

SPSS for Multidimensional Log-Linear Analysis

I. Data File Format

- Need one column for each factor to investigate. Each column will have values that represent the different categories possible for this factor (e.g., 1, 2,3 or a,b,c if there are three categories for this factor). Each row in the data set is thus the response for a single observation with respect to its placement in the contingency table row and column category. See the data file example below, where there are three factors to consider: first data column = “Marital Status”, the second data Column = “Number of Children”, and the third column = “Weekly Frequency of Sex”. (hey, this was an example from SPSS not me!) The program will automatically tally these frequencies up and put them in tabular form.

1	1	1
1	2	2
2	3	5
3	4	0
1	1	2
2	2	2
2	3	4
3	4	2
3	1	2
3	2	3
1	3	4
2	4	1

etc....

II. The Analysis

Note: this is for a full-factor (saturated) model only; which we discussed in class.

(1) From the pull-down menu:

Analyze → *Loglinear* → *Model Selection* <click on this>

(2) Specify the appropriate Row and Column factors & their format:

- a) Highlight the appropriate column name from the list on the left and click on the arrow button to include it as a factor.
- b) Highlight a factor name in the factor list, then click on the “Define Range” button and indicate what range of categories you want to include.
- c) Click on the “Enter in single step” circle at the bottom of the dialog box

(3) Specify the appropriate Model:

- click on the “Model” button at the bottom, then click on the “Saturated” option.

(4) Specify the appropriate Options:

- click on the “Options” button at the bottom, then click the boxes for “Parameter Estimates” and “Association Table”
- Exit this dialog box and then click on “OK” in the main dialog box to run the analysis.

III. The Output

The output consists of three elements:

- (1) Data & Factor Information - this is a good way to check if the computer included variables the way you wanted them.
- (2) K-way tests of significance – this is the summary of the k-way interaction tests (where k = number of factors) with the Chi-square statistic, df, and P-values. Thus, if you had 3 factors it would yield results for the 3-way test of independence.
- (3) Partial Associations – if the k-way test is NOT significant, then you’ll want to look at each lower order (e.g., 2-way) tests of independence. Again, the Chi-square statistic, df, and P-values are given.

**SPSS Example: Multidimensional Log-Linear Analysis
of 3-way Contingency Table**
(Note: this output has been trimmed; you'll get more)

* * * * * H I E R A R C H I C A L L O G L I N E A R * *

Tests that K-way and higher order effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
3	2	1.012	.6030	1.000	.6066	3
2	7	10.275	.1735	10.470	.1635	2
1	11	27.887	.0034	27.194	.0043	0

Tests that K-way effects are zero.

K	DF	L.R. Chisq	Prob	Pearson Chisq	Prob	Iteration
1	4	17.611	.0015	16.724	.0022	0
2	5	9.264	.0990	9.470	.0917	0
3	2	1.012	.6030	1.000	.6066	0

Tests of PARTIAL associations.

Effect Name	DF	Partial Chisq	Prob	Iter
FACTORA*FACTORB	1	.026	.8730	2
FACTORA*FACTORC	2	1.613	.4463	2
FACTORB*FACTORC	2	7.670	.0216	2
FACTORA	1	14.719	.0001	2
FACTORB	1	1.465	.2261	2
FACTORC	2	1.427	.4900	2
