

Scenario

You use one-way ANOVA to determine whether there are significant differences between the means of two or more populations across different levels of a categorical variable. What if you have two categorical predictor variables each with multiple levels? You could analyze each predictor variable individually using one-way ANOVA, but you'd be missing possible interactions between the predictor variables. Instead, a two-way ANOVA analyzes the effect of each predictor individually, and tests for interactions between them.

Suppose you need to analyze the results of a marathon to determine the effect of gender and age group on race completion time. Maybe you're using health-care data to analyze patient blood pressure, considering the effect of four drug dosages and three heart diseases. What about the Ames Housing data? Suppose you want to analyze the effect that season and heating system quality have on the sale price of homes simultaneously. In each case, you have a continuous response variable and two categorical predictor variables, so you'd use a two-factor, or two-way ANOVA model.

In general, an ANOVA with more than one predictor variable is called an n-way ANOVA, where n represents the number of categorical predictor variables, or factors, included in the model.

Statistics 1: Introduction to ANOVA, Regression, and Logistic Regression

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