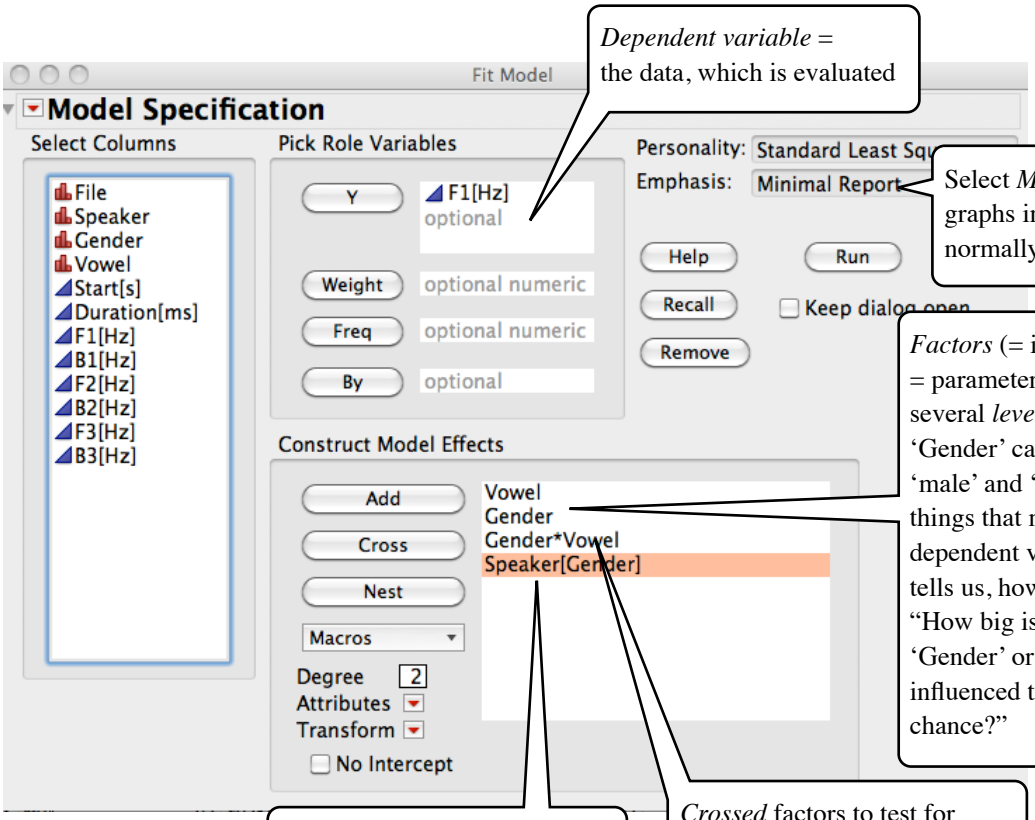
ANOVA

The *ANalysis* Of *VAriance* (ANOVA) tries to find out where the variation in the data (= variance in the dependent variable Y) comes from; by telling it "look, here is this factor (or parameter or *Model Effects* in JMP's term), which has / might have an influence" the ANOVA can compute how much variation comes from this factor. By telling it "there were different speakers" the ANOVA can assign some variation in the data to fact that there are different speakers.)



Dependent variable = the data, which is evaluated

Select *Minimal Report* to avoid graphs in the output that you normally do not want.

Factors (= independent variables = parameters), which can have several *levels* (e.g. the factor 'Gender' can have the levels 'male' and 'female'). Factors are things that may 'influence' the dependent variable. The ANOVA tells us, how likely that is, i.e. "How big is the probability that 'Gender' or 'Vowel' have influenced the 'F1[Hz]' just by chance?"

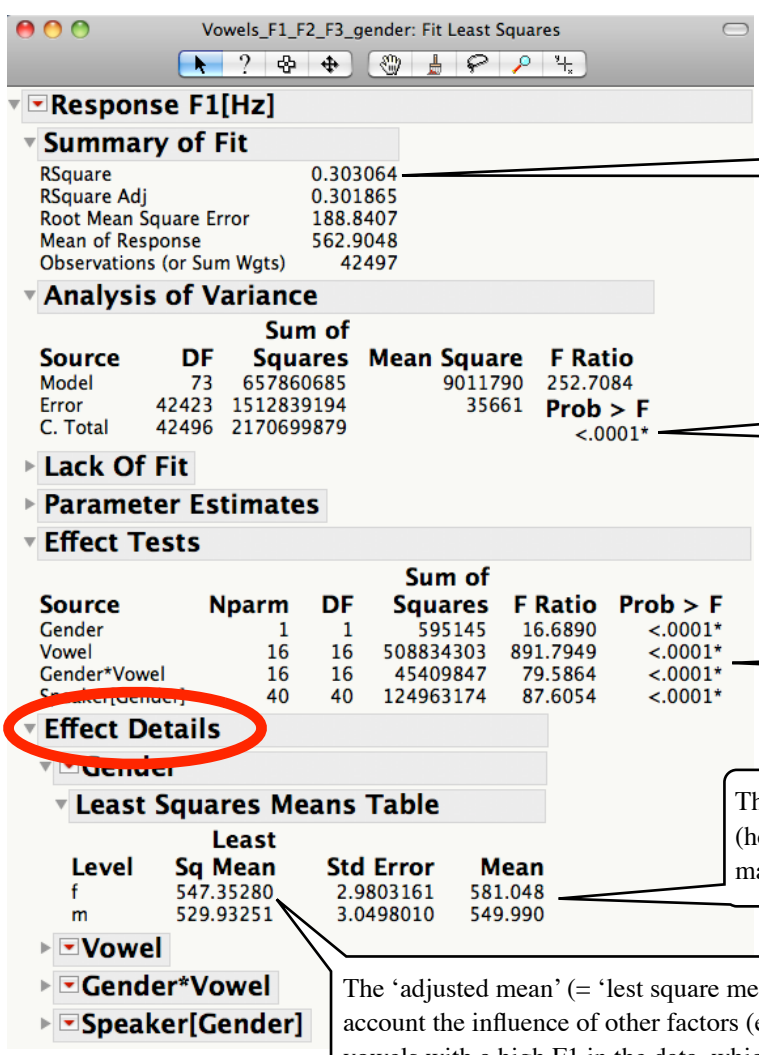
Nested factors in case one factor (here: Speaker) depend on another (here: Gender).

Crossed factors to test for *interactions* (i.e. "Do men and women produce different vowels differently?").

ANOVA results

After clicking *Run*, you get a window like this (actual window contents can be different, depending on the amount of data and the *Preferences* settings).

Usually *Lack Of Fit* and *Parameter Estimates* are open - close them by clicking on the small grey triangle. With little data, there are also some graphs in case *Minimal Report* was not selected - close them. We are normally interested in *Summary of Fit, Analysis of Variance,* **most important** in *Effect Tests* and often in *Effect Details*.



The *RSquare* tells you "how much of the data is 'explained' by your model" (here: about 30%, which is quiet okay for our research).

This is the overall probability that your model (= the set of factors) would just by chance have given the results.

These are the probabilities of the individual factors, interactions and nestings. In this example, they are all highly significant.

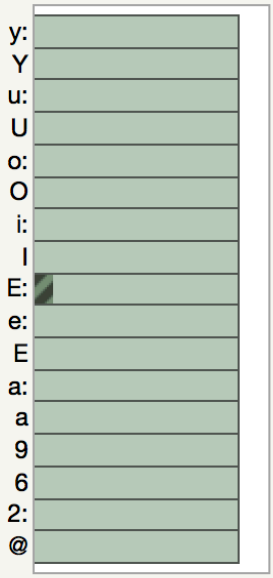
The arithmetic mean of the levels (here: the mean of the female and male subjects).

The 'adjusted mean' (= 'lest square mean') of the levels, i.e., this mean takes into account the influence of other factors (e.g., there might have been many more vowels with a high F1 in the data, which would make the average F1 higher than if an equal number of vowels with high and low F1 would have been in the data. And perhaps, the female subjects had more of these). The 'adjusted mean' takes this into account.

In this example, I used first 'File → New → Journal' to create a Journal window.
Then I right-clicked to create this text-field.
Then I did an Analyze and used 'Edit → Journal' to copy the result into this Journal window.

Distributions

Vowel



Frequencies

Level	Count	Prob
@	100	0.05882
2:	100	0.05882
6	100	0.05882
9	100	0.05882
a	100	0.05882
a:	100	0.05882
E	100	0.05882
e:	100	0.05882
E:	100	0.05882
I	100	0.05882
i:	100	0.05882
O	100	0.05882
o:	100	0.05882
U	100	0.05882
u:	100	0.05882
Y	100	0.05882
y:	100	0.05882
Total	1700	1.00000

N Missing 0
17 Levels

After that, I wrote this text. It is rather difficult to move text somewhere else. You can use 'Alt-Click' to copy things (and eventually delte the old thing.)
You can save this Journal window as a .jrn file (and edit later) or you can make a Powerpoint presentation out of it, or an HTML-file, or an .png file…