

## ***Hypothesis Testing***

Hypothesis testing usually involves either comparing a single sample of data to a benchmark or comparing two samples of data to one another. For either type of test, a pair of hypotheses is developed. The first hypothesis, known as the null hypothesis is what the researcher will assume to be true in the absence of statistical evidence to the contrary. The second hypothesis known as the alternative hypothesis is often what the researcher wishes to be able to conclude. If statistical evidence leads the researcher to conclude that the null hypothesis should be rejected, then this means that there is statistically valid evidence for the alternative hypothesis. The lack of statistical evidence that is sufficiently strong to reject the null hypothesis does not mean that we have proved the null hypothesis. Rather, it simply means that we have failed to reject the null hypothesis. It is never assumed that the null hypothesis has been proven. Rather, the only two outcomes that are possible from hypothesis testing are rejecting the null hypothesis or failing to reject the null hypothesis. When conducting hypothesis testing, since we are usually working with a sample of data and not with the entire population from which the sample was taken, there is always a chance that our statistical conclusion will be incorrect. There are two possible mistakes that can be made. A type one error occurs when we reject the null hypothesis, even though the null hypothesis is true. A type two error occurs when we fail to reject the null hypothesis even though the null hypothesis is false.