

Two-stage SEM for morality data

In this example, we return to the data discussed in Section 2.3.2, namely study of attitudes of morality and equality (Hasselrot & Lernberg (1980)), Swedish school children in grade 9 were asked questions about their attitudes regarding social issues in family, school, and society. Among the questions asked were the following eight items.

For me, questions about.....

1. human rights
2. equal conditions for all people
3. racial problems
4. equal value of all people
5. euthanasia
6. crime and punishment
7. conscientious objectors
8. guilt and bad conscience

are....

unimportant

not important

important

very important

For the present example we use a subsample of 200 cases. Responses to the eight questions were scored 1, 2, 3, and 4, where 4 denotes very important. The data matrix consists of 200 rows and 8 columns and is stored in the file **MORALITY.LSF**.

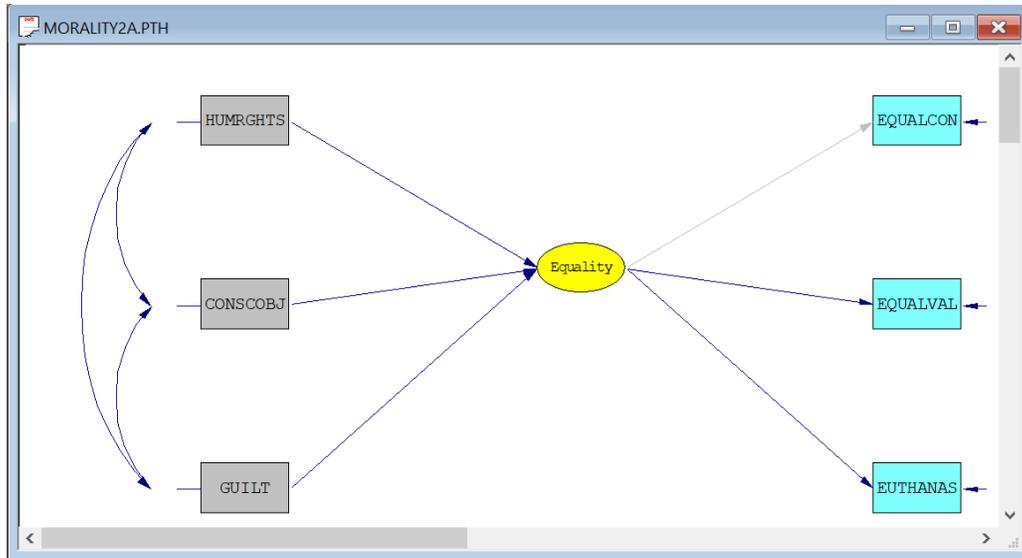
The first few cases of this data file are reflected in the image below.



	HUMRGHTS	EQUALCON	RACEPROB	EQUALVAL	EUTHANAS	CRIMEPUN	CONSCOBJ	GUILT
1	4.00	4.00	4.00	4.00	4.00	4.00	3.00	4.00
2	4.00	3.00	4.00	4.00	4.00	4.00	4.00	1.00
3	4.00	4.00	4.00	3.00	4.00	3.00	3.00	3.00
4	4.00	4.00	4.00	4.00	4.00	4.00	3.00	4.00
5	-999999.00	-999999.00	-999999.00	4.00	4.00	4.00	3.00	3.00
6	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
7	3.00	2.00	4.00	3.00	3.00	3.00	2.00	3.00
8	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	3.00	4.00	4.00	4.00	4.00	3.00	4.00	4.00
10	3.00	3.00	3.00	2.00	3.00	3.00	3.00	3.00
11	3.00	3.00	3.00	4.00	3.00	4.00	1.00	3.00
12	4.00	3.00	4.00	3.00	2.00	4.00	3.00	3.00
13	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
14	4.00	3.00	2.00	3.00	3.00	3.00	2.00	2.00

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 theoretical model is a MIMIC model that specifies that three attitude variables are reflective indicators of equality, and three attitude variables are formative indicators of equality as reflected in the path diagram shown in the image below.



The SIMPLIS syntax file to fit the model reflected in the path diagram to the average polychoric correlation matrix for 50 multiple MCMC imputations is depicted in the image below. The two-stage multiple imputation SEM syntax is reflected on the LISREL Output command as MI2S which invokes the method, NM = 50 which specifies 50 multiple imputations, and IX = 4816 specifies a starting random seed of 4816.

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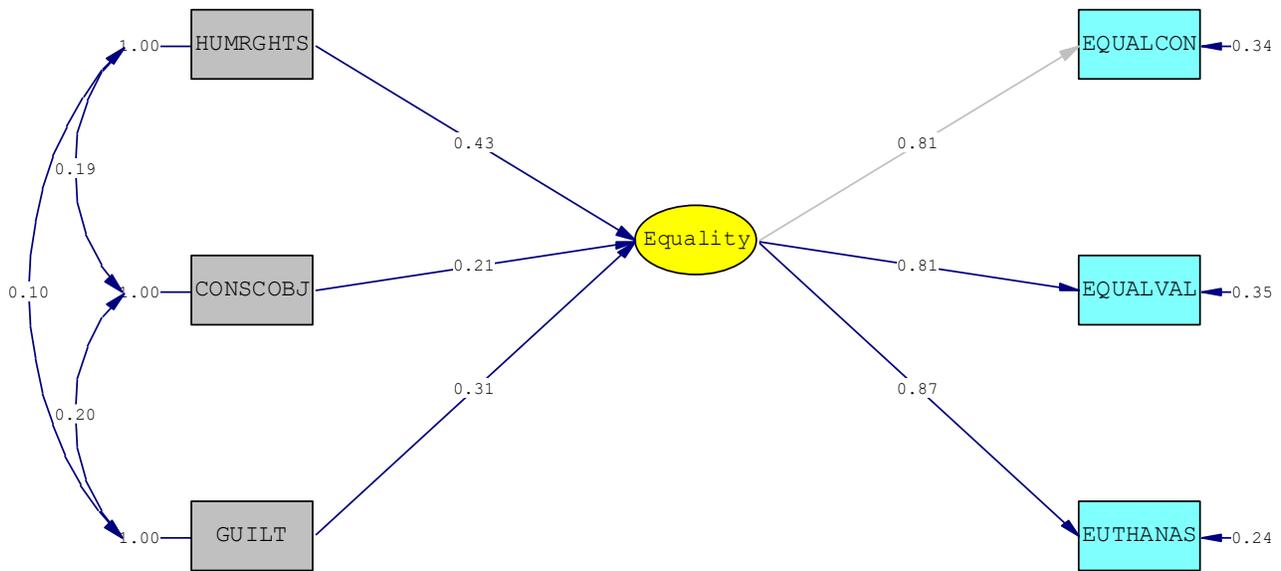
MORALITY2A.SPL
Raw Data from File MORALITY.LSF
Latent Variables
Equality
Relationships
EQUALCON EQUALVAL EUTHANAS = Equality
Equality = HUMRGHTS CONSCOBJ GUILT
LISREL Output: ND=3 SC MI2S ME=WLS IX=4816 NM=50
Path Diagram
End of Problem

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- Line 1 specifies the raw data source.
- Lines 2 and 3 specify labels for the latent variable of the model.
- Lines 4 to 6 specify the MIMIC model equality.
- 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 weighted least squares estimation (ME = WLS).
- The MI2S option invokes the two-stage multiple imputation method to fit the model to the average polychoric correlation matrix for the NM = 50 MCMC imputations based on an initial random seed of IX = 4816.
- Line 8 requests a path diagram of the model.
- Line 9 indicates that no more SIMPLIS commands are to be processed.

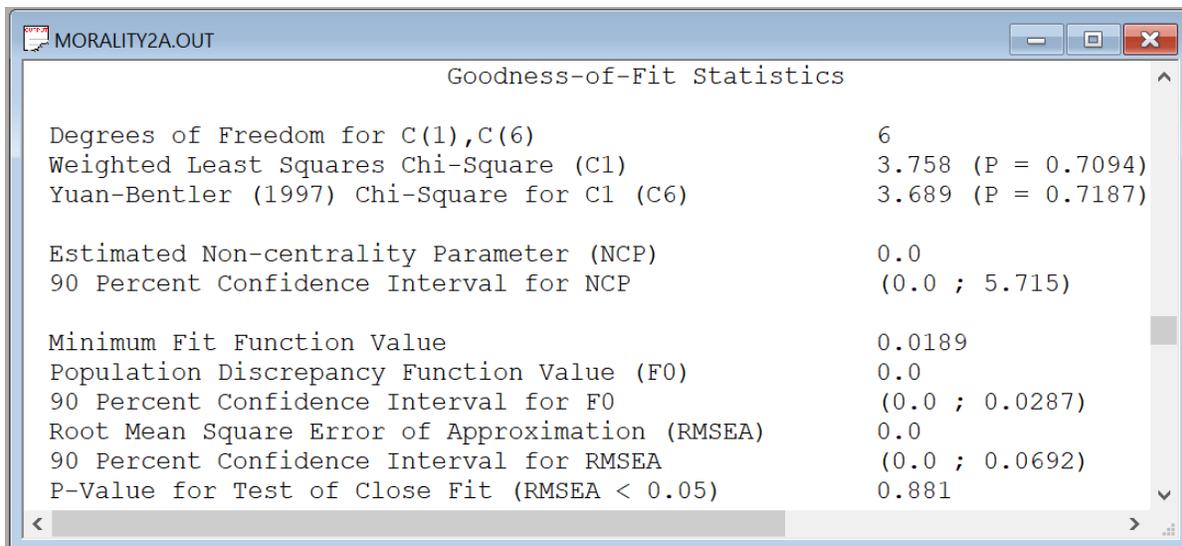
The results

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



Chi-Square=3.76, df=6, P-value=0.70935, RMSEA=0.000

The corresponding output file, **MORALITY2A.OUT**, is opened in a separate window. A small portion of this file is shown in the following image.



The values of the goodness-of-fit statistics above indicate that the theoretical model for equality is supported by the data.