Chi Square Tests for a Two-Way Table

Use to test for independence or homogeneity of two categorical variables. If comparing only two groups with a binary outcome, refer to the **Two Proportions Test and Confidence Interval** guide.

The Contingency Table Analysis

1. From an open JMP® data table, select **Analyze > Fit Y by X**.
2. Click on a categorical variable from **Select Columns**, and click **Y, Response** (categorical variables have red or green bars).
3. Click on another categorical variable and click **X, Factor**.
4. Click **OK**. The Contingency Analysis output will display.

    By defaut, a Mosaic Plot, Contingeny Table, and Chi-Square Tests are shown.
    See the Mosaic Plot and Contingency Table guide for more information.

Car Poll.jmp (Help > Sample Data Folder)
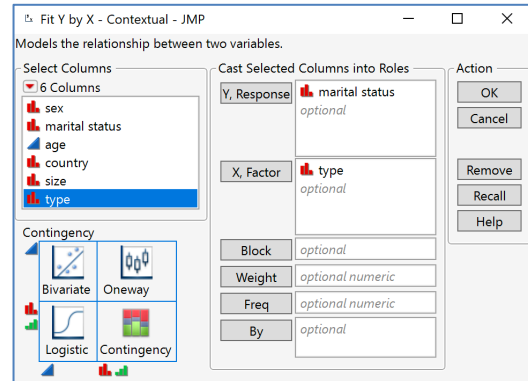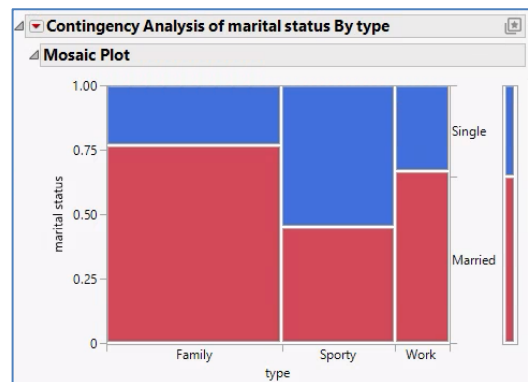

Chi-Square Tests

By default, JMP provides results for two chi-square tests under "Tests" – the **Likelihood Ratio** and **Pearson**.

*   If both variables can be considered as response (Y) variables, these chi-square statistics test that the variables are independent.
*   If one variable is considered a response (Y) and the other as a fixed factor (X), the tests are for homogeneity of Y across X.

Interpretation (using a significance level of 0.05):

*   **P-values** for the two tests are given under **Prob>ChiSq**.
*   Since the p-values are less than 0.05, we conclude that there is a significant difference in the probability of purchasing a particular type of car for married and single adults (i.e., car choice is not homogenous across the two marital status groups).

Note: Additional analysis options are available under the **Red Triangle** including **Analysis of Means for Proportions, Measures of Association,** and **Exact Tests**.

The Expected Count and the contribution of each cell results to the Chi-Square Test Statistic was added to the Contingency Table by selecting that option under the Red Triangle.

Contingency Table

Count Total % Col % Row % Expected Cell Chi^2		Married	Single	Total
type	Family	119	36	155
		39.27	11.88	51.16
		60.71	33.64	
		76.77	23.23	
		100.264	54.73597	
		3.5011	6.4133	
	Sporty	45	55	100
		14.85	18.15	33.00
		22.96	51.40	
		45.00	55.00	
		64.68647	35.31353	
		5.9913	10.9747	
	Work	32	16	48
		10.56	5.28	15.84
		16.33	14.95	
		66.67	33.33	
		31.0495	16.9505	
		0.0291	0.0533	
	Total	196	107	303
		64.69	35.31	

Tests

N	DF	-LogLike	RSquare (U)
303	2	13.382804	0.0680

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	26.766	<.0001*
Pearson	26.963	<.0001*

Visit **Basic Analysis > Contingency Analysis** in **JMP Help** to learn more.