OK Cancel

Help



# **Principal Component Analysis**

This guide provides instructions on performing a principal component analysis (PCA). This analysis method is often used to reduce the dimensionality of a data set (i.e., fewer variables) by creating a new set of variables that are linear combinations of the original variables statistically independent of each other and that capture the most information (i.e., variation and correlation) contained in the original variables.

## **Principal Components**

- 1. From an open JMP data table, 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.** 

- 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. Use the options at the bottom to select any two components to display.
- Loading Plot: Correlations between the original variables and the two selected principal components. (Note: The factor loadings are unrotated.)

# Principal Components: on Co

Socioeconomic.jmp (Help > Sample Data Folder)

Cast Selected Columns into Roles

Y, Columns

| Total Population
| Median School Years
| Total Employment
| Professional Services

🚄 Median House Value

Principal Components

▼ 5 Columns
■ Total Population
■ Median School Years
■ Total Employment
■ Professional Services
■ Median House Value

Select Columns

Standardize

nstructs independent linear combinations of factors

Standardized Method Family Default

## 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.

Visit Multivariate Methods > Principal Components in JMP Help to learn more.