Supplementary Matrials

Detailed results using the first set of hyperparameters

Table S1. Power (N = 200)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	HPD	0.02	0	0.02	0.028	0	0.017
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.52	0.84	0.72	0.36	0.743	0.597
	Thres_0.1	0.14	0.46	0.41	0.073	0.297	0.23
	Thres_0.15	0.015	0.19	0.17	0.015	0.087	0.08
	p-value	0.12	0	0.09	0.085	0.047	0.09
0.2 / 0.3	HPD	0.365	0	0.68	0.467	0.12	0.667
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.945	1	0.99	0.947	0.993	0.993
	Thres_0.1	0.71	0.96	0.98	0.743	0.957	0.963
	Thres_0.15	0.445	0.83	0.87	0.378	0.813	0.823
	p-value	0.645	0.18	0.87	0.752	0.59	0.847
0.3 / 0.7	HPD	0.81	0.02	1	0.973	0.47	1
	Thres_0	1	1	1	1	1	1
	Thres_0.05	1	1	1	1	1	1
	Thres_0.1	0.995	1	1	1	1	1
	Thres_0.15	0.93	1	1	0.967	1	1
	p-value	0.945	0.81	1	1	1	1

Note: True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval. residual cor (with): within-factor residual correlations. residual cor (bet): between-factor residual correlations.

Table S2. Power (N = 500)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	HPD	0.155	0	0.13	0.202	0.017	0.15
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.64	0.84	0.73	0.583	0.827	0.71
	Thres_0.1	0.16	0.36	0.32	0.13	0.267	0.277
	Thres_0.15	0.01	0.06	0.11	0.003	0.053	0.067
	p-value	0.335	0	0.27	0.423	0.133	0.323
0.2 / 0.3	HPD	0.87	0.02	0.96	0.955	0.607	0.99
	Thres_0	1	1	1	1	1	1
	Thres_0.05	1	1	1	0.997	1	1
	Thres_0.1	0.945	1	1	0.948	0.997	1
	Thres_0.15	0.595	0.89	0.97	0.67	0.943	0.977
	p-value	0.98	0.3	1	0.99	0.933	1
0.3 / 0.7	HPD	1	0.03	1	1	0.817	1
	Thres_0	1	1	1	1	1	1
	Thres_0.05	1	1	1	1	1	1
	Thres_0.1	1	1	1	1	1	1
	Thres_0.15	1	1	1	0.998	1	1
	p-value	1	0.83	1	1	1	1

Note: True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval. residual cor (with): within-factor residual correlations. residual cor (bet): between-factor residual correlations.

Table S3. Power (N = 1000)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	HPD	0.38	0	0.31	0.597	0.017	0.41
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.805	0.91	0.81	0.8	0.85	0.827
	Thres_0.1	0.175	0.3	0.44	0.148	0.213	0.303
	Thres_0.15	0.005	0	0.08	0.005	0.01	0.04
	p-value	0.71	0	0.59	0.81	0.19	0.62
0.2 / 0.3	HPD	1	0.02	1	1	0.913	1
	Thres_0	1	1	1	1	1	1
	Thres_0.05	1	1	1	1	1	1
	Thres_0.1	0.995	1	1	0.998	1	1
	Thres_0.15	0.8	0.93	1	0.865	0.993	1
	p-value	1	0.46	1	1	0.997	1
0.3 / 0.7	HPD	0.995	0.02	1	1	0.873	1
	Thres_0	1	1	1	1	1	1
	Thres_0.05	1	1	1	1	1	1
	Thres_0.1	1	1	1	1	1	1
	Thres_0.15	1	1	1	1	1	1
	p-value	1	0.81	1	1	1	1

Note: True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval. residual cor (with): within-factor residual correlations. residual cor (bet): between-factor residual correlations.

Table S4. Type I Error Rate (N = 200)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0	HPD	0.001	0	0.002	0	0	0.001
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.075	0.458	0.378	0.041	0.311	0.274
	Thres_0.1	0.003	0.1	0.086	0.002	0.05	0.047
	Thres_0.15	0.001	0.018	0.015	0	0.005	0.006
	p-value	0.002	0	0.012	0.002	0.002	0.009
0.1	HPD	0.001	0	0	0	0	0.001
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.128	0.432	0.362	0.06	0.309	0.276
	Thres_0.1	0.009	0.099	0.092	0.003	0.047	0.045
	Thres_0.15	0.005	0.015	0.012	0	0.004	0.004
	p-value	0.006	0.001	0.008	0.003	0.003	0.008
0.2 / 0.3	HPD	0.002	0	0	0	0	0.001
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.204	0.436	0.384	0.152	0.344	0.311
	Thres_0.1	0.028	0.134	0.107	0.013	0.076	0.058
	Thres_0.15	0.006	0.025	0.017	0.001	0.012	0.007
	p-value	0.009	0.001	0.011	0.007	0.006	0.011
0.3 / 0.7	HPD	0.004	0.013	0.011	0.001	0.018	0.011
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.318	0.586	0.52	0.226	0.633	0.49
	Thres_0.1	0.074	0.296	0.215	0.028	0.312	0.179
	Thres_0.15	0.013	0.157	0.071	0.002	0.136	0.05
	p-value	0.009	0.043	0.037	0.01	0.061	0.039

Note: True: true values, 0, 0.1, 0.2 and 0.3 for cross-loadings and 0, 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval.

Table S5. Type I Error Rate (N = 500)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0	HPD	0.001	0	0.004	0.001	0	0.003
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.039	0.289	0.246	0.016	0.169	0.156
	Thres_0.1	0	0.025	0.025	0	0.006	0.011
	Thres_0.15	0	0	0.002	0	0	0
	p-value	0.005	0	0.014	0.005	0.002	0.015
0.1	HPD	0	0	0.002	0.001	0	0.002
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.075	0.267	0.232	0.034	0.178	0.163
	Thres_0.1	0	0.022	0.02	0.001	0.011	0.01
	Thres_0.15	0	0	0	0	0	0
	p-value	0.006	0	0.011	0.007	0.003	0.014
0.2 / 0.3	HPD	0	0	0.002	0.001	0	0.003
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.14	0.324	0.259	0.073	0.248	0.2
	Thres_0.1	0.005	0.053	0.03	0.001	0.029	0.016
	Thres_0.15	0	0.006	0.002	0	0.003	0
	p-value	0.009	0.002	0.012	0.011	0.007	0.017
0.3 / 0.7	HPD	0	0.035	0.033	0.001	0.02	0.022
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.235	0.567	0.479	0.101	0.632	0.41
	Thres_0.1	0.021	0.268	0.154	0.003	0.254	0.105
	Thres_0.15	0	0.155	0.029	0	0.079	0.015
	p-value	0.002	0.082	0.074	0.009	0.066	0.063

Note: True: true values, 0, 0.1, 0.2 and 0.3 for cross-loadings and 0, 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval.

Table S6. Type I Error Rate (N = 1000)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0	HPD	0.001	0	0.004	0.001	0	0.004
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.01	0.169	0.156	0.003	0.079	0.077
	Thres_0.1	0	0.004	0.007	0	0.001	0.002
	Thres_0.15	0	0	0	0	0	0
	p-value	0.006	0	0.017	0.006	0.001	0.017
0.1	HPD	0	0	0.003	0.001	0	0.005
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.034	0.159	0.139	0.012	0.075	0.083
	Thres_0.1	0	0.004	0.006	0	0.002	0.002
	Thres_0.15	0	0	0	0	0	0
	p-value	0.011	0	0.015	0.01	0.001	0.018
0.2 / 0.3	HPD	0	0	0.003	0.001	0	0.006
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.078	0.26	0.17	0.024	0.146	0.111
	Thres_0.1	0	0.027	0.01	0	0.006	0.004
	Thres_0.15	0	0.001	0	0	0	0
	p-value	0.004	0	0.014	0.008	0.005	0.022
0.3 / 0.7	HPD	0	0.044	0.06	0.001	0.015	0.024
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.139	0.583	0.485	0.039	0.569	0.322
	Thres_0.1	0.002	0.266	0.122	0.001	0.171	0.044
	Thres_0.15	0	0.145	0.015	0	0.03	0.001
	p-value	0.002	0.087	0.123	0.003	0.05	0.061

Note: True: true values, 0, 0.1, 0.2 and 0.3 for cross-loadings and 0, 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval.

Table S7. Ratio of Correct Identification (N = 200)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	HPD	0.833	NA	0.667	1	NA	0.298
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.504	0.093	0.076	0.545	0.147	0.058
	Thres_0.1	0.795	0.196	0.157	0.83	0.309	0.127
	Thres_0.15	0.429	0.396	0.378	1	0.592	0.358
	p-value	0.833	0	0.31	0.85	0.562	0.237
0.2 / 0.3	HPD	0.979	NA	0.986	1	0.973	0.935
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.537	0.108	0.097	0.555	0.171	0.084
	Thres_0.1	0.864	0.274	0.276	0.92	0.473	0.32
	Thres_0.15	0.949	0.638	0.68	0.987	0.833	0.765
	p-value	0.947	0.9	0.77	0.956	0.876	0.694
0.3 / 0.7	HPD	0.981	0.074	0.787	0.995	0.653	0.716
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.44	0.082	0.074	0.469	0.101	0.055
	Thres_0.1	0.771	0.151	0.162	0.877	0.186	0.138
	Thres_0.15	0.947	0.251	0.37	0.99	0.345	0.365
	p-value	0.963	0.5	0.529	0.952	0.538	0.421

Note: Ratio of correct identification: the number of identified parameters that are non-zero / the number of identified parameters. True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval.

Table S8. Ratio of Correct Identification (N = 500)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	HPD	1	NA	0.765	0.976	0.836	0.643
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.681	0.142	0.116	0.774	0.249	0.111
	Thres_0.1	1	0.468	0.395	0.963	0.63	0.43
	Thres_0.15	1	1	0.917	1	0.888	0.87
	p-value	0.933	NA	0.5	0.924	0.74	0.401
0.2 / 0.3	HPD	1	1	0.96	0.995	0.989	0.897
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.641	0.14	0.139	0.732	0.224	0.125
	Thres_0.1	0.979	0.498	0.581	0.995	0.714	0.64
	Thres_0.15	1	0.89	0.96	1	0.963	0.987
	p-value	0.965	0.909	0.775	0.947	0.906	0.632
0.3 / 0.7	HPD	1	0.043	0.556	0.995	0.74	0.562
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.515	0.085	0.08	0.664	0.102	0.065
	Thres_0.1	0.923	0.164	0.213	0.985	0.219	0.214
	Thres_0.15	1	0.253	0.588	1	0.475	0.651
	p-value	0.992	0.347	0.36	0.957	0.52	0.313

Note: Ratio of correct identification: the number of identified parameters that are non-zero / the number of identified parameters. True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval.

Table S9. Ratio of Correct Identification (N = 1000)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	HPD	1	NA	0.816	0.992	1	0.703
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.855	0.231	0.195	0.93	0.449	0.221
	Thres_0.1	1	0.811	0.759	1	0.901	0.791
	Thres_0.15	1	NA	0.889	1	1	1
	p-value	0.942	NA	0.628	0.942	0.919	0.496
0.2 / 0.3	HPD	1	1	0.926	0.995	0.996	0.824
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.762	0.168	0.197	0.893	0.328	0.205
	Thres_0.1	1	0.662	0.806	1	0.92	0.885
	Thres_0.15	1	0.989	1	1	1	1
	p-value	0.984	1	0.746	0.962	0.937	0.566
0.3 / 0.7	HPD	1	0.023	0.408	0.995	0.804	0.548
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.643	0.083	0.079	0.837	0.112	0.081
	Thres_0.1	0.992	0.165	0.254	0.995	0.294	0.396
	Thres_0.15	1	0.266	0.741	1	0.706	0.952
	p-value	0.992	0.328	0.253	0.985	0.586	0.318

Note: Ratio of correct identification: the number of identified parameters that are non-zero / the number of identified parameters. True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval.

Detailed results using the second set of hyperparameters

Table S10. Relative Bias of Estimates for the Cross-loadings and Residual Correlations.

		Two-factor Model			Three-factor Model		
True	*N*	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	200	-0.215	0.04	-0.01	-0.365	-0.08	-0.15
	500	-0.205	-0.05	-0.06	-0.272	-0.08	-0.09
	1000	-0.17	-0.08	-0.02	-0.193	-0.1	-0.07
0.2 / 0.3	200	-0.177	-0.17	-0.03	-0.233	-0.167	-0.093
	500	-0.128	-0.18	-0.02	-0.129	-0.13	-0.033
	1000	-0.095	-0.177	0.007	-0.079	-0.117	-0.01
0.3 / 0.7	200	-0.115	-0.314	0.034	-0.111	-0.226	0.001
	500	-0.082	-0.333	0.053	-0.059	-0.184	0.027
	1000	-0.063	-0.333	0.061	-0.039	-0.15	0.029

Note: True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. *N*: sample size. residual cor (with): within-factor residual correlations. residual cor (bet): between-factor residual correlations.

Table S11. Root Mean Square Error (RMSE) of Estimates for the Cross-loadings and Residual Correlations.

		Two-factor Model			Three-factor Model		
True	*N*	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	200	0.053	0.029	0.036	0.057	0.027	0.034
	500	0.04	0.018	0.029	0.044	0.022	0.027
	1000	0.032	0.016	0.022	0.032	0.018	0.02
0.2 / 0.3	200	0.069	0.063	0.051	0.073	0.062	0.052
	500	0.046	0.059	0.039	0.048	0.049	0.035
	1000	0.034	0.057	0.026	0.031	0.041	0.023
0.3 / 0.7	200	0.07	0.227	0.073	0.064	0.171	0.063
	500	0.044	0.237	0.06	0.04	0.139	0.045
	1000	0.033	0.238	0.056	0.027	0.113	0.036

Note: True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. *N*: sample size. residual cor (with): within-factor residual correlations. residual cor (bet): between-factor residual correlations.

Table S12. Coverage Rate of Estimates for the Cross-loadings and Residual Correlations.

		Two-factor Model			Three-factor Model		
True	*N*	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	200	0.995	1	1	0.962	1	0.993
	500	1	1	0.97	0.943	1	0.973
	1000	0.995	1	1	0.975	1	0.977
0.2 / 0.3	200	0.985	1	0.96	0.925	0.96	0.943
	500	1	1	0.96	0.957	0.977	0.957
	1000	0.995	1	0.99	0.993	0.99	0.99
0.3 / 0.7	200	0.99	0.61	0.97	0.97	0.693	0.977
	500	1	0.52	0.91	0.993	0.83	0.963
	1000	1	0.5	0.85	0.997	0.917	0.967

Note: True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. *N*: sample size. residual cor (with): within-factor residual correlations. residual cor (bet): between-factor residual correlations.

Table S13. Power (N = 200)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	HPD	0.045	0	0.03	0.062	0.003	0.023
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.69	0.87	0.73	0.592	0.747	0.6
	Thres_0.1	0.35	0.53	0.46	0.165	0.303	0.233
	Thres_0.15	0.075	0.2	0.16	0.048	0.097	0.08
	p-value	0.165	0	0.1	0.155	0.043	0.097
0.2 / 0.3	HPD	0.475	0.01	0.68	0.587	0.117	0.693
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.98	1	1	0.978	0.993	0.993
	Thres_0.1	0.84	0.97	0.98	0.823	0.967	0.96
	Thres_0.15	0.605	0.83	0.89	0.51	0.817	0.827
	p-value	0.695	0.14	0.86	0.787	0.58	0.85
0.3 / 0.7	HPD	0.9	0.02	1	0.982	0.443	1
	Thres_0	1	1	1	1	1	1
	Thres_0.05	1	1	1	1	1	1
	Thres_0.1	0.995	1	1	1	1	1
	Thres_0.15	0.98	1	1	0.978	1	1
	p-value	0.98	0.76	1	1	1	1

Note: True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval. residual cor (with): within-factor residual correlations. residual cor (bet): between-factor residual correlations.

Table S14. Power (N = 500)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	HPD	0.13	0	0.14	0.278	0.013	0.153
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.79	0.89	0.74	0.727	0.813	0.717
	Thres_0.1	0.255	0.35	0.33	0.238	0.28	0.287
	Thres_0.15	0.02	0.06	0.11	0.013	0.053	0.07
	p-value	0.335	0	0.27	0.482	0.143	0.33
0.2 / 0.3	HPD	0.855	0.01	0.98	0.967	0.613	0.99
	Thres_0	1	1	1	1	1	1
	Thres_0.05	1	1	1	0.998	1	1
	Thres_0.1	0.99	1	1	0.965	0.997	1
	Thres_0.15	0.735	0.95	0.97	0.735	0.943	0.98
	p-value	0.98	0.33	1	0.992	0.937	1
0.3 / 0.7	HPD	1	0.02	1	1	0.783	1
	Thres_0	1	1	1	1	1	1
	Thres_0.05	1	1	1	1	1	1
	Thres_0.1	1	1	1	1	1	1
	Thres_0.15	1	1	1	0.998	1	1
	p-value	1	0.79	1	1	1	1

Note: True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval. residual cor (with): within-factor residual correlations. residual cor (bet): between-factor residual correlations.

Table S15. Power (N = 1000)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	HPD	0.27	0	0.35	0.608	0.02	0.413
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.88	0.9	0.83	0.88	0.843	0.823
	Thres_0.1	0.255	0.28	0.42	0.212	0.22	0.32
	Thres_0.15	0.01	0	0.08	0.008	0.013	0.04
	p-value	0.595	0	0.61	0.813	0.183	0.623
0.2 / 0.3	HPD	0.985	0.01	1	1	0.893	1
	Thres_0	1	1	1	1	1	1
	Thres_0.05	1	1	1	1	1	1
	Thres_0.1	1	1	1	1	1	1
	Thres_0.15	0.855	0.95	1	0.898	0.993	1
	p-value	1	0.44	1	1	1	1
0.3 / 0.7	HPD	1	0.04	1	1	0.903	1
	Thres_0	1	1	1	1	1	1
	Thres_0.05	1	1	1	1	1	1
	Thres_0.1	1	1	1	1	1	1
	Thres_0.15	1	1	1	1	1	1
	p-value	1	0.77	1	1	1	1

Note: True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval. residual cor (with): within-factor residual correlations. residual cor (bet): between-factor residual correlations.

Table S16. Type I Error Rate (N = 200)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0	HPD	0.001	0	0.001	0.001	0	0.001
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.197	0.488	0.382	0.116	0.319	0.275
	Thres_0.1	0.02	0.122	0.094	0.008	0.055	0.048
	Thres_0.15	0.001	0.02	0.018	0	0.006	0.006
	p-value	0.005	0	0.012	0.006	0.002	0.01
0.1	HPD	0.001	0	0	0.001	0	0.001
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.208	0.467	0.371	0.132	0.319	0.278
	Thres_0.1	0.019	0.12	0.098	0.01	0.05	0.046
	Thres_0.15	0.005	0.023	0.012	0	0.005	0.004
	p-value	0.005	0.001	0.007	0.006	0.003	0.009
0.2 / 0.3	HPD	0.001	0	0	0.001	0	0.001
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.235	0.467	0.392	0.179	0.356	0.316
	Thres_0.1	0.03	0.155	0.115	0.018	0.081	0.06
	Thres_0.15	0.006	0.031	0.02	0.001	0.013	0.007
	p-value	0.007	0.002	0.011	0.006	0.007	0.011
0.3 / 0.7	HPD	0.001	0.013	0.012	0.001	0.02	0.012
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.288	0.591	0.518	0.218	0.635	0.501
	Thres_0.1	0.045	0.323	0.223	0.026	0.322	0.185
	Thres_0.15	0.007	0.165	0.076	0.002	0.144	0.053
	p-value	0.007	0.047	0.043	0.007	0.064	0.041

Note: True: true values, 0, 0.1, 0.2 and 0.3 for cross-loadings and 0, 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval.

Table S17. Type I Error Rate (N = 500)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0	HPD	0.001	0	0.004	0.001	0	0.004
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.089	0.322	0.246	0.042	0.177	0.156
	Thres_0.1	0.003	0.029	0.026	0.001	0.006	0.011
	Thres_0.15	0	0	0.002	0	0	0
	p-value	0.005	0	0.014	0.01	0.002	0.016
0.1	HPD	0	0	0.002	0.001	0	0.002
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.101	0.297	0.234	0.067	0.182	0.163
	Thres_0.1	0	0.027	0.025	0.001	0.011	0.011
	Thres_0.15	0	0.001	0.001	0	0	0
	p-value	0	0	0.01	0.007	0.003	0.015
0.2 / 0.3	HPD	0	0	0.002	0.001	0	0.004
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.141	0.344	0.271	0.082	0.259	0.201
	Thres_0.1	0	0.062	0.032	0.002	0.033	0.017
	Thres_0.15	0	0.007	0.002	0	0.003	0.001
	p-value	0	0.002	0.013	0.007	0.007	0.016
0.3 / 0.7	HPD	0	0.038	0.036	0.001	0.02	0.025
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.178	0.563	0.498	0.095	0.625	0.419
	Thres_0.1	0.004	0.278	0.165	0.003	0.261	0.113
	Thres_0.15	0	0.161	0.035	0	0.088	0.017
	p-value	0	0.081	0.084	0.004	0.067	0.069

Note: True: true values, 0, 0.1, 0.2 and 0.3 for cross-loadings and 0, 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval.

Table S18. Type I Error Rate (N = 1000)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0	HPD	0.001	0	0.004	0.001	0	0.004
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.023	0.176	0.157	0.013	0.084	0.077
	Thres_0.1	0.001	0.003	0.008	0	0.001	0.002
	Thres_0.15	0	0	0	0	0	0
	p-value	0.004	0	0.017	0.008	0.001	0.017
0.1	HPD	0	0	0.003	0.001	0	0.005
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.035	0.175	0.145	0.019	0.076	0.084
	Thres_0.1	0	0.004	0.007	0	0.002	0.003
	Thres_0.15	0	0	0	0	0	0
	p-value	0.001	0	0.014	0.008	0.002	0.018
0.2 / 0.3	HPD	0	0	0.002	0.001	0	0.006
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.07	0.268	0.175	0.026	0.155	0.113
	Thres_0.1	0	0.027	0.009	0	0.008	0.004
	Thres_0.15	0	0.001	0	0	0	0
	p-value	0	0	0.013	0.004	0.005	0.022
0.3 / 0.7	HPD	0	0.046	0.06	0.001	0.015	0.022
	Thres_0	1	1	1	1	1	1
	Thres_0.05	0.096	0.574	0.489	0.035	0.561	0.319
	Thres_0.1	0	0.263	0.13	0	0.16	0.043
	Thres_0.15	0	0.144	0.016	0	0.028	0.002
	p-value	0	0.095	0.132	0.002	0.049	0.061

Note: True: true values, 0, 0.1, 0.2 and 0.3 for cross-loadings and 0, 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval.

Table S19. Ratio of Correct Identification (N = 200)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	HPD	0.918	NA	0.75	0.925	1	0.365
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.453	0.089	0.076	0.473	0.143	0.058
	Thres_0.1	0.822	0.189	0.164	0.767	0.3	0.127
	Thres_0.15	0.789	0.312	0.356	1	0.581	0.338
	p-value	0.892	0	0.37	0.838	0.54	0.244
0.2 / 0.3	HPD	0.992	1	0.986	0.992	0.972	0.937
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.51	0.101	0.096	0.522	0.166	0.083
	Thres_0.1	0.875	0.248	0.262	0.901	0.46	0.315
	Thres_0.15	0.962	0.585	0.645	0.99	0.819	0.761
	p-value	0.961	0.824	0.761	0.963	0.857	0.693
0.3 / 0.7	HPD	0.996	0.074	0.775	0.995	0.607	0.701
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.465	0.082	0.074	0.478	0.101	0.054
	Thres_0.1	0.847	0.14	0.157	0.885	0.181	0.134
	Thres_0.15	0.972	0.242	0.353	0.99	0.331	0.348
	p-value	0.972	0.461	0.49	0.966	0.527	0.408

Note: Ratio of correct identification: the number of identified parameters that are non-zero / the number of identified parameters. True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval.

Table S20. Ratio of Correct Identification (N = 500)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	HPD	1	NA	0.737	0.982	0.661	0.647
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.662	0.136	0.116	0.684	0.242	0.111
	Thres_0.1	1	0.407	0.359	0.979	0.636	0.428
	Thres_0.15	1	0.857	0.786	1	0.888	0.875
	p-value	1	NA	0.519	0.932	0.796	0.39
0.2 / 0.3	HPD	1	1	0.951	0.995	0.995	0.881
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.639	0.133	0.133	0.709	0.216	0.125
	Thres_0.1	1	0.459	0.568	0.99	0.684	0.633
	Thres_0.15	1	0.88	0.951	1	0.956	0.977
	p-value	1	0.892	0.758	0.966	0.906	0.638
0.3 / 0.7	HPD	1	0.027	0.538	0.995	0.737	0.534
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.584	0.085	0.077	0.678	0.103	0.064
	Thres_0.1	0.984	0.159	0.202	0.985	0.215	0.202
	Thres_0.15	1	0.246	0.546	1	0.448	0.629
	p-value	1	0.341	0.332	0.98	0.516	0.294

Note: Ratio of correct identification: the number of identified parameters that are non-zero / the number of identified parameters. True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval.

Table S21. Ratio of Correct Identification (N = 1000)

		Two-factor Model			Three-factor Model		
True	Methods	cross-loadings	residual cor (with)	residual cor (bet)	cross-loadings	residual cor (with)	residual cor (bet)
0.1	HPD	1	NA	0.833	0.992	0.857	0.689
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.863	0.213	0.192	0.903	0.441	0.22
	Thres_0.1	1	0.778	0.712	1	0.904	0.774
	Thres_0.15	1	NA	0.889	1	1	1
	p-value	0.993	NA	0.649	0.953	0.887	0.497
0.2 / 0.3	HPD	1	1	0.943	0.995	0.996	0.824
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.781	0.164	0.192	0.885	0.315	0.201
	Thres_0.1	1	0.658	0.826	1	0.904	0.877
	Thres_0.15	1	0.979	1	1	1	1
	p-value	1	1	0.758	0.98	0.938	0.569
0.3 / 0.7	HPD	1	0.043	0.408	0.995	0.816	0.569
	Thres_0	0.2	0.05	0.04	0.167	0.067	0.028
	Thres_0.05	0.723	0.084	0.078	0.851	0.113	0.082
	Thres_0.1	1	0.167	0.243	1	0.308	0.4
	Thres_0.15	1	0.268	0.719	1	0.718	0.94
	p-value	1	0.298	0.24	0.99	0.593	0.321

Note: Ratio of correct identification: the number of identified parameters that are non-zero / the number of identified parameters. True: true values, 0.1, 0.2 and 0.3 for cross-loadings and 0.1, 0.3, 0.7 for residual correlations. Method: methods of variable selection. Thres: thresholds include 0, 0.05, 0.1, and 0.15. HPD: 95% highest posterior density interval.