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Mplus Annotated Output

This document provides annotated Mplus output for the ordinal regression symptom improvement example in Chapter 13. In the second section, I provide annotated output for the multinomial example. I omit the various model constraint commands that I describe in the main text. My focus is on the basic output. For interpretation of Mplus output more generally, see the Output tab on my webpage. The annotations I added appear in **red:**

Mplus first repeats the input syntax.

```
INPUT INSTRUCTIONS

  TITLE: Ordinal regression with probit ;
  DATA: FILE IS symptom.dat ;
  VARIABLE:
    NAMES ARE ID GA2 TA2 BD2 CE1 CIS1 T IMP3 ;
    USEVARIABLES ARE GA2 TA2 BD2 CE1 CIS1 T IMP3 ;
    CATEGORICAL ARE IMP3 ;
    MISSING ARE ALL (-9999) ;
    ANALYSIS:
    ESTIMATOR = ML ; LINK = PROBIT ;
  MODEL:
   GA2 on T CE1 CIS1 (p1 b1 b2)  ;
   TA2 on T CE1 CIS1 (p2 b3 b4)  ;
   BD2 on T CE1 CIS1 (p3 b5 b6)  ;
   IMP3 on GA2 TA2 BD2 T CE1 CIS1 (p4 p5 p6 p7 b7 b8)  ;
   [IMP3$1] (t1) ; [IMP3$2] (t2) ; [IMP3$3] (t3) ;
   MODEL INDIRECT:
   IMP3 IND T ;
  OUTPUT: SAMP RESIDUAL STAND(STDY) CINTERVAL TECH4  ;
```

Mplus indicates there were no syntax errors.

```
INPUT READING TERMINATED NORMALLY
```

Mplus repeats the title line at the top of new pages. I delete them after this one in the interest of saving space

```
Ordinal regression with probit ;
```

SUMMARY OF ANALYSIS

Mplus will do single group or multiple group analyses. Below it tells us that it is doing a single group analysis with N = 600.

```
Number of groups                                                 1
Number of observations                                         600
```

Mplus indicates below the number of endogenous (dependent) variables in the model, the number of exogenous (independent) variables in the model, and the number of latent continuous variables.

```
Number of dependent variables                                    4
Number of independent variables                                  3
Number of continuous latent variables                            0
```

Mplus identifies the names of variables that are in each of the above categories.

```
Observed dependent variables

  Continuous
   GA2         TA2         BD2

  Binary and ordered categorical (ordinal)
   IMP3

Observed independent variables
   CE1         CIS1        T

Variables with special functions
```

Mplus tells you the estimator it used and then provides some technical information.

```
Estimator                                                       ML
Information matrix                                        OBSERVED
Optimization Specifications for the Quasi-Newton Algorithm for
Continuous Outcomes
  Maximum number of iterations                                 100
  Convergence criterion                                 0.100D-05
Optimization Specifications for the EM Algorithm
  Maximum number of iterations                                 500
  Convergence criteria
    Loglikelihood change                                0.100D-02
    Relative loglikelihood change                       0.100D-05
    Derivative                                          0.100D-02
Optimization Specifications for the M step of the EM Algorithm for
Categorical Latent variables
```

```
  Number of M step iterations                                    1
  M step convergence criterion                           0.100D-02
  Basis for M step termination                           ITERATION
Optimization Specifications for the M step of the EM Algorithm for
Censored, Binary or Ordered Categorical (Ordinal), Unordered
Categorical (Nominal) and Count Outcomes
  Number of M step iterations                                    1
  M step convergence criterion                           0.100D-02
  Basis for M step termination                           ITERATION
  Maximum value for logit thresholds                            10
  Minimum value for logit thresholds                           -10
  Minimum expected cell size for chi-square              0.100D-01
Maximum number of iterations for H1                           2000
Convergence criterion for H1                           0.100D-03
Optimization algorithm                                         EMA
Integration Specifications
  Type                                                    STANDARD
  Number of integration points                                  15
  Dimensions of numerical integration                            0
  Adaptive quadrature                                           ON
Link                                                       PROBIT
Cholesky                                                      ON
```

Mplus tells you the input data file it used and the format it was in.

```
Input data file(s)
  c:\mplus\symptom.dat ;

Input data format  FREE


SUMMARY OF DATA
```

Mplus tells you the number of different missing data patterns. In this case, there was only one and it represented no missing data because every case had complete data. See the Output tab on my web page to for how to interpret more complex missing data output. The y variables are the continuous endogenous variables and the u variable is the categorical/ordinal outcome

```
     Number of missing data patterns             1
     Number of y missing data patterns           1
     Number of u missing data patterns           1

COVARIANCE COVERAGE OF DATA

Minimum covariance coverage value   0.100
```

Mplus tells you below the proportion of complete cases for each variance and covariance of the input data. See the Output tab of my web page for details. In

the present case, there was no missing data because the proportion of the data present in each cell of the covariance matrix was 1.000.

PROPORTION OF DATA PRESENT FOR Y

Covariance Coverage

	GA2	TA2	BD2	CE1	CIS1
GA2	1.000				
TA2	1.000	1.000			
BD2	1.000	1.000	1.000		
CE1	1.000	1.000	1.000	1.000	
CIS1	1.000	1.000	1.000	1.000	1.000
T	1.000	1.000	1.000	1.000	1.000

Covariance Coverage

	T
T	1.000

Mplus tells you the proportion of cases that were in the two categories for the ordinal outcome variable

UNIVARIATE PROPORTIONS AND COUNTS FOR CATEGORICAL VARIABLES

IMP3

Category 1	0.170	102.000
Category 2	0.312	187.000
Category 3	0.355	213.000
Category 4	0.163	98.000

SAMPLE STATISTICS

Mplus provides below selected descriptive statistics for the model input data. It is good to examine it to make sure it all makes sense so you can be confident the data were read in properly. For the bivariate slopes, the endogenous variables in the rows are regressed onto the exogenous variables in the columns. The slopes for COM3 are probit coefficients

ESTIMATED SAMPLE STATISTICS

Means

GA2	TA2	BD2	CE1	CIS1
0.501	0.486	0.026	3.036	7.044

Means

	T
	0.493

Covariances

	GA2	TA2	BD2	CE1	CIS1
GA2	0.538				
TA2	0.335	0.529			
BD2	0.069	0.078	0.268		
CE1	0.274	0.324	0.254	1.067	
CIS1	0.125	0.125	0.118	0.218	0.297
T	0.254	0.242	0.003	0.026	0.009

Covariances

	T
T	0.250

Correlations

	GA2	TA2	BD2	CE1	CIS1
GA2	1.000				
TA2	0.628	1.000			
BD2	0.182	0.208	1.000		
CE1	0.362	0.432	0.474	1.000	
CIS1	0.314	0.315	0.417	0.388	1.000
T	0.693	0.664	0.013	0.051	0.032

Correlations

	T
T	1.000

Mplus provides more detailed descriptive statistics below. Each variable listed on the left has two rows of information. The labels at the top of the table described the contents of the first row of information (Mean, Skewness, Minimum, % with Minimum Score, 20th percentile, 40th percentile, Median) followed by a / and then the labels for the content of the second row of information for that variable (Sample Size, Variance, Kurtosis, Maximum, % with Maximum Score, 60th percentile, 80th percentile). I use a smaller font here to make everything fit in this table; Mplus uses its standard font.

UNIVARIATE SAMPLE STATISTICS

UNIVARIATE HIGHER-ORDER MOMENT DESCRIPTIVE STATISTICS

Variable/ Sample Size	Mean/ Variance	Skewness/ Kurtosis	Minimum/ Maximum	% with Min/Max	Percentiles 20%/60%	40%/80%	Median

GA2		0.501	-0.019	-2.050	0.33%	-0.130	0.310	0.510
	600.000	0.538	-0.107	2.790	0.33%	0.690	1.150	
TA2		0.486	-0.051	-2.130	0.33%	-0.120	0.260	0.495
	600.000	0.529	0.073	2.720	0.17%	0.670	1.120	
BD2		0.026	0.132	-1.410	0.17%	-0.390	-0.140	0.010
	600.000	0.268	0.152	1.720	0.17%	0.150	0.480	
CE1		3.036	0.004	0.160	0.33%	2.190	2.780	3.040
	600.000	1.067	0.138	6.050	0.17%	3.260	3.900	
CIS1		7.044	0.125	5.340	0.33%	6.600	6.900	7.050
	600.000	0.297	0.565	9.050	0.33%	7.170	7.480	
T		0.493	0.027	0.000	50.67%	0.000	0.000	0.000
	600.000	0.250	-1.999	1.000	49.33%	1.000	1.000	

MODEL FIT INFORMATION

Number of Free Parameters 25

Mplus below provides global fit indices for the model, but not the standard ones. You get the model log likelihood and information criteria. These are difficult to interpret as standalones, so you must rely on other facets of the analysis to evaluate global fit. See my book for details.

Loglikelihood

H0 Value -1644.122

Information Criteria

Akaike (AIC)	3336.244
Bayesian (BIC)	3441.770
Sample-Size Adjusted BIC (n* = (n + 2) / 24)	3365.576

MODEL RESULTS

Below are the unstandardized coefficients and parameter estimates for the model and their associated estimated standard errors (S.E.), critical ratios (Est./S.E.), and p values.

For the three continuous mediators listed first, the coefficients are interpreted per linear regression. Of key interest is the coefficient for the dummy variable TREAT, which is a covariate adjusted mean difference subtracting the control group adjusted mean from the treatment group adjusted mean.

		Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
		Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
GA2	ON				
T		0.989	0.037	26.750	0.000
CE1		0.179	0.019	9.232	0.000
CIS1		0.261	0.037	7.110	0.000
TA2	ON				
T		0.934	0.037	25.579	0.000
CE1		0.236	0.019	12.308	0.000
CIS1		0.220	0.036	6.059	0.000
BD2	ON				
T		-0.015	0.036	-0.415	0.678
CE1		0.185	0.019	9.869	0.000
CIS1		0.261	0.035	7.361	0.000

Because IMP3 is an ordinal outcome, the below coefficients are probit coefficients. For continuous predictors, for every one unit that the predictor increases, the predicted probit changes by a value indicated by the coefficient. Stated another way, a one-unit increase in the predictor leads to a change in the z-score corresponding to the probability of the outcome equal to the value of the coefficient. For dummy variables (e.g., T), the coefficient is the covariate adjusted predicted probit for the group scored 1 minus the corresponding probit for the reference group.

IMP3	ON				
GA2		0.801	0.110	7.257	0.000
TA2		0.692	0.110	6.314	0.000
BD2		0.684	0.111	6.160	0.000
T		0.174	0.168	1.036	0.300
CE1		0.147	0.063	2.334	0.020
CIS1		0.295	0.106	2.786	0.005

Below are the model estimated intercepts for the continuous endogenous variables in the model, with their estimated standard errors, critical ratios, and p values.

Intercepts					
GA2		-2.370	0.243	-9.751	0.000
TA2		-2.239	0.240	-9.329	0.000
BD2		-2.365	0.234	-10.084	0.000

Below is the threshold values for the ordinal outcome. There is a different threshold value for each of the three equations defined by the ordinal model. Stated another way, the thresholds define the break points for how the continuous latent variable comprising the outcome translate into the ordinal measure categories. If you multiply each threshold by minus one, you obtain the intercept for the probit equation predicting it.

Thresholds

IMP3$1	1.786	0.774	2.308	0.021
IMP3$2	3.305	0.778	4.246	0.000
IMP3$3	5.000	0.790	6.326	0.000

Below are the model estimated residual variances for the disturbance terms for endogenous continuous variables in the model. They are unstandardized. You also are given their estimated standard errors, critical ratios, and p values. See my webpage on the OUTPUT tab for how to interpret them.

Residual Variances

GA2	0.204	0.012	17.320	0.000
TA2	0.199	0.012	17.320	0.000
BD2	0.190	0.011	17.320	0.000

QUALITY OF NUMERICAL RESULTS

Condition Number for the Information Matrix 0.145E-02
(ratio of smallest to largest eigenvalue)

STANDARDIZED MODEL RESULTS

Below are the partially standardized counterparts of the above parameters. Because I used the STDY option for standardization, only the endogenous variables (GA2, TA2, BD2, and the latent y* underlying IMP3) are standardized, the exogenous variables are not. Mplus reports critical ratios and p values for them. If one endogenous variable predicts another endogenous variable, then the coefficient is a fully standardized coefficient because both variables have been standardized.

STANDARDIZED MODEL RESULTS

STDY Standardization

		Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
GA2	ON				
T		1.349	0.042	32.216	0.000
CE1		0.244	0.026	9.407	0.000
CIS1		0.356	0.050	7.189	0.000
TA2	ON				
T		1.284	0.043	30.080	0.000
CE1		0.324	0.025	12.723	0.000
CIS1		0.302	0.049	6.107	0.000
BD2	ON				
T		-0.029	0.069	-0.415	0.678
CE1		0.357	0.033	10.702	0.000
CIS1		0.504	0.066	7.688	0.000
IMP3	ON				
GA2		0.351	0.046	7.699	0.000
TA2		0.300	0.046	6.584	0.000
BD2		0.211	0.033	6.346	0.000
T		0.104	0.100	1.035	0.300
CE1		0.088	0.037	2.351	0.019
CIS1		0.176	0.063	2.810	0.005
Intercepts					
GA2		-3.232	0.320	-10.094	0.000
TA2		-3.079	0.320	-9.625	0.000
BD2		-4.569	0.416	-10.994	0.000
Thresholds					
IMP3$1		1.066	0.457	2.332	0.020
IMP3$2		1.973	0.455	4.333	0.000
IMP3$3		2.984	0.457	6.535	0.000
Residual Variances					
GA2		0.380	0.024	15.555	0.000
TA2		0.377	0.024	15.515	0.000
BD2		0.711	0.031	22.764	0.000

R-SQUARE

Below are the model estimated squared (multiple) correlations for endogenous variables in the model, with their estimated standard errors, critical ratios, and p values. The squared R for the ordinal outcome is for the latent propensity y* underlying it.

Observed Variable	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value	Residual Variance
IMP3	0.644	0.027	23.563	0.000	
GA2	0.620	0.024	25.357	0.000	
TA2	0.623	0.024	25.644	0.000	
BD2	0.289	0.031	9.274	0.000	

Below are the unstandardized coefficients for analyses of indirect effects that derive from the MODEL INDIRECT command in your syntax. For each effect, you are provided the estimate of the overall coefficient, its estimated standard error, its critical ratio, and its p value. In all cases, the coefficient predicts the unstandardized latent propensity y* underlying IMP3, so they are interpreted as traditional coefficients in linear regression. However, because the metric of y* is arbitrary, they are difficult to interpret in a substantively meaningful way.

TOTAL, TOTAL INDIRECT, SPECIFIC INDIRECT, AND DIRECT EFFECTS

	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
Effects from T to IMP3				
Total	1.602	0.118	13.555	0.000
Total indirect	1.428	0.159	8.993	0.000
Specific indirect 1				
IMP3				
GA2				
T	0.792	0.113	7.004	0.000
Specific indirect 2				
IMP3				
TA2				
T	0.646	0.105	6.130	0.000
Specific indirect 3				
IMP3				
BD2				
T	-0.010	0.024	-0.414	0.679
Direct				
IMP3				
T	0.174	0.168	1.036	0.300

Below are the partially standardized counterparts of the above parameters. The latent propensity y* underlying IMP3 has been standardized but the T variable has not been standardized. As a result, the coefficients can be interpreted as

mean differences in the standardized y* (analogous to a Cohen's d) through the particular mediational chain denoted. See my book for further explanation.

STDY Standardization

	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
Effects from T to IMP3				
Total	0.956	0.054	17.591	0.000
Total indirect	0.853	0.084	10.101	0.000
Specific indirect 1				
IMP3				
GA2				
T	0.473	0.063	7.476	0.000
Specific indirect 2				
IMP3				
TA2				
T	0.386	0.060	6.424	0.000
Specific indirect 3				
IMP3				
BD2				
T	-0.006	0.015	-0.414	0.679
Direct				
IMP3				
T	0.104	0.100	1.035	0.300

Below are the confidence intervals for the unstandardized model results. The coefficient estimate is repeated in the middle column called "Estimate" and the 95% confidence intervals are under Lower 2.5% and Upper 2.5%. I use a smaller font here so everything fits on a single line.

CONFIDENCE INTERVALS OF MODEL RESULTS

	Lower .5%	Lower 2.5%	Lower 5%	Estimate	Upper 5%	Upper 2.5%	Upper .5%
GA2 ON							
T	0.894	0.917	0.928	0.989	1.050	1.062	1.084
CE1	0.129	0.141	0.147	0.179	0.211	0.217	0.229
CIS1	0.167	0.189	0.201	0.261	0.322	0.333	0.356
TA2 ON							
T	0.840	0.862	0.874	0.934	0.994	1.005	1.028
CE1	0.186	0.198	0.204	0.236	0.267	0.273	0.285
CIS1	0.126	0.149	0.160	0.220	0.279	0.291	0.313
BD2 ON							

T	-0.107	-0.085	-0.073	-0.015	0.044	0.055	0.077
CE1	0.137	0.148	0.154	0.185	0.216	0.221	0.233
CIS1	0.170	0.191	0.203	0.261	0.319	0.330	0.352
IMP3 ON							
GA2	0.517	0.585	0.619	0.801	0.982	1.017	1.085
TA2	0.410	0.477	0.512	0.692	0.872	0.907	0.975
BD2	0.398	0.467	0.502	0.684	0.867	0.902	0.971
T	-0.258	-0.155	-0.102	0.174	0.449	0.502	0.605
CE1	-0.015	0.024	0.043	0.147	0.250	0.270	0.309
CIS1	0.022	0.088	0.121	0.295	0.469	0.503	0.568
Intercepts							
GA2	-2.996	-2.846	-2.770	-2.370	-1.970	-1.894	-1.744
TA2	-2.857	-2.709	-2.633	-2.239	-1.844	-1.768	-1.621
BD2	-2.969	-2.824	-2.750	-2.365	-1.979	-1.905	-1.760
Thresholds							
IMP3$1	-0.208	0.269	0.513	1.786	3.059	3.302	3.779
IMP3$2	1.300	1.780	2.025	3.305	4.586	4.831	5.310
IMP3$3	2.964	3.451	3.700	5.000	6.300	6.549	7.036
Residual Variances							
GA2	0.174	0.181	0.185	0.204	0.224	0.228	0.235
TA2	0.170	0.177	0.180	0.199	0.218	0.222	0.229
BD2	0.162	0.169	0.172	0.190	0.208	0.212	0.219

CONFIDENCE INTERVALS OF STANDARDIZED MODEL RESULTS

Below are the confidence intervals for the partially standardized model results.

STDY Standardization

	Lower .5%	Lower 2.5%	Lower 5%	Estimate	Upper 5%	Upper 2.5%	Upper .5%
GA2 ON							
T	1.241	1.267	1.280	1.349	1.418	1.431	1.457
CE1	0.177	0.193	0.202	0.244	0.287	0.295	0.311
CIS1	0.229	0.259	0.275	0.356	0.438	0.453	0.484
TA2 ON							
T	1.174	1.201	1.214	1.284	1.354	1.368	1.394
CE1	0.259	0.274	0.282	0.324	0.366	0.374	0.390
CIS1	0.175	0.205	0.221	0.302	0.384	0.399	0.430
BD2 ON							
T	-0.206	-0.164	-0.142	-0.029	0.085	0.106	0.149
CE1	0.271	0.292	0.302	0.357	0.412	0.422	0.443
CIS1	0.335	0.376	0.396	0.504	0.612	0.632	0.673
IMP3 ON							
GA2	0.233	0.261	0.276	0.351	0.425	0.440	0.468
TA2	0.183	0.211	0.225	0.300	0.375	0.390	0.418
BD2	0.126	0.146	0.157	0.211	0.266	0.277	0.297
T	-0.154	-0.093	-0.061	0.104	0.268	0.300	0.361
CE1	-0.008	0.015	0.026	0.088	0.149	0.161	0.183
CIS1	0.015	0.053	0.073	0.176	0.279	0.299	0.338

Intercepts							
GA2	-4.057	-3.860	-3.759	-3.232	-2.705	-2.604	-2.407
TA2	-3.903	-3.706	-3.605	-3.079	-2.553	-2.452	-2.255
BD2	-5.639	-5.383	-5.252	-4.569	-3.885	-3.754	-3.498
Thresholds							
IMP3$1	-0.111	0.170	0.314	1.066	1.818	1.962	2.243
IMP3$2	0.800	1.081	1.224	1.973	2.722	2.865	3.146
IMP3$3	1.808	2.089	2.233	2.984	3.736	3.880	4.161
Residual Variances							
GA2	0.317	0.332	0.340	0.380	0.420	0.428	0.443
TA2	0.314	0.329	0.337	0.377	0.417	0.425	0.440
BD2	0.630	0.649	0.659	0.711	0.762	0.772	0.791

CONFIDENCE INTERVALS OF TOTAL, TOTAL INDIRECT, SPECIFIC INDIRECT, AND DIRECT EFFECTS

Below are the confidence intervals for the unstandardized total and indirect effects

	Lower .5%	Lower 2.5%	Lower 5%	Estimate	Upper 5%	Upper 2.5%	Upper .5%
Effects from T to IMP3							
Total	1.297	1.370	1.407	1.602	1.796	1.834	1.906
Total indirect	1.019	1.117	1.167	1.428	1.690	1.740	1.837
Specific indirect 1							
IMP3							
GA2							
T	0.501	0.570	0.606	0.792	0.978	1.014	1.083
Specific indirect 2							
IMP3							
TA2							
T	0.375	0.440	0.473	0.646	0.820	0.853	0.918
Specific indirect 3							
IMP3							
BD2							
T	-0.073	-0.058	-0.050	-0.010	0.030	0.038	0.053
Direct							
IMP3							
T	-0.258	-0.155	-0.102	0.174	0.449	0.502	0.605

CONFIDENCE INTERVALS OF STANDARDIZED TOTAL, TOTAL INDIRECT, SPECIFIC INDIRECT, AND DIRECT EFFECTS

Below are the confidence intervals for the partially standardized total and indirect effects.

STDY Standardization

	Lower .5%	Lower 2.5%	Lower 5%	Estimate	Upper 5%	Upper 2.5%	Upper .5%
Effects from T to IMP3							

Total	0.816	0.850	0.867	0.956	1.046	1.063	1.096
Total indirect	0.635	0.687	0.714	0.853	0.991	1.018	1.070
Specific indirect 1							
IMP3							
GA2							
T	0.310	0.349	0.369	0.473	0.577	0.597	0.636
Specific indirect 2							
IMP3							
TA2							
T	0.231	0.268	0.287	0.386	0.485	0.504	0.540
Specific indirect 3							
IMP3							
BD2							
T	-0.044	-0.035	-0.030	-0.006	0.018	0.023	0.032
Direct							
IMP3							
T	-0.154	-0.093	-0.061	0.104	0.268	0.300	0.361

RESIDUAL OUTPUT

ESTIMATED MODEL AND RESIDUALS (OBSERVED - ESTIMATED)

Below are the model's predicted means and thresholds.

Model Estimated Means

GA2	TA2	BD2
0.501	0.486	0.026

Below are the observed means/thresholds for the measured variables minus their predicted model means. The residuals should be near zero.

Residuals for Means

GA2	TA2	BD2
0.000	0.000	0.000

Below are the model estimated covariances for the continuous endogenous variables in the model.

Model Estimated Covariances

	GA2	TA2	BD2
GA2	0.538		
TA2	0.330	0.529	
BD2	0.080	0.089	0.268

Below are the residuals for the observed minus predicted variances and covariances. The closer they are to zero, the better.

Residuals for Covariances

	GA2	TA2	BD2
GA2	0.000		
TA2	0.005	0.000	
BD2	-0.010	-0.011	0.000

RESIDUALS ARE NOT AVAILABLE FOR THE CATEGORICAL VARIABLES.

This next section provides model estimates of different parameters, their standard errors, their critical ratios (Est./S.E.) and their p values as part of the TECH4 output. If a value of 999 appears, that means the statistic could not be computed or is not relevant to the model. When the output specifies the variable IMP3 throughout this section and the title of the subsection refers to latent variables, the reported statistic for IMP3 (the ordinal outcome) refers to the latent y* underlying IMP3. Even though the observed variables GA2, TA2, BD2, CE1, CIS1, and T appear in sections titled with the term "latent variable," they refer to the observed variables per se.

TECHNICAL 4 OUTPUT

ESTIMATES DERIVED FROM THE MODEL

ESTIMATED MEANS FOR THE LATENT VARIABLES

IMP3	GA2	TA2	BD2	CE1
3.365	0.501	0.486	0.026	3.036

ESTIMATED MEANS FOR THE LATENT VARIABLES

CIS1	T
7.044	0.493

S.E. FOR ESTIMATED MEANS FOR THE LATENT VARIABLES

IMP3	GA2	TA2	BD2	CE1
0.778	0.030	0.030	0.021	0.042

S.E. FOR ESTIMATED MEANS FOR THE LATENT VARIABLES

CIS1	T
0.022	0.020

EST./S.E. FOR ESTIMATED MEANS FOR THE LATENT VARIABLES

IMP3	GA2	TA2	BD2	CE1
4.327	16.739	16.356	1.252	71.991

EST./S.E. FOR ESTIMATED MEANS FOR THE LATENT VARIABLES

CIS1	T
316.427	24.170

TWO-TAILED P-VALUE FOR ESTIMATED MEANS FOR THE LATENT VARIABLES

IMP3	GA2	TA2	BD2	CE1
0.000	0.000	0.000	0.211	0.000

TWO-TAILED P-VALUE FOR ESTIMATED MEANS FOR THE LATENT VARIABLES

CIS1	T
0.000	0.000

ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	IMP3	GA2	TA2	BD2	CE1
IMP3	2.807				
GA2	0.835	0.538			
TA2	0.817	0.330	0.529		
BD2	0.381	0.080	0.089	0.268	
CE1	0.843	0.274	0.324	0.254	1.067
CIS1	0.389	0.125	0.125	0.118	0.218
T	0.423	0.254	0.242	0.003	0.026

ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	CIS1	T
CIS1	0.297	
T	0.009	0.250

S.E. FOR ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	IMP3	GA2	TA2	BD2	CE1
IMP3	0.215				
GA2	0.070	0.031			
TA2	0.069	0.024	0.031		
BD2	0.042	0.014	0.014	0.015	
CE1	0.090	0.033	0.033	0.024	0.062
CIS1	0.045	0.017	0.017	0.012	0.025
T	0.043	0.018	0.018	0.011	0.021

S.E. FOR ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	CIS1	T
CIS1	0.017	
T	0.011	0.014

EST./S.E. FOR ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	IMP3	GA2	TA2	BD2	CE1
IMP3	13.042				
GA2	11.881	17.321			
TA2	11.816	13.603	17.321		
BD2	8.989	5.840	6.519	17.320	
CE1	9.418	8.337	9.705	10.501	17.321
CIS1	8.548	7.330	7.363	9.433	8.852
T	9.922	13.958	13.555	0.326	1.247

EST./S.E. FOR ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	CIS1	T
CIS1	17.321	
T	0.785	17.321

TWO-TAILED P-VALUE FOR ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	IMP3	GA2	TA2	BD2	CE1
IMP3	0.000				
GA2	0.000	0.000			
TA2	0.000	0.000	0.000		
BD2	0.000	0.000	0.000	0.000	
CE1	0.000	0.000	0.000	0.000	0.000
CIS1	0.000	0.000	0.000	0.000	0.000
T	0.000	0.000	0.000	0.744	0.212

TWO-TAILED P-VALUE FOR ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	CIS1	T
CIS1	0.000	
T	0.432	0.000

Below are the model estimated covariances and correlations between the continuous variables in the model (again, the entry for IMP3 refers to the latent continuous variable underlying the observed IMP3, namely y*). I like to compare these predicted correlations to the observed correlations for the endogenous continuous mediators (in this case GA2, TA2, and BD2) to provide me perspectives on model fit.

ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	IMP3	GA2	TA2	BD2	CE1
IMP3	1.000				
GA2	0.679	1.000			
TA2	0.671	0.618	1.000		
BD2	0.440	0.210	0.236	1.000	
CE1	0.487	0.362	0.432	0.475	1.000
CIS1	0.426	0.314	0.315	0.417	0.388
T	0.505	0.693	0.664	0.013	0.051

ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	CIS1	T
CIS1	1.000	
T	0.032	1.000

S.E. FOR ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	IMP3	GA2	TA2	BD2	CE1
IMP3	0.000				
GA2	0.024	0.000			
TA2	0.024	0.020	0.000		
BD2	0.034	0.033	0.032	0.000	
CE1	0.034	0.035	0.033	0.032	0.000
CIS1	0.036	0.037	0.037	0.034	0.035
T	0.032	0.021	0.023	0.041	0.041

S.E. FOR ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	CIS1	T
CIS1	0.000	
T	0.041	0.000

EST./S.E. FOR ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	IMP3	GA2	TA2	BD2	CE1
IMP3	999.000				
GA2	28.458	999.000			
TA2	27.720	30.997	999.000		
BD2	12.897	6.403	7.328	999.000	
CE1	14.383	10.202	12.989	15.002	999.000
CIS1	11.800	8.519	8.572	12.376	11.172
T	15.652	32.713	29.135	0.326	1.252

EST./S.E. FOR ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	CIS1	T
CIS1	999.000	
T	0.786	999.000

TWO-TAILED P-VALUE FOR ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	IMP3	GA2	TA2	BD2	CE1
IMP3	0.000				
GA2	0.000	0.000			
TA2	0.000	0.000	0.000		
BD2	0.000	0.000	0.000	0.000	
CE1	0.000	0.000	0.000	0.000	0.000
CIS1	0.000	0.000	0.000	0.000	0.000
T	0.000	0.000	0.000	0.744	0.211

TWO-TAILED P-VALUE FOR ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	CIS1	T
CIS1	0.000	
T	0.432	0.000