

## SPSS24 HELP SHEET: Two-Way Chi-Square

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

For general advice on data entry see the “How to enter data into SPSS” help sheet. The way you enter data into SPSS depends on whether it is raw observations or frequencies.

#### 1a. For data as raw observations

#### Variable View:

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	season	Numeric	8	0	Season	{1, Dry}...	None	8	Right	Nominal	Input
2	grptype	Numeric	8	0	Group Type	{1, Solitary ...	None	10	Right	Nominal	Input

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

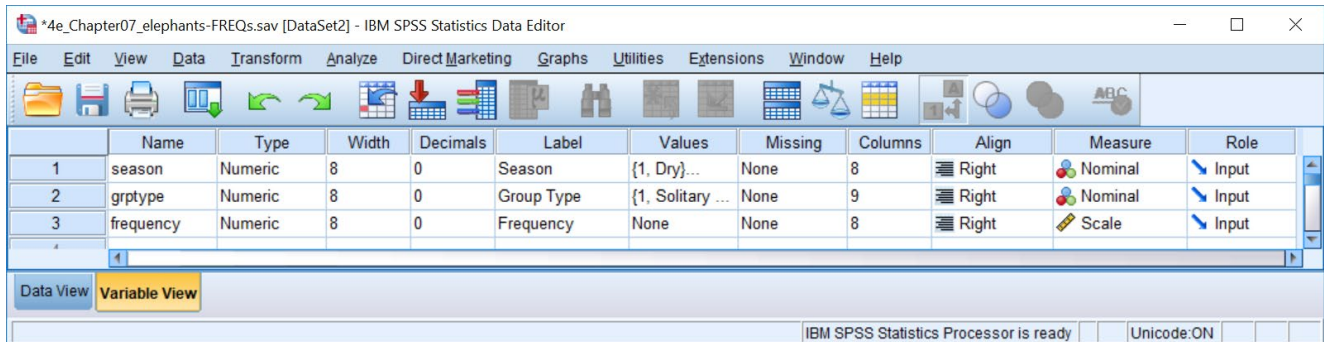
	season	grptype	var	ve
1	1	1		
2	1	1		
3	1	1		
4	1	1		
5	1	1		
6	1	1		
7	1	1		
8	1	1		
9	1	1		

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

	season	grptype	var	ve
1	Dry	Solitary Bull		
2	Dry	Solitary Bull		
3	Dry	Solitary Bull		
4	Dry	Solitary Bull		
5	Dry	Solitary Bull		
6	Dry	Solitary Bull		
7	Dry	Solitary Bull		
8	Dry	Solitary Bull		
9	Dry	Solitary Bull		

## 1b. For data as frequencies (including weighting cases procedure)

### Variable View:



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

	season	grptype	frequency
1	1	1	43
2	1	2	4
3	1	3	196
4	1	4	7
5	2	1	92
6	2	2	17
7	2	3	195
8	2	4	8
9			

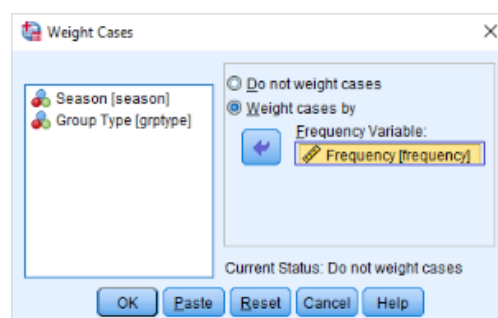
### Data View (View – Value Labels on)

	season	grptype	frequency
1	Dry	Solitary Bull	43
2	Dry	Bull Group	4
3	Dry	Family Group	196
4	Dry	Family Grou...	7
5	Wet	Solitary Bull	92
6	Wet	Bull Group	17
7	Wet	Family Group	195
8	Wet	Family Grou...	8

When data are entered as frequencies the following additional step is needed before starting the analyses.

Select: Data - Weight Cases . . .

The **Weight Cases** dialogue window should appear. You should select the **Weight cases by** option. You need to select the variable from the list on the left, which contains the frequencies, and send it to the **Frequency Variable** box.



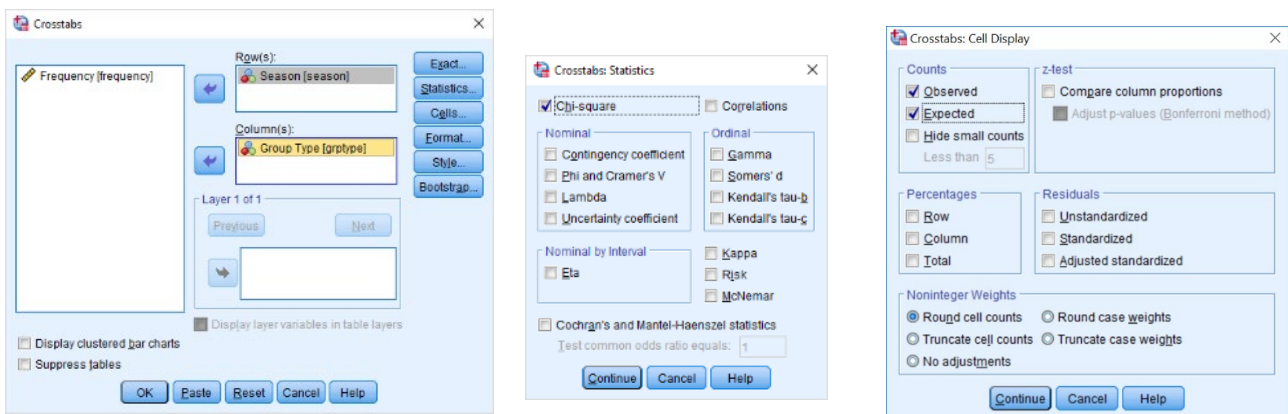
## 2. How to do a Two-way Chi-square test

To get SPSS to conduct a two-way chi-square test on your data:

Open your data file.

Select: Analyze – Descriptive - Crosstabs...

This will bring up the **Crosstabs** window. Select one variable and send it to **Row(s)**. Select the other variable and send it to the **Columns(s)** box. Click the **Statistics** button to bring up the **Crosstabs: Statistics** window and select the **Chi-square** then click **Continue**. Click the **Cells** button to bring up the **Crosstabs: Cell Display** window and select **Observed** and **Expected**. Click **Continue**, then **OK**.



This will produce the following in the **Output** window.

**Season \* Group Type Crosstabulation**

		Group Type				Total	
		Solitary Bull	Bull Group	Family Group	Family Group with Bull(s)		
Season	Dry	Count	43	4	196	7	250
		Expected Count	60.1	9.3	173.9	6.7	250.0
	Wet	Count	92	17	195	8	312
		Expected Count	74.9	11.7	217.1	8.3	312.0
Total		Count	135	21	391	15	562
		Expected Count	135.0	21.0	391.0	15.0	562.0

← Total sample size (N)

**Statistic ( $\chi^2$ ) Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	19.297 <sup>a</sup>	3	.000
Likelihood Ratio	20.075	3	.000
Linear-by-Linear Association	14.519	1	.000
N of Valid Cases	562		

← p

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.67.

In summary the key information from the test is

**two-way classification chi-square:  $\chi^2_3 = 19.30$ ,  $N = 562$ ,  $P < 0.001$**