

Research Methods

One variable Chi-squared test on SPSS

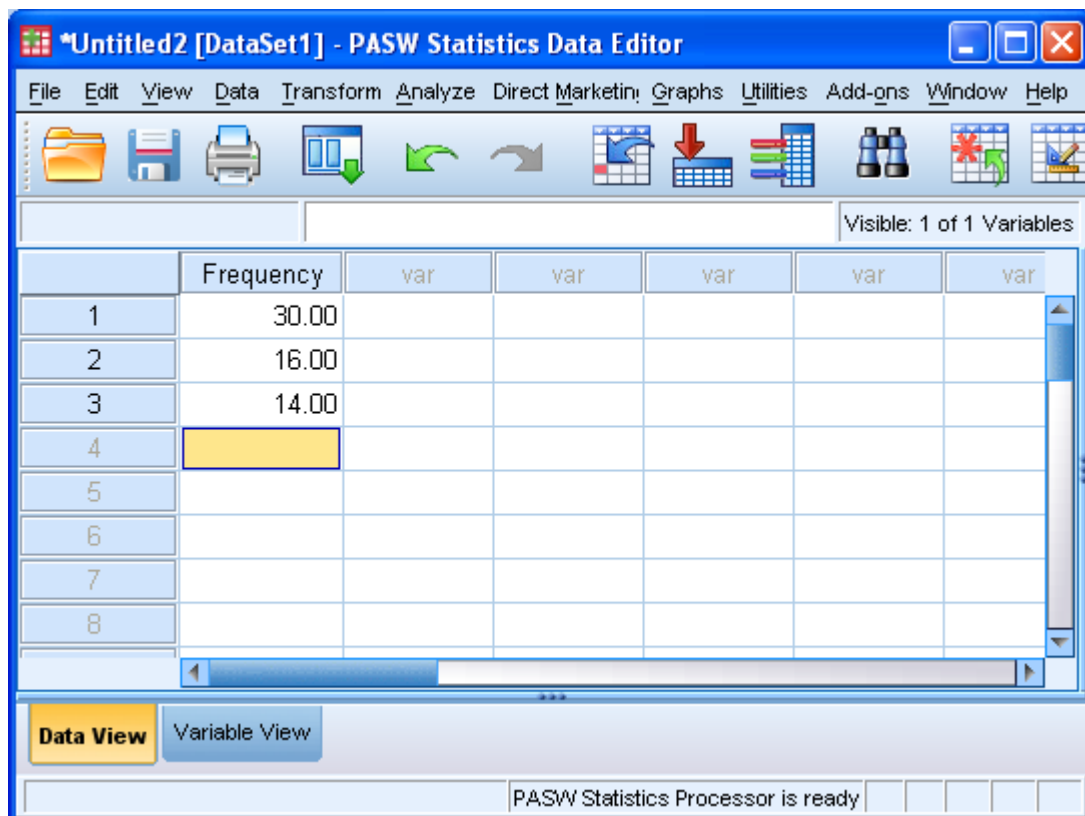
We will now use SPSS to do a chi-squared test on the table of different types of play in 3 year old children as used at the start of the workshop. Here is the table again:

Table 1: Play types observed in three-year olds

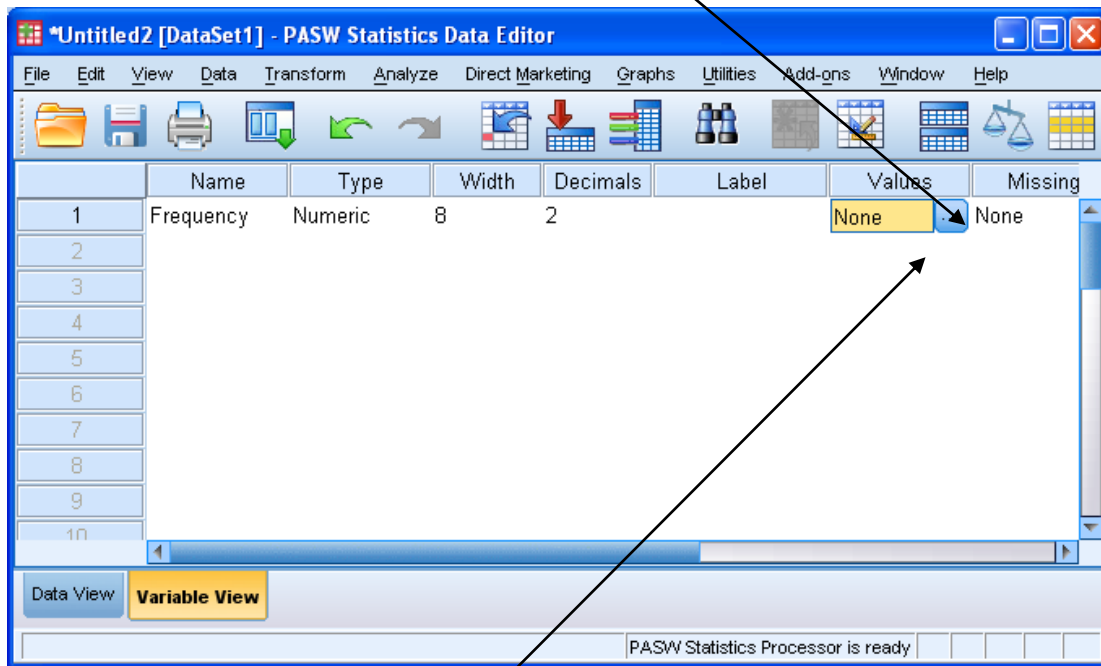
Type of play	Frequency
Associative	30
Cooperative	16
Parallel	14

Set up the data file

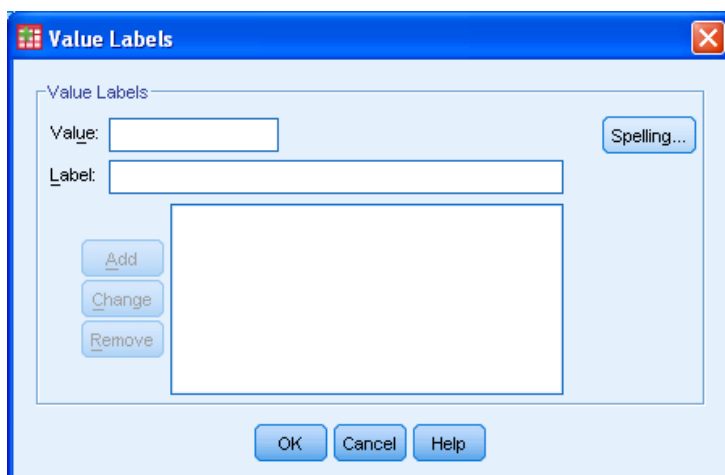
Very straightforward, you just have one column of data – the frequency of the different play types. So in the **variable view** window, name your column *Frequency*. Then enter the three data points in **data view**. Your file will look as follows:



You can also make the output more intelligible by labelling these three frequencies. Return to the **variable view** tab. In the 'Frequency' row, click on the first cell under **Values**:



Notice that a little box containing ... becomes active. Click on this box and you will get the following dialogue box:



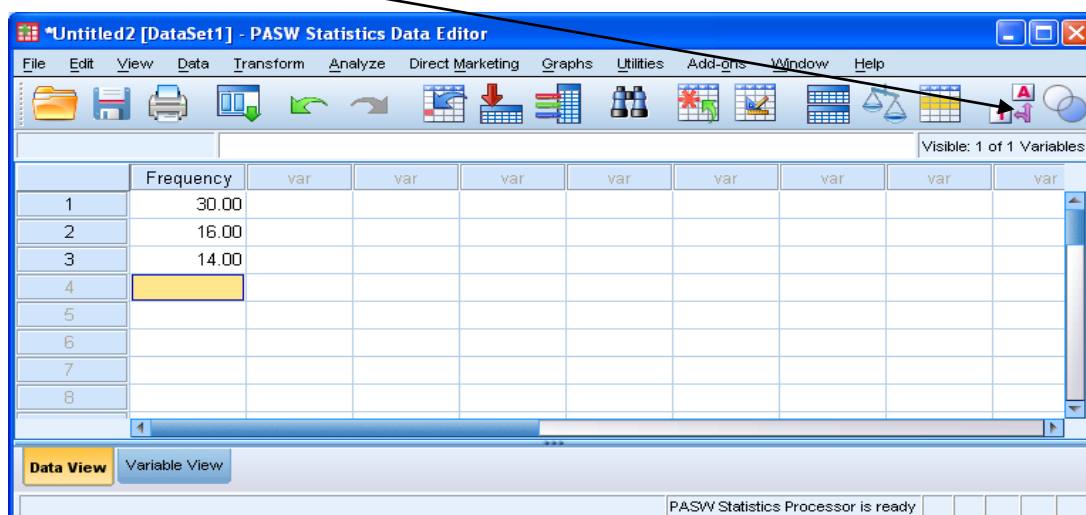
You can use this box to label the frequencies according to the types of play they represent. So for associative play, type 30 in the **Value** box and in the **Label** box type 'Associative Play':



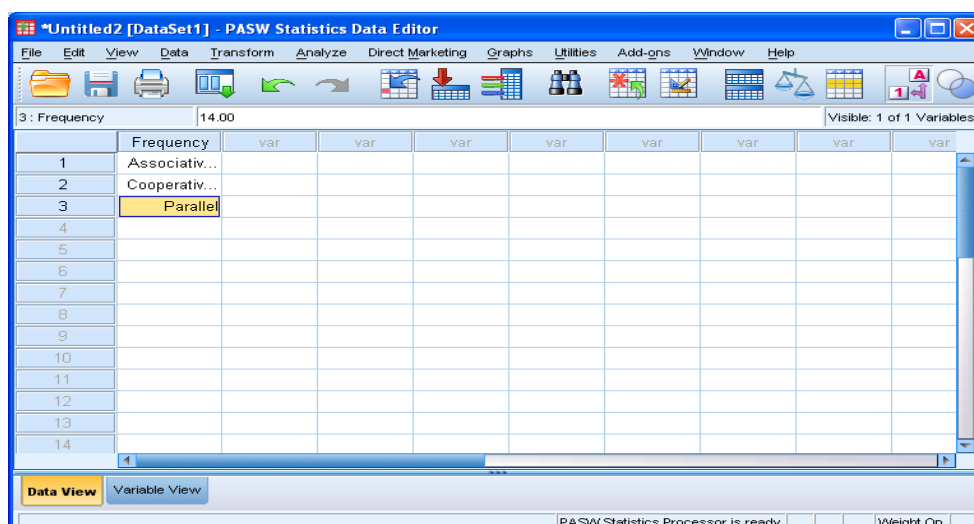
Now click **Add** to define this label. Repeat the process to label 16 as the 'Cooperative' frequency and 14 as the 'parallel' frequency. The dialogue box should look as follows at the end:



When you have done this click OK to return to the data editor. Click on the data view tab, and from here click on the **Value-Labels icon**:

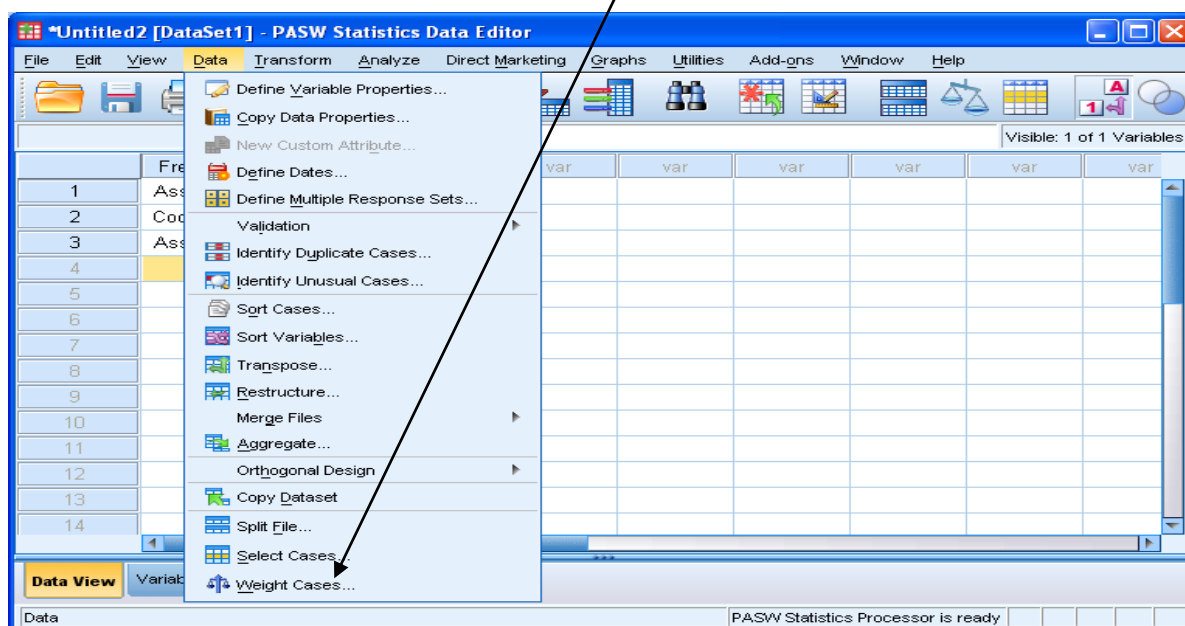


The data file should now change to the following...

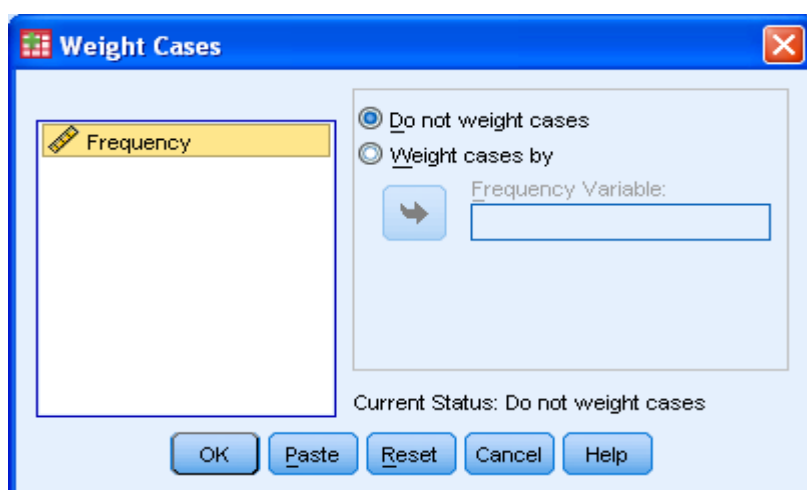


SPSS will use these labels in the output which may make it easier to understand.

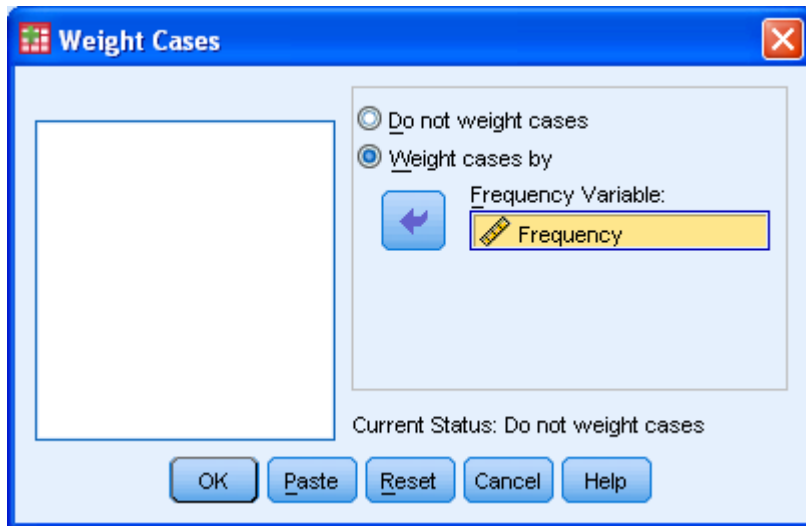
Next, you need to tell SPSS that the data in the Frequency variable represent frequencies of occurrence. Go to the **Data** menu, and select **Weight Cases By**:



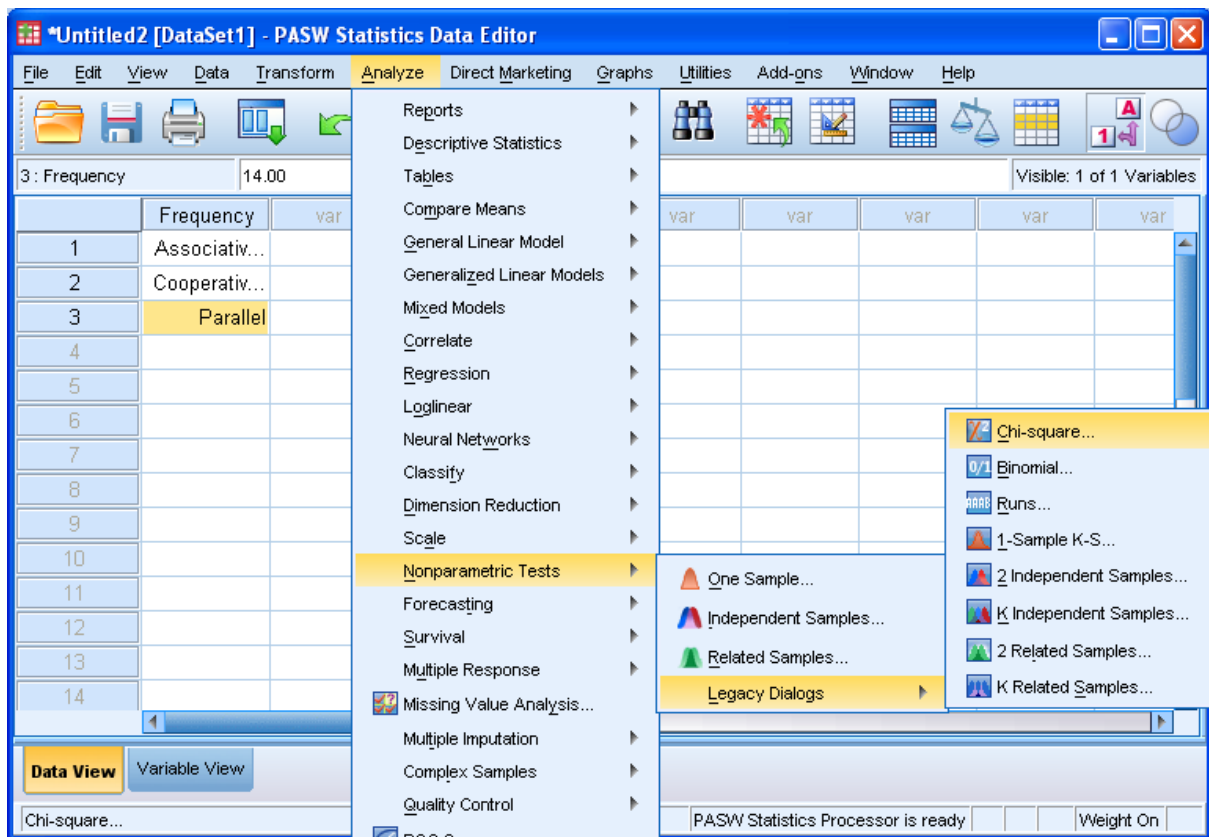
This will give you the following dialogue box:



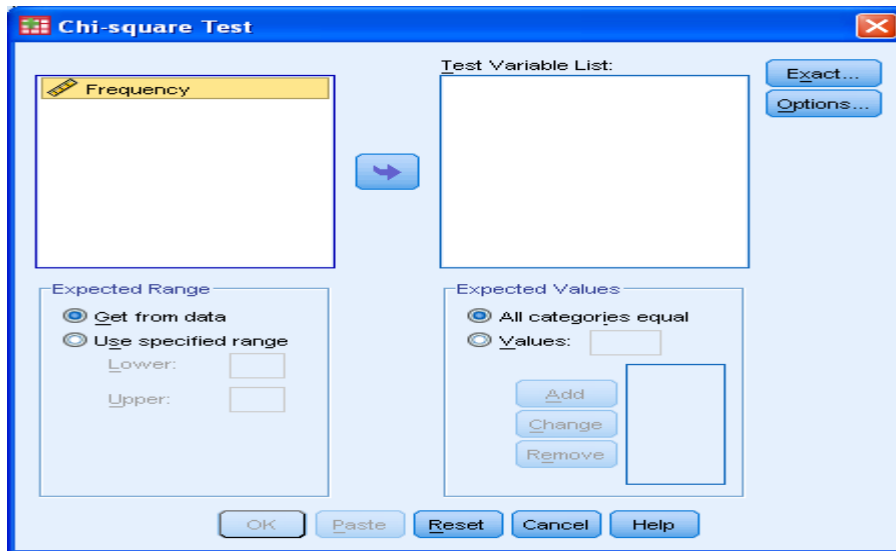
Click the mouse in the '**Weight cases by**' button. The select 'frequency' by clicking the mouse on this variable name and click the arrow button which will have the effect of placing this in the '**Frequency Variable**' box:



Click **OK**. You are now ready to do the chi-squared test. From the **Analyze** menu, select **Nonparametric tests**, from the sub menu, select **Legacy dialogs**, and from the options here, select **Chi-square**:



You will be presented with the following dialogue box:



Select Frequency and move it to the Test Variable List box. Click OK and SPSS will do the test for you. The output is produced below:

Frequency			
	Observed N	Expected N	Residual
Parallel	14	20.0	-6.0
Cooperative Play	16	20.0	-4.0
Associative Play	30	20.0	10.0
Total	60		

Here you have the table showing the observed and expected frequencies. The results of the chi-squared test are presented in the next table:

Test Statistics	
	Frequency
Chi-square	7.600 ^a
df	2
Asymp. Sig.	.022
Exact Sig.	.023
Point Probability	.004

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 20.0.

You can see the value of Chi-squared (7.6), its degrees of freedom (2) and the significance value (.022). As the significance value is less than .05, you can conclude that the difference between the categories is statistically significant.

Report the result

A chi-squared test indicated that three year old children engaged in significantly more cooperative play compared to associative and parallel play ($\chi^2(2) = 7.6, p = .022$).