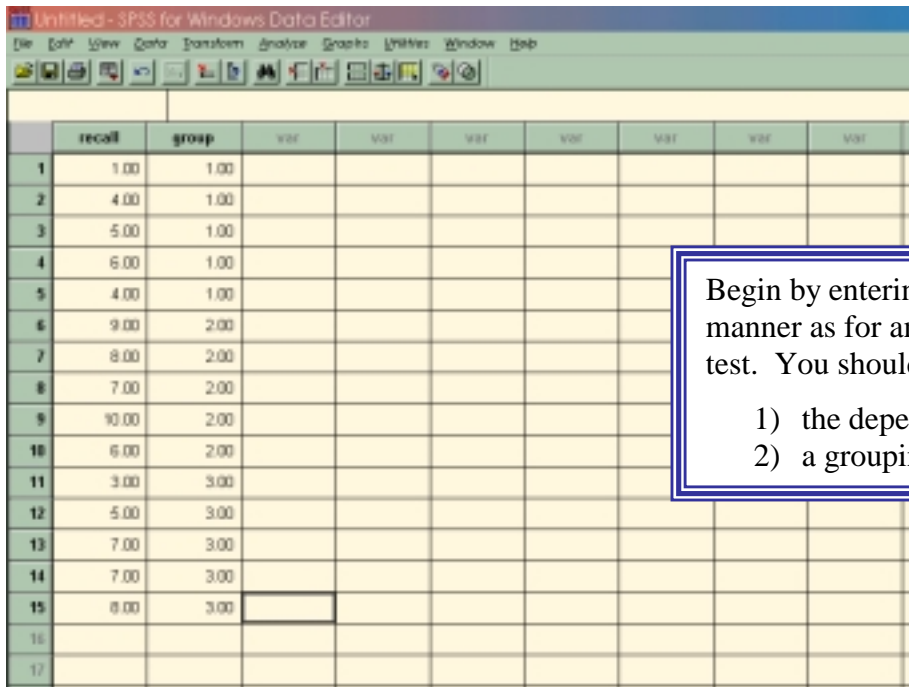


## SPSS Tutorial 2—Psych 218

### Between-Subjects Analysis of Variance

*Step 1: Enter your data.*



The screenshot shows the SPSS Data Editor window with a data table. The table has two columns: 'recall' and 'group'. The 'recall' column contains numerical values, and the 'group' column contains categorical values (1.00, 2.00, 3.00). The data is as follows:

	recall	group
1	1.00	1.00
2	4.00	1.00
3	5.00	1.00
4	6.00	1.00
5	4.00	1.00
6	9.00	2.00
7	8.00	2.00
8	7.00	2.00
9	10.00	2.00
10	6.00	2.00
11	3.00	3.00
12	5.00	3.00
13	7.00	3.00
14	7.00	3.00
15	8.00	3.00
16		
17		

Begin by entering your data in the same manner as for an independent groups t-test. You should have two columns:

- 1) the dependent variable
- 2) a grouping variable

*Step 2: Define your variables.*

Remember that to do this, you can simply double-click at the top of the variable's column, and the screen will change from "data view" to "variable view," prompting you to enter properties of the variable. For your dependent variable, giving the variable a name and a label is sufficient. For your independent variable (the grouping variable), you will also want to have **value labels** identifying what numbers correspond with which groups. See the following figure for how to do this.

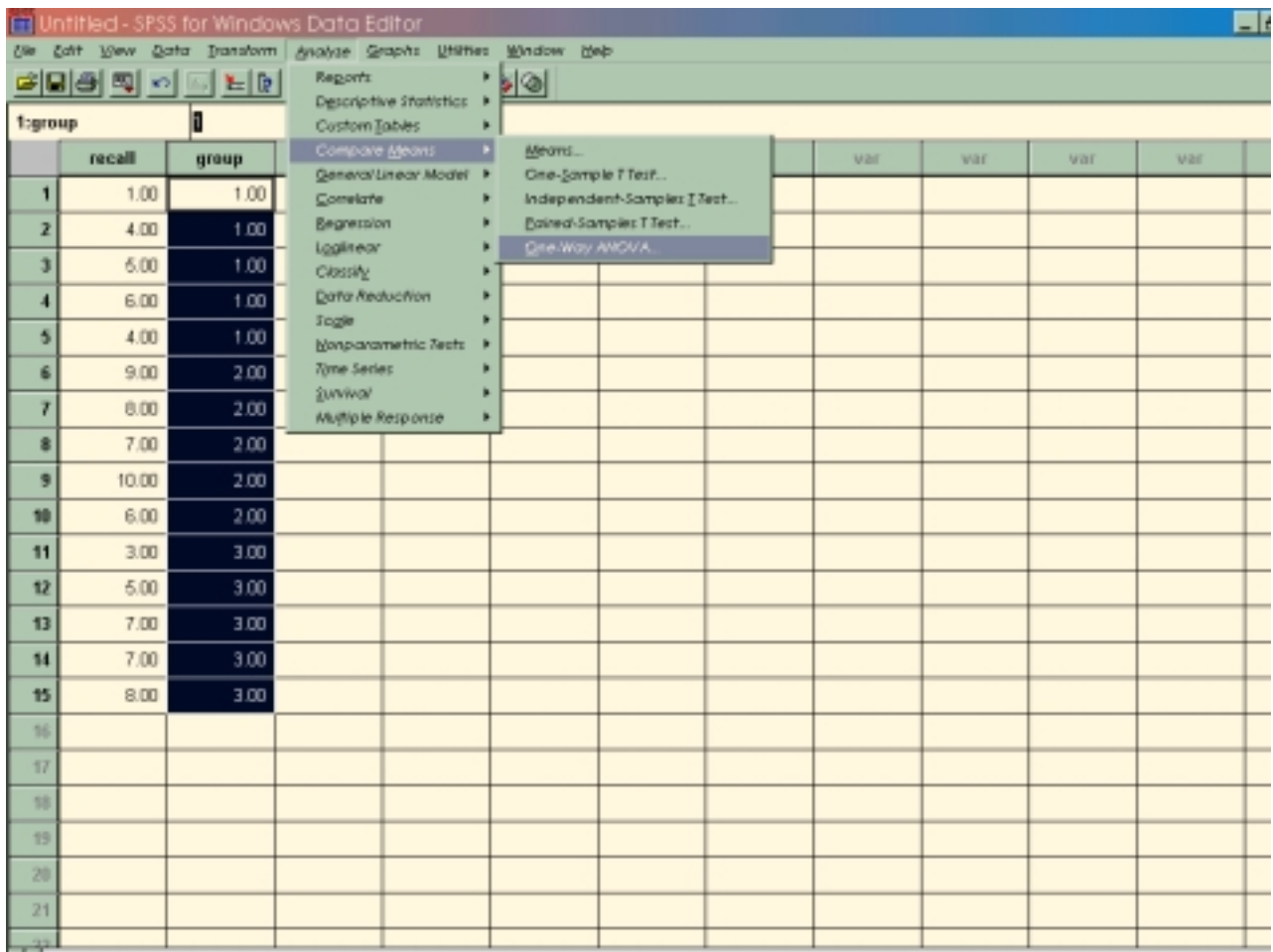
The screenshot shows the SPSS Data Editor in Variable View. The variable 'recall' is selected. The 'Values' column for 'recall' is currently set to 'None'. A red arrow points from a text box to this cell. The 'Value Labels' dialog box is open, showing a list of value labels: '1.00 = "10 year old"', '2.00 = "25 year old"', and '3.00 = "75 year old"'. A red arrow points from a text box to the 'Add' button in the dialog. The dialog also has 'OK', 'Cancel', and 'Help' buttons.

Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure
recall	Numeric	8	2		None	None	8	Right	Scale
group	Numeric	8	2		None	None	8	Right	Scale

Start by clicking on the cell for the “values” for the variable you want. The dialog box below will appear.

Remember to click the “Add” button each time you enter a value label; otherwise, the labels will not be added to your variable’s properties.

Step 3: Select Oneway ANOVA from the command list in the menu as follows:



**Note:** There is more than one way to run this command in SPSS. For now, the easiest way to do it is to go through the “compare means” option. However, since the analysis of variance procedure is based on the [general linear model](#), you could also use the analyze/general linear model option to run the ANOVA. This command allows for the analysis of much, much more sophisticated experimental designs than the one we have here, but using it on these data would yield the same result as the One-way ANOVA command.

*Step 4: Run your analysis in SPSS.*

Once you've selected the One-way ANOVA, you will get a dialog box like the one at the top. Select your dependent and grouping variables (notice that unlike in the independent samples t-test, you do not need to define your groups—SPSS assumes that you will include all groups in the analysis).

The screenshot shows the SPSS One-Way ANOVA dialog box and its options sub-dialog box. The main dialog box has 'recall' in the Dependent List and 'subject's group (n)' in the Factor list. The 'Options...' button is highlighted with a red arrow. The 'Options' sub-dialog box is open, showing the following settings:

- Statistics:
  - Descriptive
  - Homogeneity-of-variance
  - Means plot
- Missing Values:
  - Exclude cases analysis by analysis
  - Exclude cases listwise

A text box with a blue border and a red arrow pointing to the 'Options...' button contains the following text:

While you're here, you might as well select the "options..." button, and check that you would like descriptive and HOV statistics. You can also select for SPSS to plot the means if you like.

recall	group
10.00	2.00
6.00	2.00
3.00	3.00
5.00	3.00
7.00	3.00
7.00	3.00
8.00	3.00

Step 5: View and interpret your output.

The screenshot displays the SPSS Output Viewer window for an Oneway ANOVA analysis. The left sidebar shows a tree view with 'Oneway' expanded to show 'Descriptives', 'Test of Homogeneity of Variances', and 'ANOVA'. The main area shows three tables:

**Descriptives**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
10 year olds	5	4.0000	1.8708	.8367	1.6771	6.3229	1.00	6.00
21 year olds	5	8.0000	1.5811	.7071	6.0388	9.9632	6.00	10.00
75 year olds	5	6.0000	2.0800	.8944	3.5187	8.4833	3.00	8.00
Total	15	6.0000	2.3805	.6172	4.6782	7.3238	1.00	10.00

**Test of Homogeneity of Variances**

Levene Statistic	df1	df2	Sig.
.250	2	12	.783

**ANOVA**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	40.000	2	20.000	6.000	.016
Within Groups	40.000	12	3.333		
Total	80.000	14			

WOW! Look at all this information!  
Note that the descriptive statistics include CIs, your HOV test is in a separate table from your descriptive statistics, and your ANOVA partitions your sum of squares.

But some of you are begging to know, how can I do all of this with [syntax commands](#)? You can see what the syntax looks like by selecting “[paste](#)” when you are in the One-way ANOVA dialog box.

*Step 6: Now that you know how to run a between-subjects ANOVA, enter the data from the following problem and run through the previous steps on your own.*

In a verbal learning task, nonsense syllables are presented for later recall. Three different groups of subjects see the nonsense syllables at a 1-, 5-, or 10-second presentation rate. The data (number of errors) for the three groups are as follows:

1-second group	5-second group	10-second group
13	11	3
15	14	5
15	13	6
12	12	6
13	16	9
12	12	7
9	11	2
8	9	4
15	10	3
12	8	1
8	9	8

- a.) Do a boxplot to see what the distributions look like.
- b.) Perform an ANOVA on the data.

**Note:** You will not be asked to hand in this ANOVA output. However, your current homework requires that you use SPSS to do an analysis of variance.

You can practice using different data to compute ANOVAs for you using the Excel spreadsheet or the Java applet program (links are on the Tutorials page of the website).