

MATHEMATICA STUDY

Small-group tutoring

A randomized evaluation of virtual fifth-grade fractions tutoring

0.44

EFFECT SIZE

9 percentage points above the no-tutoring control

Students assigned to Cognition's virtual group tutoring scored 9 percentage points higher on the fractions assessment than control-group students after accounting for baseline differences.

POPULATION

157 students in the complete achievement analysis

SETTING

11 elementary schools in one district

SCHEDULE

Four days weekly across eight instructional weeks

SESSION LENGTH

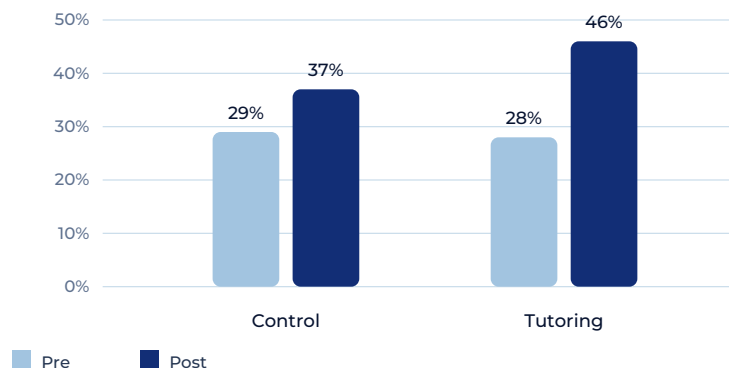
30 minutes; 28-30 sessions offered

WHAT WAS TESTED Students in school-based blocks were assigned to tutoring groups of up to four or to a no-tutoring control. Fractions-focused sessions took place during the school day.

WHAT THE STUDY FOUND

RAW PRE- AND POST-ASSESSMENT SCORES

PERCENT CORRECT



Source: Pratt et al. (2023), Figure 1. Unadjusted pre- and post-assessment percentages (n = 157).

9

percentage points above the no-tutoring control

The adjusted difference was 9 percentage points, equivalent to an effect size of 0.44. The Bayesian analysis supported 99 percent confidence in a positive effect.

Additional context: Tutoring attendance averaged 92 percent. Differences in math confidence and enjoyment favored tutoring but were not statistically significant.

STUDY DESIGN

RANDOMIZATION

Groups of students within each of 11 schools were randomly assigned to tutoring or control.

INTERVENTION

Live virtual tutoring emphasized fractions, collaborative reasoning, and stable student-tutor relationships.

MEASURES

The study used a Cognition fractions assessment plus surveys of confidence, enjoyment, and tutor relationships.

ANALYSIS

A Bayesian regression controlled for baseline achievement, school, and student characteristics.

INTERPRETING THE RESULT

This randomized study supports a causal conclusion about the effect of the evaluated 4:1 fractions program within this district and study design. Its 0.44 estimate is similar in magnitude to the earlier 1:1 study's estimate, but the studies were not a head-to-head comparison.

WHAT TO KEEP IN VIEW

- The study involved one district and a relatively small sample, limiting generalizability.
- The achievement measure was created by Cognition and aligned with the fractions content taught during tutoring.
- The similar effect estimates from the 1:1 and 4:1 studies do not establish equivalence or non-inferiority.

INDEPENDENT SOURCE

Pratt, C., Chojnacki, G., & Conroy, K. (2023, March). Cognition group tutoring: Impacts on students' math knowledge and perceptions [Middle Years Math Grantee Report]. Mathematica.

Unless otherwise noted, all study descriptions and statistics in this brief are summarized from this independent report.

[READ THE INDEPENDENT REPORT](#) »

mathematica.org/publications/cognition-group-tutoring