When the parameter is: **a mean of differences μ_{diff}**

CHOOSE: **Paired T-Interval** to estimate μ_{diff}, or
Paired T-Test to test $H_0: \mu_{diff} = 0$.

CHECK:

- There is paired data from a random sample or matched pairs experiment.
- $n_{diff} \geq 30$, OR population of differences known to be nearly normal, OR population of differences could be nearly normal because observed differences have no excessive skew or outliers (draw graph of *differences*).

CALCULATE: (`TInterval` or `T-Test`)
point estimate: mean of sample difference $\bar{x}_{diff}$
***SE* of estimate**: $\frac{s_{diff}}{\sqrt{n_{diff}}}$
$df = n_{diff} - 1$

When the parameter is: **the slope β of a regression line**

CHOOSE: **T-Interval for the slope** to estimate β, or
T-Test for the slope to test $H_0: \beta = 0$.

CHECK:

- There is (*x*, *y*) data from a random sample or experiment.
- The residual plot shows no pattern making a linear model reasonable. (More specifically, the residuals should be independent, nearly normal, and have constant standard deviation.)

CALCULATE: (`LinRegTInt` or `LinRegTTest`)
point estimate: sample slope b
***SE* of estimate**: SE of slope (from computer output)
$df = n - 2$

The χ2 tests for categorical variables: **chi-square statistic** $= \sum \frac{(\text{observed} - \text{expected})^2}{\text{expected}}$

When comparing the distribution of **one categorical variable to a fixed/specified population distribution**

CHOOSE: **χ2 Goodness of Fit Test**

CHECK:

- Data come from a random sample or process.
- All expected counts ≥ 5. (To calculate expected counts for each category, multiply the sample size by the expected proportion under H_0.)

CALCULATE: (`χ2GOF-Test`)
$\chi^2 =$
df = # of categories – 1

When comparing the distribution of **a categorical variable across 2 or more populations/treatments**

CHOOSE: **χ2 Test for Homogeneity**

CHECK:

- Data come from 2 or more independent random samples or 2 or more randomly assigned treatments.
- All expected counts ≥ 5. (Calculate expected counts and verify this to be true.)

CALCULATE: (`χ2-Test`, then `2ND MATRIX,EDIT,2:[B]` to find expected counts)
$\chi^2 =$
df = (# of rows – 1)(# of cols – 1)

When looking for **association or dependence between two categorical variables**

CHOOSE: **χ2 Test for Independence**

CHECK:

- Data come from a random sample or process.
- All expected counts ≥ 5. (Calculate expected counts and verify this to be true.)

CALCULATE: (`χ2-Test`, then `2ND MATRIX,EDIT,2:[B]` to find expected counts)
$\chi^2 =$
df = (# of rows – 1)(# of cols – 1)