

13.4: Hypothesis Testing in Regression

Regression, like all other analyses, will test a null hypothesis in our data. In regression, we are interested in predicting Y scores and explaining variance using a line, the slope of which is what allows us to get closer to our observed scores than the mean of Y can. Thus, our hypotheses concern the slope of the line, which is estimated in the prediction equation by b . Specifically, we want to test that the slope is not zero:

H_0 : There is no explanatory relation between our variables

$$H_0 : \beta = 0$$

H_A : There is an explanatory relation between our variables

$$H_A : \beta > 0$$

$$H_A : \beta < 0$$

$$H_A : \beta \neq 0$$

A non-zero slope indicates that we can explain values in Y based on X and therefore predict future values of Y based on X . Our alternative hypotheses are analogous to those in correlation: positive relations have values above zero, negative relations have values below zero, and two-tailed tests are possible. Just like ANOVA, we will test the significance of this relation using the F statistic calculated in our ANOVA table compared to a critical value from the F distribution table. Let's take a look at an example and regression in action.

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