

# Analysis of Repeated Measures (MANOVA)

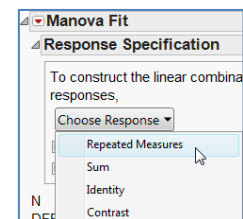
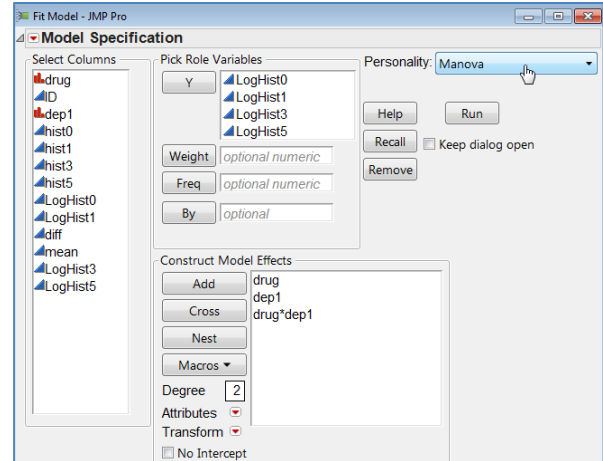
Use MANOVA (multivariate analysis of variance) for the analysis of repeated measures data. MANOVA tests between and within subject effects across the repeated measurements.

The example below 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

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**.
4. Click **Run**.
5. In the resulting window, select **Repeated Measures** from the **Choose Response** drop-down menu.
6. Accept the defaults, then click **OK**.

Dogs.jmp (Help > Sample Data Library)



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						
M Matrix						
M-transformed Parameter Estimates						
All Within Interactions						
Test	Value	Exact 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	7.1037357	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						
M Matrix						
M-transformed Parameter Estimates						
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	

Notes: For information on analyzing repeated measures data using mixed models, refer to the **Mixed Model** pages at [jmp.com/learn](http://jmp.com/learn). For additional details, search for "MANOVA" in the JMP Help or in the book, **Fitting Linear Models** (under **Help > Books**).