

One-way within ANOVA

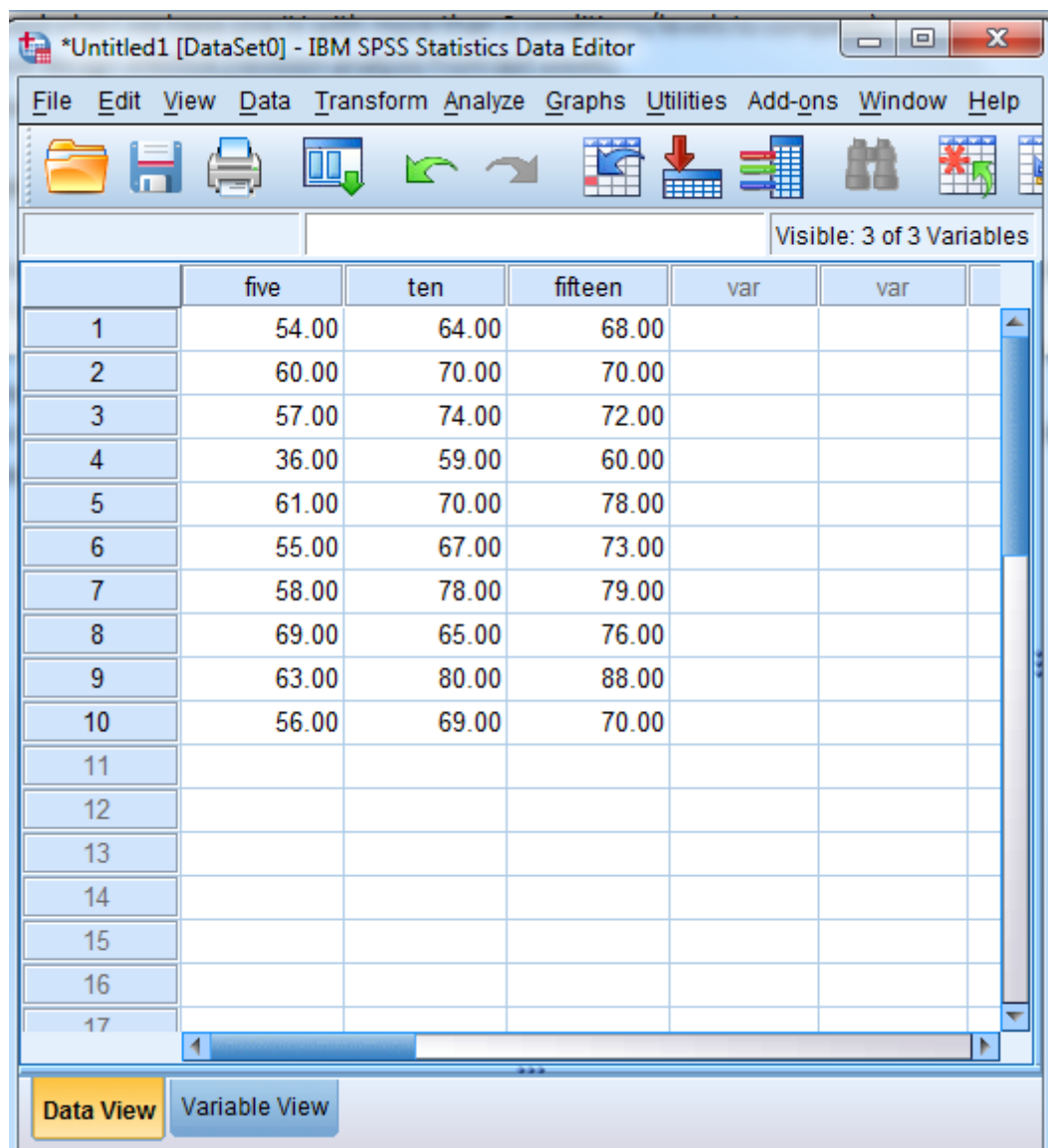
In this workshop you will practice a one-way repeated measures (within) ANOVA.

(This is used when we have one within IV with more than 2 conditions/levels to compare).

We will be using the sample data from a study on experts' ability to solve crossword puzzles under three different time-pressure conditions.

First, name the three columns to represent the 3 time conditions, in the 'variable view'. These should be 'five' 'ten' and 'fifteen' (use words not numbers for the names).

Once you have named the columns/conditions, input the data for percentage completed as shown below in the 'data view':



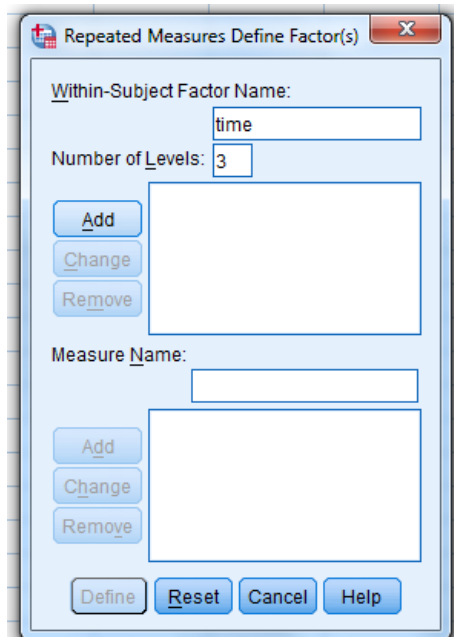
Visible: 3 of 3 Variables

	five	ten	fifteen	var	var	
1	54.00	64.00	68.00			
2	60.00	70.00	70.00			
3	57.00	74.00	72.00			
4	36.00	59.00	60.00			
5	61.00	70.00	78.00			
6	55.00	67.00	73.00			
7	58.00	78.00	79.00			
8	69.00	65.00	76.00			
9	63.00	80.00	88.00			
10	56.00	69.00	70.00			
11						
12						
13						
14						
15						
16						
17						

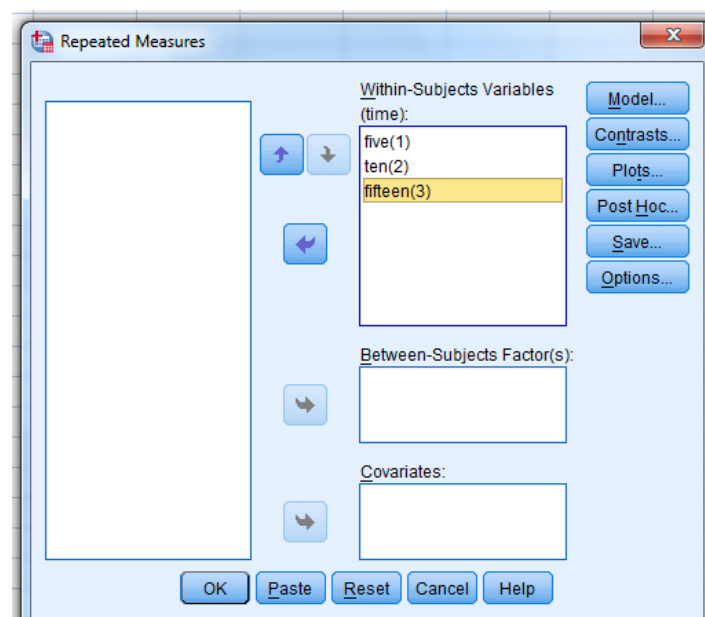
Data View Variable View

Notice how we define our 'within' variable across 3 columns, which represent the three conditions of the variable. In order to carry out our analysis of the effect of the variable 'time', we need to compare values for all these 3 conditions.

On the 'analyse' menu, go to the 'General linear model' section and select the 'repeated measures' option. You will need to define the repeated measures variable of time, and tell SPSS that there are 3 levels/conditions for this variable as shown below. Press the 'Add' button then the 'Define' button to continue defining this variable.

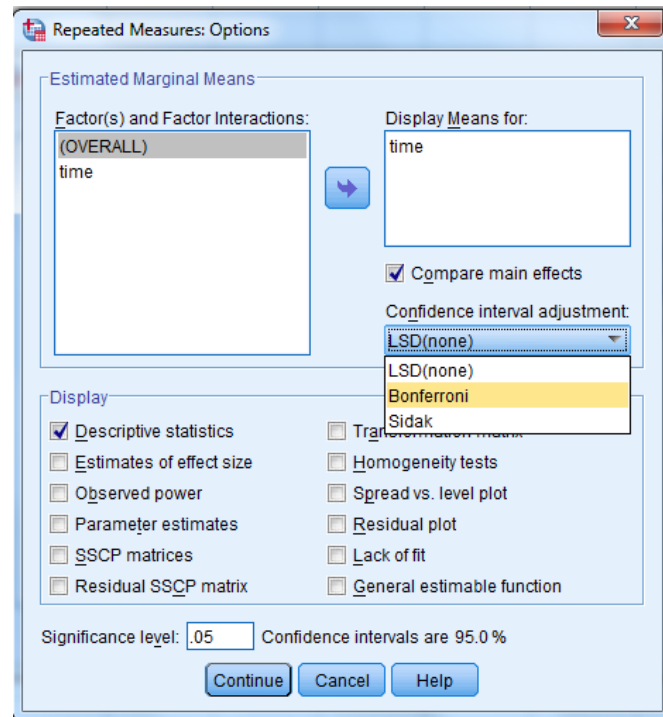


Next move the 3 conditions of the variable across into the 'Within-subjects variables' box. There are no between subjects variables for the one-way ANOVA, so leave that box empty.



Use the 'options' button to select the 'descriptives' by moving factors across into the means box and select the descriptives tickbox (as below).

We can also request that SPSS carries out a comparison between each of the conditions separately by selecting the 'Compare main effects' tickbox, and the Bonferroni adjustment from the drop down box (as below).



Then click 'Continue' and, in the 'repeated measures' box, click 'OK' to carry out the analysis.

SPSS will produce the following output tables:

Descriptive Statistics

In this table the descriptives are shown for the three different conditions of your study (scores in the three time conditions). This is useful for referring back to in order to understand where differences have been shown to be significant or non-significant. (N= number of scores in the grouping where shown).

Tests of within subjects effects

The top row of output shows you the F-value and significance value, for the effect of the within variable across all three conditions. In this case the within variable is 'time'. For ANOVA we also need to report two values from the degrees of freedom (df) column – the one from the top row and the (df) value from the 'error' row of output.

The format for reporting this output analysis for the within variable effect of time in its general format this is:

F (df, df) = F-value, $p < 0.05$ or $p > 0.05$ (alternatively $p < 0.01$ or $p < 0.001$ depending on the sig. value shown).

E.g. F (1,18) = 5.63, $p < 0.01$

Pairwise comparisons

As we also requested SPSS compares between each of the conditions (rather than just a general comparison effect across all three conditions) this is shown in the 'pairwise comparisons' table. Here you can read across table for the comparison of each specific condition (1, 2 or 3) against another specific condition (1,2, or 3). Check the significance value for each row to see whether each of these comparisons is significant. (E.g. condition 1 compared to condition 2).

Write out the values you have produced in this output table for the analysis of the variable 'time' using this format.