Class Size: Project STAR

A Summary of:

"Would Smaller Classes Help Close the Black-White Achievement Gap?" (March 2001) Princeton University Industrial Relations Section Working Paper #451. By Alan B. Krueger and Diane M. Whitmore.

"The Enduring Effects of Small Classes" (2001) *Teachers College Record* 103(2): 145-183. By Jeremy Finn, Susan Gerber, Charles M. Achilles, and Jayne Boyd-Zaharias.

"Class Size and Students At-Risk: What Is Known? What is Next?" (April 1998) Office of Educational Research and Improvement, U.S. Department of Education. By Jeremy D. Finn.

"The Tennessee Study of Class Size in the Early School Grades" (May 1995) American Academy of Arts and Sciences. By Frederick Mosteller.

Focus

- Early Childhood
- ✓ Primary School
- Middle School
- Secondary School
- Postsecondary
- Extended Learning

Overview

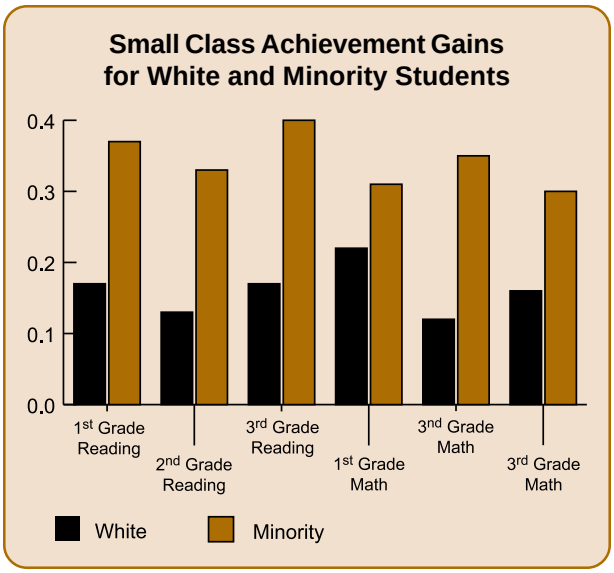
Tennessee was at the vanguard of states in conducting studies to determine the academic achievement effects of reducing class size. In Project STAR, the Lasting Benefits Study and Project Challenge, Tennessee evaluators were especially interested in the effect of reducing class sizes for minority student achievement. Project STAR (Student/Teacher Achievement Ratio) was a four-year educational reform experiment conducted from 1985-1989 by the state of Tennessee. It was intended to test whether students attending small classes in grades K-3 had higher academic achievement than their peers in larger classes. The 79 participating elementary schools throughout the state randomly assigned students entering kindergarten to one of three class types: small (S) with 13-17 pupils; regular (R) with 22-26 pupils or regular with a full time teaching aide (RA) with 22-26 pupils. With few exceptions, students remained in these class categories for four years. The teachers in these schools received no special instruction in the first year of the program, and they were randomly assigned to the different types of classes every year. After Project STAR's fourth and final year, the state continued to track the academic achievement of STAR students as they reentered regular classes for grades 4-6. (This follow-up research was called the Lasting Benefits Study.) Convinced that small classes were effective, Tennessee implemented Project Challenge in 1989, creating small classrooms for grades K-3 in the 17 districts with the lowest average incomes and test scores in the state.

POPULATION

Nearly 12,000 students in more than 300 classrooms participated in Project STAR. Approximately one quarter of the students in Project STAR were minorities, primarily African Americans from Tennessee's large metropolitan areas. In the Lasting Benefits Study, evaluators continued to track the academic progress of between 4,000 and 6,000 of the STAR participants annually from 1990-1994.

Key Findings

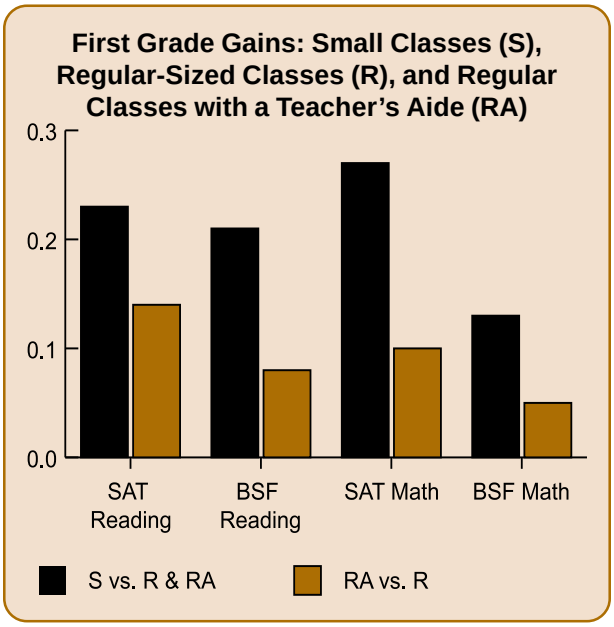
Evaluators first reported the impact of small classes, by comparing the test scores of students in these classes with the scores of students in regular classes with and without aides. They also compared the scores of students in regular classes with aides to those in regular classes without aides. The presence of Teacher Aides did not have a significant impact on academic achievement; true reduction in class size did. Gains in effect sizes are reported in the chart below.

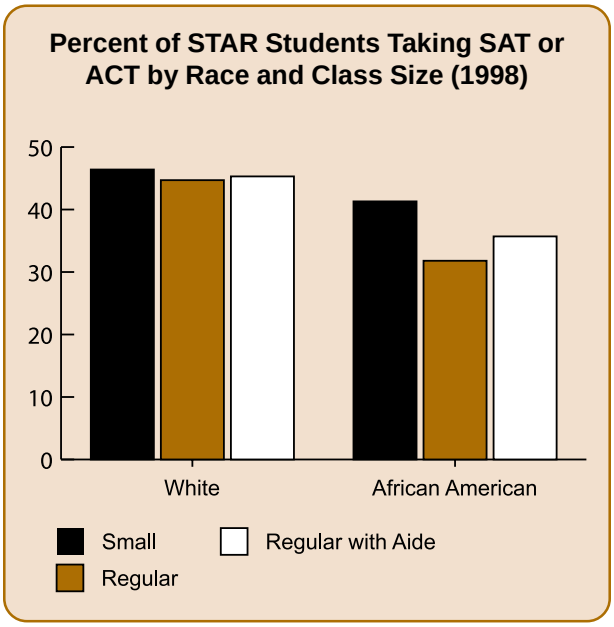


Evaluators also disaggregated the achievement gains from smaller classes by race. While all students did better in small classes, the gains in effect size for minorities were approximately twice the gains of whites, reducing the achievement gap.

The Lasting Benefits study revealed that students who had been in small classes for more than one year retained an academic achievement advantage over peers in large classes through eighth grade (four years after leaving small classes). For students who spent one year in a small class, the benefits seen above did not last through middle school. However, students who spent three years in small classes, were on average 4.5 months ahead of their peers in Grade 4, 4.2 months in Grade 6 and 5.4 months in Grade 8.

Evaluators used college admissions test taking (ACT or SAT) to determine whether class size in elementary school affected college aspirations. Both white and African American students in small classes were more likely to take the SAT or ACT than students who had been placed in regular size classes in elementary school. [See graph.] However, the difference in *scores*





between the two groups was not statistically significant.

The students in the 17 low-income districts where Project Challenge reduced class sizes in 1989 saw gains relative to student scores before the project implementation. Gains in effect sizes for these districts averaged 0.4 reading and 0.6 for mathematics. Between 1989 and 1993, these schools also improved their average rank among the 139 school districts in the state for reading (from 99th to 78th) and for math (from 85th to 56th).

Program Components

The basic intervention of Project STAR was reduction in class size, but funding for new teachers was also a component:

- The small classes in Project STAR had an average of 15 students each, down 35% from the regular class size average of 22-23 students. To be eligible for Project STAR, schools had to serve at least 57 kindergarten students (allowing a small class of 13 and two large classes of 22). When Project Challenge was implemented, classes were also reduced to an average size of 15 students.

- After the first year of Project STAR's implementation, the legislature mandated a three-day training program for a sample of teachers assigned to all three class types. Because 30% of these teachers had more than 20 years of experience and because the training was of a general nature, evaluators found that it did not affect Project STAR's results. There was little difference in the academic achievement in trained teachers' classes compared to other small classes. The benefits of small classes were confirmed for "trained" and "untrained" teachers alike.

- Teachers' aides in Project STAR were full-time, paid employees who received no special training for work with the regular sized classes.

- Project STAR provided funds only for the hiring of new teachers and teachers' aides, not for the construction of new classrooms or other facilities. Schools had to supply classrooms for the new teachers if they volunteered to participate in the program.

- In the first year of Project STAR (1985), the Tennessee state legislature allocated $3 million for its implementation. Comparable allocations were made for each of the next three years.

Contributing Factors

Early and Sustained Intervention

Evaluators suggested that small class size might be most effective for younger students because these students come from a variety of backgrounds and "many need training in paying attention, carrying out tasks and behavior towards others in a working situation." In short, they need to "learn to learn" along with others, and this may be easier in small classes at an early age. The lasting benefits accrued to students who started early and continued in small classes for 2-4 consecutive years.

Student Engagement

The evaluators found that increased student participation and engagement in smaller classes contributed to the academic achievement outcomes and constituted mutually reinforcing positive attributes of these classes.

Individualized Attention

The evaluators admitted that there were mixed findings on the amount and impact of individualized attention in smaller classes. Though teachers felt

that smaller class size facilitated individualized attention for students, observers suggested that "teachers did not alter the proportion of their time spent interacting with the whole class, with groups or with individual pupils."

Decreased Disciplinary Problems
Evaluators found that decreased disciplinary problems contributed to a more positive learning environment in which there were fewer distractions from academics.

Evaluator Comments

One researcher noted that "moving incompatible children" from the small class groups to the control group had an indeterminate impact on the study. From the first year cohort of students in small classes, 108 out of 1678 (6.4%) students were moved to the other groups, perhaps siphoning off students with behavior problems or academic deficiencies.

Evaluators were also careful to point out that Project Challenge results were not compared to a control group.

STUDY METHODOLOGY

Project STAR was a controlled randomized experiment on a large scale, and as such, it is one of the most rigorous evaluations in this compendium. Schools chose to participate in the study and 79 fit the criteria (they had to commit to the study for four years, had to supply the extra classrooms, and had to enroll at least 57 kindergarteners). Participating elementary schools throughout the state, randomly assigned students entering kindergarten to one of three class types: small (S), regular (R), or regular with a full-time teaching aide (RA). Students remained in these class categories for the next four years. Teachers were randomly assigned to the different types of classes every year. Norm referenced and criterion-referenced achievement tests (the Standford Achievement Tests and Tennessee Basic Skills Tests, respectively) were administered at the end of each school year. Finn's report summarizes different class size studies including STAR, the Lasting Benefits Study, and Project Challenge.

EVALUATION & PROGRAM FUNDING

Project STAR was funded by the state of Tennessee. The Office of Educational Research and Improvement in the U.S. Department of Education funded work on the Finn monograph and the American Academy of Arts and Sciences funded Mosteller's report.

GEOGRAPHIC AREAS

Tennessee

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