

Improving educational outcomes for disadvantaged children

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The positive relationship between educational attainment and adult earnings in the United States is strong and has increased over time. In 1979, college-educated adults earned 75 percent more per year than did high school graduates. By 2003, college-educated adults averaged well over twice the annual earnings of high school graduates.¹ High school dropouts work in the lowest-paid occupational groups at more than twice the rate of those who graduated from high school.

In general, the rate of return to an extra year of schooling is now at least ten percent.² This positive relationship between educational attainment and earnings is important in part because children from poorer homes tend to receive fewer years of schooling. Although around 95 percent of children from the highest quartile of family socioeconomic status ultimately graduate from high school, only about two-thirds of those from the lowest quartile do so.³ It is not clear how much of this difference is a direct effect of socioeconomic status and how much is due to unobserved correlations between parents and children, but the evidence suggests a strong influence of parents' socioeconomic status on children's educational outcomes.

Much of American education policy over the last four decades has focused, at least in part, on providing equal educational opportunity to children from disadvantaged backgrounds, and on remediating differences in how prepared children are when they begin school. Again, the evidence is strong that low-income children begin school at a significant disadvantage. In the kindergarten class of 1998, 52 percent of children with mothers who were high school dropouts scored in the bottom quartile of the kindergarten reading distribution, along with only 8 percent of children of college-graduate mothers.⁴ At the other end of the spectrum, only 6 percent of children of high school dropout mothers scored in the top quartile of the reading distribution while 46 percent of children of college-graduate mothers scored that high. By the end of fifth grade, the gap between advantaged and disadvantaged children had hardly changed. Two-thirds of children of high school dropout mothers were in the bottom third of the reading distribution and nearly that many

were in the bottom third of the math distribution.⁵ These are similar figures to those for children currently in poverty, and those who have been in poverty consistently since kindergarten, but they differ dramatically from those of children of college-educated mothers. Only 10 percent of children with college-educated mothers score in the bottom third of the fifth grade reading distribution, while 13 percent score in the bottom third of the fifth grade math distribution.

If anything, the gaps continue to grow as children progress through school. Among high school sophomores in 2002, 71 percent of the top socioeconomic status quartile scored proficient at "simple problem solving, requiring the understanding of low level mathematical concepts," while only 25 percent of those in the lowest quartile were proficient.⁶ These gaps in tenth grade performance have remained virtually unchanged for a generation; the comparable mathematics gap in 1980 and 1990 were very similar.⁷ Similar gaps are seen with reading scores. The stable gaps do not mask substantial improvements in performance across the spectrum: performance gains over the last quarter century have been small at best for children across the full socioeconomic distribution.

That these gaps in achievement have remained so constant over time in an era of active attempts to increase equity in educational opportunity indicates that there are no easy answers to the question of how to best educate children from disadvantaged backgrounds. However, recent policy experimentation provides lessons that could help to better understand the policies and practices that might improve the educational outcomes of these families. This article outlines some of the policy options for improving educational outcomes of disadvantaged children, and summarizes the evidence concerning the potential effectiveness of these policies. A more detailed treatment of these policy options will be included in the book chapter from which this article is drawn.

Is there a relationship between school spending and children's outcomes?

Over the last 30 years, many states have restructured their school finance systems to reduce the relationship between family wealth and school spending. If the local property tax is the major source of school district revenues and individuals are sorted into neighborhoods on

the basis of income or wealth, disadvantaged students will tend to attend schools that have fewer resources. School finance reforms seek to alter this pattern in one of several ways: by lessening the importance of the property tax as a school funding mechanism (and instead increasing the reliance on sales or income taxes); by utilizing state sources of revenue as a redistributive tool; or by maintaining the primacy of the property tax as a school finance mechanism, but reallocating some of wealthy districts' property tax revenues to poorer districts.

Today, owing partly to these school finance reforms, there is very little relationship between family income and school district spending in the United States.⁸ In fact, the twenty percent of American school districts serving the least advantaged populations average 8 percent more expenditures per pupil than do the twenty percent of American school districts serving the most advantaged populations.

In general these school finance reforms have been coupled with only limited improvements in student achievement.⁹ The fact that school spending has been considerably equalized in the United States but few improvements have occurred in the performance of disadvantaged children over the same time period has led some researchers to conclude that increasing school spending in and of itself will not lead to substantial improvement in educational outcomes.¹⁰

There are many possible reasons for this lack of a relationship between school spending and student achievement. One is that the costs of educating children from different backgrounds may themselves vary considerably. For example, disadvantaged children tend to attend school in districts with older infrastructure that requires higher maintenance costs. In addition, the rates of special education in disadvantaged communities far outstrip those in more advantaged school districts. As students with special educational needs require more costly teachers and school environments, dollars spent per pupil is not the most appropriate comparison across school districts with differing degrees of advantage. Moreover, low-income school districts tend to have more difficulty recruiting and retaining higher-quality teachers, and thus may need to spend more to do so. Therefore, simple measures of spending per pupil may not translate well into differences in school achievement. When more quasi-experimental methods are used to investigate the relationship between school spending and student outcomes, researchers tend to find positive effects of spending on measured test scores. For instance, Guryan finds that increasing school spending by \$1,000 per pupil in Massachusetts led to test score gains of one-third of a standard deviation or more.¹¹

But will merely increasing spending improve the outcomes of disadvantaged children? The evidence suggests that judicious use of these resources could lead to sub-

stantial improvements, but that these improvements are in no way guaranteed. The jury is still out as to the most effective mechanisms to deploy additional resources. As the overwhelming majority of school expenditures are used to pay for classroom teacher salaries, the most natural ways in which increased spending would be used would be to either reduce class sizes or to increase teacher compensation. I next turn to these possible uses of increased revenues.

Class-size reductions

Reducing class sizes for all students—not merely the least advantaged—has been popular policy in the United States over the last two decades. Two-thirds of all states now have class size caps, and some states, such as California, Florida, North Carolina, and Texas, have in place policies to actively reduce class sizes in the elementary grades. The reasoning behind class-size reductions is clear: teachers who are responsible for fewer students at a time can devote more individual attention to students and can choose from a wider array of potential teaching approaches than could teachers who must teach larger classes. Smaller classes can reduce the degree of classroom disruption, which has been shown to have strong negative effects on student learning in the classroom.¹² The negative consequences of disruption are particularly pronounced in classrooms serving disadvantaged students.

However, there are many reasons why class-size reductions may not lead to improvements in student outcomes. One possibility is that teachers may not be equipped to take advantage of the smaller classes, and may not alter their behavior in response to the reduced class size. Another possibility is that the critical value for improved outcomes from class-size reductions may be below the range of class sizes that are in play. If classroom disruptions cause the same problems in a class of 15 as in a class of 25, then a reduction to a class size of 15 or more may not yield appreciable benefits. Likewise, it may be the case that teachers require extremely small class sizes before they can effectively alter their classroom management and instructional styles.

The most compelling evidence regarding the benefits of class-size reductions comes from a Tennessee experiment, in which students were randomly assigned to either a small class with 13 to 17 students, a regular-sized class of 22 to 25 students, or a regular-sized class with a full-time teacher's aide. The results suggest that students across the socioeconomic distribution benefited from smaller class sizes, based on test score improvements through third grade.¹³ The estimated benefits were particularly large for black students and students from disadvantaged backgrounds, which suggests that class-size reductions have the potential for substantially improving the outcomes of children from low-income families. Fol-

low-up studies show that students assigned to smaller classes experienced persistent increases in test scores and that black students assigned to smaller classes in the early grades showed increased rates of college entrance exam test-taking and scores.¹⁴

While reduced class sizes have the potential to significantly improve performance for individual students, class-size reductions may be difficult to implement on a large scale, particularly across entire states or large school districts. Doing so would likely require the hiring of large numbers of inexperienced or potentially inadequately trained teachers, which may account for the disappointing results of class-size reductions in California, where little improvement in test scores has been observed.¹⁵

A large increase in the demand across the board for new teachers may actually have negative distributional consequences for disadvantaged students. Since schools serving relatively advantaged students will also have an increased demand for teachers, higher-quality or more-qualified teachers currently teaching in low-income schools could move to more advantaged schools. Because this pattern of teacher movement tends to happen anyway, there is ample reason to expect that a class-size reduction would exacerbate the pattern.¹⁶ Evidence is considerable that teacher quality is very important for student success.¹⁷ Therefore, wide-spread class-size reductions have the potential to worsen outcomes for disadvantaged children. On the other hand, class-size reductions that are targeted toward disadvantaged students and schools are more likely to improve the outcomes of students from low-income families.

Teacher compensation

An alternative use of increased financial resources would involve increasing teacher salaries. This policy is often motivated by the goal of improving the quality of the new teacher pool and reducing attrition of highly qualified teachers from the existing teacher pool. However, substantial evidence exists that raising salaries is unlikely to greatly improve the quality of the teaching force, and could actually have the opposite effect, if higher salaries induce fewer poor quality teachers to leave the profession.¹⁸ There is also evidence that one-time signing bonuses for teachers to teach in low-performing schools are unlikely to lead to long-term improvements in teacher quality, as they provide no incentive for teachers to remain in the low-performing schools after having received the bonus.¹⁹

Instead of increasing teacher salaries across the board, states or school districts could offer targeted, long-term bonuses to keep teachers in high-poverty schools. One study of the effects of such a policy in North Carolina found that these bonuses did reduce turnover rates of the

targeted teachers, especially among the more experienced teachers.²⁰ An important caveat, however, is that while teacher experience is correlated with student outcomes, it is only a weak proxy for teacher quality; it remains unknown whether such bonus policies lead to large improvements in teacher quality in disadvantaged schools.

Another mechanism for using teacher compensation to improve the performance of disadvantaged students involves pay for performance. Advocates of performance pay argue that teachers typically receive the same salary regardless of their performance, meaning that other than intrinsic motivations for doing a good job, there is little in the way of external motivation to do so. With this in mind, a number of states, such as Florida, and school districts, such as those in Denver, Minneapolis, and Nashville, are employing some notion of merit pay in their teacher compensation policies. While considerable research is available on the factors underlying schools' decisions to implement teacher merit pay plans and on the stability of these plans, little research has been conducted on the efficacy of merit pay in the United States. One study did find that school-based performance incentives appear to improve student performance.²¹

Even less is known about the potential benefits of individual-based teacher merit pay. A study matching test score data on a low-stakes test for schools to merit pay found evidence that schools offering judiciously administered performance bonuses (that is, large bonuses to relatively few teachers) have larger test score gains than schools that do not offer performance pay.²² Moreover, the positive estimated effects of performance pay are strongest in relatively disadvantaged schools, where parental monitoring of teachers may be lower. These results suggest that performance pay has the potential to significantly benefit disadvantaged students, though these conclusions should be treated with caution because of the cross-sectional nature of the evidence. Data from Tennessee indicates that students assigned to teachers participating in a performance pay-type system experienced gains in mathematics, though not in reading.²³ While more research is needed, the evidence to date suggests that teacher merit pay has the potential to improve student outcomes in disadvantaged schools. Randomized experiments like the U.S. Department of Education-funded experiments begun in fall 2007 will provide valuable evidence on the causal effects of individual teacher incentives.

Class-size reductions and teacher incentives would both require considerable resources to carry out. Although smaller-scale policy experimentation suggests that both types of policies have the potential to boost the performance of disadvantaged students, insufficient evidence is available to know what would happen in the event of a large-scale policy change. It is too early to determine which of these policies would offer a more cost-effective

deployment of resources, but either could result in significant performance improvements if targeted to low-income schools.

School-based accountability

While class-size reductions and teacher incentives have the potential to benefit disadvantaged students, policymakers have increasingly expressed a desire to increase school performance without significantly increasing financial outlays. Demands for more accountability and results-based incentive systems in K through 12 education come from many directions and currently dominate much of the education policy discussion at both the state and federal levels.²⁴ Accountability in education is a broad concept that could be addressed in many different ways: using political processes to assure democratic accountability, introducing market-based reforms to increase accountability to parents and children, developing peer-based accountability systems to increase the professional accountability of teachers, or using administrative accountability systems designed to drive the system toward higher student achievement. This last form of accountability—focusing on the individual school as the primary unit of accountability—has taken center stage in recent U.S. policy discussions.

School accountability typically operates within the traditional public school system and relies heavily on student testing. Most emblematic is the federal No Child Left Behind Act, which became law in 2002. The law requires states to test students in reading and mathematics in grades 3 through 8, as well as in one high school grade. In addition, it requires states to assess schools on the basis of whether their students (both in the aggregate and by subgroup) are making adequate yearly progress toward the ultimate goal of 100 percent proficiency by 2014, and it imposes consequences on schools and districts that fail to achieve yearly benchmarks.

The measurement and reporting of a school's progress allows policymakers to assess how successful a school has been in meeting the state's achievement goals. Although some policymakers favor accountability for individual teachers—through, for example, merit- or performance-based pay—rather than for schools, others view accountability at the school level as preferable because it promotes collaboration among teachers and because schools have more opportunities than do individual teachers to enact the types of changes in resource allocation and practices that may be needed to raise student achievement. Few reformers view exclusive accountability at the district level as appropriate, since that could mask important differences in performance across schools within a district.

School accountability systems might *not* generate higher achievement for several reasons. Schools may not have

the time or resources to respond appropriately to accountability systems. Alternatively, the incentives of the accountability incentives may overwhelm the natural intrinsic incentives of teachers and school administrators, offsetting any student achievement gains associated with accountability. In any monitoring situation, those being monitored face incentives to appear as effective as possible against the metric being assessed. Thus, the concern arises that teachers might teach so narrowly to the high-stakes test that little or no generalizable learning would take place. In addition, schools may engage in strategies that artificially improve test scores by changing the group of students subject to the test, including the selective assignment of students to special education programs.

Measuring the effects of test-based accountability systems on student achievement is not a simple task. When such systems are part of a larger standards-based reform effort, it is difficult to separate the effects of the accountability system from those of other components of the reform package. In addition, researchers face the challenge of finding appropriate control groups to determine what would have happened to student achievement in the absence of the accountability system. Though no one approach or study is flawless and many inconsistencies remain, taken as a whole, the body of research suggests several key conclusions. For one, the estimated positive achievement effects of accountability systems emerge far more clearly and frequently for math than for reading. The larger effects for math are intuitively plausible and are consistent with findings from other policy interventions such as voucher programs and tax and expenditure limitations. Although effects on reading have not been as strong, researchers often find measurable positive effects for reading as well.²⁵ Solid evidence thus exists to suggest that school accountability may improve student test performance, at least in the measured subjects, at low cost. Still, the positive effects of accountability tend to be more modest than the estimated effects of class-size reductions.

School choice

Accountability can also be provided by school choice programs. The rationale behind school choice involves the fact that, historically, students have been assigned to schools based on residential location, which parents cannot change without costly geographic moves. If students are relatively captive, schools may feel less of an incentive to be responsive to their needs. Some evidence exists that communities with a large number of school districts in a relatively small geographical space (thus facilitating family mobility to a preferred school district) have higher-performing public schools than do those with fewer options.²⁶ However, it is unlikely that more school districts in a community will benefit disadvantaged students because communities with many school districts

tend to contain mostly middle- to upper-class families, with few, if any, housing opportunities for disadvantaged families. Moreover, public school systems are more likely to be responsive to more affluent families with more residential, and hence, school, choices. The disproportionate costs of residential moves for disadvantaged families reinforce these incentives. Therefore, even when a range of residential options exist, disadvantaged families are less likely than are more affluent families to take advantage of the options, and therefore are less likely to draw the attention of competing school districts.

In part because of the shortcomings of traditional school choice, and the recognition that disadvantaged families may in reality be presented with few if any options for their children's schooling, policymakers have recently experimented with alternative school choice mechanisms, most notably school vouchers and charter schools. School voucher plans can take many forms, but typically provide full or near-full coverage of tuition and fees for students to attend either private religious or nonreligious schools. Some voucher plans incorporate increased public school choice as well. Charter schools draw students from throughout a school district (and in some states, other school districts as well), tend to have more autonomy than do traditional public schools, and are free from many of the state and local regulations that public schools typically face. Most importantly, charter schools are schools of choice, so parents must actively elect to have their children attend these schools.

School vouchers and charter schools increase schooling options for families whose choices might otherwise be constrained by low incomes, job location, residential segregation, or other factors. If parents are well-informed about their schooling options, vouchers and charter schools have the potential to improve their children's outcomes by giving the families increased ability to sort into optimal schools. At the same time, vouchers and charter schools can foster competition among schools, leading to improvements in the overall public sector. When a student uses a voucher to attend a private school, or elects to attend a charter school, the local public school's funding may be decreased, and the threat of budget cuts or personnel cuts could provide public schools with an incentive to improve.

Do school vouchers work?

Largely because of the relative lack of experience with school vouchers in the United States, relatively little empirical evidence exists on the benefits of private-school vouchers. The weight of the evidence indicates that voucher receipt does not lead to significant gains in performance, but this conclusion should be tempered by the fact that the evidence is quite limited.²⁷ More research is necessary before strong conclusions can be drawn about any (lack of) effect of receipt of a voucher by disadvantaged children.

A middle ground that would provide increased educational choice for disadvantaged families while reducing the likelihood of negative systemic effects for these families would involve a means-tested voucher program that is limited to disadvantaged families. Such a publicly funded means-tested voucher program has been implemented in Milwaukee, where the evidence concerning academic outcomes is relatively weak but the evidence on parental satisfaction is clear.²⁸ Dramatically increased parental satisfaction is also evident in the evaluations of privately funded voucher programs.²⁹ However, for any means-tested program to be successful, it must be coupled with strong and useful information about public and private school quality and with low enough income thresholds to keep the most disadvantaged potential recipients from being crowded out of the school choice system.

Effects of charter schools

More states have had experience with charter schools than with school vouchers. Charter schools are now in operation in 39 states and the District of Columbia, and more than 20 times as many students in the United States are enrolled in charter schools as are utilizing publicly funded school vouchers. While the experience with charter schools is still relatively short, important results have emerged from several states concerning the effects of charter schools on achievement. The available evidence indicates that many charter schools are mediocre at best, and that young, inexperienced charter schools could have negative effects on students, but that charter schools that mature and stand the market test could have significantly positive effects on student test scores.³⁰

These findings present a cautionary tale regarding the use of charter schools as a policy to bring about education reform. The principal clients of charter schools are disadvantaged students who come from families that are often poorly equipped to evaluate charter schools. Bringing charter schools into school accountability systems could help to facilitate the information-sharing that would encourage the survival of successful charter schools and perhaps lead to the improvement of less-successful charter schools. Charter school advocates, however, are of mixed minds about the desirability of including charter schools in regular school accountability systems, and states differ in the degree to which this inclusion occurs.

Observers should not expect revolutionary results from either school choice or school accountability. Even the most optimistic estimates of the benefits of these two types of reforms amount to perhaps one-third to one-half of the test score gaps between disadvantaged and relatively advantaged students, and the majority of the evidence suggests more modest likely effects of these policies. Still, the potential for significant reductions in these test score gaps at relatively low cost suggests that more

experimentation with these policies—along with class-size reductions and alternative teacher compensation policies—is in order.

Conclusions and policy implications

The persistent academic achievement gaps along socioeconomic lines present significant concerns for policymakers. This article describes some of the potential policies that are often considered for remedying these gaps. I argue that increased spending for schools that serve disadvantaged families will itself not necessarily lead to improved outcomes for these children. Specifically targeted spending, however, may pay dividends: for instance, large teacher bonuses to encourage highly qualified teachers to remain in schools serving disadvantaged children and teacher merit pay could boost the performance of these children. Likewise, the best available evidence indicates that large-scale class size reductions could improve disadvantaged children's test scores, although this potential effect could be reduced if more affluent school districts, with increased demand for teachers owing to their own class-size reductions, "poach" the better teachers from disadvantaged schools.

Other policies that need not cost much more than existing expenditure levels also have the potential to improve student outcomes. School accountability policies have been found to improve test scores across the board, but particularly for disadvantaged children, though they also can lead to disadvantaged children being differentially excluded from the testing pool and, under some circumstances, more likely to be ignored by their school. Such potential problems need not be the case, but they underscore the importance of design issues when constructing school accountability policies. School choice programs also could improve educational outcomes, both for those who actively choose and for those who remain in schools serving disadvantaged children. But the quality of a choice depends on the quality of information, and the evidence suggests that disadvantaged families do not necessarily act upon the best information when formulating their schooling choices.

There are few easy answers when considering the potential solutions to the problems of persistent low achievement by disadvantaged children. Each policy option offers trade-offs, and each has the potential to either improve or worsen the academic performance of disadvantaged children. Specific features of the policy's design are likely to play the most important role in determining the policy's success. ■

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¹C. Rouse and L. Barrow, "U.S. Elementary and Secondary Schools: Equalizing Opportunity or Replicating the Status Quo?" *The Future of Children* 16, no. 2 (Fall 2006): 99–124.

²P. Carneiro and J. Heckman, "Human Capital Policy," in *Inequality in America: What Role for Human Capital Policies*, eds. J. Heckman and A. Krueger (Cambridge, MA: MIT Press, 2003).

³These data come from the National Education Longitudinal Study of 1988.

⁴J. West, K. Denton, and E. Germino-Hausken, "America's Kindergartners," National Center for Education Statistics: Washington, DC (2000).

⁵D. Princiotta, K. Flanagan, and E. Germino-Hausken, "Fifth Grade: Findings from the Fifth Grade Follow-Up of the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99," National Center for Education Statistics: Washington, DC (2006).

⁶M. Cahalan, S. Ingels, L. Burns, M. Planty, and B. Daniel, "United States High School Sophomores: A Twenty-Two Year Comparison, 1980–2002," National Center for Education Statistics: Washington, DC (2006).

⁷In 1980, high school sophomores from the top quartile averaged 12.5 more questions correct on the mathematics test in the High School and Beyond Study. In 1990 and 2002, the gaps, taken from the National Education Longitudinal Study, were 13.2 and 12.5 questions, respectively.

⁸M. Springer, K. Liu, and J. Guthrie, "The Impact of Education Finance Litigation Reform on Resource Distribution: Is There Anything Special About Adequacy?" working paper, Vanderbilt University: Nashville, TN, 2005.

⁹For evidence of increased equality in outcomes, see, e.g., D. Card and A. Payne, "School Finance Reform, the Distribution of School Spending, and the Distribution of SAT Scores," *Journal of Public Economics* 83, no. 1 (2002): 49–82; for evidence that school finance reforms are generally not followed with dramatic improvements in student achievement, see, e.g., J. Roy, "Impact of School Finance Reform on Resource Equalization and Academic Performance: Evidence from Michigan," working paper, Economic Policy Institute: Washington, DC, 2004.

¹⁰E. Hanushek, "School Resources and Student Performance," in *Does Money Matter? The Effect of School Resources on Student Achievement and Adult Success*, ed. G. Burtless (Washington, DC: Brookings Institution, 1996).

¹¹J. Guryan, "Does Money Matter? Regression-Discontinuity Estimates from Education Finance Reform in Massachusetts," working paper, National Bureau of Economic Research: Cambridge, MA, 2001.

¹²E. Lazear, "Educational Production," *Quarterly Journal of Economics* 116, no. 3 (2001): 777–803; D. Figlio, "Boys Named Sue: Disruptive Children and their Peers," *Education Finance and Policy* 2, no. 4 (Fall 2007): 376–394.

¹³See, e.g., B. Nye, L. Hedges, and S. Konstantopoulos, "Do Low Achieving Students Benefit More from Small Classes? Evidence from the Tennessee Class Size Experiment," *Educational Evaluation and Policy Analysis* 24, no. 3 (2002): 201–217.

¹⁴A. Krueger and D. Whitmore, "The Effect of Attending a Small Class in the Early Grades on College Test-Taking and Middle School Test Results: Evidence from Project STAR," *Economic Journal* 111, no. 468 (January 2001): 1–28; A. Krueger and D. Whitmore, "Would Smaller Classes Help Close the Black-White Achievement Gap?" in

Bridging the Achievement Gap, eds. J. Chubb and T. Loveless (Washington, DC: Brookings Institution, 2002).

¹⁵See, e.g., G. Bohnstedt and B. Stecher, "What We Have Learned about Class Size Reduction in California?" *Capstone Report*, California Department of Education, Sacramento, CA, 2002.

¹⁶See, e.g., D. Reed, K. Rueben, and E. Barbour, "Retention of New Teachers in California," Public Policy Institute of California, San Francisco, February 2006.

¹⁷See, e.g., S. Rivkin, E. Hanushek, and J. Kain, "Teachers, Schools and Academic Achievement," *Econometrica* 73, no. 2 (2005): 417–458.

¹⁸See, e.g., S. Loeb and M. Page, "Examining the Link Between Wages and Quality in the Teacher Workforce: The Role of Alternative Labor Market Opportunities and Non-Pecuniary Variation," *Review of Economics and Statistics* (2000).

¹⁹R. C. Fowler and R. Clarke, "The Massachusetts Signing Bonus Program for New Teachers: A Model of Teacher Preparation Worth Copying?" *Education Policy Analysis Archives* 11, no. 13 (2003).

²⁰C. Clotfelter, H. Ladd, and J. Vigdor, "Would Higher Salaries Keep Teachers in High-Poverty Schools? Evidence from a Policy Intervention in North Carolina," working paper, Duke University: Durham, NC, 2006.

²¹C. Clotfelter and H. Ladd, "Recognizing and Rewarding Success in Public Schools," in *Holding Schools Accountable: Performance-Based Reform in Education*, ed. H. Ladd (Washington, DC: Brookings Institution, 1999); H. Ladd, "The Dallas School Accountability and Incentive Program: An Evaluation of its Impacts on Student Outcomes," *Economics of Education Review* 18, no. 1 (1999): 1–16.

²²D. Figlio and L. Kenny, "Individual Teacher Incentives and Student Performance," *Journal of Public Economics*, 91 (2007): 901–914.

²³T. Dee and B. Keys, "Does Merit Pay Reward Good Teachers? Evidence from a Randomized Experiment," *Journal of Policy Analysis and Management* 23, no. 3 (2004): 471–488.

²⁴See, e.g., M. West and P. Peterson, "The Efficacy of Choice Threats Within Accountability Systems: Results from Legislatively Induced Experiments," *The Economic Journal* (2006).

²⁵D. Figlio and C. Rouse, "Do Accountability and Voucher Threats Improve Low-Performing Schools?" *Journal of Public Economics* 90 (January 2005): 239–255, find stronger accountability-related test score gains in math, while B. Jacob, "Accountability, Incentives and Behavior: Evidence from School Reform in Chicago," *Journal of Public Economics* 89, nos. 5–6 (2005): 761–796, finds stronger accountability-related test score gains in reading low-performing students, and a recent update in Florida by C. Rouse, J. Hannaway, D. Goldhaber, and D. Figlio, "Feeling the Florida Heat? How Low-Performing Schools Respond to Voucher and Accountability Pressure," working paper, National Bureau of Economic Research: Cambridge, MA, 2007, indicates strong medium-run benefits of school accountability in both reading and mathematics.

²⁶C. Hoxby, "Does Competition Among Public Schools Benefit Students and Taxpayers?" *American Economic Review* 90, no. 5 (2000): 1209–1238, demonstrates that metropolitan areas with less concentrated public schooling choices—that is, more choice amongst public school districts—tend to have higher test scores and lower school costs than do those with more concentrated public schooling choices. While a re-analysis of these data by J. Rothstein, "Does Competition Among Public Schools Benefit Students and Taxpayers? A Comment on Hoxby (2000)," *American Economic Review* (forthcoming), suggests that these results may be overstated, at a minimum they indicate that increased traditional school choice has the potential to improve public school efficiency.

²⁷See, e.g., W. Howell and P. Peterson, *The Education Gap* (Washington, DC: Brookings Institution, 2006); C. T. Hsieh and M. Urquiola, "The Effects of Generalized School Choice on Achievement and

Stratification: Evidence from Chile's Voucher Program," *Journal of Public Economics* 90, nos. 8–9 (September 2006): 1477–1503; C. Rouse, "Private School Vouchers and Student Achievement: An Evaluation of the Milwaukee Parental Choice Program," *Quarterly Journal of Economics* (May 1998): 553–602; K. Metcalf, S. West, N. Legan, K. Paul and W. Boone, "Evaluation of the Cleveland Scholarship and Tutoring Program," working paper, Indiana University, 2003; P. Wolf, P. Peterson, and M. West, "Results of a School Voucher Experiment: The Case of Washington, DC after Two Years," working paper, Harvard University: Cambridge, MA, 2001; among others.

²⁸J. Witte, *The Market Approach to Education* (Princeton, NJ: Princeton University Press, 2000).

²⁹Howell and Peterson, *The Education Gap*, 2006.

³⁰See, e.g., R. Bifulco and H. Ladd, "The Impacts of Charter Schools on Student Achievement: Evidence from North Carolina," *Education Finance and Policy* (Winter 2006); and T. Sass, "Charter Schools and Student Achievement in Florida," *Education Finance and Policy* (Winter 2006).

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