

## SPSS 13.0 HELP SHEET: One-Way Chi-Square

### CONTENTS

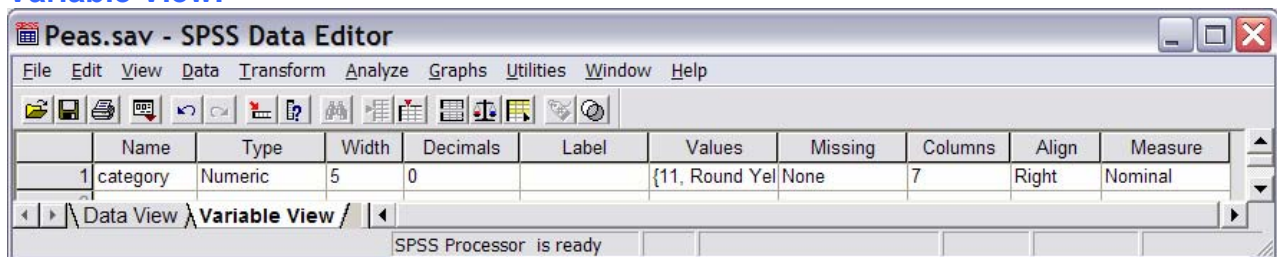
1. How to entry data to do a One-way Chi-square.
2. How to do a One-way Chi-square test with equal expected values.
3. How to do a One-Way Chi-square test with unequal expected values.

### 1. How to enter data to do a One-way Chi-square.

For general advice on data entry see the “How to enter data into SPSS” help sheet.

Your data should be in their “raw” form (see “starting point” help sheet) such as for the variable *category* in the example below. In this example *category* is measured at the nominal level using the following categories: 11 (value label = round yellow); 12 (value label = round green), 21 (wrinkled yellow), 22 (wrinkled green). If your data are already “tallied up” into a frequency distribution you are better off using the interactive calculation sheet.

### Variable View:



### Data View (View – Value Labels off)

The screenshot shows the Data View window for 'Peas.sav' with value labels off. The data is as follows:

1 :	category	var	var
1	11		
2	21		
3	21		
4	11		
5	22		
6	12		
7	11		
8	12		

### Data View (View – Value Labels on)

The screenshot shows the Data View window for 'Peas.sav' with value labels on. The data is as follows:

1 :	category	var	var
1	Round Yellow		
2	wrinkled Yellow		
3	wrinkled Yellow		
4	Round Yellow		
5	wrinkled green		
6	Round green		
7	Round Yellow		
8	Round green		

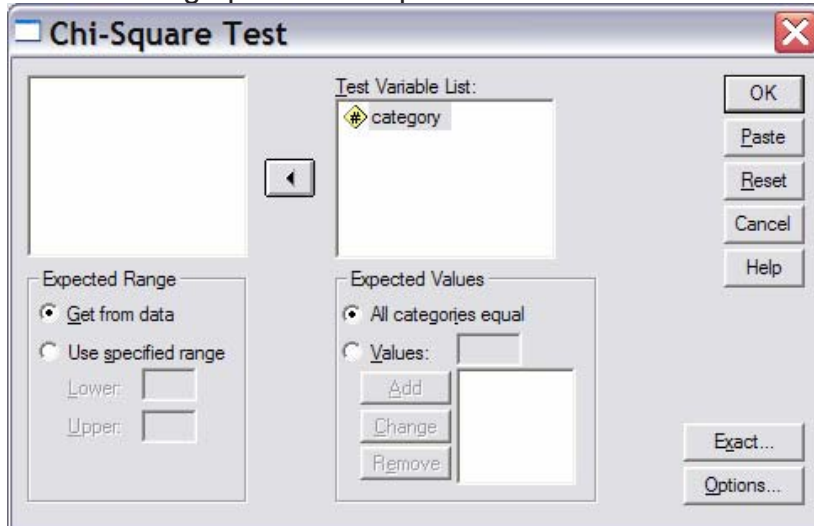
## 2. How to do a One-way Chi-square test with equal expected values.

To get SPSS to conduct a one-way chi-square test on your data when expected values are equal (Test of Homogeneity):

Open your data file.

Select: Analyze – Nonparametric Tests - Chi-Square...

This will bring up the Chi-Square Test window:



Select the variable that you want to analyse, and send it to the **Test Variable List** box (in the example above this is *Categories*).

Under **Expected Range** check that the option Get from data is selected. Under **Expected Values** the **All categories equal** is the option that should be selected for a test of homogeneity. Click OK.

The key elements of the output are:

**Categories**

	Observed N	Expected N	Residual
Round Yellow	31	27.5	3.5
Round green	26	27.5	-1.5
wrinkled Yellow	27	27.5	-.5
wrinkled green	26	27.5	-1.5
Total	110		

**Test Statistics**

	Categories
Chi-Square <sup>a</sup>	.618
df	3
Asymp. Sig.	.892

← **STATISTIC**  
← **DEGREES OF FREEDOM**  
← **P**

a. 0 cells (.0%) have expected frequencies less than  
5. The minimum expected cell frequency is 27.5.

↑ *This footnote is useful for evaluating if you have a problem with small expected values.*

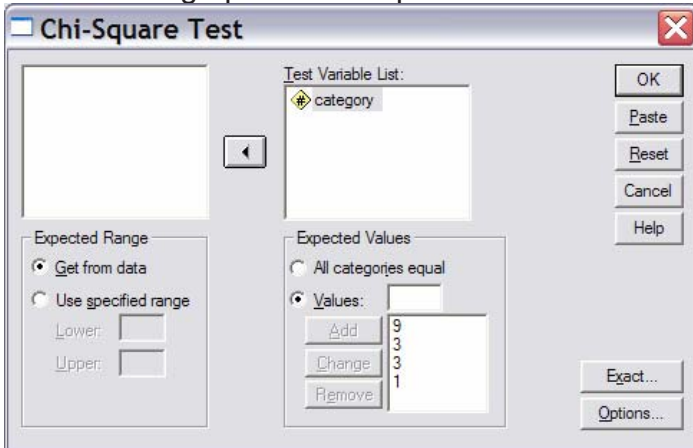
### 3. How to do a One-Way Chi-square test with unequal expected values.

To get SPSS to conduct a one-way chi-square test on your data when expected values are unequal:

Open your data file.

Select: Analyze – Nonparametric Tests - Chi-Square...

This will bring up the Chi-Square Test window:



Select the variable that you want to analyse, and send it to the **Test Variable List** box (in the example above this is *Categories*).

Under **Expected Range** check that the option **Get from data** is selected. Under **Expected Values** you have to tell SPSS what the expected ratio. To do this, for example, for a 9:3:3:1 type 9 in the adjacent box then click **Add**. Repeat this procedure for the numbers 3, 3, and 1. The order of the values is important: you have to add the ratio values in ascending order of the category-number codes, with the first value in the list corresponding to the category with the lowest-number code. Click OK.

The key elements of the output are:

**Categories**

	Observed N	Expected N	Residual
Round Yellow	31	61.9	-30.9
Round green	26	20.6	5.4
wrinkled Yellow	27	20.6	6.4
wrinkled green	26	6.9	19.1
Total	110		

**Test Statistics**

	Categories
Chi-Square <sup>a</sup>	71.980
df	3
Asymp. Sig.	.000

STATISTIC  
DEGREES OF FREEDOM  
P

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 6.9.

This footnote is useful for evaluating if you have a problem with small expected values.