



# EDUCATIONAL ISSUES POLICY BRIEF

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## Recent Research Shows Major Benefits of Small Class Size

### Introduction

In his State of the Union address on January 27, 1998, President Clinton proposed “the first ever national effort...to reduce class size in the first, second, and third grades to an average of 18 students a class all across America.” Parents, the public, and teachers consistently have ranked lower class size high on their list of desired education reforms. The question is, does lower class size make a positive difference in achievement, especially for poor children?

For years, research on class size was inconclusive. Then, in 1985, the state of Tennessee implemented a major class-size reduction initiative in grades K-3 in a way that allowed for one of the best-designed studies in the history of education. The result: Lowering class size substantially improved student achievement and was especially effective for poor children.

Now joining the “gold standard” Tennessee research are the results of a number of new, first-rate studies on class size, including some that compare the academic benefits of lower class size with vouchers. The inescapable conclusion is, again, that lower class size makes a big difference for children, particularly poor children, and that lower class size trumps vouchers.

***Cecilia Rouse, “Schools and Student Achievement: More Evidence from the Milwaukee Parental Choice Program,” Princeton University and NBER, December 1997***

The Milwaukee Parental Choice Program is one of two publicly funded voucher programs in the country. In her study, Rouse compares the achievement of Milwaukee voucher students and students in three types of Milwaukee Public Schools (MPS): regular schools, magnet schools, and schools participating in the Preschool to Grade 5 Grant Program (P-5 schools). P-5 schools, which enroll about 25 percent of all MPS elementary students, serve “predominantly minority and extremely disadvantaged” children and receive supplemental state funds that have enabled them to cut their pupil-teacher ratio, on average, to 17 to 1.\*

Rouse reports the following:

- Students in the P-5 (small class size) public schools made “substantially faster gains in reading” than those in the regular public schools, the public magnet schools, and the voucher schools.

\*Pupil-teacher ratio and class size technically are not the same thing. Pupil-teacher ratio refers to the number of students divided by the number of staff classified as teachers. Class size refers to the actual number of students in a classroom with a teacher. Pupil-teacher ratio is typically lower than average class size but often used as an approximate measure.

- Students in the P-5 (small class size) public schools made faster math gains than students in the regular public schools and the public magnet schools, and the same math gains as the voucher schools.
- Although average class size in the P-5 (small class size) public schools was larger than the voucher schools —17:1 vs. 15.3:1—P-5 schools outperformed voucher schools in reading and were even in math.
- “These [P-5] gains are relatively large for education productions, and are comparable to the effects from the Tennessee class size experiment.” (See below for more on the Tennessee study.)

Rouse ends her paper by urging researchers to explore the other factors, in addition to class size, that contribute to academic achievement. And she issues a stern warning: “If we really want to ‘fix’ our educational system, we need a better understanding of what makes a school successful, and not simply assume market forces explain sectoral differences and are therefore the magic solution for public education.”

**Peter Maier, Alex Molnar, Stephen Percy, Phillip Smith, John Zahorik, “First Year Results of the Student Achievement Guarantee in Education (SAGE) Program,” Center for Urban Initiatives and Research, University of Wisconsin-Milwaukee, December 1997**

Maier and associates report on the first-year effects of another Wisconsin (statewide) initiative, the Student Achievement Guarantee in Education (SAGE) project. Begun in 1996-97, SAGE seeks to increase the academic achievement of children living in poverty by reducing the student-teacher ratio in grades K-3 to 15:1. Evaluation of the program was legislatively mandated, and this is the first of five annual reports. After comparing about 1,300 SAGE first-graders throughout the state to their non-SAGE peers, Maier and associates conclude:

“SAGE students enjoyed significantly greater improvements in test scores in reading, language arts, and math.” These first-year results “are consistent with the Tennessee experience” (discussed below).

“African-American males, in particular, appear to benefit from participation in the SAGE program. The total scores of African-American males on all three tests rose 56 points in SAGE classrooms compared to 39.4 for the matched schools” — a 40 percent SAGE advantage.

**Alex Molnar, “Smaller Classes, Not Vouchers, Increase Student Achievement,” Keystone Research Center, Harrisburg, Pa., January 1998**

In his comprehensive review of class size and voucher research, Molnar draws the following conclusion: “There is no longer any argument about whether or not reducing class size in the primary grades increases student achievement. The research evidence is quite clear: It does.”

Molnar reviews several class-size studies in this paper and focuses on the oft-cited Tennessee STAR study and its various follow-ups and validations. Given its unparalleled scope and rigorous design, STAR is hailed by many as the “gold standard” of class-size studies—or what Harvard University Professor Frederick Mosteller, one of the nation’s most distinguished statisticians, called “one of the great experiments in education in United States history.”

**Elizabeth Word, et al., “Student/Teacher Achievement Ratio (STAR) Final Report 1985-1990,” Tennessee Department of Education, 1990**

Begun in 1985, the original Tennessee STAR study followed a group of students from kindergarten through third grade, randomly assigning these students to one of three types of classes: small (13-17 students), regular (22-25 students), and regular with an aide. With four years of data, researchers found that:

- Students in small classes significantly outperformed the other students in both math and reading, every year, at all grade levels, across all geographic areas.
- Effect sizes (a statistical measure of the impact of any program) were quite large—.23 in math and .26 in reading, on average, per year, with results even higher for inner-city, minority children.

Put another way, “students in small classes had an advantage of a bit more than 8 percentile ranks over students in regular classes in reading and a bit less than 8 percentile ranks in math,” on average, per year.

**Barbara Nye, et al., “The Lasting Benefits Study,” Tennessee State University, 1995**

This study followed-up the original STAR study to see if students in small classes in the K-3 grades maintained an academic advantage.

Tennessee students in small classes during K-3 continued to outperform their regular class peers at least

through eighth grade, with achievement advantages especially large for minority students.

**Alan Krueger, "Experimental Estimates of Education Production Functions," Princeton University, May 1997**

Using even more sophisticated analytical methods, Krueger reexamined the STAR data to see if the results held up.

The original findings of STAR were validated: overall effect sizes that range from .19 to .28 in the four years.

**Harold Wenglinsky, "When Money Matters," Educational Testing Service, April 1997**

In addition to local (e.g., Milwaukee) and state (e.g., Wisconsin, Tennessee) evidence, there is also national evidence that small class size is a major factor in improved student achievement. After analyzing spending patterns against fourth-grade math achievement in 203 districts and eighth-grade math achievement in 182 districts across the nation, Wenglinsky argues that money does indeed make a difference when it is spent correctly:

Increased teacher-student ratios (smaller class size) raise average achievement in fourth- and eighth-grade math. (In eighth grade, the achievement effect comes about through the better discipline and learning environment smaller class size produces.)

How large are the gains? "Fourth-graders in smaller-than-average classes are about a half a year ahead of fourth-graders in larger-than-average classes," with the "largest effects" (three-fourths of a year ahead) for low-income students in "high-cost" (i.e., urban) regions. Even more substantial effects are observed for low-income eighth-graders in "high-cost" regions.

## Conclusion

Taken together, these studies strongly support President Clinton's class size initiative. They provide compelling evidence that reducing class size, particularly for younger children, will have a positive effect on student achievement overall and an especially significant impact on the education of poor children. Moreover, lower class size trumps even the most generous results from the highly contested research on vouchers.

Of course, small class size is not a panacea. Reducing class size is a significant means of improving student achievement, but it is not the only piece. High academic standards and a challenging curriculum, safe and orderly classrooms, and qualified teachers are no less significant in the arsenal of solid research-proven reforms. And, in fact, when smaller class size is pursued in conjunction with these standards-based reforms, the combined impact on student achievement is far greater than either strategy alone.

—DAN MURPHY & BELLA ROSENBERG