

## 8.6: Steps of the Hypothesis Testing Process

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The process of testing hypotheses follows a simple four-step procedure. This process will be what we use for the remainder of the textbook and course, and though the hypothesis and statistics we use will change, this process will not.

**Step 1: State the Hypotheses** Your hypotheses are the first thing you need to lay out. Otherwise, there is nothing to test! You have to state the null hypothesis (which is what we test) and the alternative hypothesis (which is what we expect). These should be stated mathematically as they were presented above AND in words, explaining in normal English what each one means in terms of the research question.

**Step 2: Find the Critical Values** Next, we formally lay out the criteria we will use to test our hypotheses. There are two pieces of information that inform our critical values:  $\alpha$ , which determines how much of the area under the curve composes our rejection region, and the directionality of the test, which determines where the region will be.

**Step 3: Compute the Test Statistic** Once we have our hypotheses and the standards we use to test them, we can collect data and calculate our test statistic, in this case  $z$ . This step is where the vast majority of differences in future chapters will arise: different tests used for different data are calculated in different ways, but the way we use and interpret them remains the same.

**Step 4: Make the Decision** Finally, once we have our obtained test statistic, we can compare it to our critical value and decide whether we should reject or fail to reject the null hypothesis. When we do this, we must interpret the decision in relation to our research question, stating what we concluded, what we based our conclusion on, and the specific statistics we obtained.

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