neighborhood grant supports work by national nonprofit Save the Children to improve the health and education outcomes of the region's children through a literacy program that provides kids ages 5–12 with books and tools to develop strong reading skills. The Promise Neighborhood grant also allows Berea to offer the Children's Healthy Choices program, which provides healthy snacks and 30 minutes of daily physical activity.

Joplin's Little Blue Bookshelves give age-appropriate books to those children whose families cannot afford them, making the goal of 1,000 hours of reading by kindergarten a viable reality for every child. And the city's Lend & Learn Libraries provide stimulating toys and socialization time for young children and their parents.

How the school districts invest in K-–12 strategies to sustain and boost their early childhood investments

The whole-child approaches these districts embrace for children from birth to five years old continue as children transition to kindergarten and through elementary, middle, and even high school. This represents a sharp difference from most other districts, where the emphasis in pre-K programs—on building strong teacher-student relationships and attending to the full range of children's assets and needs—tends to fall by the wayside, replaced by narrow academic factors and assessments. As these examples illustrate, children continue to benefit from a more comprehensive approach to education and there is an array of strategies school districts can use to deliver that comprehensive approach.

Enriching K-12 curriculum and activities to sustain pre-K's whole-child emphasis

A broad set of investments and activities can help sustain pre-K's whole-child approach, including enhancing classroom experiences, aligning classroom lessons with out-of-school activities that expand children's worldviews, and using targeted strategies to improve students' readiness for college, careers, and civic engagement.

Schools that ensure hands-on learning both in and out of the classroom make the most of this opportunity. Joplin and Pea Ridge students and their teachers enjoy service learning projects that are a core component of the Bright Futures strategy. These range from kindergartners organizing coat and canned food drives for their neighbors to high school students designing, implementing, and reporting on the health and safety of Joplin's water supply to the city's water management agency. In East Durham, partnerships enable clubs, field trips to museums, and other enrichment activities.

After-school and summer programs help students build on what they learned during the school year, broaden students' worldviews and skills, and reduce summer learning loss. In most of the districts studied, schools partner with organizations such as the YMCA, Boys and Girls Clubs, Boy Scouts, and Girl Scouts to provide out-of-school time enrichment programs that range from organized sports and help with homework to math and book clubs, theatre, and robotics. In addition to boosting student engagement, some focus in particular on academic and college preparatory help, and many also provide snacks or even full meals. Summer camps in Boston and East Durham and book deliveries and clubs in Pea Ridge and Berea—where online options help bridge long distances in rural areas—keep students reading, engaged, and on track for fall classes.

In several districts, the focus on nurturing not only students' academic skills but also their social and emotional skills strengthens the transition to and throughout the K-12 years. **V**ancouver's schools teach and model social and emotional learning in classrooms as part of the district's work to improve school climate and track student data on engagement and mental health. Under City Connects, the whole-child collaboration among Boston College, Boston Public Schools, and community agencies,

school coordinators meet at the start of the year with teachers to discuss the unique strengths and needs of every student and develop plans to support teachers with academic and enrichment activities and meet student needs with small-group sessions on healthy eating and dealing with bullies, referrals to mental health providers, and a range of other supports (Weiss 2016g).

Two districts have made social and emotional learning a particularly high priority. Austin is one of eight districts working with the Collaborative for Academic, Social, and Emotional Learning (CASEL) to comprehensively embed social and emotional learning in teacher training, teacher standards, curricula, and metrics for assessing student and school progress. In Montgomery County, former Superintendent Joshua Starr drew on the Common Core's emphasis on problem-solving and critical thinking to lead the design of a new curriculum and classroom practices that nurture social and emotional skills. These are complemented by enhanced support for teachers to nurture social and emotional learning in daily classroom practice, by standards-based report cards that track key social and emotional skills, and by restorative justice policies that reengage students and build their soft skills instead of punishing them for infractions.

Several of the districts focus in particular on helping students, many of whom will be the first in their families to go to college—prepare for and make the transition to college. Strategies include middle-to-high school transition programs in Joplin and Vancouver and clubs and specialized courses that advance students' social and organizational skills in Vancouver and Montgomery County. In East Durham, three initiatives (Communities in Schools Durham, Student U, and Citizens in Schools) support youth who are preparing for graduation. They offer site-based mentoring from current undergraduates. Middle and high school students in the North Minneapolis Northside Achievement Zone receive similar assistance. And Vancouver's GRADS Teen Parent program helps teen parents stay in school, graduate, and be more effective parents. De-tracking, an intentional decision to not separate students who are achieving at different levels into different courses or classrooms, which is the norm in Austin and in some Montgomery County high schools, helps ensure that college preparatory classes serve students of all income levels rather than just wealthier, nonminority students.

College readiness is also a high priority for many Bright Futures districts. In Joplin, programs such as Operation College Bound enhance students' understanding of and access to postsecondary education, complementing initiatives that help them navigate transitions to higher education and other sensitive periods of their academic lives. And in Pea Ridge, specialized high schools such as the Manufacturing and Business Academy and Pea Ridge Academy provide targeted support for students who want to go straight to jobs and careers or need special academic supports.

Mentoring and tutoring to get and keep students engaged

In the case study districts, the whole-child approach includes understanding the critical importance of one-on-one relationships with caring adults who support children's academic and broader needs. Strategies can be as simple as the car and bus "buddies" who greet children in Pea Ridge each morning as they arrive at school, or as intensive as the volunteer "lunch buddies" who meet weekly with Joplin and Pea Ridge students to eat with them, talk about their days, and offer guidance. Northside Achievement Zone in North Minneapolis partners with Big Brothers Big Sisters to connect students with

mentors, and over 500 volunteer mentors in Vancouver, Washington support students in Family and Community Resource Centers.

These relationships are key to efforts in large urban districts and remote rural ones. The Children's Aid Society has a partnership with the New York City Department of Education to integrate a strong school curriculum with out-of-school enrichment programming, as well as child and family support services designed to remove barriers to students' learning (Weiss 2016h). Children's Aid community schools offer both tutoring and mentoring among their afterschool options, as do Boston's City Connects schools. In Berea, the long distances between one school and community and another led to the use of Skype for mentors to connect with eighth- and ninth-graders in Promise Neighborhood area schools.

Supports for student health and family wellness as a tool for sustaining early gains

Several of the districts studied have established health clinics in some or all of their schools, including Montgomery County, Vancouver, and New York City. In some other districts, such as Austin's, school coordinators can arrange for mobile clinics to come to schools. These clinics provide basic preventive care through immunizations and check-ups, along with prescriptions and other care for sick children, physical and mental health screenings, follow-up counseling, mental health care, and even crisis intervention when needed.

Nutrition is another critical factor that affects physical and mental health and thus learning. In East Durham, Back Pack Buddies and summer lunch programs prevent hunger and keep kids nourished. Food and clothing pantries plus social media outreach in Pea Ridge and Joplin enable counselors and teachers to meet targeted immediate needs so students can focus and learn. Montgomery County has expanded its breakfast-in-the-classroom program to serve all students in a growing share of schools.

Many districts look beyond meeting students' basic health and nutrition needs to advancing their and their families' wellness and strengthening their ties to the community. Vancouver's GoReady! back-to-school festivals provide backpacks with school supplies, shoes and socks, immunizations and dental screenings, and even haircuts, plus resources from community partners**.** In Berea, physical and mental health supports provided through state-supported Family Resource and Youth Service Centers are complemented by school-community collaborative activities through a run/walk club, a summer fitness program, a Jump Start program, and gardening and food preservation activities. And the East Durham Children's Initiative runs a Healthy Living Initiative which refers families to nutrition counseling programs, Zumba classes, cooking demonstrations, and walking groups, as well as partnering with local farmers markets and distributing children's bicycles.

Though research has long affirmed the importance of parental engagement, many schools struggle to meaningfully engage parents. The case study districts show how it can be done. In the rural regions around Berea, where physical distance makes engagement difficult, Partners for Education's Families and Schools Together project convenes parents, school staff, and local agency professionals to help parents build social networks.

In the North Minneapolis Northside Achievement Zone, a high-poverty heavily minority area, regular one-on-one meetings between parents and "connectors" – specialized social workers who grew

up in the area, are familiar with its challenges, and are a core component of the NAZ strategy – to conduct family needs assessments and provide referrals to relevant services, deeply engage parents in their children's schools. And full-service community schools such as those in Vancouver and New York City specialize in parent outreach and engagement. Community schools in these districts draw on parental input to shape school policies and practices, and provide parents with an opportunity to meet one another. For example, a "parents' coffee room" in a New York City school with a large Dominican population evolved from a mechanism for parents to hang out after student drop-off to parent-led workshops, parent-student collaborative plays, and more.

Other targeted supports provide added help for the most vulnerable students and their families. In Vancouver, for example, student advocates conduct home visits to parents of kindergartners and first-graders who are at risk of chronic absenteeism. In these visits the advocates emphasize the importance of attendance and brainstorm ways to reduce barriers to attendance. Complementary in-school efforts reward strong attendance. High-risk Montgomery County Public Schools students benefit from very different, but very effective, targeted support. Specifically, the districts' unique funding system redistributes money from wealthier schools to higher-poverty schools, enabling the latter to provide smaller classrooms, more individualized attention, and more specialists in English as a second language, special education, and other areas (Elmore, Thomas, and Clayton 2006).

How academic gains, including smaller achievement gaps, indicate that the investments are paying off

Providing children from birth through 12th grade and their families with targeted supports both within and outside of school has enabled these districts to make progress toward a range of goals. First, compared with peer districts, they tend to score higher on traditional measures of academic achievement such as test scores and graduation rates. Second and just as, if not more important, they have improved students' kindergarten readiness, engagement, and health and well-being, as well as getting them better prepared for college, careers, and civic engagement. Third, in contrast with the pattern in many districts with more narrowly academic goals to accrue gains heavily among better-off students, these districts are also narrowing race- and income-based achievement gaps, because while all students are gaining ground, those who started off behind tend to see the largest gains.

Establishing more expansive goals and implementing ways to track progress toward them also offers timely guidance, given that the Every Student Succeeds Act (ESSA) asks states, districts, and schools to do just that. These districts not only have set broader goals—they are demonstrating real progress toward achieving them. As such, many now serve as role models for other districts or entire regions, and a few are beginning to influence state policy as well.

Higher rates of kindergarten readiness predict school success

Some of the kindergarten readiness efforts described above have translated into improved readiness to learn and, thus, greater odds of success in kindergarten and throughout school. In Berea, East Durham, and Minneapolis, children who participated in early learning programs significantly increased their rates of kindergarten readiness across a range of metrics and developmental domains. A study of Montgomery County Public Schools found much larger gains in reading for children in the full-day Head Start program than for children in the half-day program, with full-day students more than

doubling their reading scores over the year, with especially pronounced gains for the most vulnerable students: Hispanics and English language learners (Marietta 2010).

Rising test scores and narrowing gaps in core academic subjects are an important sign of sustained early gains.

While only one of many indicators, rising test scores and narrowing gaps in core academic subjects are an important sign that schools in case study districts have sustained and enhanced early gains. Despite serving a higher percentage of low-income, black, Latino, and English language learner students than the district average, Austin's Alliance Schools saw substantial gains in scores on the Texas Assessment of Academic Skills, the state's main standardized test, in the three years after organizing began. Increases varied from four to 15-19 points, the latter in schools with the highest levels of parent engagement (Henderson 2010). Subsequent rollout of social and emotional learning in district schools (some of which were also Alliance schools), produced gains in the share of students deemed proficient on the State of Texas Assessment of Academic Readiness (STAAR, the next-generation state assessments) in the years following that rollout, with students in the first set of schools with social and emotional learning programs scoring higher on state math and reading exams than in later school cohorts. The small group of Minneapolis Northside Achievement Zone students who were tested increased their proficiency on the Minnesota Comprehensive Assessments (MCA) exam, with the share scored as proficient rising from 14 percent in 2012–2013 to 22 percent in 2013–2014.[27] Students who had enrolled in the Northside Achievement Zone in 2013 had larger gains than those who enrolled in 2014, and, overall the largest proficiency gains were among first- and second-graders, with the smallest gains in middle schools.

Despite serving a much poorer and socially and economically isolated student body than in state schools overall, Berea area schools have seen substantially higher increases in test scores: between 2012 and 2015, math test scores in the Promise Neighborhood region rose 7 percent compared with 4.4 percent across the state, and reading scores rose 7.3 percentage points, compared with 5.8 percentage points statewide.

Case study districts with more mature initiatives and those offering higher "doses" of whole-child interventions are producing particularly large academic gains. Students enrolled in City Connects elementary schools in Boston score significantly higher on tests of both academic and so-called noncognitive skills in elementary and secondary school, with the highest-risk students, such as English language learners, showing especially large gains. Scores of City Connects elementary school students on the Stanford Achievement Test version 9 increased between one-fourth and one-half a standard deviation greater than scores of non-City Connects peers. And graduates of City Connects secondary schools are more likely to attend one of Boston's three selective public high schools.

[27] While the cut score on any given assessment/test needed for a student to be considered "proficient" is an arbitrary one, and, in Minnesota and many other states, changes from year to year and from one assessment to another, these gains are a helpful indicator of program effectiveness, as they are comparable over the time period described.

An independent study of middle school students who participated in the after-school programs run by Children's Aid Society Community Schools in New York City had bigger gains in math and reading test scores than peers who did not participate. They also had higher relative increases in school attendance and in teacher-reported "motivation to learn." And while it did not make early childhood education investments a core component of its strategy, the Children's Aid Society's Zero-to-Five program, which connects the federal Early Head Start and Head Start programs, produced relative test score gains among participants. Specifically, a study found that participants outperformed their peers 97 percent of the time on third-, fourth-, and fifth-grade standardized tests in math and reading, demonstrating a major long-term positive effect (Kaspe and Lorenzo Kennedy 2014).

Summer reading scores can be an especially important indicator of sustainable academic achievement, since low-income students tend to lose substantial ground when they are out of school for the summer. Students who attended the North Minneapolis Northside Achievement Zone's extended learning summer programs increased their reading test scores between the end of one school year and the beginning of the next, a period when scores normally decrease. And an evaluation of students who attended the East Durham Children's Initiative's summer camp in the summer of 2014 found that they lost no ground in literacy over those months.

Better student attendance and engagement are also predictors of academic gains.

A 2009 study found that New York City Children's Aid Society's community schools had "far higher" attendance than peer schools, and that schools with health centers tended to have higher attendance than those without health centers (Clark 2009). Students attending City Connects high schools in Boston have significantly lower rates of chronic absenteeism than their peers (chronic absenteeism depresses achievement, particularly among low-income students) (BC Center for Optimized Student Support 2012). In Joplin, Missouri, attendance rates among high school students increased 3.7 percentage points, rising from 91.3 percent in 2008 to 95.0 percent in 2012; black and Hispanic students closed gaps with their white peers over that period. At the same time, reportable disciplinary incidents, which keep students out of school and are found to drive at-risk students to disengage, dropped by over 1,000, from 3,648 in 2008 to 2,376 in 2012.[28]

Every infant and toddler in East Durham whose family participated in the Healthy Families Durham home visiting program is up to date on immunizations, helping at-risk children in particular avoid missing school due to illness. In Pea Ridge, collaboration with one of the city's doctors enabled the district to provide physical exams for high school students who would otherwise go without them. This not only improved their health but enabled them to participate in the kinds of extracurricular sports activities that boost student engagement. And City Connects' practice of helping families draw on Medicaid coverage and of referring eligible students to insurance-eligible providers increases students' access to both physical and mental health care. Given extensive evidence linking reduced absenteeism

[28] Joplin statistics are from internal data produced for the superintendent at that time that are no longer available.

and improved physical and mental health to academic gains, these initiatives' records of boosting both attendance and health represent another pathway to student success.[29]

Increases in advanced coursework and completion of associated exams suggest improved college and career readiness.

Because most of the initiatives studied have been in place for less than ten years, and a few for five or fewer, there is less evidence of their impact on high school graduation and college enrollment. Nonetheless, the degree to which low-income and minority students in these districts perform better and have seen greater gains on these key indicators than their peers in comparable districts or across the state highlights the promise of comprehensive education approaches and in some instances, their capacity to sustain and even boost children's early gains.

Parent organizing in Austin helped establish a program to get more low-income and minority middle school students into rigorous science and math programs, enabling them to successfully compete for slots in the prestigious LBJ High School Science Academy. From 2007–08 to 2014–15, the number of Kalamazoo Public School students taking Advanced Placement (AP) courses more than doubled, with low-income and African-American students enjoying the largest gains; black and low-income students roughly quadrupled their participation in such courses; 263 black students and 193 low-income students took AP classes in 2014–15, up from 63 and 53 respectively in 2007–08 (Miller-Adams 2015). Over the same period, the number of Hispanic students taking AP courses increased from just 8 to 78. And in Vancouver, which also made socioeconomic diversity of students in advanced courses a priority, enrollment in AP courses rose by 67 percent overall from 2007 to 2013, and nearly three times as fast, by almost 200 percent, among low-income students.

Higher graduation rates and increasing college attendance of disadvantaged students are another measure of success of comprehensive strategies

In the early 2000s, the graduation rate at Austin's Reagan High School fell below 50 percent and enrollment dropped to just 600 students. By 2015, with the benefit of a community schools strategy, the school was serving more than 1,200 students and had a graduation rate of 85 percent.

In the first six years of Bright Futures, Joplin's graduation rate rose from 73 to 87 percent and by 13 percent between 2012 and 2015, versus just five percent across the state as a whole. At the same time, the cohort dropout rate fell from 6.4 percent to 2.8 percent, with the dropout rate for black students falling slightly more. And in Kalamazoo, incentives to finish high school have proven to be powerful tools for disadvantaged students when combined with mentoring, tutoring, and afterschool options. The district's graduation rate rose from 64 percent in 2009 to 69 percent in 2014, with "five-year cohort graduation rates consistently higher than four-year rates, suggesting that some students

[29] Attendance Works, a national campaign to reduce chronic absence, provides a range of studies that document and explain the connections between chronic absenteeism, student physical and mental health, and student achievement. Areas of research include elementary school absenteeism, middle and high school absenteeism, health issues, and state and local data on how these problems play out, among others. http://www.attendanceworks.org/research/

may be opting to stay in school an extra year (or even just for the summer) to complete the credits necessary to get a high school diploma" (Miller-Adams 2015, p.67). Moreover, African-American girls in Kalamazoo graduate at higher rates than their peers across the state and 85 percent of them go to college.

Initiatives that have had time to mature have made particularly large gains. Montgomery County's Linkages-to-Learning initiative began in 1993, it substantially expanded its pre-k program around a decade later, and the county policy responsible for improved racial integration has been in place even longer. Hispanic, low-income, and African-American students in Montgomery County Public Schools are much more likely than their counterparts across the state to graduate from high school – 80 vs. 77.5 percent, 81 vs. 77.8 percent, and 86.4 versus 80.5 percent, respectively (MCPS Dept. of Public Information 2015). And from 2011 to 2014, a period when poverty and the share of students who were minorities rose, overall graduation rates rose 2.9 percent, with much larger gains for Hispanic and Black students, whose rates rose by 4.7 and 5.1 percentage points, thus narrowing their gaps with their white peers by 3.4 and 3.8 points. Participation in Boston's City Connects program, which began in 2001, cuts a student's odds of dropping out of high school nearly in half: 8 percent versus 15.2 percent for comparison students (BC Center for Optimized Student Supports 2014). In Vancouver, the four-year graduation rate rose from 64 percent in 2010 to almost 80 percent in 2013, and the five-year rate rose from 69 percent in 2010 to over 80 percent in 2013. And Vancouver's Hispanic students had five-year graduation rate gains of over 15 percent.

Strong parent and community engagement is another sign of progress.

The comprehensive, whole-child, whole-community approaches in the featured school districts have built strong school-community partnerships. Two indicators of the strength of the partnerships are the levels of parent and community engagement. In Joplin, 194 more adults are now serving as mentors and tutors than five years ago. And the American Association of School Administrators, National School Public Relations Association, and Blackboard Connected selected Vancouver Public Schools Superintendent Steve Webb and Chief of Staff Tom Hagley for their 2011 Leadership through Communication Award for their efforts to increase family engagement in high-poverty VPS schools.

Parent engagement boosts student achievement both directly and through other improvements to families' situations. As they work actively with their connectors, **Northside Achievement Zone** parents in north Minneapolis become more likely to make academics a priority and engage with their children's schools, and to be focused on sending their children to college. The support also helps more families connect with stable housing, and this substantially reduces the number of times that some vulnerable families move. In 2014–2015, up to 300 Austin families benefited from help with legal, employment, health, and housing issues at the family resource center, which also provides classes for parents, including English as a second language. And Montgomery County Public Schools social workers who specialize in early childhood education make an average of 200 home visits, 1,000 phone contacts, and 300 direct contacts with parents at school or conferences each month. These lead to roughly 1,000 monthly referrals to community services—many of them emergency interventions dealing with food, clothing, and housing—that help families meet their children's basic needs and, thus, support their children's education (Marietta 2010).

In some cases, engagement enhances school leadership. Through access to supports such as social services and adult education, parents of students in New York's Children's Aid Society community schools got more involved in their children's schools, took more responsibility for their children's school work, reported feeling more welcome within the schools, and were observed to be a greater presence in the community schools than in comparison schools. And over 2,000 Kentucky parents have undergone training at the Berea Commonwealth Institute for Parent Leadership since its creation in 1997. Many of these parents have gone on to join school boards, serve on school counsels, and engage in day-to-day educational advocacy.

Expansion of these initiatives shows that other districts, states, consider them successful

After City Connects succeeded in improving student achievement in over a dozen of Boston's highest-poverty schools, the initiative caught the attention of state policymakers, who recruited City Connects to help turn around schools in Springfield, another large state district. Aided by federal School Improvement Grant funds, City Connects has operated in Springfield since 2010, expanding from six to 13 schools in its first four years there. In New York City, the Children's Aid Society played a central role in Mayor Bill de Blasio's decision to employ a community schools strategy to turn around 100 of the city's most struggling schools. And in both Vancouver and Austin, district leaders have led advocacy efforts to bring community schools to other communities in the region and to support the introduction of state-level legislation to enhance the work.

Bright Futures began in Joplin, Missouri in 2009 but is now a national organizations, Bright Futures USA, with 50 affiliates in eight states, many of which—such as Pea Ridge—are just two or three years old. The newest affiliate, in Fairbanks, Alaska, is just getting underway. In Virginia, Dave Sovine, superintendent of another second-year affiliate, Frederick County, is reaching out to several of his counterparts across the region to create the first regional Bright Futures initiative. If established, this would allow for the kind of cross-district collaboration identified by Bright Futures founder CJ Huff as critical to breaking down the silos created by arbitrary boundaries that reflect political preferences rather than children's daily realities.

5. Conclusions

Summary

As this report demonstrates, very large social-class based gaps in academic performance exist and have persisted across the two most recent cohorts of students starting kindergarten. The estimated gap between children in the top fifth and bottom fifth of the SES distribution is over a standard deviation in both reading and math in 2010 (unadjusted performance gaps are 1.17 and 1.25 sd respectively). Gaps in non-cognitive skills such as self-control and approaches to learning, which are critical not only as foundations for academic achievement but, more broadly for children's healthy development, are about half as large (about 0.4 sd in self-control, and slightly over 0.5 sd in approaches to learning in 2010).

Another important finding from our study is that gaps were not sensitive to the set of changes that may have occurred between 1998 and 2010, on average: gaps across both types of skills are

virtually unchanged compared to the prior generation of students – those who entered school in 1998. The only gap that changed substantially was in reading skills, which increased by about a tenth of a standard deviation; The gaps by SES in mathematics and in approaches to learning as reported by parents and self-control by teachers did not change significantly, and relative gaps in approaches to learning by teachers and in self-control by parents shrank between 1998 and 2010.

We also find that taking into account children's personal and family characteristics, parental activities, and other factors reduces the gaps somewhat but does not come close to eliminating them, leaving a sort of "high-SES mark-up" visible. Moreover, the capacity for these other factors to narrow gaps has decreased over time. This suggests that, while such activities as parental time spent with children and center-based pre-k programs cushion the negative consequences of growing up poor and low SES children, they can do only so much, and that the overall toxicity of lacking resources and supports is increasingly hard to compensate for.

These troubling trends point to critical implications for policy and for our society: clearly, we are failing to provide the foundational experiences and opportunities that all children need to succeed in school and thrive in life. The lack of change in gaps between 1998 and 2010 suggests, too, that investments in pre-k programs and other early education and economic supports were insufficient to counter rapidly rising rates of poverty and its increasing concentration in neighborhoods where black and brown children tend to live and learn.

But there is also good news. The final section of our report explores district-level strategies to address these gaps, which are being implemented in diverse communities across the country. The most effective ones begin very early in children's lives and are sustained throughout their K-12 years and beyond. The communities studied all employ comprehensive educational approaches that align enriching school strategies with a range of supports for children and their families. Their implementation is often guided by holistic data, and, to the extent possible, this report provides a summary, as well, of student outcomes, both traditional academic measures and a broad range of others.

Good news: parents are doing what they need to – and bad news: but the rest of us are not

Over the period studied, parents across all social class groups became more involved in their young children's lives, with increases especially pronounced among low-SES parents. They were more likely in 2010 than in 1998 to read regularly to their infants, toddlers, and preschoolers, to sing to them, play games with them, and enroll them in center-based pre-k programs. They also have significantly higher expectations for their children's educational attainment, and mothers themselves are more highly educated, both of which are in turn associated with higher achievement for those children. In other words, parents are more aware of the importance of these early years and doing more of what the brain science indicates they need to, which also suggests that the information about those years is more widely disseminated than it was for the prior cohort we studied.

And as the case studies indicate, the number of communities that have embraced system of comprehensive enrichment and supports (Broader, Bolder Approaches to Education) is growing.

However, despite the abundance of information about child development available to researchers and parents, about the serious impacts of child poverty and about what works to counter it and the importance of the first years of life for children, or about the value of education, our data indicate insufficient policy response. Pre-k programs have expanded incrementally and unevenly, with both access and quality still wildly disparate across states and overall availability severely insufficient. There is a dearth of home visiting programs and of quality child care (Bivens et al. 2016). Child poverty has increased (see Proctor et al. 2016 for recent trends in child poverty rates). And the schools into which these children enter face increasing economic and racial segregation but even fewer resources than in 1998 to deal with them (Carnoy and Garcia 2017; Adamson and Darling-Hammond 2012; Baker and Corcoran 2012).

In sum, it is positive, and somewhat impressive, that gaps by and large did not grow in the face of steadily increasing income inequality, compounded by the worst economic crisis in many decades (EPI 2012; EPI 2013; Saez 2017). But as Putnam (2015) warns, saving the American Dream requires ensuring not just opportunity but mobility. We cannot ensure real opportunities for all our children unless we tackle the severe inequities underlying our findings. And while momentum to enact comprehensive and sustained strategies to close gaps is growing, they are not gaining steam nearly as quickly as children need them to.

Next policy steps

These data on large, stubborn gaps across both traditional cognitive and noncognitive skills should guide the design of policies at the federal, state, and local levels, which will all be needed if we are to tackle them effectively.

Policymakers can begin by learning from the small-scale/district-level strategies presented in section 4. First, what are the key strategies, and how did communities effectively enact and implement them? What were they challenges they faced, what was needed to overcome them, and how can we shape policies that better support other communities' abilities to adapt them? The latter questions are particularly pertinent to issues of scalability, financing, and sustainability, all of which have posed big challenges for the districts studied and others like them. Second, what other sources or examples might we learn from? Obvious ones include other community school districts – like Vancouver, New York City, and Austin – and Promise Neighborhood initiatives beyond Berea and the Northside Achievement Zone. Bright Futures affiliates now exist in fifty districts across eight states and growing, offering another set of communities to look to.

New opportunities under the Every Student Succeeds Act (ESSA), from funding to expand and align early childhood education programs to broader and more supports-based educator and school accountability systems, provide another avenue for exploration and educational improvement. (This is already the focus of states and districts across the country, and of education policy non-profits and associations, so we do not go into more detail in this report.)

We must take action, in particular, in those areas of policy in which we have seen little or no progress over the past decade. These include child care – comprehensive supports that engage parents as partners in their children's education must start early and be of high quality to avoid the emergence

of gaps and provide time to close those that do emerge. Quality preschool, among the most agreed-upon strategies to avert and narrow early gaps, continues to be much talked about but far too little invested in and implemented. Though this argument has been stated for decades, it is discouraging that despite significant progress made in preschool enrollment in the last 50 years, enrollment stagnated soon after 2000 (U.S. Department of Education 2015; Barnet et al. 2017), and that there are significant inequities in access (see Table 1; Garcia 2015). Enough already. And these whole-child oriented supports must be sustained through children's K-12 years, with attention to issues of funding levels and equity, racial and socioeconomic integration, and enriching opportunities in the hours after school and summer months.

Finally, we must focus on non-education public policy areas that we have long known, and that these findings affirm, drive opportunity and achievement gaps (see conclusions in Garcia 2015). While strategies to compensate for the effects of low resources and inequality are important they are, at best, a much-less-than-optimal strategy, with boosting income and poverty reduction the most effective. And evidence shows that there are many viable and effective ways to do so. These include increasing wages and employment opportunities (EPI 2016). Economic growth that is spread more broadly across the income distribution will both reduce poverty and increase absolute mobility (Chetty et al. 2016, EPI 2016). We can also raise wages by increasing the earned income tax credit (EITC) and child tax credit. And research demonstrates that such strategies are effective: for children living in the lowest-income households, increasing their parents' incomes to above the federal poverty line during their first formative years had lasting educational and other benefits (Duncan, Magnuson, and Votruba-Drzal 2014).

Closing education gaps also calls for policies that address other structural factors that influence a child's odds of growing up poor. For example, children who are poor are disproportionately growing up in single-parent households—and black kindergartners are three times as likely to live in such households as are white kindergartners. While the factors that contribute to living with fewer than two parents are many, research has shown that boosting low-income workers' wages will bring many men who are currently not eligible or able to marry into the eligible pool (Carbone and Cahn 2014). A high proportion of young, poor, black men are excluded from that pool because they are in prison or the correctional system, so reforming correction systems to put fewer non-violent criminals behind bars would also help close achievement gaps (Gudrais 2013; Rothstein et al 2016; The Sentencing Project 2013). Similarly, reforming immigration policies would bring stability to a large and growing share of American families and improve their employability and access to basic supports, in turn improving their children's odds of success at school.

DATA APPENDIX

Introduction

We benefit from the existence of two companion studies conducted by the National Center for Education Statistics, the Early Childhood Longitudinal Study of the Kindergarten classes of 1998–1999 and 2010–2011 (hereafter, ECLS-K 1998–1999 NCES and ECLS-K 2010–2011 NCES). These data from these studies come with multiple advantages and a few disadvantages. On the one hand, the studies follow two nationally representative samples of children starting in their kindergarten year, through their elementary school years. The tracking of students over time is one of the most valuable features of the data. The studies include assessments of the children's cognitive performance and knowledge as well as skills that belong in the category of noncognitive or socioemotional skills. The studies also included interviews with parents, and information on teachers and schools, completed by teachers and administrators.

Another valuable feature of the data is the availability of two ECLS-K studies (ECLS-K: 1998–99 and ECLS-K: 2010–2011), which would allow for cross-comparisons "of two nationally representative kindergarten classes experiencing different policy, educational, and demographic environments" (Tourangeau et al. 2013). The two studies are 12 years apart, or a full-school cycle apart: when the 2010–2011 kindergarten class was starting school, the 1998–1999 class was graduating. A comparison of the studies thus offers insightful information about the consequences of changes in the system that may have occurred during an entire cohort's school life. For the 2010 study,[30] 18,174 children studied were enrolled in 968 schools. For the 1998 study, 21,409 children in 903 schools were tested.[31]

On the other hand, this existence of data from two cohorts is also a limitation to the current study, as explained by Tourangeau et al. 2013, who note that the assessment scores for the 2010–2011 class are not directly comparable with those developed for the class of 1998–1999. Although the IRT (Item Response Theory) procedures used in the analysis of data were similar across the two studies, each of them incorporated different items, which made that the resulting scales are different. Tourangeau et al. (2013) state that "a subsequent release of the ECLS-K: 2010–2011 data will include IRT scores that are comparable with the ECLS-K cohort." Up to the point of publication of the current study, this information had not been yet released, and we use standardized scores, instead of raw scores, for the outcomes examined. We can assess changes in the relative position in a distribution (i.e., how far high- and low-SES children are in 1998 and how far high- and low-SES children are in 2010), but not overall

[30] The sample design used to select the individuals in the study was a three-stage process that involved using primary sampling units and schools with probabilities proportional to the number of children and the selection of a fixed number of children per school. In the last stage, children enrolled in kindergarten or ungraded schools were selected within each sampled school. A clustered design was used to limit the number of geographic areas and minimize schools and costs (Tourangeau et al. 2013, 4–1).

[31] The dataset in the first year followed a stratified design structure (Ready 2010, 274), in which the primary sampling units were geographic areas consisting of counties or groups of counties. About 1,000 schools were selected, and about 24 children per school were surveyed. Assessment of the children was evaluated by trained evaluators, while parents were surveyed over the telephone. Regarding teachers and school administrators, they completed the questionnaires in their schools.

changes in their performance (i.e., it is not possible to ascertain whether performance has increased overall, or if gaps are smaller or larger due to an improvement in performance of children at the bottom of the distribution or due to a decrease in the performance of children at the top of the distribution, etc.). A full comparison remains to be produced, upon data availability.

We use data for the first wave of each study, corresponding to fall kindergarten (or school entry).

Outcomes

For the analyses, we use the by-year standardized scores corresponding to the fall semester (1998 scores and assessments are standardized using the 1998's distribution, and its mean and sd; for 2010, we use the mean and sd of the 2010 distribution).

Cognitive skills

These cognitive skills are assessed with instruments that measure the child's:

Reading skills: print familiarity, letter recognition, beginning and ending sounds, rhyming words, word recognition, vocabulary knowledge, and reading comprehension.

Math skills: conceptual knowledge, procedural knowledge, and problem-solving; number sense, properties, and operations; measurement; geometry and spatial sense; data analysis, statistics, and probability; and patterns, algebra, and functions.

Principal noncognitive skills

We use the term "principal" to identify a set of noncognitive skills that are measured by both the ECLS-K 1998–1999 and 2010–2011 surveys, and that have been relatively extensively used in research.

Teachers are asked to assess the child's:

Self-control: ability to control behavior by respecting the property rights of others, controlling temper, accepting peer ideas for group activities, and responding appropriately to pressure from peers.

Approaches to learning: organizational skills (keeps belongings organized); curiosity (is eager to learn new things); independence (works independently); adaptability (easily adapts to changes in routine); persistence in completing tasks; focus (ability to pay attention); and ability to follow classroom rules.

Parents are asked to assess the child's:

Self-control: ability to control behavior by refraining from fighting, arguing, throwing tantrums, and getting angry.

Approaches to learning: persistence (keeps working at something until finished); curiosity (shows interest in a variety of things); focus (concentrates on a task and ignores distractions); helpfulness (helps with chores); intellectual curiosity (is eager to learn new things); and creativity (in work and play).

Covariates

Appendix Table 1: Comparing covariates in ECLS-K 1998-1999 and 2010-2011

ECLS-K 1998-1999	ECLS-K 2010-2011
• Socioeconomic status (SES). The SES is a composite variable reflecting the socioeconomic status of the household at the time of data collection. SES was created using components such as father/male guardian's education and occupation; mother/female guardian's education and occupation; and household income (see Manual, p. 7-23 to 7-30). We use 5 SES the quintiles dummies that are available. We use the following labels in the tables and figures: "Low SES" indicates the first or bottom socioeconomic quintile, "Middle-low SES" indicates the second-lowest quintile, "Middle SES" is the third quintile, "High-middle SES" indicates the fourth quintile, and "High SES" represents the top or fifth quintile. • Child living in poverty. Whether a household lives in poverty is obtained from a household-level poverty variable. Household's income was compared to census poverty thresholds for 2006 (which vary by household size) and the household is in poverty if income is below the poverty threshold determined by the U.S. Census Bureau poverty threshold (Tourangeau et al. 2009, Manual page 7-24 and 7.25). • Gender. Variable indicating whether the student is a girl or a boy. • Race/ethnicity. Variable indicating the race/ethnicity of the student-whether the child is white, black, Hispanic, Asian, or other ethnicities. Hispanic children are divided into two groups, those whose families speak English at home and those whose families do not. This decomposition is first described and utilized by Nores and Barnett (2014) and Nores and García (2014). • Age of student. Age of the student calculated in months when month and year of birth. • Language at home is not English. Variable indicating whether the student's language at home is different from English (yes (1), no (0)). This variable proxies immigration origin of the families, incorporating one important factor such as the knowledge of the language that is important for the purposes of academic performance.	• Socioeconomic status (SES). The construct is based on three different components (five total variables), including the educational attainment of parents or guardians, occupational prestige (determined by a score), and household income (see more details in Tourangeau et al. 2013, 7-56 to 7-60). We use the quintile indicators based on the continuous SES variable (we construct them). • Child living in poverty. Whether a household lives in poverty is obtained from a household-level poverty variable. This variable indicates whether the household income is below 200 percent of the U.S. Census Bureau poverty threshold. More details are provided in Tourangeau et al. (2013), see pages 7-53 and 7-54. • Gender. There is a dummy indicator representing whether the child is a boy or a girl. • Race/ethnicity. Our analysis includes dummy indicators of whether the race/ethnicity of the child is white, black, Hispanic, Asian, or other. Hispanic children are divided into two groups, those whose families speak English at home and those whose families do not. Age is expressed in months. • Age of student. Age of the student calculated in months. • Language spoken at home. Our analysis includes a dummy indicator of whether the language spoken in the child's home is not English (we call a child in this setting an English language learner, or ELL), versus whether the language spoken at home is English or two languages are spoken at home. • Disability. There is a dummy indicator of whether the child has been diagnosed with some disability. • Family size. Variable measuring number of members in the household. • Type of family. This variable indicates whether the child lives with both parents, compared with living with one parent or in another family composition. • Prekindergarten care in a center-based setting. Our analysis includes a

- Disability. Variable indicating whether a child had a disability diagnosed by a professional (composite variable). Questions in the parents' interview about disabilities asked about the child's ability to pay attention and learn, overall activity level, overall behavior and relations to adults, overall emotional behavior such as anxiety or depression, ability to communicate, difficulty in hearing and understanding speech, and eyesight (yes (1), no (0)) (Manual, p.7-17).
- Family size (name in analysis: famsize; variable type: continuous). Variable measuring number of members in the household.
- Type of family. Variables indicating whether the child is living with two parents, or with one parent or other family structure.
- Prekindergarten care in a center-based setting. Dummy indicator of whether the child was cared for in a center-based setting or attended Head Start during the year prior to the kindergarten year, compared with other options. These alternatives include no nonparental care arrangements and care provided through other means (by a relative or a nonrelative, at home or outside the home, or a combination of options).
- "Literacy/reading activities" index. This is an index that captures the variance on a wide set of family early literacy practices. This procedure overcomes potential problems of multicolinearity and therefore improves the properties of our specifications. (This has an alpha of 0.6716). In particular, parents are asked the frequency ("not at all," "once or twice a week," "three to six times a week," and "every day") with which they engage with the child in the following activities: reading books; telling stories; singing songs; and talking about nature or doing science projects. Parents are also asked how often the child reads picture books outside of school, and reads to or pretends to read to himself or to others outside of school.
- "Other activities" index. Parents are asked the frequency ("not at all," "once or twice a week," "three to six times a week," and "every day") with which they engage with the child in the following activities: playing games or doing puzzles; doing sports; building something or playing with construction toys; or doing arts and crafts; or doing

dummy indicator of whether the child was cared for in a center-based setting during the year prior to the kindergarten year, compared with other options. These alternatives include no nonparental care arrangements and care provided through other means (by a relative or a nonrelative, at home or outside the home, or a combination of options). Any finding associated with this variable may be interpreted as the association between attending prekindergarten (pre-K) programs, compared with other options, but interpreted with caution. These coefficients should not be interpreted as the impact of pre-K schooling because the variable's information is limited and the model uses it as a control-only variable. For the extensive literature explaining the benefits of pre-K schooling, see Camilli et al. (2010).

- "Literacy/reading activities" index. This is an index that captures the variance on a wide set of family early literacy practices. This procedure overcomes potential problems of multicolinearity and therefore improves the properties of our specifications. (This has an alpha of 0.6948). In particular, parents are asked the frequency ("not at all," "once or twice a week," "three to six times a week," and "every day") with which they engage with the child in the following activities: reading books; telling stories; singing songs; and talking about nature or doing science projects. Parents are also asked how often the child reads picture books outside of school, and reads to or pretends to read to himself or to others outside of school.
- "Other activities" index. Parents are asked the frequency ("not at all," "once or twice a week," "three to six times a week," and "every day") with which they engage with the child in the following activities: playing games or doing puzzles; doing sports; building something or playing with construction toys; or doing arts and crafts; or doing science projects. (This has an alpha of 0.5527)
- Mother's educational attainment. Coded as "Below high-school (8th-12th grades); High-school graduate or equivalent; Vocational/technical program/some college; Bachelor's degree/Graduate or professional school with no degree; and Graduate (Master's, doctorate or professional degree)"

science projects. (This has an alpha of 0.5972) • Mother's educational attainment: Coded as "Below high-school (8th-12th grades); High-school graduate or equivalent; Vocational/technical program/some college; Bachelor's degree/Graduate or professional school with no degree; and Graduate (Master's, doctorate or professional degree)" • Income • Parents' education expectations: coded as "HS or less; 2 or more years of college; BA; MA; PHD or MD". Parents are asked how far in school do you expect your child to go? Would you say you expect {him/her} to {level}. • Number of books at home: continuous variable (0-200) and categorical variable coded as "0 to 25; 26 to 50; 51 to 100; 101 to 199; More than 200". For the regression analysis, the variable is divided by ten.	• Income • Parents' education expectations: coded as ""HS or less; 2 or more years of college/attend a vocational or technical school;[32] BA; MA; PHD or MD" • Number of books at home: continuous variable (0-200) and categorical variable coded as "0 to 25; 26 to 50; 51 to 100; 101 to 199; More than 200". For the regression analysis, the variable is divided by ten.

[32] Only in 2010

Methodology

Gaps by socioeconomic status

The expressions below show the specifications used to estimate the socioeconomic status–based (SES-based) performance gaps. For any achievement outcome A, we estimate 4 models:

- Model 1 showsthe unadjusted (descriptive) differences for children belonging to different racial/ethnic groups or SES quintiles (the reference group is children in the lowest SES quintile, "low SES").
- Model 2 adjusts for school clustering of students in different schools (i.e., gaps of students in the same schools). The purpose of this clustering is to account for school segregation (i.e., concentration of children of the same race, social class, etc., in schools, which causes that the raw average performance of students differs from the adjusted by clustering average). It offers a comparison of the gaps shown by peer students, in the same schools and classrooms (Garcia 2015; and Magnuson and Duncan 2016 offer these estimates too).

These estimates build on all the available observations (i.e., only those children who have missing values in the outcome variables are eliminated from the analysis).

Because of lack of response in some of the covariates used as predictors of performance, we construct a common sample with observations with no missing information in any of the variables of interest (see information about missing data for each variable in Appendix Table 2). We estimate two more models:

- Model 3 equals Model 2's specification but uses the restricted sample.
- Finally, Model 4 shows the fully adjusted differences (adjusted for child and family characteristics, prekindergarten care arrangements, early literacy practices at home, number of books the child has, and hours watching TV)

The equation below shows the equation we estimate for models 1 to 4.

$$A_{i,s}^{c,nc} = \delta_o + \delta_1 SES2_{i,s} + \delta_2 SES3_{i,s} + \delta_3 SES4_{i,s} + \delta_4 SES5_{i,s} + \delta_5 Year2010_{i,s} + \delta_6 Year2010xSES2_{i,s} + \delta_7 Year2010xSES3_{i,s} + \delta_7 Year2010xSES4_{i,s} + \delta_8 Year2010xSES5_{i,s} + Controls + \propto_s + \varepsilon_{i,s}$$

The main parameters of interest are: $\delta_4, \text{and } \delta_8$: They show the performance of low-SES children in 1998, the gap between high- and low-SES children in 1998, the change in the scores of low-SES children in 2010 relative to 1998, and the change in the gap between high- and low-SES children in 2010 relative to 1998.

- The high-SES versus low-SES gap in 1998 equalsδ_4 (the coefficient of SES5). The high-SES versus low-SES gap in 2010 equals $\delta_4 + \delta_8$ (the coefficients of SES5 and Year2010xSES5). If δ_8 is positive and statistically significant, it means that the gap between high- and low-SES children increased during those years. Oppositely, if $\delta_8$is negative and statistically significant, it shows a reduction in the SES-gap.

Appendix Table 2: Missing data

		1998	2010
Variable		**%Missing**	**%Missing**
Race/Ethnicity	White	0.2	0.5
	Black	0.2	0.5
	Hispanic	0.2	0.5
	Hispanic English-language learner (ELL)	6.6	11.8
	Hispanic English speaker	6.6	11.8
	Asian	0.2	0.5
	Others	0.2	0.5
Socioeconomic status	SES	5.9	11.9
Family composition	Not living with two parents	15.5	26.3
Mother's education		7.5	42.8
Pre-K care arrangements	Pre-K care center-based	16.8	17.4
Activities indices	Reading Activities (index)	15.6	26.4
	Other Activities (index)	15.6	26.5
Parents' expectations about their children's educational attainment		16.1	26.5
Total number of books	Number of books (0-200 or more)	16.3	26.7
Outcomes	Reading	17.7	13.8
	Math	13	14.2
	Self-control (by teachers)	13.8	25.4
	Approaches to learning (by teachers)	10.4	18.7
	Self-control (by parents)	15.8	27.3
	Approaches to learning (by parents)	15.8	27.3

Note: ELL stands for English-language learner.
Source: EPI analysis of ECLS-K, Kindergarten Class of 2010–2011 (National Center for Education Statistics)

Table 1 Child and family characteristics, main developmental activities, and parental expectations of the kindergarten classes of 1998–1999 and 2010–2011, by socioeconomic status (SES)

1998–1999		*Low-SES (quintile 1)*	*Low-middle SES (quintile 2)*	*Middle SES (quintile 3)*	*High-middle SES (quintile 4)*	*High SES (quintile 5)*	*Total*
Child and family characteristics and developmental activities							
Race/Ethnicity	White	26.4%	53.7%	61.2%	68.1%	78.8%	57.7%
	Black	26.2%	17.8%	15.5%	12.0%	6.4%	15.6%
	Hispanic	39.8%	21.2%	15.8%	12.7%	6.8%	19.2%
	Hispanic English-language learner (ELL)	28.4%	9.5%	4.8%	3.1%	1.4%	9.4%
	Hispanic English speaker	11.5%	11.7%	10.9%	9.6%	5.4%	9.8%
	Asian	2.3%	1.7%	2.3%	2.7%	4.7%	2.7%
	Other	5.3%	5.6%	5.3%	4.4%	3.4%	4.8%
Poverty status	Lives in poverty	71.3%	22.3%	10.6%	4.2%	1.1%	21.8%
Language	Child's language at home is not English	31.2%	12.0%	7.0%	6.1%	5.3%	12.3%
Family composition	Not living with two parents	45.6%	30.5%	23.8%	15.8%	11.1%	25.1%
	Number of family members	4.84	4.55	4.42	4.36	4.40	4.51
	First- or second-generation immigrant	30.3%	15.1%	12.8%	13.1%	15.4%	17.3%
Pre-K care arrangements	Pre-K care	64.2%	70.9%	76.5%	81.0%	87.8%	76.2%
	Pre-K care center-based, including Head Start	43.7%	45.0%	50.2%	55.4%	65.8%	52.2%
	Parental care	30.5%	22.6%	17.2%	15.4%	9.9%	18.9%
	Care by relative	15.9%	18.3%	16.2%	11.8%	6.6%	13.7%
	Care by nonrelatives	5.3%	8.2%	10.9%	11.6%	13.7%	10.0%
	Care by multiple sources	4.6%	5.9%	5.5%	5.8%	3.9%	5.2%
Activities indices	Literacy/reading	-0.221	-0.059	-0.010	0.070	0.193	-0.003
	Other activities	-0.114	-0.011	0.014	0.042	0.071	0.002
Total number of books	N	32.4	58.1	74.3	87.9	107.3	72.5
Number of books:	0 to 25	61.7%	31.6%	20.2%	11.3%	5.0%	25.5%
	26 to 50	23.1%	34.8%	30.8%	30.6%	21.4%	28.2%
	51 to 100	11.3%	23.4%	32.9%	36.0%	41.0%	29.1%
	101 to 199	1.8%	4.0%	5.7%	6.6%	9.5%	5.6%
	More than 200	2.1%	6.2%	10.3%	15.5%	23.0%	11.5%
Parents' expectations about their children's educational attainment (highest education level expected):							
	High school or less	24.1%	15.2%	7.7%	3.7%	1.2%	10.2%
	Two or more years of college, vocational	16.4%	21.8%	21.4%	11.6%	3.8%	14.9%
	Bachelor's degree	33.2%	38.7%	46.7%	58.8%	57.2%	47.1%
	Master's degree	9.2%	9.4%	10.3%	13.6%	22.8%	13.1%
	Ph.D. or M.D.	17.1%	15.0%	13.9%	12.3%	15.0%	14.6%

2010-2011		*Low-SES (quintile 1)*	*Low-middle SES (quintile 2)*	*Middle SES (quintile 3)*	*High-middle SES (quintile 4)*	*High SES (quintile 5)*	*Total*
Child and family characteristics, and main developmental activities							
Race/Ethnicity	White	23.1%	45.5%	56.8%	69.0%	71.3%	52.9%
	Black	19.6%	17.0%	13.4%	9.4%	5.8%	13.2%
	Hispanic	50.4%	28.3%	19.7%	12.2%	8.6%	24.1%
	Hispanic English-language learner (ELL)	36.1%	11.9%	5.2%	2.1%	0.9%	11.4%
	Hispanic English speaker	14.3%	16.3%	14.4%	10.1%	7.7%	12.6%
	Asian	2.5%	2.8%	3.2%	4.4%	8.7%	4.2%
	Others	4.4%	6.4%	7.0%	4.9%	5.6%	5.7%
Lives in poverty	In poverty	84.6%	35.7%	10.9%	3.1%	0.6%	25.5%
Language	Child's language at home is not English	40.3%	15.6%	8.0%	5.0%	7.0%	15.3%
Family composition	Not living with two parents	54.9%	41.7%	34.1%	19.3%	9.6%	31.8%
	Number of family members	4.81	4.62	4.53	4.44	4.46	4.57
	First- or second-generation immigrant	49.8%	25.7%	18.9%	17.2%	21.6%	26.1%
Pre-K care arrangements	Pre-k care	66.6%	75.6%	81.6%	85.0%	88.3%	79.3%
	Pre-K care center-based	44.3%	47.0%	53.1%	61.6%	69.9%	55.1%
	Parental care	34.9%	25.4%	19.1%	15.4%	12.0%	21.4%
	Care relative	16.0%	19.7%	17.4%	12.7%	8.6%	14.9%
	Care nonrelatives	3.3%	5.5%	7.4%	7.3%	6.9%	6.1%
	Care multiple	1.5%	2.4%	3.1%	2.9%	2.7%	2.5%
Activities	Literacy/reading	-0.231	-0.038	0.033	0.094	0.171	0.008
	Other activities	-0.049	0.022	0.029	0.026	0.001	0.006
Total number of books	N	35.2	57.6	74.1	90.8	106.3	73.1
Number of books:	0 to 25	59.3%	33.6%	19.4%	11.5%	5.0%	25.5%
	26 to 50	24.7%	31.7%	32.5%	26.9%	22.4%	27.7%
	51 to 100	11.2%	24.8%	32.3%	39.0%	41.7%	30.0%
	101 to 199	1.7%	3.1%	5.5%	6.5%	7.7%	4.9%
	More than 200	3.1%	6.8%	10.3%	16.2%	23.2%	12.0%
Parents' expectations about their children's educational attainment (highest education level expected):							
	High school or less	11.4%	6.2%	5.0%	2.4%	1.0%	5.2%
	Two or more years of college, vocational	16.7%	25.0%	17.2%	9.8%	3.2%	14.4%
	Bachelor's degree	34.8%	39.1%	47.0%	57.1%	53.1%	46.3%
	Master's degree	10.7%	12.3%	14.6%	16.8%	26.6%	16.2%
	Ph.D. or M.D.	26.4%	17.3%	16.2%	13.9%	16.1%	17.9%

Note: SES refers to socioeconomic status.

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998-1999 and ECLS-K, Kindergarten Class of 2010–2011 (National Center for Education Statistics)

Table 2 Reading and math skills gaps between high SES and low SES children at the beginning of kindergarten in 1998–1999 and change in gaps by 2010–2011, under unadjusted to fully adjusted models

	Reading				Mathematics			
	1 (unadjusted)	2	3	4 (fully adjusted)	1 (unadjusted)	2	3	4 (fully adjusted)
Gap in 1998–1999	1.071***	0.846***	0.641***	0.596***	1.258***	0.932***	0.668***	0.610***
	(0.024)	(0.032)	(0.031)	(0.031)	(0.022)	(0.033)	(0.030)	(0.031)
Change in gap by 2010–2011	0.098***	0.122***	0.096*	0.080	-0.008	0.025	0.053	0.051
	(0.033)	(0.046)	(0.051)	(0.052)	(0.032)	(0.045)	(0.047)	(0.048)
Controls:								
Demographics	No	No	No	Yes	No	No	No	Yes
Education and engagement	No	No	No	Yes	No	No	No	Yes
Parental expectations	No	No	No	Yes	No	No	No	Yes
School fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Observations	30950	30950	26050	26050	31850	31850	26890	26890
Adjusted R2	0.152	0.243	0.289	0.293	0.189	0.265	0.331	0.336

Models 1 and 2 use the full sample; models 3 and 4 use the complete cases sample

Note: Robust standard errors are in parentheses. For statistical significance, *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1. The number of observations is rounded to the nearest multiple of 10. SES refers to socioeconomic status.

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998–1999 and 2010–2011 (National Center for Education Statistics)

Table 3 Noncognitive skills gaps between high SES and low SES children at the beginning of kindergarten, by SES quintile in 1998–1999 and change in gaps by 2010–2011, under unadjusted to fully adjusted models

	Self-control (by teachers)				Approaches to learning (by teachers)			
	1 (unadjusted)	2	3	4 (fully adjusted)	1 (unadjusted)	2	3	4 (fully adjusted)
Gap in 1998–1999	0.394***	0.304***	0.217***	0.182***	0.630***	0.630***	0.493***	0.435***
	(0.025)	(0.037)	(0.037)	(0.038)	(0.024)	(0.035)	(0.036)	(0.037)
Change in gap by 2010–2011	-0.009	0.065	0.078	0.085	-0.117***	-0.066	-0.042	-0.043
	(0.037)	(0.054)	(0.060)	(0.061)	(0.035)	(0.053)	(0.057)	(0.057)
Controls:								
Demographics	No	No	No	Yes	No	No	No	Yes
Education and engagement	No	No	No	Yes	No	No	No	Yes
Parental expectations	No	No	No	Yes	No	No	No	Yes
School fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Observations	29500	29500	25080	25080	31260	31260	26460	26460
Adjusted R2	0.019	0.117	0.173	0.175	0.040	0.117	0.199	0.204

	Self-control (by parents)				Approaches to learning (by parents)			
	1 (unadjusted)	2	3	4 (fully adjusted)	1 (unadjusted)	2	3	4 (fully adjusted)
Gap in 1998–1999	0.467***	0.424***	0.357***	0.291***	0.539***	0.479***	0.215***	0.132***
	(0.025)	(0.036)	(0.039)	(0.040)	(0.025)	(0.032)	(0.033)	(0.033)
Change in gap by 2010–2011	-0.076**	-0.084	-0.032	0.001	0.024	-0.024	0.096*	0.112**
	(0.037)	(0.054)	(0.060)	(0.061)	(0.036)	(0.053)	(0.055)	(0.056)
Controls:								
Demographics	No	No	No	Yes	No	No	No	Yes
Education and engagement	No	No	No	Yes	No	No	No	Yes
Parental expectations	No	No	No	Yes	No	No	No	Yes
School fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Observations	30400	30400	27220	27220	30420	30420	27240	27240
Adjusted R2	0.022	0.037	0.075	0.079	0.035	0.057	0.218	0.228

Notes: Models 1 and 2 use the full sample; models 3 and 4 use the complete cases sample. Robust standard errors are in parentheses. For statistical significance, *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1. The number of observations is rounded to the nearest multiple of 10. SES refers to socioeconomic status.

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998–1999 and 2010–2011 (National Center for Education Statistics)

Table 4 Reduction in the skills gap between high SES and low SES children in 1998 and 2010, after accounting for missingness and covariates

		Reduction	Change 2010–1998 (in percentage points)
Reading	1998	45.5%	
	2010	42.9%	-2.6
Math	1998	52.6%	
	2010	48.6%	-4.1
Self-control (by teachers)	1998	50.8%	
	2010	32.6%	-18.1
Approaches to learning (by teachers)	1998	28.3%	
	2010	20.3%	-8
Self-control (by parents)	1998	35.3%	
	2010	34.3%	-1.1
Approaches to learning (by parents)	1998	73.5%	
	2010	56.0%	-17.5

Note: SES refers to socioeconomic status. Declining values from 1998 to 2010 indicate that factors such as early literacy activities and other controls are not as effective at shrinking SES-based gaps as they used to be.

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998–1999 and 2010–2011 (National Center for Education Statistics)

Table 5. Summary of association between educational performance at kindergarten entry and selected early educational practices, fully adjusted differences (Model 4)

	Reading	Math	Self-control (by teachers)	Approaches to learning (by teachers)	Self-control (by parents)	Approaches to learning (by parents)
	4 (fully adjusted)	4 (fully adjusted)	4 (fully adjusted)	4 (fully adjusted)	4 (fully adjusted)	4 (fully adjusted)
Correlations between selected practices and skills measured at kindergarten entry in 1998						
Center-based pre-K	0.106***	0.097***	-0.125***	-0.001	-0.006	0.018
	(0.016)	(0.015)	(0.018)	(0.018)	(0.019)	(0.016)
Number of books	0.012***	0.016***	0.004**	0.008***	0.002	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Reading/literacy	0.166***	0.068***	0.010	0.030*	0.143***	0.315***
	(0.016)	(0.015)	(0.018)	(0.016)	(0.018)	(0.017)
Other activities	-0.115***	-0.036***	0.047***	0.033**	0.046***	0.292***
	(0.015)	(0.014)	(0.017)	(0.016)	(0.017)	(0.016)
Correlations between parents' expectations about their children's highest level of educational attainment and skills measured at kindergarten entry in 1998						
Vocational, some college	0.029	0.066**	0.072*	0.115***	0.180***	0.136***
	(0.025)	(0.026)	(0.042)	(0.037)	(0.038)	(0.033)
Bachelor's degree	0.114***	0.172***	0.141***	0.211***	0.272***	0.228***
	(0.023)	(0.023)	(0.036)	(0.032)	(0.036)	(0.030)
Master's degree or more	0.160***	0.220***	0.120***	0.219***	0.254***	0.377***
	(0.026)	(0.025)	(0.039)	(0.034)	(0.036)	(0.033)
Change in the correlations between selected practices and skills measured at kindergarten entry between 1998 and 2010						
Center-based pre-K	-0.005	-0.036	0.060*	-0.010	-0.020	0.010
	(0.025)	(0.025)	(0.032)	(0.031)	(0.031)	(0.026)
Number of books	0.002	-0.001	0.001	0.002	-0.002	0.004
	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)
Reading/literacy	0.018	0.008	0.015	0.014	-0.079***	-0.173***
	(0.025)	(0.024)	(0.031)	(0.028)	(0.030)	(0.027)
Other activities	-0.008	-0.016	0.031	0.020	0.218***	0.265***
	(0.025)	(0.024)	(0.029)	(0.028)	(0.029)	(0.025)
Change in the correlations between parents' expectations about their children's highest level of educational attainment and skills measured at kindergarten entry between 1998 and 2010						
Vocational, some college	0.121**	0.106*	0.201**	0.204***	-0.030	0.151**
	(0.055)	(0.059)	(0.081)	(0.072)	(0.084)	(0.066)
Bachelor's degree	0.139***	0.103**	0.136*	0.174***	-0.084	0.100
	(0.048)	(0.051)	(0.070)	(0.063)	(0.078)	(0.061)
Master's degree or more	0.186***	0.117**	0.140*	0.189***	-0.041	0.076
	(0.052)	(0.054)	(0.074)	(0.066)	(0.081)	(0.063)
Observations	26050	26890	25080	26460	27220	27240
Adj.R2	0.293	0.336	0.175	0.204	0.079	0.228

Note: Robust standard errors are in parentheses. For statistical significance, *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1. The number of observations is rounded to the nearest multiple of 10.

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998–1999 and 2010–2011 (National Center for Education Statistics)

Table 6 Reading and math achievement at the beginning of kindergarten, and principal noncognitive skills at the beginning of kindergarten, as reported by teachers and parents, by mother's educational attainment (in quintiles), under unadjusted to fully adjusted models

	Reading		Math		Self-control (by teachers)		Approaches to learning (by teachers)		Self-control (by parents)		Approaches to learning (by parents)	
	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)
Gap in 1998–1999	1.294***	0.696***	1.457***	0.681***	0.317***	0.076	0.638***	0.409***	0.471***	0.254***	0.655***	0.221***
	(0.038)	(0.058)	(0.036)	(0.050)	(0.039)	(0.048)	(0.038)	(0.042)	(0.039)	(0.049)	(0.039)	(0.045)
Change in gap by 2010–2011	-0.020	-0.075	-0.154***	-0.119*	-0.099*	0.046	-0.237***	-0.141*	-0.136**	-0.093	-0.084	-0.004
	(0.051)	(0.082)	(0.049)	(0.070)	(0.055)	(0.081)	(0.053)	(0.074)	(0.053)	(0.080)	(0.053)	(0.070)
Controls:												
Demographics	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Education and engagement	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Parental expectations	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
School fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	26660	23880	27570	24710	25790	23170	27200	24380	27280	25040	27290	25050
Adjusted R2	0.134	0.282	0.166	0.328	0.009	0.172	0.029	0.199	0.017	0.079	0.032	0.223

Model 1 uses the full sample; model 4 uses the complete cases sample

Note: Robust standard errors are in parentheses. For statistical significance, *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1. The number of observations is rounded to the nearest multiple of 10.

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998–1999 and 2010–2011 (National Center for Education Statistics)

Table 7 Reading and math achievement at the beginning of kindergarten, and principal noncognitive skills at the beginning of kindergarten, by income quintile, under unadjusted to fully adjusted model

	Reading		Math		Self-control (by teachers)		Approaches to learning (by teachers)		Self-control (by parents)		Approaches to learning (by parents)	
	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)
Gap in 1998–1999	0.577***	0.384***	0.685***	0.449***	0.163***	0.118**	0.272***	0.325***	0.443***	0.274***	0.436***	0.073
	(0.031)	(0.059)	(0.030)	(0.060)	(0.033)	(0.050)	(0.032)	(0.049)	(0.045)	(0.051)	(0.044)	(0.052)
Change in gap by 2010–2011	0.386***	-0.008	0.393***	-0.067	0.306***	0.229***	0.204***	0.007	0.044	0.104	0.032	0.050
	(0.053)	(0.084)	(0.052)	(0.082)	(0.058)	(0.082)	(0.056)	(0.079)	(0.065)	(0.084)	(0.064)	(0.080)
Controls:												
Demographics	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Education and engagement	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Parental expectations	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
School fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	29410	26050	30380	26890	28360	25080	29980	26460	28170	27220	28190	27240
Adjusted R2	0.094	0.276	0.130	0.322	0.022	0.174	0.033	0.199	0.019	0.079	0.019	0.226

Model 1 uses the full sample; model 4 uses the complete cases sample

Note: Robust standard errors are in parentheses. For statistical significance, *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1. The number of observations is rounded to the nearest multiple of 10.

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998–1999 and 2010–2011 (National Center for Education Statistics)

Table 8 Reading and math achievement at the beginning of kindergarten, and principal noncognitive skills at the beginning of kindergarten, by number of books in the home (in quintiles), under unadjusted to fully adjusted models

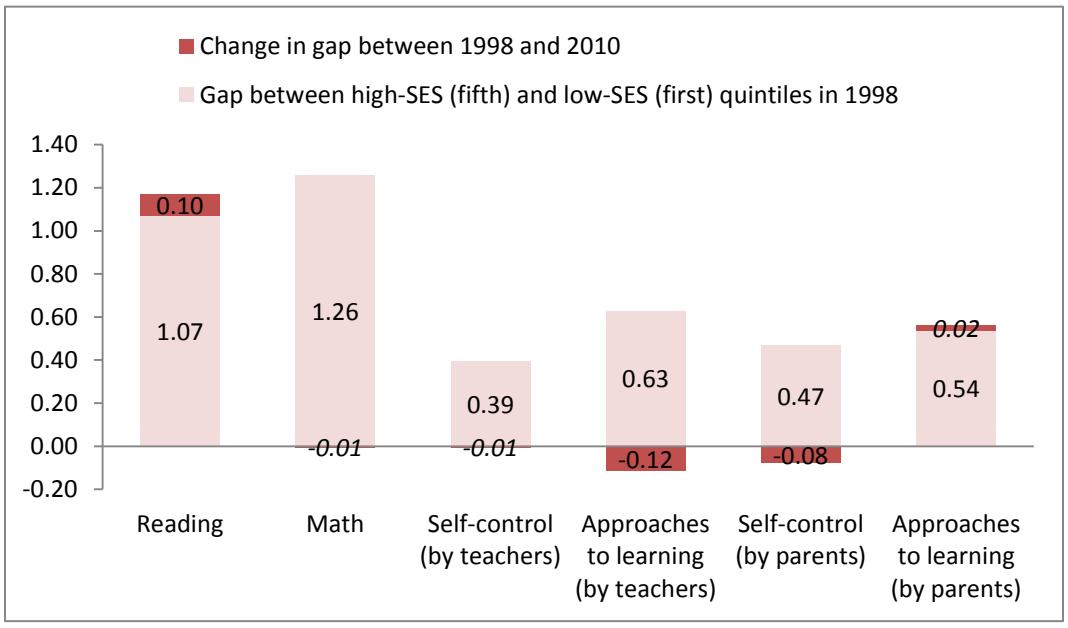
	Reading		Math		Self-control (by teachers)		Approaches to learning (by teachers)		Self-control (by parents)		Approaches to learning (by parents)	
	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)	1 (unadjusted)	4 (fully adjusted)
Gap in 1998–1999	0.736***	0.347***	0.966***	0.424***	0.324***	0.105***	0.455***	0.241***	0.283***	0.117***	0.583***	0.136***
	(0.028)	(0.034)	(0.027)	(0.031)	(0.029)	(0.035)	(0.028)	(0.033)	(0.029)	(0.037)	(0.028)	(0.033)
Change in gap by 2010–2011	0.083**	-0.540***	-0.019	-0.818***	-0.068	-0.126	-0.058	-0.244	-0.044	-0.248	0.085**	-0.026
	(0.039)	(0.184)	(0.038)	(0.188)	(0.042)	(0.225)	(0.041)	(0.184)	(0.041)	(0.216)	(0.039)	(0.178)
Controls:												
Demographics	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Education and engagement	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Parental expectations	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
School fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	29060	26050	29920	26890	27730	25080	29350	26460	30200	27220	30220	27240
Adjusted R2	0.080	0.270	0.120	0.314	0.012	0.172	0.024	0.194	0.009	0.075	0.047	0.226

Model 1 uses the full sample; model 4 uses the complete cases sample

Note: Robust standard errors are in parentheses. For statistical significance, *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1. The number of observations is rounded to the nearest multiple of 10.

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998–1999 and 2010–2011 (National Center for Education Statistics)

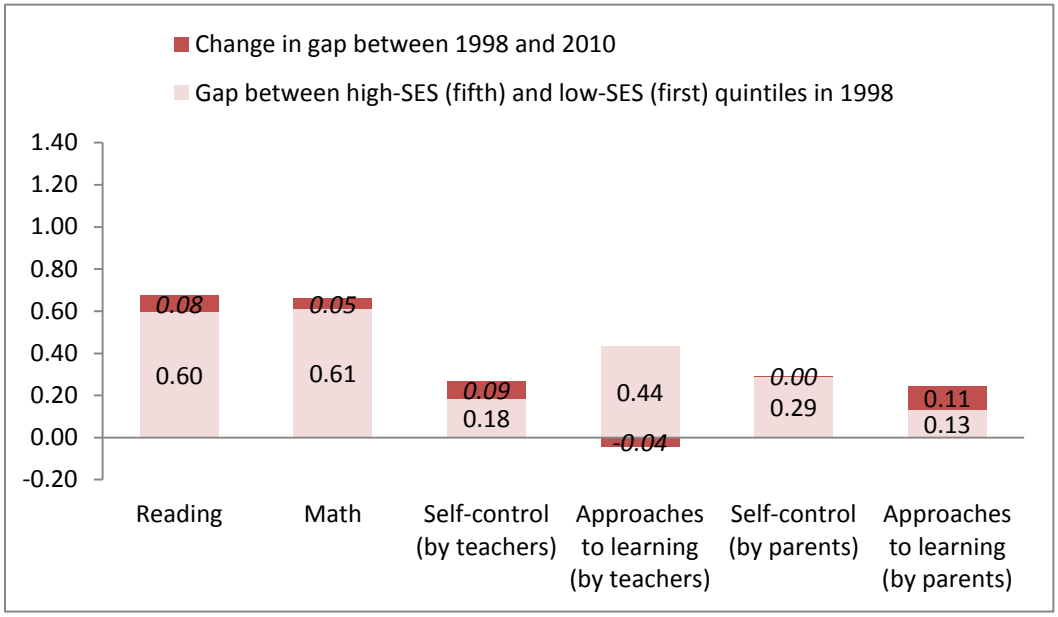
Figure A Unadjusted cognitive and noncognitive skills gaps between high- and low-SES children at the beginning of kindergarten1998 and 2010



Note: SES refers to socioeconomic status. The gaps are the baseline fully unadjusted standard deviation scores for the high-SES children relative to low-SES children. The light red bars and dark red bars combined show the gap in 2010. Numbers in normal font indicate the coefficients are statistically significant (numbers in italics are not statistically significant).

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998–1999 and 2010–2011 (National Center for Education Statistics)

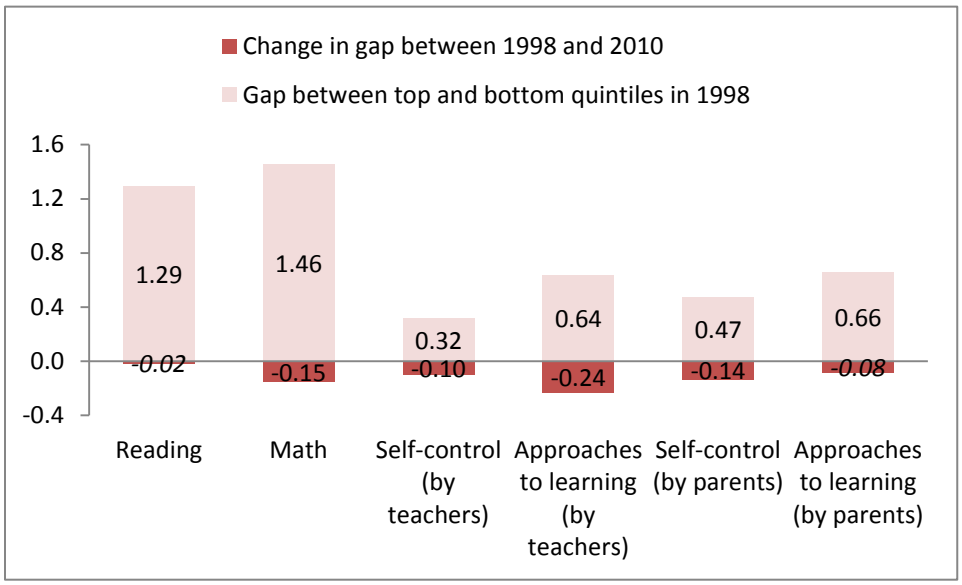
Figure B Fully adjusted cognitive and noncognitive skills gaps between high- and low-SES children at the beginning of kindergarten, 1998 and 2010



Note: SES refers to socioeconomic status. The gaps are standard deviation scores for the high-SES children relative to low-SES children after adjusting for all family and child characteristics, pre-K schooling, enrichment activities with parents, and expectations of educational attainment. The light red bars are the gaps in 1998. The light red bars and the dark bars combined show the gap in 2010. Numbers in normal font indicate the coefficients are statistically significant (numbers in italics indicate the coefficients are not statistically significant).

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998–1999 and 2010–2011 (National Center for Education Statistics).

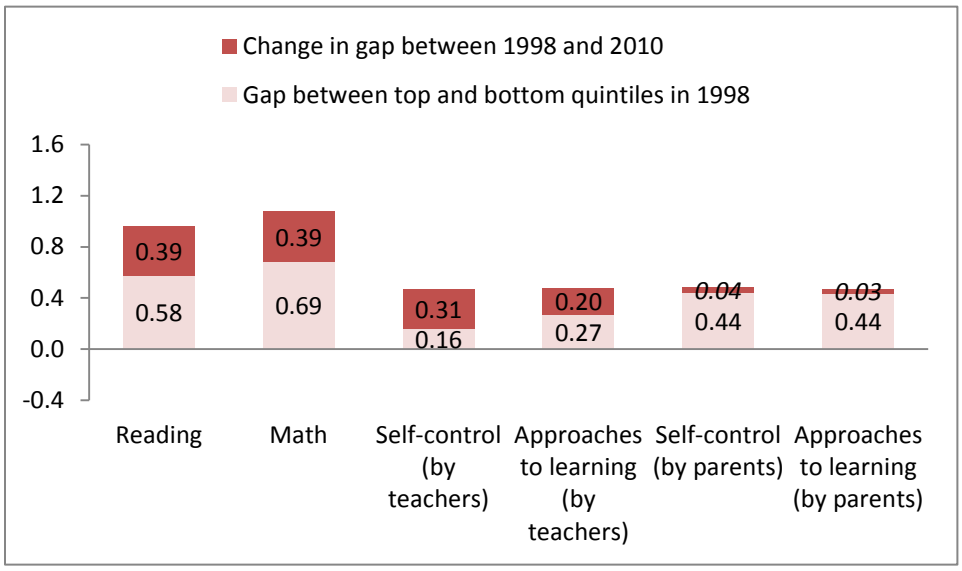
Figure C Cognitive and noncognitive skills gaps by mother's education: skills gaps between top fifth and bottom fifth of children at the beginning of kindergarten in 1998 and 2010



Note: The gaps are the baseline fully unadjusted standard deviation scores for the highest-social-class group, relative to low-social-class children. The light red bars are the gaps in 1998. The dark red bars combined show the change in the gap in 2010. Numbers in normal font indicate the coefficients are statistically significantly different from cero (numbers in italics indicate the coefficients are not statistically significantly different from cero).

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998-–1999 and 2010-–2011 (National Center for Education Statistics)

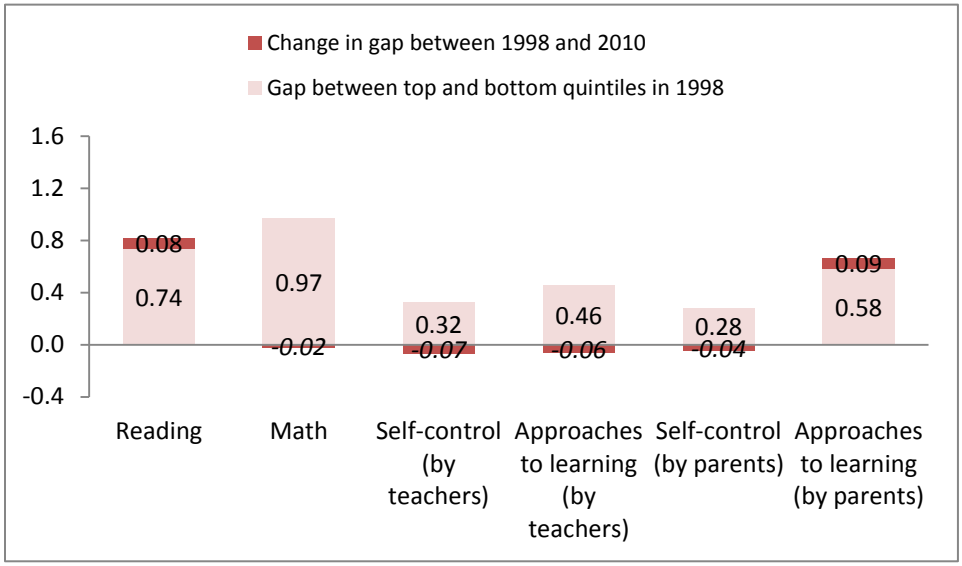
Figure D Cognitive and noncognitive skills gaps by income: skills gaps between top fifth and bottom fifth of children at the beginning of kindergarten in 1998 and 2010



Note: The gaps are the baseline fully unadjusted standard deviation scores for the highest-social-class group, relative to low-social-class children. The light red bars are the gaps in 1998. The dark red bars combined show the change in the gap in 2010. Numbers in normal font indicate the coefficients are statistically significantly different from cero (numbers in italics indicate the coefficients are not statistically significantly different from cero).

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998-–1999 and 2010-–2011 (National Center for Education Statistics)

Figure E Cognitive and noncognitive skills gaps by number of books the child has: skills gaps between top fifth and bottom fifth of children at the beginning of kindergarten in 1998 and 2010



Note: The gaps are the baseline fully unadjusted standard deviation scores for the highest-social-class group, relative to low-social-class children. The light red bars are the gaps in 1998. The dark red bars combined show the change in the gap in 2010. Numbers in normal font indicate the coefficients are statistically significantly different from cero (numbers in italics indicate the coefficients are not statistically significantly different from cero).

Source: EPI analysis of ECLS-K, Kindergarten Class of 1998-–1999 and 2010-–2011 (National Center for Education Statistics)

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