Correlation & Regression Analysis

Correlation

- The underlying principle of correlation analysis
- Measuring the strength of a correlation
- Assumptions
- Confidence intervals and hypothesis testing
- Comparing correlations
- Non-parametric correlations
- Power in correlation analysis

The Underlying Principle of Correlation Analysis

- Measures the extent to w/c two variables covary, in particular, the strength of the linear association between them.
- No implied causal relationship, therefore there is no distinction between dependent & independent variables.

When do we use Correlation?

- Do use it to determine the strength of association between 2 variables.
- Do not use it if you want to predict the value of X given Y, or vice versa.

Simple Linear Correlation versus Simple Linear Regression

- Calculations are the same.
- In correlation analysis, one must sample randomly both X and Y.
- Correlation deals w/ association (importance).
- Regression deals w/ prediction (intensity).

Lab example: fork length & round weight of sturgeon

- Since the two variables are not casually related, use correlation to measure strength of association.

Regression: fork length & age of sturgeon

- The two variables are casually related.
- The relationship between the two provides an estimate of growth rates.
- & we can use the relationship to predict the size of the sturgeon of a given age.
