

Fact Sheet – Two Mean Test (11.3)

This test is used to compare the mean of one population to the mean of another population. The two samples must be independent, meaning that there is no one-to-one relationship between values in the first sample and the second sample.

Example: Students taking a traditional algebra class have higher exam scores than students who take the course online.

Conditions

To test hypotheses regarding two means, the following two conditions must be met.

- Each sample must come from a population that is normally distributed (QQ Plot, Correlation Coefficient larger than the critical value)

(If you do not have data, you can assume this is true.)

OR

each sample size is at least 30 ($n_1 \geq 30$ and $n_2 \geq 30$)

- $20n \leq N$

Hypothesis Test

Step 1

You must identify which population is Population 1.

The null hypothesis will be $\mu_1 = \mu_2$. H_1 will be either $\mu_1 < \mu_2$, $\mu_1 > \mu_2$, or $\mu_1 \neq \mu_2$.

Step 3

The test statistic is $t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$.

Just write "Two Mean Test", rather than writing the test statistic.

Step 4

To compute the test statistic and P-value using StatCrunch ...

Summary: Stat > T Statistics > Two sample > Summary

Enter the mean, standard deviation, and size for each sample. Click Next.

Leave the value for null: mean diff. as 0. Select the appropriate sign for H_1 . Click Calculate.

Data:

Enter the data in two columns.

Stat > T Statistics > Paired

Select the correct column for each sample. Click Next.

Leave the value for null: mean diff. as 0. Select the appropriate sign for H_1 . Click Calculate.