Confirmatory Factor Analysis

Statsomat.com

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Warning: The automatic computation and interpretation delivered by the Statsomat should not completely replace the classical, made by humans graphical exploratory data analysis and statistical analysis. There may be data cases for which the Statsomat does not deliver the most optimal solution or output interpretation.

Basic Information

Automatic statistics for the file:

File
case4.csv

Your selection for the encoding: Auto
Your selection for the decimal character: Auto
Observations (rows with at least one non-missing value): 250
Variables (columns with at least one non-missing value): 12
Variables considered continuous: 12

Variables considered continuous
x1
x2
x3
x4
x5
x6
x7
x8
x9
x10
x11
x12

Numerical variables considered binary or ordinal: 0
Character variables considered binary: 0
Character variables considered nominal and transformed to binary: 0

Model Syntax

The following table describes the applied model equations in lavaan model syntax, either as entered by you in the text area (denoted by User=1) or established internally (User=0). The last column numbers the free parameters which are estimated.

Left hand side	Operator	Right hand side	User	Free parameter
Coping	=~	x1	1	0
Coping	=~	x2	1	1
Coping	=~	x3	1	2
Coping	=~	x4	1	3
Social	=~	x5	1	0
Social	=~	x6	1	4
Social	=~	x7	1	5
Social	=~	x8	1	6
Enhance	=~	x9	1	0
Enhance	=~	x10	1	7
Enhance	=~	x11	1	8
Enhance	=~	x12	1	9
x1	~~	x1	0	10
x2	~~	x2	0	11
x3	~~	x3	0	12
x4	~~	x4	0	13
x5	~~	x5	0	14
x6	~~	x6	0	15
x7	~~	x7	0	16
x8	~~	x8	0	17
x9	~~	x9	0	18
x10	~~	x10	0	19
x11	~~	x11	0	20
x12	~~	x12	0	21
Coping	~~	Coping	0	22
Social	~~	Social	0	23
Enhance	~~	Enhance	0	24
Coping	~~	Social	0	25
Coping	~~	Enhance	0	26
Social	~~	Enhance	0	27
x1	~1		0	28
x2	~1		0	29
x3	~1		0	30
x4	~1		0	31
x5	~1		0	32
x6	~1		0	33
x7	~1		0	34
x8	~1		0	35
x9	~1		0	36
x10	~1		0	37
x11	~1		0	38
x12	~1		0	39
Coping	~1		0	0
Social	~1		0	0
Enhance	~1		0	0

Assumptions

Open issue

Model Settings

Outputs

Model Fit Summary

```
lavaan 0.6-7 ended normally after 54 iterations

  Estimator                                         ML
  Optimization method                           NLMINB
  Number of free parameters                         39

  Number of observations                           250
  Number of missing patterns                         1

Model Test User Model:

  Test statistic                                43.389
  Degrees of freedom                                51
  P-value (Chi-square)                           0.767

Model Test Baseline Model:

  Test statistic                               832.013
  Degrees of freedom                                66
  P-value                                        0.000

User Model versus Baseline Model:

  Comparative Fit Index (CFI)                    1.000
  Tucker-Lewis Index (TLI)                       1.013

Loglikelihood and Information Criteria:

  Loglikelihood user model (H0)              -5970.532
  Loglikelihood unrestricted model (H1)      -5948.837

  Akaike (AIC)                               12019.063
  Bayesian (BIC)                             12156.400
  Sample-size adjusted Bayesian (BIC)        12032.767
```

Root Mean Square Error of Approximation:

RMSEA	0.000
90 Percent confidence interval - lower	0.000
90 Percent confidence interval - upper	0.029
P-value RMSEA <= 0.05	0.999

Standardized Root Mean Square Residual:

SRMR	0.034

Parameter Estimates:

Standard errors	Standard
Information	Observed
Observed information based on	Hessian

Latent Variables:

	Estimate	Std.Err	z-value	P(>|z|)
Coping =~				
x1	1.000			
x2	0.745	0.144	5.175	0.000
x3	0.974	0.185	5.277	0.000
x4	1.512	0.230	6.576	0.000
Social =~				
x5	1.000			
x6	1.208	0.130	9.279	0.000
x7	1.568	0.180	8.703	0.000
x8	1.510	0.166	9.084	0.000
Enhance =~				
x9	1.000			
x10	0.648	0.093	6.983	0.000
x11	1.053	0.162	6.483	0.000
x12	1.097	0.171	6.432	0.000

Covariances:

	Estimate	Std.Err	z-value	P(>|z|)
Coping ~~				
Social	0.775	0.155	5.002	0.000
Enhance	0.460	0.144	3.203	0.001
Social ~~				
Enhance	0.471	0.163	2.897	0.004

Intercepts:

	Estimate	Std.Err	z-value	P(>|z|)
.x1	-0.000	0.130	-0.000	1.000
.x2	0.000	0.096	0.000	1.000
.x3	0.000	0.121	0.000	1.000

```
   .x4                0.000    0.089    0.000    1.000
   .x5                0.000    0.109    0.000    1.000
   .x6                0.000    0.112    0.000    1.000
   .x7                0.000    0.157    0.000    1.000
   .x8                0.000    0.143    0.000    1.000
   .x9                0.000    0.169    0.000    1.000
   .x10              -0.000    0.110   -0.000    1.000
   .x11              -0.000    0.162   -0.000    1.000
   .x12              -0.000    0.168   -0.000    1.000
    Coping            0.000
    Social            0.000
    Enhance           0.000

Variances:
                   Estimate  Std.Err  z-value  P(>|z|)
   .x1                3.439    0.316   10.868    0.000
   .x2                1.864    0.174   10.721    0.000
   .x3                2.924    0.270   10.810    0.000
   .x4                0.181    0.126    1.439    0.150
   .x5                1.786    0.183    9.760    0.000
   .x6                1.375    0.163    8.441    0.000
   .x7                3.236    0.351    9.227    0.000
   .x8                2.407    0.276    8.722    0.000
   .x9                4.561    0.537    8.493    0.000
   .x10               1.962    0.230    8.518    0.000
   .x11               3.707    0.481    7.702    0.000
   .x12               3.929    0.517    7.603    0.000
    Coping            0.787    0.232    3.395    0.001
    Social            1.195    0.231    5.166    0.000
    Enhance           2.592    0.604    4.291    0.000
```

Completely Standardized Parameter Estimates

```
Latent Variables:
                   est.std  Std.Err  z-value  P(>|z|) ci.lower ci.upper
  Coping =~
    x1               0.432    0.055    7.800    0.000    0.323    0.540
    x2               0.436    0.057    7.668    0.000    0.324    0.547
    x3               0.451    0.055    8.279    0.000    0.344    0.558
    x4               0.953    0.034   28.440    0.000    0.888    1.019
  Social =~
    x5               0.633    0.045   14.181    0.000    0.546    0.721
    x6               0.748    0.036   20.729    0.000    0.677    0.819
    x7               0.690    0.040   17.046    0.000    0.611    0.769
    x8               0.729    0.038   19.391    0.000    0.655    0.802
  Enhance =~
    x9               0.602    0.057   10.526    0.000    0.490    0.714
```

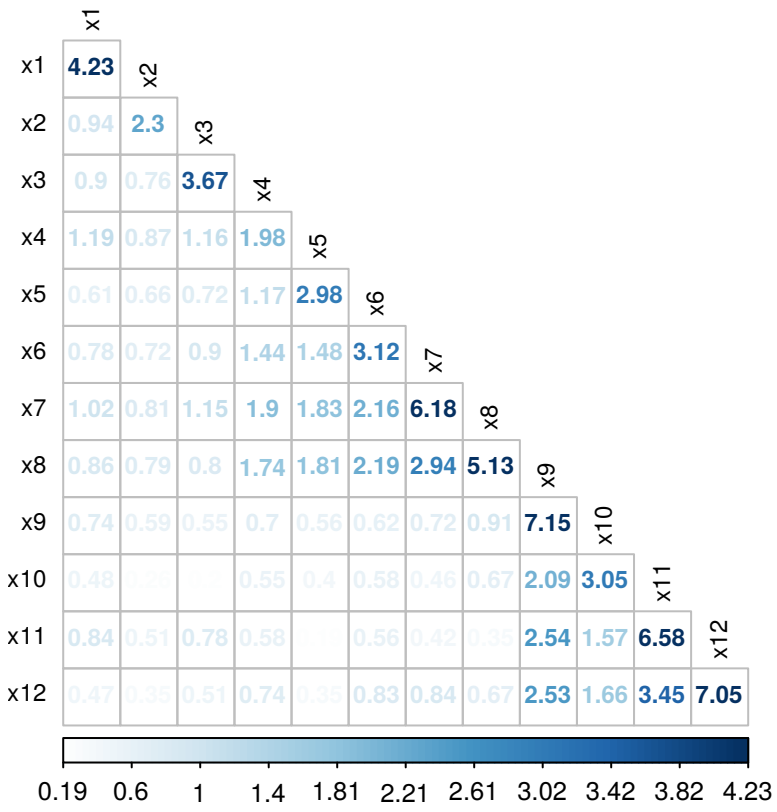
```
    x10               0.597    0.058   10.351    0.000    0.484    0.710
    x11               0.661    0.054   12.312    0.000    0.556    0.766
    x12               0.665    0.054   12.402    0.000    0.560    0.770

Covariances:
                   est.std  Std.Err  z-value  P(>|z|) ci.lower ci.upper
  Coping ~~
    Social           0.799    0.040   19.799    0.000    0.720    0.878
    Enhance          0.322    0.073    4.418    0.000    0.179    0.465
  Social ~~
    Enhance          0.268    0.079    3.382    0.001    0.113    0.423

Intercepts:
                   est.std  Std.Err  z-value  P(>|z|) ci.lower ci.upper
   .x1              -0.000    0.063   -0.000    1.000   -0.124    0.124
   .x2               0.000    0.063    0.000    1.000   -0.124    0.124
   .x3               0.000    0.063    0.000    1.000   -0.124    0.124
   .x4               0.000    0.063    0.000    1.000   -0.124    0.124
   .x5               0.000    0.063    0.000    1.000   -0.124    0.124
   .x6               0.000    0.063    0.000    1.000   -0.124    0.124
   .x7              -0.000    0.063   -0.000    1.000   -0.124    0.124
   .x8               0.000    0.063    0.000    1.000   -0.124    0.124
   .x9               0.000    0.063    0.000    1.000   -0.124    0.124
   .x10             -0.000    0.063   -0.000    1.000   -0.124    0.124
   .x11             -0.000    0.063   -0.000    1.000   -0.124    0.124
   .x12             -0.000    0.063   -0.000    1.000   -0.124    0.124
    Coping           0.000                             0.000    0.000
    Social           0.000                             0.000    0.000
    Enhance          0.000                             0.000    0.000

Variances:
                   est.std  Std.Err  z-value  P(>|z|) ci.lower ci.upper
   .x1               0.814    0.048   17.031    0.000    0.720    0.907
   .x2               0.810    0.050   16.357    0.000    0.713    0.907
   .x3               0.796    0.049   16.191    0.000    0.700    0.893
   .x4               0.091    0.064    1.430    0.153   -0.034    0.217
   .x5               0.599    0.057   10.592    0.000    0.488    0.710
   .x6               0.441    0.054    8.170    0.000    0.335    0.547
   .x7               0.524    0.056    9.381    0.000    0.415    0.633
   .x8               0.469    0.055    8.562    0.000    0.362    0.576
   .x9               0.638    0.069    9.260    0.000    0.503    0.773
   .x10              0.643    0.069    9.328    0.000    0.508    0.778
   .x11              0.563    0.071    7.945    0.000    0.424    0.702
   .x12              0.558    0.071    7.814    0.000    0.418    0.697
    Coping           1.000                             1.000    1.000
    Social           1.000                             1.000    1.000
    Enhance          1.000                             1.000    1.000
```

Communality

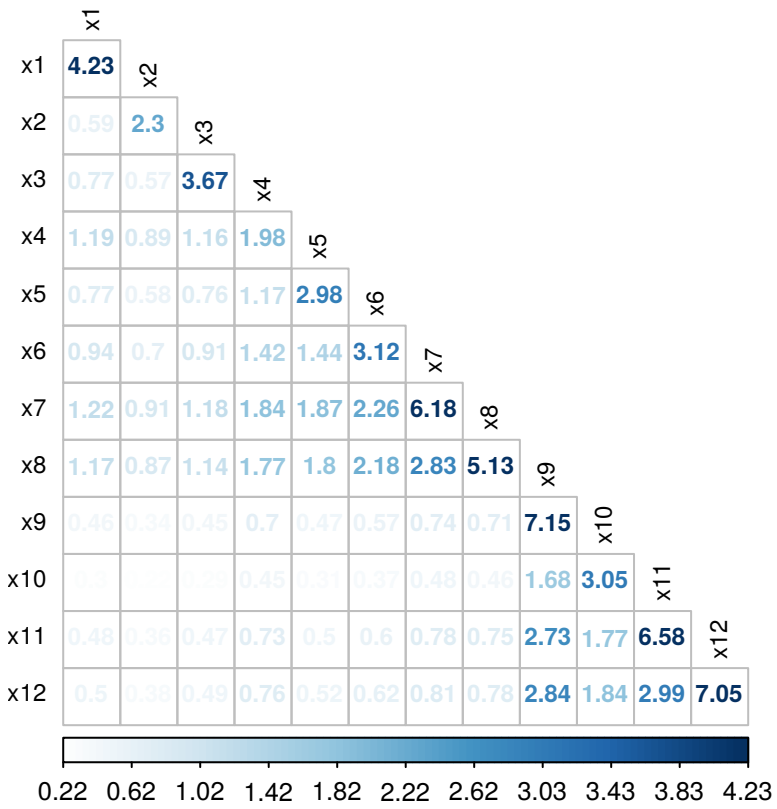
Table 1: Communality

Variable	Communality
x1	0.19
x2	0.19
x3	0.20
x4	0.91
x5	0.40
x6	0.56
x7	0.48
x8	0.53
x9	0.36
x10	0.36
x11	0.44
x12	0.44

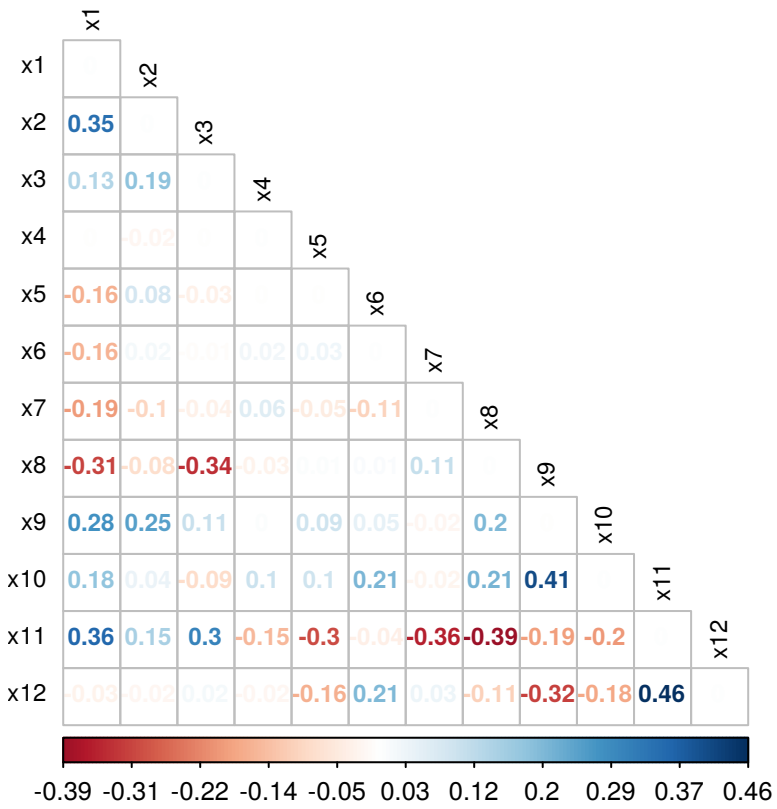
Observed Covariance Matrix



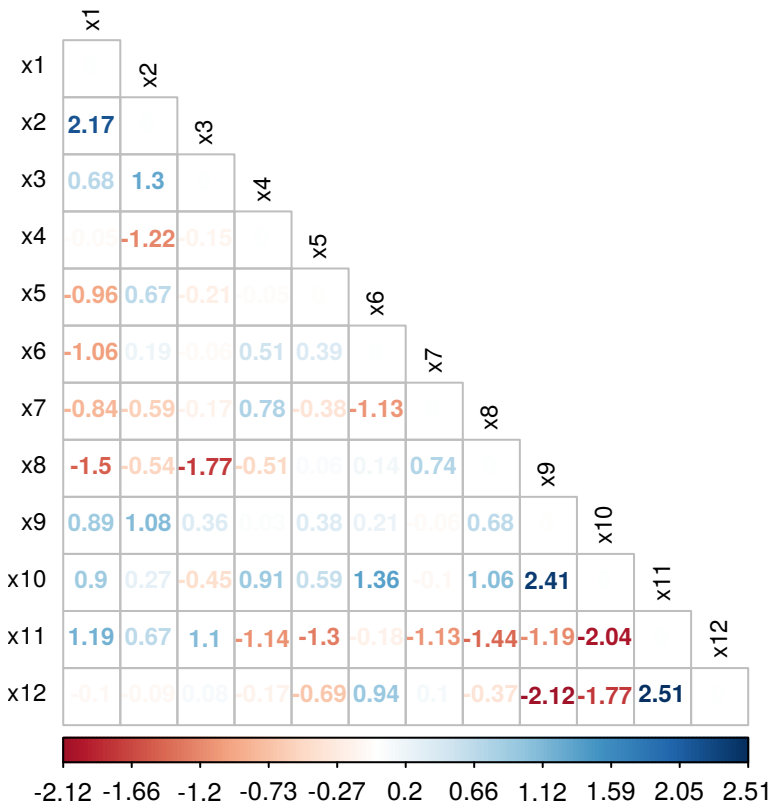
Fitted Covariance Matrix



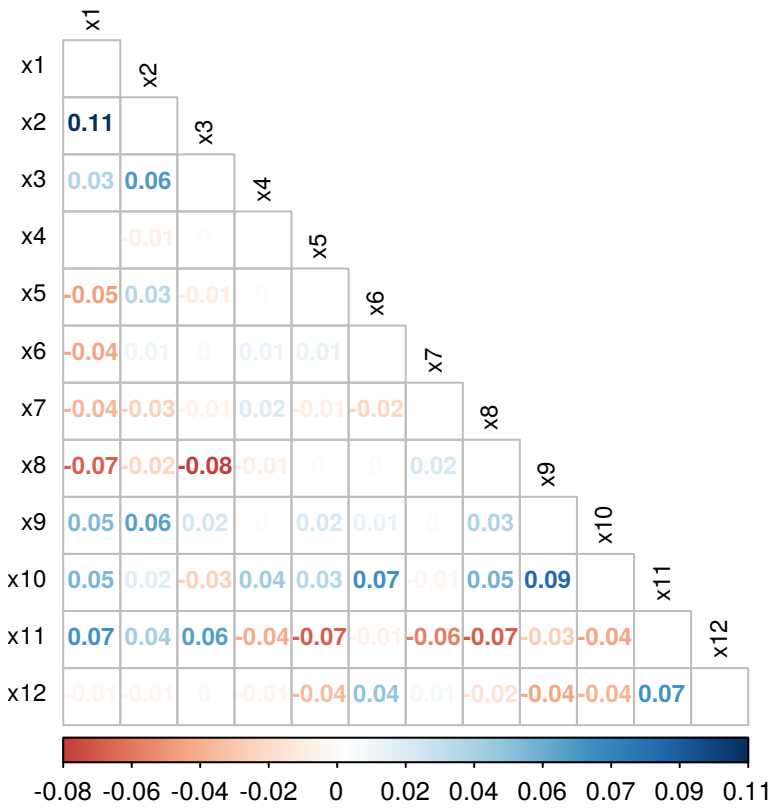
Residual Covariance Matrix



Standardized Residual Matrix



Residual Correlation Matrix



Modification Indices

Table 2: Modification Indices With Respect To (Residual) Correlation

Left	Operator	Right	Modification Index	Expected Parameter Change	Delta	Power	Decision
x11	~~	x12	13.474	1.708	0.1	0.055	**(m)**
x9	~~	x10	9.923	0.860	0.1	0.065	**(m)**
x1	~~	x2	5.149	0.378	0.1	0.092	**(m)**
x9	~~	x12	3.848	-0.874	0.1	0.056	**(m)**
x10	~~	x11	3.666	-0.532	0.1	0.065	(i)
x2	~~	x4	3.390	-0.228	0.1	0.127	(i)
x3	~~	x11	2.983	0.408	0.1	0.071	(i)
x10	~~	x12	2.786	-0.483	0.1	0.064	(i)
x3	~~	x8	2.640	-0.309	0.1	0.082	(i)
x1	~~	x11	2.015	0.363	0.1	0.068	(i)
x3	~~	x10	1.773	-0.221	0.1	0.093	(i)
x2	~~	x3	1.754	0.204	0.1	0.099	(i)
x9	~~	x11	1.454	-0.517	0.1	0.056	(i)
x4	~~	x11	1.319	-0.148	0.1	0.121	(i)
x6	~~	x7	1.264	-0.214	0.1	0.082	(i)
x8	~~	x11	1.072	-0.243	0.1	0.071	(i)
x4	~~	x7	1.057	0.130	0.1	0.124	(i)
x2	~~	x9	0.939	0.196	0.1	0.079	(i)
x6	~~	x12	0.834	0.170	0.1	0.084	(i)
x8	~~	x9	0.811	0.227	0.1	0.068	(i)
x2	~~	x11	0.799	0.168	0.1	0.083	(i)
x1	~~	x8	0.768	-0.180	0.1	0.077	(i)
x7	~~	x10	0.760	-0.163	0.1	0.083	(i)
x1	~~	x12	0.752	-0.229	0.1	0.067	(i)
x2	~~	x5	0.725	0.106	0.1	0.127	(i)
x7	~~	x8	0.715	0.206	0.1	0.070	(i)
x8	~~	x10	0.656	0.133	0.1	0.093	(i)
x2	~~	x7	0.572	-0.130	0.1	0.090	(i)
x5	~~	x12	0.572	-0.151	0.1	0.079	(i)
x5	~~	x11	0.563	-0.145	0.1	0.081	(i)
x4	~~	x10	0.531	0.065	0.1	0.201	(i)
x6	~~	x9	0.528	-0.140	0.1	0.081	(i)
x1	~~	x3	0.493	0.147	0.1	0.076	(i)
x4	~~	x9	0.444	-0.091	0.1	0.113	(i)
x5	~~	x9	0.411	0.133	0.1	0.077	(i)
x2	~~	x12	0.363	-0.117	0.1	0.081	(i)
x7	~~	x12	0.319	0.155	0.1	0.065	(i)
x6	~~	x10	0.299	0.069	0.1	0.124	(i)
x8	~~	x12	0.295	-0.132	0.1	0.070	(i)
x1	~~	x6	0.242	-0.078	0.1	0.097	(i)
x1	~~	x9	0.234	0.133	0.1	0.065	(i)
x1	~~	x5	0.226	-0.080	0.1	0.091	(i)
x2	~~	x10	0.217	-0.062	0.1	0.118	(i)
x5	~~	x6	0.185	0.057	0.1	0.118	(i)
x2	~~	x8	0.183	-0.065	0.1	0.101	(i)
x5	~~	x10	0.170	0.056	0.1	0.114	(i)
x5	~~	x7	0.146	-0.072	0.1	0.083	(i)
x1	~~	x7	0.145	-0.089	0.1	0.071	(i)

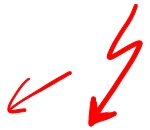


Table 3: Modification Indices With Respect To Factor Loadings

Left	Operator	Right	Modification Index	Expected Parameter Change	Delta	Power	Decision
Social	=~	x4	9.458	1.300	0.4	0.157	**(m)**
Social	=~	x1	3.463	-0.520	0.4	0.299	(i)
Social	=~	x11	2.179	-0.229	0.4	0.731	(i)
Enhance	=~	x4	1.551	-0.104	0.4	0.998	(nm)
Social	=~	x10	1.442	0.128	0.4	0.964	(nm)
Enhance	=~	x6	1.248	0.078	0.4	1.000	(nm)
Social	=~	x3	1.029	-0.267	0.4	0.331	(i)
Coping	=~	x10	1.008	0.129	0.4	0.877	(nm)
Coping	=~	x8	0.981	-0.323	0.4	0.232	(i)
Enhance	=~	x1	0.977	0.093	0.4	0.990	(nm)
Coping	=~	x11	0.935	-0.181	0.4	0.569	(i)
Enhance	=~	x2	0.431	0.045	0.4	1.000	(nm)
Coping	=~	x7	0.390	0.220	0.4	0.206	(i)
Enhance	=~	x5	0.298	-0.039	0.4	1.000	(nm)
Enhance	=~	x7	0.269	-0.052	0.4	0.979	(nm)
Coping	=~	x6	0.242	0.127	0.4	0.342	(i)
Enhance	=~	x3	0.190	0.038	0.4	0.996	(nm)
Social	=~	x9	0.169	0.067	0.4	0.691	(i)
Coping	=~	x9	0.051	0.044	0.4	0.532	(i)
Enhance	=~	x8	0.047	-0.019	0.4	0.994	(nm)
Social	=~	x2	0.026	-0.033	0.4	0.490	(i)
Coping	=~	x12	0.020	-0.027	0.4	0.540	(i)
Coping	=~	x5	0.015	-0.030	0.4	0.375	(i)
Social	=~	x12	0.001	0.004	0.4	0.701	(i)

Interpretation

Goodness of Fit Indices

We consider some of the model fit indices from the Model Fit Summary section to check the goodness-of-fit of the model. To decide for an acceptable or non-acceptable model, we apply thresholds considered in the References: [@brown], [@kline].

Model Test User Model

The degrees of freedom are calculated as the number of known parameters minus the number of free parameters: 90 - 39 = 51 . The 51 degrees of freedom indicate an over-identified model, fact which basically enables further analysis and interpretation.

The test statistic with the value 43.389 is called the Chi-square model fit index and represents the difference between summaries of the model-implied covariance matrix and the observed covariance matrix which is hypothesized and desirable to be zero. In general, if the p-value is larger than 0.05 then the test is not statistically significant at 5 % error, the hypothesis cannot be rejected, which would be in favour of the model.
In our case, the p-value is 0.767 suggesting an acceptable model fit.

Model Test Baseline Model

The test statistic with the value 832.013 represents the difference between summaries of the baseline model (an alternative model-implied covariance matrix having zero covariances, i.e. a worst fitting model assuming independent variables) and the observed covariance matrix. The p-value of the test of a zero difference is <0.001 suggesting that the baseline model does not fit good to the data. This result is used indirectly in the construction of other model fit indices.

Root Mean Square Error of Approximation:
The Root Mean Square Error of Approximation (RMSEA) is a fit index based on the chi-square test statistic, which corrects for parsimony, i.e. overly complex models are penalized. RMSEA can be greater or equal than zero, with values close to zero suggesting an acceptable model fit.
In our case, the RMSEA is 0. The upper bound of the 90% confidence interval of the RMSEA is 0.029 and smaller than the threshold value 0.05, suggesting an excellent model fit.

Standardized Root Mean Square Residual:
The Standardized Root Mean Square Residual (SRMR) is a fit index derived from the residual correlation matrix with a range between zero and one with values close to zero suggesting an acceptable model fit.
In our case, the SRMR is 0.03 which is smaller than the threshold value 0.1 suggesting an acceptable model fit.

User Model versus Baseline Model
The Comparative Fit Index (CFI), evaluates the fit of the the model in relation to the worst-fitting baseline model described above. It ranges between zero and one, with values close to one suggesting good models (in the sense of departure from the baseline model).
In our case, the CFI is 1 which is greater or equal than the threshold value 0.95, suggesting a good model fit.

Similarly to the CFI, the Tucker-Lewis Index (TLI) evaluates the fit of the model in relation to the worst-fitting baseline model described above. Moreover, overly complex models are penalized. Values can range outside zero and one but the index is interpreted similarly to the CFI.
In our case, the TLI is 1.013 which is greater or equal than the threshold value 0.95, suggesting a good model fit.

Summary of the Goodness of Fit Indices

The Chi-square model fit index, the RMSEA and the TLI suggest an acceptable model fit. We tentatively assume an acceptable model fit and verify this assertion by considering further metrics.

Residuals

We analyze the residual matrices from the Outputs chapter. The residual covariance matrix represents the difference between the observed covariance matrix and the fitted model-implied covariance matrix. Large absolute values indicate local areas of misfit. However, the residuals are affected by the raw metric and are difficult to interpret more precisely.
A better interpretation allows the standardized residual matrix (residuals divided by their estimated asymptotic standard error) and the residual correlation matrix.
Following variable pairs have standardized residuals which are larger or equal than the considered threshold 2.58 [@brown] or correlation residuals which are larger or equal than the considered threshold 0.1 [@kline]. In these cases, the zero-order covariance relationship between the involved variables is probably underestimated:

Table 4: Pairs with Underestimated Covariance

	Pair(s)	
Pair 1	x1	x2

There are no variable pairs with standardized residuals which are smaller or equal than the considered threshold -2.58 [@brown] or correlation residuals which are smaller or equal than the considered threshold -0.1 [@kline]. Therefore, no relationships among the variables are substantially overestimated by the model.

Modification Indices

In the interpretation of the modification indices we rely mostly on [@brown] and [@mi]. We cite from [@brown]: "The modification index reflects an approximation of how much the overall model Chi² will decrease if the fixed or constrained parameter is freely estimated." In other words, if adding a line with a high modification index to the model, i.e. if adding a parameter, the overall goodness-of-fit may be improved. Nevertheless, this should be done only under certain conditions, described in the sequel.
We consider only modification indices greater or equal than 3.84 (which are statistically significant at 5% type I error). Next, we search only for modification indices which achieve a power of minimum 75% in detecting a (relevant) misspecification of at least 0.1 for (residual) correlations, respectively 0.4 for factor loadings. These are characterized in the decision column by the label "epc:m".
We remark that these conditions are not fulfilled for modification indices with respect to (residual) correlations. Therefore, there exist no significant and relevant modification indices with respect to (residual) correlations.
We remark that these conditions are not fulfilled for modification indices with respect to factor loadings. Therefore, there exist no significant and relevant modification indices with respect to factor loadings.

Parameter Estimates

Factor Loadings

We remark that the completely standardized factor loadings (section "Completely Standardized Parameter Estimates") are all statistically significant at 5% type I error. Moreover, in absolute value they are all greater than 0.4. This cutoff-value is considered in some CFA research areas a magnitude that is substantively meaningful [@brown]. Please consider also cutoff-values from your particular research area when interpreting the factor loadings. We summarize the interpretation of the completely standardized factor loadings in the next table:

Table 5: Check Completely Standardized Factor Loadings

Latent Variable	Observed Variable	Factor Loading[1]	P-Value	Significant?[2]	Relevance[3]	Direction	Check
Coping	x1	0.43	<0.001	Yes	*	Ok	Ok
Coping	x2	0.44	<0.001	Yes	*	Ok	Ok
Coping	x3	0.45	<0.001	Yes	*	Ok	Ok
Coping	x4	0.95	<0.001	Yes	***	Ok	Ok
Social	x5	0.63	<0.001	Yes	**	Ok	Ok
Social	x6	0.75	<0.001	Yes	**	Ok	Ok
Social	x7	0.69	<0.001	Yes	**	Ok	Ok
Social	x8	0.73	<0.001	Yes	**	Ok	Ok

repeat head of the table

Enhance	x9	0.60	<0.001	Yes	**	Ok	Ok
Enhance	x10	0.60	<0.001	Yes	*	Ok	Ok
Enhance	x11	0.66	<0.001	Yes	**	Ok	Ok
Enhance	x12	0.67	<0.001	Yes	**	Ok	Ok

[1] The completely standardized factor loading can be interpreted as the correlation with the factor.

[2] 5% type I error.

[3] Stars correspond to factor loadings cutoff-values: 0.4, 0.6, 0.8.

[4] The observed variable is probably not related to latent factor.

[5] Uncertain. The evidence is insufficient or the model is misspecified.

[6] Uncertain. Significant but small(er) effect size.

Next, we inspect the unstandardized factor loadings (section "Model Fit Summary"). We remark that the unstandardized factor loadings are all statistically significant at 5% type I error. Therefore, the significance test results for standardized and unstandardized factor loadings coincide (for non-marker variables). We summarize the interpretation of the unstandardized factor loadings in the next table(s):

Table 6: Check Unstandardized Factor Loadings

Latent Variable	Observed Variable	Factor Loading	P-Value	Significant?[1]	Direction
Coping	x1	1.00			Ok
Coping	x2	0.74	<0.001	Yes	Ok
Coping	x3	0.97	<0.001	Yes	Ok
Coping	x4	1.51	<0.001	Yes	Ok
Social	x5	1.00			Ok
Social	x6	1.21	<0.001	Yes	Ok
Social	x7	1.57	<0.001	Yes	Ok
Social	x8	1.51	<0.001	Yes	Ok
Enhance	x9	1.00			Ok
Enhance	x10	0.65	<0.001	Yes	Ok
Enhance	x11	1.05	<0.001	Yes	Ok
Enhance	x12	1.10	<0.001	Yes	Ok

[1] 5% type I error.

Table 7: Interpretation of Unstandardized Factor Loadings

Interpretation of Unstandardized Factor Loadings
x1 is marker variable for Coping
A 1-unit increase in Coping leads to a 0.74 -unit increase in the x2
A 1-unit increase in Coping leads to a 0.97 -unit increase in the x3
A 1-unit increase in Coping leads to a 1.51 -unit increase in the x4
x5 is marker variable for Social
A 1-unit increase in Social leads to a 1.21 -unit increase in the x6
A 1-unit increase in Social leads to a 1.57 -unit increase in the x7
A 1-unit increase in Social leads to a 1.51 -unit increase in the x8
x9 is marker variable for Enhance
A 1-unit increase in Enhance leads to a 0.65 -unit increase in the x10
A 1-unit increase in Enhance leads to a 1.05 -unit increase in the x11

A 1-unit increase in Enhance leads to a 1.10 -unit increase in the x12

Factor Correlations

As noted by [@brown], “the interpretability of the size and statistical significance of factor intercorrelations depends on the specific research context.” Still, large or statistically significant factor covariances are questionable and provide evidence of poor discriminant validity. There is evidence to question the distinctness of the following factors, since their correlation approaches in absolute value 1.0:

Table 8: Factor Correlations

				Factor Correlation
Pair 1	Coping	~~	Social	0.8

Factor Reliability

Error Variances

Table 9: Completely Standardized Error Variances and Communality

Observed Variable	Error Variance[1]	Communality[2,3]	P-Value	Significant Error Variance?[4]
x1	0.81	0.19	<0.001	Yes
x10	0.64	0.36	<0.001	Yes
x11	0.56	0.44	<0.001	Yes
x12	0.56	0.44	<0.001	Yes
x2	0.81	0.19	<0.001	Yes
x3	0.80	0.20	<0.001	Yes
x4	0.09	0.91	0.153	No
x5	0.60	0.40	<0.001	Yes
x6	0.44	0.56	<0.001	Yes
x7	0.52	0.48	<0.001	Yes
x8	0.47	0.53	<0.001	Yes
x9	0.64	0.36	<0.001	Yes

[1] Can be interpreted as proportion of unexplained variance by the latent factor(s) (%).

[2] Corresponds to the squared factor loading.

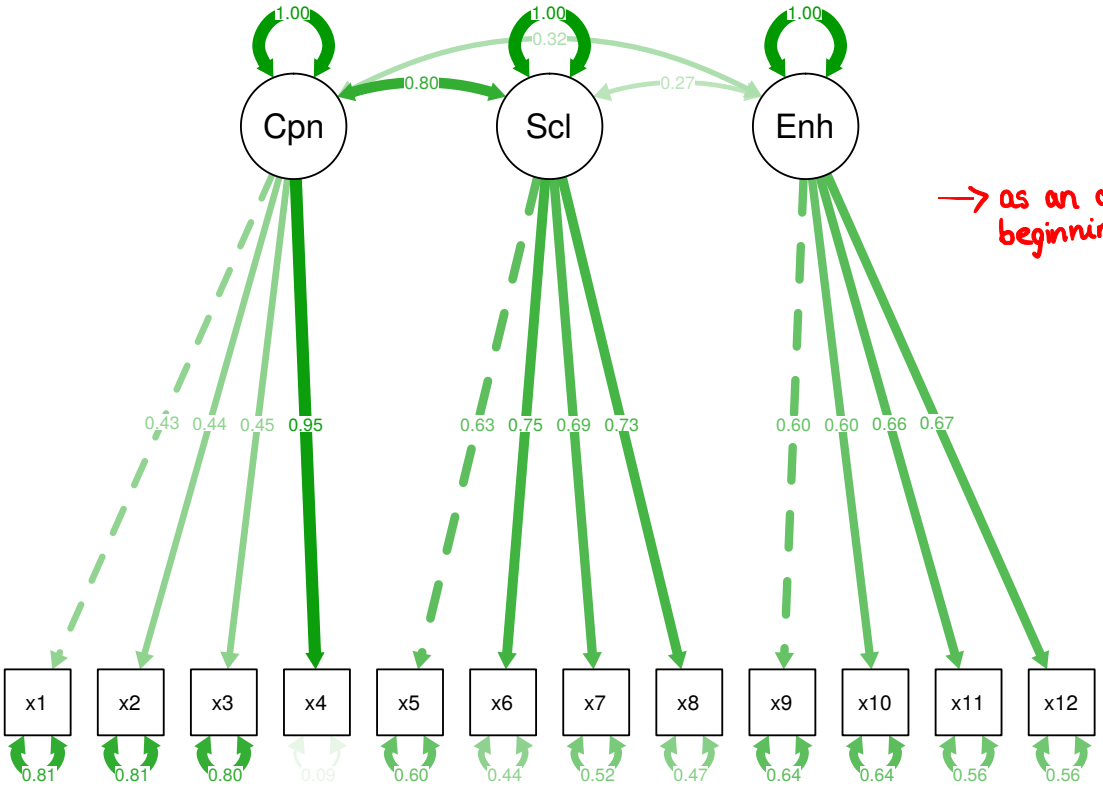
[3] Can be interpreted as proportion of explained variance by the latent factor(s) (%).

[4] 5% type I error. Typically significant since a large portion of variance is not explained by the latent variable.

Intercepts

In case of missing values and estimation via FIML, a meanstructure i.e. the intercepts of the observed variables are added to the model. The means of the latent factors are fixed to zero. Therefore, the estimated intercepts within the section “Model Fit Summary” are just the means of the observed variables.

Path Diagram



→ as an overview at the beginning

References