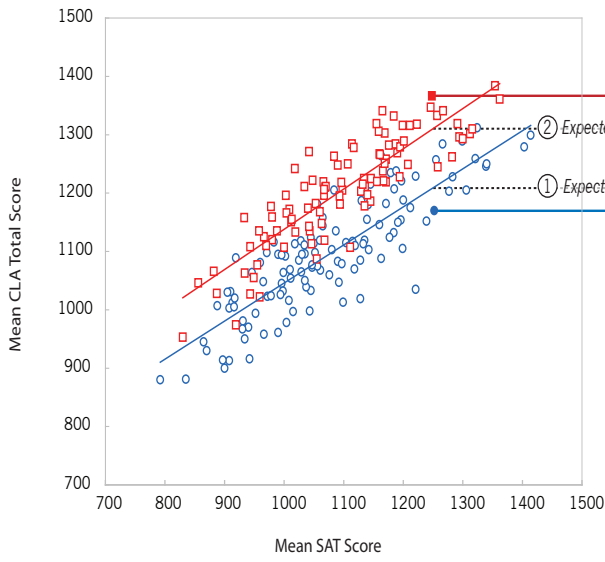


Relationship Between CLA Performance and Incoming Academic Ability



Freshmen (○) and Seniors (□)
 Freshmen (●) and Seniors (■) at University College

- ① *Expected Score Freshmen*: The mean CLA score we expect given the mean SAT score of freshmen at University College.
- ② *Expected Score Seniors*: The mean CLA score we expect given the mean SAT score of seniors at University College.
- ③ *Expected Value Added*: The difference in expected CLA scores between the freshmen and seniors tested at University College.
- ④ *Actual Score Seniors*: The mean CLA score for the sample of seniors tested at University College.
- ⑤ *Actual Score Freshmen*: The mean CLA score for the sample of freshmen tested at University College.
- ⑥ *Actual Value Added*: This estimated value added is the difference in actual CLA scores between the freshmen and seniors tested at University College.

Squares (for seniors) and circles (for freshmen) represent colleges or universities with a sufficient number of students with both CLA and SAT (or converted ACT) scores.

Diagonal lines (red for seniors and blue for freshmen) show the typical relationship between incoming academic ability (average ACT or SAT scores) and average CLA scores across all participating institutions. The lines represent expected CLA scores at different levels of incoming academic ability.

Figure 1: Council for Aid to Education, “Collegiate Learning Assessment: Draft Institutional Report, 2005-6” www.cae.org

Statistical Modeling: A Fresh Approach

Prac 4.6

[M/M105]

The graphic in Figure ?? is part of a report describing a standardized test for college graduates, the Collegiate Learning Assessment (CLA). The test consists of several essay questions which probe students’ critical thinking skills.

Although individual students take the test and receive a score, the purpose of the test is not to evaluate the students individually. Instead, the test is intended to evaluate the effect that the institution has on its students as indicated by the difference in test scores between 1st- and 4th-year students (freshmen and seniors). The cases in the graph are

institutions, not individual students.

There are three variables involved in the graphic:

cla The CLA test score (averaged over each institution)

sat The SAT test score of entering students (averaged over each institution)

class Whether the CLA test was taken by freshmen or seniors.

What model is being depicted by the straight lines in the graph? Give your answer in the standard modeling notation (e.g, $A \sim B+C$) using the variable names above. Make sure to indicate what interaction term, if any, has been included in the model and explain how you can tell whether the interaction is or is not there.

Enter Text Prac 4.6-1