## Amos User's Guide Part I

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Notes: guide tells you how to use AMOS, not just the homework, you won't want to follow it exactly. I use the term "opposite click" rather than "right click", because the latter term assumes a right-handed user.

1. Open AMOS

This is a great program that lets you specify structural equation models by drawing them. this guide tells you how to use AMOS, not the homework specifically, you won't want to follow it exactly.

Select Amos 4 and then select Amos Graphics.



 Image: Unnamed project : Group number 1 : Input
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 File
 Edit
 View/Set
 Diagram
 Model-Fit
 Tools
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This is the top bit of the main screen. It says two important thing on the top: Groups we'll come back to later; but the input and output windows look the same, so remember to look up at the top.

2. Specify Data. Click File Name



Specify SPSS files in the "files of type". Then select your data file and click on "open" in lower right-hand corner. It will take you back to the previous screen, and you will see your data file listed. Click OK.

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## 3. Specify Model

This is the top bit of the toolbar for drawing the model.



Passing your mouse over a picture on this toolbar will bring up a description of each item.

Place an observed	Place a latent	Draw latent variables and indicators	
variable	variable		
Draw a straight	Draw a curved	This puts error on an	
arrow	arrow	indicator.	
Figure Caption	Lists variables in the	Lists variables in	
	model	dataset	
Select an Object	Select all Objects	Deselect all Objects	
Copies an object	Moves an Object	Deletes an Object	

When you have one of these pressed, this tells you what it will do when you click with your mouse.



The first thing I want to do is draw an observed variable. So click on the square, and you see the cursor now also has a square. Place the cursor where you want the upper left-hand corner of the box to be. Click and drag until it is the desired size. The ellipse will work the same way.





Clicking on the draw latent variables and indicators button is

a shortcut. If you click on an already existing ellipse, it will automatically add an indicator and its error. When the cursor approaches the ellipse, the ellipse will turn red. This color change is a general sign of selection in AMOS.





Suppose you don't want the observed variable on that side of the ellipse. You have two options:

you can click the move button and click and drag it to the desired location.

You can click the rotate button; clicking on the *ellipse* will rotate the rectangle and its error. Keep clicking until its where you want it.

Now you want to name your observed variable. Click on this button and you will see a list of the variables in your dataset.



Click and drag the variable name you want up to its corresponding rectangle. Don't let go until the square turns red. Continue until you have all your indicators named.







To name your latent variable, opposite click on the ellipse. Select Object Properties. Don't click "Set Default" as that will give that name to all future latent variables. Don't change any of

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the other settings. Click the x on the upper right hand corner to close this screen.

Suppose now I want to draw a curved arrow between two observed variables. You actually have to draw it between their errors. It always draws the arrow clockwise from where you started. So, if you want a concave arrow, you would start from the variable on the right-hand side of the diagram.





Now prepare to run the model. Click the DF button, this will give you information about the model as you have specified it. You will want to decide if the model is identified.

Degrees of freedom

Parameters: 15 Free parameters: 10 Sample moments: 10 DF: 0



File Edit View/Set Diagram Model-Fit Tools Help

 Analysis Properties
 ? ×

 Output formatting
 Output
 Bootstrap

 Estimation
 Numerical
 Bias

 Permutations
 Random #
 Title

 Title and description of analysis
 Item 1

You will want to set the analysis properties.

Titles will make the output easier to interpret.

Now click on the estimation tab. You want Maximum Likelihood. Now click on the output tab.

Discrepancy

Maximum likelihood

- C <u>G</u>eneralized least sauares
- Unweighted least

These are the options I recommend for your output.

Output formatting Ou	tput Bootstrap
Minimization <u>history</u>	✓ Indirect, direct & total effects
🔽 Standardized estimates	Eactor score weights
Sguared multiple correlations	Covariances of estimates
☑ Sample moments	Correlations of estimates
Implied moments	Critical ratios for differences
All implied moments	□ Tests for <u>n</u> ormality and outliers
🗖 <u>R</u> esidual moments	Observed information     matrix



Go to model-fit and click on calculate estimates. You'll be asked where you want to save your input file, you will want to save this back to your own disk. Every time you change the model, you will want to recalculate the estimates.

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File	Edit	View/Set	Diagram	Model-
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This is very important. The figure on the left shows two pictures. You were working in the input window. If you click the picture on the right, you will be looking at the ouput window. After you

Unstandardized estimates Standardized estimates calculate the estimates. Click on standardized estimates, and click the button on the right. This will take you into the output window, where you will see the parameter estimates on the model.

As a general note, if you are trying to alter your model, and you can't, it is probably because you are in the wrong (output) window.

👬 Hw1a : Group number 1 : OK: Defa					
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	Redo		Ctr	ί+Υ	
	Copy (to clipboard) Ctrl+C				
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You will want to cut and paste the model with the parameters on it into your homework. Don't print it out onto a separate page and attach it to your homework, embed it in the text of your homework instead. Most pictures can be reduced in size as well.



You will want to include the *relevant* portions of your output. Don't print out the whole input and attach it on the back. If you need something other than a standard size stapler to bind your homework, it is too long. Paradoxically, the better you understand the material, the shorter your homework answers will be.

Go to view/set and then text output.

Here's an example of answering a question with the input imbedded. (changing the font to courier straightens it out)

Question: How did this model compare to the saturated model?

Answer: The model was significantly different from the saturated model, p<.001.

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	13	118.738	1	0.000	118.738
Saturated model	14	0.000	0		
Independence model	4	4978.147	10	0.000	497.815