Interaction Terms - Quiz

Back to our SAT scores by ethnicity example. You decide you want to do something to help minorities score better on the SAT. To that goal, you decide to run an SAT prep course, and are interested in seeing whether or not that had an impact.

Suppose you run the following regression:

$$Y_i = \alpha + \beta D_i + \gamma M_i + \delta D_i M_i + \epsilon_i$$

where Y_i denotes the SAT score of person i and D_i be an indicator equal to 1 if person i took an SAT prep course, and 0 otherwise, and M_i is an indicator equal to 1 if person i belongs to a non-white minority, and 0 otherwise. You have data from a sample of students from your university. You load it into R, and run the regression, and get the following output:

```
Call:
lm(formula = score ~ minority + presat + presat * minority, data = sample)

Residuals:
    Min      1Q  Median      3Q     Max
-4.2579 -0.6729 -0.0016  0.6800  4.5101

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)
(Intercept)            0.998960   0.008165 122.339   <2e-16 ***
minorityTRUE          -0.300283   0.014772 -20.328   <2e-16 ***
presatTRUE             0.203320   0.018322  11.097   <2e-16 ***
minorityTRUE:presatTRUE  0.002893   0.033334   0.087    0.931
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.9976 on 26782 degrees of freedom
Multiple R-squared:  0.0252,    Adjusted R-squared:  0.0251
F-statistic: 230.8 on 3 and 26782 DF,  p-value: < 2.2e-16
```

Question 1

1/1 point (graded)

For the following questions, please round your answer to the second decimal place (i.e. if your answer is 2.006, round to 2.01 and if it is 2.001, round to 2.00)

Based on these estimates, what is the mean SAT score for white students (non-minorities) who did not take a prep course?

1.00 ✔ **Answer:** 1.00

1.00

Regressions, and Omitted Variable Bias

Practical Issues in Running Regressions
due Dec 5, 2016 05:00 IST

Omitted Variable Bias
due Dec 5, 2016 05:00 IST

Module 10: Homework
due Nov 28, 2016 05:00 IST

What is the difference in scores between non-minorities who took the prep course and non-minorities who didn't?

0.20 ✔ **Answer:** 0.20

0.20

What is the difference in scores between minorities and non-minorities who didn't take the prep course?

-0.30 ✔ **Answer:** -0.30

-0.30

What is the difference in the effect of the prep course on SAT scores for minorities relative to non-minorities?

0.00 ✔ **Answer:** 0.00

0.00

Explanation

$\hat{\alpha}$ denotes the mean SAT score for the group that has $D_i = M_i = 0$, so $\hat{\alpha}$ the mean SAT score for white students who did not take a prep course. In the regression output, this corresponds to the estimate for (Intercept).

$\hat{\beta}$ is the difference in scores between non-minorities who took the prep course and non-minorities who didn't. In the regression output, this corresponds to the estimate for the coefficient "minorityTRUE"

$\hat{\gamma}$ is the difference in scores between minorities and non-minorities who didn't take the prep course. In the regression output, this corresponds to the estimate for the coefficient "presatTRUE"

$\hat{\delta}$ denotes the additional effect of the prep course for minorities, so $\hat{\delta}$ is the difference in the effect of the prep course on SAT scores between minorities and non-minorities. In the regression output, this corresponds to the estimate for the coefficient "minorityTRUE:presatTRUE"

Submit You have used 2 of 2 attempts

✔ Correct (1/1 point)

Discussion

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1