

Reference: Mosteller, F. (1995). The Tennessee study of class size in the early school grades. *The Future of Children: Critical Issues for Children and Youths*, 5 (2), pp. 113-127.

STRUCTURED ABSTRACT

Background: The Tennessee study of class size in the early school grades is one of the most important educational investigations conducted to date in the United States. Funded by the Tennessee state legislature through an annual appropriation of close to \$3 million for four years, the centerpiece of this study was a randomized-controlled experiment where students were randomly assigned to small or regular class sizes in kindergarten in 1985 and then kept in those small or regular class sizes for four years through third grade. This study is unique in terms of its quality, scale, and duration and is a definitive examination of the effects of small class size in the early grades.

Purpose: To provide educators and policymakers with access to detailed statistical information about the Tennessee class size study and its findings, and to examine the implications of these findings for school improvement and student learning.

Setting: All three phases of the study took place in public elementary schools in Tennessee. The first two phases involved a total of approximately 80 schools in inner-city, urban, suburban, and rural districts throughout the state; the third phase occurred by design in the 17 economically poorest school districts in 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 they resumed elementary school under normal conditions (i.e., in regular size classes) in fourth grade and beyond. The final phase of the study, a large-scale policy intervention, involved students in kindergarten through third grade in the 17 economically poorest school districts in Tennessee.

Intervention: In the first phase of the study, called 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's 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's 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.

The second phase of the Tennessee class size study, called the Lasting Benefits Study, did not feature a new intervention but rather continued the evaluation of the randomized-controlled class size intervention of Project STAR by observing the school performance of the participating students over time after they resumed elementary school under normal conditions in fourth grade and beyond. This ongoing study began in 1989.

The third phase of the Tennessee class size study was a policy intervention called Project Challenge in which the 17 economically poorest school districts in Tennessee received additional funds to implement small class sizes in kindergarten through third grade.

Research Design: The three phases of the Tennessee class size study involved different research designs. Project STAR was a randomized-controlled field trial; the Lasting Benefits Study was a quantitative comparison study that observed and compared the performance of former participants in Project STAR after they began 4th grade; and the research component of Project Challenge was a program evaluation of a large-scale policy intervention in kindergarten through third grade in 17 school districts in Tennessee.

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 the Lasting Benefits Study and Project Challenge, students each year 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.

Findings: In Project STAR, students in the small size classes showed substantial academic gains over their counterparts in the regular size classes. In first grade, student performance on the Stanford Achievement Test in reading and math showed an effect size of close to .25 – in other words, on average, students who would have scored at the 50th percentile in reading or math if no intervention had taken place now scored in the 60th percentile after being randomly assigned to a small class for two years. The academic gains of small class size especially benefited African American students, as the average effect size for African American students in first grade was roughly double the effect size for white students.

In the Lasting Benefits Study, 4th and 5th grade students who had been assigned to small classes in kindergarten through third grade as part of Project STAR continued to outperform their counterparts who had been assigned to regular size classes during that same time period. The 4th grade performance on standardized tests (n=4,230) in reading and math showed an effect size for small class size of about .13 – on average, students who would have scored at the 50th percentile in reading or math if no intervention had occurred now scored in the 55th percentile after being randomly assigned to a small class size in kindergarten through third grade. The 5th grade

performance on standardized tests in reading and math (n=4,639) showed an effect size for small class size of about .20 – on average, students who would have scored at the 50th percentile in reading or math if no intervention had taken place now scored in the 58th percentile. The effect sizes for 6th grade students (n=4,333) ranged from .14 to .26 on the four standardized tests, and for 7th grade students (n=4,944) ranged from .08 to .16. In all cases, the Lasting Benefits Study demonstrated that the academic benefits of small class size in the early elementary grades persisted even after students had returned to regular size classes in 4th grade and beyond.

In the evaluation of Project Challenge, researchers found that student performance substantially improved in both reading and math in the 17 school districts where small class sizes were implemented in kindergarten through third grade. In reading, the academic performance of 2nd graders on standardized tests moved the average state-wide ranking of the 17 districts from #99 in 1990 (out of the 139 school districts in Tennessee, where #1 was the highest ranking) up to #78 in 1993 – a gain of more than 20 ranks. In math, the academic performance of the 2nd graders moved the average ranking of the 17 districts from #85 in 1990 up to #56 in 1993 – a gain of almost 30 ranks in which the Project Challenge school districts moved from well below average in 2nd grade math in 1990 (the average district ranked #70) to considerably above average in 1993.

Conclusions: The Tennessee class size study provides compelling evidence that small class size in the early elementary grades provides both short-term and long-term academic benefits to students.