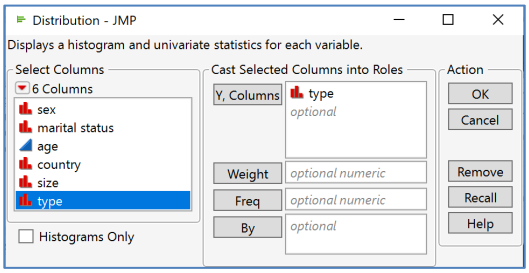
Hypothesis Tests and Confidence Intervals for Proportions

Use to estimate via a confidence interval and perform hypothesis tests for a population proportion.

Confidence Intervals for Population Proportions

1. From an open JMP® data table, select **Analyze > Distribution**.
2. Select one or more categorical variables from **Select Columns**, click **Y, Columns** (categorical variables have red or green bars).
   Note: If you have summarized data (a column with counts), enter the column into **Freq**.
3. Click **OK**.
4. In the resulting window, click on the **red triangle** for the variable and select **Confidence Interval > 0.95**.
   JMP will produce 95% confidence intervals for the true population proportion for each level.

Car Poll.jmp (Help > Sample Data Folder)



Confidence Intervals

Level	Count	Prob	Lower CI	Upper CI	1-Alpha
Family	155	0.51155	0.455476	0.567337	0.950
Sporty	100	0.33003	0.279504	0.384817	0.950
Work	48	0.15842	0.121615	0.20377	0.950
Total	303				

Note: Computed using score confidence intervals.

Hypothesis Tests for Population Proportions

1. From the Distribution output window, click on the **red triangle** for the variable and select **Test Probabilities.**
2. Enter the hypothesized proportions under **Hypoth Prob**, and click **Done.**
   Here we are testing the following set of hypotheses:
   H_0: $p_{Family} = 0.5$ vs. H_A: $p_{Family} \neq 0.5$
   H_0: $p_{Sporty} = 0.3$ vs. H_A: $p_{Sporty} \neq 0.3$
   H_0: $p_{Work} = 0.2$ vs. H_A: $p_{Work} \neq 0.2$

Test Probabilities

Level	Estim Prob	Hypoth Prob
Family	0.51155	0.5
Sporty	0.33003	0.3
Work	0.15842	0.2

Click then Enter Hypothesized Probabilities.

Choose rescaling method to sum probabilities to 1.

- ○ Fix omitted at estimated values, rescale hypothesis
- ◉ Fix hypothesized values, rescale omitted

Done Help

Notes: The hypothesized probabilities must sum to one. You may choose to specify some values and have JMP rescale according to your choice of rescaling method.

Test Probabilities

Level	Estim Prob	Hypoth Prob
Family	0.51155	0.5
Sporty	0.33003	0.3
Work	0.15842	0.2

Test	ChiSquare	DF	Prob>Chisq
Likelihood Ratio	3.7853	2	0.1507
Pearson	3.6117	2	0.1643

Method: Fix hypothesized values, rescale omitted

- JMP will provide the results of two chi-square tests: **Likelihood Ratio** and **Pearson**.
- The null hypothesis is that the true proportions are equal to the hypothesized values.
- Small p-values (<0.05) indicate that at least one sample proportion is significantly different from the hypothesized value.
- Since the p-values in this example are large (> 0.05), we **cannot reject any of the null hypotheses.**

This analysis can also be performed using the **Hypothesis Test for One Proportion** and **Confidence Intervals for One Proportion Calculators** under **Help > Sample Index > Calculators** or **Student > Calculators** in JMP Student Subscription.

Visit **Basic Analysis > Distributions > Additional Examples of the Distribution Platform > Example of Testing Probabilities for Two Levels** and **Example of Testing Probabilities for More Than Two Levels** in **JMP Help** to learn more.