

# Instructions for carrying out statistical procedures and tests using SPSS

These instructions are closely linked to the author's book:

**Essential Statistics for the Pharmaceutical Sciences**  
**John Wiley & Sons Ltd <http://eu.wiley.com>**  
**2007**  
**ISBN: 978-0-470-03468-2**

For all references to chapters or tables, see the above book.

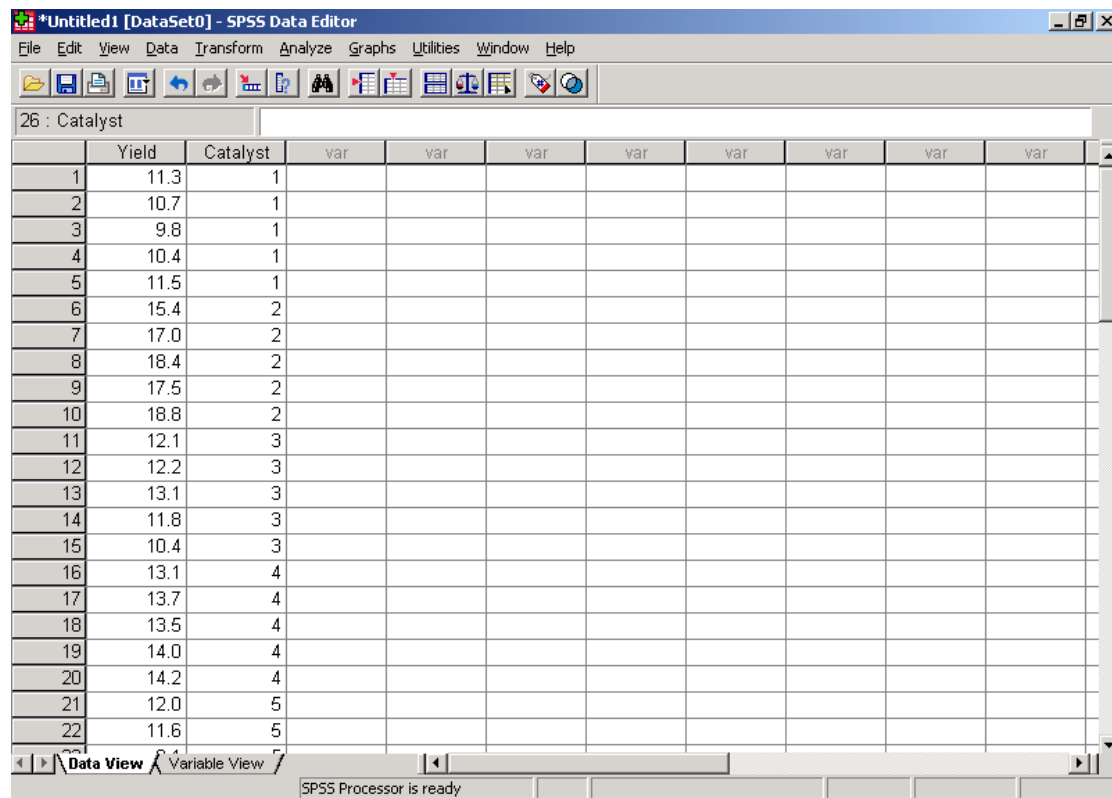
**Using SPSS to perform a  
one-way analysis of variance**

## Using SPSS to perform a one-way analysis of variance

### Example: Table 13.1 Effect of catalyst on yield (Percentage of theoretical maximum)

Label one numeric column to hold the yields ('Yield') and another (Also numeric) to hold the labels that will indicate which group each yield belongs to ('Catalyst'). The metals will be coded as Pt=1, Pd=2, Ir=3, Pd/Ir=4 and Rh=5.

Enter all the percentage yields into the relevant column and put suitable labels into the other column. The Data editor should then look like this:

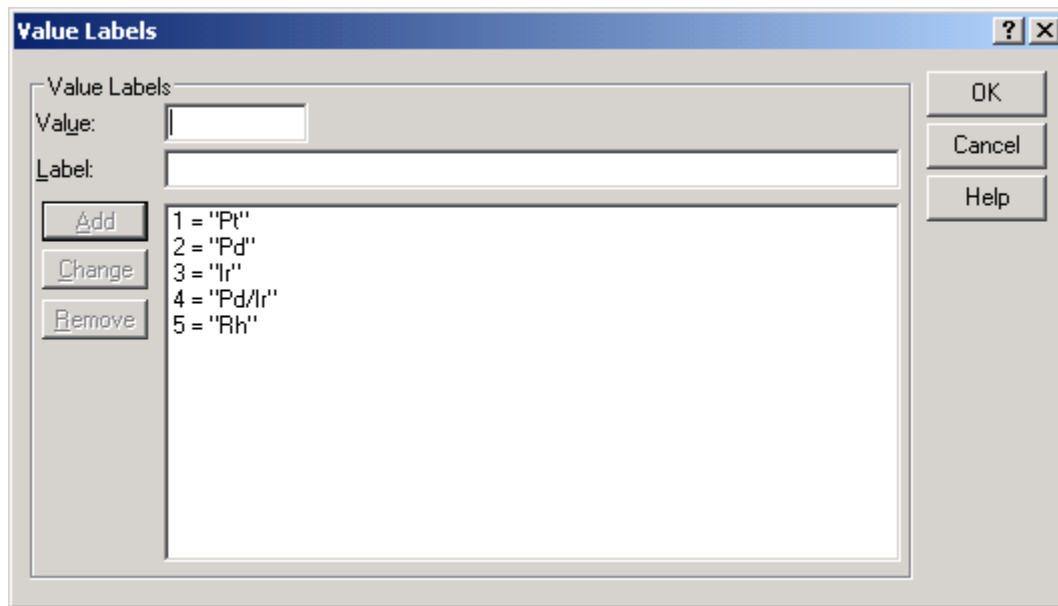


	Yield	Catalyst	var	var	var	var	var	var	var	var
1	11.3	1								
2	10.7	1								
3	9.8	1								
4	10.4	1								
5	11.5	1								
6	15.4	2								
7	17.0	2								
8	18.4	2								
9	17.5	2								
10	18.8	2								
11	12.1	3								
12	12.2	3								
13	13.1	3								
14	11.8	3								
15	10.4	3								
16	13.1	4								
17	13.7	4								
18	13.5	4								
19	14.0	4								
20	14.2	4								
21	12.0	5								
22	11.6	5								

### Add value labels:

If you switch to variable view, you will see that among the properties that we have not generally used, the 5<sup>th</sup> column allows us to allocate 'Value labels'. These are meaningful text labels that can be associated with numeric codes. These can help to make output clearer. Adding value labels will not in fact clarify the output from a simple analysis of variance, but if (as is likely) you also use a follow up test, these will be greatly clarified.

Click in the Values cell for Catalyst and a Value Labels box will appear. Enter 1 in the Value box and Pt in the Label box and then click the Add button. This will allocate the label 'Pt' to the value 1. Repeat the process for numbers 2-5 and the box should appear as on next page:



To perform the analysis, follow the menus:

*Analyze / Compare Means / One-Way ANOVA*

Move 'Yield' into the 'Dependent List' box and 'Catalyst' into the 'Factor' box.

The output will be:

#### ANOVA

Yield

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	148.062	4	37.016	38.366	.000
Within Groups	19.296	20	.965		
Total	167.358	24			

The P value (shown as 0.000 in the last column) indicates that there are differences among the catalysts.

To find out which catalyst differs from which other, you will need to add on either a [Tukey's](#) or a [Dunnett's test](#).

