



A measurement model

Barnes & Kaase (1979) conducted a cross-national survey to obtain information on conventional and unconventional forms of political participation in industrial societies. The survey is known as the Political Action Survey. The survey included several attitude and perception statements to which the respondents had to respond with one of:

- agree strongly
- agree
- disagree
- disagree strongly
- do not know
- no answer

Amongst others, the following statements were administered to each USA respondent.

- "People like me have no say in what the government does." (NOSAY)
- "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 Congress in Washington lose touch with people pretty quickly." (TOUCH)
- "Parties are only interested in people's votes but not in their opinions." (INTEREST)

The file **usa.LSF** in the **SIMPLIS Examples** folder contains the responses to these statements from a sample from 1076 United States respondents, along with their

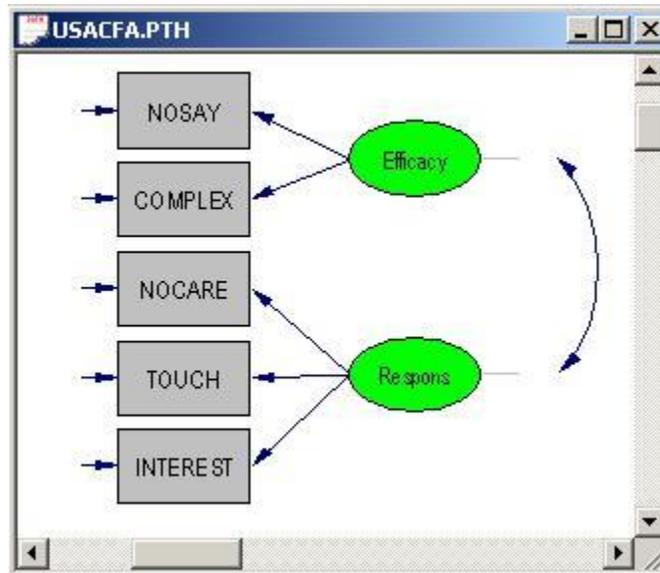
- gender (GENDER)
- education level (EDUCAT)
- age (AGE)
- left-right score (LEFTRIGH)

The first portion of **usa.LSF** is shown in the following **LSF** window.

	NOSAY	VOTING	COMPLEX	NOCARE	TOUCH	INTEREST	GENDER
1	2.00	2.00	1.00	1.00	1.00	1.00	2.00
2	2.00	3.00	3.00	3.00	2.00	3.00	2.00
3	3.00	2.00	2.00	3.00	3.00	3.00	1.00
4	2.00	2.00	2.00	2.00	1.00	2.00	2.00
5	2.00	1.00	2.00	2.00	1.00	1.00	1.00
6	3.00	3.00	2.00	2.00	3.00	3.00	1.00
7	2.00	2.00	3.00	1.00	1.00	1.00	1.00
8	3.00	2.00	3.00	3.00	2.00	3.00	1.00
9	3.00	2.00	1.00	1.00	2.00	2.00	2.00
10	1.00	1.00	1.00	1.00	1.00	1.00	2.00
11	3.00	3.00	3.00	3.00	3.00	3.00	2.00
12	1.00	4.00	4.00	2.00	1.00	1.00	2.00
13	3.00	3.00	2.00	2.00	2.00	2.00	1.00
14	3.00	3.00	4.00	2.00	1.00	1.00	1.00
15	3.00	3.00	3.00	3.00	3.00	3.00	2.00
16	3.00	2.00	4.00	2.00	1.00	2.00	1.00
17	3.00	2.00	1.00	2.00	2.00	2.00	1.00
18	3.00	3.00	2.00	3.00	3.00	3.00	2.00
19	3.00	3.00	2.00	2.00	2.00	2.00	2.00

- NOSAY and COMPLEX are indicators of political efficacy (Efficacy).
- NOCARE, TOUCH and INTEREST are indicators of political responsiveness (Respons).

A path diagram of the corresponding measurement model is shown below.



Generating the Matrix Files

Use the **Open** option on the **File** menu to load the **Open** dialog box. Select the **Lisrel data (*.lsf)** option from the **Files of type:** drop-down list box. Browse for the file **usa.LSF**. Click on the **Output Options** option on the **Statistics** menu to load the **Output** dialog box.

Select the **Correlations** option from the drop-down list box in the **Moment Matrix** section. Check the **Save to File** checkbox in the **Moment Matrix** section. Enter the name **USA.PCM** in the string field in the **Moment Matrix** section. Check the **Save to File** checkbox in the **Asymptotic Covariance Matrix** section. Enter the name **USA.ACC** in the string field in the **Asymptotic Covariance Matrix** section to produce the following **Output** dialog box.

The screenshot shows the 'Output' dialog box with the following settings:

- Moment Matrix:**
 - Drop-down: Correlations
 - Save to file: LISREL system data:
 - Text field: USA.PCM
- Means:**
 - Save to file:
 - Text field: (empty)
- Standard Deviations:**
 - Save to file:
 - Text field: (empty)
- Asymptotic Covariance Matrix:**
 - Save to file: Print in output:
 - Text field: USA.ACC
- Asymptotic Variances:**
 - Save to file: Print in output:
 - Text field: (empty)
- Data:**
 - Save the transformed data to file:
 - Text field: (empty)
 - Width of fields: 15
 - Number of decimals: 6
 - Number of repetitions: 1
 - Rewind data after each repetition:
 - Print bivariate frequency tables:
 - Print tests of underlying bivariate normality:
 - Perform tests of multivariate normality:
 - Wide print:
 - Random seed: Set seed to: 123456

Buttons: OK, Cancel

Click on the **OK** button to generate the text editor window for **USA.OUT**.

Fitting the Measurement Model to the Ordinal Data Set

Select the **New** option on the **File** menu to load the **New** dialog box. Select the **Syntax Only** option from the list box on the **New** dialog box to open the **SYNTAX1** text editor window. Select the **Save As** option on the **File** menu to load the **Save As** dialog box. Select the **SIMPLIS Syntax (*.spl)** option on the **Save as type:** drop-down list box. Enter the name **USACFA.SPL** in the **File name:** string field. Click on the **Save** button to save the file **USACFA.SPL**. Enter the following commands into the text editor window for **USACFA.SPL**.

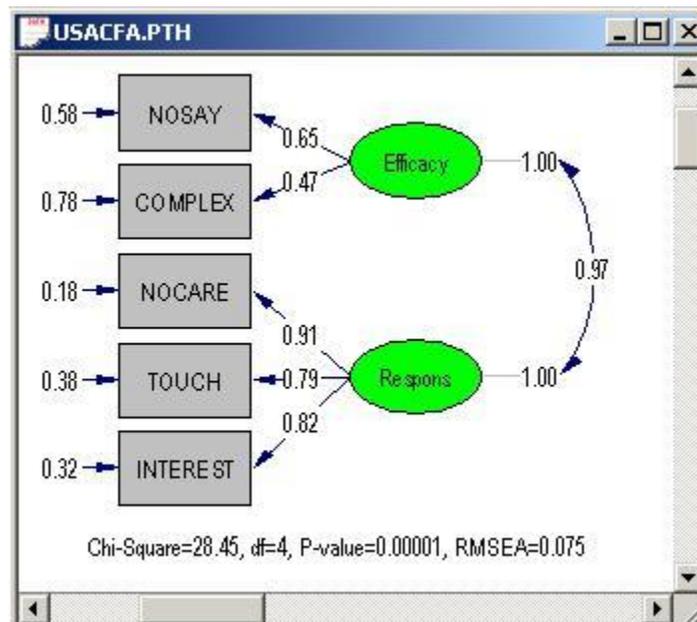
```

USACFA.SPL
CFA Model - Ordinal
Observed Variables:
NOSAY VOTING COMPLEX NOCARE TOUCH INTEREST
GENDER LEFTRIGH EDUCAT AGE
Correlation Matrix from File USA.PCM
Asymptotic Covariance Matrix from File USA.ACC
Sample Size: 1076
Latent Variables: Efficacy Respons
Relationships:
NOSAY COMPLEX = Efficacy
NOCARE TOUCH INTEREST = Respons
LISREL Output: ND=3 SC ME=WLS
Path Diagram
End of Problem

```

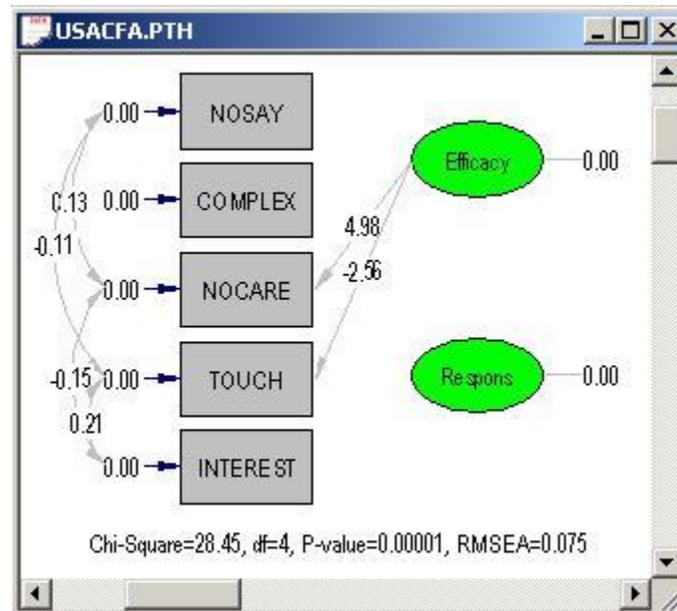
- Line 1 provides a title for the analysis.
- Lines 2 to 4 specify labels for the observed variables.
- Lines 5 and 6 specify the matrix files for the polychoric correlation matrix and the estimated asymptotic covariance matrix of the polychoric correlations respectively.
- Line 7 specifies the number of observations in **USA.PSF**.
- Line 8 specifies labels for the latent variables.
- Lines 9 to 11 specify the CFA model to be fitted to the data.
- Line 12 specifies the Weighted Least Squares (WLS) method for ordinal variables and that the results should be printed in terms of the LISREL model for the CFA path diagram on Model page.
- Line 13 requests a path diagram.
- Line 14 indicates no more SIMPLIS commands are to be processed.

Click on the **Run LISREL** icon on the main toolbar to produce the following **PTH** window.



Adjusting the Measurement Model

Select the **Modification Indices** option from the **Estimates** drop-down list box to open the following **PTH** window.



From the results above, it is evident that the largest modification index is that of the factor loading of the variable **NOCARE** as an indicator of latent variable **Efficacy**. The wording of the **NOCARE** supports this suggestion. In other words, this factor loading makes sense from a theoretical point of view.

Select the **Open** option on the **File** menu to load the **Open** dialog box. Browse for the file **USACFA.SPL**. Click on the **Open** button to open the text editor window for **USACFA.SPL**. Change line 10 from

```
NOSAY COMPLEX = Efficacy
```

to

```
NOSAY COMPLEX NOCARE = Efficacy
```

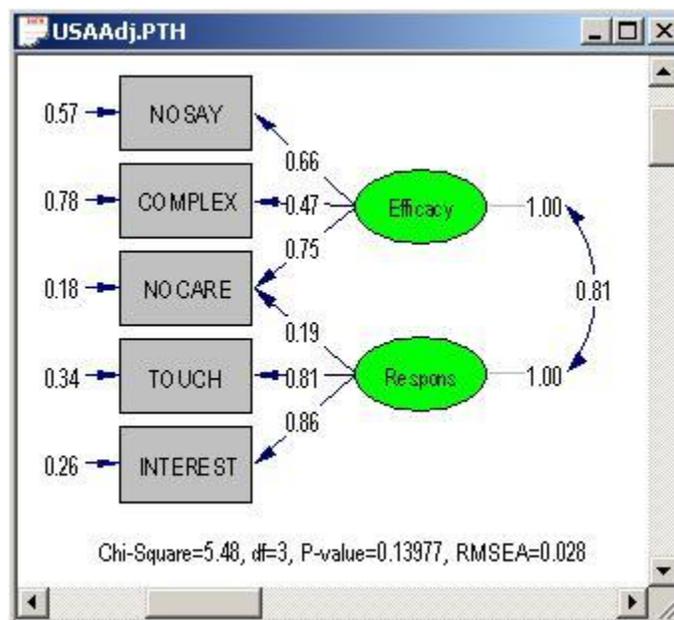
Select the **Save As** option on the **File** menu to load the **Save As** dialog box. Enter the name **CFAAdj.SPL** in the **File name** string field. Click on the **Save** button to create the following **SPL** text editor window.

```

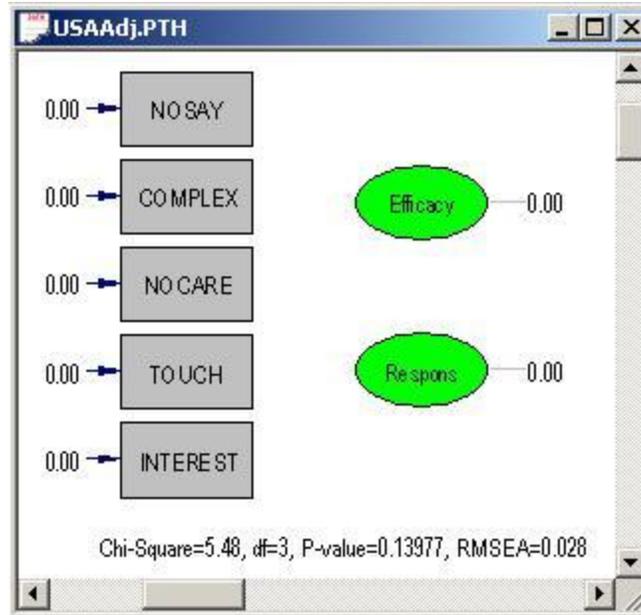
USAAdj.SPL
CFA Model - Ordinal
Observed Variables:
NOSAY VOTING COMPLEX NOCARE TOUCH INTEREST
GENDER LEFTRIGH EDUCAT AGE
Correlation Matrix from File USA.PCM
Asymptotic Covariance Matrix from File USA.ACC
Sample Size: 1076
Latent Variables: Efficacy Respons
Relationships:
NOSAY COMPLEX NOCARE = Efficacy
NOCARE TOUCH INTEREST = Respons
LISREL Output: ND=3 SC ME=WLS
Path Diagram
End of Problem

```

Click on the **Run LISREL** icon on the main toolbar to produce the following **PTH** window.



Select the **Modification Indices** option from the **Estimates** drop-down list box to open the following **PTH** window.



From the results above, it is evident that none of the modification indices suggests further refining of the measurement model.