```
Mplus VERSION 7
MUTHEN & MUTHEN
12/29/2023   8:21 PM

INPUT INSTRUCTIONS

  TITLE: CFA of IES.

  DATA: FILE = IES MIMIC.dat;

  VARIABLE:
  NAMES = Dum_JK Dum_Rlg Dum_Ets Dum_SMhs Dum_SPT Dum_CYoS
  BFL_1 BFL_2 BFL_3 BFL_4
  IRX_1 IRX_2 IRX_3 IRX_4 IRX_5
  IRS_1 IRS_2 IRS_3
  MSS_1 MSS_2 MSS_3
  IMT_1 IMT_2 IMT_3
  IMM_1 IMM_2;

  USEVARIABLES ARE

  BFL_1 BFL_2 BFL_3
  IRX_1 IRX_2 IRX_3 IRX_4 IRX_5
  IRS_1 IRS_2 IRS_3
  MSS_1 MSS_2 MSS_3
  IMT_1 IMT_2
  IMM_1 IMM_2;

  ANALYSIS: ESTIMATOR = MLR;

  MODEL:

  BFL BY BFL_1 BFL_2 BFL_3;
  IRX BY IRX_1 IRX_2 IRX_3 IRX_4 IRX_5;
  IRS BY IRS_1 IRS_2 IRS_3;
  MSS BY MSS_1 MSS_2 MSS_3;
  IMT BY IMT_1 IMT_2;
  IMM BY IMM_1 IMM_2;

  OUTPUT: SAMPSTAT TECH4 STDY MOD;



INPUT READING TERMINATED NORMALLY



CFA of IES.

SUMMARY OF ANALYSIS

Number of groups                                                 1
Number of observations                                         589

Number of dependent variables                                   18
Number of independent variables                                  0
Number of continuous latent variables                            6

Observed dependent variables

  Continuous
   BFL_1       BFL_2       BFL_3       IRX_1       IRX_2       IRX_3
   IRX_4       IRX_5       IRS_1       IRS_2       IRS_3       MSS_1
   MSS_2       MSS_3       IMT_1       IMT_2       IMM_1       IMM_2
```

Continuous latent variables
BFL IRX IRS MSS IMT IMM

Estimator	MLR
Information matrix	OBSERVED
Maximum number of iterations	1000
Convergence criterion	0.500D-04
Maximum number of steepest descent iterations	20

Input data file(s)
IES MIMIC.dat

Input data format FREE

SAMPLE STATISTICS

SAMPLE STATISTICS

Means

	BFL_1	BFL_2	BFL_3	IRX_1	IRX_2
1	3.182	2.679	2.902	3.883	3.861

Means

	IRX_3	IRX_4	IRX_5	IRS_1	IRS_2
1	3.635	3.711	3.684	3.759	4.253

Means

	IRS_3	MSS_1	MSS_2	MSS_3	IMT_1
1	4.256	2.725	3.041	2.747	3.076

Means

	IMT_2	IMM_1	IMM_2
1	3.148	3.698	3.716

Covariances

	BFL_1	BFL_2	BFL_3	IRX_1	IRX_2
BFL_1	1.069				
BFL_2	0.383	1.142			
BFL_3	0.327	0.614	1.084		
IRX_1	0.072	0.051	0.028	0.426	
IRX_2	0.110	0.035	0.054	0.204	0.524
IRX_3	0.102	-0.031	-0.016	0.185	0.212
IRX_4	0.144	0.016	0.014	0.150	0.170
IRX_5	0.042	-0.057	-0.018	0.101	0.114
IRS_1	-0.011	-0.045	-0.071	0.091	0.097
IRS_2	0.049	0.001	-0.004	0.064	0.140
IRS_3	-0.008	0.011	-0.027	0.078	0.107
MSS_1	0.384	0.350	0.374	0.059	0.047
MSS_2	0.278	0.234	0.223	-0.021	0.001
MSS_3	0.280	0.272	0.269	0.001	-0.006

IMT_1	0.315	0.221	0.293	-0.003	0.009
IMT_2	0.345	0.266	0.334	0.060	0.117
IMM_1	0.125	0.075	0.040	0.146	0.230
IMM_2	0.036	-0.030	0.009	0.142	0.171

Covariances

	IRX_3	IRX_4	IRX_5	IRS_1	IRS_2
IRX_3	0.738				
IRX_4	0.261	0.643			
IRX_5	0.167	0.140	0.559		
IRS_1	0.160	0.080	0.083	0.672	
IRS_2	0.092	0.054	0.126	0.182	0.478
IRS_3	0.085	0.099	0.123	0.125	0.224
MSS_1	0.015	0.084	0.017	-0.007	0.015
MSS_2	0.001	0.042	0.003	-0.011	0.041
MSS_3	-0.016	0.039	-0.041	-0.008	0.003
IMT_1	-0.062	-0.012	-0.030	-0.048	0.025
IMT_2	0.049	0.058	-0.037	0.061	0.095
IMM_1	0.260	0.174	0.202	0.144	0.134
IMM_2	0.202	0.198	0.146	0.135	0.075

Covariances

	IRS_3	MSS_1	MSS_2	MSS_3	IMT_1
IRS_3	0.411				
MSS_1	-0.031	1.109			
MSS_2	0.040	0.352	0.908		
MSS_3	-0.029	0.314	0.207	0.736	
IMT_1	-0.023	0.327	0.291	0.179	0.886
IMT_2	-0.033	0.353	0.227	0.251	0.318
IMM_1	0.086	0.014	0.029	0.002	-0.007
IMM_2	0.086	0.078	0.017	0.022	0.015

Covariances

	IMT_2	IMM_1	IMM_2
IMT_2	0.968		
IMM_1	0.079	0.537	
IMM_2	0.052	0.191	0.505

Correlations

	BFL_1	BFL_2	BFL_3	IRX_1	IRX_2
BFL_1	1.000				
BFL_2	0.346	1.000			
BFL_3	0.304	0.552	1.000		
IRX_1	0.107	0.073	0.040	1.000	
IRX_2	0.147	0.045	0.072	0.433	1.000
IRX_3	0.115	-0.033	-0.017	0.330	0.342
IRX_4	0.174	0.019	0.017	0.286	0.293
IRX_5	0.054	-0.072	-0.023	0.206	0.211
IRS_1	-0.012	-0.051	-0.084	0.169	0.164
IRS_2	0.069	0.002	-0.005	0.141	0.281
IRS_3	-0.011	0.016	-0.041	0.185	0.230
MSS_1	0.353	0.311	0.341	0.086	0.061
MSS_2	0.282	0.230	0.225	-0.033	0.001
MSS_3	0.316	0.297	0.301	0.002	-0.010
IMT_1	0.324	0.220	0.299	-0.005	0.013
IMT_2	0.339	0.253	0.326	0.093	0.165

IMM_1	0.164	0.095	0.052	0.306	0.433
IMM_2	0.049	-0.039	0.013	0.305	0.332

Correlations

	IRX_3	IRX_4	IRX_5	IRS_1	IRS_2
IRX_3	1.000				
IRX_4	0.379	1.000			
IRX_5	0.259	0.233	1.000		
IRS_1	0.227	0.121	0.136	1.000	
IRS_2	0.156	0.098	0.243	0.320	1.000
IRS_3	0.154	0.193	0.257	0.237	0.505
MSS_1	0.017	0.099	0.021	-0.008	0.021
MSS_2	0.002	0.055	0.004	-0.014	0.062
MSS_3	-0.022	0.057	-0.064	-0.012	0.005
IMT_1	-0.077	-0.016	-0.043	-0.062	0.038
IMT_2	0.058	0.073	-0.050	0.076	0.140
IMM_1	0.413	0.296	0.368	0.241	0.265
IMM_2	0.331	0.348	0.276	0.232	0.153

Correlations

	IRS_3	MSS_1	MSS_2	MSS_3	IMT_1
IRS_3	1.000				
MSS_1	-0.046	1.000			
MSS_2	0.066	0.351	1.000		
MSS_3	-0.052	0.348	0.254	1.000	
IMT_1	-0.038	0.330	0.324	0.222	1.000
IMT_2	-0.052	0.341	0.242	0.298	0.344
IMM_1	0.183	0.018	0.042	0.003	-0.011
IMM_2	0.189	0.104	0.025	0.036	0.022

Correlations

	IMT_2	IMM_1	IMM_2
IMT_2	1.000		
IMM_1	0.109	1.000	
IMM_2	0.074	0.367	1.000

THE MODEL ESTIMATION TERMINATED NORMALLY

WARNING: THE LATENT VARIABLE COVARIANCE MATRIX (PSI) IS NOT POSITIVE DEFINITE. THIS COULD INDICATE A NEGATIVE VARIANCE/RESIDUAL VARIANCE FOR A LATENT VARIABLE, A CORRELATION GREATER OR EQUAL TO ONE BETWEEN TWO LATENT VARIABLES, OR A LINEAR DEPENDENCY AMONG MORE THAN TWO LATENT VARIABLES. CHECK THE TECH4 OUTPUT FOR MORE INFORMATION.
PROBLEM INVOLVING VARIABLE IMM.

MODEL FIT INFORMATION

Number of Free Parameters 69

Loglikelihood

H0 Value -12180.006
H0 Scaling Correction Factor for MLR 1.3438

H1 Value	-12011.762
H1 Scaling Correction Factor for MLR	1.3249

Information Criteria

Akaike (AIC)	24498.013
Bayesian (BIC)	24800.124
Sample-Size Adjusted BIC (n* = (n + 2) / 24)	24581.072

Chi-Square Test of Model Fit

Value	256.080*
Degrees of Freedom	120
P-Value	0.0000
Scaling Correction Factor for MLR	1.3140

* The chi-square value for MLM, MLMV, MLR, ULSMV, WLSM and WLSMV cannot be used for chi-square difference testing in the regular way. MLM, MLR and WLSM chi-square difference testing is described on the Mplus website. MLMV, WLSMV, and ULSMV difference testing is done using the DIFFTEST option.

RMSEA (Root Mean Square Error Of Approximation)

Estimate	0.044	
90 Percent C.I.	0.036	0.051
Probability RMSEA <= .05	0.911	

CFI/TLI

CFI	0.912
TLI	0.888

Chi-Square Test of Model Fit for the Baseline Model

Value	1701.493
Degrees of Freedom	153
P-Value	0.0000

SRMR (Standardized Root Mean Square Residual)

Value	0.048

MODEL RESULTS

		Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
BFL	BY				
BFL_1		1.000	0.000	999.000	999.000
BFL_2		1.288	0.188	6.841	0.000
BFL_3		1.298	0.194	6.674	0.000
IRX	BY				
IRX_1		1.000	0.000	999.000	999.000
IRX_2		1.281	0.149	8.588	0.000
IRX_3		1.449	0.173	8.395	0.000
IRX_4		1.173	0.147	7.981	0.000
IRX_5		0.975	0.167	5.831	0.000

IRS	BY				
	IRS_1	1.000	0.000	999.000	999.000
	IRS_2	1.453	0.292	4.974	0.000
	IRS_3	1.176	0.273	4.317	0.000
MSS	BY				
	MSS_1	1.000	0.000	999.000	999.000
	MSS_2	0.699	0.078	8.980	0.000
	MSS_3	0.666	0.070	9.471	0.000
IMT	BY				
	IMT_1	1.000	0.000	999.000	999.000
	IMT_2	1.119	0.133	8.422	0.000
IMM	BY				
	IMM 1	1.000	0.000	999.000	999.000
	IMM_2	0.826	0.077	10.685	0.000
IRX	WITH				
	BFL	0.022	0.016	1.382	0.167
IRS	WITH				
	BFL	-0.003	0.013	-0.228	0.819
	IRX	0.064	0.015	4.199	0.000
MSS	WITH				
	BFL	0.304	0.053	5.727	0.000
	IRX	0.018	0.022	0.842	0.400
	IRS	0.004	0.018	0.197	0.843
IMT	WITH				
	BFL	0.225	0.048	4.692	0.000
	IRX	0.018	0.019	0.954	0.340
	IRS	0.016	0.019	0.833	0.405
	MSS	0.323	0.043	7.467	0.000
IMM	WITH				
	BFL	0.037	0.022	1.661	0.097
	IRX	0.173	0.021	8.385	0.000
	IRS	0.088	0.023	3.800	0.000
	MSS	0.035	0.030	1.183	0.237
	IMT	0.037	0.025	1.451	0.147
Intercepts					
	BFL_1	3.182	0.043	74.688	0.000
	BFL_2	2.679	0.044	60.857	0.000
	BFL_3	2.902	0.043	67.645	0.000
	IRX_1	3.883	0.027	144.378	0.000
	IRX_2	3.861	0.030	129.451	0.000
	IRX_3	3.635	0.035	102.710	0.000
	IRX_4	3.711	0.033	112.297	0.000
	IRX_5	3.684	0.031	119.588	0.000
	IRS_1	3.759	0.034	111.291	0.000
	IRS_2	4.253	0.028	149.354	0.000
	IRS_3	4.256	0.026	161.060	0.000
	MSS_1	2.725	0.043	62.787	0.000
	MSS_2	3.041	0.039	77.430	0.000
	MSS_3	2.747	0.035	77.729	0.000
	IMT_1	3.076	0.039	79.342	0.000
	IMT 2	3.148	0.041	77.645	0.000
	IMM_1	3.698	0.030	122.482	0.000
	IMM_2	3.716	0.029	126.880	0.000
Variances					

BFL	0.322	0.067	4.839	0.000
IRX	0.125	0.028	4.507	0.000
IRS	0.127	0.038	3.307	0.001
MSS	0.478	0.064	7.502	0.000
IMT	0.284	0.055	5.174	0.000
IMM	0.231	0.037	6.241	0.000
Residual Variances				
BFL_1	0.747	0.061	12.269	0.000
BFL_2	0.607	0.065	9.280	0.000
BFL_3	0.541	0.071	7.581	0.000
IRX_1	0.301	0.032	9.503	0.000
IRX_2	0.319	0.036	8.886	0.000
IRX_3	0.475	0.042	11.189	0.000
IRX_4	0.472	0.042	11.139	0.000
IRX_5	0.440	0.034	12.956	0.000
IRS_1	0.545	0.052	10.473	0.000
IRS_2	0.210	0.041	5.161	0.000
IRS_3	0.236	0.036	6.604	0.000
MSS_1	0.631	0.056	11.313	0.000
MSS_2	0.675	0.046	14.707	0.000
MSS_3	0.523	0.037	14.196	0.000
IMT_1	0.601	0.051	11.743	0.000
IMT_2	0.612	0.059	10.443	0.000
IMM_1	0.306	0.040	7.580	0.000
IMM_2	0.348	0.036	9.751	0.000

STANDARDIZED MODEL RESULTS

STDY Standardization

	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
BFL BY				
BFL_1	0.549	0.052	10.612	0.000
BFL_2	0.684	0.043	15.780	0.000
BFL_3	0.707	0.046	15.270	0.000
IRX BY				
IRX_1	0.542	0.053	10.168	0.000
IRX_2	0.626	0.043	14.619	0.000
IRX_3	0.596	0.041	14.474	0.000
IRX_4	0.517	0.047	10.994	0.000
IRX_5	0.461	0.051	9.114	0.000
IRS BY				
IRS_1	0.434	0.063	6.902	0.000
IRS_2	0.748	0.059	12.757	0.000
IRS_3	0.653	0.065	10.038	0.000
MSS BY				
MSS_1	0.657	0.038	17.195	0.000
MSS_2	0.507	0.046	11.020	0.000
MSS_3	0.537	0.043	12.579	0.000
IMT BY				
IMT_1	0.567	0.049	11.533	0.000
IMT_2	0.606	0.049	12.425	0.000
IMM BY				
IMM_1	0.656	0.047	13.820	0.000

IMM_2	0.559	0.051	11.001	0.000
IRX WITH				
BFL	0.109	0.072	1.512	0.130
IRS WITH				
BFL	-0.014	0.062	-0.228	0.819
IRX	0.508	0.064	7.949	0.000
MSS WITH				
BFL	0.775	0.062	12.559	0.000
IRX	0.075	0.088	0.856	0.392
IRS	0.015	0.075	0.199	0.843
IMT WITH				
BFL	0.743	0.082	9.081	0.000
IRX	0.094	0.100	0.938	0.348
IRS	0.085	0.100	0.851	0.395
MSS	0.875	0.071	12.305	0.000
IMM WITH				
BFL	0.136	0.078	1.739	0.082
IRX	1.016	0.059	17.217	0.000
IRS	0.513	0.082	6.262	0.000
MSS	0.105	0.089	1.182	0.237
IMT	0.143	0.102	1.403	0.161
Intercepts				
BFL_1	3.077	0.091	33.712	0.000
BFL_2	2.508	0.058	42.985	0.000
BFL_3	2.787	0.071	39.132	0.000
IRX_1	5.949	0.252	23.602	0.000
IRX_2	5.334	0.218	24.498	0.000
IRX_3	4.232	0.144	29.319	0.000
IRX_4	4.627	0.178	26.013	0.000
IRX_5	4.928	0.195	25.220	0.000
IRS_1	4.586	0.188	24.422	0.000
IRS_2	6.154	0.328	18.774	0.000
IRS_3	6.636	0.346	19.190	0.000
MSS_1	2.587	0.066	39.450	0.000
MSS_2	3.190	0.089	35.658	0.000
MSS_3	3.203	0.085	37.884	0.000
IMT_1	3.269	0.100	32.775	0.000
IMT_2	3.199	0.095	33.625	0.000
IMM_1	5.047	0.200	25.280	0.000
IMM_2	5.228	0.193	27.157	0.000
Variances				
BFL	1.000	0.000	999.000	999.000
IRX	1.000	0.000	999.000	999.000
IRS	1.000	0.000	999.000	999.000
MSS	1.000	0.000	999.000	999.000
IMT	1.000	0.000	999.000	999.000
IMM	1.000	0.000	999.000	999.000
Residual Variances				
BFL_1	0.699	0.057	12.309	0.000
BFL_2	0.532	0.059	8.971	0.000
BFL_3	0.500	0.066	7.623	0.000
IRX_1	0.707	0.058	12.247	0.000
IRX_2	0.609	0.054	11.367	0.000
IRX_3	0.645	0.049	13.123	0.000
IRX_4	0.733	0.049	15.087	0.000
IRX_5	0.788	0.047	16.907	0.000

IRS_1	0.812	0.055	14.869	0.000
IRS_2	0.440	0.088	5.015	0.000
IRS_3	0.574	0.085	6.765	0.000
MSS_1	0.569	0.050	11.343	0.000
MSS_2	0.743	0.047	15.908	0.000
MSS_3	0.711	0.046	15.497	0.000
IMT_1	0.679	0.056	12.192	0.000
IMT_2	0.632	0.059	10.687	0.000
IMM_1	0.569	0.062	9.129	0.000
IMM_2	0.688	0.057	12.113	0.000

R-SQUARE

Observed Variable	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
BFL_1	0.301	0.057	5.306	0.000
BFL_2	0.468	0.059	7.890	0.000
BFL_3	0.500	0.066	7.635	0.000
IRX_1	0.293	0.058	5.084	0.000
IRX_2	0.391	0.054	7.310	0.000
IRX_3	0.355	0.049	7.237	0.000
IRX_4	0.267	0.049	5.497	0.000
IRX_5	0.212	0.047	4.557	0.000
IRS_1	0.188	0.055	3.451	0.001
IRS_2	0.560	0.088	6.378	0.000
IRS_3	0.426	0.085	5.019	0.000
MSS_1	0.431	0.050	8.597	0.000
MSS_2	0.257	0.047	5.510	0.000
MSS_3	0.289	0.046	6.290	0.000
IMT_1	0.321	0.056	5.766	0.000
IMT_2	0.368	0.059	6.212	0.000
IMM_1	0.431	0.062	6.910	0.000
IMM_2	0.312	0.057	5.501	0.000

QUALITY OF NUMERICAL RESULTS

Condition Number for the Information Matrix (ratio of smallest to largest eigenvalue) 0.366E-03

MODEL MODIFICATION INDICES

NOTE: Modification indices for direct effects of observed dependent variables regressed on covariates may not be included. To include these, request MODINDICES (ALL).

Minimum M.I. value for printing the modification index 10.000

		M.I.	E.P.C.	Std E.P.C.	StdYX E.P.C.
BY Statements					
IRX	BY BFL_1	12.020	0.504	0.178	0.172
MSS	BY BFL_1	30.293	1.085	0.751	0.726
MSS	BY BFL_2	13.668	-0.902	-0.624	-0.584
IMT	BY BFL_1	31.862	1.367	0.729	0.705
IMT	BY BFL_2	19.085	-1.274	-0.679	-0.636
IMM	BY BFL_1	13.127	0.387	0.186	0.180
IMM	BY IRX_5	12.727	-5.394	-2.594	-3.470
WITH Statements					

BFL_3	WITH BFL_1	22.673	-0.225	-0.225	-0.354
BFL_3	WITH BFL_2	40.614	0.395	0.395	0.689
IRX_2	WITH IRX_1	14.079	0.068	0.068	0.220
IRS_3	WITH IRS_2	10.094	0.152	0.152	0.684
IMT_2	WITH IRS_3	12.544	-0.082	-0.082	-0.215

TECHNICAL 4 OUTPUT

ESTIMATES DERIVED FROM THE MODEL

ESTIMATED MEANS FOR THE LATENT VARIABLES

	BFL	IRX	IRS	MSS	IMT
1	0.000	0.000	0.000	0.000	0.000

ESTIMATED MEANS FOR THE LATENT VARIABLES

	IMM
1	0.000

ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	BFL	IRX	IRS	MSS	IMT
BFL	0.322				
IRX	0.022	0.125			
IRS	-0.003	0.064	0.127		
MSS	0.304	0.018	0.004	0.478	
IMT	0.225	0.018	0.016	0.323	0.284
IMM	0.037	0.173	0.088	0.035	0.037

ESTIMATED COVARIANCE MATRIX FOR THE LATENT VARIABLES

	IMM
IMM	0.231

ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	BFL	IRX	IRS	MSS	IMT
BFL	1.000				
IRX	0.109	1.000			
IRS	-0.014	0.508	1.000		
MSS	0.775	0.075	0.015	1.000	
IMT	0.743	0.094	0.085	0.875	1.000
IMM	0.136	1.016	0.513	0.105	0.143

ESTIMATED CORRELATION MATRIX FOR THE LATENT VARIABLES

	IMM
IMM	1.000

DIAGRAM INFORMATION

Use View Diagram under the Diagram menu in the Mplus Editor to view the diagram.
If running Mplus from the Mplus Diagrammer, the diagram opens automatically.

Diagram output
d:\research\pdp 2023\data\mplus\ies\ies cfa.dgm

Beginning Time: 20:21:18
Ending Time: 20:21:19
Elapsed Time: 00:00:01

MUTHEN & MUTHEN
3463 Stoner Ave.
Los Angeles, CA 90066

Tel: (310) 391-9971
Fax: (310) 391-8971
Web: www.StatModel.com
Support: Support@StatModel.com