Crosstab (with Chi-Square)

A crosstabulation displays the number of cases in each category defined by two or more grouping variables.

```
CROSSTABS
  /TABLES=happy  BY freqdum
  /FORMAT= AVALUE TABLES
  /STATISTIC=CHISQ
  /CELLS= COUNT EXPECTED
  /COUNT ROUND CELL .
```

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
GENERAL HAPPINESS * SEXFREQ (Monthly+ =1)	1060	38.3%	1705	61.7%	2765	100.0%

GENERAL HAPPINESS * SEXFREQ (Monthly+ =1) Crosstabulation

			SEXFREQ (Monthly+ =1)		
			Less than of equal to 1/month	More than 1/month	Total
GENERAL HAPPINESS	VERY HAPPY (1)	Count	103	207	310
		Expected Count	132.2	177.8	310.0
	PRETTY HAPPY (2)	Count	286	333	619
		Expected Count	264.0	355.0	619.0
	NOT TOO HAPPY (3)	Count	63	68	131
		Expected Count	55.9	75.1	131.0
Total		Count	452	608	1060
		Expected Count	452.0	608.0	1060.0

For example, we see that there are 207 cases reporting "very happy" for general happiness and "more than once per month" for frequency of sex.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.039[a]	2	.000
Likelihood Ratio	16.297	2	.000
Linear-by-Linear Association	13.123	1	.000
N of Valid Cases	1060		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 55.86.

The Chi-Square measure tests the hypothesis that the row and column variables in a crosstabulation are independent of one another. While the Chi-Square measure may indicate that there is a relationship between two variables, they do not indicate the strength or direction of the relationship.

The cell size note checks for a validation of one of the Chi Square assumptions: If one or more of the cells has less than 5, then use Fisher's test.

Chi-Square

The Chi-Square Goodness of Fit Test determines if the observed frequencies are different from what we would expect to find (we expect equal numbers in each group within a variable). Use a Chi-Square Test when you want to know if there is a significant relationship between two categorical variables. In this example, we use "frequency of sex" and "happiness."

Null Hypothesis: There are approximately equal numbers of cases in each group.
Alternate Hypothesis: There are not equal numbers of cases in each group.

```
NPAR TEST
  /CHISQUARE=happy
  /EXPECTED=EQUAL
  /MISSING ANALYSIS.
```

GENERAL HAPPINESS

	Observed N	Expected N	Residual
VERY HAPPY	415	456.3	-41.3
PRETTY HAPPY	784	456.3	327.7
NOT TOO HAPPY	170	456.3	-286.3
Total	1369		

Test Statistics

	GENERAL HAPPINESS
Chi-Square[a]	418.687
df	2
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 456.3.

We have a Chi-Square value of 418.7, which is large. Our significance level is .000. We can conclude that there are not equal numbers of cases in each happiness category.

The cell size note checks for a validation of one of the Chi Square assumptions: If one or more of the cells has less than 5, then use Fisher's test.