

Reference: Finn, J. D., & Achilles, C. M. (1999). Tennessee's class size study: Findings, implications, misconceptions. *Educational Evaluation and Policy Analysis*, 21 (2), pp. 97-109.

STRUCTURED ABSTRACT

Background: Tennessee's Project STAR was a controlled scientific experiment that produced clear findings regarding the effect of small class size on student achievement in the early grades.

Purpose: To summarize the findings of Project STAR on the effect of class size on student achievement and student behavior, and to discuss the implications of these findings for educators and policymakers.

Setting: Approximately 80 schools in inner-city, urban, suburban, and rural districts throughout the state of Tennessee.

Participants: The first phase of the study began with a cohort of 6,325 students who started kindergarten in 1985. By the time the study's first phase ended four years later in 1989, 11,600 students had participated. Approximately one-third of the participating students were African-American. The second phase observed the school performance of these participants over time after all students returned to regular size classes in fourth grade. This study followed student performance in fourth grade and beyond.

Intervention: In Project STAR students and teachers were randomly assigned to one of three experimental conditions: small class size kindergarten (13 to 17 pupils), regular class size kindergarten (22 to 25 students), or regular class size kindergarten (22 to 25 students) with a teacher aide. Each participating school had at least three classrooms in the appropriate grade (i.e., kindergarten in 1985, first grade in 1986) participating in Project STAR to represent each of the three experimental conditions, allowing within-school comparisons. Participating schools received funds for additional teachers and teacher aides, but had to supply the extra classrooms themselves and did not get additional financial support. Students in the small class size kindergarten subsequently had small classes (13 to 17 pupils) in first, second, and third grade over the four-year course of the study. Students in the small classes remained in those small classes all day and every day throughout the school year; there were no pull-out programs. Students in the regular class size kindergartens subsequently remained in regular size classes (22 to 25 students) in first, second, and third grades. In the second year of the study, all students in the regular size classes were re-randomized to regular size classes with or without a teacher aide and then remained in those classroom conditions for the next three years. New teachers were assigned to each class each year in both small and regular class sizes. New special textbooks or curricula were not allowed to be introduced in the Project STAR classrooms during the study. Project STAR began in 1985 and concluded at the end of the school year in 1989.

Research Design: Randomized-controlled field trial.

Data Collection and Analysis: To assess the reading and math performance of participants in Project STAR, students took both a nationally-normed standardized test (i.e., the Stanford Achievement Test) in the spring of each school year and a state-specific curriculum-based test

(i.e., the Tennessee Basic Skills First test). In fourth grade and beyond, students took another nationally-normed standardized test (i.e., the Comprehensive Tests of Basic Skills) as well as the Tennessee Basic Skills First tests in reading and math.

Behavioral data came from fourth grade teachers who rated each student who had participated in Project STAR on a 28-item questionnaire.

Test and behavioral data were analyzed using multivariate analysis with statistical procedures that take into account that individual students were “nested” (or contained) within classes, and that classes were themselves “nested” within schools.

Findings: During the four-year course of Project STAR, students in the small size classes consistently showed substantial academic gains over their counterparts in the regular size classes. Statistically significant differences were found on all achievement measures in all subject areas in every year of the experiment. For all students combined, the effect sizes of small classes were 0.15 to 0.18 in kindergarten; from 0.22 to 0.27 in first grade; and from 0.19 to 0.26 in second and third grade. In other words, at the end of kindergarten students in small classes were about one month ahead of their counterparts in regular size classes in terms of grade equivalents; the difference was about two months at the end of second grade.

The effect of small classes was the same for boys and girls.

The benefits of small classes were substantially greater for minority students or students attending inner-city schools. White students in small classes had statistically significant gains over their counterparts in regular-size classes. However, the benefits for African American students in small classes, when compared to their African American counterparts in regular-size classes, were on average two to three times as large as those for white students.

The effect of small classes extended to student behavior. Fourth-grade students who had been in small classes in grades K-3 showed more engagement in classroom learning activities than their counterparts who had been in regular-size classes. In fourth grade, the effect sizes of students who previously attended a small class in the early grades were 0.12 for effort; 0.14 for initiative-taking; and 0.11 for less disruptive behavior.

In all analyses, there were no benefits found for adding a teacher aide to a regular-size classroom in the early grades.

In the follow-up studies of student performance in fourth grade and beyond, the advantage of having attended small classes in grades K-3 was statistically significant for all subjects through seventh grade. The effect sizes in fourth grade through seventh grade in reading, language, math, science, social science, and study skills ranged from 0.10 to 0.22; the mean and median effect size was 0.15.

In terms of the ongoing debate on class size research, one important distinction to make is that pupil-teacher ratio is a different construct than class size, and the two should not be confused with each other. Pupil-teacher ratios are aggregate measures commonly determined by

comparing the number of students in a school with the number of full-time professional staff at that school. This results in figures that do not represent average class size which reflects the number of students in a teacher's room all day. Researchers, policymakers, and educators interested in the effect of small class size on student achievement need to keep the concept of "pupil-teacher ratio" separate from "class size" and not use the terms interchangeably.

Conclusions: Project STAR shows that small classes in the early grades have significantly positive effects on student achievement, significantly positive effects on student behavior, and lasting benefits in subsequent years after students return to regular-size classes. At least 30 states in the U.S. have launched class size reduction initiatives in the primary grades since the findings of Project STAR were published, suggesting that the results of this controlled scientific experiment on a high-profile subject have been positively received by the education and political communities.