

Frances Cotto-Jones

Week 4 Quiz

**Question 1:** Explain what inferential statistics are. Provide a sample research question (from your thesis or from anything else) that could be answered with inferential statistics.

Inferential statistics is a process of analysis in which a sample is taken from a study and then conclusions about the population are drawn from it. Probability theory can be used in these instances which will estimate the likelihood of an occurrence.

A sample research question that could be answered using inferential statistics is: "Does laissez-faire leadership decrease an employee's ability to flourish at work? In order to answer this question, a researcher could select a group of employees who worked under such leadership and compare it to those who work under a more influential type of leadership. The emotional well-being of both groups can be tested and its result will then give a better understanding into if leadership has any sort of impact on the flourishing of its employees.

**Question 2:** Compare and contrast Type I and Type II error in statistics. Why do we want to avoid these?

A Type I error is known as a false positive error. It is the rejection of a true null hypothesis. A Type II error is a false negative error. This happens when a null hypothesis that is false does not get rejected. When considering the severity of the two, one would say a Type I error is more severe as it provides a result that is not conclusive to the actual result. A Type II error can eventually be corrected. Avoidance of both errors should be the goal. If either exists, it can lead to skewed research which can have major consequences.

**Question 3:** How can one reduce the chance of a Type I error? Type II error? Describe a few for each.

In order to reduce the chance of a Type I error one can increase the sample size which would in turn expand the data set thus minimizing the chance of inaccuracies. They can increase the significance which can lead to the reduction of rejection of the null hypothesis. Lastly, one can use high power which will increase accuracy.

In order to reduce the chance of a Type II error, one can increase the sample size which will afford them the opportunity to assess comprehensive data. One can increase the sensitivity of tests which will ensure differences are recognized. Lastly, one can decrease significance which will reduce the chance of accepting a null hypothesis.

**Question 4:** What is the difference between a one-sample and two-sample hypothesis test?

A one-sample hypothesis test is used when trying to figure out if a population mean is different from a hypothesized value. A two-sample hypothesis test involves the usage of two sample populations and determining the different mean values.

