

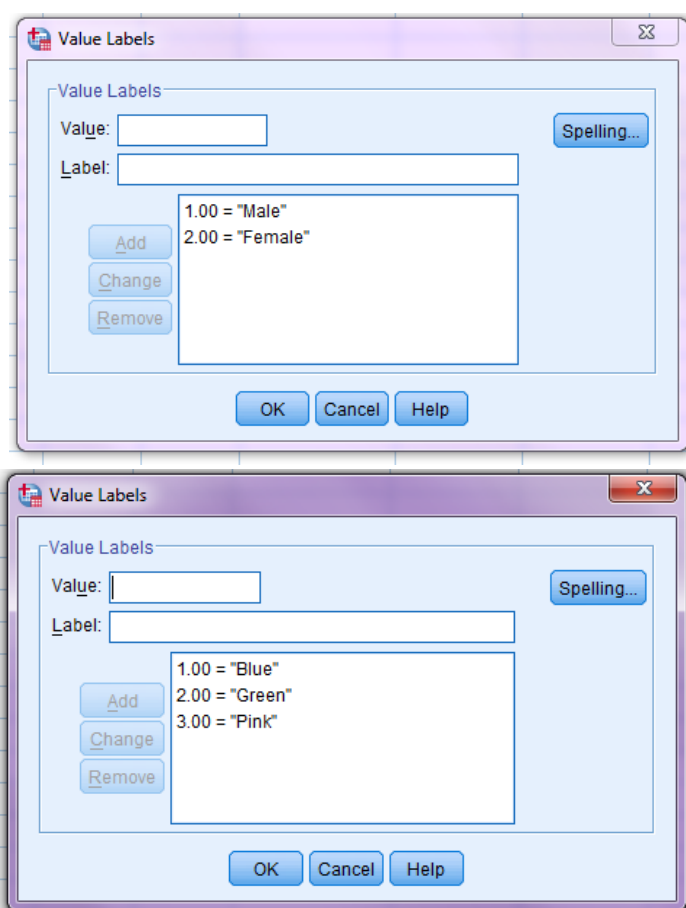
Academic Skills and Research Methods

Worksheet 11: Chi²

In this workshop you will be practising the Chi-square test for independence. This test is used to discover if there is a relationship between two categorical variables.

We will use several different data-sets, each of which can be assessed using the Chi-square test for independence. For each data set, you should input the data in the format shown on the following page, with a column for each of the variables. The first example depicts measures taken from school children on their favourite colour.

Remember! – you are using categorical variables, so the first thing you will need to do is create your variables accordingly using values to show what the numbers mean.



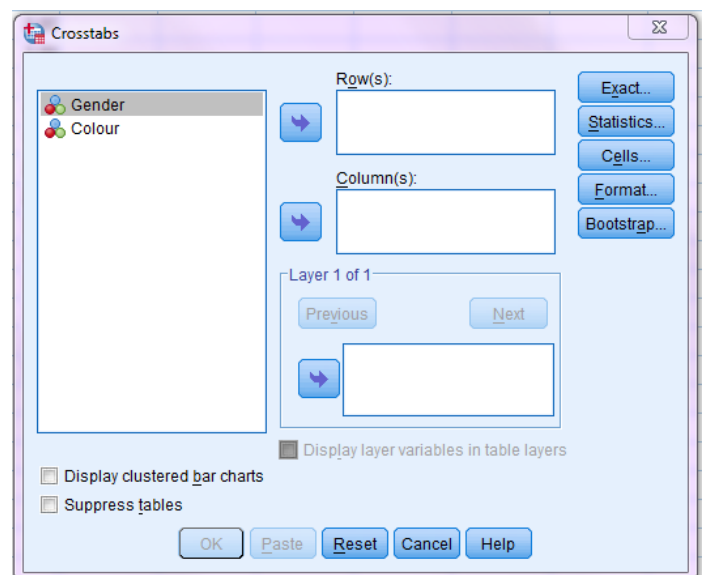
	Blue	Green	Pink	Total
Male	5	3	2	10
Female	2	2	6	10

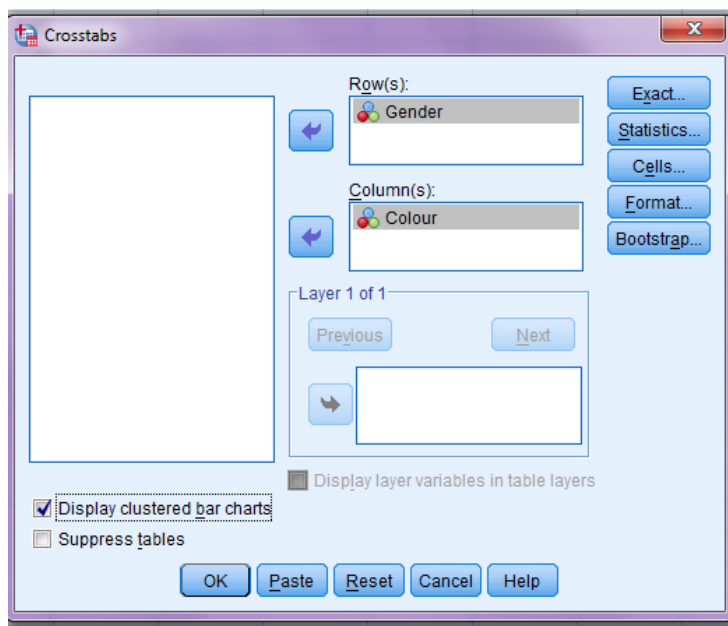
	Gender	Colour
1	1.00	1.00
2	1.00	1.00
3	1.00	1.00
4	1.00	1.00
5	1.00	1.00
6	1.00	2.00
7	1.00	2.00
8	1.00	2.00
9	1.00	3.00
10	1.00	3.00
11	2.00	1.00
12	2.00	1.00
13	2.00	2.00
14	2.00	2.00
15	2.00	3.00
16	2.00	3.00
17	2.00	3.00
18	2.00	3.00
19	2.00	3.00
20	2.00	3.00
21		

Now, we can carry out the statistical test to make a judgement about how 'significant' any relation is between the variables.

- Select 'Analyze' on the top menu bar
- Go to the 'Descriptives statistics' section
- Select the 'Crosstabs' option

You will be presented with the following **Crosstabs** dialogue box:



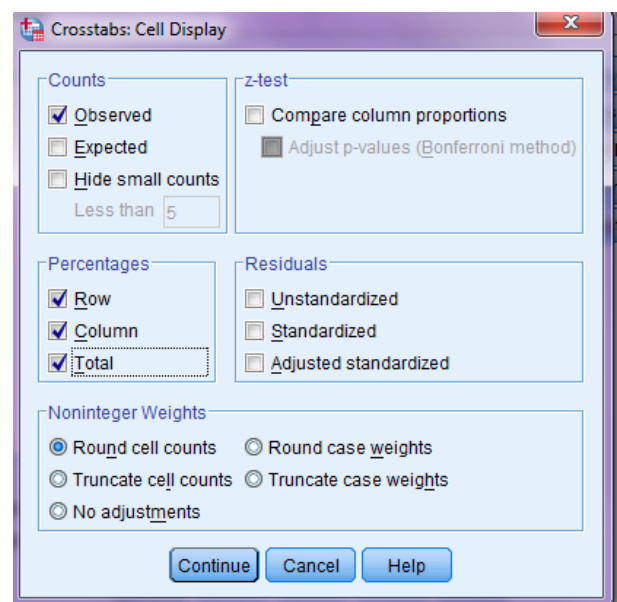


Move one of the variables into the **Rows** box and the other variable into the **Columns** box. In this example, Gender has been transferred into the rows box, and Colour into the columns box.

Check the box that says **Display clustered bar charts**.

Click on the **Statistics** button and select **Chi-Square** and **Phi and Cramer's V** options. Then click continue.

Next, click the **Cells** button and make sure the following are selected:



Click on **Continue** and **OK** to run the analysis.

The SPSS output will provide a table labelled **Chi-Square Tests**. When reading this table, you are interested in the results of the Pearson Chi-Square row. We can see here that:

$$\chi^2(2, N = 20) = 3.49, p = .18.$$

This tells us that there is no statistically significant association between Gender and favourite colour: that is, both males and females equally prefer each of the three colours.

Work through the same steps to investigate the association between the following sets of data:

Data set 1:

	Smoker	Non-smoker	<i>Total</i>
Male	9	1	10
Female	4	6	10

Data set 2:

	Political	Non-political	<i>Total</i>
18-25	2	8	10
26-40	4	6	10
40+	7	3	10

Data set 3:

	Pass	Fail	<i>Total</i>
Attended	15	5	20
Skipped	7	13	20