

One-way Between-subjects ANOVA

Here you have the opportunity to practice the procedure for using SPSS to make a comparison between the mean scores of more than two different groups of participants. Specifically, you will be running a one-way between-subjects ANOVA. This type of analysis is used when we have one between subjects IV with **three or more** levels to compare.

We will be using sample data from a hypothetical study looking to explore the effect of age on problematic gambling behaviour.

Step 1:

Create the variable of Age within the 'Variable View', including the three age groups of 1 (adolescent), 2 (emerging adult) and 3 (adult).

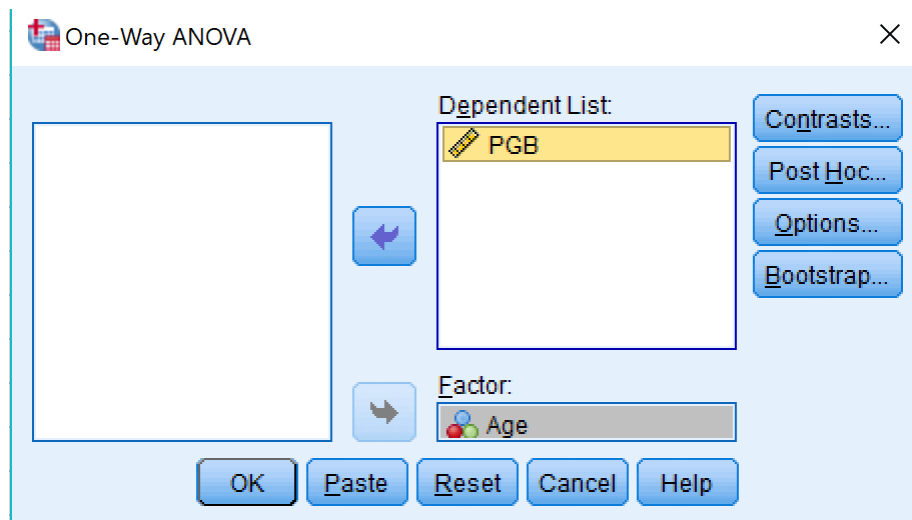
Note: Remember that if you were collecting this data you would be asking for age as a continuous number, so there are likely steps that you would need to follow prior to this for your own study.

Next, input the data as shown below in the 'Data View':

	 Age	 PGB	
1	1.00	55.00	
2	1.00	68.00	
3	1.00	48.00	
4	1.00	47.00	
5	1.00	43.00	
6	1.00	59.00	
7	1.00	47.00	
8	2.00	44.00	
9	2.00	63.00	
10	2.00	60.00	
11	2.00	57.00	
12	2.00	56.00	
13	2.00	51.00	
14	2.00	44.00	
15	3.00	59.00	
16	3.00	46.00	
17	3.00	51.00	
18	3.00	50.00	
19	3.00	50.00	
20	3.00	54.00	
21	3.00	45.00	
22			

Step 2: NB: there are two methods for conducting this analysis, and which you use will depend on whether you have planned comparisons or post-hoc analyses (this must be determined before you carry out the analysis). Shown here is the process for the ANOVA with post-hoc tests.

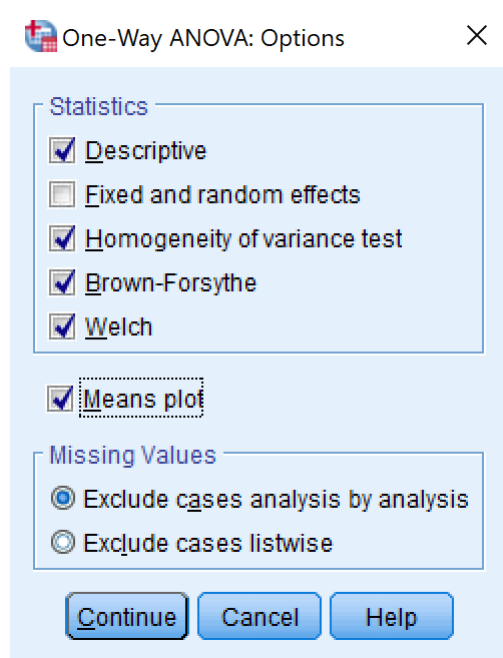
Select 'Analyze' on the top menu bar, hover over 'Compare Means' and select the 'One-way ANOVA' option. Move your DV (PGB in this case) into the box headed 'Dependent List', and move your IV (age) into the box labelled 'Factor'.



Next, select 'Options' and tick 'Descriptive', 'Homogeneity of variance test', 'Brown-Forsythe', 'Welch', and 'Means Plot'.

Underneath 'Missing Values', make sure there is a dot in the option marked 'Exclude cases analysis by analysis' (this is usually the default).

Click Continue.



Now, click on the 'Post Hoc' button and select 'Tukey'. Click Continue and then OK within the One-Way ANOVA dialogue box to run the analysis.

Step 4: Report and interpret results.

SPSS will produce the following output tables:

Descriptives

In this table the descriptives (means, SD's and N) are shown for the three different groups of participants within your study. This is useful for referring back to in order to understand where (if) differences have been shown to be significant or non-significant.

Test of Homogeneity of Variances

This tests whether the variance in the scores you have obtained are the same for each of the three groups. Check the **Sig.** value (Based on Mean) and if this value is *greater than* .05 (i.e., not significant) then we have *not* violated the assumption of homogeneity of variance.

*If you DO violate this assumption, then you will need to consult the **Robust Tests of Equality of Means** table to determine how to proceed.*

ANOVA

The top row of this output table (Between Groups) will give you the first df, the F-value and the significance value for reporting the effect of the variable 'age' on reported problematic gambling behaviour (the main effect). For ANOVA we need to report two values from the degrees of freedom (df) column –the second df value comes from the 'Within Groups' row of the output.

The format for reporting the results of ANOVA is:

$$F(df, df) = F\text{-value}, p < 0.05 \text{ or } p > 0.05 \text{ (} p = \text{___ if you prefer)}$$

For example: $F(2, 18) = .28, p > .05$

Multiple Comparisons

If the main effect of our IV was significant, then we would need to use the information in this table to determine and report where the significant difference lay across our three groups. The main effect for this analysis was not significant, so we do not need to further interpret this information for now.