Abstract

Connecticut’s interc on that appears to satisfy current leg net schools have provided students f ically isolated educational environ student achievement. To address potential selection biases, the analyses exploit the random assignment that results from lottery-based admissions for a small set of schools, as well as value-added and fixed-effect estimators that rely on pre–magnet school measures of student achievement to obtain effect estimates for a broader set of interdistrict magnet schools. Results indicate that attendance at an interdistrict magnet high school has positive effects on the math and reading achievement of central city students and that interdistrict magnet middle schools have positive effects on reading achievement.

Figure and Tables

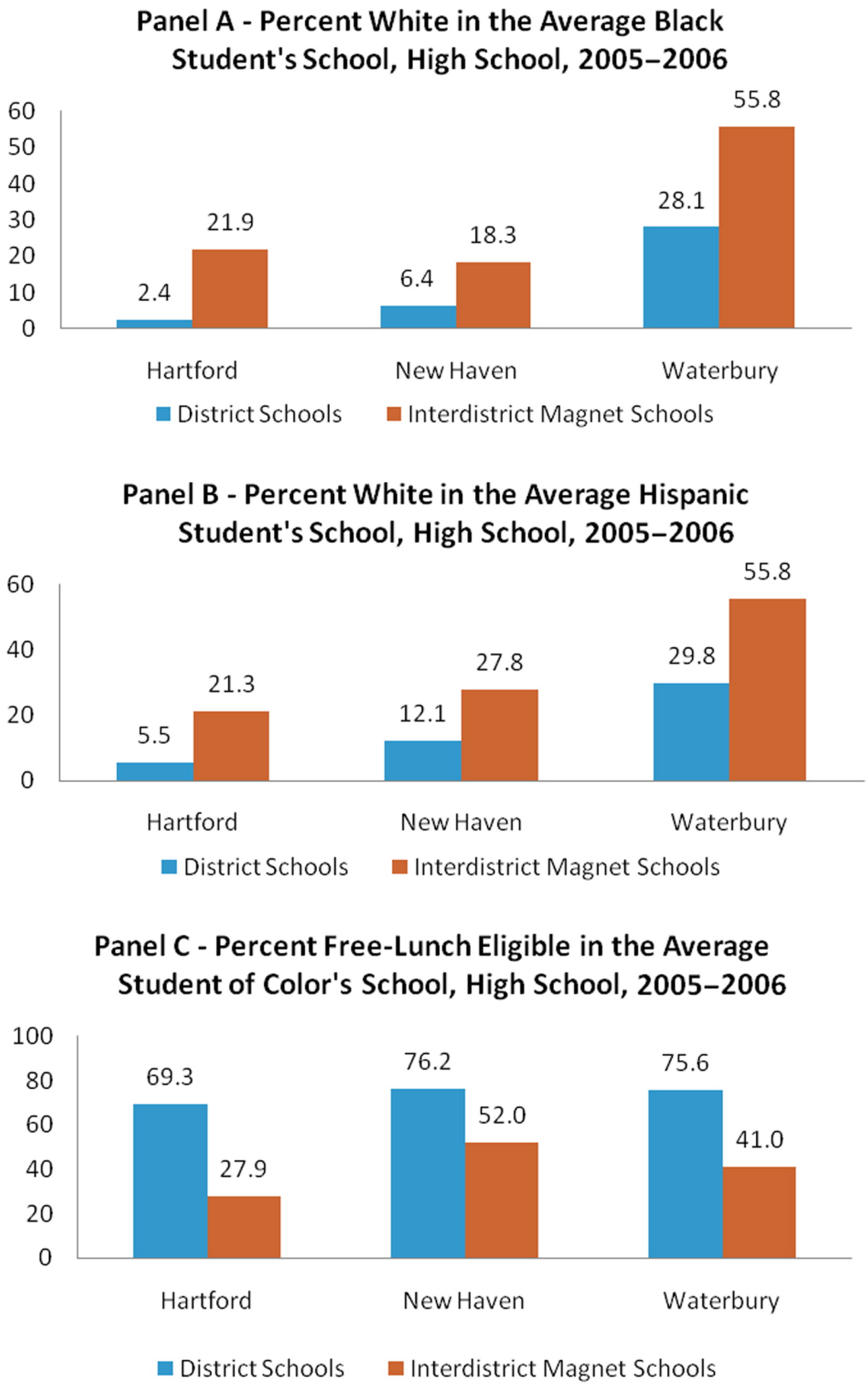

FIGURE 1. *Comparison of student composition in city and interdistrict magnet schools.*

TABLE 1 *Magnet School Students, Compared to Nonmagnet School Students*

	Urban students	Suburban students

	Urban students		Suburban students	
	Magnet	Nonmagnet	Magnet	Nonmagnet
Tenth graders				
Black	.533***	.465	.509***	.119
Hispanic	.299***	.392	.146**	.121
White	.150**	.127	.313***	.724
Free-lunch eligible	.684	.671	.343***	.193
Male	.429***	.506	.471**	.508
Grade 8 scores				
Mathematics	−.361***	−.735	−.157***	.186
Reading	−.308***	−.686	−.035*	.171
Grade 6 scores				
Mathematics	−.370***	−.699	−.218***	.151
Reading	−.393***	−.733	−.120***	.170
n	1,369	6,207	815	22,277
Eighth graders				
Black	.572***	.412	.356***	.118
Hispanic	.314***	.458	.123	.132
White	.104	.116	.493***	.706
Free-lunch eligible	.720***	.761	.301***	.239
Male	.482**	.515	.523	.515

	Urban students		Suburban students	
	Magnet	Nonmagnet	Magnet	Nonmagnet
Grade 6 scores				
Mathematics	−.392***	−.609	.104***	.193
Reading	−.343***	−.641	.180	.207
Grade 4 scores				
Mathematics	−.368***	−.576	.082**	.155
Reading	−.433***	−.659	.112**	.192
n	1,386	7,946	984	23,033

Note. Samples of urban students consist of students appearing in Connecticut State Department of Education test score files during 2005–2006 or 2006–2007 and residing in Hartford, New Haven, or Waterbury. Samples of suburban students consist of students appearing in the test score files during 2005–2006 or 2006–2007 and residing in a district in New Haven or Hartford county that participates in an interdistrict magnet school that serves Hartford, New Haven, or Waterbury. Figures reported are sample means. Test scores are standardized using year-specific means and standard deviations for the entire population. Test scores are missing for some students; as such, test score means are based on less than a full sample.

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$p < .10$.

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$p < .05$.

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$p < .01$. Significance indicates difference between magnet and nonmagnet school students.

TABLE 2 *Change in Peer Environments for Magnet School Students*

	Urban students		Suburban students	
	Previous school	Magnet school	Previous school	Magnet school
Tenth graders				
Black (%)	46.1	48.3**	34.4	49.0***

	Urban students		Suburban students	
	Previous school	Magnet school	Previous school	Magnet school
Hispanic (%)	37.2	25.3***	17.4	22.9***
White (%)	15.1	24.6***	45.2	25.6***
Free-lunch eligible (%)	72.0	59.9***	41.7	55.8***
Grade 8 scores (*Means*)				
Mathematics	−.549	−.330***	−.229	−.293***
Reading	−.618	−.322***	−.202	−.253**
n	970		626	
Eighth graders				
Black (%)	47.6	49.7**	28.2	41.8***
Hispanic (%)	38.3	23.7***	17.4	22.1***
White (%)	12.7	24.7***	50.6	33.0***
Free-lunch eligible (%)	71.7	55.8***	35.5	44.1***
Grade 4 scores (*Means*)				
Mathematics	−.553	−.255***	−.073	−.045
Reading	−.681	−.296***	−.049	−.053
n	874		706	

Note. Urban students include those in a magnet school serving students in Hartford, New Haven, or Waterbury during 2005–2006 or 2006–2007 and whom we can place in a nonmagnet school before their enrollment in their current magnet school. Suburban students consist of students appearing in the test score files during 2005–2006 or 2006–2007 who reside in a district in New Haven or Hartford county that participates in an interdistrict magnet school that serves Hartford, New Haven, or Waterbury and whom we can place in a nonmagnet school before their enrollment in their current magnet school.

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$p < .01$. Significance indicates difference between previous school and magnet school.

TABLE 3 *Sample of Lottery Participants, Compared to Nonparticipants From the Same Districts*

	Lottery sample	Nonmagnet sample
Black	.407**	.356
Hispanic	.109***	.212
White	.471***	.387
Free-lunch eligible	.235***	.394
Male	.495	.510
Grade 4 scores		
Mathematics	.088***	−.182
Reading	.208**	−.150
n	553	3,043

*

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$p < .05$.

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$p < .01$. Significance indicates difference between lottery sample and nonmagnet school students.

TABLE 4 *Testing the Balance of Lottery Samples*

Dependent Variable	All lottery participants (*n* = 553)			Participants observed in eighth grade (*n* = 517)		
	Coeff.	*SE*	*p*	Coeff.	*SE*	*p*

Dependent Variable	All lottery participants (n = 553)			Participants observed in eighth grade (n = 517)		
	Coeff.	*SE*	*p*	Coeff.	*SE*	*p*
Age (in years)	.025	.042	.552	.066*	.037	.074
Black	−.047	.040	.243	.000	.041	.301
Hispanic	.017	.028	.545	.023	.028	.389
White	−.066	.042	.114	.059	.043	.170
Asian	−.026	.017	.110	−.028	.017	.103
Free-lunch eligible	.004	.040	.912	.014	.040	.730
Special education	.007	.021	.889	.006	.022	.798
Male	−.050	.048	.297	−.065	.048	.179
Grade 6 scores						
Mathematics	.011	.079	.889	.006	.080	.943
Reading	.046	.083	.582	.047	.083	.576
Grade 4 scores						
Mathematics	.011	.083	.894	.014	.085	.870
Reading	.034	.087	.696	.038	.088	.665

Note. Coefficient, standard error, and *p* value reported for indicator of whether the student was a lottery winner or not—including on-time and delayed winners. Each row represents a separate regression; all regressions include lottery-fixed effects. Test scores are standardized using year-specific means and standard deviations for the entire population.

*

$p < .10$.

TABLE 5 *Lottery-Based Estimates of the Effect of Interdistrict Magnet Schools on Achievement*

Grade 8	On-time lottery winners			On-time + delayed lottery winners		
	ITT	TOT	TOT-WC	ITT	TOT	TOT-WC
Mathematics	.110 (.080)	.142 (.103)	.139*** (.054)	.109 (.076)	.139 (.097)	.138*** (.050)
R^2	.088	.083	.767	.084	.079	.772
n		492			514	
Reading	.243*** (.093)	.312*** (.120)	.283*** (.070)	.252*** (.088)	.318*** (.112)	.278*** (.064)
R^2	.072	.055	.703	.077	.062	.709
n		494			516	

Note. Each set of results are from separate regressions. Dependent variables include test scores standardized using year-specific mean and standard deviation for the population. Results in column labeled *ITT* (intent to treat) are ordinary least squares regressions of test score on indicator of whether student won the admission lottery or not. Results in columns labeled *TOT* (treatment on treated) are two stage least squares estimates using an indicator of students who won lottery as instrument for enrollment in an interdistrict magnet school during eighth grade. The covariates included in the models presented in columns labeled TOT-WC include student's age, gender, ethnicity, free-lunch eligibility in Grade 4, special education status in Grade 4, and Grade 4 and Grade 6 mathematics and reading scores. In the first three columns, only on-time lottery winners are counted as lottery winners; that is, delayed winners are excluded from the sample. In the last three columns, delayed winners are included and counted as lottery winners. All regressions include lottery fixed effects. Standard errors robust to clustering with in schools are in parentheses.

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TABLE 6 *Comparison of Nonexperimental Estimates With Lottery-Based Estimates*

Grade 8	Value-added regression	Fixed-effect regression	Lottery-based estimate
Mathematics	.144* (.074)	.130** (.052)	.138*** (.050)
R^2	.811	.897	.772
n	4,026	12,018	514
Reading	.340*** (.019)	.306*** (.035)	.278*** (.064)
R^2	.731	.879	.709
n	4,024	11,982	516

Note. Dependent variables are test scores standardized using the grade- and year-specific mean and standard deviation for the population. Valued-added regressions include age, gender, ethnicity, free-lunch eligibility, special education status, year fixed effect, and fourth- and sixth-grade mathematics and reading test scores, as well as a magnet enrollment indicator. The coefficient on the magnet school enrollment indicator is reported. The fixed-effect regression includes magnet school indicator, year fixed effects, and controls for individual fixed effects. Lottery-based estimates are taken from last column of Table 5. The figures in parentheses are standard errors, adjusted for clustering at the school level.

*
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TABLE 7 *Treatment and Comparison Group Samples*

	Central city students		Suburban students	
	Magnet	Nonmagnet	Magnet	Nonmagnet
Tenth graders				
n	700	2,151	373	4,525
Black	.520	.497	.450***	.231
Hispanic	.329**	.379	.121***	.190

	Central city students		Suburban students	
	Magnet	Nonmagnet	Magnet	Nonmagnet
White	.130	.110	.408***	.550
Asian	.017	.011	.016	.027
Free-lunch eligible	.673***	.731	.305*	.356
Special education	.069***	.102	.064**	.099
Male	.403*	.440	.428*	.476
Age	16.0*** (.515)	16.1 (.592)	15.9 (.432)	15.9 (.452)
Grade 8 scores				
Mathematics	−.337*** (.767)	−.599 (.828)	−.068** (.799)	−.167 (.937)
Reading	−.283*** (.776)	−.538 (.829)	.049*** (.841)	−.115 (.923)
Grade 6 scores				
Mathematics	−.399*** (.843)	−.629 (.929)	−.142 (.834)	−.219 (.972)
Reading	−.448*** (.857)	−.705 (.881)	.003*** (.870)	−.187 (.989)
Eighth graders				
n	376	2,770	473	4,275
Black	.378	.371	.277***	.198
Hispanic	.439	.463	.082***	.231
White	.176	.149	.611***	.528
Asian	.005	.014	.030	.042
Free-lunch eligible	.601***	.744	.203***	.354
Special education	.051***	.105	.055*	.080

	Central city students		Suburban students	
	Magnet	Nonmagnet	Magnet	Nonmagnet
Male	.441	.472	.491	.529
Age	14.0*** (.510)	14.2 (.626)	13.8*** (.388)	13.9 (.435)
Grade 6 scores				
Mathematics	−.113*** (.816)	−.461 (.842)	.231*** (.889)	.041 (1.024)
Reading	−.093*** (.800)	−.531 (.809)	.322*** (.901)	.027 (.968)
Grade 4 scores				
Mathematics	−.202*** (.851)	−.552 (.847)	.225*** (.908)	−.050 (1.041)
Reading	−.224*** (.867)	−.625 (.834)	.289*** (.926)	−.008 (1.027)

Note. Means (with standard deviations in parentheses). Test scores are *z* scores computed using the year-specific mean and standard deviation for entire population of students.

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TABLE 8 *Estimated Magnet School Treatment on Treated Effects, by Students' Residence*

	Value-added estimates		Fixed-effect estimates	
	Central city students	Suburban students	Central city students	Suburban students
Grade 8				
Mathematics	.126** (.058)	.104 (.077)	.082* (.049)	.095 (.067)
n	3,062	4,690	9,186	14,070

	Value-added estimates		Fixed-effect estimates	
	Central city students	Suburban students	Central city students	Suburban students
Reading	.152*** (.050)	.265*** (.048)	.093*** (.019)	.219*** (.051)
n	3,063	4,693	9,189	14,079
Grade 10				
Mathematics	.135*** (.044)	.085* (.047)	.108*** (.034)	.061* (.036)
n	2,709	4,740	8,127	14,220
Reading	.153*** (.042)	.082 (.055)	.110** (.042)	.030 (.040)
n	2,725	4,759	8,175	14,277
Lottery schools excluded				
Grade 8				
Mathematics	.077 (.051)	.103** (.052)	.038 (.033)	.057 (.048)
n	2,989	2,935	8,967	8,805
Reading	.123** (.056)	.147*** (.055)	.062 (.037)	.095* (.049)
n	2,989	2,936	8,967	8,808
Hartford-area schools only				
Grade 8				
Mathematics	.199** (.082)	.124 (.079)	.148** (.075)	.107 (.077)
n	1,690	4,568	5,070	13,704
Reading	.237*** (.038)	.301*** (.043)	.147*** (.053)	.249*** (.060)

	Value-added estimates		Fixed-effect estimates	
	Central city students	Suburban students	Central city students	Suburban students
n	1,697	4,572	5,091	13,716
Grade 10				
Mathematics	.277*** (.045)	.165*** (.049)	.255*** (.045)	.126* (.069)
n	1,035	1,770	3,105	5,310
Reading	.228*** (.070)	.193*** (.065)	.155* (.094)	.134*** (.049)
n	1,050	1,779	3,150	5,337

Note. Dependent variables are test scores standardized using the grade- and year-specific mean and standard deviation for the population. Valued-added regressions include age, gender, ethnicity, free-lunch eligibility, special education status, year fixed effect, and fourth- and sixth-grade mathematics and reading test scores, as well as magnet enrollment indicator. The coefficient on the magnet school enrollment indicator is reported. The fixed-effect regression includes magnet school indicator, year fixed effects, and controls for individual fixed effects. The figures in parentheses are standard errors, adjusted for clustering within schools.

*

$p < .10$.

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$p < .05$.

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$p < .01$.

References

Agodini R and Dynarski M. Are experiments the only option? A look at dropout prevention programs. *Review of Economics and Statistics* 2004;86:180-194

Crossref

Web of Science

Google Scholar

Armor DJ. *Forced justice: School desegregation and the law* 1995 Oxford, UK Oxford University Press

Crossref

Google Scholar

Armor DJ, Thernstrom A, and Thernstrom S. Social science brief to the Supreme Court of the United States in support of petitioners in *Parents Involved v. Seattle School District No. 1* and *Meredith v. Jefferson County Board of Education*. 2006 August http://www.thernstrom.com/pdf/Amicus_Brief.pdf, accessed July 13, 2009.

Google Scholar

Ballou D. *Magnet schools and peers: Effects on student achievement* 2007 Unpublished paper.

Google Scholar

Baltagi BH. *Econometric analysis of panel data* 1995 New York Wiley

Google Scholar

Betts J, Rice L, Zau A, Tang E, and Koedel C. *Does school choice work? Effects on student integration and academic achievement* 2006 San Francisco Public Policy Institute of California

Google Scholar

Bifulco R and Ladd HF. The impacts of charter schools on student achievement: Evidence from North Carolina. *Education Finance and Policy* 2006;1:50-90

Crossref

Web of Science

Google Scholar

Clotfelter CT, Ladd HF, and Vigdor J. Who teaches whom? Race and the distribution of novice teachers. *Economics of Education Review* 2005;24:377-392

Crossref

Web of Science

Google Scholar

Cobb-Clark DA and Crossley T. Econometrics for evaluations: An introduction to recent developments. *The Economic Record* 2003;79:491-511

Crossref

Google Scholar

Cook T. Cook T et al. What have Black children gained academically from school integration? Examination of meta-analytic evidence. *School desegregation and Black achievement* 1984 Washington, DC National Institute of Education 7-42

Google Scholar

Cullen JB, Jacob BA, and Levitt S. The effect of school choice on student outcomes: Evidence from randomized lotteries. *Econometrica* 2006;74:1191-1230

Crossref

Web of Science

Google Scholar

Freeman C, Scafidi B, and Sjoquist DL. Boger J, Edley C, and Orfield G. Racial segregation in Georgia public schools, 1994–2001: Trends, causes and impact on teacher quality. *School resegregation: Must the South turn back?* 2005 Chapel Hill University of North Carolina Press 148-163

Google Scholar

Gamoran A. Access to excellence: Assignment to honors English classes in the transition from middle to high school. *Educational Evaluation and Policy Analysis* 1992;14:185-204

Crossref

Web of Science

Google Scholar

Gamoran A. Student achievement in public magnet, public comprehensive, and private city high schools. *Educational Evaluation and Policy Analysis* 1996;18:1-18

Crossref

Web of Science

Google Scholar

Hanushek EA, Kain JF, and Rivkin SG. *New evidence about* Brown v. Board of Education. *The complex effects of school racial composition on achievement* 2006 Unpublished manuscript, University of Texas, Dallas.

Google Scholar

Hawley W and Smylie MA. Katz P and Taylor D. The contribution of school desegregation to academic achievement and racial integration. *Eliminating racism: Means and controversies* 1986 New York Pergamon Press 281-297

Google Scholar

Heckman JJ, LaLonde RJ, and Smith JA. Ashenfelter O and Card D. The economics and econometrics of active labor market programs. *Handbook of labor economics* 1999;3 New York Elsevier 1865-2097

Crossref

Google Scholar

Howell WG and Peterson PE. *The education gap: Vouchers and urban schools* 2002 Washington, DC Brookings Institution Press

Google Scholar

Hoxby CM and Murarka S. Berends M, Springer MG, and Walberg HJ. Methods of assessing the achievement of students in charter schools. *Charter school outcomes* 2008 New York Lawrence Erlbaum 7-38

Google Scholar

Hoxby CM and Rockoff J. The impact of charter schools on student achievement. 2005 Unpublished paper.

Google Scholar

Kemple JJ and Willner CJ. *Long-term impacts on labor market outcomes, educational attainment, and transitions to adulthood* 2008 New York MDRC

Google Scholar

Lankford H, Loeb S, and Wyckoff J. Teacher sorting and the plight of urban schools: A descriptive analysis. *Education Evaluation and Policy Analysis* 2002;24:37-62

Crossref

Web of Science

Google Scholar

Lavy V, Passerman DM, and Schlosser A. *Inside the black box of ability peer effects: Evidence from variation in high and low achievers in the classroom* 2007 Unpublished paper.

Google Scholar

Linn RL and Welner KG. *Race-conscious policies for assigning students to schools: Social science research and the Supreme Court cases* 2007 Washington, DC National Academy of Education

Google Scholar

Loeb S, Darling-Hammond L, and Luczak J. How teaching conditions predict teacher turnover in California schools. *Peabody Journal of Education* 2005;80:44-70

Crossref

Google Scholar

Oakes J. Opportunities, achievement, and choice: Women and minority students in science and mathematics. *Review of Research in Education* 1990;16:153-222

Crossref

Web of Science

Google Scholar

Orfield G, Frankenberg E, and Garces LM. Statement of American social scientists of research on school desegregation to the U. S. Supreme Court in *Parents v. Seattle School District* and *Meredith v. Jefferson County*. *Urban Review* 2008;40:96-136

Crossref

Google Scholar

Rossell CH. How effective are voluntary plans with magnet schools?. *Educational Evaluation and Policy Analysis* 1988;10:325-342

Crossref

Google Scholar

Rouse CE. Private school vouchers and student achievement: An evaluation of the Milwaukee parental choice program. *The Quarterly Journal of Economics* 1998;113:553-602

Crossref

Web of Science

Google Scholar

Schofield JW. Banks JA and McGee Banks CA. Review of research on school desegregation's impact on elementary and secondary school students. *Handbook of research on multi-cultural education* 1995 New York Macmillan 597-617

Google Scholar

Stuart E. Estimating causal effects using school-level data sets. *Educational Researcher* 2007;36:187-198

Crossref

Google Scholar

Wilde ET and Hollister R. How close is close enough? Evaluating propensity score matching using data from a class size reduction experiment. *Journal of Policy Analysis and Management* 2007;26:455-477

Crossref

Web of Science

Google Scholar

Yu CM, Taylor WT, Goldring E, Smrekar C, and Piche D. *Do magnet schools serve children in need?* 1997 Washington, DC Citizens' Commission on Civil Rights

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