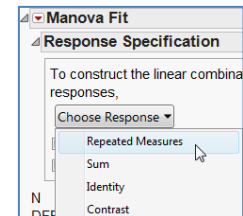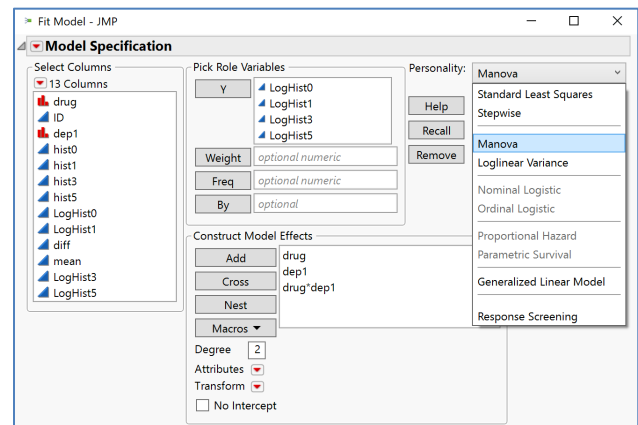# Analysis of Repeated Measures (MANOVA)

Use MANOVA (multivariate analysis of variance) for a way to analyze repeated measures data. The term *repeated measures* refers to data with multiple measurements taken on the same subjects, often taken over a period of time. The MANOVA platform provides tests of between and within subject effects across the repeated measurements.

This example involves 16 dogs assigned to different treatment groups. Blood concentration of histamine is measured at four points in time. The data are arranged in a wide format (log-histamine measures are in separate columns), which is needed for the MANOVA analysis.

Analysis of Repeated Measures: MANOVA

Dogs.jmp (Help > Sample Data Folder)

1. From an open JMP® data table, select **Analyze > Fit Model**. Select **Manova** from the **Personality** drop-down menu.

2. Add the responses: From **Select Columns**, select the continuous response variables (continuous variables have blue triangles), and click **Y**.

3. Add model effects: Select variables and click **Add** (under **Construct Model Effects**). To specify an interaction term, select multiple columns, then click **Cross**. Click **Run**.

4. In the resulting window, select **Repeated Measures** from the **Choose Response** drop-down menu.

5. Accept the defaults, then click **OK**.

By default, JMP will display the **Parameter Estimates**, **Least Squares Means**, **Between Subjects** and **Within Subjects** results and more. Additional options are available under the **red triangles.**

- **Within Subjects** results include the multivariate significance tests for the differences over time for both the whole model and each effect.

- **Between Subjects** results include the multivariate significance tests for the differences in the repeated measures across subjects for both the whole model and each effect.

Within Subjects

Contrast

All Within Interactions

Test	Value	Approx. F	NumDF	DenDF	Prob>F
Wilks' Lambda	0.0198871	9.8056	9	22.054	<.0001*
Pillai's Trace	1.7570944	5.1836	9	33	0.0002*
Hotelling-Lawley	13.863757	13.0935	9	11.333	<.0001*
Roy's Max Root	11.007649	40.3614	3	11	<.0001*

Time

Test	Value	Exact F	NumDF	DenDF	Prob>F
F Test	8.0108714	24.0326	3	9	0.0001*

Time*drug

Test	Value	Exact F	NumDF	DenDF	Prob>F
F Test	1.9277447	5.7832	3	9	0.0175*

Time*dep1

Test	Value	Exact F	NumDF	DenDF	Prob>F
F Test	7.1037307	21.3112	3	9	0.0002*

Time*drug*dep1

Test	Value	Exact F	NumDF	DenDF	Prob>F
F Test	4.1591573	12.4775	3	9	0.0015*

Between Subjects

Sum

All Between

Test	Value	Exact F	NumDF	DenDF	Prob>F
F Test	1.1101495	4.0705	3	11	0.0359*

Intercept

Test	Value	Exact F	NumDF	DenDF	Prob>F
F Test	9.7533317	107.2866	1	11	<.0001*

drug

Test	Value	Exact F	NumDF	DenDF	Prob>F
F Test	0.246166	2.7078	1	11	0.1281

dep1

Test	Value	Exact F	NumDF	DenDF	Prob>F
F Test	0.634514	6.9797	1	11	0.0229*

drug*dep1

Test	Value	Exact F	NumDF	DenDF	Prob>F
F Test	0.1926688	2.1194	1	11	0.1734

See the **Repeated Measures Analysis (Mixed Model)** Guide to learn how to analyze repeated measures data using the mixed models platform.

Visit **Fitting Linear Models > Multivariate Response Models** in **JMP Help** to learn more.