

# Independent measures ANOVA in JMP (incl. assumption test and effect sizes)

[by Bernhard Riecke, [iSpaceLab.com](https://www.ispacelab.com)]

**Disclaimer:** this is work in progress - in case you find any errors or have suggestions for improvement, please email me at [b\\_r@sfu.ca](mailto:b_r@sfu.ca)

Sharable Link: <https://docs.google.com/document/d/1OfFJffL3vFGpGyufhLi04BI2tEIHI3Arw8d30e8hk3M/edit?usp=sharing>

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## Example: Independent measures (= between-subject) 3-way ANOVA

From Julian Parris' Module 2:7 - Multifactor ANOVA module available at

[https://www.jmp.com/en\\_us/academic/ssms.html#2-7](https://www.jmp.com/en_us/academic/ssms.html#2-7)

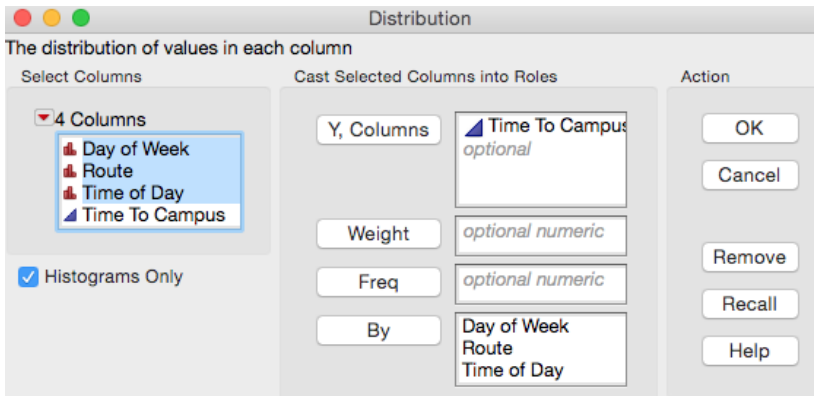
Idea: if you can run a 3-way ANOVA, you'll definitely be able to run a 2 or 1-way ANOVA as well.

### Assumptions test: Normality

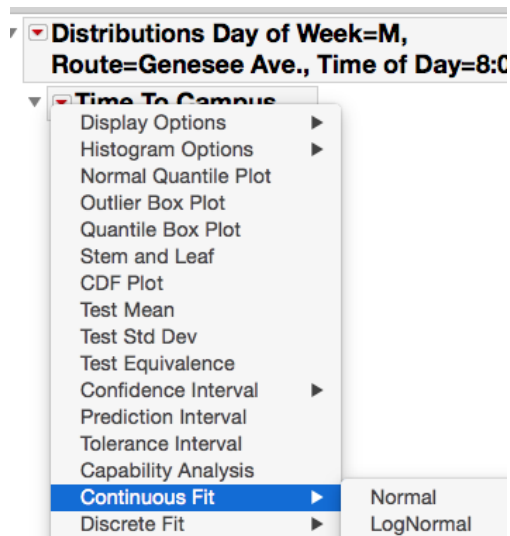
For details, see See

[https://docs.google.com/document/d/14MGICSpw28KSY-6mLS\\_13dORbgpbhP-c\\_GMlo-MchJo/edit?usp=sharing](https://docs.google.com/document/d/14MGICSpw28KSY-6mLS_13dORbgpbhP-c_GMlo-MchJo/edit?usp=sharing)

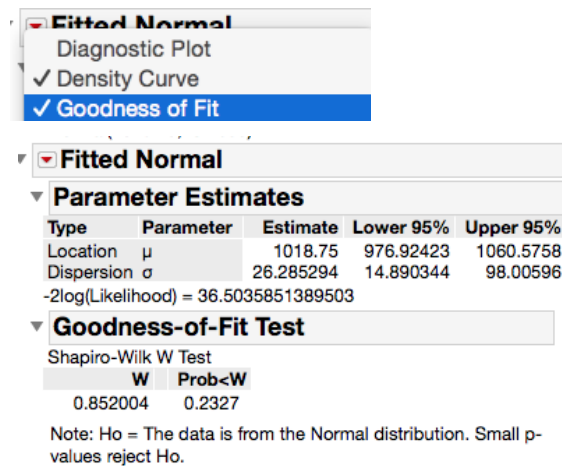
Analyze / Distribution:



While pressing command key, select Continuous Fit / Normal



The “Goodness of Fit” from “Fitted Normal” menu, which produces the Shapiro-Wilk W test



## Assumptions test: Homogeneity of Variances

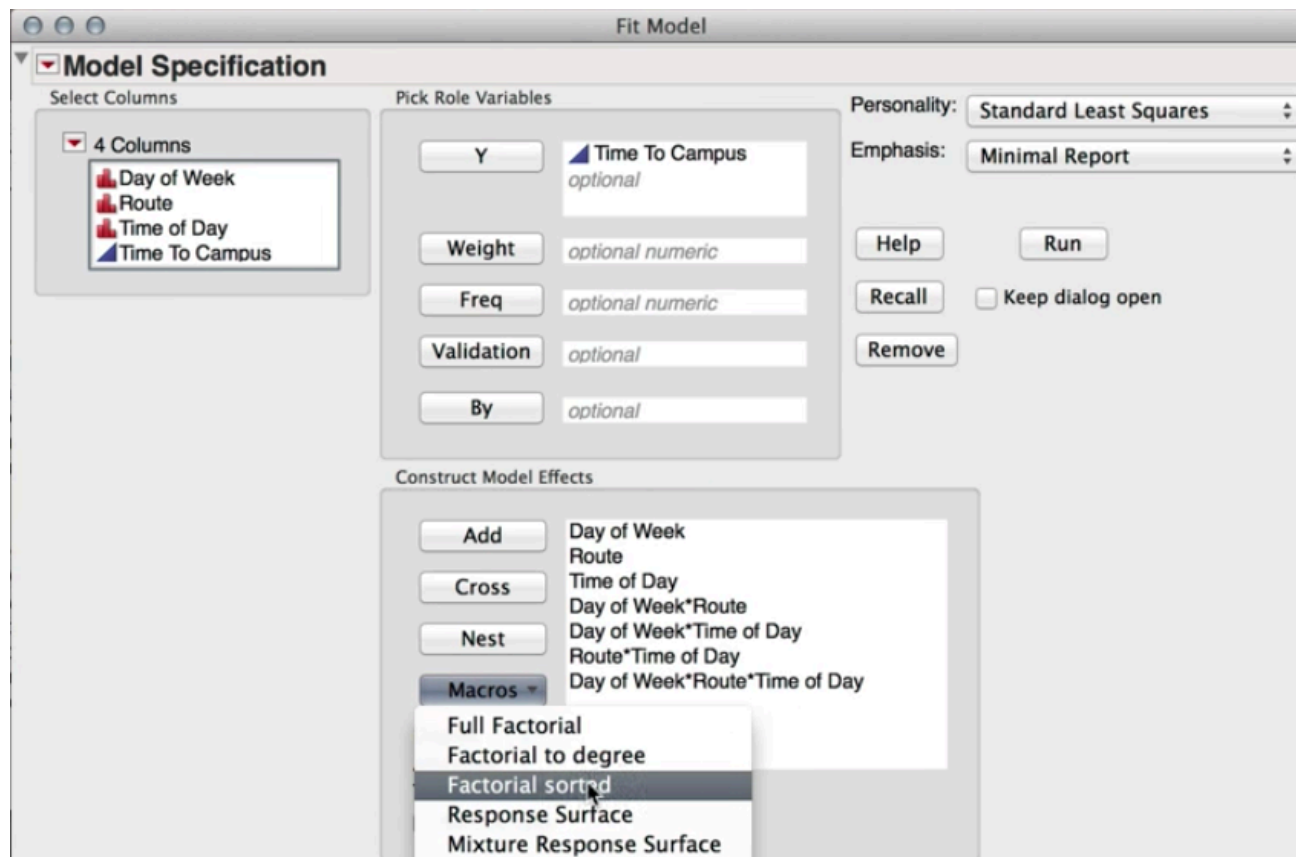
See [https://docs.google.com/document/d/14MGICSpw28KSY-6mLS\\_13dORbgpbhP-c\\_GMlo-MchJo/edit?usp=sharing](https://docs.google.com/document/d/14MGICSpw28KSY-6mLS_13dORbgpbhP-c_GMlo-MchJo/edit?usp=sharing)

## Run ANOVA

Analyze / Fit Model

Select IV, use Macros / Factorial Sorted (or Full Factorial) to automatically create all interaction model terms

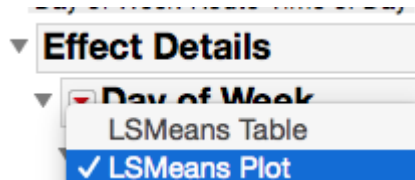
Note: selecting Emphasis / Minimal Report reduces the amount of output to what you'll likely need.



ANOVA main effect and interaction results:

Effect Tests					
Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F
Day of Week	4	4	463327.1	31.6748	<.0001*
Route	3	3	1969131.0	179.4895	<.0001*
Time of Day	3	3	309683.6	28.2282	<.0001*
Day of Week*Route	12	12	59245.9	1.3501	0.1912
Day of Week*Time of Day	12	12	52432.6	1.1948	0.2873
Route*Time of Day	9	9	133122.7	4.0448	<.0001*
Day of Week*Route*Time of Day	36	36	119983.1	0.9114	0.6177

Start interpreting w/ highest interaction, as it qualifies main effects or other interactions  
Ideally after looking at all the main effects and interaction plots:



## Calculate effect sizes

See [How to calculate effect sizes in JMP](#) google doc for details

For independent measures ANOVA, you can use Julian Parris' very useful add-in:

<https://community.jmp.com/t5/JMP-Add-Ins/Calculate-Effect-Sizes-Add-in/ta-p/22642>

Add-InsViewWindowHelp

Statistics Calculators II▶

Partial Correlation Diagram▶

Repeated Measures▶

Correlate Y by X

Calculate Effect Sizes▶

One-way ANCOVA with Interaction Simple Slopes Test

Model Effect Sizes									
	Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F	Eta Squared	Partial Eta Squared	Omega Squared
1	Day of Week	4	4	463327.1	31.6748	<.0001	0.11628	0.34551	0.11251
2	Route	3	3	1969131.0	179.4895	<.0001	0.49419	0.69170	0.49098
3	Time of Day	3	3	309683.6	28.2282	<.0001	0.07772	0.26082	0.07490
4	Day of Week*Route	12	12	59245.9	1.3501	0.1912	0.01487	0.06324	0.00385
5	Day of Week*Time of Day	12	12	52432.6	1.1948	0.2873	0.01316	0.05637	0.00214
6	Route*Time of Day	9	9	133122.7	4.0448	<.0001	0.03341	0.13170	0.02513
7	Day of Week*Route*Time of Day	36	36	119983.1	0.9114	0.6177	0.03011	0.12027	0.00000