

Virginia Teacher Salaries, A Policy Brief*

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The Bottom Line

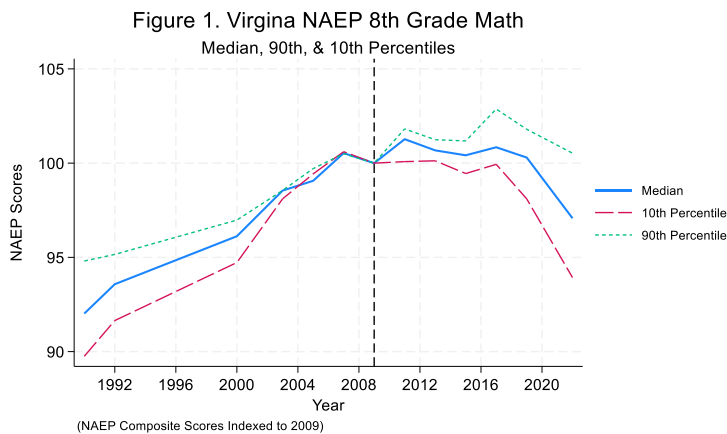
- ✓ Some Virginia elementary and secondary schools are experiencing high levels of unfilled K-12 teaching positions, out-of-field teaching, and provisionally licensed teachers.
- ✓ At the same time, academic achievement in these schools has dramatically declined.
- ✓ Improving the supply of effective teachers would address both issues, yet average starting salaries for Virginia teachers were more than \$4000 lower in inflation adjusted terms in 2022-23 than in 2007-08.
- ✓ Substantially improved salaries for teachers in high poverty schools and shortage subjects, such as special education, math and science would go a long way to addressing staffing shortages and declining student achievement.

Background

Virginia, like many states, is experiencing substantial numbers of teacher vacancies. Unfilled teaching positions have existed in Virginia and elsewhere for decades, although recent events have increased shortages in many schools.¹ Schools with high rates of unfilled positions, out-of-field teaching, provisionally licensed teachers, and high teacher turnover rates, are signals of a

shortage of effective teachers, a more pervasive, but more difficult to detect, problem. Research has consistently shown that some schools (those which disproportionately educate poor, Black and Latino students) and some subjects (typically special education, math, and science), are more likely to suffer from shortages of effective teachers,² patterns we find in Virginia. At the same time, students in many Virginia schools are failing to achieve even relatively low levels of proficiency and on average Virginia

students have experienced some of the largest learning losses of any state.³ Results from the National Assessment of Educational Progress (NAEP) show widespread, pandemic-induced learning losses between 2019 and 2022 (Figure 1). Decreased achievement is greatest for the lowest performing students and continues a trend that began in 2008.⁴ Results from Virginia's



* This brief builds on a policy memo written for the Virginia SB 1215 Work Group on Competitive Teacher Pay (Goldhaber, Hanushek, Kane & Wyckoff, 2023). Asta Jorgensen, Zoe Jenkins, and Isa Sheridan provided excellent research assistance. Thanks to Brendan Bartanen, Hamp Lankford, Luke Miller, Jim Soland, and participants at the EdPolicyWorks Lab for helpful comments.

¹ See Nguyen, Lam & Bruno (2022)

² Allensworth et al., 2009; Betts et al., 2000; Clotfelter et al., 2007; Goldhaber et al., 2015; Greenberg & McCall, 1974; Hanushek et al., 2004; Kershaw & McKean, 1962; Lankford et al., 2002.

³ Based on changes in NAEP scores between 2019 and 2022. Changes in SOL scores show similar results.

⁴ Similar patterns are found for NAEP 4th grade math and reading and 8th grade reading.

SOL exams show similar patterns and indicate that schools with concentrations of poor students fared worst (see Appendix Figure A1).

This policy brief examines how measures of teacher qualifications vary across Virginia elementary and secondary schools, how teachers’ salaries vary across school divisions⁵ and over time, and the relationship between salaries and teacher qualifications. Based on these analyses, the brief concludes with a proposal for school and subject specific teacher salary increases.

Virginia Teacher Shortages

In fall 2022, 3.8 percent of teacher positions in Virginia schools were unfilled, a vacancy rate like many other states.⁶ However, vacancy rates varied widely across schools. Forty percent of schools reported no unfilled positions, and 80 percent of all vacant positions were in the 20 percent of schools with the greatest number of vacancies. Measures of less qualified teachers were much more likely in schools with concentrations of poor students. Schools in the top twenty five percent of rates of poor students had more than three times as many unfilled positions as those in the bottom twenty five percent, about two and half times as many out-of-field teachers, and about twice as many provisionally licensed teachers (Table 1). These high poverty schools had SOL failure rates more than two and half times as great as the low poverty schools. In short, high poverty schools have much lower teacher quality as signaled by their substantially greater rates of less qualified teachers. Yet these are the schools most in need of quality teaching as demonstrated by SOL failure rates.

Table 1. Teacher, Student and School Attributes by Quartile of Elementary and Middle School-level Percent Economic Disadvantage

Quartiles of School Economic Disadvantage %	Unfilled teaching vacancies %	Provisional licenses %	Out of Field %	Less than 1 Year Experience (%)	Fail SOL		Econ disadvantage %	Black %	Hispanic %
					Math %	Reading %			
Least	2.0	5.7	2.8	4.2	18.3	16.7	15.4	8.7	11.1
2	2.9	7.3	4.2	5.4	30.6	28.1	36.5	16.4	16.1
3	3.9	8.1	5.5	6.5	37.0	34.4	48.5	19.5	18.9
Most	6.5	11.0	7.3	6.4	46.7	42.5	67.0	39.4	19.4

Note: See Appendix Table A1 for a summary of variables and their sources.

Teacher shortages are not just a problem in high poverty schools, schools with lower levels of poverty experience shortages in particular subjects too. For example, while vacancy rates average 3.8 percent, 6.0 percent of special education positions were unfilled in fall 2022.

While important differences exist between school divisions, about 60 percent of the differences in unfilled positions result from differences between schools within school divisions. For example, among elementary schools in the same school division, those with higher concentrations of poor students have more than twice as many teacher vacancies, more than 80 percent more out-of-field teachers, and nearly 60 percent more provisionally licensed teachers (Table 2). The high poverty schools experience SOL failure rates that are nearly twice as high as the low poverty schools in the same district. Greater differences result for urban elementary schools (Appendix Table A2). These shortages reflect an insufficient supply of effective teachers. This issue is worse in some divisions than others, and importantly, far worse in some schools within divisions than others. Teacher supply is influenced by many factors. Prominent

⁵ Virginia refers to school districts as school divisions.

⁶ Nguyen, Lam & Bruno (2022)

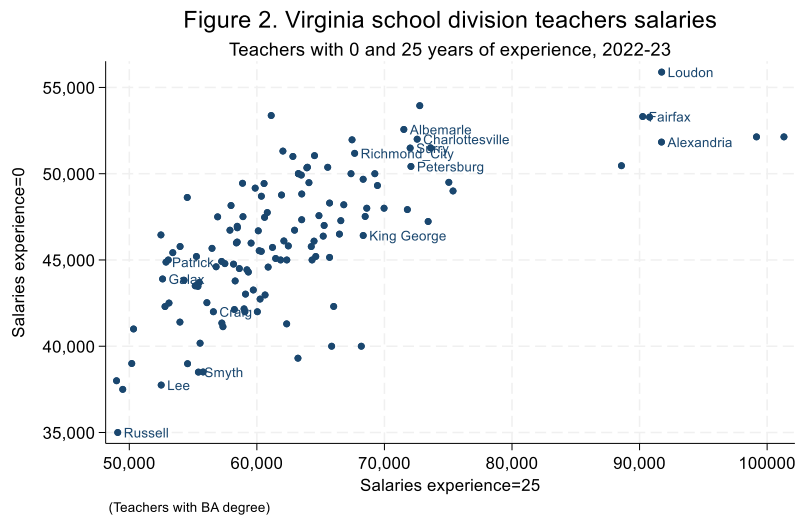
among these is teacher compensation.⁷ How does teacher compensation differ among Virginia schools?

Table 2. Teacher, Student and School Attributes of Elementary Schools by Within District Tercile of Percent School Economic Disadvantage

Terciles of School Economic Disadvantage %	Unfilled teaching positions %	Out of Field %	Provisional licenses %	Less than 1 Year Experience	Fail SOL		Econ disadvantage %	Black %
					Math %	Reading %		
Least	2.3	3.6	6.4	5.0	22.6	20.7	23.5	12.4
Middle	3.3	4.8	7.9	5.9	33.7	31.0	42.3	17.6
Most	6.1	6.7	10.0	6.0	44.4	40.6	62.1	34.6

Virginia Teacher Salaries

School divisions within Virginia, like most districts in the U.S., compensate teachers based on experience and education (the single salary schedule). Teacher salaries in Virginia vary widely across school divisions. Entry level salaries (vertical axis) in some school divisions are less than \$40,000, while several divisions pay novice teachers more than \$50,000 (Figure 2).⁸ Even larger disparities exist for teachers with 25 years of experience (horizontal axis). These differences likely reflect differences in regional labor markets and cost of living, and don't necessarily imply that some districts are paying competitive salaries while others are not. Another perspective on whether salaries are competitive is provided by examining how salaries have changed over time and how they compare to similarly situated workers in other occupations.



Changes over Time. Real, inflation adjusted, entry level salaries in nearly all Virginia school divisions have declined since 2007-08. (The horizontal axis of Figure 3 shows the real change in starting salaries between 2007-08 and 2022-23 for all Virginia districts.) Although nominal starting salaries increased, once adjusted for inflation, starting salaries fell by an average of \$4,200 (8.3%) between 2007-08 and 2022-23. In more than a quarter of school divisions real starting salaries fell by more than \$6,000. Veteran teachers on average experienced larger real decreases. Several economic and political factors likely contributed to the decline in real compensation. For example, the Great Recession substantially reduced school funding once federal subsidies ended in 2011 and the state was slow to restore education funding to prior levels.

These comparisons examine salary schedules for 2022-23 and do not account for the salary increases initiated by the state for 2023-24, in which the state offered to provide their share of a 7 percent increase in teacher salaries. At this point it is unclear the extent to which school divisions opted to adopt this policy. If all school divisions provided a 7 percent increase, on average

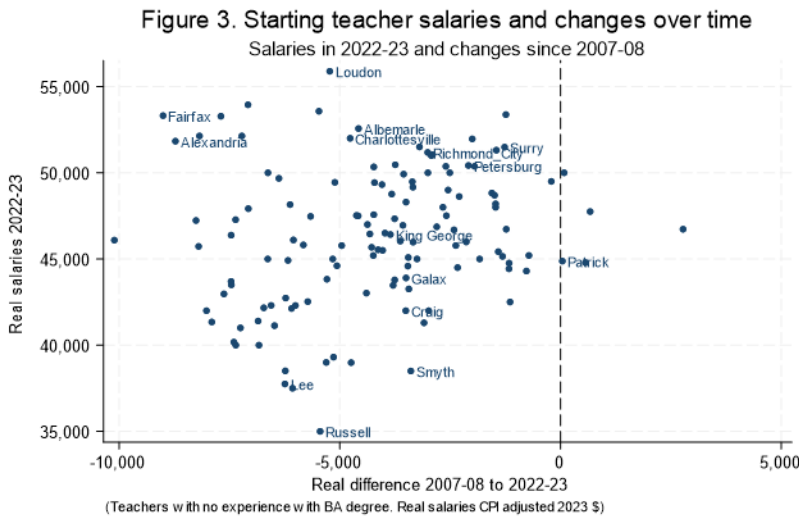
⁷ For a review of much of this literature see, Boyd et al., 2011; Hanushek and Rivkin, 2007; Johnston, 2022.

⁸ Teacher salary data are from the salary schedules in each Virginia school division between 2007-08 and 2022-23.

inflation adjusted starting teacher salaries would be \$990 lower in 2023-24 than in 2007-08. This is a meaningful improvement, but in more than a quarter of school divisions starting real salaries remain more than \$3000 lower than 15 years ago. Teacher quality in high poverty schools and subjects like special education, math and science have been especially disadvantaged as to be competitive wages for these teachers need to be substantially higher than for other teachers.

Comparison to Comparable Workers.

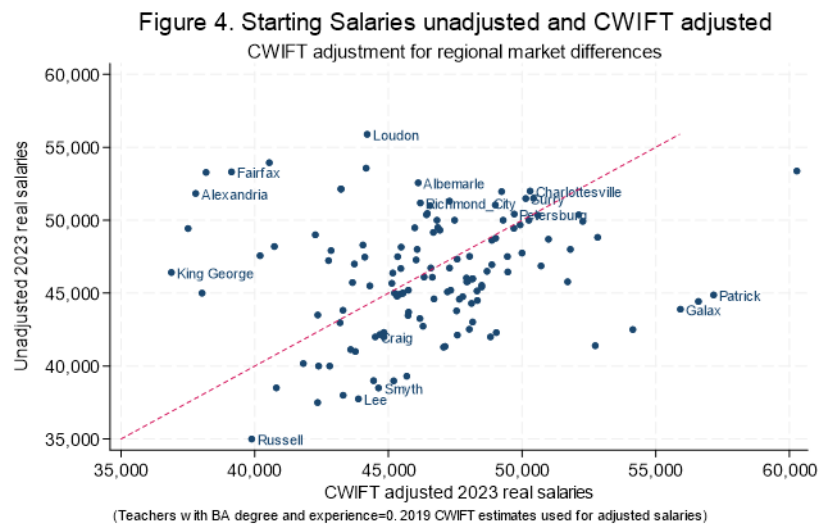
The competitiveness of teacher salaries in part depends on the employment opportunities in other occupations in the same local labor markets. The



Comparable Wage Index For Teachers (CWIFT)⁹ estimated by the Census Bureau adjusts teacher salaries for differences between local labor markets across the state needed to compensate for differences like cost of living and what other occupations pay to make teaching salaries comparable. School divisions in the same local labor market all have the same comparable wage index value but because nonteaching salaries vary across these markets, the CWIFT provides a measure to account for these regional differences.

Comparable wages for teachers in Virginia vary in predictable ways. Salaries of comparable workers in rural areas are often 20 to 30 percent lower than the state average suggesting that teacher salaries which are 20 to 30 percent lower may be roughly competitive. Similarly, comparable salaries in Northern Virginia and some other urban areas may be as much as 30 to 40 percent above the state mean, suggesting that teacher salaries should be higher to be competitive. Figure 4 shows the effect of adjusting entry level teacher salaries with the CWIFT.

Some school divisions who had relatively low unadjusted salaries experience a meaningful increase following the CWIFT adjustment to put those salaries on comparable footing with salaries in other parts of the state (see, for example, Lee, Smyth, Galax or Patrick). Other divisions have their salaries effectively reduced after the adjustment, as those salaries are effectively less competitive in those markets (e.g., Fairfax, Alexandria, Loudon).



⁹ The Census Bureau, employing data from the American Community Survey, designed and estimated the CWIFT. The most recent Census Bureau CWIFT estimates are for 2019 based on data for the preceding three years.

Most economists and policy analysts would defend employing local labor markets when defining competitive wages for teachers and the approach employed in the CWIFT is conceptually sound. Importantly, it illustrates that defining competitive wages employing a national or state benchmark will make potentially large errors in school districts where wages for comparable workers differ from such benchmarks.

Finally, these comparable wages are intended to reflect comparable employment opportunities for the typical teacher in the region. Importantly, the CWIFT adjustment does not account for differences in division or school level working conditions that likely also warrant potentially large salary adjustments. A similar adjustment is likely needed for teachers in certain subject areas in short supply. How do the differences in teacher salaries relate to teacher vacancies?

Teacher Salaries and Teacher Vacancies

Higher teacher salaries in Virginia schools are associated with lower vacancy rates. An analysis of the relationship between teacher vacancies and teacher salaries in Virginia finds that a \$5000 increase in starting salary is associated with a 16 percent decrease in the mean vacancy rate.¹⁰ The \$5000 increase in starting salaries also is estimated to reduce the rates of out-of-field teachers by 18 percent and provisionally licensed teachers by 9 percent. Research suggests that these salary increases will also improve the quality of teachers in these schools.¹¹

A Teacher Salary Proposal

State and division policymakers understand that realizing educational opportunities for all students depends on an effective teacher workforce. Salaries are not the only factor that influence teacher decisions about whether and where to work. School leadership, support staff and teacher development are also important. However, compensating teachers with competitive wages is necessary to reverse the declining performance of Virginia's schools.

Shortages of teachers in Virginia, as demonstrated by unfilled vacancies, out-of-field teaching and provisionally licensed teachers, have meaningfully reduced the effectiveness of some Virginia schools, particularly those serving poor students. These are the schools where student achievement is unacceptably low. Fifteen years of research documents that improved teacher effectiveness will improve student outcomes.¹²

School divisions in Virginia, like most U.S. school districts, compensate teachers based on their years of experience and education levels—the single salary schedule. As a result, salaries don't vary by attributes of the schools in which teachers work, the subjects they teach, or teacher effectiveness. In short, the single salary schedule aggravates shortages of teacher quality. Patterns of teacher shortages, the relationship between teacher salaries and shortages in Virginia, as well as a body of research suggest a more effective approach.

This policy brief makes clear that teacher shortages and declining student achievement are disproportionately located in schools with concentrations of poor students. The analysis also shows that compensation for teachers is still too low, even after the recent across the board salary increases, compensation for teachers in high-poverty schools and some subjects is substantially too low to allow them to compete for effective teachers.

¹⁰ The regressions are provided in Appendix Table A3.

¹¹ For a summary of additional evidence see Goldhaber, Hanushek, Kane and Wyckoff (2023).

¹² See Goldhaber, Hanushek, Kane and Wyckoff (2023).

Based on this analysis and a large body of research, a more effective policy is easily within the grasp of state and local policymakers. Policymakers should:

- Increase salaries for all teachers to at least their 2008-09 inflation adjusted levels.
- Provide large bonuses for teachers in high poverty schools and those teaching special education, math and science. Research suggests these bonuses should be at least \$5000.¹³

These policies would encourage teachers to choose to teach in schools and subjects where the interrelated problems of teacher quality and student achievement are greatest. Ideally, these policies would be coupled with a rigorous assessment of early career teacher performance to allow teachers to realize their potential more quickly. Over the last 16 years Virginia has underinvested in the school resource most vital to the success and well-being of students. Targeting teacher compensation where the intersecting problems of teacher shortages and low student achievement are greatest will meaningfully improve the impact of new investments.

¹³ See, for example, Biasi (2021), Feng and Sass (2018), Glazerman et al. (2015), Hendricks (2014, 2015).

Appendix

Figure A1.

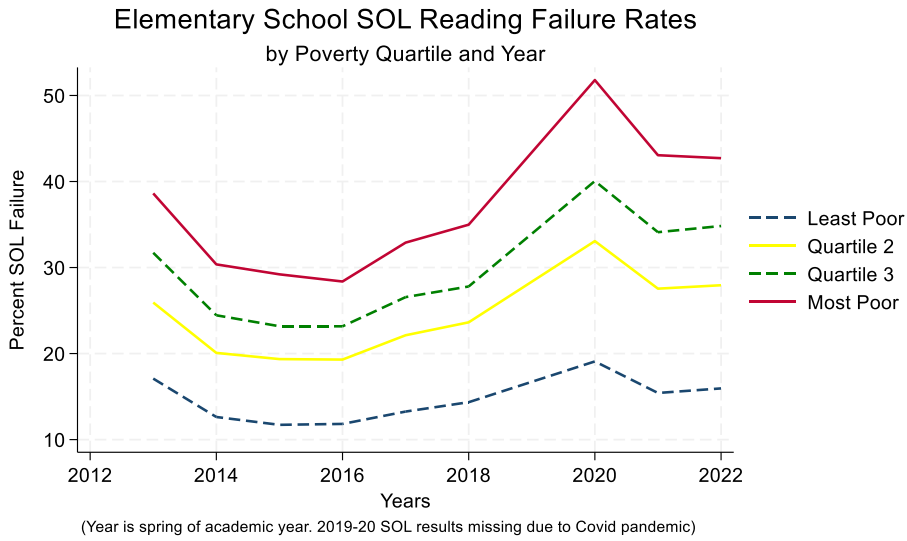
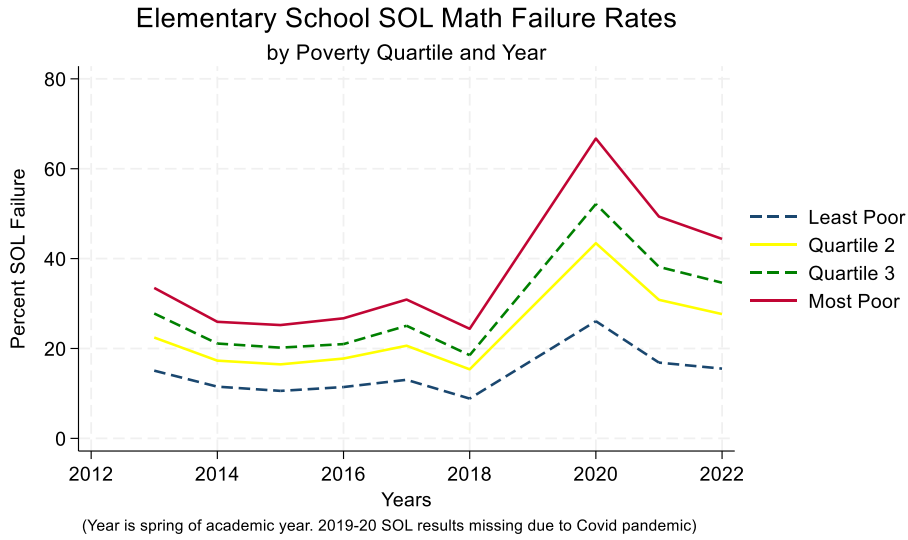


Table A1. Descriptive Statistics Virginia Elementary and Middle Schools, 2022-23

Variable	Obs	Mean	Std. dev.	Data Source
Starting Salaries 2023	1,464	49,085	4,359.2	Division salary schedule PDFs from B. Snidow, VEA. Inflation adjustments employ Bureau of Labor Statistics
Starting Salaries 2008	1,460	53,691	5,374.0	
Salary exp=25 2023	1,464	73,253	16,195.9	Consumer Price Index provided by the Federal Reserve Bank of Minneapolis.
Salary exp=25 2008	1,402	83,700	18,201.3	
Unfilled positions (%)	1,464	3.9	5.6	VDOE Staffing and Vacancy Reports
Provisionally licensed (%)	1,453	8.1	6.2	
Teaching Out of Field (%)	1,421	5.0	6.4	VDOE School Quality Profiles
Teaching Less than 1 year (%)	1,421	5.6	5.3	
Failing Math SOL (%)	1,404	33.4	16.8	VDOE SOL Test Pass Rates
Failing Reading SOL (%)	1,404	30.6	13.8	
Economic Disadvantage (%)	1,464	0.4	0.2	
Black (%)	1,464	21.4	22.7	VDOE Fall Membership
Hispanic (%)	1,464	16.5	16.9	
Urban (%)	1,464	23.4	42.4	Geographic designations use the U.S. Census Geographic Edge Files
Rural (%)	1,464	30.7	46.2	

Table A2. Teacher, Student and School Attributes of Urban Elementary Schools by Within District Tercile of Percent School Economic Disadvantage

Terciles of School Economic Disadvantage %	Unfilled teaching vacancies %	Provisional licenses %	Out of Field %	Less than 1 Year Experience	Fail SOL		Econ disadvantage %	Black %
					Math %	Reading %		
Least	2.6	6.0	2.8	7.2	21.9	21.1	25.7	18.4
Middle	3.8	7.5	3.3	6.2	37.8	36.5	48.6	30.2
Most	10.6	12.1	8.1	6.4	52.1	47.2	66.4	58.6

A regression of 2022 school vacancies on the CWIFT adjusted starting salary for 2022-23 and controlling for student poverty and race found that increasing starting salaries by \$5000 predicts a reduction in vacancy rates of 0.6 percentage point (column 1), a 16 percent decrease from the mean vacancy rate. Similarly an starting salary increase of \$5000 is associated with a reduction of Out-of-Field teaching of 0.9 percentage point (column 3), or an 18 percent decrease. Results employing the unadjusted starting salaries typically results in similar estimates (columns 2, 4 and 6).

Table A3. OLS Estimates of School Attributes on Various Teacher Quality Measures, 2022-23

VARIABLES	Teacher Vacancies %		Teaching Out of Field %		Provisional License %	
	(1)	(2)	(3)	(4)	(5)	(6)
Starting salary CWI adjusted	-0.000122*** (3.58e-05)		-0.000176*** (4.52e-05)		-0.000150*** (4.16e-05)	
Starting salary unadjusted		-9.26e-05** (4.39e-05)		-0.000294*** (5.54e-05)		-8.97e-05* (5.11e-05)
% Economic disadvantage	0.00885 (0.00779)	-0.0126 (0.0103)	0.0606*** (0.00993)	0.00333 (0.0130)	0.0418*** (0.00914)	0.0190 (0.0120)
% Black	0.129*** (0.00658)	0.138*** (0.00808)	0.0782*** (0.00859)	0.106*** (0.0102)	0.111*** (0.00773)	0.120*** (0.00945)
% Hispanic	0.0471*** (0.00828)	0.0734*** (0.0108)	-0.0244** (0.0107)	0.0431*** (0.0139)	0.0120 (0.00968)	0.0403*** (0.0126)
Constant	5.521*** (1.613)	4.813** (2.245)	9.242*** (2.035)	16.37*** (2.840)	10.52*** (1.876)	8.443*** (2.617)
Observations	1,464	1,464	1,421	1,421	1,453	1,453
R-squared	0.293	0.290	0.142	0.150	0.227	0.221
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1						

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