



What Is a Comparison Study?

Comparison studies seek to compare two or more groups to observe differences between the groups on relevant outcomes.

The goal of a comparison study is to compare participants who were exposed to a solution (**treatment group**) to participants who were not (**comparison group**).

Defining Groups

Groups were created in two ways.

- **Random assignment** | Students were randomly assigned to a treatment or comparison group.
- **Matching** | We identified treatment students and their teachers. We determined the comparison group using a matching process that selected students who were as similar as possible to those in the treatment group based on things you can see or measure—like past test scores or background information.



Scales of Outcomes Examined

Student outcomes are on different scales.

- **Survey outcomes** related to math class experience and math identity are on a scale of 1 (Completely Disagree) to 6 (Completely Agree).
- **Math proficiency outcomes** are on the following scales:
 - State and formative math assessment outcomes are on a population-standardized metric (mean = 0, standard deviation = 1).
 - The math course grade outcome is on a scale of 0 (F-) to 4 (A+).



Interpreting Results

Results are expressed as the **average difference in an outcome** between treatment and comparison students.

The **treatment average** is the average value of the outcome for students in the treatment group. The **comparison adjusted average** is the outcome average you would expect for the same set of students if they didn't participate in the solution.



Example

In this example, the differences in average effects tell us that, on average, treatment students:

- indicated a significantly higher level of **enjoyment in math class**—by 0.50 points on a 6-point survey scale—than comparison students;
- obtained **state assessment scores** that are 0.05 standard deviations higher than comparison students, but the difference is not statistically significant; and
- had **math course grades** that are 0.10 points lower on a 5-point grading scale than comparison group students, but the difference is not statistically significant.

Student Outcome	Treatment Average	Comparison Adjusted Average	Difference
Enjoyment in math class	4.50 (N = 80)	4.00 (N = 80)	0.50*
State assessment score	0.30 (N = 100)	0.35 (N = 100)	0.05
Course grade	3.00 (N = 110)	2.90 (N = 110)	-0.10

N = sample size. * Indicates statistical significance at $p < 0.05$.