

## 13.1: Introduction to Linear Regression

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In its most basic form, **linear regression** is a technique built upon correlation to test whether and how well the values from one variable can be used to estimate values for another variable. Because this builds from the ideas used in correlation, it is important to review Chapter 12 before starting this chapter. When a bivariate correlation is appropriate to the data but the hypothesis is about prediction or estimation, a linear regression is the best fit. The version of this which is the focus of this chapter can be referred to by several names, including: simple regression, linear regression, bivariate linear regression, or bivariate regression using a least squares model.

The simplest form of regression is a bivariate (i.e. two variable) form called simple linear regression. Simple linear regression establishes whether there is a relationship between two quantitative variables and, if so, uses one to estimate the other. In this way, you can think of linear regression as a companion to a correlational analysis. For example, a bivariate correlation could be used to test whether income is related to level of happiness or whether hours spent exercising are related to amount of stress. A regression would be used to test whether income is (mathematically) predictive of happiness or whether hours of exercise are useful in estimating level of stress.

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