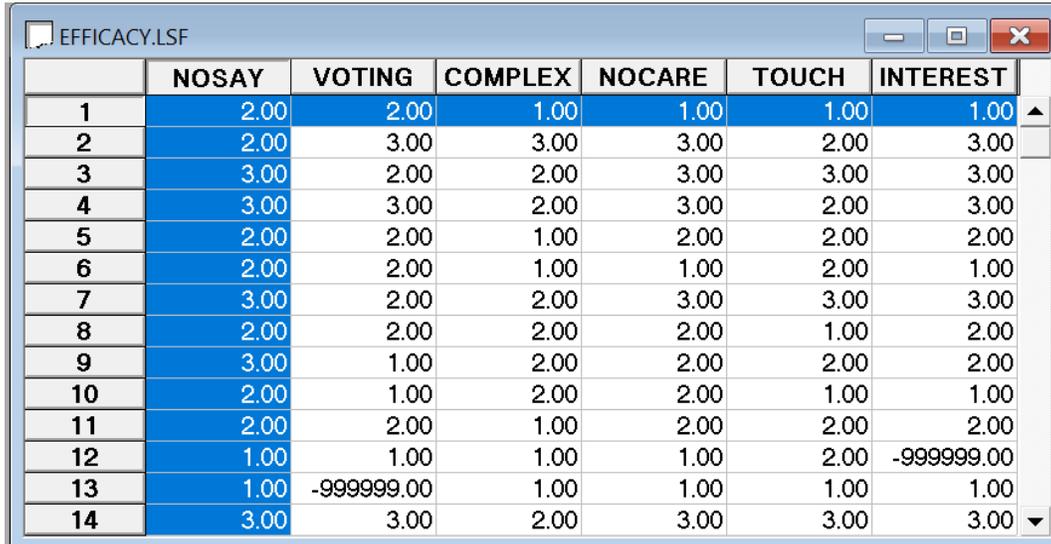# Two-stage SEM for political efficacy data

This example is based on six political efficacy measurements as described in Aish & Jöreskog (1990). The dataset **EFFICACY.LSF** consists of 1719 cases obtained in a USA sample. The first few lines of this data set are shown below.

	NOSAY	VOTING	COMPLEX	NOCARE	TOUCH	INTEREST
1	2.00	2.00	1.00	1.00	1.00	1.00
2	2.00	3.00	3.00	3.00	2.00	3.00
3	3.00	2.00	2.00	3.00	3.00	3.00
4	3.00	3.00	2.00	3.00	2.00	3.00
5	2.00	2.00	1.00	2.00	2.00	2.00
6	2.00	2.00	1.00	1.00	2.00	1.00
7	3.00	2.00	2.00	3.00	3.00	3.00
8	2.00	2.00	2.00	2.00	1.00	2.00
9	3.00	1.00	2.00	2.00	2.00	2.00
10	2.00	1.00	2.00	2.00	1.00	1.00
11	2.00	2.00	1.00	2.00	2.00	2.00
12	1.00	1.00	1.00	1.00	2.00	-999999.00
13	1.00	-999999.00	1.00	1.00	1.00	1.00
14	3.00	3.00	2.00	3.00	3.00	3.00

Note that the data values of -999999.00 are missing data values. Should a different code be used to indicate missing values, it should be assigned as the global missing code using the **Define Variables** dialog box.

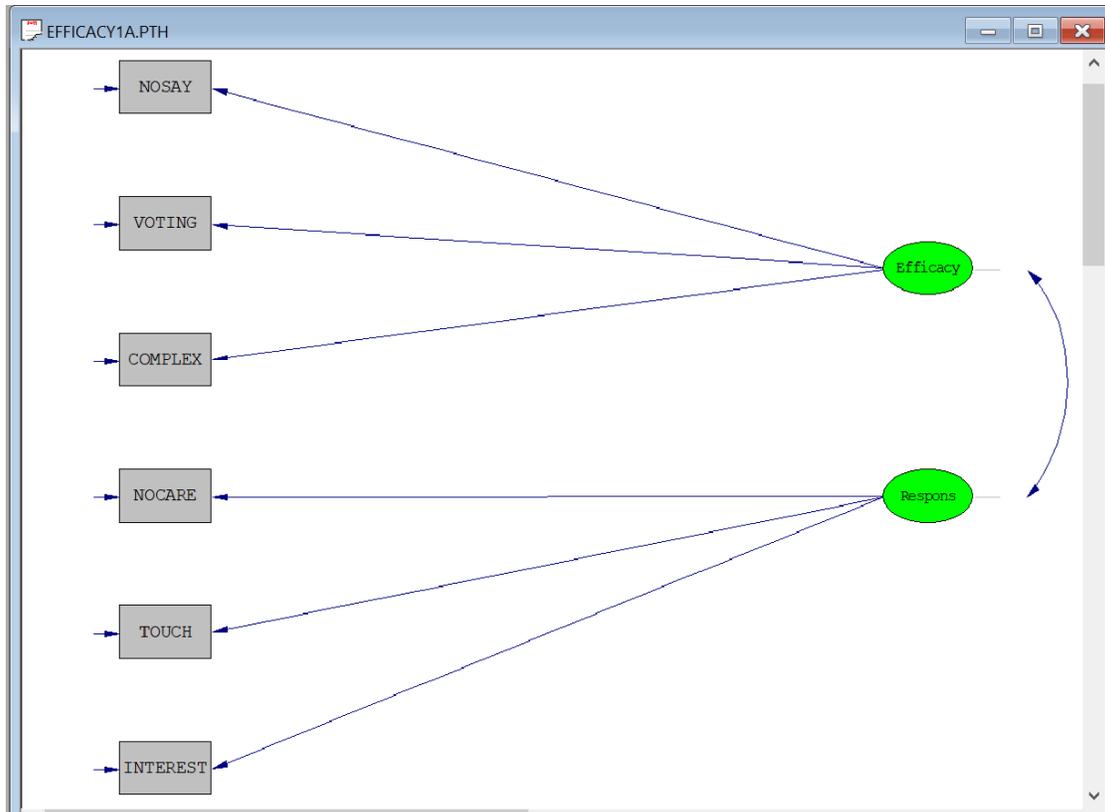The data are the responses to the following statements:
- People like me have no say in what the government does (NOSAY)
- Voting is the only way that people like me can have any say about how the government runs things (VOTING)
- Sometimes politics and government seem so complicated that a person like me cannot really understand what is going on (COMPLEX)
- I don't think that public officials care much about what people like me think (NOCARE)
- Generally speaking, those we elect to Parliament lose touch with the people pretty quickly (TOUCH)
- Parties are only interested in people's votes but not in their opinions (INTEREST)

The ordered categories are:
- 1: agree strongly
- 2: agree
- 3: disagree

- 4: disagree strongly

The theoretical measurement model is a confirmatory factor analysis model that specifies that the six political variables are indicators of political efficacy and political responsiveness. A path diagram of the theoretical model is shown in the image below.

The SIMPLIS syntax file to fit the model reflected in the path diagram above to the average polychoric correlation matrix for 10 multiple MCMC imputations is depicted in the image below.
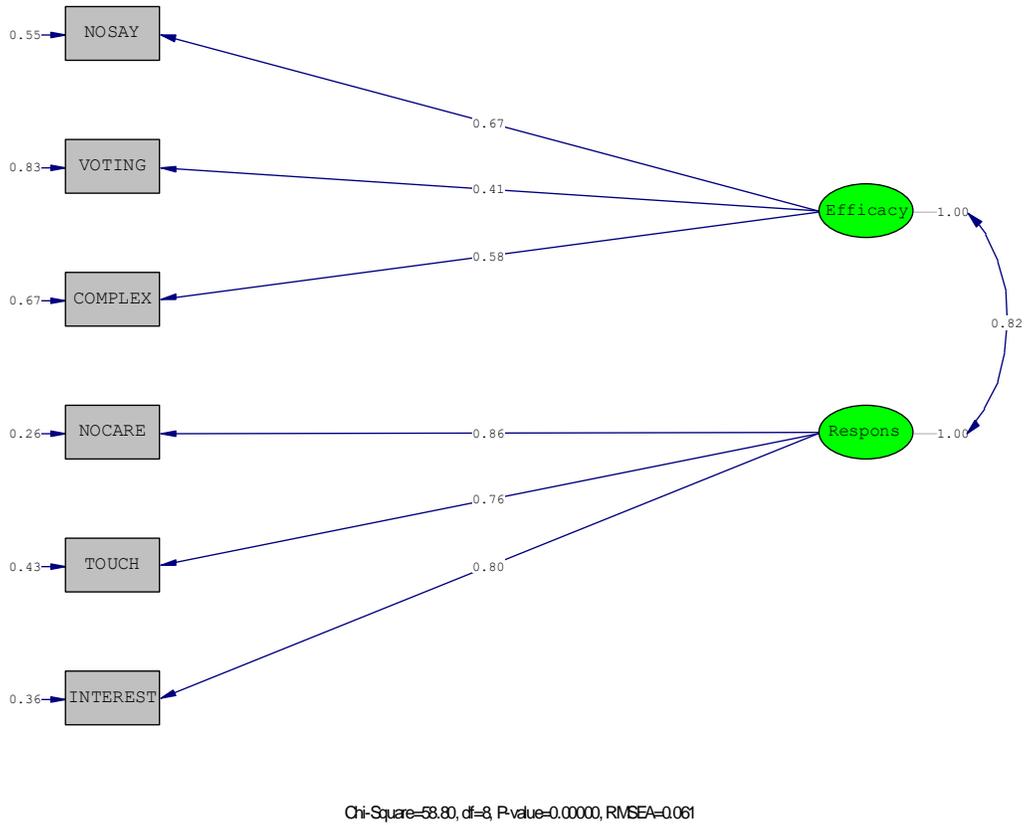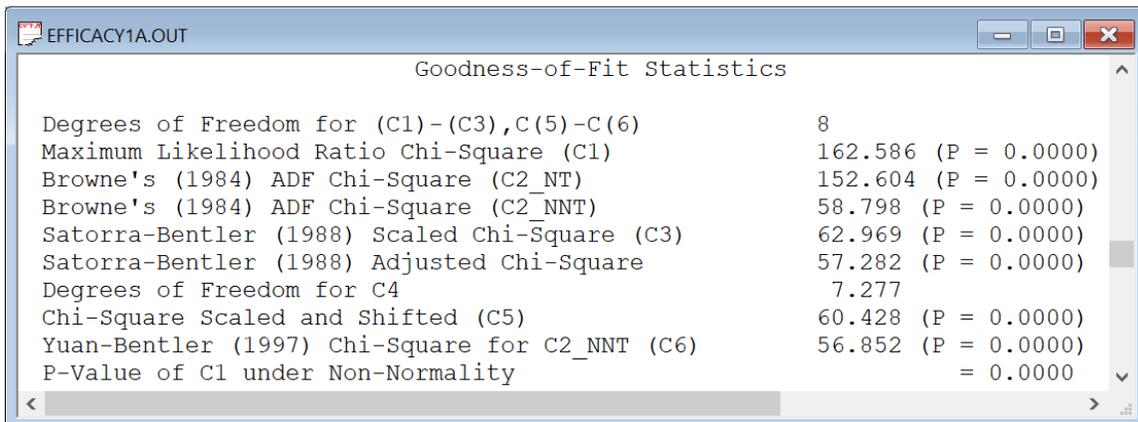

- Line 1 specifies the raw data source.
- Lines 2 and 3 specify labels for the latent variables of the model.
- Lines 4 to 6 specify the measurement model for the latent variables political efficacy and political responsiveness.
- Line 7 requests that the results in the output file should be given in terms of the LISREL model for the structural equation model (LISREL Output). It also requests that the results should be written to three decimal places (ND= 3), that the completely standardized solution should be written to the output file (SC), and robust diagonally weighted least squares estimation (ME = DWLS).
- The MI2S option invokes the two-stage multiple imputation SEM method to fit the model to the average polychoric correlation matrix for the NM = 10 MCMC imputations based on an initial random seed of IX = 37966.

- Line 8 requests a path diagram of the model.
- Line 9 indicates that no more SIMPLIS commands are to be processed.

If the above **SPL** file is opened with LISREL and the **Run LISREL** button is clicked, the following **PTH** file is obtained.

Chi-Square=58.80, df=8, P-value=0.00000, RMSEA=0.061

The corresponding output file, **EFFICACY1A.OUT**, is opened in a separate window. A small portion of this file is shown in the following image.

EFFICACY1A.OUT

```
                    Goodness-of-Fit Statistics

Degrees of Freedom for (C1)-(C3),C(5)-C(6)            8
Maximum Likelihood Ratio Chi-Square (C1)             162.586  (P = 0.0000)
Browne's (1984) ADF Chi-Square (C2_NT)               152.604  (P = 0.0000)
Browne's (1984) ADF Chi-Square (C2_NNT)               58.798  (P = 0.0000)
Satorra-Bentler (1988) Scaled Chi-Square (C3)         62.969  (P = 0.0000)
Satorra-Bentler (1988) Adjusted Chi-Square            57.282  (P = 0.0000)
Degrees of Freedom for C4                              7.277
Chi-Square Scaled and Shifted (C5)                    60.428  (P = 0.0000)
Yuan-Bentler (1997) Chi-Square for C2_NNT (C6)        56.852  (P = 0.0000)
P-Value of C1 under Non-Normality                            = 0.0000
```

The Chi-square test statistic values above indicate that the theoretical measurement model for political efficacy and political responsiveness is not supported by the data.