

Case 11: Examining Student Math Performance

A researcher is studying math test scores of students. The study involves 200 randomly selected students from a large metropolitan area, with each student sampled independently. Each student is tested twice (Time 0 and Time 1) using standardized tests. The following variables are collected: Math score, Time, Student ID, and student socioeconomic status (SES). The researcher wants to study whether math scores improve over time and how SES affects math performance. ([download data](#))

Initial Questions

1. What are the research objectives?
2. What are the statistical questions?
3. What is the response variable, and what is the data type of the response variable?
4. What are the explanatory variables of interest?
5. Are there covariates?
6. What is the population of interest?
7. What is the subject, and what is the number of distinct subjects?
8. Are there subject-level data?
9. Are response variables dependent (repeated measures / clustered subjects)?
10. Are the subjects selected randomly?
11. Are the subjects randomly assigned to different groups?

Initial Thoughts