The Fragile Families and Child Wellbeing Study changed its name to The Future of Families and Child Wellbeing Study (FFCWS). Due to the issue date of this document, FFCWS will be referenced by its former name. Any further reference to FFCWS should kindly observe this name change.

Disadvantaged Children who are Beating the Odds:

Family, School, Neighborhood and City Contexts that Predict Academic Success among Socio-economically Disadvantaged Children

Abstract: This report combines contextual data on family, school, neighborhood, and city environments with newly collected survey data from the Year 15 Fragile Families and Child Wellbeing Study (FFCWS) to study socio-economically disadvantaged children who are beating the odds. The study examines the extent to which a wide variety of contextual characteristics during childhood (age 9) are associated with academic success during adolescence (age 15) among socio-economically disadvantaged children. We identify children as beating the odds if they were born to families of low socio-economic status (low education and low income) but were academically on-track by age 15 (high grade point average and no recent history of academic failure). We find that a range of both risk and protective factors at multiple ecological levels are associated with the likelihood of beating the odds. We conclude with a discussion of policy implications.

Overview

The central research question of this study is "What are the contextual characteristics associated with academic success among children from disadvantaged families?"

To address this question, we use data from the Fragile Families and Child Wellbeing Study (FFCWS), a longitudinal, birth cohort study based on a probability sample of children born in large US cities between 1998 and 2000. The FFCWS oversampled children born to unmarried parents, which resulted in a disproportionate share of children born into disadvantaged families.

To better understand how various contexts predict success among disadvantaged children, we restrict our analyses to children born into low-income households and to parents with low levels of education. We identify low-SES children who are beating the odds during adolescence based on parent and child reports of academic achievement at the Year 15 survey. Finally, we examine the extent to which a wide range of risk and protective factors at the family, school, neighborhood, and city levels – all measured 6 years earlier at the Year 9 survey – are associated with changes in the likelihood that low-SES children will beat the odds.

Overall, we find that a variety of family, school, and residential contexts are associated with academic success among low-SES children. At the family level, parental stress, harsh parenting and material hardship are associated with a substantially lower likelihood that economically disadvantaged children will beat the odds. At the school level, low teacher/student ratios, non-instructional expenditures and low levels of teacher absenteeism also predict academic achievement among low-SES children. At the neighborhood level, children who grow up in neighborhoods with higher levels of social cohesion and social control are more likely to succeed academically. Finally, children who are beating the odds at age 15 are more likely to live in metropolitan areas with high levels of religiosity and more affordable rent.

However, we also find that many hypothesized risk and protective factors are not associated with low-SES children's likelihood of beating the odds. It is possible that these findings are the result of study limitations, such as an insufficient sample size to detect small but meaningful associations. The null results may also be interpreted as evidence that context matters differently for low-SES children – many previously studied contexts that were correlated with success among a general population of children may not be predictive of success for the most economically disadvantaged children.

We conclude by recommending that policies aimed at improving the prospects of low-SES children target multiple ecological levels –family, school, neighborhood, and city environments. In addition, we recommend that future research build on the scope of study in this report by incorporating a life course perspective, considering sensitive periods in children's development and the accumulation of children's exposure to various contexts.

Background

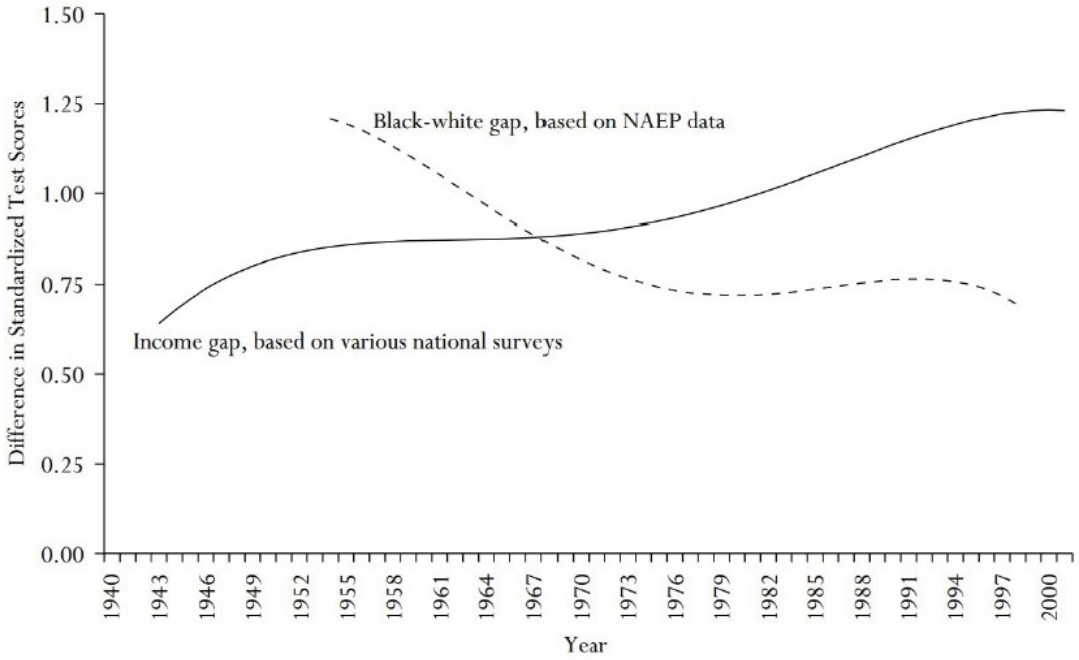
The United States has experienced large increases in income inequality since the mid-1970s, with important implications for the social mobility of the next generation. Figure 1 shows the estimated gaps in reading achievement across time. Although some progress has been made in reducing the black-white achievement gap, the income gap in children's academic achievement has grown steadily over time, likely reinforcing the intergenerational reproduction of economic inequality.

For those who care about reversing these trends and increasing opportunities for upward mobility, an important question is "Which characteristics of cities, neighborhoods and schools show the strongest associations with upward mobility among children from disadvantaged backgrounds?" Identifying the contextual characteristics in which children from disadvantaged backgrounds are beating the odds can help policy makers and practitioners improve conditions and programs for families and children.

A wide range of research has examined correlations between children's academic success and the family, school, neighborhood, and community contexts in which they grew up. Studies generally show that children who grow up in more affluent environments where more resources and opportunities are available fare better academically (Catsambis & Beveridge, 2001; Crosnoe et al., 2010; Eccles, 2005).

Most of this research, however, focuses on children from both advantaged and disadvantaged families. Although these findings are representative for the general population, they may not accurately depict the importance of particular contexts for children who grow up in poverty or whose parents have low levels of education. A range of research has shown that the contexts in which children grow up, including parenting practices, school characteristics and neighborhood conditions, may interact with family socio-economic status to affect children's wellbeing. If true, policy geared towards improving the odds of disadvantaged children's success depends on findings from studies that focus exclusively on children who grow up in disadvantaged families.

Figure 1. Estimated Gaps in Reading Achievement among Students by Birth Year



Source: Duncan & Murnane (2011)

Methods

Identifying Socio-economically disadvantaged Children in FFCWS

We identified disadvantaged children in FFCWS based on their family's socio-economic status (SES) at birth. Children were categorized as low-SES if neither of their parents reported having earned a college degree at the baseline interview and the mean household income-to-needs ratio reported at the baseline and 1-year follow-up interview (the year proceeding and following the child's birth) was below 200% of the federal poverty line (FPL). Based on these criteria, the majority of children in the study were classified as low-SES.

The analytic sample of the current study consists of children who participated in the Year 15 survey and whose parents also participated in the Year 9 survey (N=3,100). Among this sample, 72% met the definition of low-SES at birth (N=2,236). For ease of comparison, we refer to the remaining 28% of the sample (N=864) as high-SES. The high-SES sample includes children born in families with college educated parents or whose household income was twice the poverty line at the time of the focal child's birth. We highlight that our use of "high-SES" is relative to the low-SES sample. Many children that are included in this sub-sample are not economically affluent and have household incomes that appropriate the median national income.

The economically disadvantaged sub-sample of FFCWS children is disproportionately children of color: 58% black and 28% Hispanic. Only 12% of low-SES children in FFCWS are non-Hispanic white, compared to 45% of the middle/high-SES children in FFCWS.

In the year preceding and following the focal child's birth, the average household income in the low-SES sub-sample is barely above the poverty line (116% FPL); the average child in the middle/high-SES sub-sample, however, was born to a family with a household income nearly four and half times the poverty line (442% FPL).

Mother's education level, maternal age and marital status also differ substantially by SES. In the sub-sample, none of the mothers have a college degree, while 53% of middle/high-SES mothers have a college degree. Only 12% of low-SES mothers were married to the focal child's biological father at birth, compared to 56% of middle/high-SES mothers. The average maternal age at birth was 23.9 years for low-SES mothers and 28.5 years for middle/high-SES mothers. Despite these differences, immigration status of children's mothers varies little by SES at birth – around 13% of low-SES mothers were born outside the U.S., compared to 14% of middle/high-SES mothers.

Given the research objectives of this study, the analyses that follow primarily focus on the low-SES sample of FFCWS children. However, as a point of reference, we also present select statistics on academic achievement and contextual characteristics for the high-SES sample.

Table 1. FFCWS sample by socio-economic status

	Low-SES	High-SES
N	2,236	864
Household income as % of FPL	1.16	4.42
Mother's education		
< High School	25%	2%
High school	46%	13%
Some college	30%	32%
College	0%	53%
Mother's race/ethnicity		
White	12%	45%
Black	58%	32%
Hispanic	28%	16%
Mother's age (years)	23.9	28.5
Mother immigrant	13%	14%
Mother-father married	12%	56%

Notes: Household income as % of FPL refers to the mean household income as a percent of the federal poverty line (FPL) as reported by mothers at the baseline and 1-year follow-up interview. All other characteristics are reported by mothers at the baseline interview.

Identifying Children who were Beating the Odds

Children who were low-SES at baseline and academically on-track at the Year 15 were identified as beating the odds. Table 2 shows the four indicators of academic achievement used to assess whether children were academically on-track.

First, we used children's reports of their most recent marking period grade in their English, math, science, and social studies classes. We calculated their *recent GPA* (grade point average) as the mean of their four responses, each coded as follows: A=4, B=3, C=2, D or lower=1. Around 45% of low-SES children reported a GPA of 3.0 or higher, compared to 69% of high-SES children.

Second, children were asked if they failed a class in the current or past school year. Around 60% of low-SES children *passed all course in the past year*. Nearly four in five (79%) of high-SES children passed all courses.

Third, parents were asked if their children ever repeated a grade (since the Year 9 survey). Nearly three in four low-SES children (74%) *did not repeat a grade*. Nearly nine in ten (88%) of high-SES children had no history of grade retention (since Year 9).

Fourth, parents were asked if their children were ever required to attend summer school (since the Year 9 survey). Around 89% of low-SES children were *not required to attend summer school*, compared to 97% of high-SES children.

Children who met all of these four criteria – had a GPA of 3.0 or higher, passed all courses in the past year, did not repeat a grade, and were not required to attend summer school – were classified as being *academically on-track*. Based on this definition, a minority of low-SES children were on-track at Year 15 (28%), compared to a majority of high-SES children (59%).

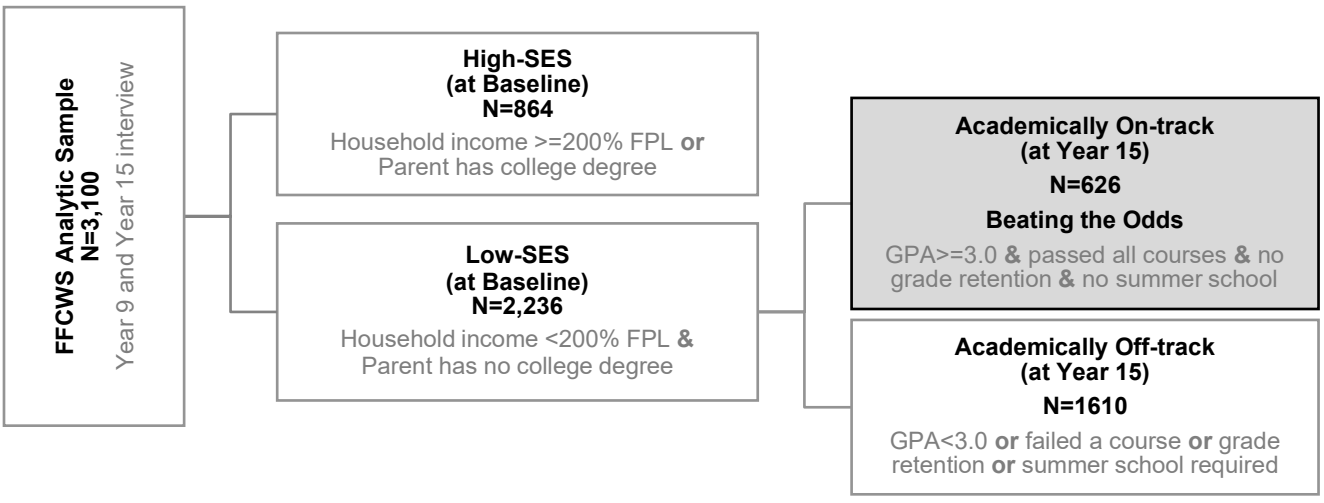
Table 2. Year 15 Academic Achievement by SES

	Low-SES	High-SES
Recent GPA>=3.0	45%	69%
Passed all courses in past year	60%	79%
Did not repeat grade	74%	88%
Not required to attend summer school	89%	97%
Academically on-track	28%	59%

Note: Students are academically on-track if they had GPA of 3.0 or higher, passed all courses in the past year, did not repeat a grade (since age 9), and were not required to attend summer school (since age 9).

Figure 2 illustrates this process of determining which children were beating the odds. First, we focused on the children identified as low-SES at baseline (N=2,236). Within the low-SES sample, we identified children who were on- and off-track. Children who were low-SES and academically on-track were beating the odds.

Figure 2. Children in FFCWS who are Beating the Odds



Uncovering Contexts Associated with Beating the Odds

Contextual predictors of academic success may differ for children from low- and high-SES backgrounds. Therefore, to uncover contexts associated with beating the odds, we limited the analytic sample to children identified as low-SES at baseline (N=2,236), around 72% of the FFCWS sample. All children born to a parent with a college education or in a household twice the poverty line were excluded from analyses. By restricting the analytic sample this way, we ensure that predictors of academic success are generalizable to economically disadvantaged children.

Next, we selected a range of contexts that prior research and theory indicated were likely associated with disadvantaged children's academic success (Borman & Overman, 2004; Erberber et al., 2015; Williams, Bryan & Morrison, 2017). These contexts are divided into four domains: family, school, neighborhood, and city. For each domain, we selected five risk factors (hypothesized to be negatively associated with beating the odds) and five protective factors (hypothesized to be positively associated with beating the odds). All contextual measures were based on data reported at Year 9 survey or before.

Our analytic plan involves two steps. First, we compare Year 9 contexts between low-SES children who are academically on-track at Year 15 (beating the odds) and low-SES children who are academically off-track. Second, among low-SES children only, we use linear probability models (LPM) to regress on-track at Year 15 on each Year 9 context. All contextual variables are standardized to a mean of zero and standard deviation of 1 within the analytic sample, which allows us to compare the magnitude of associations across models.

For each contextual variable, we run three separate models: (1) a bivariate model (no controls); (2) a model with a limited set of time-invariant controls (race/ethnicity and immigrant status); and (3) a model that controls for all variables shown in Table 1. Although the analytic sample is low-SES, they are not uniformly disadvantaged. Control variables are included to hold constant variations in family socio-economic and demographic characteristics.

Table 3 shows that even within the low-SES sample, there are meaningful differences in family characteristics by Year 15 academic status. Children who were academically on-track were born in households with slightly more income, to older parents who were more likely to be married, to mothers born outside the U.S., and to mothers who have some college education. These family characteristics are predictive of academic achievement among low-SES children. Table 4 presents regression coefficients from LPM regressions of on-track. Model 1 shows that within the low-SES sample, black and Hispanic children are 8.4 and 7.2 percentage points less likely to be on-track than white children. In addition, children of immigrant mothers are more than 10 percentage points more likely to be on-track than children of mothers born in the U.S. Model 2 adds household income, mother education, age, and marital status. Children of mothers who attended some college are 10.7 percentage points more likely to be on-track than children of mothers who did not graduate from high school. In addition, children born to married parents are 5.8 percentage points more likely to be on-track than children born to unmarried parents.

Table 3. Low-SES Sample by Year 15 Academic Status

	Off-track	On-track
Household income as % of FPL	1.12	1.25
Mother's education		
< High School	26%	20%
High school	46%	44%
Some college	27%	36%
Mother's race/ethnicity		
White	11%	14%
Black	60%	53%
Hispanic	27%	31%
Mother's age (years)	23.7	24.4
Mother immigrant	11%	17%
Mother-father married	10%	16%

Table 4. Linear Probability Model Regressions of Year 15 On-Track Status among Low-SES Children

	Model 1 "Limited Controls"	Model 2 "Full Controls"
Mother black	-0.084 (0.030) **	-0.068 (0.031) *
Mother Hispanic	-0.072 (0.035) *	-0.050 (0.035)
Mother immigrant	0.107 (0.028) **	0.102 (0.033) **
Household income		0.019 (0.012)
High school		0.056 (0.025)
Some college		0.107 (0.028) **
Mother age (years)		0.002 (0.002)
Mother-father married		0.058 (0.031) +

Notes: Standard errors of regression coefficients are shown in parentheses. +p<.10, *p<.05, **p<.01.

Family-level Risk and Protective Factors

We analyzed five family-level risk factors and five family-level protective factors that prior research suggest are likely to be associated with children's academic success. The following protective factors were reported by children's parents at the Year 9 interview: *parent health* ("In general, how is your health?"); instrumental *social support* (6-item scale; e.g., could you count on somebody to "loan you $200, provide you with a place to live, help you with emergency child care?"); *religiosity* (How often do you attend religious services?"); *parenting engagement* (8-item scale; e.g., "How often did you talk with child about his/her day, help with homework or school assignments?"); and *two-parent household* (years child lived with two biological parents from birth to Year 9).

In addition, parents reported the following family-level risk factors: *parenting stress* (4-item scale; e.g., "Taking care of children is more work than pleasure"); *harsh parenting* (9-item scale, including psychological and physical aggression); *domestic violence* (8-item scale, including psychological and physical aggression between parents); *material hardship* (9-item scale, including food and housing insecurity); and *residential mobility* (number of residential moves between birth and Year 9). A complete description of all family-level factors is summarized in Appendix A.

Table 5 shows the means and standard deviations of the family-level risk and protective factors by low-SES children's Year 15 academic status. As a point of reference, the means and standard deviations are also shown for high-SES children (in gray).

Low-SES children who were academically on-track at Year 15 (i.e., beating the odds) had parents who reported higher instrumental social support (3.95) than parents of low-SES children who are academically off-track (3.77). In addition, low-SES children who were on-track spent more time in two-parent households between birth and age 9 (3.85 years) than low-SES children who are off-track (3.33 years).

Among low-SES children, levels of parenting stress and harsh parenting were substantially lower for adolescents who were beating the odds (0.97 and 0.98, respectively) than adolescents who were academically off-track (1.08 and 1.21, respectively). In fact, low-SES parents of adolescents who were academically on-track report levels of parenting stress and harsh parenting comparable to high-SES parents. In addition, low-SES children who were beating the odds experienced lower levels of material hardship (1.07) than low-SES children who were off-track (1.35), but much higher levels than high-SES children (0.59).

Among economically disadvantaged children, several family-level contexts at Year 9 were similar for those who were on- and off-track at Year 15. The differences in parent health, religiosity, parenting engagement, domestic violence, and residential mobility between low-SES children who were on- and off-track are not significant at conventional levels of statistical significance. In addition, there were no statistically significant differences in parenting engagement between low- and high- SES children.

Table 5. Family-level Factors: By Baseline SES and Year 15 Academic Status

.	Range		Mean (Standard Deviation)			
	Low (description)	High (description)	Low-SES All	Low-SES Off-track	Low-SES On-track	High-SES All
Parent health	0 (poor)	4 (excellent)	2.45 (1.05)	2.44 (1.05)	2.49 (1.05)	2.86 (0.92)
Instrumental Social support	0 (supports)	6 (supports)	3.82 (1.76)	3.77 (1.78)	**3.95** (1.69) *	5.15 (1.38)
Religiosity	0 (never)	6 (every day)	2.65 (1.53)	2.62 (1.53)	2.73 (1.52)	2.97 (1.41)
Parenting engagement	0 (never)	4 (often)	2.84 (0.61)	2.84 (0.62)	2.86 (0.61)	2.90 (0.52)
Two-parent household	0 (years)	9 (years)	3.48 (3.68)	3.33 (3.64)	**3.85** (3.77) *	6.26 (3.62)
Parenting stress	0 (s. disagree)	3 (s. agree)	1.05 (0.70)	1.08 (0.71)	**0.97** (0.67) *	0.96 (0.64)
Harsh parenting	0 (never)	6 (20+ times)	1.15 (0.88)	1.21 (0.90)	**0.98** (0.82) *	1.01 (0.78)
Domestic violence	0 (acts)	6 (acts)	0.20 (0.67)	0.21 (0.64)	0.20 (0.72)	0.17 (0.55)
Material hardship	0 (hardships)	9 (hardships)	1.27 (1.56)	1.35 (1.59)	**1.07** (1.46) *	0.59 (1.10)
Residential mobility	0 (moves)	10 (moves)	3.29 (2.67)	3.34 (2.66)	3.16 (2.67)	2.14 (2.04)

Notes: Mean of Low-SES On-track is significantly different than mean of Low-SES Off-track at +p<.10, *p<.05.

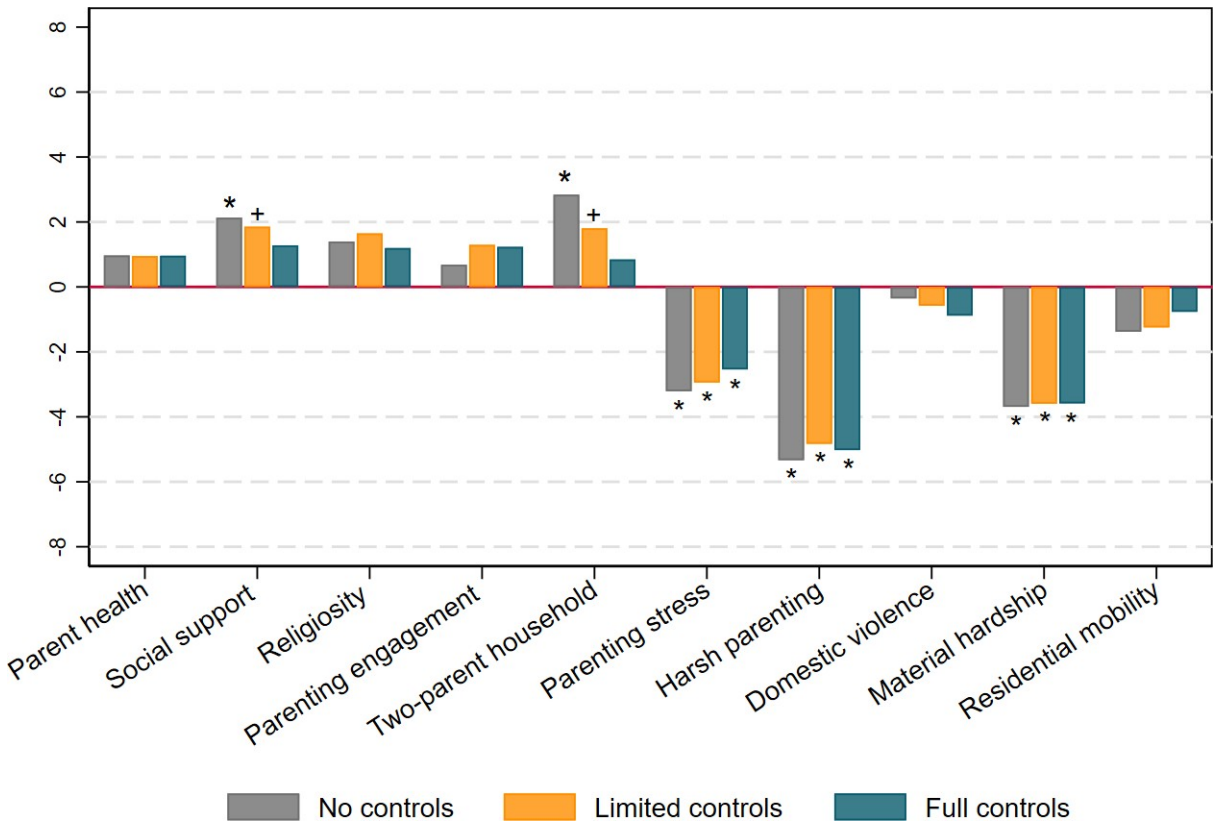
Family-level Predictors of Beating the Odds

Figure 3 shows associations between low-SES children being academically on-track (i.e., beating the odds) and each of the ten family-level contexts. Note that high-SES children are excluded from these analyses. For each context, we regressed on-track at Year 15 on the Year 9 family-level context using a linear probability model. All contexts are standardized to a mean of zero and standard deviation of one so that the magnitude of the associations represents the percentage point change in the probability of low-SES children beating the odds for a one standard deviation change in the family-level context. For each context, three estimates are presented: no controls (bivariate association); limited controls (mother race/ethnicity, immigration status); and full controls (all family socio-demographic variables shown in Table 1).

All family characteristics hypothesized to be protective factors are positively associated with children's likelihood of beating the odds, although the magnitude of these associations is small and not statistically significant for parent health, religiosity, and parenting engagement. A one standard deviation increase in levels of instrumental social support and a one standard deviation increase in two-parent household duration (~3.7 years) is associated with a 2.1 and 2.8 percentage point increase in the probability of beating the odds, respectively; however, these associations attenuate and are no longer statistically significant after controlling for family socio-demographic characteristics.

With the exception of domestic violence and residential mobility, family-level risk factors are stronger predictors of academic achievement than the family-level protective factors. Controlling for family socio-demographic characteristics, a one standard deviation increase in harsh parenting is associated with a 5.0 percentage point decrease in the probability of beating the odds. Parenting stress and material hardship are also predictive of academic achievement: holding all else constant, a one standard deviation increase in each context is associated with a 2.5 and 3.6 percentage point decrease in beating the odds, respectively. Standardized regression coefficient and standard errors for all models are shown in Appendix B.

Figure 3. Percentage Point Change in Beating the Odds for 1 Standard Deviation Change in Family Context



+p<.10, * p<0.05

School Contexts

School-level Risk and Protective Factors

We analyzed five school-level risk factors and five school-level protective factors that prior research suggests are likely to be associated with children's academic success. All school characteristics were obtained from secondary data on public schools and linked to the schools attended by children at the Year 9 interview. The teacher-student ratio (full time teachers per 100 students) was calculated from the National Center for Education Statistics Common Core Data (NCES CCD; 2009-10). Data on other protective factors were obtained from the Civil Rights Data Collection (CRDC; 2009-10), including the percent of experienced teachers (three or more years) and the percent of certified teachers (met all state qualifications in their subject area), instructional expenditures (salaries for teachers and instructional staff) and non-instructional expenditures (all other expenditures) per student, excluding federal funds. A complete description of all school-level factors is summarized in Appendix C.

School-level poverty (percent of students who receive free lunch) and racial minority composition (percentage of non-White, non-Hispanic students) were obtained from NCES CCD (2009-10). The following additional risk factors were obtained from CRDC 2009-10): student out-of-school suspension rate, teacher absenteeism (percentage absent ten or more times in the past year), and student harassment (incidents on the basis of sex, race, or disability status per 100 students).

Table 6 shows the means and standard deviations of the school-level risk and protective factors by low-SES children's Year 15 academic status. As a point of reference, the means and standard deviations are also shown for high-SES children (in gray). Low-SES children who were academically on-track at Year 15 (i.e., beating the odds) attended schools with greater non-instructional expenditures and lower levels of student poverty, racial minority composition, and teacher absenteeism than low-SES children who were academically off-track.

Adolescents who were beating the odds attended schools that spent $1,834 per student on non-instructional expenditures annually, compared to $1,680 spent by the average school attended by low-SES children who were academically off-track. Note that the non-instructional expenditures of schools attended by low-SES children who were beating the odds is comparable to the non-instructional expenditures of schools attended by high-SES children.

Among low-SES children, the student poverty rate and racial minority composition was around 3% lower in schools attended by adolescents who were beating the odds. In addition, teacher absenteeism was common among low-SES children who were off-track, 35.4% of teachers were absent 10 or more days in the past year, compared to 32.9% of teachers for low-SES children who were beating the odds.

Table 6. School-level Factors: By Baseline SES and Year 15 Academic Status

.	Range		Mean (Standard Deviation)			
	Low	High	Low-SES			High-SES
	(description)	(description)	All	Off-track	On-track	All
Teachers/students	3.28 [a]	28.47 [a]	6.44 (1.42)	6.41 (1.45)	6.52 (1.33)	6.32 (1.35)
Teachers experienced	0.0 (%)	100.0 (%)	87.2 (12.4)	87.2 (12.4)	87.3 (12.4)	89.9 (11.5)
Teachers certified	0.0 (%)	100.0 (%)	97.7 (5.48)	97.7 (5.55)	97.8 (5.32)	98.6 (6.1)
Instructional expenditures	165 ($)	12,332 ($)	3,341 (1,400)	3,339 (1,365)	3,347 (1,489)	3,484 (1,352)
Non-instructional expenditures	150 ($)	12,421 ($)	1,723 (1,353)	1,680 (1,345)	**1,834** (1,369) *	1,841 (1,648)
Student poverty	0.0 (%)	99.7 (%)	65.8 (24.2)	66.7 (24.3)	**63.4** (24.0) *	38.2 (27.5)
Student racial minority	26.1 (%)	100.0 (%)	79.7 (26.4)	80.7 (25.7)	**77.3** (27.9) *	56.0 (32.3)
Student suspension rate	0.0 (%)	68.0 (%)	5.81 (7.78)	5.98 (8.00)	5.36 (7.17)	2.91 (4.76)
Teacher absenteeism	0.0 (%)	100.0 (%)	34.7 (24.2)	35.4 (24.5)	**32.9** (23.1) *	31.6 (%)
Student harassment	0.00 [b]	4.93 [b]	0.11 (0.46)	0.11 (0.46)	0.11 (0.47)	0.09 (0.35)

Notes: Mean of Low-SES On-track is significantly different than mean of Low-SES Off-track at +p<.10, *p<.05.
[a] Number of teachers per 100 students. [b] Number of student harassment incidents reported per 100 students.

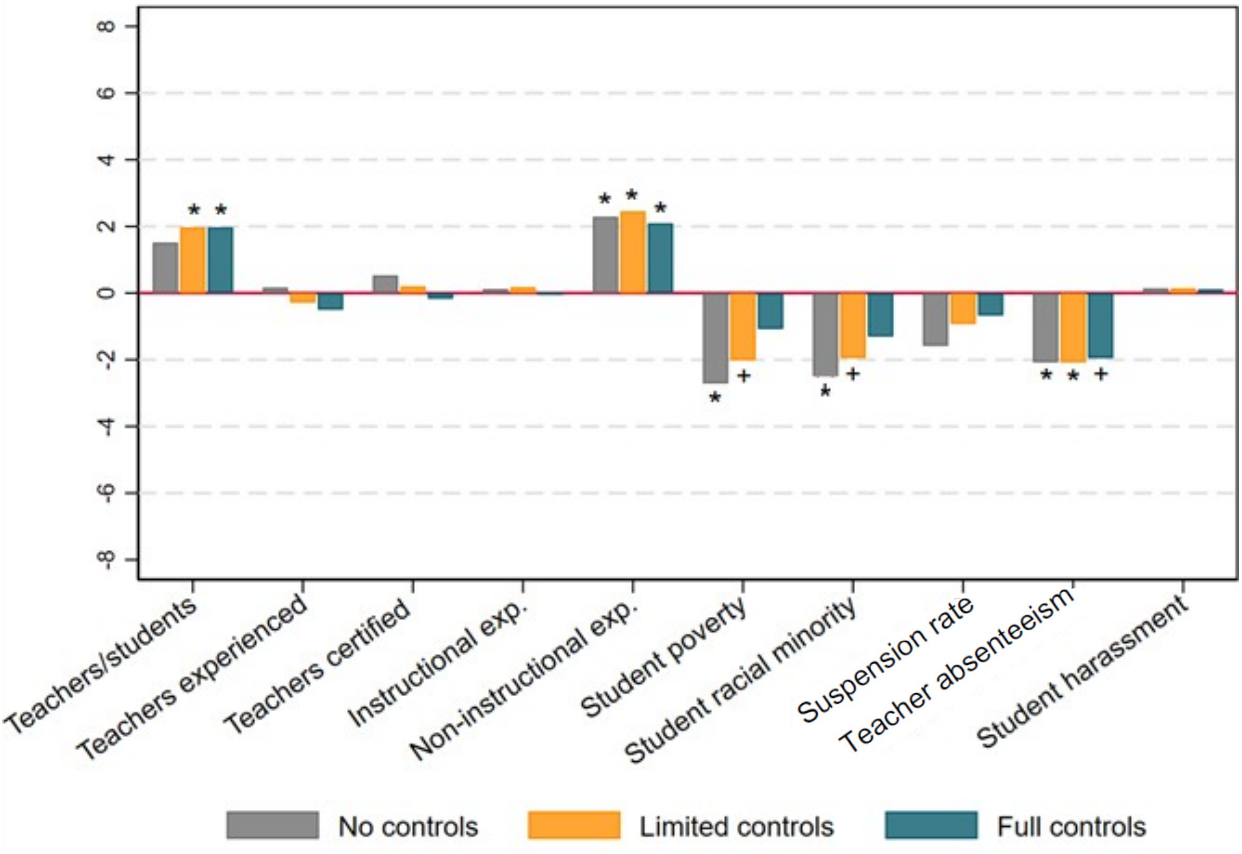
School-level Predictors of Beating the Odds

Figure 4 shows associations between low-SES children being academically on-track (i.e., beating the odds) and each of the ten school-level contexts. As before, high-SES children are excluded from these analyses. We regressed on-track at Year 15 on the standardized Year 9 school-level context using a linear probability model. For each context, three estimates are presented: no controls (bivariate association); limited controls (mother race/ethnicity and immigration status); and full controls (all variables in Table 1).

Controlling for family socio-economic characteristics, the teacher-student ratio at Year 9 is positively correlated with disadvantaged children's academic achievement at Year 15: a one standard deviation increase (1.42 teachers per 100 students) is associated with a 2 percentage point increase in the probability of beating the odds. Neither the school's proportion of teachers who are experienced nor the proportion who are certified is predictive of academic achievement. Instructional expenditures per student are not associated with beating the odds, but non-instructional expenditures are: a one standard deviation increase ($1,353 per student annually) is associated with a 2 percentage point increase in the probability of low-SES children being academically on-track.

After controlling for family characteristics, associations between measures of school composition, such as student poverty and student racial minority, and beating the odds weaken in magnitude and are no longer statistically significant. In addition, neither the school suspension rate nor the number of bullying/harassment incidents are correlated with beating the odds at conventional levels of statistical significance. However, a one standard deviation increase in the school's percentage of teachers who are absent ten or more days (~24%) is associated with a 2 percentage point decrease in the probability of low-SES children being academically on-track at Year 15. Standardized regression coefficient and standard errors for all models are shown in Appendix D.

Figure 4. Percentage Point Change in Beating the Odds for 1 Standard Deviation Change in School Context



+p<.10, * p<0.05

Neighborhood Contexts

Neighborhood-level Risk and Protective Factors

We analyzed five neighborhood-level risk factors and five neighborhood-level protective factors that previous research indicates are correlated with children's wellbeing and academic achievement. Three neighborhood protective factors and one risk factor were assessed by children's parents at the Year 9 interview: *social ties* ("How many of the families on your block would you say that you know well?"), *social cohesion* (4-item scale; e.g., "People around here are willing to help their neighbors"); *social control* (4-item scale; likelihood that neighbors would intervene if children were misbehaving), and *local violence* (5-item scale; e.g., "Have you ever been afraid to let child go outside because of violence in your neighborhood?").

Two neighborhood protective factors and three risk factors were obtained from the U.S. Census and merged to the census tract of residence at the Year 9 interview: *professional occupation* (percentage of working residents with a professional or managerial occupation), *two-parent households* (percentage of resident households with children that are headed by married couples), *poverty rate* (percentage of all residents below the federal poverty line), *housing vacancy* (percentage of housing units that are vacant), *racial minority* (percentage of non-white, non-Hispanic residents). Finally, as an indicator for local air pollution, we linked the neurological hazard score, constructed by Environmental Protect Agency for the National Air Toxins Assessment, to children's census tract at the Year 9 interview. A complete description of all neighborhood-level factors is summarized in Appendix E.

Table 7 shows the means and standard deviations of the neighborhood-level risk and protective factors by low-SES children's Year 15 academic status. As a point of reference, the means and standard deviations are also shown for high-SES children (in gray). Low-SES children who were academically on-track at Year 15 (i.e., beating the odds) resided in neighborhoods with higher levels of social ties, social cohesion, and social control than low-SES children who were academically off-track.

In addition, adolescents who were beating the odds were more likely to reside in neighborhoods with lower levels of poverty, violence and racial minority composition than children who were academically off-track. Notably, the neighborhood characteristics of high-SES children are dramatically different from the neighborhood characteristics of low-SES children, including low-SES children who are beating the odds. For example, the mean neighborhood violence score is 0.89 for low-SES children who are off-track, 0.76 for low-SES children who are on-track, and 0.31 for high-SES children.

Table 7. Neighborhood-level Factors: By Baseline SES and Year 15 Academic Status

.	Range		Mean (Standard Deviation)			
	Low	High	Low-SES			High-SES
	(description)	(description)	All	Off-track	On-track	All
Social ties	0.00 (none)	3.00 (almost all)	1.43 (1.08)	1.39 (1.08)	**1.52** (1.07) *	1.72 (1.00)
Social cohesion	0.00 (s. disagree)	3.00 (s. agree)	1.91 (0.70)	1.88 (0.70)	**1.97** (0.72) *	2.16 (0.60)
Social control	0.00 (v. unlikely)	3.00 (v. likely)	2.15 (0.90)	2.11 (0.91)	**2.23** (0.87) *	2.44 (0.70)
Professional occupation	0.0 (%)	76.9 (%)	24.8 (10.8)	24.5 (10.9)	25.4 (10.6)	36.8 (15.0)
Two-parent households	3.8 (%)	100.0 (%)	52.3 (20.7)	51.5 (20.7)	54.4 (20.5)	69.8 (19.0)
Poverty rate	0.0 (%)	78.3 (%)	21.0 (13.8)	21.4 (14.1)	20.2 (13.2) +	10.6 (10.6)
Housing vacancy	0.0 (%)	89.6 (%)	8.6 (7.1)	8.5 (6.9)	8.7 (7.5)	5.8 (6.0)
Racial minority	1.1 (%)	99.9 (%)	65.8 (31.5)	66.7 (31.3)	**63.6** (32.1) *	39.4 (33)
Local violence	0 (incidents)	5 (incidents)	0.85 (1.24)	0.89 (1.26)	**0.76** (1.2) *	0.31 (.79)
Air pollution	-0.94 (z-score)	5.23 (z-score)	0.48 (1.04)	0.49 (1.03)	0.45 (1.06)	0.12 (0.90)

Notes: Mean of Low-SES On-track is significantly different than mean of Low-SES Off-track at +p<.10, *p<.05.

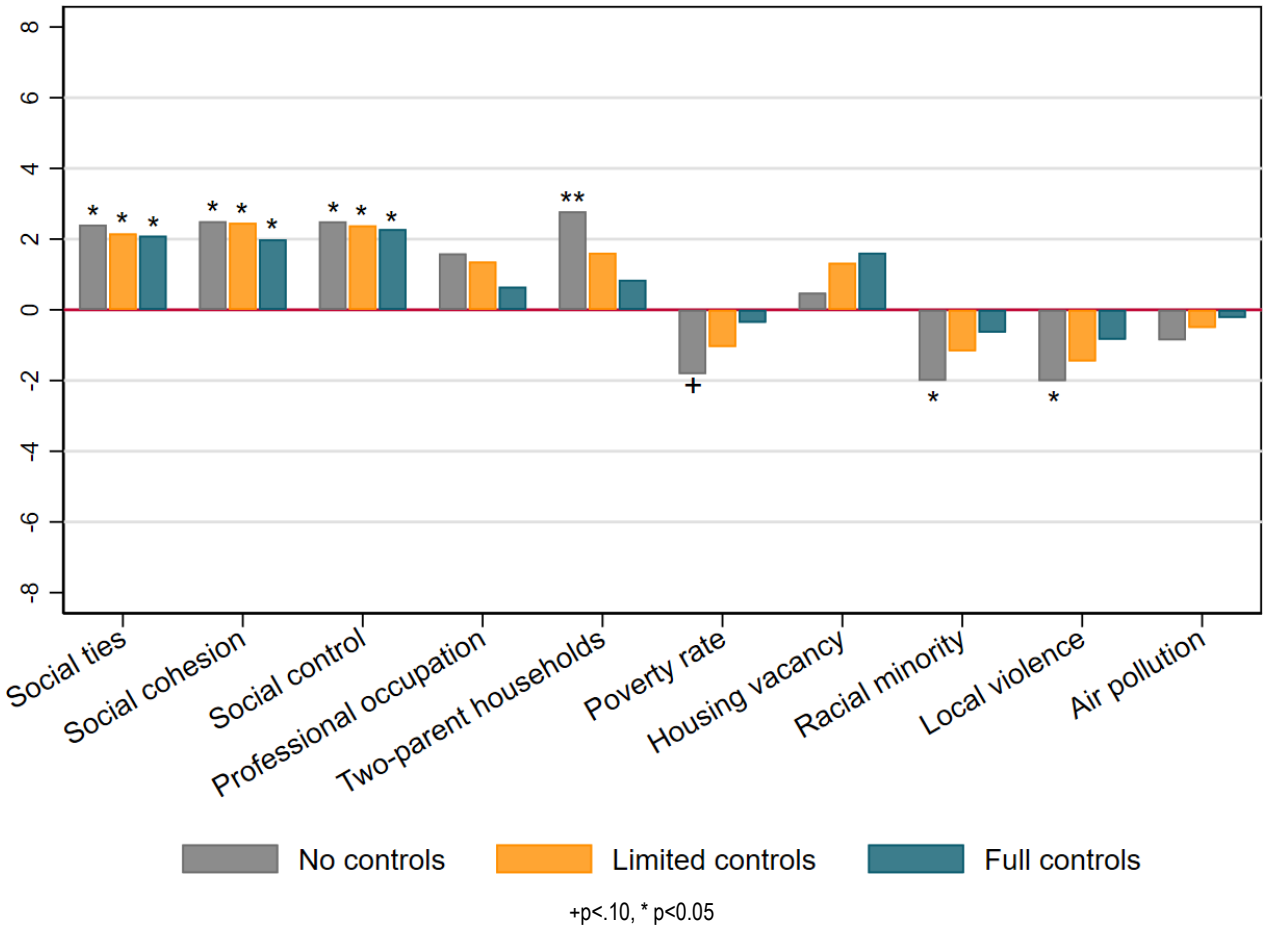
Neighborhood-level Predictors of Beating the Odds

Figure 5 shows associations between low-SES children being academically on-track (i.e., beating the odds) and each of the ten neighborhood-level contexts. We regressed on-track at Year 15 on the standardized Year 9 neighborhood-level context using a linear probability model. For each context, three estimates are presented: no controls (bivariate association); limited controls (mother race/ethnicity and immigration status); and full controls (all variables in Table 1).

Neighborhood-level social ties, social cohesion, and social control are all predictive of beating the odds. In addition, the magnitude of these associations changes little after controlling for family socio-economic and demographic characteristics. Among low-SES children, a one standard deviation increase in each of these contexts is associated with around a 2 percentage point increase in the probability of being on-track at Year 15. For example, an increase of 0.70 on the 4-point social cohesion scale (ranging from 0=strongly disagreeing with all statements about social cohesion to 3=strongly agreeing with all statements), is associated with a 2.0 percentage point increase in the probability of beating the odds, holding constant family socio-economic and demographic characteristics.

Although low-SES children who are academically on-track live in neighborhoods with more two-parent households than off-rack low-SES children, the association between two-parent households and beating the odds is not statistically significant after controlling for parent race/ethnicity and other family-level factors. For both neighborhood poverty and racial composition, bivariate associations also attenuate substantially after controlling for family characteristics. All other neighborhood-level factors are correlated with beating the odds in the expected direction; however, these associations are relatively small in magnitude and not statistically significant. Standardized regression coefficient and standard errors for all models are shown in Appendix F.

Figure 5. Percentage Point Change in Beating the Odds for 1 Standard Deviation Change in Neighborhood Context



City Contexts

City (county)-level Risk and Protective Factors

We analyzed five city-level risk factors and five city-level protective factors that prior research suggest are likely to be associated with children's academic success. All characteristics come from county-level data compiled by Raj Chetty and colleagues from the "The Impacts of Neighborhoods on Intergenerational Mobility II: County-Level Estimates" (2018). We selected ten variables that prior theory suggests would be relevant to children's success and that Chetty and colleagues found were highly correlated with low-income children's upward mobility and income in adulthood. County-level variables were merged to the county of residence at the Year 9 survey. For nearly all children in this primarily urban sample, the county boundaries approximate the city/municipal boundaries. Notable exceptions include New York City (each borough is a separate county) and children who resided in suburban areas where the county of residence may include one or more cities or towns. A complete description of all city (county)-level factors is summarized in Appendix G.

Table 8 shows the means and standard deviations of the city-level risk and protective factors by low-SES children's Year 15 academic status. As a point of reference, the means and standard deviations are also shown for high-SES children (in gray). Low-SES children who were academically on-track at Year 15 (i.e., beating the odds) lived in cities with more middle class residents and more religious adherents (46.4% and 49.4%, respectively) than did low-SES children who were academically off-track (45.9% and 47.9%, respectively). Notably, with respect to these two characteristics, the cities in which low-SES children who were beating the odds were comparable to the cities of high-SES children.

Unexpectedly, among low-SES children, the percentage of teenagers in the labor force and the social capital index were lower in cities where academically on-track children lived than in cities where academically off-track children lived. However, as expected, both of these city characteristics were substantially higher for high-SES children.

Among low-SES children, the differences between children who were beating the odds and those who were not in terms of colleges per capita, racial segregation, income inequality, violent crime, and rent for low-income households were relatively small and not statistically significant. In general, all low-SES children, regardless of their academic achievements, resided in cities that were substantially more segregated, unequal, and prone to violence than did high-SES children.

Table 8. City (county)-level Factors: By Baseline SES and Year 15 Academic Status

.	Range		Mean (Standard Deviation)			
	Low	High	Low-SES			High-SES
	(description)	(description)	All	Off-track	On-track	All
Middle class	29.6 (%)	70.7 (%)	46.0 (4.9)	45.9 (4.8)	**46.4** (5.1) *	46.2 (6.0)
Teenage labor force	21.9 (%)	70.0 (%)	46.0 (6.9)	43.3 (6.9)	**42.3** (6.9) *	44.9 (8.4)
Social capital	-3.46 (z-score)	2.40 (z-score)	-0.25 (0.93)	-0.23 (0.92)	**-0.32** (0.96) *	-0.13 (0.96)
Religious	18.9 (%)	101.2 (%)	48.3 (10.0)	47.9 (9.8)	**49.4** (10.3) *	49.5 (11.1)
Colleges per capita	0.13 [(a)]	10.86 [(a)]	1.27 (0.74)	1.26 (0.75)	1.28 (0.71)	1.27 (0.88)
Racial segregation	0.00 (Theil)	0.54 (Theil)	0.28 (0.13)	0.28 (0.13)	0.28 (0.13)	0.23 (0.13)
Income inequality	0.23 (Gini)	1.10 (Gini)	0.52 (0.11)	0.52 (0.11)	0.53 (0.12)	0.48 (0.13)
Violent crime rate	0 [(b)]	912 [(b)]	319 (209)	321 (210)	315 (205)	263 (200)
Single mother households	10.2 (%)	52.2 (%)	29.5 (10.7)	29.7 (10.7)	29.2 (10.5)	24.7 (9.8)
Rent for low-income families	135 ($/month)	1132 ($/month)	559 (171)	562 (171)	549 (172)	594 (185)

Notes: Mean of Low-SES On-track is significantly different than mean of Low SES Off-track at +p<.10, *p<.05.

[(a)] Number of Title IV, degree offering institutions per 100,000 residents. [(b)] Number of violent crimes per 100,000 residents.

City (county)-level Predictors of Beating the Odds

Figure 6 shows associations between low-SES children being academically on-track (i.e., beating the odds) and each of the ten city (county)-level contexts. We regressed on-track at Year 15 on the standardized Year 9 city-level context using a linear probability model. For each context, three estimates are presented: no controls (bivariate association); limited controls (mother race/ethnicity and immigration status); and full controls (all variables in Table 1).

Net of family socio-economic and demographic characteristics, a one standard deviation increase in the proportion of residents in the city who are middle class (around 5 percentage points) and religious adherent is associated with a 2.1 and 3.2 percentage point increase in the probability of low-SES being academically on-track at Year 15, respectively. These associations remain relatively constant and statistically significant in all three models. Controlling for family characteristics attenuates the negative association between teenage labor force participation and beating the odds, but the association remains statistically significant. The negative association between city-level social capital and academic achievement is no longer statistically significant after controlling for maternal race/ethnicity and immigration status.

The association between the cost of rent for low-income residents and low-SES children beating the odds increases after accounting for family demographic characteristics, in part because higher-income families live in higher costing cities. Controlling for family characteristics, a one standard deviation increase in the cost of rent for low-income families ($171 per month) is associated with a 2.8 percentage point reduction in the probability of low-SES children being academically on-track at Year 15. Standardized regression coefficient and standard errors for all models are shown in Appendix H.

Figure 6. Percentage Point Change in Beating the Odds for 1 Standard Deviation Change in City (County) Context

+p<.10, * p<0.05

Summary of Findings

Table 9 shows all family-, school-, neighborhood-, and city-level contexts that were examined in this report. Contexts are ordered by domain (in columns) and ranked according to their association with low-SES children's probability of beating the odds, controlling for family socio-economic and demographic characteristics.

For the family-level contexts, harsh parenting, material hardship and parenting stress are the strongest predictors of academic achievement. Low-SES children who experience lower level of harsh parenting, parenting stress and material hardships are more likely to beat the odds. Out of all the contexts examined in this study, (the absence) of harsh parenting was the strongest predictor of academic success among low-SES children: a one standard deviation increase in harsh parenting was associated with around a 5 percentage point reduction in the probability of beating the odds, holding constant family socio-economic and demographic characteristics.

At the school-level, lower levels of teacher absenteeism, higher levels of teacher/student ratios, and more non-instructional expenditures were all similarly predictive of low-SES children's chances of academic success. Around a one standard deviation change in each of these contexts was associated with a 2 percentage point change in the probability of beating the odds.

Neighborhood social control, social ties and social cohesion were all positively associated with low-SES children's chances of beating the odds. At the city-level, low-SES children who live in cities with more middle-class residents and greater religious attendance are more likely to be academically on track. High rent for low-income families is also associated with a reduction in the probability of beating the odds.

However, many hypothesized risk and protective factors at Year 9 were not associated with low-SES children's academic outcomes at Year 15 (at conventional levels of statistical significance). For example, family-level protective factors (e.g., parenting engagement, parent health) and neighborhood-level risk factors (e.g., poverty rate, local violence) were comparable between low-SES children who were academically on-track and similarly low-SES children who were academically off-track.

There are several explanations for these null associations. First, the sample size of the sub-sample may limit our ability to detect small but meaningful associations. Second, there may be measurement error in our survey-reported measures of context and academic achievement. Third, it is possible that these contexts are less salient for low-SES children; contexts that were previously demonstrated to be correlated with success among a general population of children may not be predictive of success for the most economically disadvantaged children.

Table 9. Summary of Findings

Family Contexts	School Contexts	Neighborhood Contexts	City Contexts
Harsh parenting ↓↓↓↓↓	Non-instructional expenditures ↑↑	Social control ↑↑	Religious ↑↑↑
Material hardship ↓↓↓↓	Teacher-student ratio ↑↑	Social ties ↑↑	Rent for low-income families ↓↓↓
Parenting stress ↓↓↓	Teacher absenteeism ↓↓	Social cohesion ↑↑	Teenage labor force ↓↓
Social support	Racial minority	Two-parent households	Middle class ↑↑
Parenting engagement	Poverty	Housing vacancy	Income inequality
Religiosity	School suspension rate	Local violence	Colleges per capita
Parent health	Teachers experienced	Professional occupation	Social capital index
Two-parent household	Teachers certified	Racial minority	Single mother households
Residential mobility	Student harassment	Poverty rate	Racial segregation
Domestic violence	Instructional expenditures	Air pollution	Violent crime rate

Notes. ↑ / ↓ = 1 standard deviation increase in context associated with 1 percentage point increase / decrease in beating the odds (rounded to nearest percentage point), controlling for all family characteristics shown in Table 1.

Policy Implications

None of the associations described in the previous sections were based on causal models, and therefore we must be careful in drawing policy implications. That said, our findings are useful for identifying children at risk of not being on-track in school. Some of these predictors were consistent with a good deal of prior research. Others were unexpected and merit further investigation to determine if they are causal and, if so, through which specific mechanisms they operate.

Regarding family characteristics, the strongest predictors of school success or failure were harsh parenting, material hardship and parental stress, which are consistent with prior research. In contrast, other indicators that we expected to be strong predictors – parental health and engagement, living with both biological parents and religiosity – were not statistically significant once we adjusted for race/ethnicity, immigrant status and family socio-economic status.

Regarding school-level characteristics, teacher-student ratios, non-instructional expenditures and teacher absenteeism were the strongest predictors of being on-track. Whereas teacher/student ratios have received a great deal of attention, the importance of non-instructional expenditures and teacher absenteeism are less well documented and understood. If the latter two predictors turn out to be causal, this finding could have important policy implications since school expenditures and teacher absenteeism should be amenable to policy change.

Regarding neighborhood-level predictors, the most significant predictors of being on-track were parents' reports of neighborhood social ties, social cohesion and social control. Each of these predictors remained statistically significant after adjusting for controls. This finding is consistent with prior research on the role of neighborhood social capital in promoting school success. Unfortunately, although we know that social capital is important, we know much less about how to produce it. Note that neighborhood-level characteristics, such as poverty rates, fear of violence and the prevalence of two-parent families, were not significant predictors after controlling for individual characteristics.

Finally, regarding city/county-level predictors, four indicators were associated with being on-track: high levels of middle-class families and church attendance were positively associated with school success, whereas high rates of teenage labor-force participation and high housing costs were negatively associated with success. These findings provide additional support for the importance of housing assistance in the lives of children from low-income families.

References

Borman, G. D., & Overman, L. T. (2004). Academic resilience in mathematics among poor and minority students. *The Elementary School Journal*, *104*(3), 177-195.

Catsambis, S., & Beveridge, A. A. (2001). Does neighborhood matter? Family, neighborhood, and school influences on eighth-grade mathematics achievement. *Sociological Focus*, *34*(4), 435-457.

Chetty, R., & Hendren, N. (2018). The impacts of neighborhoods on intergenerational mobility II: County-level estimates. *The Quarterly Journal of Economics*, *133*(3), 1163-1228.

Crosnoe, R., Leventhal, T., Wirth, R. J., Pierce, K. M., Pianta, R. C., & NICHD Early Child Care Research Network. (2010). Family socioeconomic status and consistent environmental stimulation in early childhood. *Child development*, *81*(3), 972-987.

Duncan, G. J., & Murnane, R. J. (Eds.). (2011). *Whither opportunity?: Rising inequality, schools, and children's life chances*. Russell Sage Foundation.

Eccles, J. S. (2005). Influences of parents' education on their children's educational attainments: The role of parent and child perceptions. *London review of education*, *3*(3), 191-204

Erberber, E., Stephens, M., Mamedova, S., Ferguson, S., & Kroeger, T. (2015). Socioeconomically Disadvantaged Students Who Are Academically Successful: Examining Academic Resilience Cross-Nationally. Policy Brief No. 5. *International Association for the Evaluation of Educational Achievement*.

Williams, J. M., Bryan, J., Morrison, S., & Scott, T. R. (2017). Protective factors and processes contributing to the academic success of students living in poverty: Implications for counselors. *Journal of Multicultural Counseling and Development*, *45*(3), 183-200.

Appendix A. Description of Family-level Contextual Variables

Measure	Source	Units	Description	N Missing (%)
Parent health	FFCWS Survey (Year 9)	Single-item scale score Range=0-4	Parent response: "In general, how is your health?" 0=poor, 1=fair, 2=good, 3=very good, 4=excellent.	32 (1.4%)
Social support	FFCWS Survey (Year 9)	6-item scale score (sum) Range=0-6	Parent response: "If you needed help during the next year, could you count on someone to: (1) Loan you $200? (2) Loan you $1,000? (3) Provide you with a place to live? (4) Help you with emergency child care? (5) Co-sign for a bank loan with you for $1,000? (6) Co-sign for $5,000?" 0=no, 1=yes. Scale score=sum of 6 responses.	119 (5.3%) [1, 2]
Religiosity	FFCWS Survey (Year 9)	Single-item scale score Range=0-6	Parent response: "How often do you attend religious services?" 0=never, 1=less often than that; 2=a few times a year; 3=a few times a month; 4=once a week; 5=a few times a week; 6=every day.	123 (5.5%) [2]
Parenting engagement	FFCWS Survey (Year 9)	8-item scale score (average) Range=0-4	Parent response: "How often did you do this with {child} in the past month: (1) Do dishes, prepare food, or do other household chores together? (2) Play sports or do outdoor activities together? (3) Read books with {child} or talk with {him/her} about books {he/she} reads? (4) Participate in indoor activities together such as arts and crafts or board games? (5) Talk with {child} about current events, like things going on in the news? (6) Talk with {child} about {his/her} day? (7) Check to make sure the {child} has completed {his/her} homework? (8) Help {child} with homework or school assignments?" 0=not once, 1=one to two times, 2=once a week, 3=several times a week; 4=every day. Scale score=average of 8 responses.	3 (<1%) [3]
Two-parent household	FFCWS Survey (Baseline; Year 1, 3, 5, 9)	Years Range=0-9	Total years in which the child lived with both biological parents from birth to the Year 9 survey constructed from parents' responses to questions about current living arrangements. A two-parent household is defined as a household in which the child is living with both biological parents, irrespective of the parents' marital status. Changes in two-parent household status between waves is assumed to have occurred at the midpoint between waves.	36 (1.6%)
Parenting stress	FFCWS Survey (Year 9)	4-item scale score (average) Range=0-3	Parent response: "I'm going to read some statements about being a parent to {CHILD}. Please tell me how much you agree or disagree with each statement: (1) Being a parent is harder than I thought; (2) I feel trapped by parental responsibilities; (3) Taking care of children more work than pleasure; (4) I Feel tired and worn out from raising family" 0=strongly disagree, 1=somewhat agree, 2=somewhat disagree, 3=strongly disagree. Scale score=average of 4 responses.	8 (<1%) [2]
Harsh parenting	FFCWS Survey (Year 9)	9-item scale score (average) Range=0-6	Parent response: "We would like to know what you have done when {child} did something wrong or made you upset or angry: For each item record whether you have done this once in the past year (1) Shouted, yelled, or screamed at {child}; (2) Threatened to spank or hit him or her but did not actually do it; (3) Called him or her dumb or lazy or some other name like that; (4) Said you would send him or her away or would kick him or her out of the house; (5) Spanked him or her on the bottom with your bare hand; (6) Hit him or her on the bottom with something like a belt, hairbrush, a stick or some other hard object; (7) Slapped him or her on the hand, arm, or leg; (8) Pinched him or her; (9) Shook {child}" 0=this has never happened or not in the past year, 1=once, 2=twice,	134 (6.0%) [2, 4]

			3=3-5 times, 4=6-10 times 5=11-20 times, 6=more than 20 times. Scale score=average of 9 responses.	
Domestic violence	FFCWS Survey (Year 9)	8-item scale score (sum) Range=0-8	Mother response: "Does {child's father/current partner} behave this way often, sometimes, or never? (1) He tries to keep you from seeing or talking with your friends or family; (2) He tries to prevent you from going to work or school; (3) He withholds money, makes you ask for money, or takes your money; (4) He slaps or kicks you; (5) He hits you with a fist or an object that could hurt you; (6) He tries to make you have sex or do sexual things you don't want to do" 0=never, 1=sometimes or often. (7) "Have you and {child's father/current partner} had a physical fight in front of {child} in the last year?" 0=no, 1=yes. (8) "Have you been seriously hurt in a fight with {child's father/current partner} in the last 12 months?" 0=no, 1=yes. Scale score=sum of 8 responses.	121 (5.3%) [5]
Material hardship	FFCWS Survey (Year 9)	9-item scale score (sum) Range=0-9	Parent response: "In the past twelve months, did you do any of the following because there wasn't enough money? (1) Did you receive free food or meals? (2) Were you ever hungry, but didn't eat because you couldn't afford enough food; (3) Did you not pay the full amount of rent or mortgage payments? (4) Were you evicted from your home or apartment for not paying the rent or mortgage? (5) Did you not pay the full amount of a gas, oil, or electricity bill? (6) Was your gas or electric service ever turned off, or the heating oil company did not deliver oil, because there wasn't enough money to pay the bills? (7) Did you stay at a shelter, in an abandoned building, an automobile or any other place not meant for regular housing, even for one night? (8) Was there anyone in your household who needed to see a doctor or go to the hospital but couldn't go because of the cost? (9) Was your telephone service ever disconnected by the telephone company?" 0=no, 1=yes. Scale score=sum of 9 responses.	132 (5.9%) [2]
Residential mobility	FFCWS Survey (Year 1, 3, 5, 9)	Residential moves Range=0-22	Total residential movies from birth to the Year 9 survey constructed from parents' responses to questions about residential mobility. At each wave, parents were asked: "Have you moved since {date of last interview}? How many times have you moved since {date of last interview}?"	134 (6.0%) [2]

Notes: Numbers and percentages are reported for the analytic sample of low-SES children (N=2,236). All survey measures are reported by the child's primary caregiver unless noted otherwise. For the purposes of these analyses, the child's primary caregiver is: the biological mother if the mother lives with the child at least half of the time; the biological father if the father lives with the child at least half the time and the biological mother does not; the non-parental caregiver if neither the biological mother nor biological father lives with the child at least half the time.

[1] Missing social support items because of item-specific non-response (e.g., parent did not know or refused to answer) were assumed 0=no (parent could not count on someone for support).

[2] Survey question(s) were only asked of children's biological parents. Therefore, no data are available for children with non-parental caregivers. Children with non-parental caregivers were coded as missing.

[3] Scale constructed based on available (non-missing) survey items. Cases with more than half the survey items missing were coded to missing.

[4] Survey question(s) were asked during the Year 9 Primary Caregiver Self-Administered Questionnaire. Around 5% of the analytic sample did not participate in the Year 9 Primary Caregiver Self-Administered Questionnaire.

[5] Domestic violence questions asked of mothers only in relation to child's biological father and current domestic partner. Children who do not live with their mothers were coded as missing.

Appendix B. Linear probability model regressions of On-Track on Standardized Family-Level Contexts among Low-SES Sample

Measure	N	Model 1	Model 2	Model 3
Parent health	2204	0.00970 (0.00959)	0.00951 (0.00955)	0.00961 (0.00959)
Social support	2117	0.0213* (0.00982)	0.0186+ (0.00982)	0.0128 (0.00988)
Religiosity	2113	0.0140 (0.00984	0.0165 (0.0100)	0.0120 (0.0101)
Parenting engagement	2233	0.00685 (0.00954)	0.0130 (0.00967)	0.0123 (0.00964)
Two-parent household	2200	0.0284** (0.00958)	0.0181+ (0.0101)	0.00846 (0.0105)
Parenting stress	2228	-0.0321*** (0.00952)	-0.0294** (0.00955)	-0.0254** (0.00952)
Harsh parenting	2102	-0.0534*** (0.00974)	-0.0483*** (0.00990)	-0.0502*** (0.00991)
Domestic violence	2115	-0.00355 (0.00983)	-0.00579 (0.00982)	-0.00885 (0.00980)
Material hardship	2104	-0.0369*** (0.00983)	-0.0360*** (0.00987)	-0.0359*** (0.00982)
Residential mobility	2102	-0.0138 (0.00986)	-0.0125 (0.00993)	-0.00767 (0.0101)

Notes: The sample is limited to children identified as low-SES at baseline, which is defined as follows: neither of their parents reported having earned a college degree at the baseline interview and the mean household income-to-needs ratio reported at the baseline and 1-year follow-up interview was below 200% of the federal poverty line. All contexts are standardized to a mean of zero and standard deviation of 1 within the analytic sample. Standard errors are in parentheses; + p<.10, * p<0.05, ** p<0.01, *** p<0.001.

Appendix C. Description of School-level Contextual Variables

Measure	Source	Units	Description	N Missing (%)
Teacher-student ratio	NCES Common Core (2009-2010)	Teachers per 100 students	The number of full-time equivalent teachers in the school per 100 students in the school. Data reported by the National Center for Education Statistics (NCES) Common Core Data on Schools in the 2009 to 2010 school year.	193 (8.6%)
Teachers experienced	Civil Rights Data Collection (CRDC; 2009-2012) [1]	Percentage of teachers	The percent of full-time equivalent teachers in the school with two or more years of teaching experience. CRDC includes teaching in any school, subject, or grade (it does not have to be in the school, subject, or grade that the teacher is presently teaching), but excludes student teaching or other similar preparation experiences. Administrators report the number of teachers who are in their first and second year of teaching. The number of teachers in the school with two or more years of teaching experience is calculated by subtracting the number of teachers in their first and second year from the total number of teachers.	281 (12.6%)
Teachers certified	Civil Rights Data Collection (CRDC; 2009-2012) [1]	Percentage of teachers	The percent of full-time equivalent teachers in the school who have met all applicable state teacher certification requirements for a standard certificate—i.e., has a regular/standard certificate/license/endorsement issued by the state. A beginning teacher who has met the standard teacher education requirements is considered to meet state requirements even if he or she has not completed a state-required probationary period. A teacher with an emergency, temporary, or provisional credential is not considered to meet state requirements.	281 (12.6%)
Instructional expenditures	Civil Rights Data Collection (CRDC; 2009-2012) [1]	Expenditure per student	The amount of salaries for teachers and instructional staff.	305 (13.6%)
Non-instructional expenditures	Civil Rights Data Collection (CRDC; 2009-2012) [1]	Expenditure per student	The amount of all other expenditures.	300 (13.4%)
Poverty	NCES Common Core (2009-2010)	Percentage of students	The percent of students in the school who are eligible for free lunch under the National School Lunch Program (children in households with incomes at or below 130 percent of the federal poverty level).	266 (11.9%)
Racial minority	NCES Common Core (2009-2010)	Percentage of students	The percent of students in the school who are not Non-Hispanic white.	186 (8.3%)
School suspension rate	Civil Rights Data Collection (CRDC; 2009-2012) [1]	Percentage of students	The percent of students in the school who received at least one out-of-school suspension in the past year. CRDC defines out-of-school suspensions as excluding a student from school for disciplinary reasons for one school day or longer. This does not include students who served their suspension in the school. The school suspension rate was calculated as the number of students suspended divided by the number of students enrolled.[2]	281 (12.6%)
Teacher absenteeism	Civil Rights Data Collection (CRDC; 2009-2012) [1]	Percentage of teachers	The percent of full time equivalent teachers in the school who were absent more than ten days in the past school year. CRDC considers a teacher absent if he or she is not in attendance on a day in the regular school year when the teacher would otherwise be expected to be teaching students in an assigned class. This includes both days taken	281 (12.6%)

			for sick leave and days taken for personal leave. Personal leave includes voluntary absences for reasons other than sick leave. This does not include administratively approved leave for professional development, field trips or other off-campus activities with students.	
Student harassment	Civil Rights Data Collection (CRDC; 2009-2012) [1]	Number of incidents per 100 students	The number of incidents on the basis of sex, race, or disability status per 100 students.	285 (12.7%)

Notes: Numbers and percentages are reported for the analytic sample of low-SES children (N=2,236). Data on private schools were not available from the NCES Common Core and the Civil Rights Data Collection. Children who attended private schools and children whose school attendance could not be determined at the Year 9 Survey were coded as missing and excluded from all school-level analyses.

[1] Data from the 2009-2010 Civil Rights Data Collection series was used if available; if not available, data from the 2011-2012 Civil Rights Data Collection series was used.

[2] Data from the CRDC on student enrollment and school suspensions is reported by gender and disability status. In addition, CRDC adopts rounding procedures to protect student privacy. For these reasons, the calculated number of students enrolled and suspended in the school is an approximation, not necessarily an exact value, of the true number of students enrolled and suspended in the school.

Appendix D. Linear probability model regressions of On-Track on Standardized School-Level Contexts among Low-SES Sample

Measure	N	Model 1	Model 2	Model 3
Teacher-student ratio	2043	0.0151 (0.00993)	0.0197* (0.00996)	0.0197* (0.00992)
Teachers experienced	1955	0.00164 (0.0101)	-0.00286 (0.0102)	-0.00500 (0.0102)
Teachers certified	1955	0.00527 (0.0101)	0.00201 (0.0102)	-0.00169 (0.0102)
Instructional expenditures	1931	0.00120 (0.0102)	0.00176 (0.0102)	-0.000369 (0.0102)
Non-instructional expenditures	1936	0.0229* (0.0102)	0.0245* (0.0102)	0.0209* (0.0102)
Poverty	1970	-0.0271** (0.0101)	-0.0201+ (0.0106)	-0.0108 (0.0108)
Racial minority	2050	-0.0255* (0.00990)	-0.0195+ (0.0115)	-0.0131 (0.0115)
School suspension rate	1955	-0.0158 (0.0101)	-0.00929 (0.0104)	-0.00673 (0.0104)
Teacher absenteeism	1955	-0.0208* (0.0101)	-0.0208* (0.0102)	-0.0195+ (0.0101)
Student harassment	1951	0.00138 (0.0102)	0.00137 (0.0102)	0.00111 (0.0101)

Notes: The sample is limited to children identified as low-SES at baseline, which is defined as follows: neither of their parents reported having earned a college degree at the baseline interview and the mean household income-to-needs ratio reported at the baseline and 1-year follow-up interview was below 200% of the federal poverty line. All contexts are standardized to a mean of zero and standard deviation of 1 within the analytic sample. Standard errors are in parentheses; + p<.10, * p<0.05, ** p<0.01, *** p<0.001.

Appendix E. Description of Neighborhood-level Contextual Variables

Measure	Source	Units	Description	N Missing (%)
Social ties	FFCWS Survey (Year 9)	Single-item scale score Range=0-3	Parent response: "How many of the families on your block would you say that you know well?" 0=none, 1=very few, 2=some, 3=most or almost all.	9 (<1%)
Social cohesion	FFCWS Survey (Year 9)	4-item scale score Range=0-3	Parent response indicating level of agreement to: "(1) People around here are willing to help their neighbors; (2) this is a close-knit neighborhood; (3) people in this neighborhood generally don't get along with each other; (4) people in this neighborhood do not share the same values" 0=strongly disagree, 1=disagree, 2=agree, 3=strongly disagree. Items (3) and (4) reverse coded. Scale score=average of 4 responses.	146 (6.5%) [1]
Social control	FFCWS Survey (Year 9)	4-item scale score Range=0-3	Parent response: "For each item I read, please tell me how likely it would be for your neighbors to do something or get involved: (1) if children were skipping school and hanging out on the street; (2) if children were spray painting buildings with graffiti; (3) if children were showing disrespect to an adult; (4) if a fight broke out in front of the house or building." 0=very unlikely, 1=not very likely, 2=somewhat likely, 3=very likely. Scale score=average of 4 responses.	87 (3.9%) [1]
Professional occupation	Decennial Census (2000)	Percentage of residents	Percentage of residents in managerial or professional occupation groups.	122 (5.5%)
Two-parent households	Decennial Census (2000)	Percentage of households	Percentage of resident households with children that are headed by married couples.	122 (5.5%)
Poverty rate	Decennial Census (2000)	Percentage of residents	Percentage of all residents below the federal poverty line.	122 (5.5%)
Housing vacancy	Decennial Census (2000)	Percentage of housing units	Percentage of housing units that are vacant.	122 (5.5%)
Racial minority	Decennial Census (2000)	Percentage of residents	Percentage of non-white, non-Hispanic residents.	122 (5.5%)
Local violence	FFCWS Survey (Year 9)	5-item scale score Range=0-5	Parent response to: (1) " Have you ever been afraid to let {child} go outside because of violence in your neighborhood?" 0=no, 1=yes; (2) "Gangs are a problem in this neighborhood." 0=disagree, 1=agree; (3) "In the past year, about how many times did you see someone else get hit, slapped, punched, or beaten up by someone?" 0=never, 1=ever; (4) "…get attacked by someone with a weapon like a knife or bat?" 0=never, 1=ever; (5) "…get shot at by someone?" 0=never, 1=ever. Scale score=total of 5 responses.	10 (<1%)
Air pollution	National Air Toxics Assessment, US EPA (2005)	Standardized hazard score (national mean=0, standard deviation=1)	Census tract-level neurological hazard estimates from National Air Toxics Assessment. This measure sums the estimated hazards from airborne toxic substances with known consequences on neurological function and development. The Hazard estimates are standardized to a mean of 0 and standard deviation (SD) of 1 across all U.S. census tracts.	122 (5.5%)

Notes: Numbers and percentages are reported for the analytic sample of low-SES children (N=2,236). All survey measures are reported by the child's primary caregiver unless noted otherwise. For the purposes of these analyses, the child's primary caregiver is: the biological mother if the mother lives with the child at least half of the time; the biological father if the father lives with the child at least half the time and the biological mother does not; the non-parental caregiver if neither the biological mother nor biological father lives with the child at least half the time.

[1] Scale constructed based on available (non-missing) survey items. Cases with half or more of the survey items missing were coded to missing.

Appendix F. Linear probability model regressions of On-Track on Standardized Neighborhood-Level Contexts among Low-SES Sample

Measure	N	Model 1	Model 2	Model 3
Social ties	2227	0.0241* (0.00953)	0.0216* (0.00954)	0.0210* (0.00950)
Social cohesion	2090	0.0251* (0.00984)	0.0246* (0.00981)	0.0199* (0.00979)
Social control	2149	0.0250* (0.00971)	0.0239* (0.00972)	0.0228* (0.00966)
Professional occupation	2114	0.0159 (0.00983)	0.0137 (0.00984)	0.00653 (0.00992)
Two-parent households	2114	0.0278** (0.00981)	0.0162 (0.0112)	0.0162 (0.0113)
Poverty rate	2114	-0.0182 (0.00982)	-0.0105 (0.0101)	-0.00367 (0.0102)
Housing vacancy	2114	0.00485 (0.00983)	0.0133 (0.0100)	0.0162 (0.00999)
Racial minority	2114	-0.0201* (0.00982)	-0.0118 (0.0110)	-0.00648 (0.0110)
Local violence	2226	-0.0202* (0.00954)	-0.0146 (0.00965)	-0.00845 (0.00969)
Air pollution	2114	-0.00863 (0.00983)	-0.00512 (0.0100)	-0.00229 (0.0100)

Notes: The sample is limited to children identified as low-SES at baseline, which is defined as follows: neither of their parents reported having earned a college degree at the baseline interview and the mean household income-to-needs ratio reported at the baseline and 1-year follow-up interview was below 200% of the federal poverty line. All contexts are standardized to a mean of zero and standard deviation of 1 within the analytic sample. Standard errors are in parentheses; + p<.10, * p<0.05, ** p<0.01, *** p<0.001.

Appendix G. Description of City (county)-level Contextual Variables

Measure	Source	Units	Description	N Missing (%)
Middle class	Tax Records, Core Sample (Chetty, 2014)	Percentage of parents	Percentage of parents (in the core sample) whose income falls between the 25th and 75th percentile of the national parent income distribution.	155 (6.9%)
Teenage labor force	Tax Records, Extended Sample (Chetty, 2014)	Percentage of children ages 14-16	Percentage of children in birth cohorts 1985-1987 who received a W2 (i.e. had positive wage earnings) in any of the tax years when they were age 14-16.	155 (6.9%)
Social capital	Rupasingha and Goetz (2008)	Standardized index: national mean=0, standard deviation=1	Standardized index combining measures of voter turnout rates, the fraction of people who return their census forms, and measures of participation in community organizations.	155 (6.9%)
Religious	Association of Religion Data Archives	Percentage of residents	Percentage of residents who are religious adherents.	155 (6.9%)
Colleges per capita	Integrated Postsecondary Education Data System (2000)	Colleges per 100,000 residents	Number of Title IV, degree offering institutions per capita.	286 (12.7%)
Racial segregation	Decennial Census (2000)	Theil index	Multi-group Theil Index calculated at the census-tract level over four groups: White alone, Black alone, Hispanic, and Other.	155 (6.9%)
Income inequality	Tax Records, Core Sample (Chetty, 2014)	Gini coefficient	Gini coefficient computed using parents of children in the core sample, with income top coded at $100 million in 2012 dollars.	155 (6.9%)
Violent crime rate	FBI Uniform Crime Reports	Violent crimes per 100,000 residents.	Number of arrests for serious violent crimes per capita.	214 (9.6%)
Single mother households	Decennial Census (2000)	Percentage of households	Number of single female households with children divided by total number of households with children.	155 (6.9%)
Rent for low-income families	Decennial Census (2000)	Median rent	Median rent for households below median household income.	155 (6.9%)

Notes: Numbers and percentages are reported for the analytic sample of low-SES children (N=2,236). All data and data descriptions come from Chetty and Hendren's (2018) "The Impacts of Neighborhoods on Intergenerational Mobility II: County-Level Estimates".

Appendix H. Linear probability model regressions of On-Track on Standardized City (county)-Level Contexts among Low-SES Sample

Measure	N	Model 1	Model 2	Model 3
Middle class	2081	0.0213* (0.00993)	0.0215* (0.0103)	0.0208* (0.0103)
Teenage labor force	2081	-0.0308** (0.00991)	-0.0267* (0.0107)	-0.0246* (0.0106)
Social capital	2081	-0.0207* (0.00993)	-0.0156 (0.0103)	-0.0104 (0.0103)
Religious	2081	0.0323** (0.00991)	0.0329** (0.0100)	0.0294** (0.0100)
Colleges per capita	1950	0.0054 (0.0102)	0.0081 (0.0104)	0.0104 (0.0103)
Racial segregation	2081	-0.0076 (0.00994)	0.0051 (0.0108)	0.0070 (0.0107)
Income inequality	2081	0.0102 (0.00993)	0.0144 (0.0101)	0.0149 (0.0101)
Violent crime rate	2022	-0.0060 (0.0101)	-0.0017 (0.0103)	0.00071 (0.0103)
Single mother households	2081	-0.0087 (0.00994)	0.0038 (0.0107)	0.00886 (0.0107)
Rent for low-income families	2081	-0.0153 (0.00993)	-0.0279** (0.0106)	-0.0275** (0.0106)

Notes: The sample is limited to children identified as low-SES at baseline, which is defined as follows: neither of their parents reported having earned a college degree at the baseline interview and the mean household income-to-needs ratio reported at the baseline and 1-year follow-up interview was below 200% of the federal poverty line. All contexts are standardized to a mean of zero and standard deviation of 1 within the analytic sample. Standard errors are in parentheses; + p<.10, * p<0.05, ** p<0.01, *** p<0.001.