EXERCISE 22

Loglinear analysis

Before you start

Before you proceed with this practical, please read Chapter 13.

Helping behaviour: The opposite-sex dyadic hypothesis

In the literature on helping behaviour by (and towards) men and women, there is much interest in three questions:

1. Are women more likely to receive help?
2. Are women more likely to give help?
3. Are people more likely to help members of the opposite sex?
   (This is known as the **opposite-sex dyadic hypothesis**.)

A male or female confederate of the experimenter approached male and female students who were entering a university library and asked them to participate in a survey. Table 1 shows the incidence of helping in relation to the sex of the confederate and that of the participant.

Table 1. Results of an experiment to test the opposite-sex dyadic hypothesis

Sex of Confederate	Sex of Participant	Help	
		Yes	No
Male	Male	52	35
	Female	21	43
Female	Male	39	40
	Female	23	75

Preparing the SPSS data set

Prepare the data set as in Section 13.4.2 with three coding variables Confederate's Sex (*ConfedSex*), Participant's Sex (*ParticSex*), and Participant's Response (*Help*), complete with appropriately defined value labels. There will be a fourth variable (*Count*) for the cell frequencies. Remember to use the **Weight Cases** command for the cell frequency variable *count*.

Exploring the data

Before carrying out any formal analysis, a brief inspection of the contingency table (Table 1) may prove informative. First of all, we notice that, on the whole, help was more likely to be refused than given; moreover, the females helped less than did the males. In view of the generally lower rate of helping in the female participants, therefore, there seems to be little

support for the hypothesis that females help more. Finally, turning to the third question, although the male participants did help the male confederate more often, the female participants tended to be more helpful towards the male confederate. This provides some support for the opposite-sex dyadic hypothesis.

Procedure for a loglinear analysis

To answer the three research questions, we shall use a **hierarchical loglinear analysis** (following the **backward elimination** strategy), with a view to fitting the most parsimonious **unsaturated model**. Run the loglinear command (ignoring the preliminary Crosstabs operation) as described in Section 13.4.2 by selecting **Analyze➔Loglinear➔Model Selection…** to open the **Model Selection Loglinear Analysis** dialog box.

Enter the coding variables in the **Factor(s)** box and the **Range** values for each factor. In the **Model Building** box, select **Use backward elimination** (the default radio button). Click **OK**.

Output for the loglinear analysis

The main features of the output for a hierarchical loglinear analysis are described in Section 13.4.2.

Look at the table of Tests that K-way and higher order effects are zero.

- **Up to what level of complexity are the effects significant?**

Now look for the effects retained in the **final model**.

- **List the effects in the final model. Does the highest order of complexity correspond with what you noted in the previous bullet point question?**

Finally look at the table of **Observed, Expected Frequencies and Residuals**. Compare the magnitudes of the observed (OBS) count and the expected (EXP) count assuming the final model.

- **Write down the value of chi-square for the Goodness-of-fit test and its associated p-value. Does this p-value suggest a good or a bad fit?**

Finally, test the hypothesis of total independence of all three variables, using the procedure described in Section 13.3.2.

- **Write down the value of chi-square for the Goodness-of-fit test and its associated p-value. Does this p-value suggest a good or a bad fit?**

Conclusion

It should be quite clear from the foregoing comparisons that the final loglinear model is a very considerable improvement upon mere dismissal of the model of total independence after a traditional chi-square test. Loglinear models provide a powerful tool for teasing out the relationships among the variables in multi-way contingency tables.