

A comprehensive summary of the main topics and concepts covered in the provided notes on T-tests, including definitions, formulas, and interpretations of the results.

## T-Tests Summary:

### 1. T-Test:

\* Definition: A statistical inference method used to compare two groups' means from independent samples.

\* Formula:  $t = (p - 1) / \sqrt{N-1}$

\* Interpretation: Compares the difference between two groups' means and determines if they are significantly different.

### 2. Paired Samples:

\* Definition: Used in T-tests where dependent samples are compared.

\* Formula:  $t = (p - 1) / \sqrt{N-1}$

\* Interpretation: Compares the difference between two groups' means and determines if they are significantly different.

### 3. Calculating D:

\* Definition: Represents the difference between the two means in T-tests.

\* Formula:  $D = (\text{mean of sample A} - \text{mean of sample B})^2 / \text{standard deviation of each group}$

\* Interpretation: Measures how spread out the data is from its mean value.

### 4. Standard Deviation:

\* Definition: The square root of the variance or dispersion of a dataset.

\* Formula:  $\text{standard deviation} = \sqrt{\text{sum of deviations}}$

\* Interpretation: Measures how spread out the data is from its mean value.

### 5. Hypothesis Testing:

\* Definition: A statistical technique used to determine whether a hypothesis is true or false.

\* Formula:  $t = (p - 1) / \sqrt{N-1}$

\* Interpretation: Compares the difference between two groups' means and determines if they are significantly different.

### 6. Correlation:

\* Definition: The statistical relationship between two or more variables.

\* Formula:  $\text{Pearson's } r = (\text{sum of } x_i x_j) / (\sqrt{N-1})$

\* Interpretation: Measures the strength and direction of the linear association between two variables.

### 7. Confidence Interval:

\* Definition: A range within which the true value of a population parameter is likely to lie.

\* Formula:  $CI = (\text{population mean} + z * \sqrt{\text{sum of deviations}}) - z / \sqrt{N}$

\* Interpretation: Provides an estimate of the true value of a population parameter with a certain degree of confidence.

In conclusion, T-tests are statistical methods used to compare two groups' means from independent samples or dependent samples. The formulas for calculating t-values and D include n (sample size), s (standard deviation of each group), and the difference between the two means. Correlation measures the strength and direction of the linear association between two variables, while confidence intervals provide an estimate of the true value of a population parameter with a certain degree of confidence.