

1. This model has two explanatory variables and three terms:

$$Q = \beta_0 + \beta_{X1}X1 + \beta_{X2}X2 + \beta_{X1X2}X1*X2 + e$$

For the following tests, list the number of explanatory and response variables.

Regression of proportion of prey population captured on light levels and predator density.

Response	Explanatory
<u>1</u>	<u>2</u>

ANCOVA with two categorical variables.

<u>1</u>	<u>3</u>
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Correlated densities of 2 species of trees, measured in 30 sample plots.

<u>2</u>	<u>1</u>
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Genotype frequencies of homozygous versus heterozygous individuals in 4 different populations.

<u>1</u>	<u>2</u>
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Three way ANOVA.

<u>1</u>	<u>3</u>
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Analysis of variance of ATP content of cells from 3 types of tissue.

<u>1</u>	<u>1</u>
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2. An entomologist obtains a sample correlation of $r = -0.5$ between egg number and survival in the corn earworm *Heliothis armigera*.

The explained variance is thus $r^2 = \underline{0.25}$

The unexplained variance is thus $1 - r^2 = \underline{0.75}$.

Compute the F-ratio for an analysis of 35 cases, by setting up and completing an ANOVA table where SS_{model} is the explained variance, SS_{residual} is the unexplained variance, and the model has one degree of freedom.

$$SS_{\text{total}} = \underline{1.0}$$

Source	df	SS	MS	F
regr	1	0.25	0.25	11.0
error	33	0.75	0.023	
total	34			

Does the F-ratio depend on the magnitude of SS_{model} ? Yes