Structural Equation Model

Humor and Public Opinion Study 2010

Mark Pace & Changhyun Ahn

Before we go into SEM…..

There are some things you need to know about SEM.

What makes SEM different than other statistic measures?

1. SEM uses **latent variable.**

Technically, latent variable doesn't exist: so how do we use variables that do not exist? That is why we do confirmatory factor analysis.

Note that confirmatory factor analysis comes from reflective theory model. In SEM, there are two types of theoretical model: formative theory model vs. reflective theory model.

    a. Formative theory model: observed variables explain latent variable in 100%
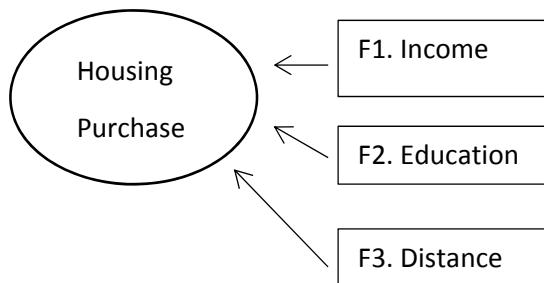
    But is this true? Think about your case of housing purchase. Do your income, your education, and your distance from house to work explain all about housing purchase? What about neighborhood, nearby high schools, or nearby parks?

    b. Reflective theory model: observed variables DOES NOT explain latent variable in 100%
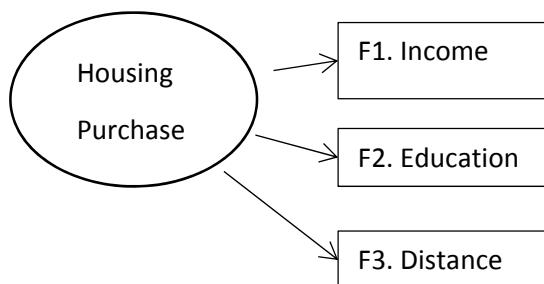
    Notice that arrow direction is different. Your income, education, and distance may NOT explain whole part of housing purchase behavior, but they at least explain SOME part of housing purchase behavior (that's why it is called **reflective**; your income, education, and distance **reflects** in explanation of housing purchase); this is where confirmatory factor analysis comes in.

c. In general, you are NEVER going to use formative theory model. Especially in Social Science. Can you think of any one concept in social science that is fully explained by some measures?

2. SEM uses maximum likelihood – there is a HUGE difference between finding AT LEAST ONE significant result vs. finding BEST significant result; SEM looks for BEST significant result (that is why we look for model fit)

3. SEM uses error terms (i.e. EM, error of measures, and EP, error of prediction)

a. Think about multiple regressions. If you draw a regression line for a linear combination, that means that you are going to IGNORE those residuals if it is an significant linear regression line.

b. However, in SEM, we don't simply ignore those errors; that is why you have to put EMs and EPs all over your model. You can actually look into relationship between those error of measures (even though our model didn't

4. SEM looks for direct effect and indirect effect – DO NOT make a model with model which contains more than one indirect relationship at once (i.e. DO NOT draw things like "(latent variable) A leads to (latent variable) B, and B leads to (latent variable) C, which in turn, C leads to (latent variable) D"). Not only it will make your model very complex, but also you will go crazy struggling with it ☺

Once you understand these basic things, SEM will not be too scary.

Now… shall we begin?

I. Model outline and measures
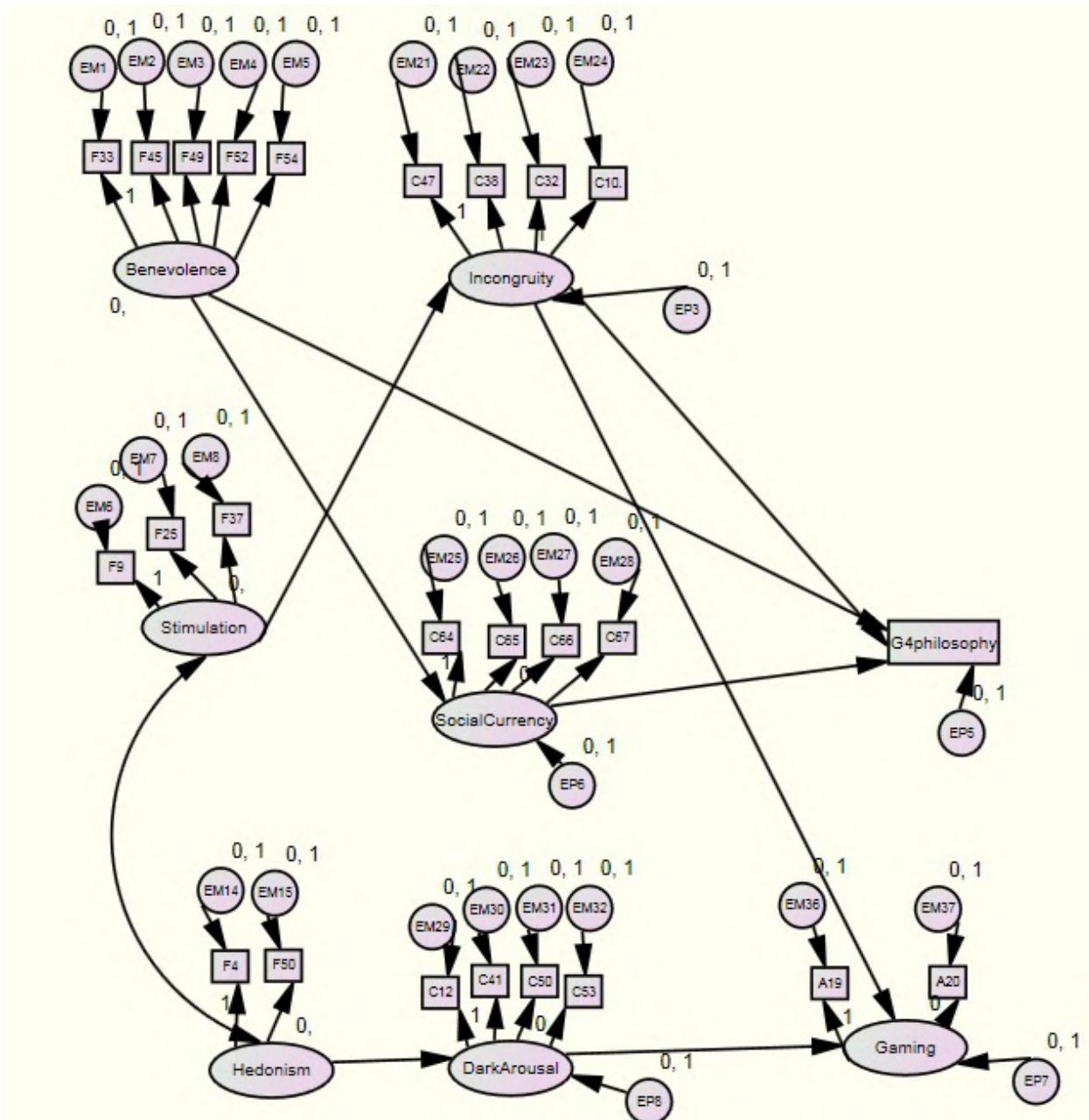
Benevolence - Exogenous / Latent variable

F33- Loyal (faithful to my friends, group)

F45- Honest (genuine, sincere)

F49- Helpful (working for the welfare of others)

F52- Responsible (dependable, reliable)

F54- Forgiving (willing to pardon others)

Observed Variables,

8-point interval scale

Stimulation - Exogenous / Latent variable

F9- An Exciting Life (stimulating experiences)

F25- A Varied Life (filled with challenge, novelty, and change)

F37- Daring (seeking adventure, risk)

Observed Variables,

8-point interval scale

Incongruity - Endogenous / Latent variable

C47- I think incongruity is funny (i.e., when incompatible elements are put together).

C38- When something happens that is a "one in a million" occurrence, I find it funny.

C32- I think it's funny when things are combined in unexpected ways.

C10- Unlikely events seem funny.

O.V.

11-point

Social Currency - Endogenous / Latent variable

C64- I like humor that is shared by a group.

C65- I find it amusing when others make reference to things I'm really familiar with.

C66- like "inside" jokes (jokes only certain people "get").

C67- I find it humorous when I explore common knowledge or experiences with others.

O.V.

11-point

Hedonism - Exogenous / Latent variable

F4- Pleasure (gratification of desires)

F50- Enjoying life (enjoying food, sex, leisure, etc.)

O.V.

8-point interval

Dark/Arousal - Endogenous / Latent variable

C12- I like humor about death.

C41-I like dark comedy.

C50- I like gross-out humor.

C53- I think it's funny when other people actually get hurt.

O.V.

11-point interval

Gaming - Endogenous / Latent variable

A20- During an average weekday, how many minutes do you spend playing video games with another person or group?

A19-During an average weekday, how many minutes do you spend playing video games by yourself?

O.V.

Ratio

Political Philosophy - Endogenous / Observed variable, 6-point interval scale

G4- Which of the following categories best describes your political philosophy?

II. Running AMOS

1. Go to Start – IBM SPSS Statistics – IBM SPSS Amos 19 – Amos Graphics. You can also search in programs
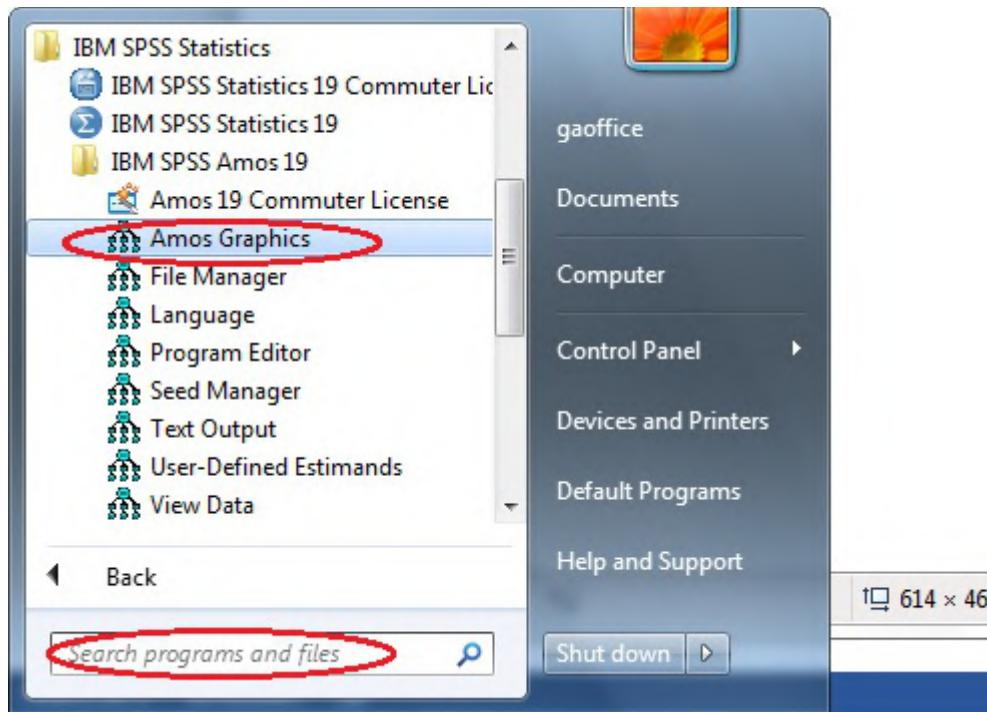
2. In AMOS, Click Select data file(s) icon
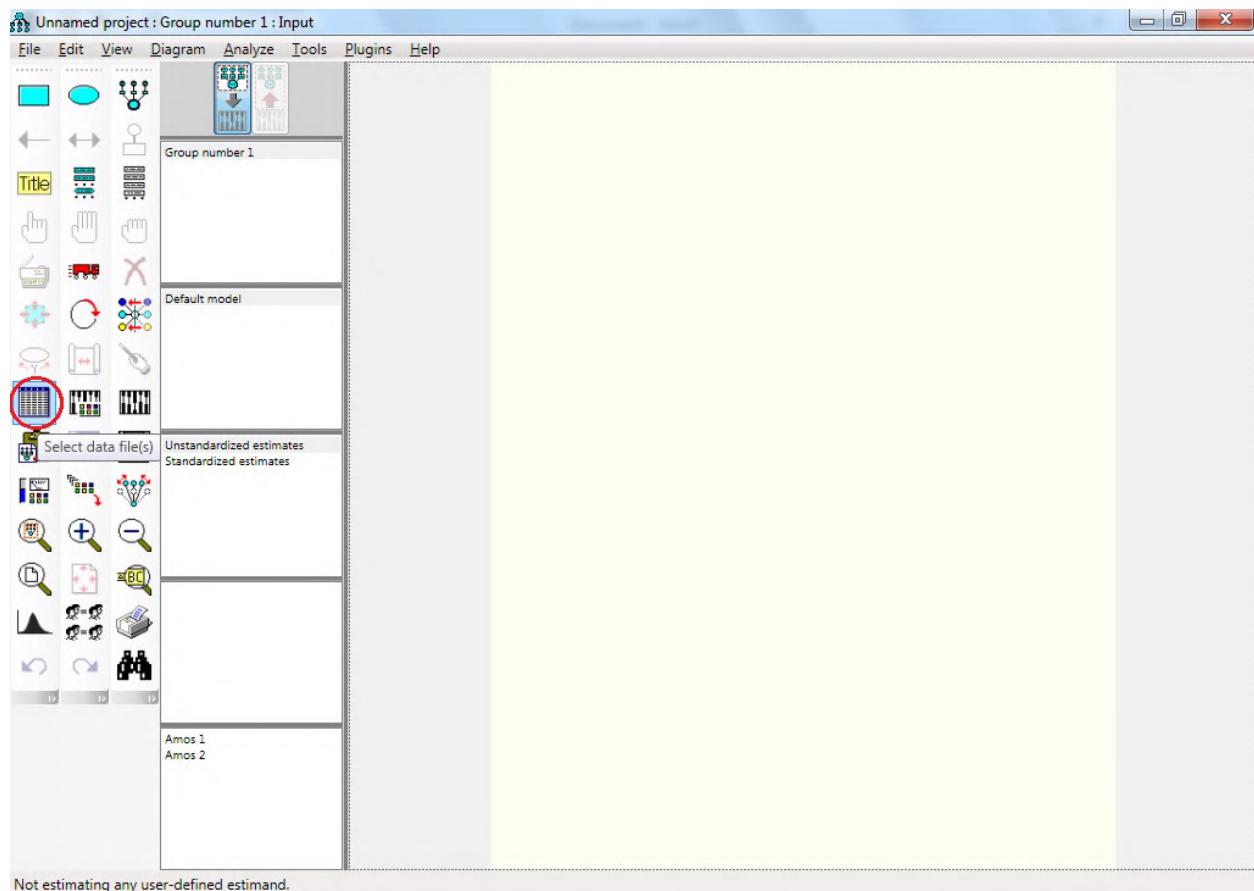
3. You need to link up your SPSS dataset before you go any further. Your data set should be saved in your computer **(you CANNOT just open your dataset from web).** Once you hit select data file(s) icon, a new pop-up window shows up (window in the upper left that says 'Data Files'). Click 'File Name', then select your SPSS data file, hit 'open', and click 'OK'.
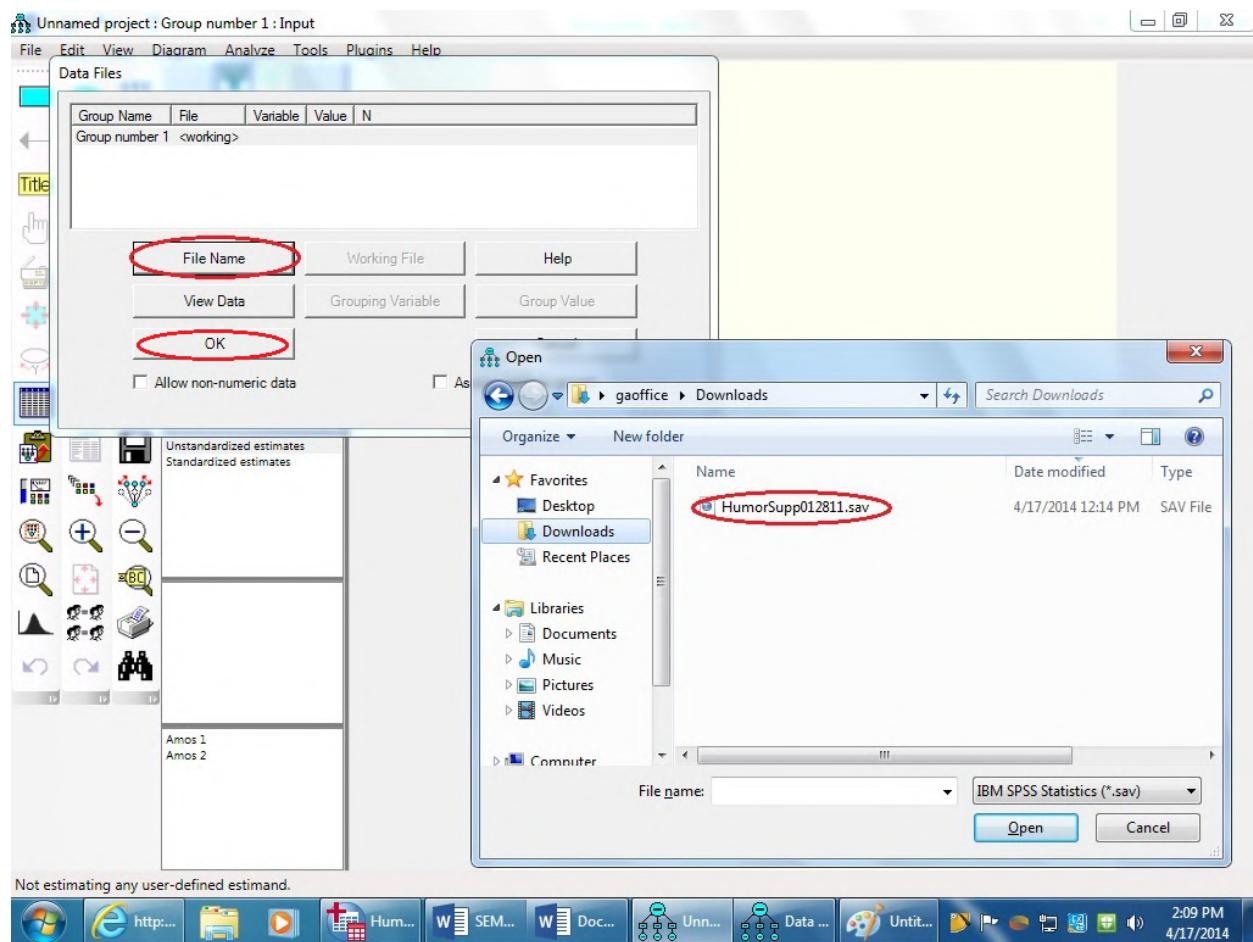
4. Assume you want a model like the one on page 1- with both a theoretic model (i.e. latent variables) and a measurement model. Start drawing your model with 'Draw a latent variable or add an indicator to a latent variable' icon.
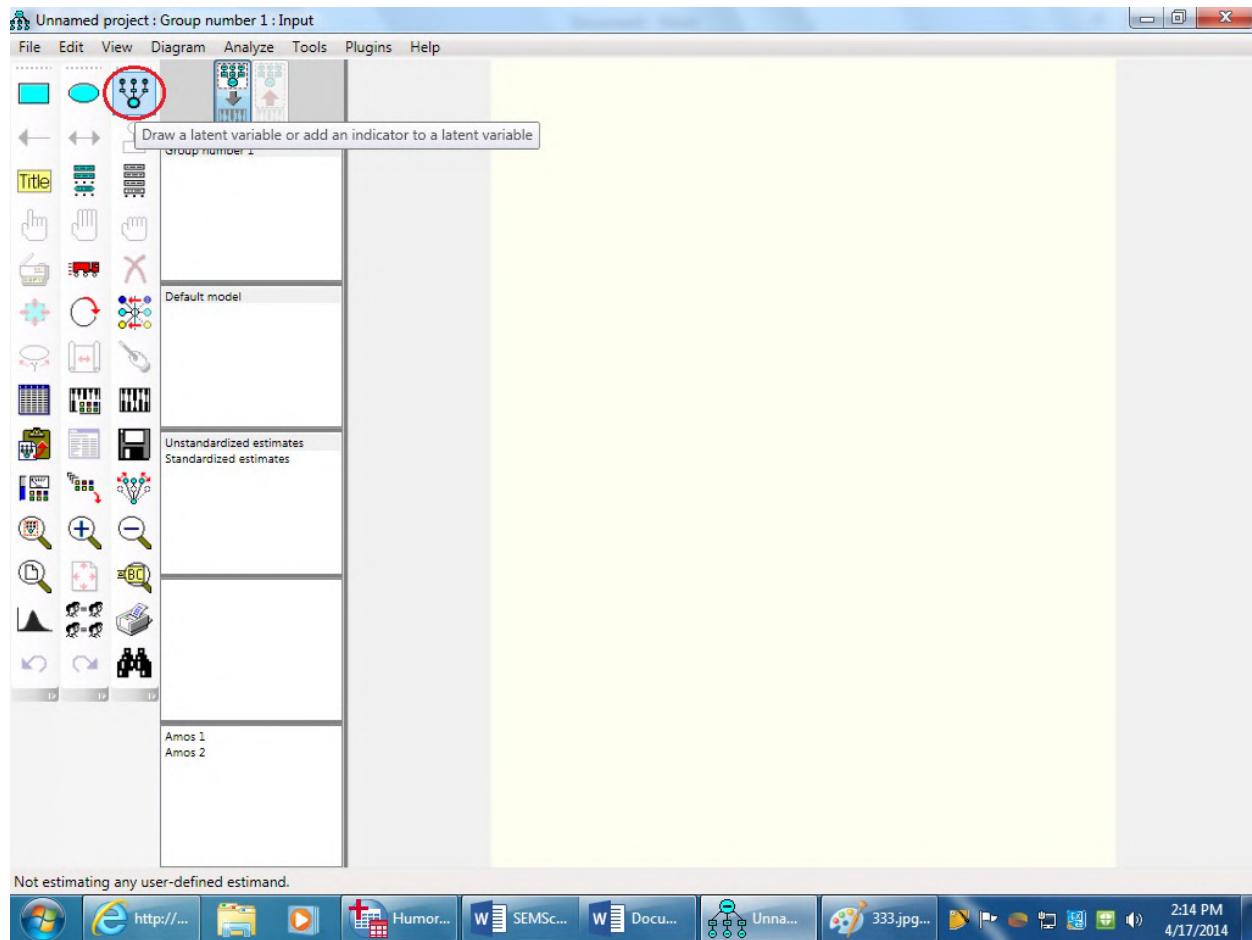
5. When you draw variables, keep in mind that you have to add 'EM (error of measurement)' for each observed/measured variable and 'EP (error of prediction)' for each endogenous variable. If you use the drawing icon in the upper left, AMOS automatically draws EMs for you. HOWEVER, you still need to inset labels as 'EM#'. Also, you MUST draw and label EPs by using latent variable icon.
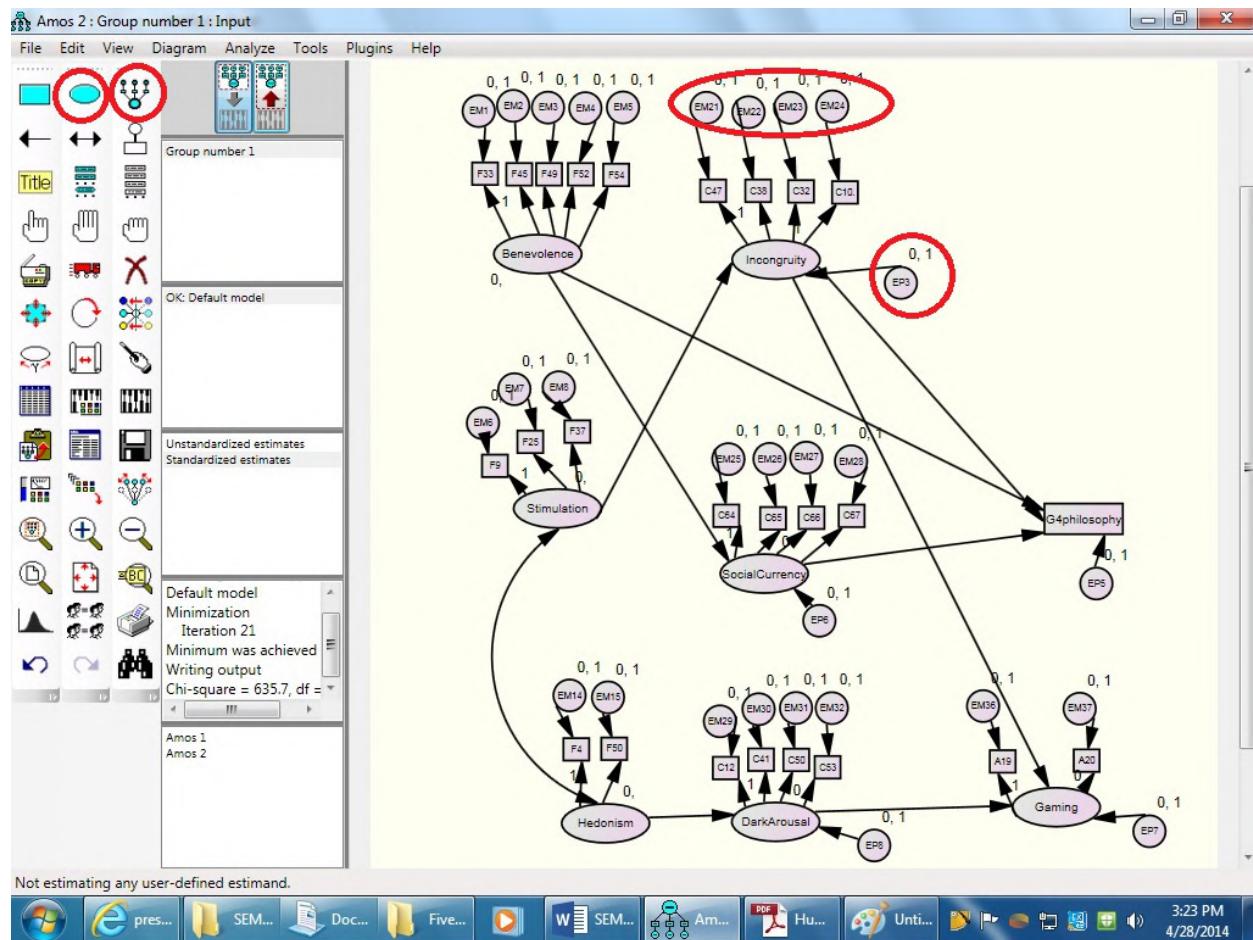
6. Keep in mind that there must be a regression weight of 1 on one arrow for each between a latent variable and one observed/measured variables (If you added variables by using 'Draw a latent variable or add an indicator to a latent variable' icon, AMOS does this automatically for you). If you are going to do this manually, click icon on the left, double click an arrow, go to parameters tab, type Regression weight as '1'.
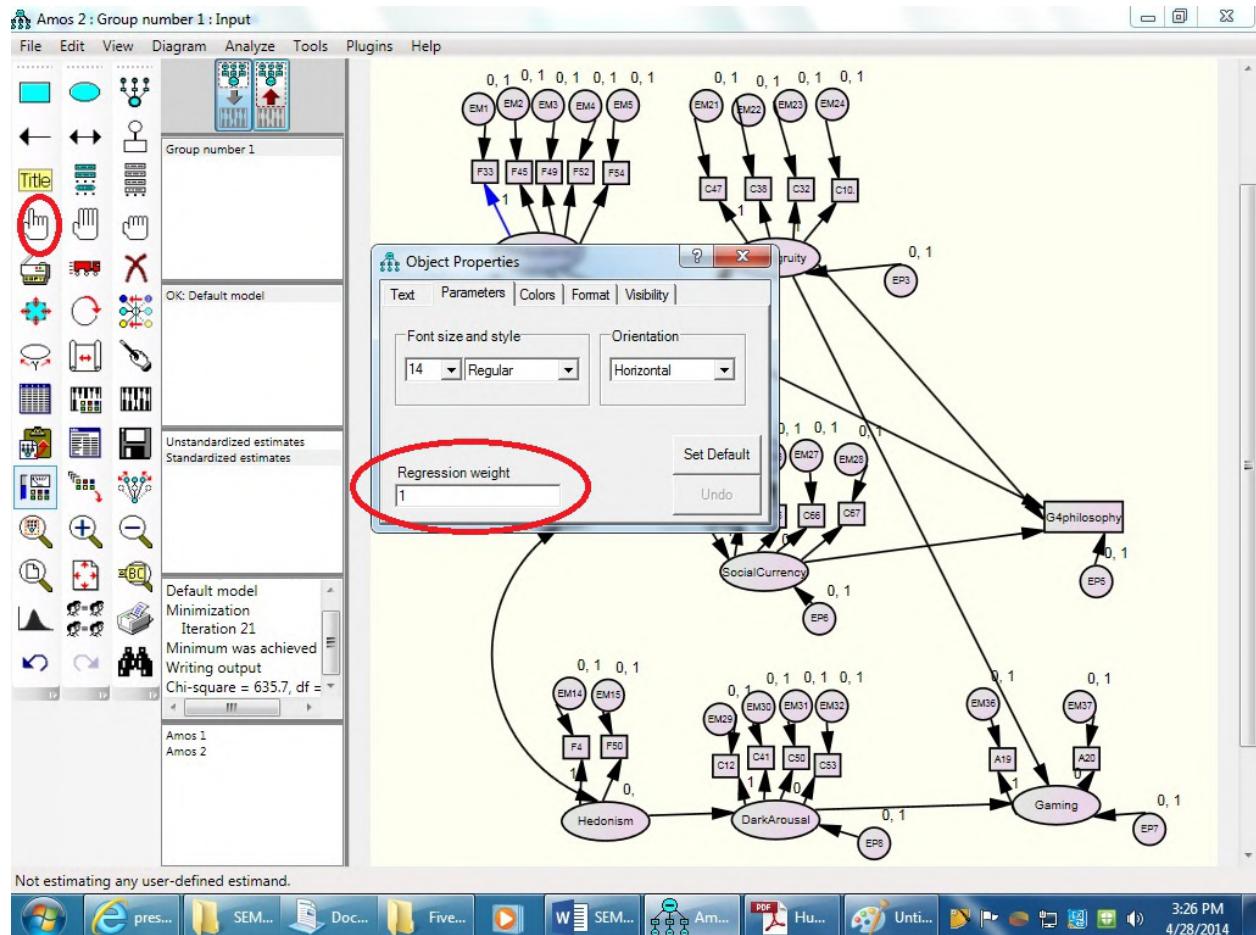
7. Once you are done drawing, click View – Analysis Properties (you can also click icon in the middle left).
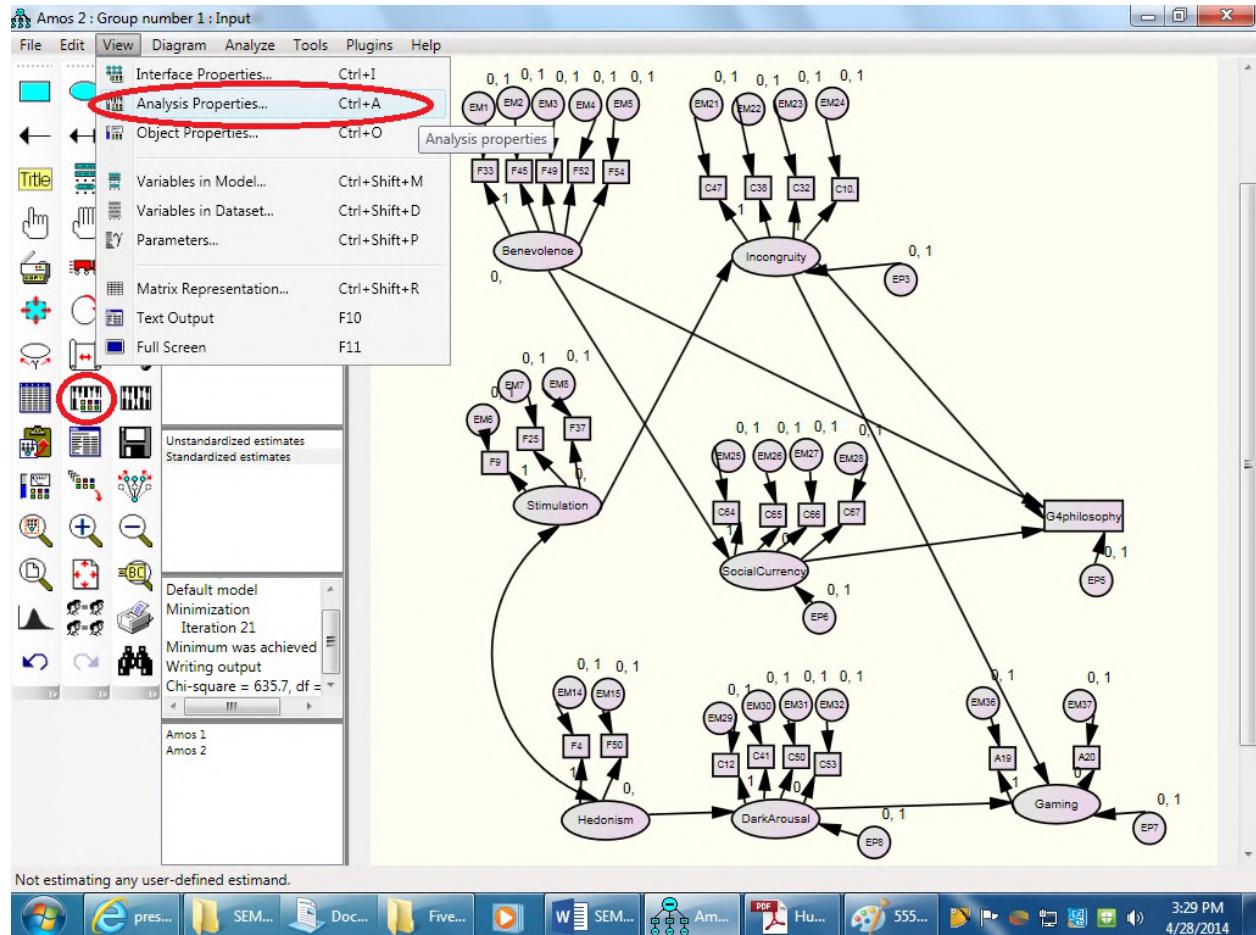
8. In the 'Output' tab, check 'Minimization history', 'Standardized estimates', 'Squared multiple correlations', 'Indirect, direct & total effects', 'Factor score weights', and 'Critical ratios for differences'.

9. Click 'Analyze – Calculate Estimates'. You can also click the icon at the middle-left.
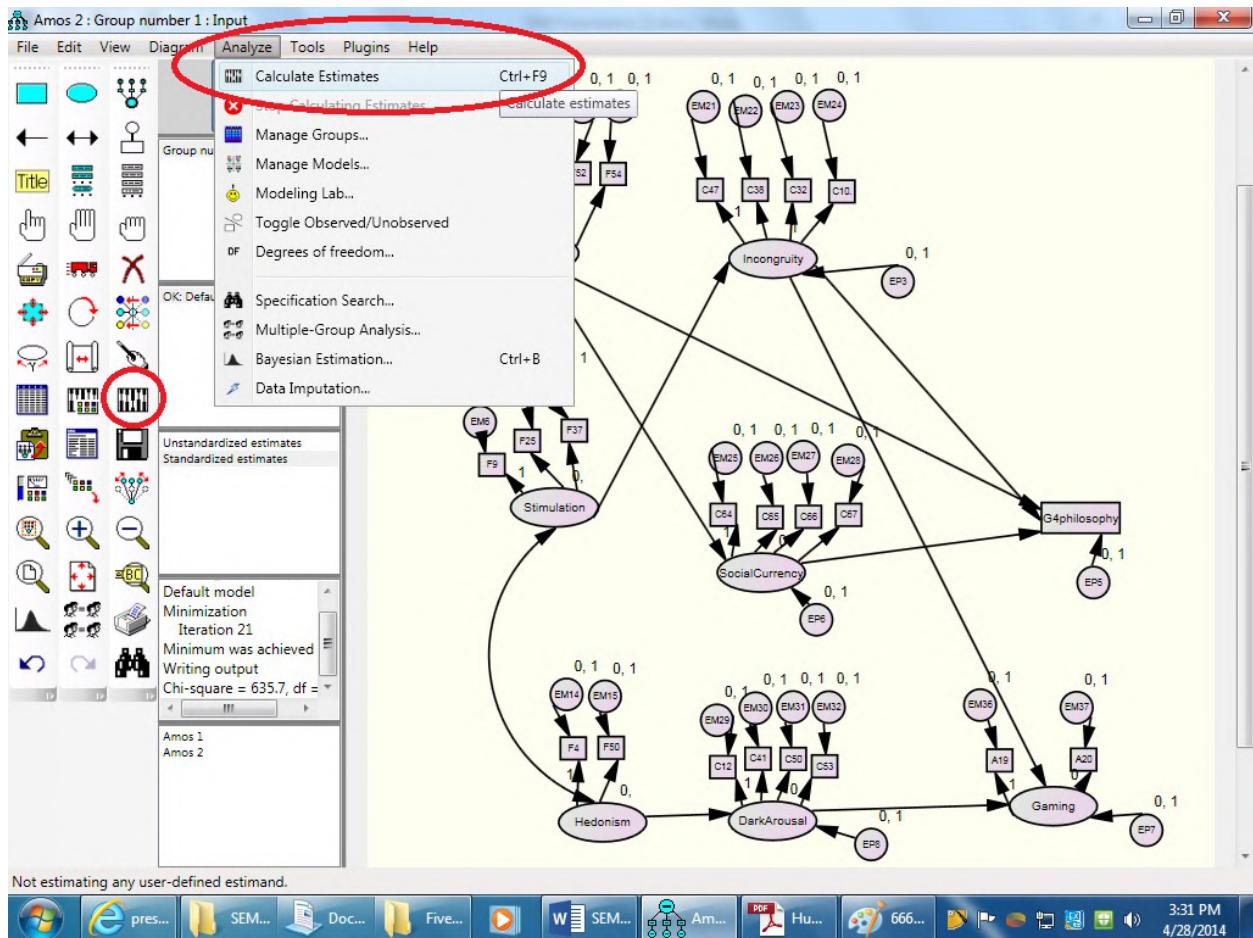
10. Click 'Proceed with the analysis'.
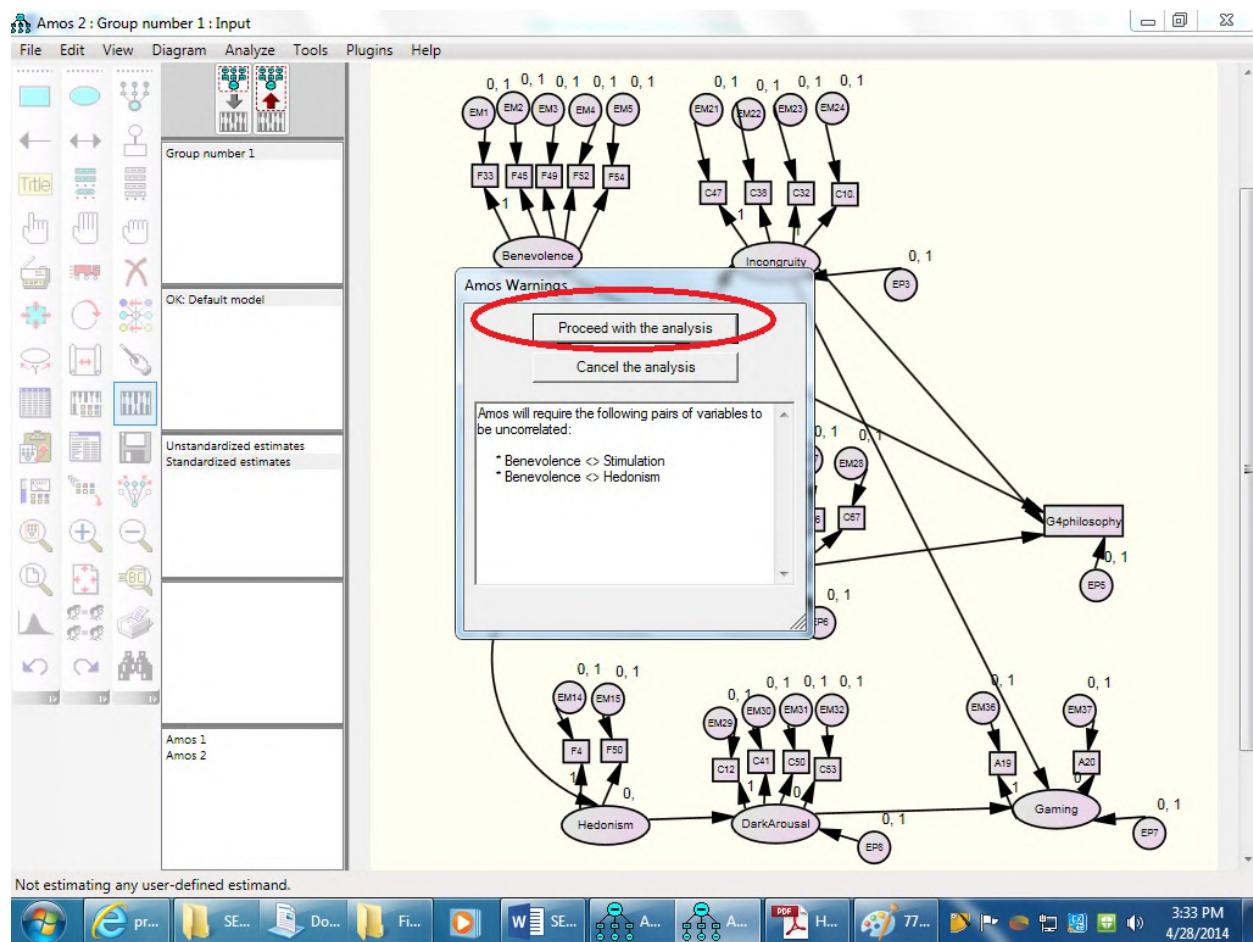
11. Click the icon at the top first, then click 'Standardized estimates' at the middle-left. You will see values. Numbers shown above curved arrows between latent variables are correlations. Numbers shown above linear arrows between latent variables are regression coefficient values. Numbers shown above linear arrows between a latent variable and an observed variable are factor loadings.
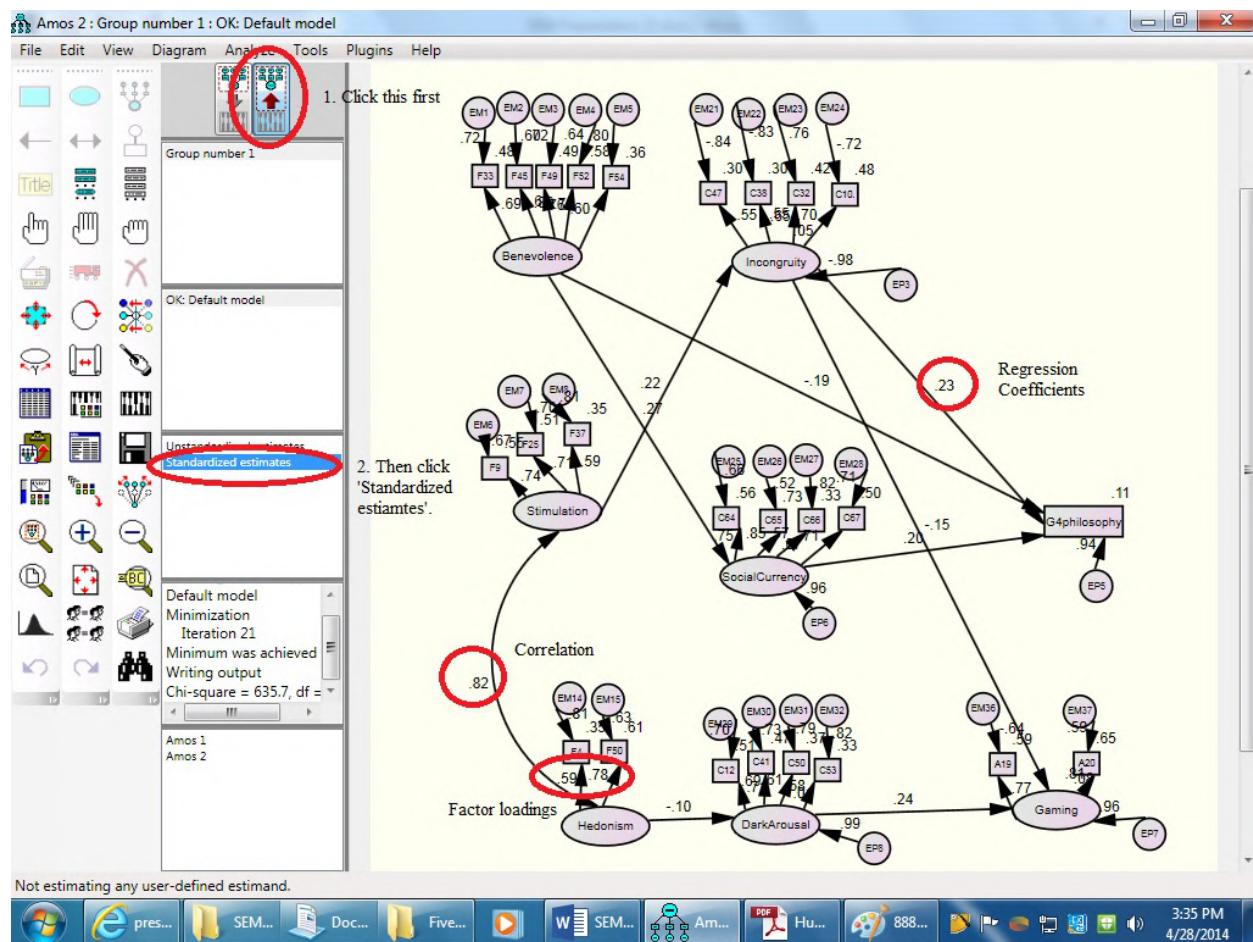
12. Click 'View Text' icon at the middle-left. Then the text output shows up. You can check model fit in the text output (Check red circles).

III. AMOS output

Date and Time

Date: Monday, April 28, 2014
Time: 3:34:39 PM

Title

Amos 2: Monday, April 28, 2014 3:34 PM

Notes for Group (Group number 1)

The model is recursive.
Sample size = 288

Variable Summary (Group number 1)

Your model contains the following variables (Group number 1)

Observed, endogenous variables
F33
F45
F49
F52
F54
G4
F9
F25
F37
C47
C38
C32
C10
C64
C65
C66
C67
F4
F50
C12
C41
C50

C53
A20
A19
Unobserved, endogenous variables
Incongruity
SocialCurrency
DarkArousal
Gaming
Unobserved, exogenous variables
Benevolence
EM1
EM2
EM3
EM4
EM5
EP5
Stimulation
EM6
EM7
EM8
EM21
EM22
EM23
EM24
EP3
EM25
EM26
EM27
EM28
EP6
EM14
EM15
Hedonism
EM29
EM30
EM31
EM32
EP8
EM37
EP7
EM36

Variable counts (Group number 1)

Number of variables in your model: 61
Number of observed variables: 25

Number of unobserved variables: 36
Number of exogenous variables: 32
Number of endogenous variables: 29

Parameter summary (Group number 1)

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	7	0	29	0	1	37
Labeled	0	0	0	0	0	0
Unlabeled	54	1	3	0	25	83
Total	61	1	32	0	26	120

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 350
Number of distinct parameters to be estimated: 83
Degrees of freedom (350 - 83): 267

Result (Default model)

Minimum was achieved
Chi-square = 635.685
Degrees of freedom = 267
Probability level = .000

Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
Incongruity	<---	Stimulation	.264	.108	2.460	.014	par_24
Incongruity	<---	EP3	-1.262	.158	-7.995	***	par_26
DarkArousal	<---	Hedonism	-.240	.199	-1.204	.229	par_47
DarkArousal	<---	EP8	1.990	.179	11.085	***	par_48
SocialCurrency	<---	EP6	1.589	.123	12.939	***	par_33
SocialCurrency	<---	Benevolence	.538	.155	3.476	***	par_35

			Estimate	S.E.	C.R.	P	Label
Gaming	<---	DarkArousal	9.866	3.699	2.668	.008	par_51
Gaming	<---	Incongruity	-9.907	5.501	-1.801	.072	par_52
Gaming	<---	EP7	80.003	11.941	6.700	***	par_53
F33	<---	Benevolence	1.000				
F45	<---	Benevolence	1.108	.107	10.353	***	par_1
F49	<---	Benevolence	1.253	.135	9.317	***	par_2
F52	<---	Benevolence	1.104	.110	10.019	***	par_3
F54	<---	Benevolence	1.009	.124	8.132	***	par_4
F33	<---	EM1	.878	.049	18.052	***	par_5
F45	<---	EM2	.694	.048	14.497	***	par_6
F49	<---	EM3	1.078	.060	17.896	***	par_7
F52	<---	EM4	.783	.049	16.034	***	par_8
F54	<---	EM5	1.134	.058	19.515	***	par_9
G4	<---	EP5	1.060	.054	19.584	***	par_10
G4	<---	Benevolence	-.251	.103	-2.430	.015	par_11
F9	<---	Stimulation	1.000				
F25	<---	Stimulation	1.072	.122	8.753	***	par_12
F37	<---	Stimulation	.971	.127	7.644	***	par_13
F9	<---	EM6	.985	.070	14.074	***	par_14
F25	<---	EM7	1.138	.076	15.073	***	par_15
F37	<---	EM8	1.432	.078	18.335	***	par_16
C47	<---	Incongruity	1.000				
C38	<---	Incongruity	1.070	.177	6.051	***	par_17
C32	<---	Incongruity	1.096	.167	6.547	***	par_18
C10	<---	Incongruity	1.330	.200	6.658	***	par_19
C47	<---	EM21	-1.991	.104	-19.208	***	par_20
C38	<---	EM22	-2.096	.109	-19.171	***	par_21
C32	<---	EM23	1.660	.102	16.266	***	par_22
C10	<---	EM24	-1.777	.123	-14.385	***	par_23
G4	<---	Incongruity	.203	.072	2.828	.005	par_25
C64	<---	EM25	1.469	.086	17.067	***	par_27
C65	<---	EM26	1.100	.098	11.195	***	par_28
C66	<---	EM27	2.023	.096	21.052	***	par_29
C67	<---	EM28	1.623	.088	18.496	***	par_30
C64	<---	SocialCurrency	1.000				
C66	<---	SocialCurrency	.852	.098	8.650	***	par_31
C67	<---	SocialCurrency	.979	.092	10.648	***	par_32
G4	<---	SocialCurrency	.137	.053	2.607	.009	par_34
F4	<---	EM14	1.195	.069	17.435	***	par_36
F50	<---	EM15	.847	.092	9.241	***	par_37
F4	<---	Hedonism	1.000				

			Estimate	S.E.	C.R.	P	Label
F50	<---	Hedonism	1.208	.177	6.812	***	par_38
C12	<---	EM29	1.976	.133	14.821	***	par_40
C41	<---	EM30	2.220	.139	15.976	***	par_41
C50	<---	EM31	2.524	.137	18.442	***	par_42
C53	<---	EM32	2.456	.128	19.118	***	par_43
C12	<---	DarkArousal	1.000				
C41	<---	DarkArousal	1.043	.127	8.201	***	par_44
C50	<---	DarkArousal	.965	.126	7.679	***	par_45
C53	<---	DarkArousal	.868	.117	7.393	***	par_46
A20	<---	EM37	52.297	13.484	3.878	***	par_49
A19	<---	Gaming	1.000				
A20	<---	Gaming	.861	.237	3.633	***	par_50
A19	<---	EM36	-69.948	13.744	-5.090	***	par_54
C65	<---	SocialCurrency	1.083	.091	11.891	***	par_55

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
Incongruity	<---	Stimulation	.221
Incongruity	<---	EP3	-.975
DarkArousal	<---	Hedonism	-.105
DarkArousal	<---	EP8	.994
SocialCurrency	<---	EP6	.962
SocialCurrency	<---	Benevolence	.274
Gaming	<---	DarkArousal	.237
Gaming	<---	Incongruity	-.154
Gaming	<---	EP7	.959
F33	<---	Benevolence	.692
F45	<---	Benevolence	.802
F49	<---	Benevolence	.699
F52	<---	Benevolence	.765
F54	<---	Benevolence	.599
F33	<---	EM1	.722
F45	<---	EM2	.598
F49	<---	EM3	.715
F52	<---	EM4	.644
F54	<---	EM5	.801
G4	<---	EP5	.943
G4	<---	Benevolence	-.188
F9	<---	Stimulation	.740
F25	<---	Stimulation	.714

			Estimate
F37	<---	Stimulation	.592
F9	<---	EM6	.673
F25	<---	EM7	.700
F37	<---	EM8	.806
C47	<---	Incongruity	.545
C38	<---	Incongruity	.551
C32	<---	Incongruity	.650
C10	<---	Incongruity	.696
C47	<---	EM21	-.838
C38	<---	EM22	-.834
C32	<---	EM23	.760
C10	<---	EM24	-.718
G4	<---	Incongruity	.234
C64	<---	EM25	.664
C65	<---	EM26	.524
C66	<---	EM27	.821
C67	<---	EM28	.708
C64	<---	SocialCurrency	.747
C66	<---	SocialCurrency	.571
C67	<---	SocialCurrency	.706
G4	<---	SocialCurrency	.201
F4	<---	EM14	.807
F50	<---	EM15	.626
F4	<---	Hedonism	.590
F50	<---	Hedonism	.780
C12	<---	EM29	.703
C41	<---	EM30	.729
C50	<---	EM31	.794
C53	<---	EM32	.816
C12	<---	DarkArousal	.711
C41	<---	DarkArousal	.685
C50	<---	DarkArousal	.608
C53	<---	DarkArousal	.577
A20	<---	EM37	.589
A19	<---	Gaming	.766
A20	<---	Gaming	.808
A19	<---	EM36	-.642
C65	<---	SocialCurrency	.852

Intercepts: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
Incongruity	1.000				
F33	6.089	.079	76.837	***	par_56
F45	6.228	.076	82.157	***	par_57
F49	5.799	.098	59.025	***	par_58
F52	6.130	.079	77.393	***	par_59
F54	5.700	.092	61.817	***	par_60
G4	3.190	.106	30.209	***	par_61
F9	5.767	.095	60.470	***	par_62
F25	5.255	.106	49.481	***	par_63
F37	5.052	.116	43.563	***	par_64
C10	5.486	.250	21.909	***	par_65
C32	5.990	.214	27.992	***	par_66
C38	5.608	.234	23.968	***	par_67
C47	5.230	.145	35.978	***	par_68
C64	6.912	.135	51.238	***	par_69
C65	7.406	.128	57.806	***	par_70
C66	7.126	.150	47.431	***	par_71
C67	6.803	.140	48.602	***	par_72
F4	5.431	.097	56.129	***	par_73
F50	6.151	.088	69.711	***	par_74
C12	3.731	.172	21.694	***	par_75
C41	5.474	.186	29.483	***	par_76
C50	4.518	.194	23.268	***	par_77
C53	3.234	.184	17.564	***	par_78
A19	50.108	8.460	5.923	***	par_79
A20	43.693	7.011	6.232	***	par_80

Covariances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
Stimulation <--> Hedonism	.777	.140	5.572	***	par_39

Correlations: (Group number 1 - Default model)

	Estimate
Stimulation <--> Hedonism	.821

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
EM1	1.000				
EM2	1.000				

	Estimate	S.E.	C.R.	P	Label
EM3	1.000				
EM4	1.000				
EM5	1.000				
EP5	1.000				
EM6	1.000				
EM7	1.000				
EM8	1.000				
EM21	1.000				
EM22	1.000				
EM23	1.000				
EM24	1.000				
EP3	1.000				
EM25	1.000				
EM26	1.000				
EM27	1.000				
EM28	1.000				
EP6	1.000				
EM14	1.000				
EM15	1.000				
EM29	1.000				
EM30	1.000				
EM31	1.000				
EM32	1.000				
EP8	1.000				
EM36	1.000				
EM37	1.000				
EP7	1.000				
Benevolence	.707	.126	5.627	***	par_81
Stimulation	1.174	.205	5.720	***	par_82
Hedonism	.764	.182	4.203	***	par_83

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
DarkArousal	.011
Incongruity	.049
Gaming	.081
SocialCurrency	.075
A19	.587
A20	.654
C53	.333

	Estimate
C50	.369
C41	.469
C12	.506
F50	.608
F4	.349
C67	.498
C66	.326
C65	.726
C64	.558
C10	.484
C32	.422
C38	.304
C47	.297
F37	.351
F25	.510
F9	.547
G4	.110
F54	.359
F52	.585
F49	.489
F45	.643
F33	.478

Matrices (Group number 1 - Default model)

Total Effects (Group number 1 - Default model)

	Hedonism	Stimulation	Benevolence	DarkArousal	Incongruity	Gaming	SocialCurrency
DarkArousal	-.240	.000	.000	.000	.000	.000	.000
Incongruity	.000	.264	.000	.000	.000	.000	.000
Gaming	-2.369	-2.620	.000	9.866	-9.907	.000	.000
SocialCurrency	.000	.000	.538	.000	.000	.000	.000
A19	-2.369	-2.620	.000	9.866	-9.907	1.000	.000
A20	-2.039	-2.255	.000	8.492	-8.527	.861	.000
C53	-.208	.000	.000	.868	.000	.000	.000
C50	-.232	.000	.000	.965	.000	.000	.000
C41	-.251	.000	.000	1.043	.000	.000	.000
C12	-.240	.000	.000	1.000	.000	.000	.000
F50	1.208	.000	.000	.000	.000	.000	.000

	Hedoni sm	Stimulat ion	Benevole nce	DarkAro usal	Incongru ity	Gami ng	SocialCurre ncy
F4	1.000	.000	.000	.000	.000	.000	.000
C67	.000	.000	.526	.000	.000	.000	.979
C66	.000	.000	.458	.000	.000	.000	.852
C65	.000	.000	.582	.000	.000	.000	1.083
C64	.000	.000	.538	.000	.000	.000	1.000
C10	.000	.352	.000	.000	1.330	.000	.000
C32	.000	.290	.000	.000	1.096	.000	.000
C38	.000	.283	.000	.000	1.070	.000	.000
C47	.000	.264	.000	.000	1.000	.000	.000
F37	.000	.971	.000	.000	.000	.000	.000
F25	.000	1.072	.000	.000	.000	.000	.000
F9	.000	1.000	.000	.000	.000	.000	.000
G4	.000	.054	-.177	.000	.203	.000	.137
F54	.000	.000	1.009	.000	.000	.000	.000
F52	.000	.000	1.104	.000	.000	.000	.000
F49	.000	.000	1.253	.000	.000	.000	.000
F45	.000	.000	1.108	.000	.000	.000	.000
F33	.000	.000	1.000	.000	.000	.000	.000

Standardized Total Effects (Group number 1 - Default model)

	Hedoni sm	Stimulat ion	Benevole nce	DarkAro usal	Incongru ity	Gami ng	SocialCurre ncy
DarkArous al	-.105	.000	.000	.000	.000	.000	.000
Incongruity	.000	.221	.000	.000	.000	.000	.000
Gaming	-.025	-.034	.000	.237	-.154	.000	.000
SocialCurre ncy	.000	.000	.274	.000	.000	.000	.000
A19	-.019	-.026	.000	.181	-.118	.766	.000
A20	-.020	-.028	.000	.191	-.124	.808	.000
C53	-.061	.000	.000	.577	.000	.000	.000
C50	-.064	.000	.000	.608	.000	.000	.000
C41	-.072	.000	.000	.685	.000	.000	.000
C12	-.075	.000	.000	.711	.000	.000	.000
F50	.780	.000	.000	.000	.000	.000	.000
F4	.590	.000	.000	.000	.000	.000	.000
C67	.000	.000	.193	.000	.000	.000	.706
C66	.000	.000	.156	.000	.000	.000	.571
C65	.000	.000	.233	.000	.000	.000	.852

	Hedonism	Stimulation	Benevolence	DarkArousal	Incongruity	Gaming	SocialCurrency
C64	.000	.000	.205	.000	.000	.000	.747
C10	.000	.154	.000	.000	.696	.000	.000
C32	.000	.144	.000	.000	.650	.000	.000
C38	.000	.122	.000	.000	.551	.000	.000
C47	.000	.121	.000	.000	.545	.000	.000
F37	.000	.592	.000	.000	.000	.000	.000
F25	.000	.714	.000	.000	.000	.000	.000
F9	.000	.740	.000	.000	.000	.000	.000
G4	.000	.052	-.133	.000	.234	.000	.201
F54	.000	.000	.599	.000	.000	.000	.000
F52	.000	.000	.765	.000	.000	.000	.000
F49	.000	.000	.699	.000	.000	.000	.000
F45	.000	.000	.802	.000	.000	.000	.000
F33	.000	.000	.692	.000	.000	.000	.000

Direct Effects (Group number 1 - Default model)

	Hedonism	Stimulation	Benevolence	DarkArousal	Incongruity	Gaming	SocialCurrency
DarkArousal	-.240	.000	.000	.000	.000	.000	.000
Incongruity	.000	.264	.000	.000	.000	.000	.000
Gaming	.000	.000	.000	9.866	-9.907	.000	.000
SocialCurrency	.000	.000	.538	.000	.000	.000	.000
A19	.000	.000	.000	.000	.000	1.000	.000
A20	.000	.000	.000	.000	.000	.861	.000
C53	.000	.000	.000	.868	.000	.000	.000
C50	.000	.000	.000	.965	.000	.000	.000
C41	.000	.000	.000	1.043	.000	.000	.000
C12	.000	.000	.000	1.000	.000	.000	.000
F50	1.208	.000	.000	.000	.000	.000	.000
F4	1.000	.000	.000	.000	.000	.000	.000
C67	.000	.000	.000	.000	.000	.000	.979
C66	.000	.000	.000	.000	.000	.000	.852
C65	.000	.000	.000	.000	.000	.000	1.083
C64	.000	.000	.000	.000	.000	.000	1.000
C10	.000	.000	.000	.000	1.330	.000	.000
C32	.000	.000	.000	.000	1.096	.000	.000
C38	.000	.000	.000	.000	1.070	.000	.000

	Hedonism	Stimulation	Benevolence	DarkArousal	Incongruity	Gaming	SocialCurrency
C47	.000	.000	.000	.000	1.000	.000	.000
F37	.000	.971	.000	.000	.000	.000	.000
F25	.000	1.072	.000	.000	.000	.000	.000
F9	.000	1.000	.000	.000	.000	.000	.000
G4	.000	.000	-.251	.000	.203	.000	.137
F54	.000	.000	1.009	.000	.000	.000	.000
F52	.000	.000	1.104	.000	.000	.000	.000
F49	.000	.000	1.253	.000	.000	.000	.000
F45	.000	.000	1.108	.000	.000	.000	.000
F33	.000	.000	1.000	.000	.000	.000	.000

Standardized Direct Effects (Group number 1 - Default model)

	Hedonism	Stimulation	Benevolence	DarkArousal	Incongruity	Gaming	SocialCurrency
DarkArousal	-.105	.000	.000	.000	.000	.000	.000
Incongruity	.000	.221	.000	.000	.000	.000	.000
Gaming	.000	.000	.000	.237	-.154	.000	.000
SocialCurrency	.000	.000	.274	.000	.000	.000	.000
A19	.000	.000	.000	.000	.000	.766	.000
A20	.000	.000	.000	.000	.000	.808	.000
C53	.000	.000	.000	.577	.000	.000	.000
C50	.000	.000	.000	.608	.000	.000	.000
C41	.000	.000	.000	.685	.000	.000	.000
C12	.000	.000	.000	.711	.000	.000	.000
F50	.780	.000	.000	.000	.000	.000	.000
F4	.590	.000	.000	.000	.000	.000	.000
C67	.000	.000	.000	.000	.000	.000	.706
C66	.000	.000	.000	.000	.000	.000	.571
C65	.000	.000	.000	.000	.000	.000	.852
C64	.000	.000	.000	.000	.000	.000	.747
C10	.000	.000	.000	.000	.696	.000	.000
C32	.000	.000	.000	.000	.650	.000	.000
C38	.000	.000	.000	.000	.551	.000	.000
C47	.000	.000	.000	.000	.545	.000	.000
F37	.000	.592	.000	.000	.000	.000	.000
F25	.000	.714	.000	.000	.000	.000	.000
F9	.000	.740	.000	.000	.000	.000	.000

	Hedonism	Stimulation	Benevolence	DarkArousal	Incongruity	Gaming	SocialCurrency
G4	.000	.000	-.188	.000	.234	.000	.201
F54	.000	.000	.599	.000	.000	.000	.000
F52	.000	.000	.765	.000	.000	.000	.000
F49	.000	.000	.699	.000	.000	.000	.000
F45	.000	.000	.802	.000	.000	.000	.000
F33	.000	.000	.692	.000	.000	.000	.000

Indirect Effects (Group number 1 - Default model)

	Hedonism	Stimulation	Benevolence	DarkArousal	Incongruity	Gaming	SocialCurrency
DarkArousal	.000	.000	.000	.000	.000	.000	.000
Incongruity	.000	.000	.000	.000	.000	.000	.000
Gaming	-2.369	-2.620	.000	.000	.000	.000	.000
SocialCurrency	.000	.000	.000	.000	.000	.000	.000
A19	-2.369	-2.620	.000	9.866	-9.907	.000	.000
A20	-2.039	-2.255	.000	8.492	-8.527	.000	.000
C53	-.208	.000	.000	.000	.000	.000	.000
C50	-.232	.000	.000	.000	.000	.000	.000
C41	-.251	.000	.000	.000	.000	.000	.000
C12	-.240	.000	.000	.000	.000	.000	.000
F50	.000	.000	.000	.000	.000	.000	.000
F4	.000	.000	.000	.000	.000	.000	.000
C67	.000	.000	.526	.000	.000	.000	.000
C66	.000	.000	.458	.000	.000	.000	.000
C65	.000	.000	.582	.000	.000	.000	.000
C64	.000	.000	.538	.000	.000	.000	.000
C10	.000	.352	.000	.000	.000	.000	.000
C32	.000	.290	.000	.000	.000	.000	.000
C38	.000	.283	.000	.000	.000	.000	.000
C47	.000	.264	.000	.000	.000	.000	.000
F37	.000	.000	.000	.000	.000	.000	.000
F25	.000	.000	.000	.000	.000	.000	.000
F9	.000	.000	.000	.000	.000	.000	.000
G4	.000	.054	.074	.000	.000	.000	.000
F54	.000	.000	.000	.000	.000	.000	.000
F52	.000	.000	.000	.000	.000	.000	.000
F49	.000	.000	.000	.000	.000	.000	.000

	Hedonism	Stimulation	Benevolence	DarkArousal	Incongruity	Gaming	SocialCurrency
F45	.000	.000	.000	.000	.000	.000	.000
F33	.000	.000	.000	.000	.000	.000	.000

Standardized Indirect Effects (Group number 1 - Default model)

	Hedonism	Stimulation	Benevolence	DarkArousal	Incongruity	Gaming	SocialCurrency
DarkArousal	.000	.000	.000	.000	.000	.000	.000
Incongruity	.000	.000	.000	.000	.000	.000	.000
Gaming	-.025	-.034	.000	.000	.000	.000	.000
SocialCurrency	.000	.000	.000	.000	.000	.000	.000
A19	-.019	-.026	.000	.181	-.118	.000	.000
A20	-.020	-.028	.000	.191	-.124	.000	.000
C53	-.061	.000	.000	.000	.000	.000	.000
C50	-.064	.000	.000	.000	.000	.000	.000
C41	-.072	.000	.000	.000	.000	.000	.000
C12	-.075	.000	.000	.000	.000	.000	.000
F50	.000	.000	.000	.000	.000	.000	.000
F4	.000	.000	.000	.000	.000	.000	.000
C67	.000	.000	.193	.000	.000	.000	.000
C66	.000	.000	.156	.000	.000	.000	.000
C65	.000	.000	.233	.000	.000	.000	.000
C64	.000	.000	.205	.000	.000	.000	.000
C10	.000	.154	.000	.000	.000	.000	.000
C32	.000	.144	.000	.000	.000	.000	.000
C38	.000	.122	.000	.000	.000	.000	.000
C47	.000	.121	.000	.000	.000	.000	.000
F37	.000	.000	.000	.000	.000	.000	.000
F25	.000	.000	.000	.000	.000	.000	.000
F9	.000	.000	.000	.000	.000	.000	.000
G4	.000	.052	.055	.000	.000	.000	.000
F54	.000	.000	.000	.000	.000	.000	.000
F52	.000	.000	.000	.000	.000	.000	.000
F49	.000	.000	.000	.000	.000	.000	.000
F45	.000	.000	.000	.000	.000	.000	.000
F33	.000	.000	.000	.000	.000	.000	.000

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	83	635.685	267	.000	2.381
Saturated model	350	.000	0		
Independence model	25	2286.856	325	.000	7.036

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.722	.662	.817	.771	.812
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.822	.593	.667
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	368.685	298.780	446.292
Saturated model	.000	.000	.000
Independence model	1961.856	1813.893	2117.242

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	2.215	1.285	1.041	1.555
Saturated model	.000	.000	.000	.000
Independence model	7.968	6.836	6.320	7.377

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.069	.062	.076	.000
Independence model	.145	.139	.151	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	801.685	818.221		
Saturated model	700.000	769.732		
Independence model	2336.856	2341.837		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	2.793	2.550	3.064	2.851
Saturated model	2.439	2.439	2.439	2.682
Independence model	8.142	7.627	8.684	8.160

HOELTER

| Model	HOELTER .05	HOELTER .01
Default model	139	147
Independence model	47	49

IV. Results and write-up
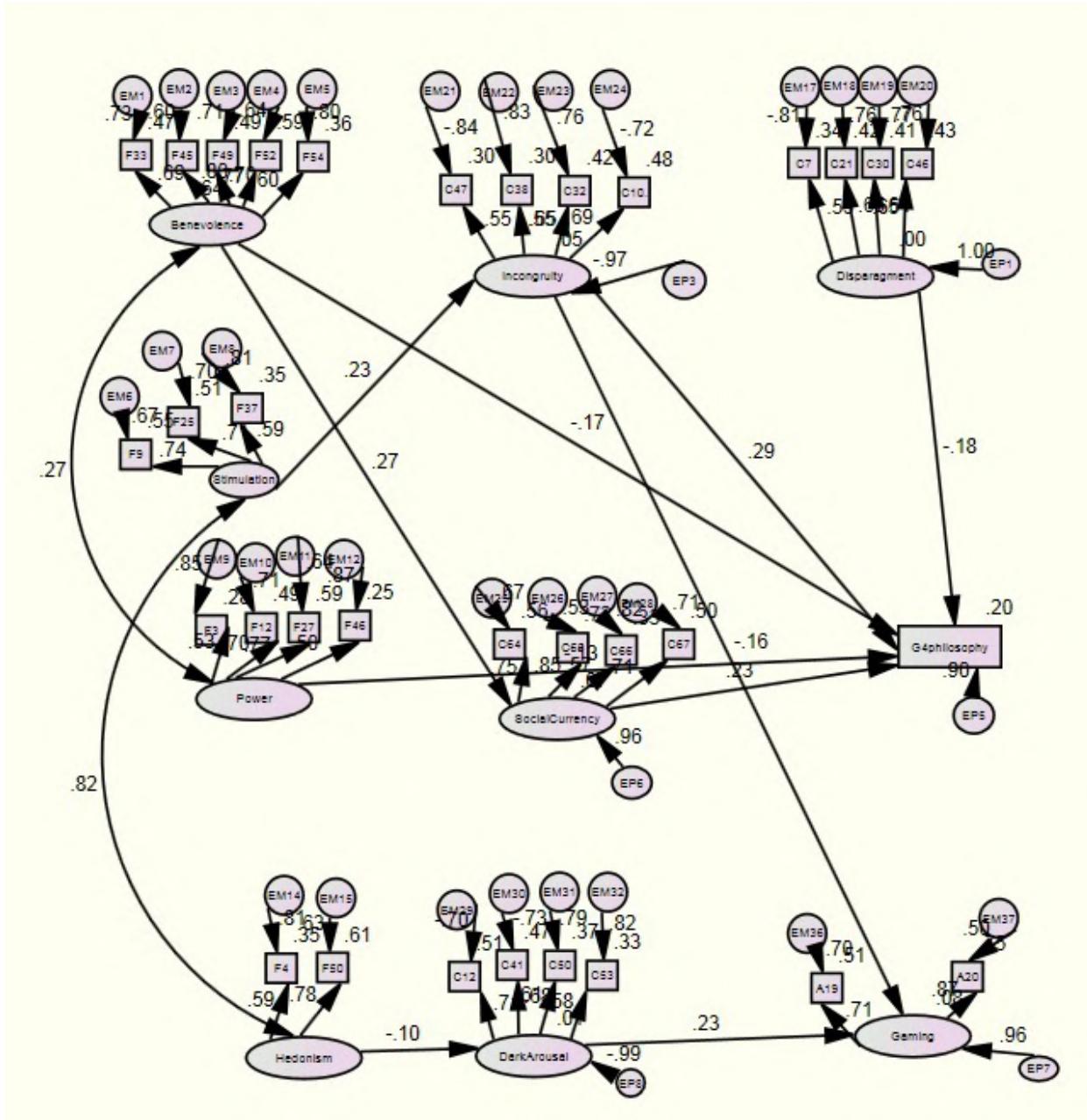
Figure 1. Original SEM model.

Fit for the original model indicated an inadequate fit of the general structural equation model, χ^2 (507) = 1253.63, $p < .001$; CFI = .72; RMSEA = .07 (90% confidence interval = .067, 077). Alterations of this model were made to attempt better fit.
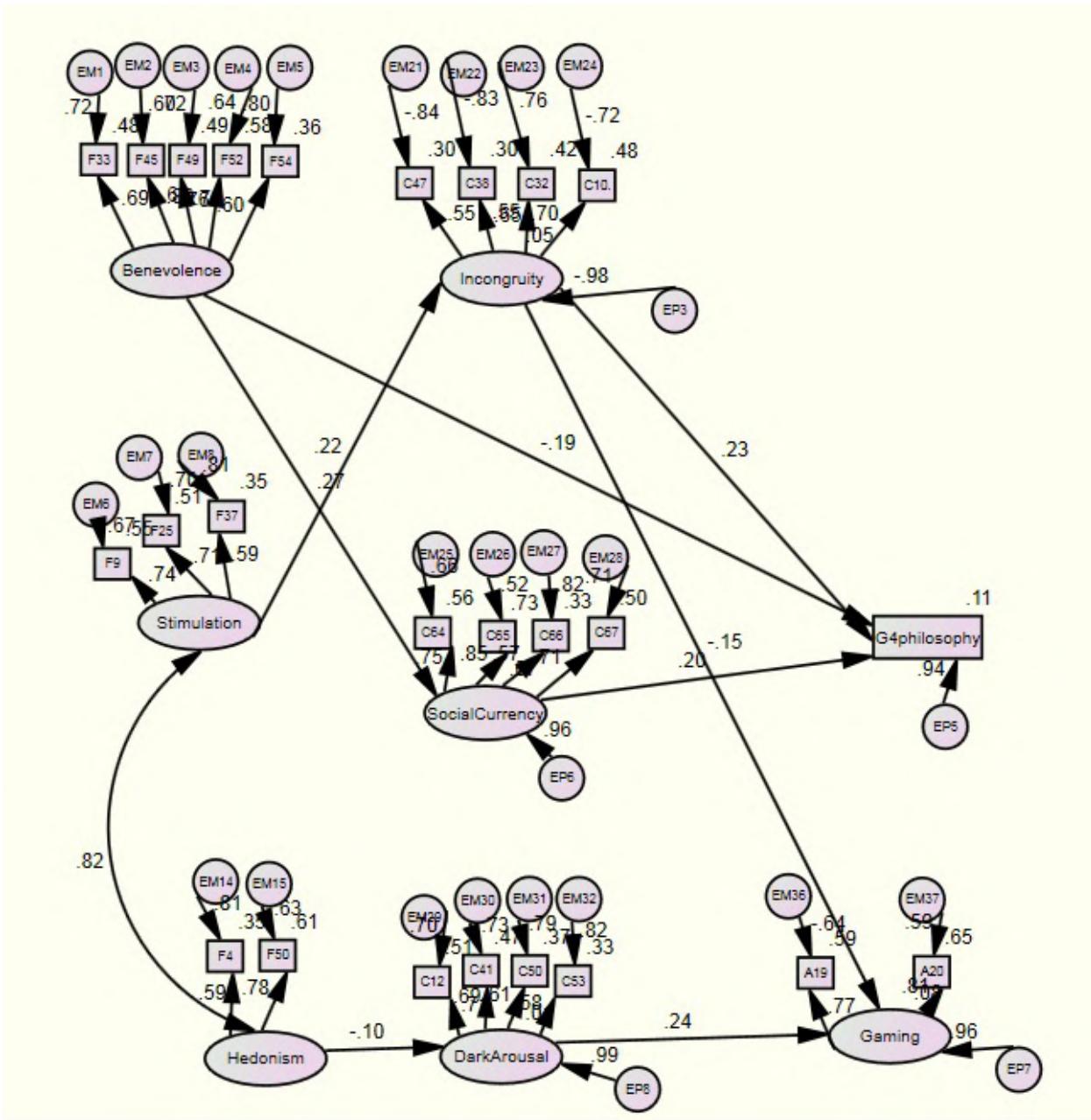
Figure 2. Final SEM model.

Fit for the final model indicated an adequate fit of the general structural equation model, $\chi^2 (267) = 635.69$, $p < .001$; CFI = .81; RMSEA = .07 (90% confidence interval = .062, 076). The final model explained 11% of the variance in political philosophy ($R^2 = .11$). Beta coefficients indicated that incongruity ($\beta = .23$, $SE = .07$, $p < .05$), benevolence ($\beta = -.19$, $SE = .10$, $p < .05$), and social currency ($\beta = .20$, $SE = .05$, $p < .05$) were significantly associated with political philosophy.

There were two mediating variables in the model; incongruity and social currency. First, stimulation explained 4.7% of the variance in incongruity ($\beta = .22$, $SE = .11$, $p < .05$), which in

turn, incongruity significantly predicted political philosophy ($\beta = .23$, $SE = .07$, $p < .05$). Second, benevolence explained 7.3% of the variance in social currency ($\beta = .27$, $SE = .16$, $p < .001$), which in turn, social currency significantly predicted political philosophy ($\beta = .20$, $SE = .05$, $p < .05$). Hedonism did not significantly explain dark arousal ($\beta = -.10$, $SE = .20$, $p > .05$). However, dark arousal significantly predicted gaming ($\beta = .24$, $SE = 3.70$, $p < .05$). Also, incongruity significantly predicted gaming ($\beta = -.15$, $SE = 5.50$, $p < .05$). Finally, there was high correlation between stimulation and hedonism ($r = .82$, $p < .001$). All standardized within-factor item loadings were above .50.