

Inferential Statistical Significance Tests

All researchers face a common problem and turn to statistics to help solve this problem. The problem? All of our research questions are about **populations**, but the data we use to answer these questions come from relatively small **samples** from those populations! You are already familiar with this issue, which we discussed earlier -- the distinction between **descriptive** and **inferential** statistics. Whenever we use statistics to summarize the data from a sample, we are using descriptive statistics, but usually we use those statistics to try to estimate values of the population which is represented by the sample; then we are using inferential statistics (because we "infer" information about the population from the sample).

Inferential statistical tests are the next logical step! Here our interest is to test a hypothesis about the relationship between two variables in the population of interest. But, again we can't get data from the entire population, and must settle for a test of the hypothesis based upon data collected from a representative sample. So, analyze the term: "inferential statistical tests" means we are going to use a statistical procedure to test a research hypothesis about a population based on data from only a sample of that population (inferring that the answer we obtain from the sample tells us about the relationship between those variables in the whole population).

Below are step-by-step computational procedures for completing a variety of statistical significance tests, the kinds of statistics used to analyze research data. Using the computational steps below and information from class, you should be able to do the following for any given data set.

- 1) understand the research question and the research hypothesis
- 2) decide if each variable is qualitative or quantitative
- 3) based on (2), select the appropriate statistical test
- 4) write a complete version of the null for each statistical test
- 5) be able to complete the computation of each statistical test
- 6) determine whether to retain or reject the null hypothesis (see the next section below)
- 7) determine whether the RH is supported or not (or partially supported) by the results of the statistical analysis
- 8) write the results of the analysis in a prescribed form.