

Principal Component Analysis

Use principal components analysis (PCA) to reduce the dimensionality of a data set.

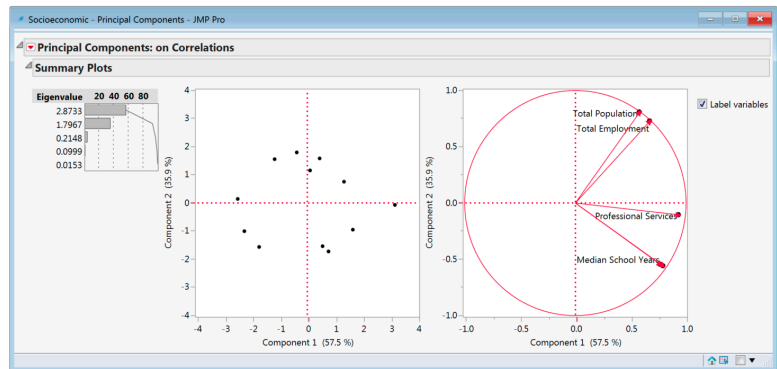
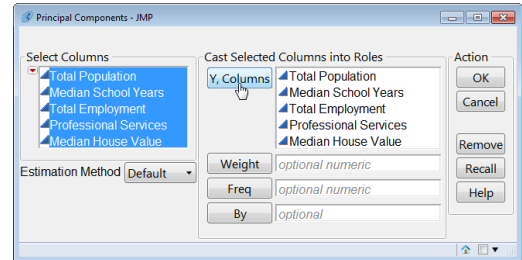
Principal Components

1. Select **Analyze > Multivariate Methods > Principal Components**.
2. Select continuous variables from **Select Columns**, and Click **Y, Columns** (continuous variables have blue triangles).
3. Click **OK**.

By default, JMP® displays the eigenvalues and three **Summary Plots** (below, from left to right).

- **Eigenvalue Pareto Plot:** The percent and cumulative total percent of the variation accounted for by each principal component.
- **Score Plot** (middle): A scatterplot of the first two principal components.
- **Loading Plot:** Correlations between the original variables and the first two principal components. (Note: The factor loadings are unrotated.)

Example: Socioeconomic.jmp (Help > Sample Data)



Interpretation:

- The first two principal components account for 93.4% ($57.5 + 35.9 = 93.4$) of the total variation in the data (see the Pareto Plot). These numbers are displayed on the graph axes of the Score Plot and Loading Plot.
- All of the original variables are positively correlated with the first principal component (see the Loading Plot). Total Population and Total Employment are positively correlated with the second principal component, while the other variables are negatively correlated with the second principal component.

Tips:

- By default, PCA is performed on correlations.
- Click on the **top red triangle** to change the method of calculation, view additional results, save the principal components to the data table, or view detailed information associated with the eigenvalues.
- Principal component analysis can also be accessed through the **Scatterplot 3D** platform or the **Multivariate** platform.

Note: For more information about principal components analysis, see “principal components” in the JMP Help or see the book *Multivariate Methods* (under **Help > Books**).

