

## 🤖 Amos Tutorial: Exploratory Analysis 🤖

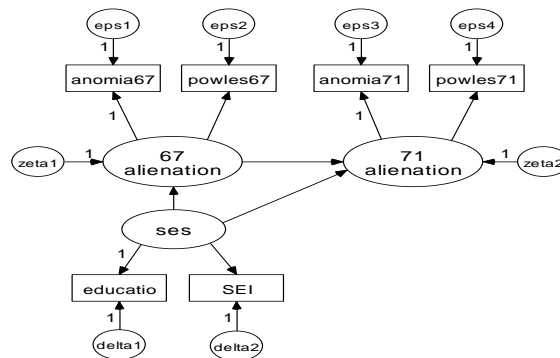
This workshop uses files on the AcadLabs server. These folders are read-only, so, to begin, copy them to your home directory (your F:\ drive), or to the C:\drive.

1. From My Computer, navigate to “Sasuser on Acadlabs (N:)” → psy6140\amos\
2. Select the folder Ex06-Wheaton, and copy this either to your F:\ drive or to the C:\ drive.

### ***Exploratory Analysis and Model Modification***

In this exercise, you will examine a model for a longitudinal study to determine the reliability and stability of measures of alienation by Wheaton et al. (1977). There were two measures of alienation (anomia and powerless), measured in 1967 and 1971, and two measures of SES (years of schooling and a Socioeconomic Index), recorded in 1967. Of interest is whether loadings for the alienation measures remain constant over time.

1. From My Computer, navigate to the Ex06-Wheaton folder, wherever you saved it.
2. Double-click on the wheaton.sav file to view the SPSS file containing the correlation matrix. Close this file to continue.
3. Double-click on the file Ex06-a.amw with the blue Amos Graphics icon.
4. Note that the path diagram has some fixed path loadings of 1’s required for model identification. All other unlabeled paths are free parameters of this model.



Example 6: Model A  
Exploratory analysis  
Wheaton (1977)  
Model Specification

5. From the menu, select View → Analysis Properties. On the Output tab, make sure that **Modification Indices** is checked, and enter 4 for Threshold for Modification Indices.
6. From the menu, select Analyze → Calculate Estimates (or press Ctrl-F9).
  - You can now view the results visually by selecting the “view output path diagram” at the top, or numerically, by selecting View → Text Output from the menus. In the Amos Output window, first examine the Model Fit statistics. You will see that this model does not fit very well.
  - Examine the Modification indices. Under Covariances, the largest modification index is 40.9 for **eps1 ↔ eps3**, suggesting that the  $\chi^2$  will drop by (at least) 40.9 by allowing correlated errors of measurement between anomia67 and anomia71.
7. Try to improve the model by adding a double-headed arrow between eps1 and eps3 in the path diagram. Select the ↔ icon from the tool bar and drag from eps1 to eps3. You could also add a double-headed arrow between eps2 and eps4 if you wish—allowing correlated errors of measurement between powerlessness in 67 and 71. Select Analyze → Calculate Estimates to fit this new model and examine the results.
8. **Further exploration:** The file Ex06-b.amw fits the model with just one double arrow between eps1 and eps3.
9. The file Ex06-c.amw suggests another modification for improving parsimony and testing the hypothesis that the coefficients for powerlessness are the same in 67 and 71, and also that the unique variances of anomie and powerlessness are the same over years. Note that in the path diagram this is achieved by assigning the same label to two (or more) links (e.g., path\_p).
10. The file Ex06-a11.amw fits these three models, plus a fourth model (Model D) combining autocorrelation of errors and time invariance of parameters. Note that Model B here is the most general (all parameters have distinct labels), and that other models specify fixed values (e.g., cov1=0) or equality constraints (e.g., b\_pow67 = b\_pow71).
11. Open this file, fit the models, and then examine the Model Comparison statistics in the Text Output window.
  - Examine the differences in  $\chi^2$  between the pairs of models: (B and C), and (A and D). What do you conclude about the effect of constraining cov1=0?
  - Examine the differences in  $\chi^2$  between the pairs of models: (B and A), and (C and D). What do you conclude about the effect of constraining equal coefficients for the measure of alienation?

Further information: [Tutorial: Getting Running with Amos Graphics](#)