Hypothesis Testing: The Process

A hypothesis test occurs in stages.

The logic of hypothesis testing is as follows:

1. Identify a population of interest, a parameter of interest, and a question you have about that parameter
2. Make an assumption about the value of the population parameter you are interested in
3. Examine a random sample from the population to see if it contradicts that assumption
4. If the sample contradicts the assumption, then reject the assumption. Otherwise, do not reject the assumption. (NOTE: you can never prove that the assumption is true in a hypothesis test – you can only prove that it is wrong. Hence: “Reject,” or “Do not reject”)
5. Answer the original question.

In practice, these are the steps in a **hypothesis test**, in which you use a sample to infer information about the value of a population parameter:

1. **Formulate a null hypothesis and an alternative hypothesis** according to the question you want to answer about the population parameter of interest. The null hypothesis is an assumption about the value of the population parameter; the alternative hypothesis is the mathematical opposite of the null hypothesis.
2. **Calculate the Test-Statistic.** In this step, you standardize information from the sample against the appropriate sampling distribution.
3. **Decide whether or not to reject the null hypothesis.** Determine the probability of getting that Test-Statistic (in other words, that sample), assuming that the null hypothesis is true. If the probability is less than the significance level, then reject the null hypothesis and accept the alternative hypothesis. Otherwise, do not reject the null hypothesis and conclude that the alternative hypothesis is unsupported.
4. **Interpret the hypothesis test** in order to answer the original question.