

Full SEM

This script is to perform the full SEM models from Chapter 6 of Byrne (2012), which examine burnout in secondary teachers

Load Packages

```
library(lavaan)
```

```
## This is lavaan 0.6-9  
## lavaan is FREE software! Please report any bugs.
```

```
library(tidyverse)
```

```
## -- Attaching packages ----- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.5      v purrr  0.3.4  
## v tibble  3.1.5      v dplyr  1.0.7  
## v tidyr   1.1.4      v stringr 1.4.0  
## v readr   2.1.2      v forcats 0.5.1
```

```
## -- Conflicts ----- tidyverse_conflicts() --  
## x dplyr::filter() masks stats::filter()  
## x dplyr::lag()    masks stats::lag()
```

```
library(dplyr)  
library(psych)
```

```
##  
## Attaching package: 'psych'
```

```
## The following objects are masked from 'package:ggplot2':  
##  
## %+%, alpha
```

```
## The following object is masked from 'package:lavaan':  
##  
## cor2cov
```

```
library(semTools)
```

```
##
```

```
## #####
```

```
## This is semTools 0.5-5
```

```
## All users of R (or SEM) are invited to submit functions or ideas for functions.
```

```
## #####
```

```
##
```

```
## Attaching package: 'semTools'
```

```
## The following objects are masked from 'package:psych':
```

```
##
```

```
##      reliability, skew
```

```
## The following object is masked from 'package:readr':
```

```
##
```

```
##      clipboard
```

Load Data

You can change how you read the file if you are using the data in csv format, for example. There are different ways to do this but `read.csv`, which is part of base R, is probably the easiest. If using `read.csv`, remember to use `header = FALSE` so that R doesn't read the first row as variable names.

The dat file doesn't have variable names, so we need to add them.

The dataset uses “.” for missing values. One easy way to turn them into NAs is to convert the full dataset in to numeric values, which will replace text with NAs.

```
teachers <- data.frame(lapply(teachers, function(x) as.numeric(as.character(x))))
```

CFA

Following Chapter 6 of Byrne (2012), we need to specify the measurement model before testing the structural model. This is to test the validity of the measurement model before we proceed to test relationships between the variables in the model.

The model has 12 latent variables defined below.

Specify the Model

```
modelcfa <- '  
    F1 =~ rolea1 + rolea2 #role ambiguity  
    F2 =~ rolec1 + rolec2 #role conflict  
    F3 =~ work1 + work2 #work overload  
    F4 =~ cclim1 + cclim2 + cclim3 + cclim4 #classroom climate  
    F5 =~ dec1 + dec2 #decision-making  
    F6 =~ ssup1 + ssup2 #superior support  
    F7 =~ psup1 + psup2 #peer support  
    F8 =~ self1 + self2 + self3 #self-esteem  
    F9 =~ elc1 + elc2 + elc3 + elc4 + elc5 #external loc of control  
    F10 =~ ee1 + ee2 + ee3 #emotional exhaustion  
    F11 =~ dp1 + dp2 #depersonalization  
    F12 =~ pa1 + pa2 + pa3 #personal accomplishment  
'
```

Then we fit the model with MLR as the estimator and FIML to account for missing data.

To account for non-normality in this data, we'll use MLM estimator.

Fit the Model

```
fitcfa <- cfa(modelcfa,  
              data = teachers,  
              estimator = "mlm",  
              meanstructure = TRUE)
```

Request the Output

We'll request the model summary with standardized estimates, fit indices, r-square and `meanstructure = TRUE`. Requesting the mean structure will give us the intercepts of the variables in the model.

The fit indices look good in this model.

```
summary(fitcfa,  
        standardized = TRUE,  
        fit.measures = TRUE,  
        rsquare = TRUE)
```

```

## lavaan 0.6-9 ended normally after 135 iterations
##
## Estimator ML
## Optimization method NLMINB
## Number of model parameters 162
##
## Number of observations 1430
##
## Model Test User Model:
## Standard Robust
## Test Statistic 1511.698 1348.748
## Degrees of freedom 398 398
## P-value (Chi-square) 0.000 0.000
## Scaling correction factor 1.121
## Satorra-Bentler correction
##
## Model Test Baseline Model:
##
## Test statistic 23532.624 19072.057
## Degrees of freedom 496 496
## P-value 0.000 0.000
## Scaling correction factor 1.234
##
## User Model versus Baseline Model:
##
## Comparative Fit Index (CFI) 0.952 0.949
## Tucker-Lewis Index (TLI) 0.940 0.936
##
## Robust Comparative Fit Index (CFI) 0.954
## Robust Tucker-Lewis Index (TLI) 0.942
##
## Loglikelihood and Information Criteria:
##
## Loglikelihood user model (H0) -47127.432 -47127.432
## Loglikelihood unrestricted model (H1) -46371.583 -46371.583
##
## Akaike (AIC) 94578.864 94578.864
## Bayesian (BIC) 95431.863 95431.863
## Sample-size adjusted Bayesian (BIC) 94917.245 94917.245
##
## Root Mean Square Error of Approximation:
##
## RMSEA 0.044 0.041
## 90 Percent confidence interval - lower 0.042 0.039
## 90 Percent confidence interval - upper 0.047 0.043
## P-value RMSEA <= 0.05 1.000 1.000
##
## Robust RMSEA 0.043
## 90 Percent confidence interval - lower 0.041
## 90 Percent confidence interval - upper 0.046
##

```

Standardized Root Mean Square Residual:

##

SRMR 0.038 0.038

##

Parameter Estimates:

##

Standard errors Robust.sem

Information Expected

Information saturated (h1) model Structured

##

Latent Variables:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
## F1 =~						
## rolea1	1.000				0.644	0.705
## rolea2	1.229	0.057	21.438	0.000	0.792	0.815
## F2 =~						
## rolec1	1.000				0.763	0.693
## rolec2	1.259	0.049	25.675	0.000	0.961	0.778
## F3 =~						
## work1	1.000				0.954	0.794
## work2	0.726	0.032	22.714	0.000	0.692	0.636
## F4 =~						
## cclim1	1.000				0.333	0.617
## cclim2	1.479	0.075	19.664	0.000	0.493	0.785
## cclim3	0.965	0.056	17.379	0.000	0.322	0.653
## cclim4	1.335	0.079	16.847	0.000	0.445	0.608
## F5 =~						
## dec1	1.000				0.679	0.672
## dec2	1.582	0.062	25.336	0.000	1.074	0.809
## F6 =~						
## ssup1	1.000				1.080	0.868
## ssup2	1.086	0.026	41.851	0.000	1.173	0.931
## F7 =~						
## psup1	1.000				0.762	0.790
## psup2	1.107	0.049	22.541	0.000	0.843	0.911
## F8 =~						
## self1	1.000				0.340	0.764
## self2	1.276	0.045	28.207	0.000	0.433	0.860
## self3	1.365	0.057	23.759	0.000	0.464	0.852
## F9 =~						
## elc1	1.000				0.425	0.681
## elc2	0.852	0.042	20.347	0.000	0.362	0.578
## elc3	0.957	0.041	23.206	0.000	0.407	0.742
## elc4	0.925	0.048	19.258	0.000	0.393	0.649
## elc5	1.132	0.050	22.438	0.000	0.481	0.746
## F10 =~						
## ee1	1.000				1.142	0.873
## ee2	1.020	0.019	53.664	0.000	1.166	0.927
## ee3	0.970	0.023	42.984	0.000	1.109	0.855
## F11 =~						
## dp1	1.000				0.973	0.889

##	dp2	0.891	0.042	21.302	0.000	0.867	0.733
##	F12 =~						
##	pa1	1.000				0.755	0.828
##	pa2	1.027	0.036	28.347	0.000	0.776	0.806
##	pa3	0.953	0.039	24.642	0.000	0.720	0.747
##							
##	Covariances:						
##		Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
##	F1 ~~						
##	F2	0.381	0.026	14.623	0.000	0.775	0.775
##	F3	0.402	0.028	14.121	0.000	0.654	0.654
##	F4	-0.065	0.008	-7.725	0.000	-0.302	-0.302
##	F5	-0.288	0.023	-12.254	0.000	-0.658	-0.658
##	F6	-0.388	0.030	-12.744	0.000	-0.558	-0.558
##	F7	-0.235	0.022	-10.724	0.000	-0.480	-0.480
##	F8	-0.091	0.010	-8.776	0.000	-0.418	-0.418
##	F9	0.123	0.011	10.967	0.000	0.450	0.450
##	F10	0.305	0.028	10.879	0.000	0.414	0.414
##	F11	0.225	0.026	8.790	0.000	0.359	0.359
##	F12	-0.164	0.018	-9.148	0.000	-0.338	-0.338
##	F2 ~~						
##	F3	0.686	0.035	19.405	0.000	0.941	0.941
##	F4	-0.081	0.011	-7.572	0.000	-0.317	-0.317
##	F5	-0.340	0.027	-12.743	0.000	-0.656	-0.656
##	F6	-0.463	0.033	-13.895	0.000	-0.562	-0.562
##	F7	-0.242	0.023	-10.388	0.000	-0.417	-0.417
##	F8	-0.103	0.011	-9.741	0.000	-0.398	-0.398
##	F9	0.161	0.014	11.400	0.000	0.498	0.498
##	F10	0.507	0.033	15.409	0.000	0.582	0.582
##	F11	0.351	0.031	11.326	0.000	0.473	0.473
##	F12	-0.167	0.021	-7.835	0.000	-0.289	-0.289
##	F3 ~~						
##	F4	-0.099	0.013	-7.574	0.000	-0.311	-0.311
##	F5	-0.349	0.029	-11.966	0.000	-0.538	-0.538
##	F6	-0.471	0.039	-12.112	0.000	-0.457	-0.457
##	F7	-0.255	0.029	-8.840	0.000	-0.351	-0.351
##	F8	-0.120	0.014	-8.538	0.000	-0.371	-0.371
##	F9	0.174	0.016	10.633	0.000	0.429	0.429
##	F10	0.749	0.041	18.488	0.000	0.687	0.687
##	F11	0.393	0.036	10.780	0.000	0.423	0.423
##	F12	-0.213	0.026	-8.034	0.000	-0.295	-0.295
##	F4 ~~						
##	F5	0.084	0.010	8.584	0.000	0.372	0.372
##	F6	0.120	0.014	8.617	0.000	0.333	0.333
##	F7	0.053	0.009	5.863	0.000	0.210	0.210
##	F8	0.026	0.004	5.797	0.000	0.226	0.226
##	F9	-0.039	0.005	-7.376	0.000	-0.276	-0.276
##	F10	-0.138	0.015	-9.483	0.000	-0.363	-0.363
##	F11	-0.160	0.015	-10.969	0.000	-0.493	-0.493
##	F12	0.095	0.010	9.459	0.000	0.377	0.377
##	F5 ~~						

##	F6	0.704	0.039	18.173	0.000	0.960	0.960
##	F7	0.302	0.025	12.245	0.000	0.584	0.584
##	F8	0.078	0.009	8.324	0.000	0.337	0.337
##	F9	-0.109	0.012	-9.165	0.000	-0.379	-0.379
##	F10	-0.354	0.029	-12.040	0.000	-0.456	-0.456
##	F11	-0.238	0.027	-8.712	0.000	-0.361	-0.361
##	F12	0.235	0.021	11.006	0.000	0.458	0.458
##	F6 ~~						
##	F7	0.393	0.032	12.220	0.000	0.478	0.478
##	F8	0.085	0.013	6.561	0.000	0.232	0.232
##	F9	-0.135	0.016	-8.280	0.000	-0.294	-0.294
##	F10	-0.424	0.039	-10.943	0.000	-0.343	-0.343
##	F11	-0.360	0.038	-9.560	0.000	-0.342	-0.342
##	F12	0.296	0.028	10.576	0.000	0.363	0.363
##	F7 ~~						
##	F8	0.080	0.011	7.066	0.000	0.311	0.311
##	F9	-0.098	0.012	-7.933	0.000	-0.302	-0.302
##	F10	-0.247	0.029	-8.428	0.000	-0.284	-0.284
##	F11	-0.192	0.027	-7.057	0.000	-0.259	-0.259
##	F12	0.184	0.021	8.952	0.000	0.320	0.320
##	F8 ~~						
##	F9	-0.055	0.006	-9.769	0.000	-0.378	-0.378
##	F10	-0.185	0.016	-11.749	0.000	-0.477	-0.477
##	F11	-0.133	0.013	-9.846	0.000	-0.401	-0.401
##	F12	0.111	0.011	10.022	0.000	0.434	0.434
##	F9 ~~						
##	F10	0.158	0.017	9.248	0.000	0.326	0.326
##	F11	0.120	0.015	8.186	0.000	0.290	0.290
##	F12	-0.104	0.012	-8.924	0.000	-0.325	-0.325
##	F10 ~~						
##	F11	0.613	0.042	14.577	0.000	0.552	0.552
##	F12	-0.360	0.029	-12.314	0.000	-0.417	-0.417
##	F11 ~~						
##	F12	-0.344	0.030	-11.492	0.000	-0.468	-0.468
##							
##	Intercepts:						
##		Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
##	.rolea1	2.401	0.024	99.362	0.000	2.401	2.628
##	.rolea2	2.086	0.026	81.108	0.000	2.086	2.145
##	.rolec1	3.015	0.029	103.524	0.000	3.015	2.738
##	.rolec2	3.018	0.033	92.468	0.000	3.018	2.445
##	.work1	3.240	0.032	101.996	0.000	3.240	2.697
##	.work2	2.243	0.029	77.885	0.000	2.243	2.060
##	.cclim1	2.964	0.014	207.379	0.000	2.964	5.484
##	.cclim2	2.723	0.017	163.890	0.000	2.723	4.334
##	.cclim3	2.928	0.013	224.532	0.000	2.928	5.938
##	.cclim4	3.053	0.019	157.758	0.000	3.053	4.172
##	.dec1	4.039	0.027	151.305	0.000	4.039	4.001
##	.dec2	4.242	0.035	120.842	0.000	4.242	3.196
##	.ssup1	4.299	0.033	130.631	0.000	4.299	3.454
##	.ssup2	4.370	0.033	131.136	0.000	4.370	3.468

##	.psup1	4.571	0.026	179.200	0.000	4.571	4.739
##	.psup2	4.621	0.024	188.754	0.000	4.621	4.991
##	.self1	3.603	0.012	306.319	0.000	3.603	8.100
##	.self2	3.613	0.013	271.109	0.000	3.613	7.169
##	.self3	3.483	0.014	241.972	0.000	3.483	6.399
##	.elc1	2.918	0.016	176.985	0.000	2.918	4.680
##	.elc2	3.008	0.017	181.556	0.000	3.008	4.801
##	.elc3	2.801	0.014	193.300	0.000	2.801	5.112
##	.elc4	2.200	0.016	137.503	0.000	2.200	3.636
##	.elc5	2.483	0.017	145.731	0.000	2.483	3.854
##	.ee1	3.855	0.035	111.347	0.000	3.855	2.944
##	.ee2	3.530	0.033	106.201	0.000	3.530	2.808
##	.ee3	3.165	0.034	92.281	0.000	3.165	2.440
##	.dp1	2.319	0.029	80.113	0.000	2.319	2.119
##	.dp2	2.086	0.031	66.763	0.000	2.086	1.765
##	.pa1	5.748	0.024	238.172	0.000	5.748	6.298
##	.pa2	5.850	0.025	229.759	0.000	5.850	6.076
##	.pa3	5.815	0.025	228.188	0.000	5.815	6.034
##	F1	0.000				0.000	0.000
##	F2	0.000				0.000	0.000
##	F3	0.000				0.000	0.000
##	F4	0.000				0.000	0.000
##	F5	0.000				0.000	0.000
##	F6	0.000				0.000	0.000
##	F7	0.000				0.000	0.000
##	F8	0.000				0.000	0.000
##	F9	0.000				0.000	0.000
##	F10	0.000				0.000	0.000
##	F11	0.000				0.000	0.000
##	F12	0.000				0.000	0.000
##							
##	Variances:						
##		Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
##	.rolea1	0.420	0.025	17.056	0.000	0.420	0.503
##	.rolea2	0.318	0.027	11.736	0.000	0.318	0.336
##	.rolec1	0.630	0.029	21.701	0.000	0.630	0.520
##	.rolec2	0.600	0.038	15.710	0.000	0.600	0.394
##	.work1	0.532	0.036	14.779	0.000	0.532	0.369
##	.work2	0.707	0.036	19.792	0.000	0.707	0.596
##	.cclim1	0.181	0.008	22.752	0.000	0.181	0.619
##	.cclim2	0.152	0.010	15.281	0.000	0.152	0.384
##	.cclim3	0.140	0.007	19.292	0.000	0.140	0.574
##	.cclim4	0.337	0.015	21.948	0.000	0.337	0.630
##	.dec1	0.558	0.025	22.676	0.000	0.558	0.548
##	.dec2	0.609	0.040	15.118	0.000	0.609	0.346
##	.ssup1	0.382	0.026	14.548	0.000	0.382	0.247
##	.ssup2	0.211	0.023	9.080	0.000	0.211	0.133
##	.psup1	0.350	0.029	12.260	0.000	0.350	0.376
##	.psup2	0.146	0.028	5.195	0.000	0.146	0.170
##	.self1	0.082	0.005	16.624	0.000	0.082	0.417
##	.self2	0.066	0.005	13.255	0.000	0.066	0.261

##	.self3	0.081	0.006	12.968	0.000	0.081	0.275
##	.elc1	0.208	0.010	21.016	0.000	0.208	0.536
##	.elc2	0.261	0.011	23.550	0.000	0.261	0.666
##	.elc3	0.135	0.007	18.221	0.000	0.135	0.449
##	.elc4	0.212	0.010	21.572	0.000	0.212	0.578
##	.elc5	0.184	0.010	18.617	0.000	0.184	0.444
##	.ee1	0.409	0.024	17.211	0.000	0.409	0.239
##	.ee2	0.222	0.019	11.687	0.000	0.222	0.140
##	.ee3	0.453	0.025	17.784	0.000	0.453	0.269
##	.dp1	0.251	0.042	5.919	0.000	0.251	0.210
##	.dp2	0.645	0.047	13.743	0.000	0.645	0.462
##	.pa1	0.262	0.021	12.391	0.000	0.262	0.315
##	.pa2	0.325	0.025	13.039	0.000	0.325	0.351
##	.pa3	0.411	0.023	17.568	0.000	0.411	0.442
##	F1	0.415	0.033	12.418	0.000	1.000	1.000
##	F2	0.583	0.042	13.859	0.000	1.000	1.000
##	F3	0.911	0.052	17.372	0.000	1.000	1.000
##	F4	0.111	0.010	10.824	0.000	1.000	1.000
##	F5	0.461	0.037	12.573	0.000	1.000	1.000
##	F6	1.166	0.061	19.120	0.000	1.000	1.000
##	F7	0.580	0.043	13.552	0.000	1.000	1.000
##	F8	0.115	0.011	10.150	0.000	1.000	1.000
##	F9	0.180	0.014	12.485	0.000	1.000	1.000
##	F10	1.305	0.056	23.241	0.000	1.000	1.000
##	F11	0.947	0.068	13.932	0.000	1.000	1.000
##	F12	0.571	0.034	16.978	0.000	1.000	1.000
##							
##	R-Square:						
##		Estimate					
##	rolea1	0.497					
##	rolea2	0.664					
##	rolec1	0.480					
##	rolec2	0.606					
##	work1	0.631					
##	work2	0.404					
##	cclim1	0.381					
##	cclim2	0.616					
##	cclim3	0.426					
##	cclim4	0.370					
##	dec1	0.452					
##	dec2	0.654					
##	ssup1	0.753					
##	ssup2	0.867					
##	psup1	0.624					
##	psup2	0.830					
##	self1	0.583					
##	self2	0.739					
##	self3	0.725					
##	elc1	0.464					
##	elc2	0.334					
##	elc3	0.551					

```
##      elc4      0.422
##      elc5      0.556
##      ee1       0.761
##      ee2       0.860
##      ee3       0.731
##      dp1       0.790
##      dp2       0.538
##      pa1       0.685
##      pa2       0.649
##      pa3       0.558
```

Request Modification Indices

Despite good fit, modification indices show that the indicator of the variable DEC2 cross-loads significantly on F1 and F6. Because these are all subscales of the same measure, it isn't surprising that we had cross-loadings. If we estimate a second and third CFAs with these cross-loadings freely-estimated, we'd see that it would substantially improve model fit. We won't do this in a separate step, but you will see that we make this adjustment in the structural model.

```
modindices(fitcfa,
           sort = TRUE) # The sort argument allows us to sort the indices from largest
to smallest
```

##	lhs	op	rhs	mi	epc	sepc.lv	sepc.all	sepc.nox
## 195	F1	=~	dec1	139.634	-0.715	-0.460	-0.456	-0.456
## 196	F1	=~	dec2	139.632	1.131	0.728	0.549	0.549
## 346	F6	=~	dec2	122.318	1.869	2.018	1.520	1.520
## 345	F6	=~	dec1	122.316	-1.181	-1.275	-1.263	-1.263
## 225	F2	=~	dec1	109.026	-0.495	-0.378	-0.374	-0.374
## 226	F2	=~	dec2	109.025	0.783	0.598	0.450	0.450
## 255	F3	=~	dec1	96.850	-0.340	-0.324	-0.321	-0.321
## 256	F3	=~	dec2	96.849	0.537	0.513	0.386	0.386
## 826	dec2	~~	ssup2	88.699	0.215	0.215	0.600	0.600
## 1007	ee1	~~	ee2	76.193	0.230	0.230	0.764	0.764
## 251	F3	=~	cclim1	70.284	-0.129	-0.123	-0.228	-0.228
## 806	dec1	~~	ssup2	70.056	-0.141	-0.141	-0.411	-0.411
## 676	work1	~~	ee1	68.603	0.140	0.140	0.299	0.299
## 375	F7	=~	dec1	66.954	0.352	0.268	0.266	0.266
## 376	F7	=~	dec2	66.953	-0.557	-0.425	-0.320	-0.320
## 221	F2	=~	cclim1	64.161	-0.153	-0.117	-0.217	-0.217
## 477	F10	=~	pa1	56.774	-0.142	-0.163	-0.178	-0.178
## 506	F11	=~	ee3	55.022	0.216	0.210	0.162	0.162
## 1034	pa2	~~	pa3	54.534	0.155	0.155	0.424	0.424
## 211	F1	=~	ee3	53.754	0.296	0.191	0.147	0.147
## 270	F3	=~	ee2	53.516	-0.240	-0.229	-0.182	-0.182
## 534	F12	=~	ee1	51.912	0.234	0.176	0.135	0.135
## 299	F4	=~	ee3	50.734	-0.538	-0.179	-0.138	-0.138
## 957	elc1	~~	elc2	46.793	0.051	0.051	0.220	0.220
## 241	F2	=~	ee3	45.972	0.261	0.199	0.153	0.153
## 1008	ee1	~~	ee3	45.285	-0.153	-0.153	-0.356	-0.356
## 457	F10	=~	cclim1	44.457	-0.084	-0.096	-0.177	-0.177
## 240	F2	=~	ee2	44.101	-0.233	-0.178	-0.141	-0.141
## 311	F5	=~	cclim1	41.958	0.138	0.093	0.173	0.173
## 329	F5	=~	ee3	41.504	-0.231	-0.157	-0.121	-0.121
## 536	F12	=~	ee3	38.294	-0.205	-0.155	-0.119	-0.119
## 274	F3	=~	pa1	37.636	-0.135	-0.129	-0.141	-0.141
## 191	F1	=~	cclim1	37.484	-0.142	-0.091	-0.169	-0.169
## 244	F2	=~	pa1	36.754	-0.166	-0.127	-0.139	-0.139
## 421	F8	=~	pa1	35.624	0.397	0.135	0.148	0.148
## 422	F8	=~	pa2	35.199	-0.416	-0.141	-0.147	-0.147
## 332	F5	=~	pa1	34.707	0.192	0.130	0.142	0.142
## 359	F6	=~	ee3	34.129	-0.124	-0.134	-0.103	-0.103
## 341	F6	=~	cclim1	33.871	0.076	0.082	0.152	0.152
## 461	F10	=~	dec1	33.335	-0.142	-0.163	-0.161	-0.161
## 462	F10	=~	dec2	33.335	0.225	0.257	0.194	0.194
## 846	ssup1	~~	psup1	29.204	0.068	0.068	0.185	0.185
## 333	F5	=~	pa2	28.867	-0.184	-0.125	-0.130	-0.130
## 847	ssup1	~~	psup2	28.838	-0.063	-0.063	-0.266	-0.266
## 214	F1	=~	pa1	28.592	-0.183	-0.118	-0.129	-0.129
## 418	F8	=~	ee3	28.035	-0.400	-0.136	-0.105	-0.105
## 1033	pa1	~~	pa3	27.800	-0.109	-0.109	-0.332	-0.332
## 578	rolea2	~~	dec1	26.979	-0.081	-0.081	-0.191	-0.191
## 249	F3	=~	rolec1	25.230	-0.590	-0.563	-0.511	-0.511
## 250	F3	=~	rolec2	25.229	0.742	0.708	0.574	0.574

## 271	F3 =~	ee3	25.046	0.181	0.172	0.133	0.133
## 504	F11 =~	ee1	24.103	-0.141	-0.137	-0.104	-0.104
## 827	dec2 ~~	psup1	23.288	-0.075	-0.075	-0.163	-0.163
## 865	ssup2 ~~	psup2	22.700	0.054	0.054	0.308	0.308
## 245	F2 =~	pa2	22.362	0.137	0.104	0.108	0.108
## 697	work2 ~~	elc1	21.946	-0.055	-0.055	-0.142	-0.142
## 362	F6 =~	pa1	21.783	0.090	0.097	0.106	0.106
## 210	F1 =~	ee2	21.471	-0.168	-0.108	-0.086	-0.086
## 198	F1 =~	ssup2	21.396	0.246	0.158	0.126	0.126
## 197	F1 =~	ssup1	21.395	-0.226	-0.146	-0.117	-0.117
## 864	ssup2 ~~	psup1	21.220	-0.054	-0.054	-0.198	-0.198
## 478	F10 =~	pa2	20.765	0.091	0.104	0.108	0.108
## 275	F3 =~	pa2	20.506	0.105	0.101	0.104	0.104
## 416	F8 =~	ee1	20.373	0.334	0.114	0.087	0.087
## 363	F6 =~	pa2	20.144	-0.091	-0.098	-0.102	-0.102
## 1022	ee3 ~~	pa1	19.709	-0.055	-0.055	-0.159	-0.159
## 327	F5 =~	ee1	19.675	0.155	0.106	0.081	0.081
## 971	elc2 ~~	elc5	19.279	-0.033	-0.033	-0.152	-0.152
## 389	F7 =~	ee3	19.114	-0.132	-0.100	-0.077	-0.077
## 662	work1 ~~	dec1	18.757	-0.082	-0.082	-0.151	-0.151
## 357	F6 =~	ee1	18.112	0.088	0.095	0.073	0.073
## 942	self2 ~~	pa2	18.063	-0.024	-0.024	-0.163	-0.163
## 807	dec1 ~~	psup1	17.885	0.059	0.059	0.132	0.132
## 215	F1 =~	pa2	17.534	0.151	0.097	0.101	0.101
## 371	F7 =~	cclim1	16.873	0.074	0.056	0.104	0.104
## 253	F3 =~	cclim3	16.419	0.056	0.054	0.109	0.109
## 190	F1 =~	work2	16.270	0.299	0.192	0.177	0.177
## 189	F1 =~	work1	16.270	-0.412	-0.265	-0.221	-0.221
## 223	F2 =~	cclim3	16.201	0.069	0.053	0.108	0.108
## 486	F11 =~	cclim1	15.498	-0.068	-0.067	-0.123	-0.123
## 753	cclim2 ~~	ee3	15.286	-0.037	-0.037	-0.141	-0.141
## 449	F9 =~	pa2	14.706	0.204	0.087	0.090	0.090
## 658	work1 ~~	cclim1	14.564	-0.040	-0.040	-0.128	-0.128
## 464	F10 =~	ssup2	14.517	0.083	0.094	0.075	0.075
## 463	F10 =~	ssup1	14.517	-0.076	-0.087	-0.070	-0.070
## 735	cclim2 ~~	cclim3	14.253	0.029	0.029	0.198	0.198
## 623	rolec1 ~~	ee3	13.609	0.062	0.062	0.117	0.117
## 727	cclim1 ~~	ee1	13.567	-0.032	-0.032	-0.119	-0.119
## 701	work2 ~~	elc5	13.543	0.042	0.042	0.117	0.117
## 677	work1 ~~	ee2	13.444	-0.055	-0.055	-0.161	-0.161
## 448	F9 =~	pa1	13.233	-0.183	-0.078	-0.085	-0.085
## 434	F9 =~	dec1	12.982	-0.244	-0.104	-0.103	-0.103
## 435	F9 =~	dec2	12.981	0.386	0.164	0.124	0.124
## 220	F2 =~	work2	12.972	0.540	0.412	0.379	0.379
## 219	F2 =~	work1	12.971	-0.745	-0.568	-0.473	-0.473
## 700	work2 ~~	elc4	12.961	0.042	0.042	0.108	0.108
## 580	rolea2 ~~	ssup1	12.616	-0.049	-0.049	-0.139	-0.139
## 297	F4 =~	ee1	12.543	0.262	0.087	0.067	0.067
## 258	F3 =~	ssup2	12.509	0.107	0.102	0.081	0.081
## 257	F3 =~	ssup1	12.508	-0.098	-0.094	-0.076	-0.076
## 817	dec1 ~~	ee1	12.340	-0.052	-0.052	-0.110	-0.110

## 479	F10	=~	pa3	12.212	0.071	0.081	0.084	0.084
## 995	elc4	~~	dp2	12.087	-0.040	-0.040	-0.108	-0.108
## 313	F5	=~	cclim3	12.005	-0.066	-0.045	-0.091	-0.091
## 703	work2	~~	ee2	11.829	-0.052	-0.052	-0.132	-0.132
## 228	F2	=~	ssup2	11.822	0.145	0.111	0.088	0.088
## 227	F2	=~	ssup1	11.822	-0.133	-0.102	-0.082	-0.082
## 515	F12	=~	work2	11.455	-0.137	-0.104	-0.095	-0.095
## 514	F12	=~	work1	11.454	0.189	0.143	0.119	0.119
## 705	work2	~~	dp1	11.259	0.063	0.063	0.149	0.149
## 825	dec2	~~	ssup1	11.071	-0.073	-0.073	-0.152	-0.152
## 269	F3	=~	ee1	10.962	0.118	0.112	0.086	0.086
## 688	work2	~~	dec1	10.837	0.061	0.061	0.098	0.098
## 445	F9	=~	ee3	10.666	0.185	0.079	0.061	0.061
## 458	F10	=~	cclim2	10.530	0.047	0.054	0.085	0.085
## 459	F10	=~	cclim3	10.478	0.037	0.042	0.085	0.085
## 260	F3	=~	psup2	10.409	0.100	0.095	0.103	0.103
## 259	F3	=~	psup1	10.409	-0.090	-0.086	-0.089	-0.089
## 453	F10	=~	rolec1	10.402	-0.105	-0.120	-0.109	-0.109
## 454	F10	=~	rolec2	10.402	0.132	0.151	0.122	0.122
## 268	F3	=~	elc5	10.374	0.058	0.055	0.086	0.086
## 581	rolea2	~~	ssup2	10.309	0.043	0.043	0.167	0.167
## 230	F2	=~	psup2	10.233	0.145	0.111	0.120	0.120
## 229	F2	=~	psup1	10.233	-0.131	-0.100	-0.104	-0.104
## 193	F1	=~	cclim3	10.193	0.067	0.043	0.087	0.087
## 343	F6	=~	cclim3	10.122	-0.037	-0.040	-0.082	-0.082
## 874	ssup2	~~	ee1	10.120	0.040	0.040	0.137	0.137
## 200	F1	=~	psup2	10.120	0.216	0.139	0.150	0.150
## 199	F1	=~	psup1	10.120	-0.195	-0.126	-0.130	-0.130
## 252	F3	=~	cclim2	10.015	0.056	0.053	0.085	0.085
## 304	F4	=~	pa3	9.925	-0.234	-0.078	-0.081	-0.081
## 415	F8	=~	elc5	9.871	-0.148	-0.050	-0.078	-0.078
## 630	rolec2	~~	work2	9.862	0.076	0.076	0.117	0.117
## 959	elc1	~~	elc4	9.526	-0.022	-0.022	-0.104	-0.104
## 527	F12	=~	self2	9.409	-0.047	-0.035	-0.070	-0.070
## 207	F1	=~	elc4	9.403	0.084	0.054	0.090	0.090
## 602	rolec1	~~	work2	9.218	-0.067	-0.067	-0.101	-0.101
## 393	F7	=~	pa2	9.065	-0.087	-0.066	-0.069	-0.069
## 694	work2	~~	self1	9.055	-0.022	-0.022	-0.093	-0.093
## 352	F6	=~	elc1	8.920	-0.041	-0.045	-0.071	-0.071
## 853	ssup1	~~	elc3	8.895	0.023	0.023	0.102	0.102
## 891	psup1	~~	ee1	8.759	-0.038	-0.038	-0.100	-0.100
## 590	rolea2	~~	elc4	8.666	0.027	0.027	0.106	0.106
## 265	F3	=~	elc2	8.590	-0.056	-0.053	-0.085	-0.085
## 538	F12	=~	dp2	8.559	-0.147	-0.111	-0.094	-0.094
## 537	F12	=~	dp1	8.559	0.165	0.124	0.114	0.114
## 943	self2	~~	pa3	8.506	0.017	0.017	0.105	0.105
## 855	ssup1	~~	elc5	8.437	-0.026	-0.026	-0.099	-0.099
## 474	F10	=~	elc5	8.365	0.038	0.044	0.068	0.068
## 465	F10	=~	psup1	8.265	-0.056	-0.064	-0.066	-0.066
## 466	F10	=~	psup2	8.265	0.062	0.070	0.076	0.076
## 526	F12	=~	self1	8.260	0.041	0.031	0.069	0.069

## 388	F7 =~	ee2	8.234	0.076	0.058	0.046	0.046
## 549	rolea1 ~~	dec2	8.219	0.049	0.049	0.097	0.097
## 298	F4 =~	ee2	8.208	0.192	0.064	0.051	0.051
## 405	F8 =~	dec1	8.195	0.229	0.078	0.077	0.077
## 406	F8 =~	dec2	8.195	-0.363	-0.123	-0.093	-0.093
## 208	F1 =~	elc5	8.083	0.079	0.051	0.079	0.079
## 400	F8 =~	work2	7.919	-0.261	-0.089	-0.081	-0.081
## 399	F8 =~	work1	7.919	0.360	0.122	0.102	0.102
## 368	F7 =~	rolec2	7.859	0.152	0.115	0.094	0.094
## 367	F7 =~	rolec1	7.859	-0.120	-0.092	-0.083	-0.083
## 710	cclim1 ~~	cclim2	7.844	-0.022	-0.022	-0.136	-0.136
## 456	F10 =~	work2	7.826	-0.108	-0.124	-0.114	-0.114
## 455	F10 =~	work1	7.826	0.149	0.171	0.142	0.142
## 443	F9 =~	ee1	7.519	-0.152	-0.065	-0.049	-0.049
## 428	F9 =~	work1	7.493	-0.302	-0.128	-0.107	-0.107
## 429	F9 =~	work2	7.493	0.219	0.093	0.085	0.085
## 560	rolea1 ~~	elc4	7.438	0.026	0.026	0.086	0.086
## 531	F12 =~	elc3	7.413	0.048	0.037	0.067	0.067
## 293	F4 =~	elc2	7.291	-0.138	-0.046	-0.074	-0.074
## 512	F12 =~	rolec1	7.266	0.110	0.083	0.076	0.076
## 513	F12 =~	rolec2	7.266	-0.139	-0.105	-0.085	-0.085
## 392	F7 =~	pa1	7.251	0.073	0.056	0.061	0.061
## 322	F5 =~	elc1	7.130	-0.061	-0.042	-0.067	-0.067
## 627	rolec1 ~~	pa2	7.078	0.041	0.041	0.090	0.090
## 919	self1 ~~	elc3	7.031	0.009	0.009	0.086	0.086
## 238	F2 =~	elc5	7.025	0.062	0.047	0.074	0.074
## 490	F11 =~	dec1	6.960	-0.077	-0.075	-0.074	-0.074
## 491	F11 =~	dec2	6.960	0.122	0.118	0.089	0.089
## 205	F1 =~	elc2	6.932	-0.078	-0.050	-0.080	-0.080
## 811	dec1 ~~	self3	6.871	-0.019	-0.019	-0.088	-0.088
## 235	F2 =~	elc2	6.870	-0.065	-0.050	-0.079	-0.079
## 706	work2 ~~	dp2	6.716	-0.054	-0.054	-0.080	-0.080
## 690	work2 ~~	ssup1	6.678	0.043	0.043	0.084	0.084
## 473	F10 =~	elc4	6.645	-0.034	-0.038	-0.064	-0.064
## 802	cclim4 ~~	pa2	6.640	0.028	0.028	0.085	0.085
## 222	F2 =~	cclim2	6.626	0.057	0.043	0.069	0.069
## 754	cclim2 ~~	dpl	6.453	-0.026	-0.026	-0.132	-0.132
## 751	cclim2 ~~	ee1	6.432	0.023	0.023	0.093	0.093
## 692	work2 ~~	psup1	6.395	0.040	0.040	0.080	0.080
## 691	work2 ~~	ssup2	6.341	-0.040	-0.040	-0.104	-0.104
## 583	rolea2 ~~	psup2	6.264	0.032	0.032	0.148	0.148
## 990	elc4 ~~	elc5	6.223	0.018	0.018	0.093	0.093
## 542	rolea1 ~~	work1	6.219	-0.043	-0.043	-0.091	-0.091
## 557	rolea1 ~~	elc1	6.197	-0.023	-0.023	-0.079	-0.079
## 916	self1 ~~	self3	6.146	-0.013	-0.013	-0.157	-0.157
## 1011	ee1 ~~	pa1	6.115	0.030	0.030	0.090	0.090
## 509	F11 =~	pa3	6.085	0.065	0.063	0.066	0.066
## 516	F12 =~	cclim1	6.021	0.049	0.037	0.069	0.069
## 338	F6 =~	rolec2	6.011	0.103	0.112	0.090	0.090
## 337	F6 =~	rolec1	6.011	-0.082	-0.089	-0.081	-0.081
## 622	rolec1 ~~	ee2	5.928	-0.035	-0.035	-0.093	-0.093

## 899	psup2	~~	self1	5.805	0.012	0.012	0.113	0.113
## 926	self1	~~	dp2	5.791	0.018	0.018	0.077	0.077
## 770	cclim3	~~	elc2	5.783	-0.014	-0.014	-0.072	-0.072
## 994	elc4	~~	dpl	5.725	0.024	0.024	0.103	0.103
## 312	F5	==	cclim2	5.650	-0.058	-0.039	-0.063	-0.063
## 412	F8	==	elc2	5.634	0.119	0.040	0.065	0.065
## 837	dec2	~~	ee1	5.601	0.039	0.039	0.078	0.078
## 960	elc1	~~	elc5	5.580	-0.018	-0.018	-0.091	-0.091
## 860	ssup1	~~	dp2	5.566	-0.039	-0.039	-0.079	-0.079
## 1032	pa1	~~	pa2	5.550	-0.056	-0.056	-0.191	-0.191
## 316	F5	==	ssup2	5.543	-0.449	-0.305	-0.242	-0.242
## 315	F5	==	ssup1	5.542	0.413	0.281	0.225	0.225
## 746	cclim2	~~	elc1	5.502	0.015	0.015	0.082	0.082
## 1002	elc5	~~	dpl	5.497	-0.023	-0.023	-0.108	-0.108
## 1015	ee2	~~	dpl	5.496	-0.031	-0.031	-0.131	-0.131
## 579	rolea2	~~	dec2	5.478	0.045	0.045	0.102	0.102
## 302	F4	==	pa1	5.433	0.160	0.053	0.058	0.058
## 607	rolec1	~~	dec1	5.303	-0.042	-0.042	-0.070	-0.070
## 965	elc1	~~	dp2	5.205	0.026	0.026	0.072	0.072
## 755	cclim2	~~	dp2	5.202	0.026	0.026	0.083	0.083
## 818	dec1	~~	ee2	5.186	0.030	0.030	0.084	0.084
## 640	rolec2	~~	psup2	5.106	0.035	0.035	0.119	0.119
## 823	dec1	~~	pa2	5.090	-0.031	-0.031	-0.073	-0.073
## 355	F6	==	elc4	5.066	0.031	0.033	0.055	0.055
## 674	work1	~~	elc4	5.036	-0.025	-0.025	-0.075	-0.075
## 484	F11	==	work1	5.028	-0.107	-0.104	-0.087	-0.087
## 485	F11	==	work2	5.028	0.078	0.076	0.070	0.070
## 1010	ee1	~~	dp2	5.003	-0.038	-0.038	-0.074	-0.074
## 471	F10	==	elc2	4.977	-0.031	-0.036	-0.057	-0.057
## 951	self3	~~	ee3	4.860	-0.015	-0.015	-0.079	-0.079
## 507	F11	==	pa1	4.831	-0.054	-0.053	-0.058	-0.058
## 308	F5	==	rolec2	4.784	0.163	0.111	0.090	0.090
## 307	F5	==	rolec1	4.783	-0.129	-0.088	-0.080	-0.080
## 204	F1	==	elc1	4.717	-0.060	-0.039	-0.062	-0.062
## 871	ssup2	~~	elc3	4.679	-0.016	-0.016	-0.093	-0.093
## 739	cclim2	~~	ssup1	4.672	-0.019	-0.019	-0.081	-0.081
## 427	F9	==	rolec2	4.469	-0.225	-0.095	-0.077	-0.077
## 426	F9	==	rolec1	4.468	0.179	0.076	0.069	0.069
## 366	F7	==	rolea2	4.463	0.101	0.077	0.079	0.079
## 365	F7	==	rolea1	4.463	-0.082	-0.062	-0.068	-0.068
## 822	dec1	~~	pa1	4.458	0.027	0.027	0.071	0.071
## 671	work1	~~	elc1	4.425	0.024	0.024	0.071	0.071
## 752	cclim2	~~	ee2	4.421	0.017	0.017	0.091	0.091
## 561	rolea1	~~	elc5	4.415	0.019	0.019	0.070	0.070
## 431	F9	==	cclim2	4.379	0.081	0.035	0.055	0.055
## 593	rolea2	~~	ee2	4.294	-0.025	-0.025	-0.095	-0.095
## 498	F11	==	self3	4.260	-0.026	-0.025	-0.046	-0.046
## 588	rolea2	~~	elc2	4.253	-0.021	-0.021	-0.072	-0.072
## 621	rolec1	~~	ee1	4.234	-0.034	-0.034	-0.067	-0.067
## 556	rolea1	~~	self3	4.169	0.014	0.014	0.073	0.073
## 859	ssup1	~~	dpl	4.161	0.030	0.030	0.096	0.096

## 342	F6 =~	cclim2	4.141	-0.031	-0.033	-0.052	-0.052
## 923	self1 ~~	ee2	4.137	-0.011	-0.011	-0.079	-0.079
## 873	ssup2 ~~	elc5	4.108	0.017	0.017	0.087	0.087
## 1030	dp2 ~~	pa2	3.994	-0.031	-0.031	-0.069	-0.069
## 633	rolec2 ~~	cclim3	3.950	0.019	0.019	0.065	0.065
## 468	F10 =~	self2	3.942	0.020	0.023	0.045	0.045
## 401	F8 =~	cclim1	3.909	0.080	0.027	0.050	0.050
## 276	F3 =~	pa3	3.899	0.047	0.045	0.047	0.047
## 517	F12 =~	cclim2	3.805	-0.045	-0.034	-0.055	-0.055
## 587	rolea2 ~~	elc1	3.792	-0.018	-0.018	-0.071	-0.071
## 505	F11 =~	ee2	3.783	-0.051	-0.050	-0.040	-0.040
## 920	self1 ~~	elc4	3.751	-0.008	-0.008	-0.060	-0.060
## 678	work1 ~~	ee3	3.707	-0.033	-0.033	-0.068	-0.068
## 643	rolec2 ~~	self3	3.698	-0.016	-0.016	-0.071	-0.071
## 529	F12 =~	elc1	3.635	-0.040	-0.030	-0.048	-0.048
## 494	F11 =~	psup1	3.612	-0.044	-0.043	-0.045	-0.045
## 495	F11 =~	psup2	3.612	0.049	0.048	0.051	0.051
## 188	F1 =~	rolec2	3.550	-0.224	-0.144	-0.117	-0.117
## 187	F1 =~	rolec1	3.549	0.178	0.115	0.104	0.104
## 300	F4 =~	dp1	3.539	-0.257	-0.086	-0.078	-0.078
## 301	F4 =~	dp2	3.539	0.229	0.076	0.065	0.065
## 693	work2 ~~	psup2	3.522	-0.028	-0.028	-0.087	-0.087
## 679	work1 ~~	dp1	3.512	-0.038	-0.038	-0.103	-0.103
## 379	F7 =~	self1	3.497	0.024	0.018	0.041	0.041
## 952	self3 ~~	dp1	3.438	-0.013	-0.013	-0.092	-0.092
## 555	rolea1 ~~	self2	3.426	-0.011	-0.011	-0.068	-0.068
## 1016	ee2 ~~	dp2	3.348	0.027	0.027	0.072	0.072
## 956	self3 ~~	pa3	3.331	-0.012	-0.012	-0.065	-0.065
## 325	F5 =~	elc4	3.321	0.041	0.028	0.046	0.046
## 296	F4 =~	elc5	3.302	0.087	0.029	0.045	0.045
## 209	F1 =~	ee1	3.267	-0.072	-0.046	-0.035	-0.035
## 954	self3 ~~	pa1	3.205	0.010	0.010	0.070	0.070
## 988	elc3 ~~	pa2	3.184	0.013	0.013	0.062	0.062
## 559	rolea1 ~~	elc3	3.184	-0.014	-0.014	-0.059	-0.059
## 550	rolea1 ~~	ssup1	3.172	-0.024	-0.024	-0.060	-0.060
## 231	F2 =~	self1	3.128	0.024	0.018	0.041	0.041
## 499	F11 =~	elc1	3.117	0.028	0.028	0.044	0.044
## 708	work2 ~~	pa2	3.079	-0.028	-0.028	-0.058	-0.058
## 470	F10 =~	elc1	3.071	0.023	0.026	0.042	0.042
## 1026	dp1 ~~	pa1	3.054	0.023	0.023	0.088	0.088
## 854	ssup1 ~~	elc4	3.041	0.016	0.016	0.056	0.056
## 440	F9 =~	self1	3.021	0.043	0.018	0.041	0.041
## 1020	ee3 ~~	dp1	3.017	0.026	0.026	0.078	0.078
## 666	work1 ~~	psup1	2.989	-0.026	-0.026	-0.061	-0.061
## 681	work1 ~~	pa1	2.977	0.025	0.025	0.067	0.067
## 543	rolea1 ~~	work2	2.952	0.030	0.030	0.054	0.054
## 1017	ee2 ~~	pa1	2.936	-0.018	-0.018	-0.074	-0.074
## 596	rolea2 ~~	dp2	2.869	0.029	0.029	0.063	0.063
## 544	rolea1 ~~	cclim1	2.837	-0.015	-0.015	-0.053	-0.053
## 614	rolec1 ~~	self2	2.815	-0.012	-0.012	-0.059	-0.059
## 488	F11 =~	cclim3	2.812	0.026	0.026	0.052	0.052

## 713	cclim1	~~	dec1	2.774	0.016	0.016	0.049	0.049
## 641	rolec2	~~	self1	2.753	0.012	0.012	0.055	0.055
## 594	rolea2	~~	ee3	2.751	0.024	0.024	0.062	0.062
## 246	F2	==	pa3	2.748	0.049	0.038	0.039	0.039
## 541	rolea1	~~	rolec2	2.723	0.030	0.030	0.060	0.060
## 1023	ee3	~~	pa2	2.666	0.022	0.022	0.056	0.056
## 1000	elc5	~~	ee2	2.654	0.013	0.013	0.065	0.065
## 497	F11	==	self2	2.625	0.019	0.018	0.036	0.036
## 687	work2	~~	cclim4	2.586	-0.024	-0.024	-0.048	-0.048
## 571	rolea2	~~	rolec2	2.575	-0.032	-0.032	-0.073	-0.073
## 927	self1	~~	pa1	2.570	0.008	0.008	0.056	0.056
## 659	work1	~~	cclim2	2.564	0.018	0.018	0.064	0.064
## 206	F1	==	elc3	2.560	-0.038	-0.025	-0.045	-0.045
## 881	ssup2	~~	pa3	2.552	0.020	0.020	0.067	0.067
## 1012	ee1	~~	pa2	2.549	0.021	0.021	0.056	0.056
## 832	dec2	~~	elc1	2.541	-0.018	-0.018	-0.050	-0.050
## 831	dec2	~~	self3	2.482	0.013	0.013	0.056	0.056
## 792	cclim4	~~	elc2	2.469	-0.014	-0.014	-0.046	-0.046
## 551	rolea1	~~	ssup2	2.467	0.020	0.020	0.068	0.068
## 584	rolea2	~~	self1	2.442	-0.009	-0.009	-0.058	-0.058
## 838	dec2	~~	ee2	2.409	-0.023	-0.023	-0.062	-0.062
## 996	elc4	~~	pa1	2.406	0.013	0.013	0.053	0.053
## 653	rolec2	~~	dp2	2.397	-0.032	-0.032	-0.052	-0.052
## 797	cclim4	~~	ee2	2.386	-0.016	-0.016	-0.058	-0.058
## 469	F10	==	self3	2.378	-0.017	-0.019	-0.035	-0.035
## 866	ssup2	~~	self1	2.378	-0.008	-0.008	-0.064	-0.064
## 841	dec2	~~	dp2	2.365	0.031	0.031	0.050	0.050
## 799	cclim4	~~	dp1	2.364	0.019	0.019	0.067	0.067
## 715	cclim1	~~	ssup1	2.353	0.013	0.013	0.050	0.050
## 438	F9	==	psup1	2.351	0.087	0.037	0.038	0.038
## 439	F9	==	psup2	2.351	-0.096	-0.041	-0.044	-0.044
## 769	cclim3	~~	elc1	2.333	-0.008	-0.008	-0.047	-0.047
## 661	work1	~~	cclim4	2.314	0.022	0.022	0.051	0.051
## 900	psup2	~~	self2	2.311	-0.008	-0.008	-0.081	-0.081
## 566	rolea1	~~	dp2	2.310	-0.026	-0.026	-0.049	-0.049
## 915	self1	~~	self2	2.309	0.007	0.007	0.100	0.100
## 663	work1	~~	dec2	2.274	0.037	0.037	0.065	0.065
## 993	elc4	~~	ee3	2.266	-0.015	-0.015	-0.047	-0.047
## 328	F5	==	ee2	2.247	0.048	0.032	0.026	0.026
## 372	F7	==	cclim2	2.228	-0.031	-0.023	-0.037	-0.037
## 842	dec2	~~	pa1	2.184	0.021	0.021	0.054	0.054
## 981	elc3	~~	elc5	2.178	0.010	0.010	0.064	0.064
## 733	cclim1	~~	pa2	2.176	-0.012	-0.012	-0.049	-0.049
## 836	dec2	~~	elc5	2.174	0.016	0.016	0.049	0.049
## 1019	ee2	~~	pa3	2.146	0.017	0.017	0.057	0.057
## 781	cclim3	~~	pa3	2.145	-0.011	-0.011	-0.047	-0.047
## 533	F12	==	elc5	2.133	-0.030	-0.023	-0.036	-0.036
## 773	cclim3	~~	elc5	2.131	0.008	0.008	0.047	0.047
## 801	cclim4	~~	pa1	2.118	-0.015	-0.015	-0.050	-0.050
## 216	F1	==	pa3	2.094	0.054	0.035	0.036	0.036
## 655	rolec2	~~	pa2	2.082	-0.023	-0.023	-0.052	-0.052

## 736	cclim2	~~	cclim4	2.081	0.016	0.016	0.069	0.069
## 945	self3	~~	elc2	2.060	0.007	0.007	0.048	0.048
## 869	ssup2	~~	elc1	2.003	-0.012	-0.012	-0.058	-0.058
## 361	F6	==	dp2	1.995	-0.039	-0.042	-0.036	-0.036
## 360	F6	==	dp1	1.995	0.044	0.047	0.043	0.043
## 433	F9	==	cclim4	1.965	-0.065	-0.028	-0.038	-0.038
## 192	F1	==	cclim2	1.962	0.037	0.024	0.038	0.038
## 631	rolec2	~~	cclim1	1.946	-0.015	-0.015	-0.045	-0.045
## 644	rolec2	~~	elc1	1.933	-0.016	-0.016	-0.045	-0.045
## 840	dec2	~~	dp1	1.931	-0.028	-0.028	-0.072	-0.072
## 962	elc1	~~	ee2	1.929	0.011	0.011	0.053	0.053
## 649	rolec2	~~	ee1	1.921	-0.024	-0.024	-0.047	-0.047
## 632	rolec2	~~	cclim2	1.917	-0.016	-0.016	-0.053	-0.053
## 721	cclim1	~~	self3	1.911	-0.006	-0.006	-0.047	-0.047
## 548	rolea1	~~	dec1	1.907	-0.021	-0.021	-0.043	-0.043
## 280	F4	==	rolec2	1.884	-0.169	-0.056	-0.046	-0.046
## 667	work1	~~	psup2	1.884	0.021	0.021	0.077	0.077
## 279	F4	==	rolec1	1.884	0.134	0.045	0.041	0.041
## 281	F4	==	work1	1.858	0.181	0.060	0.050	0.050
## 282	F4	==	work2	1.858	-0.131	-0.044	-0.040	-0.040
## 758	cclim2	~~	pa3	1.853	-0.012	-0.012	-0.049	-0.049
## 918	self1	~~	elc2	1.847	0.006	0.006	0.041	0.041
## 654	rolec2	~~	pa1	1.843	-0.020	-0.020	-0.051	-0.051
## 324	F5	==	elc3	1.827	0.026	0.018	0.033	0.033
## 972	elc2	~~	ee1	1.818	-0.014	-0.014	-0.042	-0.042
## 939	self2	~~	dp1	1.807	0.009	0.009	0.068	0.068
## 724	cclim1	~~	elc3	1.806	0.007	0.007	0.043	0.043
## 650	rolec2	~~	ee2	1.777	0.020	0.020	0.055	0.055
## 668	work1	~~	self1	1.766	0.010	0.010	0.046	0.046
## 998	elc4	~~	pa3	1.729	-0.012	-0.012	-0.041	-0.041
## 922	self1	~~	ee1	1.725	0.008	0.008	0.043	0.043
## 813	dec1	~~	elc2	1.711	0.014	0.014	0.037	0.037
## 430	F9	==	cclim1	1.706	-0.045	-0.019	-0.035	-0.035
## 858	ssup1	~~	ee3	1.702	-0.018	-0.018	-0.044	-0.044
## 331	F5	==	dp2	1.687	-0.062	-0.042	-0.036	-0.036
## 330	F5	==	dp1	1.687	0.070	0.048	0.043	0.043
## 870	ssup2	~~	elc2	1.685	-0.012	-0.012	-0.051	-0.051
## 778	cclim3	~~	dp2	1.675	-0.012	-0.012	-0.041	-0.041
## 1014	ee2	~~	ee3	1.649	-0.032	-0.032	-0.100	-0.100
## 502	F11	==	elc4	1.633	-0.020	-0.020	-0.033	-0.033
## 567	rolea1	~~	pa1	1.619	-0.015	-0.015	-0.046	-0.046
## 263	F3	==	self3	1.571	-0.016	-0.015	-0.028	-0.028
## 585	rolea2	~~	self2	1.558	0.008	0.008	0.053	0.053
## 373	F7	==	cclim3	1.546	-0.020	-0.015	-0.031	-0.031
## 867	ssup2	~~	self2	1.545	0.007	0.007	0.059	0.059
## 272	F3	==	dp1	1.521	0.056	0.053	0.049	0.049
## 928	self1	~~	pa2	1.521	0.007	0.007	0.042	0.042
## 273	F3	==	dp2	1.521	-0.050	-0.047	-0.040	-0.040
## 683	work1	~~	pa3	1.516	-0.020	-0.020	-0.043	-0.043
## 911	psup2	~~	dp2	1.507	0.018	0.018	0.058	0.058
## 932	self2	~~	elc2	1.500	-0.005	-0.005	-0.042	-0.042

## 242	F2 ==	dp1	1.497	0.065	0.050	0.045	0.045
## 243	F2 ==	dp2	1.497	-0.058	-0.044	-0.037	-0.037
## 782	cclim4 ~~	dec1	1.471	-0.015	-0.015	-0.036	-0.036
## 940	self2 ~~	dp2	1.461	-0.009	-0.009	-0.043	-0.043
## 732	cclim1 ~~	pa1	1.447	0.009	0.009	0.041	0.041
## 985	elc3 ~~	dp1	1.436	0.010	0.010	0.055	0.055
## 833	dec2 ~~	elc2	1.424	-0.014	-0.014	-0.036	-0.036
## 519	F12 ==	cclim4	1.405	0.032	0.024	0.033	0.033
## 966	elc1 ~~	pa1	1.403	-0.010	-0.010	-0.041	-0.041
## 535	F12 ==	ee2	1.398	-0.035	-0.026	-0.021	-0.021
## 608	rolec1 ~~	dec2	1.394	0.025	0.025	0.040	0.040
## 233	F2 ==	self3	1.374	-0.018	-0.014	-0.026	-0.026
## 612	rolec1 ~~	psup2	1.354	-0.017	-0.017	-0.055	-0.055
## 577	rolea2 ~~	cclim4	1.337	0.014	0.014	0.042	0.042
## 805	dec1 ~~	ssup1	1.336	0.019	0.019	0.041	0.041
## 765	cclim3 ~~	psup2	1.334	0.008	0.008	0.054	0.054
## 895	psup1 ~~	dp2	1.333	-0.018	-0.018	-0.038	-0.038
## 613	rolec1 ~~	self1	1.333	0.008	0.008	0.036	0.036
## 569	rolea1 ~~	pa3	1.332	0.016	0.016	0.038	0.038
## 358	F6 ==	ee2	1.315	0.022	0.023	0.019	0.019
## 609	rolec1 ~~	ssup1	1.314	-0.019	-0.019	-0.038	-0.038
## 731	cclim1 ~~	dp2	1.304	0.012	0.012	0.036	0.036
## 685	work2 ~~	cclim2	1.303	0.013	0.013	0.040	0.040
## 698	work2 ~~	elc2	1.297	-0.014	-0.014	-0.033	-0.033
## 682	work1 ~~	pa2	1.295	0.018	0.018	0.043	0.043
## 828	dec2 ~~	psup2	1.291	0.018	0.018	0.061	0.061
## 1018	ee2 ~~	pa2	1.281	-0.013	-0.013	-0.047	-0.047
## 946	self3 ~~	elc3	1.269	-0.004	-0.004	-0.041	-0.041
## 886	psup1 ~~	elc1	1.266	0.010	0.010	0.036	0.036
## 546	rolea1 ~~	cclim3	1.262	0.009	0.009	0.036	0.036
## 986	elc3 ~~	dp2	1.260	-0.011	-0.011	-0.037	-0.037
## 384	F7 ==	elc3	1.258	0.019	0.015	0.027	0.027
## 261	F3 ==	self1	1.253	0.012	0.012	0.026	0.026
## 289	F4 ==	self1	1.247	0.033	0.011	0.025	0.025
## 937	self2 ~~	ee2	1.237	0.006	0.006	0.049	0.049
## 511	F12 ==	rolea2	1.227	0.047	0.035	0.036	0.036
## 510	F12 ==	rolea1	1.227	-0.038	-0.029	-0.031	-0.031
## 573	rolea2 ~~	work2	1.220	0.020	0.020	0.041	0.041
## 642	rolec2 ~~	self2	1.219	0.008	0.008	0.042	0.042
## 930	self2 ~~	self3	1.212	0.008	0.008	0.113	0.113
## 740	cclim2 ~~	ssup2	1.205	0.009	0.009	0.052	0.052
## 582	rolea2 ~~	psup1	1.193	-0.014	-0.014	-0.042	-0.042
## 730	cclim1 ~~	dp1	1.190	-0.010	-0.010	-0.048	-0.048
## 1028	dp1 ~~	pa3	1.189	0.016	0.016	0.049	0.049
## 743	cclim2 ~~	self1	1.186	0.004	0.004	0.039	0.039
## 976	elc2 ~~	dp2	1.184	0.014	0.014	0.033	0.033
## 771	cclim3 ~~	elc3	1.172	-0.005	-0.005	-0.035	-0.035
## 595	rolea2 ~~	dp1	1.166	-0.017	-0.017	-0.061	-0.061
## 413	F8 ==	elc3	1.166	0.043	0.015	0.027	0.027
## 639	rolec2 ~~	psup1	1.161	-0.017	-0.017	-0.037	-0.037
## 856	ssup1 ~~	ee1	1.160	-0.015	-0.015	-0.037	-0.037

## 651	rolec2	~~	ee3	1.148	0.019	0.019	0.036	0.036
## 419	F8	==	dp1	1.147	-0.118	-0.040	-0.037	-0.037
## 420	F8	==	dp2	1.147	0.105	0.036	0.030	0.030
## 292	F4	==	elc1	1.146	-0.051	-0.017	-0.027	-0.027
## 723	cclim1	~~	elc2	1.136	0.007	0.007	0.032	0.032
## 748	cclim2	~~	elc3	1.131	-0.006	-0.006	-0.039	-0.039
## 354	F6	==	elc3	1.130	0.012	0.013	0.025	0.025
## 903	psup2	~~	elc2	1.122	-0.009	-0.009	-0.047	-0.047
## 852	ssup1	~~	elc2	1.111	0.011	0.011	0.033	0.033
## 436	F9	==	ssup1	1.105	0.058	0.025	0.020	0.020
## 437	F9	==	ssup2	1.105	-0.063	-0.027	-0.021	-0.021
## 518	F12	==	cclim3	1.098	-0.019	-0.014	-0.029	-0.029
## 948	self3	~~	elc5	1.053	-0.005	-0.005	-0.037	-0.037
## 493	F11	==	ssup2	1.033	0.027	0.026	0.021	0.021
## 492	F11	==	ssup1	1.033	-0.025	-0.024	-0.019	-0.019
## 636	rolec2	~~	dec2	1.026	0.024	0.024	0.040	0.040
## 759	cclim3	~~	cclim4	1.025	-0.008	-0.008	-0.036	-0.036
## 1004	elc5	~~	pa1	1.019	-0.008	-0.008	-0.037	-0.037
## 760	cclim3	~~	dec1	1.013	-0.008	-0.008	-0.030	-0.030
## 905	psup2	~~	elc4	0.996	-0.008	-0.008	-0.045	-0.045
## 933	self2	~~	elc3	0.976	-0.003	-0.003	-0.036	-0.036
## 680	work1	~~	dp2	0.960	0.020	0.020	0.034	0.034
## 750	cclim2	~~	elc5	0.956	0.006	0.006	0.036	0.036
## 460	F10	==	cclim4	0.954	-0.017	-0.019	-0.026	-0.026
## 522	F12	==	ssup1	0.951	-0.031	-0.024	-0.019	-0.019
## 523	F12	==	ssup2	0.951	0.034	0.026	0.020	0.020
## 897	psup1	~~	pa2	0.950	-0.011	-0.011	-0.034	-0.034
## 728	cclim1	~~	ee2	0.935	0.007	0.007	0.037	0.037
## 1024	ee3	~~	pa3	0.935	0.014	0.014	0.032	0.032
## 489	F11	==	cclim4	0.934	0.023	0.022	0.030	0.030
## 553	rolea1	~~	psup2	0.931	-0.012	-0.012	-0.047	-0.047
## 1031	dp2	~~	pa3	0.927	-0.016	-0.016	-0.031	-0.031
## 487	F11	==	cclim2	0.916	0.020	0.019	0.030	0.030
## 1021	ee3	~~	dp2	0.915	0.017	0.017	0.031	0.031
## 278	F4	==	rolea2	0.905	0.092	0.031	0.031	0.031
## 277	F4	==	rolea1	0.905	-0.074	-0.025	-0.027	-0.027
## 892	psup1	~~	ee2	0.897	0.010	0.010	0.038	0.038
## 552	rolea1	~~	psup1	0.897	-0.012	-0.012	-0.032	-0.032
## 563	rolea1	~~	ee2	0.896	0.011	0.011	0.037	0.037
## 217	F2	==	rolea1	0.893	-0.086	-0.065	-0.072	-0.072
## 218	F2	==	rolea2	0.893	0.105	0.080	0.083	0.083
## 913	psup2	~~	pa2	0.885	0.010	0.010	0.048	0.048
## 793	cclim4	~~	elc3	0.871	0.006	0.006	0.030	0.030
## 711	cclim1	~~	cclim3	0.864	-0.005	-0.005	-0.033	-0.033
## 902	psup2	~~	elc1	0.858	-0.007	-0.007	-0.043	-0.043
## 857	ssup1	~~	ee2	0.848	-0.011	-0.011	-0.037	-0.037
## 1003	elc5	~~	dp2	0.839	0.010	0.010	0.030	0.030
## 890	psup1	~~	elc5	0.836	0.008	0.008	0.031	0.031
## 672	work1	~~	elc2	0.835	-0.011	-0.011	-0.030	-0.030
## 387	F7	==	ee1	0.830	0.027	0.020	0.016	0.016
## 194	F1	==	cclim4	0.825	0.029	0.018	0.025	0.025

## 554	rolea1	~~	self1	0.823	0.005	0.005	0.029	0.029
## 850	ssup1	~~	self3	0.819	-0.006	-0.006	-0.033	-0.033
## 868	ssup2	~~	self3	0.817	0.005	0.005	0.042	0.042
## 525	F12	==	psup2	0.816	0.032	0.024	0.026	0.026
## 524	F12	==	psup1	0.816	-0.029	-0.022	-0.023	-0.023
## 887	psup1	~~	elc2	0.805	0.008	0.008	0.028	0.028
## 349	F6	==	self1	0.796	-0.008	-0.008	-0.018	-0.018
## 821	dec1	~~	dp2	0.793	-0.016	-0.016	-0.027	-0.027
## 844	dec2	~~	pa3	0.792	-0.014	-0.014	-0.029	-0.029
## 796	cclim4	~~	ee1	0.791	0.011	0.011	0.029	0.029
## 605	rolec1	~~	cclim3	0.776	0.008	0.008	0.027	0.027
## 775	cclim3	~~	ee2	0.759	0.006	0.006	0.033	0.033
## 974	elc2	~~	ee3	0.750	0.009	0.009	0.027	0.027
## 907	psup2	~~	ee1	0.748	0.010	0.010	0.042	0.042
## 810	dec1	~~	self2	0.747	0.006	0.006	0.029	0.029
## 616	rolec1	~~	elc1	0.738	0.010	0.010	0.026	0.026
## 574	rolea2	~~	cclim1	0.732	0.007	0.007	0.031	0.031
## 380	F7	==	self2	0.726	-0.012	-0.009	-0.017	-0.017
## 779	cclim3	~~	pa1	0.723	0.006	0.006	0.030	0.030
## 794	cclim4	~~	elc4	0.709	-0.007	-0.007	-0.025	-0.025
## 374	F7	==	cclim4	0.708	-0.021	-0.016	-0.021	-0.021
## 917	self1	~~	elc1	0.698	0.003	0.003	0.026	0.026
## 239	F2	==	ee1	0.693	0.032	0.024	0.018	0.018
## 704	work2	~~	ee3	0.690	0.015	0.015	0.026	0.026
## 619	rolec1	~~	elc4	0.689	0.009	0.009	0.025	0.025
## 562	rolea1	~~	ee1	0.687	-0.012	-0.012	-0.028	-0.028
## 618	rolec1	~~	elc3	0.676	0.008	0.008	0.026	0.026
## 742	cclim2	~~	psup2	0.675	-0.007	-0.007	-0.044	-0.044
## 441	F9	==	self2	0.666	-0.021	-0.009	-0.018	-0.018
## 234	F2	==	elc1	0.665	-0.019	-0.015	-0.023	-0.023
## 964	elc1	~~	dp1	0.659	-0.008	-0.008	-0.036	-0.036
## 335	F6	==	rolea1	0.655	0.025	0.027	0.029	0.029
## 336	F6	==	rolea2	0.655	-0.030	-0.033	-0.034	-0.034
## 712	cclim1	~~	cclim4	0.644	-0.007	-0.007	-0.027	-0.027
## 597	rolea2	~~	pa1	0.643	0.010	0.010	0.033	0.033
## 385	F7	==	elc4	0.637	-0.016	-0.012	-0.020	-0.020
## 1027	dp1	~~	pa2	0.635	-0.011	-0.011	-0.039	-0.039
## 565	rolea1	~~	dp1	0.634	0.012	0.012	0.037	0.037
## 568	rolea1	~~	pa2	0.632	-0.010	-0.010	-0.028	-0.028
## 949	self3	~~	ee1	0.628	0.005	0.005	0.029	0.029
## 285	F4	==	ssup1	0.623	-0.058	-0.019	-0.016	-0.016
## 286	F4	==	ssup2	0.623	0.063	0.021	0.017	0.017
## 764	cclim3	~~	psup1	0.621	-0.006	-0.006	-0.025	-0.025
## 665	work1	~~	ssup2	0.618	0.013	0.013	0.039	0.039
## 914	psup2	~~	pa3	0.617	0.009	0.009	0.037	0.037
## 686	work2	~~	cclim3	0.612	-0.008	-0.008	-0.024	-0.024
## 908	psup2	~~	ee2	0.612	0.008	0.008	0.045	0.045
## 884	psup1	~~	self2	0.609	0.004	0.004	0.029	0.029
## 997	elc4	~~	pa2	0.609	-0.007	-0.007	-0.026	-0.026
## 835	dec2	~~	elc4	0.606	0.009	0.009	0.024	0.024
## 786	cclim4	~~	psup1	0.604	-0.008	-0.008	-0.025	-0.025

## 785	cclim4	~~	ssup2	0.599	0.008	0.008	0.031	0.031
## 885	psup1	~~	self3	0.589	-0.005	-0.005	-0.028	-0.028
## 772	cclim3	~~	elc4	0.578	0.004	0.004	0.023	0.023
## 921	self1	~~	elc5	0.571	-0.003	-0.003	-0.025	-0.025
## 941	self2	~~	pa1	0.569	-0.004	-0.004	-0.030	-0.030
## 699	work2	~~	elc3	0.567	-0.007	-0.007	-0.024	-0.024
## 532	F12	==	elc4	0.567	0.016	0.012	0.019	0.019
## 791	cclim4	~~	elc1	0.561	-0.006	-0.006	-0.023	-0.023
## 820	dec1	~~	dp1	0.558	0.012	0.012	0.033	0.033
## 402	F8	==	cclim2	0.557	-0.034	-0.012	-0.019	-0.019
## 403	F8	==	cclim3	0.555	-0.027	-0.009	-0.019	-0.019
## 334	F5	==	pa3	0.553	-0.026	-0.018	-0.018	-0.018
## 326	F5	==	elc5	0.549	-0.017	-0.012	-0.018	-0.018
## 472	F10	==	elc3	0.548	-0.008	-0.010	-0.017	-0.017
## 382	F7	==	elc1	0.545	-0.015	-0.011	-0.018	-0.018
## 570	rolea2	~~	rolec1	0.535	0.013	0.013	0.029	0.029
## 446	F9	==	dp1	0.528	0.058	0.025	0.023	0.023
## 447	F9	==	dp2	0.528	-0.052	-0.022	-0.019	-0.019
## 824	dec1	~~	pa3	0.528	-0.011	-0.011	-0.022	-0.022
## 586	rolea2	~~	self3	0.522	-0.005	-0.005	-0.030	-0.030
## 808	dec1	~~	psup2	0.512	0.009	0.009	0.033	0.033
## 979	elc2	~~	pa3	0.506	-0.007	-0.007	-0.022	-0.022
## 675	work1	~~	elc5	0.505	-0.008	-0.008	-0.025	-0.025
## 381	F7	==	self3	0.497	-0.010	-0.008	-0.014	-0.014
## 501	F11	==	elc3	0.495	-0.010	-0.009	-0.017	-0.017
## 934	self2	~~	elc4	0.491	0.003	0.003	0.024	0.024
## 635	rolec2	~~	dec1	0.475	-0.013	-0.013	-0.023	-0.023
## 991	elc4	~~	ee1	0.472	-0.006	-0.006	-0.022	-0.022
## 912	psup2	~~	pa1	0.469	-0.007	-0.007	-0.036	-0.036
## 777	cclim3	~~	dp1	0.468	0.006	0.006	0.030	0.030
## 789	cclim4	~~	self2	0.465	-0.004	-0.004	-0.024	-0.024
## 717	cclim1	~~	psup1	0.452	0.005	0.005	0.021	0.021
## 540	rolea1	~~	rolec1	0.448	-0.011	-0.011	-0.022	-0.022
## 819	dec1	~~	ee3	0.435	-0.010	-0.010	-0.020	-0.020
## 528	F12	==	self3	0.433	0.011	0.008	0.015	0.015
## 747	cclim2	~~	elc2	0.427	-0.004	-0.004	-0.022	-0.022
## 483	F11	==	rolec2	0.415	0.029	0.028	0.023	0.023
## 482	F11	==	rolec1	0.415	-0.023	-0.022	-0.020	-0.020
## 442	F9	==	self3	0.410	-0.018	-0.008	-0.014	-0.014
## 370	F7	==	work2	0.408	-0.026	-0.020	-0.018	-0.018
## 369	F7	==	work1	0.408	0.036	0.027	0.023	0.023
## 880	ssup2	~~	pa2	0.407	-0.008	-0.008	-0.029	-0.029
## 628	rolec1	~~	pa3	0.407	0.010	0.010	0.020	0.020
## 545	rolea1	~~	cclim2	0.402	-0.006	-0.006	-0.023	-0.023
## 673	work1	~~	elc3	0.400	0.006	0.006	0.022	0.022
## 664	work1	~~	ssup1	0.399	-0.010	-0.010	-0.023	-0.023
## 500	F11	==	elc2	0.398	0.011	0.010	0.017	0.017
## 629	rolec2	~~	work1	0.397	-0.017	-0.017	-0.031	-0.031
## 411	F8	==	elc1	0.394	0.030	0.010	0.016	0.016
## 812	dec1	~~	elc1	0.390	-0.006	-0.006	-0.019	-0.019
## 625	rolec1	~~	dp2	0.384	0.012	0.012	0.020	0.020

## 947	self3	~~	elc4	0.374	0.003	0.003	0.021	0.021
## 624	rolec1	~~	dp1	0.373	0.011	0.011	0.028	0.028
## 283	F4	==	dec1	0.373	0.054	0.018	0.018	0.018
## 284	F4	==	dec2	0.373	-0.085	-0.028	-0.021	-0.021
## 290	F4	==	self2	0.372	-0.019	-0.006	-0.013	-0.013
## 264	F3	==	elc1	0.372	-0.011	-0.010	-0.017	-0.017
## 729	cclim1	~~	ee3	0.370	0.005	0.005	0.019	0.019
## 849	ssup1	~~	self2	0.369	-0.004	-0.004	-0.023	-0.023
## 295	F4	==	elc4	0.365	0.029	0.010	0.016	0.016
## 973	elc2	~~	ee2	0.365	-0.005	-0.005	-0.022	-0.022
## 950	self3	~~	ee2	0.364	0.003	0.003	0.026	0.026
## 741	cclim2	~~	psup1	0.361	0.005	0.005	0.022	0.022
## 696	work2	~~	self3	0.360	0.005	0.005	0.020	0.020
## 520	F12	==	dec1	0.354	0.023	0.018	0.017	0.017
## 521	F12	==	dec2	0.354	-0.037	-0.028	-0.021	-0.021
## 783	cclim4	~~	dec2	0.352	0.008	0.008	0.018	0.018
## 726	cclim1	~~	elc5	0.347	0.003	0.003	0.019	0.019
## 201	F1	==	self1	0.344	0.010	0.006	0.014	0.014
## 592	rolea2	~~	ee1	0.340	0.008	0.008	0.022	0.022
## 425	F9	==	rolea2	0.330	-0.049	-0.021	-0.021	-0.021
## 424	F9	==	rolea1	0.330	0.040	0.017	0.018	0.018
## 848	ssup1	~~	self1	0.326	0.003	0.003	0.019	0.019
## 648	rolec2	~~	elc5	0.318	-0.006	-0.006	-0.019	-0.019
## 925	self1	~~	dp1	0.312	-0.004	-0.004	-0.025	-0.025
## 709	work2	~~	pa3	0.310	-0.009	-0.009	-0.017	-0.017
## 875	ssup2	~~	ee2	0.307	-0.006	-0.006	-0.028	-0.028
## 350	F6	==	self2	0.300	0.005	0.005	0.011	0.011
## 883	psup1	~~	self1	0.294	-0.003	-0.003	-0.018	-0.018
## 467	F10	==	self1	0.292	-0.005	-0.006	-0.013	-0.013
## 967	elc1	~~	pa2	0.290	0.005	0.005	0.018	0.018
## 591	rolea2	~~	elc5	0.289	0.005	0.005	0.021	0.021
## 877	ssup2	~~	dp1	0.288	-0.008	-0.008	-0.034	-0.034
## 647	rolec2	~~	elc4	0.287	-0.006	-0.006	-0.017	-0.017
## 294	F4	==	elc3	0.283	0.022	0.007	0.013	0.013
## 638	rolec2	~~	ssup2	0.276	0.009	0.009	0.025	0.025
## 395	F8	==	rolea1	0.262	0.041	0.014	0.015	0.015
## 396	F8	==	rolea2	0.262	-0.050	-0.017	-0.017	-0.017
## 757	cclim2	~~	pa2	0.258	0.004	0.004	0.019	0.019
## 496	F11	==	self1	0.254	0.005	0.005	0.012	0.012
## 815	dec1	~~	elc4	0.253	0.005	0.005	0.015	0.015
## 953	self3	~~	dp2	0.253	0.004	0.004	0.018	0.018
## 980	elc3	~~	elc4	0.246	-0.003	-0.003	-0.018	-0.018
## 714	cclim1	~~	dec2	0.234	-0.005	-0.005	-0.015	-0.015
## 862	ssup1	~~	pa2	0.232	-0.006	-0.006	-0.017	-0.017
## 202	F1	==	self2	0.227	-0.009	-0.006	-0.011	-0.011
## 576	rolea2	~~	cclim3	0.224	-0.004	-0.004	-0.017	-0.017
## 247	F3	==	rolea1	0.223	-0.023	-0.022	-0.024	-0.024
## 248	F3	==	rolea2	0.223	0.028	0.026	0.027	0.027
## 834	dec2	~~	elc3	0.222	-0.004	-0.004	-0.015	-0.015
## 839	dec2	~~	ee3	0.221	0.008	0.008	0.015	0.015
## 417	F8	==	ee2	0.218	0.032	0.011	0.009	0.009

## 695	work2	~~	self2	0.218	0.004	0.004	0.016	0.016
## 237	F2	==	elc4	0.212	0.011	0.008	0.013	0.013
## 958	elc1	~~	elc3	0.209	0.003	0.003	0.018	0.018
## 303	F4	==	pa2	0.209	0.033	0.011	0.011	0.011
## 377	F7	==	ssup1	0.205	-0.016	-0.012	-0.010	-0.010
## 378	F7	==	ssup2	0.205	0.017	0.013	0.010	0.010
## 287	F4	==	psup1	0.204	0.030	0.010	0.010	0.010
## 288	F4	==	psup2	0.204	-0.034	-0.011	-0.012	-0.012
## 963	elc1	~~	ee3	0.203	-0.004	-0.004	-0.014	-0.014
## 872	ssup2	~~	elc4	0.203	0.004	0.004	0.018	0.018
## 637	rolec2	~~	ssup1	0.201	0.008	0.008	0.016	0.016
## 236	F2	==	elc3	0.198	-0.009	-0.007	-0.012	-0.012
## 656	rolec2	~~	pa3	0.197	0.007	0.007	0.015	0.015
## 684	work2	~~	cclim1	0.196	0.005	0.005	0.013	0.013
## 878	ssup2	~~	dp2	0.190	0.007	0.007	0.018	0.018
## 1009	ee1	~~	dp1	0.189	0.006	0.006	0.020	0.020
## 795	cclim4	~~	elc5	0.184	-0.003	-0.003	-0.014	-0.014
## 305	F5	==	rolea1	0.180	0.025	0.017	0.019	0.019
## 306	F5	==	rolea2	0.180	-0.031	-0.021	-0.022	-0.022
## 798	cclim4	~~	ee3	0.178	-0.005	-0.005	-0.013	-0.013
## 410	F8	==	psup2	0.177	-0.032	-0.011	-0.012	-0.012
## 409	F8	==	psup1	0.177	0.029	0.010	0.010	0.010
## 319	F5	==	self1	0.165	-0.006	-0.004	-0.009	-0.009
## 749	cclim2	~~	elc4	0.162	-0.002	-0.002	-0.014	-0.014
## 738	cclim2	~~	dec2	0.161	0.005	0.005	0.015	0.015
## 224	F2	==	cclim4	0.160	0.010	0.008	0.011	0.011
## 348	F6	==	psup2	0.156	0.015	0.016	0.018	0.018
## 347	F6	==	psup1	0.156	-0.014	-0.015	-0.015	-0.015
## 876	ssup2	~~	ee3	0.152	0.005	0.005	0.016	0.016
## 969	elc2	~~	elc3	0.152	-0.003	-0.003	-0.013	-0.013
## 660	work1	~~	cclim3	0.152	0.004	0.004	0.013	0.013
## 861	ssup1	~~	pa1	0.150	-0.005	-0.005	-0.014	-0.014
## 611	rolec1	~~	psup1	0.150	-0.006	-0.006	-0.012	-0.012
## 982	elc3	~~	ee1	0.147	0.003	0.003	0.013	0.013
## 767	cclim3	~~	self2	0.147	0.001	0.001	0.014	0.014
## 910	psup2	~~	dp1	0.146	-0.005	-0.005	-0.027	-0.027
## 266	F3	==	elc3	0.144	-0.006	-0.006	-0.010	-0.010
## 669	work1	~~	self2	0.144	-0.003	-0.003	-0.015	-0.015
## 575	rolea2	~~	cclim2	0.144	-0.004	-0.004	-0.016	-0.016
## 745	cclim2	~~	self3	0.140	-0.002	-0.002	-0.015	-0.015
## 999	elc5	~~	ee1	0.139	-0.003	-0.003	-0.013	-0.013
## 720	cclim1	~~	self2	0.138	0.001	0.001	0.013	0.013
## 984	elc3	~~	ee3	0.134	-0.003	-0.003	-0.012	-0.012
## 212	F1	==	dp1	0.133	0.022	0.014	0.013	0.013
## 213	F1	==	dp2	0.133	-0.019	-0.012	-0.010	-0.010
## 652	rolec2	~~	dp1	0.128	0.007	0.007	0.019	0.019
## 383	F7	==	elc2	0.128	0.008	0.006	0.009	0.009
## 323	F5	==	elc2	0.125	0.009	0.006	0.009	0.009
## 909	psup2	~~	ee3	0.124	-0.004	-0.004	-0.017	-0.017
## 924	self1	~~	ee3	0.124	0.002	0.002	0.011	0.011
## 364	F6	==	pa3	0.116	-0.007	-0.008	-0.008	-0.008

## 716	cclim1	~~	ssup2	0.114	-0.003	-0.003	-0.014	-0.014
## 734	cclim1	~~	pa3	0.113	0.003	0.003	0.011	0.011
## 707	work2	~~	pa1	0.106	-0.005	-0.005	-0.011	-0.011
## 829	dec2	~~	self1	0.105	-0.002	-0.002	-0.010	-0.010
## 232	F2	==	self2	0.105	-0.005	-0.004	-0.007	-0.007
## 444	F9	==	ee2	0.101	-0.016	-0.007	-0.005	-0.005
## 407	F8	==	ssup1	0.100	0.021	0.007	0.006	0.006
## 408	F8	==	ssup2	0.100	-0.022	-0.008	-0.006	-0.006
## 291	F4	==	self3	0.100	-0.011	-0.004	-0.007	-0.007
## 944	self3	~~	elc1	0.092	0.001	0.001	0.011	0.011
## 763	cclim3	~~	ssup2	0.091	-0.002	-0.002	-0.012	-0.012
## 262	F3	==	self2	0.090	0.004	0.003	0.007	0.007
## 904	psup2	~~	elc3	0.089	0.002	0.002	0.014	0.014
## 722	cclim1	~~	elc1	0.088	-0.002	-0.002	-0.009	-0.009
## 645	rolec2	~~	elc2	0.088	0.004	0.004	0.009	0.009
## 1029	dp2	~~	pa1	0.086	0.004	0.004	0.010	0.010
## 314	F5	==	cclim4	0.083	0.008	0.006	0.008	0.008
## 961	elc1	~~	ee1	0.077	0.003	0.003	0.009	0.009
## 394	F7	==	pa3	0.071	0.008	0.006	0.006	0.006
## 267	F3	==	elc4	0.070	-0.005	-0.004	-0.007	-0.007
## 599	rolea2	~~	pa3	0.069	0.004	0.004	0.010	0.010
## 670	work1	~~	self3	0.068	0.002	0.002	0.010	0.010
## 530	F12	==	elc2	0.068	-0.006	-0.004	-0.007	-0.007
## 977	elc2	~~	pa1	0.067	0.002	0.002	0.009	0.009
## 843	dec2	~~	pa2	0.066	-0.004	-0.004	-0.009	-0.009
## 863	ssup1	~~	pa3	0.065	-0.003	-0.003	-0.009	-0.009
## 646	rolec2	~~	elc3	0.062	0.002	0.002	0.009	0.009
## 572	rolea2	~~	work1	0.062	0.005	0.005	0.012	0.012
## 503	F11	==	elc5	0.061	-0.004	-0.004	-0.006	-0.006
## 788	cclim4	~~	self1	0.061	0.001	0.001	0.008	0.008
## 929	self1	~~	pa3	0.059	-0.001	-0.001	-0.008	-0.008
## 601	rolec1	~~	work1	0.058	0.006	0.006	0.010	0.010
## 803	cclim4	~~	pa3	0.056	0.003	0.003	0.007	0.007
## 481	F11	==	rolea2	0.055	-0.008	-0.008	-0.008	-0.008
## 480	F11	==	rolea1	0.055	0.006	0.006	0.007	0.007
## 626	rolec1	~~	pa1	0.054	-0.003	-0.003	-0.008	-0.008
## 1013	ee1	~~	pa3	0.054	-0.003	-0.003	-0.008	-0.008
## 780	cclim3	~~	pa2	0.054	0.002	0.002	0.008	0.008
## 1005	elc5	~~	pa2	0.053	-0.002	-0.002	-0.008	-0.008
## 809	dec1	~~	self1	0.052	0.001	0.001	0.007	0.007
## 816	dec1	~~	elc5	0.051	0.002	0.002	0.007	0.007
## 776	cclim3	~~	ee3	0.051	0.002	0.002	0.007	0.007
## 762	cclim3	~~	ssup1	0.046	-0.002	-0.002	-0.007	-0.007
## 344	F6	==	cclim4	0.046	0.004	0.004	0.006	0.006
## 476	F10	==	dp2	0.046	0.009	0.010	0.008	0.008
## 475	F10	==	dp1	0.046	-0.010	-0.011	-0.010	-0.010
## 404	F8	==	cclim4	0.044	-0.012	-0.004	-0.005	-0.005
## 830	dec2	~~	self2	0.044	-0.002	-0.002	-0.008	-0.008
## 423	F8	==	pa3	0.044	-0.015	-0.005	-0.005	-0.005
## 989	elc3	~~	pa3	0.043	0.002	0.002	0.007	0.007
## 744	cclim2	~~	self2	0.041	0.001	0.001	0.008	0.008

## 310	F5 =~	work2	0.041	-0.011	-0.007	-0.007	-0.007
## 309	F5 =~	work1	0.041	0.015	0.010	0.008	0.008
## 975	elc2 ~~	dp1	0.040	0.002	0.002	0.008	0.008
## 414	F8 =~	elc4	0.039	-0.009	-0.003	-0.005	-0.005
## 968	elc1 ~~	pa3	0.038	0.002	0.002	0.006	0.006
## 351	F6 =~	self3	0.036	0.002	0.002	0.004	0.004
## 894	psup1 ~~	dp1	0.036	0.003	0.003	0.009	0.009
## 320	F5 =~	self2	0.036	0.003	0.002	0.004	0.004
## 879	ssup2 ~~	pa1	0.033	0.002	0.002	0.009	0.009
## 547	rolea1 ~~	cclim4	0.032	0.002	0.002	0.006	0.006
## 620	rolec1 ~~	elc5	0.032	-0.002	-0.002	-0.006	-0.006
## 766	cclim3 ~~	self1	0.029	0.001	0.001	0.005	0.005
## 737	cclim2 ~~	dec1	0.028	-0.002	-0.002	-0.006	-0.006
## 814	dec1 ~~	elc3	0.028	-0.001	-0.001	-0.005	-0.005
## 356	F6 =~	elc5	0.027	-0.002	-0.002	-0.004	-0.004
## 353	F6 =~	elc2	0.026	-0.002	-0.003	-0.004	-0.004
## 987	elc3 ~~	pa1	0.026	0.001	0.001	0.006	0.006
## 938	self2 ~~	ee3	0.026	-0.001	-0.001	-0.006	-0.006
## 598	rolea2 ~~	pa2	0.024	-0.002	-0.002	-0.006	-0.006
## 604	rolec1 ~~	cclim2	0.024	0.002	0.002	0.005	0.005
## 321	F5 =~	self3	0.023	0.002	0.002	0.003	0.003
## 719	cclim1 ~~	self1	0.021	-0.001	-0.001	-0.005	-0.005
## 784	cclim4 ~~	ssup1	0.021	-0.002	-0.002	-0.005	-0.005
## 983	elc3 ~~	ee2	0.021	-0.001	-0.001	-0.006	-0.006
## 787	cclim4 ~~	psup2	0.021	-0.001	-0.001	-0.007	-0.007
## 893	psup1 ~~	ee3	0.015	0.002	0.002	0.004	0.004
## 617	rolec1 ~~	elc2	0.014	0.001	0.001	0.004	0.004
## 756	cclim2 ~~	pa1	0.014	-0.001	-0.001	-0.005	-0.005
## 888	psup1 ~~	elc3	0.014	-0.001	-0.001	-0.004	-0.004
## 935	self2 ~~	elc5	0.012	0.000	0.000	0.004	0.004
## 718	cclim1 ~~	psup2	0.012	0.001	0.001	0.005	0.005
## 606	rolec1 ~~	cclim4	0.011	0.001	0.001	0.003	0.003
## 889	psup1 ~~	elc4	0.011	0.001	0.001	0.003	0.003
## 898	psup1 ~~	pa3	0.011	-0.001	-0.001	-0.003	-0.003
## 615	rolec1 ~~	self3	0.011	0.001	0.001	0.004	0.004
## 450	F9 =~	pa3	0.011	-0.006	-0.002	-0.002	-0.002
## 603	rolec1 ~~	cclim1	0.009	0.001	0.001	0.003	0.003
## 725	cclim1 ~~	elc4	0.009	-0.001	-0.001	-0.003	-0.003
## 1001	elc5 ~~	ee3	0.009	-0.001	-0.001	-0.003	-0.003
## 1006	elc5 ~~	pa3	0.009	0.001	0.001	0.003	0.003
## 558	rolea1 ~~	elc2	0.008	-0.001	-0.001	-0.003	-0.003
## 992	elc4 ~~	ee2	0.007	-0.001	-0.001	-0.003	-0.003
## 610	rolec1 ~~	ssup2	0.006	-0.001	-0.001	-0.003	-0.003
## 955	self3 ~~	pa2	0.006	0.000	0.000	0.003	0.003
## 768	cclim3 ~~	self3	0.006	0.000	0.000	0.003	0.003
## 901	psup2 ~~	self3	0.004	0.000	0.000	-0.003	-0.003
## 398	F8 =~	rolec2	0.004	0.007	0.003	0.002	0.002
## 397	F8 =~	rolec1	0.004	-0.006	-0.002	-0.002	-0.002
## 589	rolea2 ~~	elc3	0.004	0.000	0.000	-0.002	-0.002
## 774	cclim3 ~~	ee1	0.004	0.000	0.000	0.002	0.002
## 386	F7 =~	elc5	0.003	-0.001	-0.001	-0.001	-0.001

## 970	elc2	~~	elc4	0.003	0.000	0.000	-0.002	-0.002
## 339	F6	==	work1	0.003	-0.002	-0.002	-0.002	-0.002
## 340	F6	==	work2	0.003	0.002	0.002	0.002	0.002
## 391	F7	==	dp2	0.002	-0.002	-0.001	-0.001	-0.001
## 390	F7	==	dp1	0.002	0.002	0.002	0.001	0.001
## 689	work2	~~	dec2	0.002	0.001	0.001	0.002	0.002
## 790	cclim4	~~	self3	0.002	0.000	0.000	-0.002	-0.002
## 978	elc2	~~	pa2	0.002	0.000	0.000	0.002	0.002
## 761	cclim3	~~	dec2	0.002	0.000	0.000	-0.001	-0.001
## 254	F3	==	cclim4	0.002	-0.001	-0.001	-0.001	-0.001
## 564	rolea1	~~	ee3	0.001	0.000	0.000	0.001	0.001
## 432	F9	==	cclim3	0.001	-0.001	0.000	-0.001	-0.001
## 906	psup2	~~	elc5	0.001	0.000	0.000	-0.001	-0.001
## 451	F10	==	rolea1	0.001	-0.001	-0.001	-0.001	-0.001
## 452	F10	==	rolea2	0.001	0.001	0.001	0.001	0.001
## 800	cclim4	~~	dp2	0.001	0.000	0.000	0.001	0.001
## 634	rolec2	~~	cclim4	0.001	0.000	0.000	0.001	0.001
## 896	psup1	~~	pa1	0.000	0.000	0.000	-0.001	-0.001
## 203	F1	==	self3	0.000	0.000	0.000	0.000	0.000
## 931	self2	~~	elc1	0.000	0.000	0.000	0.000	0.000
## 318	F5	==	psup2	0.000	0.001	0.001	0.001	0.001
## 317	F5	==	psup1	0.000	-0.001	-0.001	-0.001	-0.001
## 851	ssup1	~~	elc1	0.000	0.000	0.000	0.000	0.000
## 936	self2	~~	ee1	0.000	0.000	0.000	0.000	0.000
## 702	work2	~~	ee1	0.000	0.000	0.000	0.000	0.000
## 508	F11	==	pa2	0.000	0.000	0.000	0.000	0.000

Request Sample Statistics

```
lavInspect(fitcfa,
           what = "sampstat")
```

```

## $cov
##      rolea1 rolea2 rolec1 rolec2 work1  work2  cclim1 cclim2 cclim3 cclim4
## rolea1  0.835
## rolea2  0.510  0.945
## rolec1  0.380  0.487  1.213
## rolec2  0.486  0.573  0.733  1.523
## work1   0.362  0.479  0.663  0.864  1.443
## work2   0.337  0.403  0.453  0.690  0.661  1.186
## cclim1 -0.112 -0.115 -0.127 -0.183 -0.189 -0.125  0.292
## cclim2 -0.099 -0.109 -0.097 -0.149 -0.114 -0.095  0.158  0.395
## cclim3 -0.045 -0.058 -0.043 -0.062 -0.061 -0.061  0.104  0.166  0.243
## cclim4 -0.083 -0.088 -0.095 -0.137 -0.114 -0.124  0.144  0.224  0.139  0.535
## dec1   -0.377 -0.490 -0.474 -0.532 -0.506 -0.287  0.138  0.117  0.060  0.106
## dec2   -0.369 -0.480 -0.489 -0.572 -0.459 -0.347  0.189  0.180  0.099  0.185
## ssup1  -0.421 -0.536 -0.531 -0.584 -0.511 -0.337  0.182  0.149  0.085  0.158
## ssup2  -0.393 -0.497 -0.526 -0.589 -0.492 -0.375  0.192  0.182  0.097  0.182
## psup1  -0.272 -0.302 -0.294 -0.317 -0.294 -0.185  0.088  0.076  0.042  0.060
## psup2  -0.277 -0.297 -0.298 -0.296 -0.262 -0.215  0.091  0.076  0.051  0.069
## self1  -0.084 -0.116 -0.090 -0.113 -0.100 -0.114  0.033  0.042  0.025  0.037
## self2  -0.121 -0.143 -0.140 -0.163 -0.143 -0.127  0.040  0.045  0.029  0.039
## self3  -0.115 -0.157 -0.145 -0.191 -0.157 -0.141  0.039  0.048  0.031  0.044
## elc1    0.098  0.126  0.174  0.178  0.174  0.098 -0.049 -0.049 -0.047 -0.068
## elc2    0.090  0.096  0.129  0.144  0.105  0.090 -0.042 -0.061 -0.052 -0.075
## elc3    0.105  0.135  0.168  0.185  0.159  0.130 -0.036 -0.051 -0.038 -0.051
## elc4    0.151  0.174  0.169  0.180  0.134  0.163 -0.039 -0.047 -0.030 -0.058
## elc5    0.167  0.188  0.208  0.235  0.205  0.208 -0.043 -0.049 -0.033 -0.063
## ee1     0.284  0.363  0.447  0.666  0.870  0.527 -0.213 -0.148 -0.092 -0.172
## ee2     0.296  0.350  0.427  0.657  0.730  0.468 -0.199 -0.168 -0.098 -0.201
## ee3     0.354  0.447  0.550  0.734  0.771  0.535 -0.225 -0.239 -0.130 -0.236
## dp1     0.233  0.273  0.351  0.455  0.372  0.343 -0.195 -0.242 -0.144 -0.200
## dp2     0.183  0.256  0.303  0.365  0.332  0.233 -0.152 -0.182 -0.130 -0.172
## pa1    -0.211 -0.227 -0.180 -0.293 -0.230 -0.235  0.122  0.140  0.095  0.136
## pa2    -0.158 -0.170 -0.079 -0.204 -0.142 -0.186  0.107  0.139  0.091  0.161
## pa3    -0.144 -0.171 -0.108 -0.196 -0.169 -0.176  0.095  0.101  0.062  0.116
##      dec1  dec2  ssup1  ssup2  psup1  psup2  self1  self2  self3  elc1
## rolea1
## rolea2
## rolec1
## rolec2
## work1
## work2
## cclim1
## cclim2
## cclim3
## cclim4
## dec1    1.019
## dec2    0.729  1.763
## ssup1    0.677  1.123  1.548
## ssup2    0.678  1.274  1.267  1.588
## psup1    0.418  0.381  0.427  0.406  0.931
## psup2    0.419  0.477  0.415  0.485  0.642  0.857

```

```

## self1    0.091  0.109  0.083  0.082  0.088  0.102  0.198
## self2    0.121  0.145  0.111  0.122  0.104  0.108  0.148  0.254
## self3    0.114  0.162  0.116  0.128  0.106  0.117  0.155  0.201  0.296
## elc1     -0.152 -0.198 -0.161 -0.188 -0.090 -0.119 -0.046 -0.069 -0.072  0.389
## elc2     -0.096 -0.142 -0.105 -0.134 -0.069 -0.094 -0.030 -0.053 -0.048  0.189
## elc3     -0.119 -0.145 -0.102 -0.139 -0.082 -0.099 -0.040 -0.067 -0.071  0.174
## elc4     -0.104 -0.122 -0.085 -0.110 -0.090 -0.112 -0.053 -0.065 -0.069  0.153
## elc5     -0.150 -0.176 -0.164 -0.164 -0.099 -0.126 -0.068 -0.091 -0.100  0.196
## ee1      -0.447 -0.415 -0.425 -0.355 -0.298 -0.247 -0.166 -0.205 -0.234  0.165
## ee2      -0.432 -0.506 -0.479 -0.434 -0.268 -0.245 -0.196 -0.228 -0.263  0.186
## ee3      -0.497 -0.567 -0.559 -0.514 -0.320 -0.305 -0.204 -0.249 -0.292  0.188
## dp1      -0.265 -0.353 -0.354 -0.378 -0.211 -0.206 -0.133 -0.163 -0.197  0.134
## dp2      -0.268 -0.313 -0.378 -0.366 -0.201 -0.178 -0.099 -0.144 -0.161  0.135
## pa1       0.291  0.431  0.330  0.375  0.195  0.225  0.144  0.152  0.181 -0.136
## pa2       0.191  0.319  0.242  0.277  0.152  0.188  0.111  0.101  0.132 -0.101
## pa3       0.215  0.331  0.267  0.313  0.171  0.202  0.115  0.135  0.139 -0.111
##          elc2  elc3  elc4  elc5  ee1  ee2  ee3  dp1  dp2  pa1
## rolea1
## rolea2
## rolec1
## rolec2
## work1
## work2
## cclim1
## cclim2
## cclim3
## cclim4
## dec1
## dec2
## ssup1
## ssup2
## psup1
## psup2
## self1
## self2
## self3
## elc1
## elc2      0.393
## elc3      0.146  0.300
## elc4      0.142  0.158  0.366
## elc5      0.155  0.199  0.198  0.415
## ee1       0.084  0.134  0.100  0.189  1.714
## ee2       0.105  0.147  0.118  0.216  1.353  1.580
## ee3       0.125  0.157  0.120  0.221  1.228  1.289  1.683
## dp1       0.111  0.115  0.109  0.128  0.565  0.606  0.684  1.198
## dp2       0.103  0.086  0.055  0.120  0.481  0.562  0.615  0.843  1.396
## pa1      -0.101 -0.097 -0.096 -0.146 -0.354 -0.455 -0.509 -0.345 -0.345  0.833
## pa2      -0.079 -0.065 -0.083 -0.113 -0.241 -0.335 -0.356 -0.347 -0.361  0.580
## pa3      -0.093 -0.081 -0.096 -0.121 -0.235 -0.297 -0.332 -0.287 -0.304  0.524
##          pa2  pa3
## rolea1

```

```

## rolea2
## rolec1
## rolec2
## work1
## work2
## cclim1
## cclim2
## cclim3
## cclim4
## dec1
## dec2
## ssup1
## ssup2
## psup1
## psup2
## self1
## self2
## self3
## elc1
## elc2
## elc3
## elc4
## elc5
## ee1
## ee2
## ee3
## dp1
## dp2
## pa1
## pa2      0.927
## pa3      0.591  0.929
##
## $mean
## rolea1 rolea2 rolec1 rolec2 work1 work2 cclim1 cclim2 cclim3 cclim4 dec1
## 2.401 2.086 3.015 3.018 3.240 2.243 2.964 2.723 2.928 3.053 4.039
## dec2 ssup1 ssup2 psup1 psup2 self1 self2 self3 elc1 elc2 elc3
## 4.242 4.299 4.370 4.571 4.621 3.603 3.613 3.483 2.918 3.008 2.801
## elc4 elc5 ee1 ee2 ee3 dp1 dp2 pa1 pa2 pa3
## 2.200 2.483 3.855 3.530 3.165 2.319 2.086 5.748 5.850 5.815

```

Request List of Estimated Parameters (equivalent to top-half of Mplus' TECH1)

```
lavInspect(fitcfa)
```

```

## $lambda
##      F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12
## rolea1 0 0 0 0 0 0 0 0 0 0 0 0
## rolea2 1 0 0 0 0 0 0 0 0 0 0 0
## rolec1 0 0 0 0 0 0 0 0 0 0 0 0
## rolec2 0 2 0 0 0 0 0 0 0 0 0 0
## work1  0 0 0 0 0 0 0 0 0 0 0 0
## work2  0 0 3 0 0 0 0 0 0 0 0 0
## cclim1 0 0 0 0 0 0 0 0 0 0 0 0
## cclim2 0 0 0 4 0 0 0 0 0 0 0 0
## cclim3 0 0 0 5 0 0 0 0 0 0 0 0
## cclim4 0 0 0 6 0 0 0 0 0 0 0 0
## dec1   0 0 0 0 0 0 0 0 0 0 0 0
## dec2   0 0 0 0 7 0 0 0 0 0 0 0
## ssup1  0 0 0 0 0 0 0 0 0 0 0 0
## ssup2  0 0 0 0 0 8 0 0 0 0 0 0
## psup1  0 0 0 0 0 0 0 0 0 0 0 0
## psup2  0 0 0 0 0 0 9 0 0 0 0 0
## self1  0 0 0 0 0 0 0 0 0 0 0 0
## self2  0 0 0 0 0 0 0 10 0 0 0 0
## self3  0 0 0 0 0 0 0 11 0 0 0 0
## elc1   0 0 0 0 0 0 0 0 0 0 0 0
## elc2   0 0 0 0 0 0 0 0 12 0 0 0
## elc3   0 0 0 0 0 0 0 0 13 0 0 0
## elc4   0 0 0 0 0 0 0 0 14 0 0 0
## elc5   0 0 0 0 0 0 0 0 15 0 0 0
## ee1    0 0 0 0 0 0 0 0 0 0 0 0
## ee2    0 0 0 0 0 0 0 0 0 16 0 0
## ee3    0 0 0 0 0 0 0 0 0 17 0 0
## dp1    0 0 0 0 0 0 0 0 0 0 0 0
## dp2    0 0 0 0 0 0 0 0 0 0 18 0
## pa1    0 0 0 0 0 0 0 0 0 0 0 0
## pa2    0 0 0 0 0 0 0 0 0 0 0 19
## pa3    0 0 0 0 0 0 0 0 0 0 0 20
##
## $theta
##      rolea1 rolea2 rolec1 rolec2 work1 work2 cclim1 cclim2 cclim3 cclim4 dec1
## rolea1 21
## rolea2 0      22
## rolec1 0      0      23
## rolec2 0      0      0      24
## work1  0      0      0      0      25
## work2  0      0      0      0      0      26
## cclim1 0      0      0      0      0      0      27
## cclim2 0      0      0      0      0      0      0      28
## cclim3 0      0      0      0      0      0      0      0      29
## cclim4 0      0      0      0      0      0      0      0      0      30
## dec1   0      0      0      0      0      0      0      0      0      0      31
## dec2   0      0      0      0      0      0      0      0      0      0      0
## ssup1  0      0      0      0      0      0      0      0      0      0      0
## ssup2  0      0      0      0      0      0      0      0      0      0      0

```

##	psup1	0	0	0	0	0	0	0	0	0	0	0	0	
##	psup2	0	0	0	0	0	0	0	0	0	0	0	0	
##	self1	0	0	0	0	0	0	0	0	0	0	0	0	
##	self2	0	0	0	0	0	0	0	0	0	0	0	0	
##	self3	0	0	0	0	0	0	0	0	0	0	0	0	
##	elc1	0	0	0	0	0	0	0	0	0	0	0	0	
##	elc2	0	0	0	0	0	0	0	0	0	0	0	0	
##	elc3	0	0	0	0	0	0	0	0	0	0	0	0	
##	elc4	0	0	0	0	0	0	0	0	0	0	0	0	
##	elc5	0	0	0	0	0	0	0	0	0	0	0	0	
##	ee1	0	0	0	0	0	0	0	0	0	0	0	0	
##	ee2	0	0	0	0	0	0	0	0	0	0	0	0	
##	ee3	0	0	0	0	0	0	0	0	0	0	0	0	
##	dp1	0	0	0	0	0	0	0	0	0	0	0	0	
##	dp2	0	0	0	0	0	0	0	0	0	0	0	0	
##	pa1	0	0	0	0	0	0	0	0	0	0	0	0	
##	pa2	0	0	0	0	0	0	0	0	0	0	0	0	
##	pa3	0	0	0	0	0	0	0	0	0	0	0	0	
##	dec2	ssup1	ssup2	psup1	psup2	self1	self2	self3	elc1	elc2	elc3	elc4	elc5	
##	rolea1													
##	rolea2													
##	rolec1													
##	rolec2													
##	work1													
##	work2													
##	cclim1													
##	cclim2													
##	cclim3													
##	cclim4													
##	dec1													
##	dec2	32												
##	ssup1	0	33											
##	ssup2	0	0	34										
##	psup1	0	0	0	35									
##	psup2	0	0	0	0	36								
##	self1	0	0	0	0	0	37							
##	self2	0	0	0	0	0	0	38						
##	self3	0	0	0	0	0	0	0	39					
##	elc1	0	0	0	0	0	0	0	0	40				
##	elc2	0	0	0	0	0	0	0	0	0	41			
##	elc3	0	0	0	0	0	0	0	0	0	0	42		
##	elc4	0	0	0	0	0	0	0	0	0	0	0	43	
##	elc5	0	0	0	0	0	0	0	0	0	0	0	0	44
##	ee1	0	0	0	0	0	0	0	0	0	0	0	0	0
##	ee2	0	0	0	0	0	0	0	0	0	0	0	0	0
##	ee3	0	0	0	0	0	0	0	0	0	0	0	0	0
##	dp1	0	0	0	0	0	0	0	0	0	0	0	0	0
##	dp2	0	0	0	0	0	0	0	0	0	0	0	0	0
##	pa1	0	0	0	0	0	0	0	0	0	0	0	0	0
##	pa2	0	0											


```

##          ee1 ee2 ee3 dp1 dp2 pa1 pa2 pa3
## rolea1
## rolea2
## rolec1
## rolec2
## work1
## work2
## cclim1
## cclim2
## cclim3
## cclim4
## dec1
## dec2
## ssup1
## ssup2
## psup1
## psup2
## self1
## self2
## self3
## elc1
## elc2
## elc3
## elc4
## elc5
## ee1      45
## ee2      0  46
## ee3      0   0  47
## dp1      0   0   0  48
## dp2      0   0   0   0  49
## pa1      0   0   0   0   0  50
## pa2      0   0   0   0   0   0  51
## pa3      0   0   0   0   0   0   0  52
##
## $psi
##      F1  F2  F3  F4  F5  F6  F7  F8  F9  F10 F11 F12
## F1    53
## F2    65  54
## F3    66  76  55
## F4    67  77  86  56
## F5    68  78  87  95  57
## F6    69  79  88  96 103  58
## F7    70  80  89  97 104 110  59
## F8    71  81  90  98 105 111 116  60
## F9    72  82  91  99 106 112 117 121  61
## F10   73  83  92 100 107 113 118 122 125  62
## F11   74  84  93 101 108 114 119 123 126 128  63
## F12   75  85  94 102 109 115 120 124 127 129 130  64
##
## $nu
##          intrcp

```

```

## rolea1      131
## rolea2      132
## rolec1      133
## rolec2      134
## work1       135
## work2       136
## cclim1      137
## cclim2      138
## cclim3      139
## cclim4      140
## dec1        141
## dec2        142
## ssup1       143
## ssup2       144
## psup1       145
## psup2       146
## self1       147
## self2       148
## self3       149
## elc1        150
## elc2        151
## elc3        152
## elc4        153
## elc5        154
## ee1         155
## ee2         156
## ee3         157
## dp1         158
## dp2         159
## pa1         160
## pa2         161
## pa3         162
##
## $alpha
##      intrcp
## F1      0
## F2      0
## F3      0
## F4      0
## F5      0
## F6      0
## F7      0
## F8      0
## F9      0
## F10     0
## F11     0
## F12     0

```

Structural Model 1

We'll now test the full SEM model (i.e., the structural model) of burnout in secondary teachers. To do that, we add the regression paths using `~`.

In this analysis, we'll look for the best fitting and most parsimonious model.

Specify the Model

```
fullsem1 <- '
  # Measurement Model
  F1 =~ rolea1 + rolea2 + dec2 #role ambiguity with DEC2 cross-loading
  F2 =~ rolec1 + rolec2 #role conflict
  F3 =~ work1 + work2 #work overload
  F4 =~ cclim1 + cclim2 + cclim3 + cclim4 #classroom climate
  F5 =~ dec1 + dec2 #decision-making
  F6 =~ ssup1 + ssup2 + dec2 #superior support with DEC2 cross-loading
  F7 =~ psup1 + psup2 #peer support
  F8 =~ self1 + self2 + self3 #self-esteem
  F9 =~ elc1 + elc2 + elc3 + elc4 + elc5 #external loc of control
  F10 =~ ee1 + ee2 + ee3 #emotional exhaustion
  F11 =~ dp1 + dp2 #depersonalization
  F12 =~ pa1 + pa2 + pa3 #personal accomplishment

  # Structural Model
  F8 ~ F5 + F6 + F7
  F9 ~ F5
  F10 ~ F2 + F3 + F4
  F11 ~ F2 + F10
  F12 ~ F1 + F8 + F9 + F10 + F11
'
```

Fit the Model

Notice that we get a warning that there is a negative latent variable variance. Lavaan doesn't tell us which variable may be the problem, so we need to do some detective work by scrolling down to the variances in the output. This will show us the value of the variances and which is negative.

```
# Estimate the Model
fullsem1_fit <-
  sem(model = fullsem1,
    data = teachers,
    estimator = "MLM",
    meanstructure = TRUE
  )
```

```
## Warning in lav_object_post_check(object): lavaan WARNING: some estimated lv
## variances are negative
```

Request the Output

Remember that we used MLM as our estimator. When using MLM, the chi-square difference tests of nested models are inappropriate because values are not actually distributed as chi-square. The scaling correction factor indicates that if the MLM chi-square were multiplied by the scaling factor, it would approximate the uncorrected ML chi-square value. We can thus use the chi-square and scaling correction factor to compute the Satorra and Bentler (2001) corrected chi-square difference test.

Nested models are models with fewer constraints than another model with the same variables and same cases. Constraints are fixed parameters. This means that a nested model has more free parameters (i.e., fewer constraints/restrictions) than another model. We call this nested model the reduced model (because it has fewer constraints and thus fewer dfs) and the other model the full model.

We use nested models and difference tests all the time when using hierarchical multiple regressions. In hierarchical regressions, each additional model is nested in the previous, which is more constrained than the next.

Imagine a hierarchical multiple model with $Y \sim X1 + X2 + X3$ and we enter the variables sequentially like:

$Y \sim X1 + X2$ $Y \sim X1 + X2 + X3$

The first model is more constrained because we are essentially treating the regression of X3 on Y to take the value of 0. That is, we could rewrite the equations above as:

$Y \sim X1 + X2 + 0 \cdot X3$ $Y \sim X1 + X2 + X3$

When we allow $Y \sim X3$ to be estimated, we have one additional free parameter and one fewer df. This means that the second model (the one with more freely estimated parameters/fewer constraints/fewer dfs) is the reduced model.

Request the Output

First, we can see that model fit is good. But we'll check the MIs later to see if there are any paths that should be freed.

Next, if we scroll to the variances in the output, we can see that the variance of F10 is negative.

```
summary(fullsem1_fit,
        fit.measures = TRUE,
        standardized = TRUE,
        rsquare = TRUE)
```

```

## lavaan 0.6-9 ended normally after 199 iterations
##
## Estimator ML
## Optimization method NLMINB
## Number of model parameters 133
##
## Number of observations 1430
##
## Model Test User Model:
## Standard Robust
## Test Statistic 1737.090 1541.844
## Degrees of freedom 427 427
## P-value (Chi-square) 0.000 0.000
## Scaling correction factor 1.127
## Satorra-Bentler correction
##
## Model Test Baseline Model:
##
## Test statistic 23532.624 19072.057
## Degrees of freedom 496 496
## P-value 0.000 0.000
## Scaling correction factor 1.234
##
## User Model versus Baseline Model:
##
## Comparative Fit Index (CFI) 0.943 0.940
## Tucker-Lewis Index (TLI) 0.934 0.930
##
## Robust Comparative Fit Index (CFI) 0.945
## Robust Tucker-Lewis Index (TLI) 0.936
##
## Loglikelihood and Information Criteria:
##
## Loglikelihood user model (H0) -47240.128 -47240.128
## Loglikelihood unrestricted model (H1) -46371.583 -46371.583
##
## Akaike (AIC) 94746.256 94746.256
## Bayesian (BIC) 95446.558 95446.558
## Sample-size adjusted Bayesian (BIC) 95024.063 95024.063
##
## Root Mean Square Error of Approximation:
##
## RMSEA 0.046 0.043
## 90 Percent confidence interval - lower 0.044 0.041
## 90 Percent confidence interval - upper 0.049 0.045
## P-value RMSEA <= 0.05 0.996 1.000
##
## Robust RMSEA 0.045
## 90 Percent confidence interval - lower 0.043
## 90 Percent confidence interval - upper 0.048
##

```

```

## Standardized Root Mean Square Residual:
##
##      SRMR                      0.051          0.051
##
## Parameter Estimates:
##
##      Standard errors                      Robust.sem
##      Information                      Expected
##      Information saturated (h1) model          Structured
##
## Latent Variables:
##      Estimate  Std.Err  z-value  P(>|z|)  Std.lv  Std.all
##      F1 =~
##      rolea1      1.000
##      rolea2      1.238      0.058      21.499      0.000      0.643      0.703
##      dec2         0.229      0.089       2.579      0.010      0.147      0.111
##      F2 =~
##      rolec1      1.000
##      rolec2      1.308      0.053      24.767      0.000      0.755      0.686
##      F3 =~
##      work1       1.000
##      work2       0.749      0.032      23.203      0.000      0.893      0.743
##      F4 =~
##      cclim1      1.000
##      cclim2      1.478      0.077      19.254      0.000      0.669      0.614
##      cclim3      0.958      0.056      17.114      0.000      0.334      0.618
##      cclim4      1.334      0.080      16.764      0.000      0.494      0.786
##      F5 =~
##      dec1        1.000
##      dec2        0.407      0.106       3.852      0.000      0.320      0.649
##      F6 =~
##      ssup1       1.000
##      ssup2       1.098      0.026      42.261      0.000      0.446      0.609
##      dec2        0.859      0.049      17.574      0.000      1.073      0.862
##      F7 =~
##      psup1       1.000
##      psup2       1.079      0.046      23.684      0.000      1.178      0.935
##      F8 =~
##      self1       1.000
##      self2       1.278      0.045      28.157      0.000      0.921      0.694
##      self3       1.357      0.057      23.744      0.000      0.771      0.800
##      F9 =~
##      elc1        1.000
##      elc2        0.848      0.042      20.398      0.000      0.833      0.899
##      elc3        0.944      0.041      23.153      0.000      0.340      0.765
##      elc4        0.904      0.047      19.274      0.000      0.435      0.863
##      elc5        1.110      0.050      22.388      0.000      0.462      0.848
##      F10 =~
##      ee1         1.000
##      ee2         1.020      0.019      53.503      0.000      0.430      0.690
##      ee3         0.973      0.023      43.048      0.000      0.365      0.582
##                      1.111      0.856

```

```

##      F11 =~
##      dp1          1.000          0.959      0.876
##      dp2          0.918      0.046      20.022      0.000      0.880      0.745
##      F12 =~
##      pa1          1.000          0.742      0.819
##      pa2          1.039      0.038      27.420      0.000      0.771      0.807
##      pa3          0.963      0.040      23.869      0.000      0.715      0.746
##
## Regressions:
##      Estimate      Std.Err      z-value      P(>|z|)      Std.lv      Std.all
##      F8 ~
##      F5          0.475      0.054      8.784      0.000      0.990      0.990
##      F6         -0.155      0.026     -5.890      0.000     -0.490     -0.490
##      F7         -0.066      0.030     -2.223      0.026     -0.150     -0.150
##      F9 ~
##      F5         -0.288      0.023    -12.787      0.000     -0.476     -0.476
##      F10 ~
##      F2         -8.707      6.705     -1.298      0.194     -5.765     -5.765
##      F3          8.082      5.647      1.431      0.152      6.325      6.325
##      F4         -0.930      0.740     -1.257      0.209     -0.272     -0.272
##      F11 ~
##      F2          0.258      0.054      4.789      0.000      0.203      0.203
##      F10         0.373      0.036     10.242      0.000      0.444      0.444
##      F12 ~
##      F1         -0.071      0.048     -1.474      0.140     -0.062     -0.062
##      F8          0.472      0.090      5.245      0.000      0.217      0.217
##      F9         -0.208      0.052     -3.975      0.000     -0.121     -0.121
##      F10         -0.064      0.026     -2.416      0.016     -0.098     -0.098
##      F11         -0.218      0.033     -6.556      0.000     -0.281     -0.281
##
## Covariances:
##      Estimate      Std.Err      z-value      P(>|z|)      Std.lv      Std.all
##      F1 ~~
##      F2          0.360      0.025     14.389      0.000      0.742      0.742
##      F3          0.419      0.027     15.239      0.000      0.730      0.730
##      F4         -0.065      0.008     -7.755      0.000     -0.304     -0.304
##      F5         -0.373      0.026    -14.497      0.000     -0.817     -0.817
##      F6         -0.386      0.030    -12.736      0.000     -0.560     -0.560
##      F7         -0.242      0.022    -10.976      0.000     -0.488     -0.488
##      F2 ~~
##      F3          0.666      0.035     19.038      0.000      0.988      0.988
##      F4         -0.086      0.011     -8.092      0.000     -0.340     -0.340
##      F5         -0.407      0.028    -14.530      0.000     -0.759     -0.759
##      F6         -0.429      0.032    -13.235      0.000     -0.529     -0.529
##      F7         -0.234      0.023    -10.351      0.000     -0.402     -0.402
##      F3 ~~
##      F4         -0.097      0.013     -7.504      0.000     -0.326     -0.326
##      F5         -0.491      0.030    -16.117      0.000     -0.775     -0.775
##      F6         -0.501      0.035    -14.309      0.000     -0.523     -0.523
##      F7         -0.277      0.026    -10.790      0.000     -0.403     -0.403
##      F4 ~~

```

##	F5	0.100	0.011	9.329	0.000	0.421	0.421
##	F6	0.120	0.014	8.728	0.000	0.335	0.335
##	F7	0.055	0.009	5.897	0.000	0.212	0.212
##	F5 ~~						
##	F6	0.616	0.038	16.239	0.000	0.810	0.810
##	F7	0.385	0.028	13.835	0.000	0.704	0.704
##	F6 ~~						
##	F7	0.394	0.032	12.431	0.000	0.476	0.476
##							
##	Intercepts:						
##		Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
##	.rolea1	2.401	0.024	99.362	0.000	2.401	2.628
##	.rolea2	2.086	0.026	81.108	0.000	2.086	2.145
##	.dec2	4.242	0.035	120.842	0.000	4.242	3.196
##	.rolec1	3.015	0.029	103.524	0.000	3.015	2.738
##	.rolec2	3.018	0.033	92.468	0.000	3.018	2.445
##	.work1	3.240	0.032	101.996	0.000	3.240	2.697
##	.work2	2.243	0.029	77.885	0.000	2.243	2.060
##	.cclim1	2.964	0.014	207.379	0.000	2.964	5.484
##	.cclim2	2.723	0.017	163.890	0.000	2.723	4.334
##	.cclim3	2.928	0.013	224.532	0.000	2.928	5.938
##	.cclim4	3.053	0.019	157.758	0.000	3.053	4.172
##	.dec1	4.039	0.027	151.305	0.000	4.039	4.001
##	.ssup1	4.299	0.033	130.631	0.000	4.299	3.454
##	.ssup2	4.370	0.033	131.136	0.000	4.370	3.468
##	.psup1	4.571	0.026	179.200	0.000	4.571	4.739
##	.psup2	4.621	0.024	188.754	0.000	4.621	4.991
##	.self1	3.603	0.012	306.319	0.000	3.603	8.100
##	.self2	3.613	0.013	271.109	0.000	3.613	7.169
##	.self3	3.483	0.014	241.972	0.000	3.483	6.399
##	.elc1	2.918	0.016	176.985	0.000	2.918	4.680
##	.elc2	3.008	0.017	181.556	0.000	3.008	4.801
##	.elc3	2.801	0.014	193.300	0.000	2.801	5.112
##	.elc4	2.200	0.016	137.503	0.000	2.200	3.636
##	.elc5	2.483	0.017	145.731	0.000	2.483	3.854
##	.ee1	3.855	0.035	111.347	0.000	3.855	2.944
##	.ee2	3.530	0.033	106.201	0.000	3.530	2.808
##	.ee3	3.165	0.034	92.281	0.000	3.165	2.440
##	.dp1	2.319	0.029	80.113	0.000	2.319	2.119
##	.dp2	2.086	0.031	66.763	0.000	2.086	1.765
##	.pa1	5.748	0.024	238.172	0.000	5.748	6.345
##	.pa2	5.850	0.025	229.759	0.000	5.850	6.119
##	.pa3	5.815	0.025	228.188	0.000	5.815	6.071
##	F1	0.000				0.000	0.000
##	F2	0.000				0.000	0.000
##	F3	0.000				0.000	0.000
##	F4	0.000				0.000	0.000
##	F5	0.000				0.000	0.000
##	F6	0.000				0.000	0.000
##	F7	0.000				0.000	0.000
##	.F8	0.000				0.000	0.000

##	.F9	0.000			0.000	0.000
##	.F10	0.000			0.000	0.000
##	.F11	0.000			0.000	0.000
##	.F12	0.000			0.000	0.000
##						
##	Variances:					
##		Estimate	Std.Err	z-value	P(> z)	Std.lv Std.all
##	.rolea1	0.422	0.024	17.386	0.000	0.422 0.505
##	.rolea2	0.313	0.027	11.556	0.000	0.313 0.331
##	.dec2	0.598	0.033	18.016	0.000	0.598 0.339
##	.rolec1	0.642	0.029	22.304	0.000	0.642 0.530
##	.rolec2	0.546	0.037	14.798	0.000	0.546 0.359
##	.work1	0.646	0.030	21.317	0.000	0.646 0.448
##	.work2	0.739	0.035	20.903	0.000	0.739 0.623
##	.cclim1	0.180	0.008	22.588	0.000	0.180 0.618
##	.cclim2	0.151	0.010	14.874	0.000	0.151 0.382
##	.cclim3	0.141	0.007	19.356	0.000	0.141 0.579
##	.cclim4	0.337	0.015	21.843	0.000	0.337 0.629
##	.dec1	0.515	0.027	19.233	0.000	0.515 0.505
##	.ssup1	0.398	0.026	15.205	0.000	0.398 0.257
##	.ssup2	0.200	0.022	8.898	0.000	0.200 0.126
##	.psup1	0.336	0.027	12.238	0.000	0.336 0.361
##	.psup2	0.164	0.026	6.287	0.000	0.164 0.191
##	.self1	0.082	0.005	16.563	0.000	0.082 0.415
##	.self2	0.065	0.005	13.033	0.000	0.065 0.256
##	.self3	0.083	0.006	13.021	0.000	0.083 0.281
##	.elc1	0.204	0.010	20.506	0.000	0.204 0.524
##	.elc2	0.259	0.011	23.326	0.000	0.259 0.661
##	.elc3	0.135	0.007	18.174	0.000	0.135 0.451
##	.elc4	0.215	0.010	21.720	0.000	0.215 0.587
##	.elc5	0.187	0.010	18.595	0.000	0.187 0.451
##	.ee1	0.413	0.024	17.250	0.000	0.413 0.241
##	.ee2	0.225	0.019	11.753	0.000	0.225 0.142
##	.ee3	0.449	0.025	17.799	0.000	0.449 0.267
##	.dp1	0.278	0.045	6.144	0.000	0.278 0.232
##	.dp2	0.622	0.049	12.655	0.000	0.622 0.445
##	.pa1	0.270	0.022	12.414	0.000	0.270 0.329
##	.pa2	0.319	0.025	12.783	0.000	0.319 0.349
##	.pa3	0.407	0.024	17.000	0.000	0.407 0.443
##	F1	0.413	0.033	12.434	0.000	1.000 1.000
##	F2	0.571	0.041	13.843	0.000	1.000 1.000
##	F3	0.797	0.047	16.926	0.000	1.000 1.000
##	F4	0.112	0.010	10.732	0.000	1.000 1.000
##	F5	0.504	0.038	13.435	0.000	1.000 1.000
##	F6	1.151	0.061	18.983	0.000	1.000 1.000
##	F7	0.595	0.043	13.894	0.000	1.000 1.000
##	.F8	0.079	0.008	9.693	0.000	0.682 0.682
##	.F9	0.143	0.012	12.447	0.000	0.774 0.774
##	.F10	-0.432	0.816	-0.530	0.596	-0.332 -0.332
##	.F11	0.605	0.053	11.482	0.000	0.658 0.658
##	.F12	0.383	0.025	15.337	0.000	0.695 0.695

```
##
## R-Square:
##           Estimate
##   rolea1      0.495
##   rolea2      0.669
##   dec2        0.661
##   rolec1      0.470
##   rolec2      0.641
##   work1       0.552
##   work2       0.377
##   cclim1      0.382
##   cclim2      0.618
##   cclim3      0.421
##   cclim4      0.371
##   dec1        0.495
##   ssup1       0.743
##   ssup2       0.874
##   psup1       0.639
##   psup2       0.809
##   self1       0.585
##   self2       0.744
##   self3       0.719
##   elc1        0.476
##   elc2        0.339
##   elc3        0.549
##   elc4        0.413
##   elc5        0.549
##   ee1         0.759
##   ee2         0.858
##   ee3         0.733
##   dp1         0.768
##   dp2         0.555
##   pa1         0.671
##   pa2         0.651
##   pa3         0.557
##   F8          0.318
##   F9          0.226
##   F10         NA
##   F11         0.342
##   F12         0.305
```

Request MIs

We'll request only the MIs for the regression paths, as that's the part of the model we're testing now. Additionally, we're only interested in paths that make theoretical sense. Here, F4 is an IV and making it a DV may not make sense.

For example, F11 (depersonalization) is an IV and F4 (scores on classroom climate) is a DV. As you can see from the output, allowing F11 to be regressed on F4 (i.e., $F4 \rightarrow F11$) would improve

fit substantially. But allowing F4 to be regressed on F11 (i.e., $F11 \rightarrow F4$) doesn't make theoretical sense. In the next model, we'll free the path from F4 to F11. The reason we ignore all other MIs is, besides theoretical reasons, the fact that we only change 1 path at a time, recheck the MIs, and continue making changes 1 at a time, if sensible.

```
modindices(fullseml_fit,  
            sort = TRUE, # The sort argument allows us to sort the indices from largest  
            to smallest  
            op = "~") # The op argument lets us ask for specific MIs
```

##	lhs	op	rhs	mi	epc	sepc.lv	sepc.all	sepc.nox
## 1082	F11	~	F4	112.597	-0.974	-0.339	-0.339	-0.339
## 1148	F4	~	F11	90.818	-0.141	-0.404	-0.404	-0.404
## 1081	F11	~	F3	85.322	-4.799	-4.467	-4.467	-4.467
## 1052	F8	~	F12	49.986	0.329	0.719	0.719	0.719
## 1102	F6	~	F9	48.829	0.530	0.212	0.212	0.212
## 1084	F12	~	F5	48.215	0.486	0.465	0.465	0.465
## 1149	F4	~	F12	44.936	0.114	0.252	0.252	0.252
## 1067	F10	~	F8	44.307	-1.047	-0.312	-0.312	-0.312
## 1057	F9	~	F8	42.493	-0.295	-0.234	-0.234	-0.234
## 1137	F3	~	F11	42.233	-0.079	-0.085	-0.085	-0.085
## 1063	F9	~	F2	41.747	0.199	0.350	0.350	0.350
## 1077	F11	~	F12	40.700	-0.882	-0.683	-0.683	-0.683
## 1134	F3	~	F8	40.592	-0.133	-0.051	-0.051	-0.051
## 1085	F12	~	F6	40.197	0.155	0.223	0.223	0.223
## 1123	F2	~	F8	40.139	0.109	0.049	0.049	0.049
## 1064	F9	~	F3	34.824	0.157	0.326	0.326	0.326
## 1050	F8	~	F10	33.210	-0.117	-0.391	-0.391	-0.391
## 1061	F9	~	F6	31.688	0.127	0.317	0.317	0.317
## 1056	F8	~	F1	29.006	0.244	0.461	0.461	0.461
## 1051	F8	~	F11	28.603	-0.066	-0.187	-0.187	-0.187
## 1126	F2	~	F11	26.405	0.058	0.074	0.074	0.074
## 1101	F6	~	F8	25.697	2.295	0.728	0.728	0.728
## 1049	F8	~	F9	24.833	-0.136	-0.171	-0.171	-0.171
## 1089	F12	~	F4	24.491	0.355	0.160	0.160	0.160
## 1078	F11	~	F5	24.409	-0.326	-0.241	-0.241	-0.241
## 1075	F11	~	F8	23.832	-0.436	-0.155	-0.155	-0.155
## 1147	F4	~	F10	21.851	-3.186	-10.883	-10.883	-10.883
## 1088	F12	~	F3	21.639	0.272	0.327	0.327	0.327
## 1066	F9	~	F1	21.538	0.193	0.288	0.288	0.288
## 1136	F3	~	F10	20.490	2.683	3.429	3.429	3.429
## 1069	F10	~	F11	19.680	-0.388	-0.326	-0.326	-0.326
## 1053	F8	~	F2	19.332	0.161	0.357	0.357	0.357
## 1071	F10	~	F5	18.286	-2.238	-1.393	-1.393	-1.393
## 1086	F12	~	F7	18.040	0.138	0.143	0.143	0.143
## 1079	F11	~	F6	17.857	-0.122	-0.137	-0.137	-0.137
## 1112	F7	~	F8	16.635	2.235	0.986	0.986	0.986
## 1105	F6	~	F12	15.370	0.164	0.113	0.113	0.113
## 1087	F12	~	F2	15.330	0.233	0.237	0.237	0.237
## 1092	F5	~	F10	14.344	1.657	2.663	2.663	2.663
## 1074	F10	~	F1	13.374	2.303	1.297	1.297	1.297
## 1072	F10	~	F6	12.156	-0.772	-0.725	-0.725	-0.725
## 1065	F9	~	F4	9.423	-0.140	-0.109	-0.109	-0.109
## 1091	F5	~	F9	8.499	-0.135	-0.082	-0.082	-0.082
## 1124	F2	~	F9	7.404	0.024	0.013	0.013	0.013
## 1080	F11	~	F7	7.209	-0.102	-0.082	-0.082	-0.082
## 1083	F11	~	F1	6.830	0.205	0.138	0.138	0.138
## 1054	F8	~	F3	6.742	0.099	0.260	0.260	0.260
## 1094	F5	~	F12	5.709	0.078	0.081	0.081	0.081
## 1076	F11	~	F9	5.603	0.162	0.073	0.073	0.073
## 1059	F9	~	F11	5.363	0.035	0.079	0.079	0.079

##	1146	F4	~	F9	5.238	-0.067	-0.086	-0.086	-0.086
##	1073	F10	~	F7	4.357	-0.592	-0.400	-0.400	-0.400
##	1135	F3	~	F9	4.355	-0.021	-0.010	-0.010	-0.010
##	1068	F10	~	F9	4.302	-0.162	-0.061	-0.061	-0.061
##	1160	F1	~	F12	4.206	0.068	0.078	0.078	0.078
##	1113	F7	~	F9	4.146	0.125	0.070	0.070	0.070
##	1156	F1	~	F8	3.540	0.169	0.089	0.089	0.089
##	1145	F4	~	F8	3.535	0.099	0.101	0.101	0.101
##	1116	F7	~	F12	3.425	0.059	0.057	0.057	0.057
##	1103	F6	~	F10	2.985	0.634	0.675	0.675	0.675
##	1058	F9	~	F10	2.930	0.026	0.068	0.068	0.068
##	1060	F9	~	F12	2.858	-0.072	-0.124	-0.124	-0.124
##	1090	F5	~	F8	2.786	-0.262	-0.125	-0.125	-0.125
##	1062	F9	~	F7	2.577	0.042	0.075	0.075	0.075
##	1093	F5	~	F11	2.401	-0.030	-0.040	-0.040	-0.040
##	1158	F1	~	F10	2.378	-0.420	-0.746	-0.746	-0.746
##	1125	F2	~	F10	1.878	0.577	0.872	0.872	0.872
##	1138	F3	~	F12	1.245	0.013	0.011	0.011	0.011
##	1104	F6	~	F11	0.809	-0.029	-0.026	-0.026	-0.026
##	1127	F2	~	F12	0.779	0.008	0.008	0.008	0.008
##	1055	F8	~	F4	0.580	0.034	0.034	0.034	0.034
##	1157	F1	~	F9	0.286	0.025	0.017	0.017	0.017
##	1115	F7	~	F11	0.274	-0.014	-0.018	-0.018	-0.018
##	1159	F1	~	F11	0.153	-0.009	-0.013	-0.013	-0.013
##	1114	F7	~	F10	0.003	-0.016	-0.024	-0.024	-0.024
##	1070	F10	~	F12	0.002	0.004	0.003	0.003	0.003

Structural Model 2

```

fullsem2 <- '
    # Measurement Model
    F1 =~ rolea1 + rolea2 + dec2 #role ambiguity with DEC2 cross-loading
    F2 =~ rolec1 + rolec2 #role conflict
    F3 =~ work1 + work2 #work overload
    F4 =~ cclim1 + cclim2 + cclim3 + cclim4 #classroom climate
    F5 =~ dec1 + dec2 #decision-making
    F6 =~ ssup1 + ssup2 + dec2 #superior support with DEC2 cross-loading
    F7 =~ psup1 + psup2 #peer support
    F8 =~ self1 + self2 + self3 #self-esteem
    F9 =~ elc1 + elc2 + elc3 + elc4 + elc5 #external loc of control
    F10 =~ ee1 + ee2 + ee3 #emotional exhaustion
    F11 =~ dp1 + dp2 #depersonalization
    F12 =~ pa1 + pa2 + pa3 #personal accomplishment

    # Structural Model
    F8 ~ F5 + F6 + F7
    F9 ~ F5
    F10 ~ F2 + F3 + F4
    F11 ~ F2 + F10 + F4 #Adding here the path from F4 to F11
    F12 ~ F1 + F8 + F9 + F10 + F11
    '

```

Fit the Model

We still get the warning about the negative variance.

```

# Estimate the Model
fullsem2_fit <-
  sem(model = fullsem2,
      data = teachers,
      estimator = "MLM",
      meanstructure = TRUE
  )

```

```

## Warning in lav_object_post_check(object): lavaan WARNING: some estimated lv
## variances are negative

```

Request the Output

Notice in the output, that we also have several non-significant paths from IVs to DVs. To create a more parsimonious model, we can delete them from the model, but we'll leave them for now.

```
summary(fullsem2_fit,  
        fit.measures = TRUE,  
        standardized = TRUE,  
        rsquare = TRUE)
```

```

## lavaan 0.6-9 ended normally after 181 iterations
##
##   Estimator                      ML
##   Optimization method          NLMINB
##   Number of model parameters    134
##
##   Number of observations        1430
##
## Model Test User Model:
##
##               Standard      Robust
##   Test Statistic      1620.425    1440.864
##   Degrees of freedom           426         426
##   P-value (Chi-square)      0.000         0.000
##   Scaling correction factor          1.125
##   Satorra-Bentler correction
##
## Model Test Baseline Model:
##
##   Test statistic      23532.624    19072.057
##   Degrees of freedom           496         496
##   P-value              0.000         0.000
##   Scaling correction factor          1.234
##
## User Model versus Baseline Model:
##
##   Comparative Fit Index (CFI)      0.948         0.945
##   Tucker-Lewis Index (TLI)        0.940         0.936
##
##   Robust Comparative Fit Index (CFI)      0.950
##   Robust Tucker-Lewis Index (TLI)        0.942
##
## Loglikelihood and Information Criteria:
##
##   Loglikelihood user model (H0)      -47181.795    -47181.795
##   Loglikelihood unrestricted model (H1) -46371.583    -46371.583
##
##   Akaike (AIC)                      94631.591    94631.591
##   Bayesian (BIC)                     95337.158    95337.158
##   Sample-size adjusted Bayesian (BIC)  94911.486    94911.486
##
## Root Mean Square Error of Approximation:
##
##   RMSEA                        0.044         0.041
##   90 Percent confidence interval - lower      0.042         0.039
##   90 Percent confidence interval - upper      0.047         0.043
##   P-value RMSEA <= 0.05              1.000         1.000
##
##   Robust RMSEA                      0.043
##   90 Percent confidence interval - lower      0.041
##   90 Percent confidence interval - upper      0.046
##

```



```

## Standardized Root Mean Square Residual:
##
##      SRMR                      0.046          0.046
##
## Parameter Estimates:
##
##      Standard errors          Robust.sem
##      Information              Expected
##      Information saturated (h1) model    Structured
##
## Latent Variables:
##      Estimate  Std.Err  z-value  P(>|z|)  Std.lv  Std.all
##      F1 =~
##      rolea1      1.000
##      rolea2      1.238    0.058   21.496   0.000    0.643    0.703
##      dec2         0.228    0.089    2.576   0.010    0.147    0.111
##      F2 =~
##      rolec1      1.000
##      rolec2      1.310    0.053   24.771   0.000    0.756    0.686
##      F3 =~
##      work1       1.000
##      work2       0.748    0.032   23.192   0.000    0.895    0.745
##      F4 =~
##      cclim1      1.000
##      cclim2      1.485    0.076   19.602   0.000    0.669    0.614
##      cclim3      0.963    0.055   17.373   0.000    0.333    0.616
##      cclim4      1.328    0.079   16.761   0.000    0.495    0.788
##      F5 =~
##      dec1        1.000
##      dec2        0.407    0.106    3.855   0.000    0.321    0.650
##      F6 =~
##      ssup1       1.000
##      ssup2       1.099    0.026   42.253   0.000    0.442    0.605
##      dec2        0.859    0.049   17.589   0.000    0.710    0.703
##      F7 =~
##      psup1       1.000
##      psup2       1.080    0.046   23.687   0.000    0.289    0.218
##      F8 =~
##      self1       1.000
##      self2       1.278    0.045   28.156   0.000    1.073    0.862
##      self3       1.357    0.057   23.743   0.000    1.178    0.935
##      F9 =~
##      elc1        1.000
##      elc2        0.848    0.042   20.397   0.000    0.921    0.694
##      elc3        0.944    0.041   23.154   0.000    0.771    0.799
##      elc4        0.904    0.047   19.273   0.000    0.833    0.899
##      elc5        1.110    0.050   22.390   0.000    0.340    0.765
##      F10 =~
##      ee1         1.000
##      ee2         1.020    0.019   53.497   0.000    0.435    0.863
##      ee3         0.969    0.023   42.983   0.000    0.462    0.848
##      ee1         1.000
##      ee2         1.020    0.019   53.497   0.000    0.771    0.799
##      ee3         0.969    0.023   42.983   0.000    0.833    0.899

```

```

##      F11 =~
##      dp1          1.000          0.965      0.882
##      dp2          0.902      0.041      21.767      0.000      0.871      0.737
##      F12 =~
##      pa1          1.000          0.743      0.819
##      pa2          1.040      0.038      27.497      0.000      0.772      0.808
##      pa3          0.963      0.040      23.910      0.000      0.715      0.746
##
## Regressions:
##      Estimate      Std.Err      z-value      P(>|z|)      Std.lv      Std.all
##      F8 ~
##      F5          0.474      0.054       8.781      0.000      0.989      0.989
##      F6         -0.155      0.026     -5.884      0.000     -0.489     -0.489
##      F7         -0.066      0.030     -2.222      0.026     -0.150     -0.150
##      F9 ~
##      F5         -0.288      0.023    -12.791      0.000     -0.476     -0.476
##      F10 ~
##      F2         -8.396      6.311     -1.331      0.183     -5.553     -5.553
##      F3          7.856      5.337       1.472      0.141       6.151       6.151
##      F4         -0.563      0.675     -0.833      0.405     -0.164     -0.164
##      F11 ~
##      F2          0.173      0.052       3.352      0.001       0.135       0.135
##      F10         0.299      0.034       8.710      0.000       0.354       0.354
##      F4         -0.969      0.107     -9.059      0.000     -0.334     -0.334
##      F12 ~
##      F1         -0.069      0.049     -1.417      0.156     -0.060     -0.060
##      F8          0.473      0.090       5.275      0.000       0.217       0.217
##      F9         -0.204      0.052     -3.913      0.000     -0.118     -0.118
##      F10        -0.058      0.026     -2.261      0.024     -0.089     -0.089
##      F11        -0.228      0.032     -7.048      0.000     -0.297     -0.297
##
## Covariances:
##      Estimate      Std.Err      z-value      P(>|z|)      Std.lv      Std.all
##      F1 ~~
##      F2          0.360      0.025     14.361      0.000       0.740       0.740
##      F3          0.418      0.027     15.231      0.000       0.728       0.728
##      F4         -0.065      0.008     -7.792      0.000     -0.305     -0.305
##      F5         -0.372      0.026    -14.495      0.000     -0.817     -0.817
##      F6         -0.385      0.030    -12.730      0.000     -0.559     -0.559
##      F7         -0.242      0.022    -10.973      0.000     -0.488     -0.488
##      F2 ~~
##      F3          0.668      0.035     19.091      0.000       0.988       0.988
##      F4         -0.080      0.010     -7.633      0.000     -0.318     -0.318
##      F5         -0.405      0.028    -14.463      0.000     -0.754     -0.754
##      F6         -0.425      0.032    -13.142      0.000     -0.525     -0.525
##      F7         -0.233      0.023    -10.290      0.000     -0.399     -0.399
##      F3 ~~
##      F4         -0.095      0.013     -7.369      0.000     -0.319     -0.319
##      F5         -0.491      0.030    -16.116      0.000     -0.774     -0.774
##      F6         -0.500      0.035    -14.261      0.000     -0.520     -0.520
##      F7         -0.277      0.026    -10.775      0.000     -0.402     -0.402

```

```

##      F4 ~~
##      F5          0.101    0.011    9.457    0.000    0.426    0.426
##      F6          0.121    0.014    8.894    0.000    0.339    0.339
##      F7          0.056    0.009    5.979    0.000    0.216    0.216
##      F5 ~~
##      F6          0.616    0.038   16.232    0.000    0.809    0.809
##      F7          0.385    0.028   13.834    0.000    0.704    0.704
##      F6 ~~
##      F7          0.394    0.032   12.428    0.000    0.476    0.476
##
## Intercepts:
##              Estimate Std.Err  z-value  P(>|z|)  Std.lv  Std.all
##      .rolea1         2.401    0.024   99.362    0.000    2.401    2.628
##      .rolea2         2.086    0.026   81.108    0.000    2.086    2.145
##      .dec2           4.242    0.035  120.842    0.000    4.242    3.196
##      .rolec1         3.015    0.029  103.524    0.000    3.015    2.738
##      .rolec2         3.018    0.033   92.468    0.000    3.018    2.445
##      .work1          3.240    0.032  101.996    0.000    3.240    2.697
##      .work2          2.243    0.029   77.885    0.000    2.243    2.060
##      .cclim1         2.964    0.014  207.379    0.000    2.964    5.484
##      .cclim2         2.723    0.017  163.890    0.000    2.723    4.334
##      .cclim3         2.928    0.013  224.532    0.000    2.928    5.938
##      .cclim4         3.053    0.019  157.758    0.000    3.053    4.172
##      .dec1           4.039    0.027  151.305    0.000    4.039    4.001
##      .ssup1          4.299    0.033  130.631    0.000    4.299    3.454
##      .ssup2          4.370    0.033  131.136    0.000    4.370    3.468
##      .psup1          4.571    0.026  179.200    0.000    4.571    4.739
##      .psup2          4.621    0.024  188.754    0.000    4.621    4.991
##      .self1          3.603    0.012  306.319    0.000    3.603    8.100
##      .self2          3.613    0.013  271.109    0.000    3.613    7.169
##      .self3          3.483    0.014  241.972    0.000    3.483    6.399
##      .elc1           2.918    0.016  176.985    0.000    2.918    4.680
##      .elc2           3.008    0.017  181.556    0.000    3.008    4.801
##      .elc3           2.801    0.014  193.300    0.000    2.801    5.112
##      .elc4           2.200    0.016  137.503    0.000    2.200    3.636
##      .elc5           2.483    0.017  145.731    0.000    2.483    3.854
##      .ee1            3.855    0.035  111.347    0.000    3.855    2.944
##      .ee2            3.530    0.033  106.201    0.000    3.530    2.808
##      .ee3            3.165    0.034   92.281    0.000    3.165    2.440
##      .dp1            2.319    0.029   80.113    0.000    2.319    2.119
##      .dp2            2.086    0.031   66.763    0.000    2.086    1.765
##      .pa1            5.748    0.024  238.172    0.000    5.748    6.341
##      .pa2            5.850    0.025  229.759    0.000    5.850    6.116
##      .pa3            5.815    0.025  228.188    0.000    5.815    6.068
##      F1             0.000          0.000    0.000    0.000    0.000    0.000
##      F2             0.000          0.000    0.000    0.000    0.000    0.000
##      F3             0.000          0.000    0.000    0.000    0.000    0.000
##      F4             0.000          0.000    0.000    0.000    0.000    0.000
##      F5             0.000          0.000    0.000    0.000    0.000    0.000
##      F6             0.000          0.000    0.000    0.000    0.000    0.000
##      F7             0.000          0.000    0.000    0.000    0.000    0.000

```

##	.F8	0.000			0.000	0.000
##	.F9	0.000			0.000	0.000
##	.F10	0.000			0.000	0.000
##	.F11	0.000			0.000	0.000
##	.F12	0.000			0.000	0.000
##						
##	Variances:					
##		Estimate	Std.Err	z-value	P(> z)	Std.lv Std.all
##	.rolea1	0.422	0.024	17.393	0.000	0.422 0.505
##	.rolea2	0.313	0.027	11.550	0.000	0.313 0.331
##	.dec2	0.599	0.033	18.024	0.000	0.599 0.340
##	.rolec1	0.642	0.029	22.248	0.000	0.642 0.529
##	.rolec2	0.543	0.037	14.685	0.000	0.543 0.356
##	.work1	0.642	0.030	21.239	0.000	0.642 0.445
##	.work2	0.739	0.035	20.918	0.000	0.739 0.623
##	.cclim1	0.181	0.008	22.717	0.000	0.181 0.620
##	.cclim2	0.150	0.010	14.986	0.000	0.150 0.380
##	.cclim3	0.140	0.007	19.315	0.000	0.140 0.577
##	.cclim4	0.340	0.015	22.100	0.000	0.340 0.634
##	.dec1	0.515	0.027	19.233	0.000	0.515 0.506
##	.ssup1	0.398	0.026	15.213	0.000	0.398 0.257
##	.ssup2	0.199	0.022	8.883	0.000	0.199 0.125
##	.psup1	0.336	0.027	12.240	0.000	0.336 0.361
##	.psup2	0.164	0.026	6.284	0.000	0.164 0.191
##	.self1	0.082	0.005	16.561	0.000	0.082 0.415
##	.self2	0.065	0.005	13.031	0.000	0.065 0.256
##	.self3	0.083	0.006	13.020	0.000	0.083 0.281
##	.elc1	0.204	0.010	20.507	0.000	0.204 0.524
##	.elc2	0.259	0.011	23.326	0.000	0.259 0.661
##	.elc3	0.135	0.007	18.173	0.000	0.135 0.451
##	.elc4	0.215	0.010	21.719	0.000	0.215 0.587
##	.elc5	0.187	0.010	18.594	0.000	0.187 0.451
##	.ee1	0.408	0.024	17.131	0.000	0.408 0.238
##	.ee2	0.221	0.019	11.525	0.000	0.221 0.140
##	.ee3	0.455	0.026	17.817	0.000	0.455 0.271
##	.dp1	0.266	0.042	6.279	0.000	0.266 0.222
##	.dp2	0.638	0.047	13.649	0.000	0.638 0.457
##	.pa1	0.270	0.022	12.446	0.000	0.270 0.329
##	.pa2	0.318	0.025	12.762	0.000	0.318 0.348
##	.pa3	0.407	0.024	17.018	0.000	0.407 0.443
##	F1	0.413	0.033	12.434	0.000	1.000 1.000
##	F2	0.571	0.041	13.852	0.000	1.000 1.000
##	F3	0.801	0.047	16.998	0.000	1.000 1.000
##	F4	0.111	0.010	10.824	0.000	1.000 1.000
##	F5	0.504	0.038	13.431	0.000	1.000 1.000
##	F6	1.150	0.061	18.982	0.000	1.000 1.000
##	F7	0.595	0.043	13.894	0.000	1.000 1.000
##	.F8	0.079	0.008	9.696	0.000	0.682 0.682
##	.F9	0.143	0.012	12.446	0.000	0.774 0.774
##	.F10	-0.377	0.762	-0.495	0.621	-0.289 -0.289
##	.F11	0.535	0.046	11.678	0.000	0.574 0.574

```
##      .F12              0.380      0.025      15.329      0.000      0.689      0.689
##
## R-Square:
##              Estimate
##      rolea1          0.495
##      rolea2          0.669
##      dec2            0.660
##      rolec1          0.471
##      rolec2          0.644
##      work1           0.555
##      work2           0.377
##      cclim1          0.380
##      cclim2          0.620
##      cclim3          0.423
##      cclim4          0.366
##      dec1            0.494
##      ssup1           0.743
##      ssup2           0.875
##      psup1           0.639
##      psup2           0.809
##      self1           0.585
##      self2           0.744
##      self3           0.719
##      elc1            0.476
##      elc2            0.339
##      elc3            0.549
##      elc4            0.413
##      elc5            0.549
##      ee1             0.762
##      ee2             0.860
##      ee3             0.729
##      dp1             0.778
##      dp2             0.543
##      pa1             0.671
##      pa2             0.652
##      pa3             0.557
##      F8              0.318
##      F9              0.226
##      F10             NA
##      F11             0.426
##      F12             0.311
```

Request MIs

We'll look again at the MIs only for the regression paths. The largest one is from F8 to F12. We'll leave that one alone because, in this dataset and theory, it doesn't make sense to change it. The largest and meaningful MI (in this model, with this theory) is the regression path going from F5 to F12, or the regression of F12 on F5. This path suggests that when teachers have more opportunities to make decisions about their work environment, they have a stronger sense of

personal accomplishment. We'll free this path in our next model.

```
modindices(fullsem2_fit,  
            sort = TRUE, # The sort argument allows us to sort the indices from largest  
            to smallest  
            op = "~") # The op argument lets us ask for specific MIs
```

##	lhs	op	rhs	mi	epc	sepc.lv	sepc.all	sepc.nox
## 1053	F8	~	F12	49.856	0.330	0.720	0.720	0.720
## 1102	F6	~	F9	48.895	0.530	0.213	0.213	0.213
## 1084	F12	~	F5	47.087	0.480	0.458	0.458	0.458
## 1068	F10	~	F8	42.770	-1.029	-0.306	-0.306	-0.306
## 1058	F9	~	F8	42.452	-0.295	-0.234	-0.234	-0.234
## 1064	F9	~	F2	39.926	0.193	0.339	0.339	0.339
## 1134	F3	~	F8	38.966	-0.134	-0.051	-0.051	-0.051
## 1123	F2	~	F8	38.826	0.110	0.050	0.050	0.050
## 1085	F12	~	F6	38.645	0.152	0.219	0.219	0.219
## 1065	F9	~	F3	34.198	0.155	0.321	0.321	0.321
## 1051	F8	~	F10	32.655	-0.115	-0.385	-0.385	-0.385
## 1062	F9	~	F6	31.853	0.127	0.317	0.317	0.317
## 1052	F8	~	F11	30.061	-0.070	-0.200	-0.200	-0.200
## 1057	F8	~	F1	29.160	0.245	0.462	0.462	0.462
## 1050	F8	~	F9	24.753	-0.135	-0.171	-0.171	-0.171
## 1101	F6	~	F8	23.546	2.191	0.695	0.695	0.695
## 1076	F11	~	F8	21.773	-0.402	-0.142	-0.142	-0.142
## 1067	F9	~	F1	21.398	0.192	0.287	0.287	0.287
## 1147	F4	~	F10	20.877	-3.195	-10.960	-10.960	-10.960
## 1089	F12	~	F4	20.671	0.364	0.163	0.163	0.163
## 1054	F8	~	F2	19.862	0.161	0.358	0.358	0.358
## 1088	F12	~	F3	19.841	0.255	0.308	0.308	0.308
## 1136	F3	~	F10	19.772	2.938	3.753	3.753	3.753
## 1086	F12	~	F7	17.873	0.137	0.142	0.142	0.142
## 1072	F10	~	F5	17.317	-2.111	-1.311	-1.311	-1.311
## 1112	F7	~	F8	16.697	2.238	0.987	0.987	0.987
## 1087	F12	~	F2	16.255	0.235	0.240	0.240	0.240
## 1092	F5	~	F10	14.842	1.865	3.002	3.002	3.002
## 1105	F6	~	F12	14.534	0.160	0.111	0.111	0.111
## 1149	F4	~	F12	13.051	0.070	0.155	0.155	0.155
## 1075	F10	~	F1	12.978	2.201	1.237	1.237	1.237
## 1073	F10	~	F6	11.396	-0.725	-0.680	-0.680	-0.680
## 1066	F9	~	F4	9.119	-0.138	-0.107	-0.107	-0.107
## 1091	F5	~	F9	8.421	-0.134	-0.081	-0.081	-0.081
## 1124	F2	~	F9	7.499	0.025	0.014	0.014	0.014
## 1055	F8	~	F3	7.489	0.103	0.270	0.270	0.270
## 1146	F4	~	F9	7.209	-0.079	-0.102	-0.102	-0.102
## 1079	F11	~	F5	6.836	-0.171	-0.126	-0.126	-0.126
## 1148	F4	~	F11	6.763	0.155	0.449	0.449	0.449
## 1060	F9	~	F11	6.108	0.038	0.086	0.086	0.086
## 1094	F5	~	F12	5.778	0.079	0.083	0.083	0.083
## 1127	F2	~	F12	5.004	0.021	0.021	0.021	0.021
## 1135	F3	~	F9	4.351	-0.022	-0.010	-0.010	-0.010
## 1069	F10	~	F9	4.312	-0.163	-0.061	-0.061	-0.061
## 1113	F7	~	F9	4.178	0.126	0.070	0.070	0.070
## 1074	F10	~	F7	4.111	-0.557	-0.376	-0.376	-0.376
## 1080	F11	~	F6	4.070	-0.058	-0.064	-0.064	-0.064
## 1160	F1	~	F12	3.875	0.065	0.076	0.076	0.076
## 1081	F11	~	F7	3.556	-0.069	-0.055	-0.055	-0.055
## 1156	F1	~	F8	3.477	0.167	0.089	0.089	0.089

##	1116	F7	~	F12	3.446	0.060	0.058	0.058	0.058
##	1061	F9	~	F12	3.411	-0.079	-0.136	-0.136	-0.136
##	1059	F9	~	F10	2.814	0.025	0.067	0.067	0.067
##	1090	F5	~	F8	2.785	-0.261	-0.125	-0.125	-0.125
##	1103	F6	~	F10	2.646	0.665	0.709	0.709	0.709
##	1063	F9	~	F7	2.612	0.042	0.075	0.075	0.075
##	1145	F4	~	F8	2.530	0.083	0.085	0.085	0.085
##	1093	F5	~	F11	2.483	-0.033	-0.045	-0.045	-0.045
##	1158	F1	~	F10	2.302	-0.462	-0.821	-0.821	-0.821
##	1071	F10	~	F12	2.111	-0.125	-0.081	-0.081	-0.081
##	1083	F11	~	F1	2.008	0.108	0.072	0.072	0.072
##	1125	F2	~	F10	1.774	0.625	0.945	0.945	0.945
##	1056	F8	~	F4	1.533	0.056	0.054	0.054	0.054
##	1077	F11	~	F9	1.491	0.081	0.036	0.036	0.036
##	1137	F3	~	F11	1.017	-0.016	-0.018	-0.018	-0.018
##	1138	F3	~	F12	0.487	-0.009	-0.008	-0.008	-0.008
##	1115	F7	~	F11	0.314	-0.017	-0.021	-0.021	-0.021
##	1104	F6	~	F11	0.294	-0.019	-0.017	-0.017	-0.017
##	1157	F1	~	F9	0.290	0.025	0.017	0.017	0.017
##	1070	F10	~	F11	0.272	0.056	0.047	0.047	0.047
##	1082	F11	~	F3	0.272	0.625	0.579	0.579	0.579
##	1159	F1	~	F11	0.109	-0.008	-0.012	-0.012	-0.012
##	1126	F2	~	F11	0.050	0.003	0.004	0.004	0.004
##	1114	F7	~	F10	0.008	-0.027	-0.040	-0.040	-0.040
##	1078	F11	~	F12	0.000	-0.001	0.000	0.000	0.000

Structural Model 3


```

fullsem3 <- '
    # Measurement Model
    F1 =~ rolea1 + rolea2 + dec2 #role ambiguity with DEC2 cross-loading
    F2 =~ rolec1 + rolec2 #role conflict
    F3 =~ work1 + work2 #work overload
    F4 =~ cclim1 + cclim2 + cclim3 + cclim4 #classroom climate
    F5 =~ dec1 + dec2 #decision-making
    F6 =~ ssup1 + ssup2 + dec2 #superior support with DEC2 cross-loading
    F7 =~ psup1 + psup2 #peer support
    F8 =~ self1 + self2 + self3 #self-esteem
    F9 =~ elc1 + elc2 + elc3 + elc4 + elc5 #external loc of control
    F10 =~ ee1 + ee2 + ee3 #emotional exhaustion
    F11 =~ dp1 + dp2 #depersonalization
    F12 =~ pa1 + pa2 + pa3 #personal accomplishment

    # Structural Model
    F8 ~ F5 + F6 + F7
    F9 ~ F5
    F10 ~ F2 + F3 + F4
    F11 ~ F2 + F10 + F4 #Adding here the path from F4 to F11
    F12 ~ F1 + F8 + F9 + F10 + F11 + F5 #Adding here the path from F5 to F12
    '

```

Fit the Model

We still get the warning about the negative variance.

```

# Estimate the Model
fullsem3_fit <-
  sem(model = fullsem3,
      data = teachers,
      estimator = "MLM",
      meanstructure = TRUE
  )

```

```

## Warning in lav_object_post_check(object): lavaan WARNING: some estimated lv
## variances are negative

```

Request the Output

Check the output again. Remember we had some non-significant regression paths. Notice that two of them (F3 → F10; F1 → F12) is now significant and another (F2 → F10) is trending in the right direction. This is why we don't eliminate non-significant paths until we're done checking if other paths should be freed, as freeing a path can change the relationships between other variables.

```
summary(fullsem3_fit,  
        fit.measures = TRUE,  
        standardized = TRUE,  
        rsquare = TRUE)
```

```

## lavaan 0.6-9 ended normally after 172 iterations
##
##   Estimator                      ML
##   Optimization method          NLMINB
##   Number of model parameters    135
##
##   Number of observations        1430
##
## Model Test User Model:
##
##               Standard      Robust
##   Test Statistic    1570.968    1396.527
##   Degrees of freedom      425      425
##   P-value (Chi-square)    0.000      0.000
##   Scaling correction factor      1.125
##   Satorra-Bentler correction
##
## Model Test Baseline Model:
##
##   Test statistic    23532.624    19072.057
##   Degrees of freedom      496      496
##   P-value            0.000      0.000
##   Scaling correction factor      1.234
##
## User Model versus Baseline Model:
##
##   Comparative Fit Index (CFI)    0.950      0.948
##   Tucker-Lewis Index (TLI)      0.942      0.939
##
##   Robust Comparative Fit Index (CFI)    0.952
##   Robust Tucker-Lewis Index (TLI)      0.944
##
## Loglikelihood and Information Criteria:
##
##   Loglikelihood user model (H0)    -47157.067    -47157.067
##   Loglikelihood unrestricted model (H1)    -46371.583    -46371.583
##
##   Akaike (AIC)    94584.133    94584.133
##   Bayesian (BIC)    95294.966    95294.966
##   Sample-size adjusted Bayesian (BIC)    94866.118    94866.118
##
## Root Mean Square Error of Approximation:
##
##   RMSEA    0.043    0.040
##   90 Percent confidence interval - lower    0.041    0.038
##   90 Percent confidence interval - upper    0.046    0.042
##   P-value RMSEA <= 0.05    1.000    1.000
##
##   Robust RMSEA    0.042
##   90 Percent confidence interval - lower    0.040
##   90 Percent confidence interval - upper    0.045
##

```

```

## Standardized Root Mean Square Residual:
##
##      SRMR                      0.044          0.044
##
## Parameter Estimates:
##
##      Standard errors          Robust.sem
##      Information              Expected
##      Information saturated (h1) model    Structured
##
## Latent Variables:
##      Estimate  Std.Err  z-value  P(>|z|)  Std.lv  Std.all
##      F1 =~
##      rolea1      1.000
##      rolea2      1.237    0.058   21.478   0.000    0.640    0.700
##      dec2        0.287    0.091    3.158   0.002    0.184    0.138
##      F2 =~
##      rolec1      1.000
##      rolec2      1.309    0.053   24.791   0.000    0.756    0.687
##      F3 =~
##      work1       1.000
##      work2       0.747    0.032   23.193   0.000    0.897    0.747
##      F4 =~
##      cclim1      1.000
##      cclim2      1.486    0.076   19.586   0.000    0.670    0.615
##      cclim3      0.964    0.055   17.365   0.000    0.333    0.616
##      cclim4      1.329    0.079   16.765   0.000    0.495    0.788
##      F5 =~
##      dec1        1.000
##      dec2        0.479    0.108    4.424   0.000    0.321    0.651
##      F6 =~
##      ssup1       1.000
##      ssup2       1.099    0.026   42.466   0.000    0.443    0.605
##      dec2        0.842    0.049   17.187   0.000    0.712    0.705
##      F7 =~
##      psup1       1.000
##      psup2       1.088    0.046   23.706   0.000    0.341    0.257
##      F8 =~
##      self1       1.000
##      self2       1.277    0.045   28.182   0.000    1.072    0.861
##      self3       1.356    0.057   23.729   0.000    1.178    0.935
##      F9 =~
##      elc1        1.000
##      elc2        0.848    0.042   20.391   0.000    0.903    0.680
##      elc3        0.945    0.041   23.158   0.000    0.768    0.796
##      elc4        0.906    0.047   19.265   0.000    0.836    0.903
##      elc5        1.111    0.050   22.376   0.000    0.340    0.765
##      F10 =~
##      ee1         1.000
##      ee2         1.020    0.019   53.539   0.000    0.435    0.863
##      ee3         0.969    0.023   42.986   0.000    0.461    0.848
##      ee1         1.000
##      ee2         1.020    0.019   53.539   0.000    0.430    0.689
##      ee3         0.969    0.023   42.986   0.000    0.365    0.582
##      ee1         1.000
##      ee2         1.020    0.019   53.539   0.000    0.406    0.742
##      ee3         0.969    0.023   42.986   0.000    0.389    0.643
##      ee1         1.000
##      ee2         1.020    0.019   53.539   0.000    0.478    0.741
##      ee3         0.969    0.023   42.986   0.000    1.143    0.873
##      ee1         1.000
##      ee2         1.020    0.019   53.539   0.000    1.166    0.927
##      ee3         0.969    0.023   42.986   0.000    1.108    0.854

```

```

##      F11 =~
##      dp1          1.000          0.971      0.887
##      dp2          0.894      0.042      21.327      0.000      0.868      0.734
##      F12 =~
##      pa1          1.000          0.748      0.824
##      pa2          1.028      0.037      27.513      0.000      0.768      0.803
##      pa3          0.957      0.040      23.973      0.000      0.716      0.746
##
## Regressions:
##      Estimate      Std.Err      z-value      P(>|z|)      Std.lv      Std.all
##      F8 ~
##      F5              0.473      0.054       8.817      0.000      0.989      0.989
##      F6             -0.157      0.026      -6.059      0.000     -0.496     -0.496
##      F7             -0.061      0.029      -2.120      0.034     -0.138     -0.138
##      F9 ~
##      F5             -0.288      0.023     -12.771      0.000     -0.477     -0.477
##      F10 ~
##      F2             -6.345      3.544      -1.790      0.073     -4.198     -4.198
##      F3              6.113      2.994       2.042      0.041      4.797      4.797
##      F4             -0.576      0.521      -1.107      0.268     -0.168     -0.168
##      F11 ~
##      F2              0.176      0.052       3.399      0.001      0.137      0.137
##      F10             0.300      0.034       8.718      0.000      0.353      0.353
##      F4             -0.963      0.107      -9.008      0.000     -0.330     -0.330
##      F12 ~
##      F1              0.333      0.090       3.700      0.000      0.285      0.285
##      F8              0.469      0.091       5.138      0.000      0.213      0.213
##      F9             -0.153      0.056      -2.744      0.006     -0.088     -0.088
##      F10             0.025      0.030       0.818      0.413      0.038      0.038
##      F11            -0.200      0.032      -6.202      0.000     -0.259     -0.259
##      F5              0.504      0.088       5.702      0.000      0.480      0.480
##
## Covariances:
##      Estimate      Std.Err      z-value      P(>|z|)      Std.lv      Std.all
##      F1 ~~
##      F2              0.365      0.025     14.586      0.000      0.755      0.755
##      F3              0.423      0.027     15.441      0.000      0.737      0.737
##      F4             -0.063      0.008      -7.605      0.000     -0.297     -0.297
##      F5             -0.374      0.026     -14.543      0.000     -0.821     -0.821
##      F6             -0.384      0.030     -12.714      0.000     -0.561     -0.561
##      F7             -0.241      0.022     -10.935      0.000     -0.490     -0.490
##      F2 ~~
##      F3              0.668      0.035     19.113      0.000      0.984      0.984
##      F4             -0.080      0.010      -7.630      0.000     -0.318     -0.318
##      F5             -0.396      0.028     -14.276      0.000     -0.736     -0.736
##      F6             -0.426      0.032     -13.147      0.000     -0.525     -0.525
##      F7             -0.231      0.023     -10.221      0.000     -0.397     -0.397
##      F3 ~~
##      F4             -0.095      0.013      -7.366      0.000     -0.319     -0.319
##      F5             -0.485      0.030     -15.941      0.000     -0.761     -0.761
##      F6             -0.499      0.035     -14.225      0.000     -0.518     -0.518

```

##	F7	-0.275	0.026	-10.768	0.000	-0.400	-0.400
##	F4 ~~						
##	F5	0.104	0.011	9.751	0.000	0.438	0.438
##	F6	0.120	0.014	8.853	0.000	0.337	0.337
##	F7	0.055	0.009	5.967	0.000	0.216	0.216
##	F5 ~~						
##	F6	0.613	0.037	16.400	0.000	0.804	0.804
##	F7	0.377	0.027	13.929	0.000	0.690	0.690
##	F6 ~~						
##	F7	0.392	0.032	12.345	0.000	0.475	0.475
##							
##	Intercepts:						
##		Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
##	.rolea1	2.401	0.024	99.362	0.000	2.401	2.628
##	.rolea2	2.086	0.026	81.108	0.000	2.086	2.145
##	.dec2	4.242	0.035	120.842	0.000	4.242	3.196
##	.rolec1	3.015	0.029	103.524	0.000	3.015	2.738
##	.rolec2	3.018	0.033	92.468	0.000	3.018	2.445
##	.work1	3.240	0.032	101.996	0.000	3.240	2.697
##	.work2	2.243	0.029	77.885	0.000	2.243	2.060
##	.cclim1	2.964	0.014	207.379	0.000	2.964	5.484
##	.cclim2	2.723	0.017	163.890	0.000	2.723	4.334
##	.cclim3	2.928	0.013	224.532	0.000	2.928	5.938
##	.cclim4	3.053	0.019	157.758	0.000	3.053	4.172
##	.dec1	4.039	0.027	151.305	0.000	4.039	4.001
##	.ssup1	4.299	0.033	130.631	0.000	4.299	3.454
##	.ssup2	4.370	0.033	131.136	0.000	4.370	3.468
##	.psup1	4.571	0.026	179.200	0.000	4.571	4.739
##	.psup2	4.621	0.024	188.754	0.000	4.621	4.991
##	.self1	3.603	0.012	306.319	0.000	3.603	8.100
##	.self2	3.613	0.013	271.109	0.000	3.613	7.169
##	.self3	3.483	0.014	241.972	0.000	3.483	6.399
##	.elc1	2.918	0.016	176.985	0.000	2.918	4.680
##	.elc2	3.008	0.017	181.556	0.000	3.008	4.801
##	.elc3	2.801	0.014	193.300	0.000	2.801	5.112
##	.elc4	2.200	0.016	137.503	0.000	2.200	3.636
##	.elc5	2.483	0.017	145.731	0.000	2.483	3.854
##	.ee1	3.855	0.035	111.347	0.000	3.855	2.944
##	.ee2	3.530	0.033	106.201	0.000	3.530	2.808
##	.ee3	3.165	0.034	92.281	0.000	3.165	2.440
##	.dp1	2.319	0.029	80.113	0.000	2.319	2.119
##	.dp2	2.086	0.031	66.763	0.000	2.086	1.765
##	.pa1	5.748	0.024	238.172	0.000	5.748	6.336
##	.pa2	5.850	0.025	229.759	0.000	5.850	6.111
##	.pa3	5.815	0.025	228.188	0.000	5.815	6.064
##	F1	0.000				0.000	0.000
##	F2	0.000				0.000	0.000
##	F3	0.000				0.000	0.000
##	F4	0.000				0.000	0.000
##	F5	0.000				0.000	0.000
##	F6	0.000				0.000	0.000

##	F7	0.000			0.000	0.000
##	.F8	0.000			0.000	0.000
##	.F9	0.000			0.000	0.000
##	.F10	0.000			0.000	0.000
##	.F11	0.000			0.000	0.000
##	.F12	0.000			0.000	0.000
##						
##	Variances:					
##		Estimate	Std.Err	z-value	P(> z)	Std.lv Std.all
##	.rolea1	0.426	0.024	17.678	0.000	0.426 0.510
##	.rolea2	0.320	0.027	12.023	0.000	0.320 0.338
##	.dec2	0.592	0.033	18.019	0.000	0.592 0.336
##	.rolec1	0.641	0.029	22.204	0.000	0.641 0.528
##	.rolec2	0.543	0.037	14.702	0.000	0.543 0.356
##	.work1	0.638	0.030	21.110	0.000	0.638 0.442
##	.work2	0.738	0.035	20.939	0.000	0.738 0.622
##	.cclim1	0.181	0.008	22.723	0.000	0.181 0.620
##	.cclim2	0.150	0.010	14.991	0.000	0.150 0.380
##	.cclim3	0.140	0.007	19.300	0.000	0.140 0.577
##	.cclim4	0.339	0.015	22.072	0.000	0.339 0.634
##	.dec1	0.513	0.026	19.476	0.000	0.513 0.503
##	.ssup1	0.399	0.026	15.295	0.000	0.399 0.258
##	.ssup2	0.199	0.022	8.869	0.000	0.199 0.125
##	.psup1	0.340	0.027	12.392	0.000	0.340 0.366
##	.psup2	0.159	0.026	6.078	0.000	0.159 0.185
##	.self1	0.082	0.005	16.582	0.000	0.082 0.414
##	.self2	0.065	0.005	12.988	0.000	0.065 0.256
##	.self3	0.083	0.006	12.991	0.000	0.083 0.282
##	.elc1	0.204	0.010	20.539	0.000	0.204 0.525
##	.elc2	0.260	0.011	23.334	0.000	0.260 0.661
##	.elc3	0.135	0.007	18.146	0.000	0.135 0.450
##	.elc4	0.214	0.010	21.685	0.000	0.214 0.586
##	.elc5	0.187	0.010	18.564	0.000	0.187 0.450
##	.ee1	0.407	0.024	17.117	0.000	0.407 0.238
##	.ee2	0.221	0.019	11.571	0.000	0.221 0.140
##	.ee3	0.456	0.026	17.828	0.000	0.456 0.271
##	.dp1	0.256	0.043	5.910	0.000	0.256 0.214
##	.dp2	0.644	0.047	13.700	0.000	0.644 0.461
##	.pa1	0.264	0.021	12.469	0.000	0.264 0.321
##	.pa2	0.326	0.025	12.993	0.000	0.326 0.356
##	.pa3	0.407	0.024	17.314	0.000	0.407 0.443
##	F1	0.409	0.033	12.353	0.000	1.000 1.000
##	F2	0.572	0.041	13.868	0.000	1.000 1.000
##	F3	0.805	0.047	17.087	0.000	1.000 1.000
##	F4	0.111	0.010	10.814	0.000	1.000 1.000
##	F5	0.506	0.037	13.625	0.000	1.000 1.000
##	F6	1.149	0.061	18.982	0.000	1.000 1.000
##	F7	0.590	0.043	13.856	0.000	1.000 1.000
##	.F8	0.077	0.008	9.773	0.000	0.669 0.669
##	.F9	0.143	0.011	12.436	0.000	0.772 0.772
##	.F10	-0.124	0.428	-0.290	0.772	-0.095 -0.095

```

##      .F11      0.545      0.047      11.650      0.000      0.578      0.578
##      .F12      0.360      0.024      14.825      0.000      0.644      0.644
##
## R-Square:
##      Estimate
##      rolea1      0.490
##      rolea2      0.662
##      dec2        0.664
##      rolec1      0.472
##      rolec2      0.644
##      work1       0.558
##      work2       0.378
##      cclim1      0.380
##      cclim2      0.620
##      cclim3      0.423
##      cclim4      0.366
##      dec1        0.497
##      ssup1       0.742
##      ssup2       0.875
##      psup1       0.634
##      psup2       0.815
##      self1       0.586
##      self2       0.744
##      self3       0.718
##      elc1        0.475
##      elc2        0.339
##      elc3        0.550
##      elc4        0.414
##      elc5        0.550
##      ee1         0.762
##      ee2         0.860
##      ee3         0.729
##      dp1         0.786
##      dp2         0.539
##      pa1         0.679
##      pa2         0.644
##      pa3         0.557
##      F8          0.331
##      F9          0.228
##      F10         NA
##      F11         0.422
##      F12         0.356

```

Request MIs

We'll look again at the MIs for the regression paths. The largest and perhaps most meaningful MI (in this model, with this theory) is that of F9 ~ F2 (i.e., F2 → F9), which suggests that role conflict would be associated with external locus of control. We'll free this path in the next model.


```
modindices(fullsem3_fit,  
            sort = TRUE, # The sort argument allows us to sort the indices from largest  
to smallest  
            op = "~") # The op argument lets us ask for specific MIs
```

##	lhs	op	rhs	mi	epc	sepc.lv	sepc.all	sepc.nox
## 1102	F6	~	F9	48.570	0.523	0.210	0.210	0.210
## 1069	F10	~	F8	43.412	-1.021	-0.304	-0.304	-0.304
## 1065	F9	~	F2	41.343	0.191	0.336	0.336	0.336
## 1059	F9	~	F8	39.841	-0.284	-0.225	-0.225	-0.225
## 1054	F8	~	F12	39.568	0.295	0.647	0.647	0.647
## 1134	F3	~	F8	38.645	-0.172	-0.065	-0.065	-0.065
## 1066	F9	~	F3	36.061	0.154	0.321	0.321	0.321
## 1123	F2	~	F8	35.047	0.134	0.060	0.060	0.060
## 1052	F8	~	F10	34.969	-0.116	-0.389	-0.389	-0.389
## 1063	F9	~	F6	33.752	0.130	0.323	0.323	0.323
## 1053	F8	~	F11	29.856	-0.069	-0.197	-0.197	-0.197
## 1058	F8	~	F1	29.652	0.248	0.467	0.467	0.467
## 1101	F6	~	F8	26.955	2.126	0.675	0.675	0.675
## 1068	F9	~	F1	23.199	0.204	0.303	0.303	0.303
## 1051	F8	~	F9	22.580	-0.128	-0.162	-0.162	-0.162
## 1112	F7	~	F8	22.578	2.436	1.079	1.079	1.079
## 1077	F11	~	F8	21.567	-0.398	-0.140	-0.140	-0.140
## 1147	F4	~	F10	20.639	-7.270	-24.963	-24.963	-24.963
## 1088	F12	~	F3	20.059	0.283	0.340	0.340	0.340
## 1136	F3	~	F10	18.406	6.678	8.509	8.509	8.509
## 1073	F10	~	F5	17.922	-1.647	-1.025	-1.025	-1.025
## 1087	F12	~	F2	17.812	0.272	0.275	0.275	0.275
## 1092	F5	~	F10	15.311	4.444	7.140	7.140	7.140
## 1127	F2	~	F12	14.411	0.054	0.053	0.053	0.053
## 1076	F10	~	F1	13.773	1.816	1.016	1.016	1.016
## 1149	F4	~	F12	13.698	0.082	0.184	0.184	0.184
## 1072	F10	~	F12	11.433	-0.345	-0.226	-0.226	-0.226
## 1074	F10	~	F6	10.863	-0.546	-0.512	-0.512	-0.512
## 1062	F9	~	F12	10.294	-0.178	-0.309	-0.309	-0.309
## 1089	F12	~	F4	10.242	0.274	0.122	0.122	0.122
## 1160	F1	~	F12	9.072	-0.136	-0.159	-0.159	-0.159
## 1124	F2	~	F9	8.613	0.034	0.019	0.019	0.019
## 1138	F3	~	F12	8.440	-0.063	-0.052	-0.052	-0.052
## 1055	F8	~	F2	8.329	0.094	0.210	0.210	0.210
## 1067	F9	~	F4	7.596	-0.127	-0.098	-0.098	-0.098
## 1061	F9	~	F11	6.441	0.039	0.088	0.088	0.088
## 1091	F5	~	F9	6.306	-0.114	-0.069	-0.069	-0.069
## 1146	F4	~	F9	5.551	-0.069	-0.089	-0.089	-0.089
## 1090	F5	~	F8	5.355	-0.287	-0.137	-0.137	-0.137
## 1080	F11	~	F5	4.895	-0.144	-0.105	-0.105	-0.105
## 1156	F1	~	F8	4.733	0.190	0.101	0.101	0.101
## 1148	F4	~	F11	4.429	0.115	0.334	0.334	0.334
## 1075	F10	~	F7	4.109	-0.429	-0.288	-0.288	-0.288
## 1070	F10	~	F9	3.958	-0.155	-0.058	-0.058	-0.058
## 1135	F3	~	F9	3.917	-0.027	-0.013	-0.013	-0.013
## 1079	F11	~	F12	3.458	-0.153	-0.117	-0.117	-0.117
## 1060	F9	~	F10	3.063	0.026	0.069	0.069	0.069
## 1113	F7	~	F9	2.922	0.103	0.058	0.058	0.058
## 1084	F11	~	F1	2.467	0.125	0.082	0.082	0.082
## 1094	F5	~	F12	2.440	0.064	0.067	0.067	0.067

```

## 1081 F11 ~ F6 2.438 -0.045 -0.050 -0.050 -0.050
## 1082 F11 ~ F7 2.415 -0.057 -0.045 -0.045 -0.045
## 1158 F1 ~ F10 2.348 -1.098 -1.963 -1.963 -1.963
## 1103 F6 ~ F10 2.346 1.481 1.579 1.579 1.579
## 1064 F9 ~ F7 2.134 0.037 0.066 0.066 0.066
## 1125 F2 ~ F10 1.913 1.481 2.238 2.238 2.238
## 1093 F5 ~ F11 1.590 -0.026 -0.036 -0.036 -0.036
## 1078 F11 ~ F9 1.538 0.082 0.036 0.036 0.036
## 1056 F8 ~ F3 1.100 0.034 0.089 0.089 0.089
## 1137 F3 ~ F11 1.029 -0.020 -0.022 -0.022 -0.022
## 1086 F12 ~ F7 0.955 -0.046 -0.047 -0.047 -0.047
## 1116 F7 ~ F12 0.930 -0.040 -0.039 -0.039 -0.039
## 1105 F6 ~ F12 0.739 -0.056 -0.039 -0.039 -0.039
## 1145 F4 ~ F8 0.703 0.043 0.044 0.044 0.044
## 1071 F10 ~ F11 0.695 0.085 0.072 0.072 0.072
## 1083 F11 ~ F3 0.694 2.274 2.102 2.102 2.102
## 1115 F7 ~ F11 0.223 -0.014 -0.018 -0.018 -0.018
## 1057 F8 ~ F4 0.216 0.020 0.020 0.020 0.020
## 1085 F12 ~ F6 0.151 -0.021 -0.030 -0.030 -0.030
## 1157 F1 ~ F9 0.142 0.017 0.012 0.012 0.012
## 1104 F6 ~ F11 0.106 -0.011 -0.010 -0.010 -0.010
## 1159 F1 ~ F11 0.013 0.003 0.004 0.004 0.004
## 1126 F2 ~ F11 0.010 0.002 0.002 0.002 0.002
## 1114 F7 ~ F10 0.002 -0.030 -0.045 -0.045 -0.045

```

Structural Model 4

```

fullsem4 <- '
# Measurement Model
F1 =~ rolea1 + rolea2 + dec2 #role ambiguity with DEC2 cross-loading
F2 =~ rolec1 + rolec2 #role conflict
F3 =~ work1 + work2 #work overload
F4 =~ cclim1 + cclim2 + cclim3 + cclim4 #classroom climate
F5 =~ dec1 + dec2 #decision-making
F6 =~ ssup1 + ssup2 + dec2 #superior support with DEC2 cross-loading
F7 =~ psup1 + psup2 #peer support
F8 =~ self1 + self2 + self3 #self-esteem
F9 =~ elc1 + elc2 + elc3 + elc4 + elc5 #external loc of control
F10 =~ ee1 + ee2 + ee3 #emotional exhaustion
F11 =~ dp1 + dp2 #depersonalization
F12 =~ pa1 + pa2 + pa3 #personal accomplishment

# Structural Model
F8 ~ F5 + F6 + F7
F9 ~ F5 + F2 # Adding the path from F2 to F9
F10 ~ F2 + F3 + F4
F11 ~ F2 + F10 + F4 #Adding here the path from F4 to F11
F12 ~ F1 + F8 + F9 + F10 + F11 + F5 #Adding here the path from F5 to F12
'

```

Fit the Model

We still get the warning about the negative variance.

```
# Estimate the Model
fullsem4_fit <-
  sem(model = fullsem4,
      data = teachers,
      estimator = "MLM",
      meanstructure = TRUE
  )
```

```
## Warning in lav_object_post_check(object): lavaan WARNING: some estimated lv
## variances are negative
```

Request the Output

Notice that the number of dfs is decreasing. Each model we're estimating is less restricted compared to the previous, as it has more freely estimated parameters (all those parameters we freely estimated based on the MIs). This means we have more unknowns in our model even though our knowns didn't change, leaving us with fewer dfs. Also notice that model fit is improving little by little, as would be expected from freeing the paths we freed (given what the MIs told us).

```
summary(fullsem4_fit,
      fit.measures = TRUE,
      standardized = TRUE,
      rsquare = TRUE)
```

```

## lavaan 0.6-9 ended normally after 178 iterations
##
## Estimator ML
## Optimization method NLMINB
## Number of model parameters 136
##
## Number of observations 1430
##
## Model Test User Model:
## Standard Robust
## Test Statistic 1526.767 1356.810
## Degrees of freedom 424 424
## P-value (Chi-square) 0.000 0.000
## Scaling correction factor 1.125
## Satorra-Bentler correction
##
## Model Test Baseline Model:
##
## Test statistic 23532.624 19072.057
## Degrees of freedom 496 496
## P-value 0.000 0.000
## Scaling correction factor 1.234
##
## User Model versus Baseline Model:
##
## Comparative Fit Index (CFI) 0.952 0.950
## Tucker-Lewis Index (TLI) 0.944 0.941
##
## Robust Comparative Fit Index (CFI) 0.954
## Robust Tucker-Lewis Index (TLI) 0.946
##
## Loglikelihood and Information Criteria:
##
## Loglikelihood user model (H0) -47134.966 -47134.966
## Loglikelihood unrestricted model (H1) -46371.583 -46371.583
##
## Akaike (AIC) 94541.933 94541.933
## Bayesian (BIC) 95258.031 95258.031
## Sample-size adjusted Bayesian (BIC) 94826.006 94826.006
##
## Root Mean Square Error of Approximation:
##
## RMSEA 0.043 0.039
## 90 Percent confidence interval - lower 0.040 0.037
## 90 Percent confidence interval - upper 0.045 0.041
## P-value RMSEA <= 0.05 1.000 1.000
##
## Robust RMSEA 0.042
## 90 Percent confidence interval - lower 0.039
## 90 Percent confidence interval - upper 0.044
##

```

Standardized Root Mean Square Residual:

##

SRMR 0.041 0.041

##

Parameter Estimates:

##

Standard errors Robust.sem

Information Expected

Information saturated (h1) model Structured

##

Latent Variables:

Estimate Std.Err z-value P(>|z|) Std.lv Std.all

F1 =~

rolea1 1.000 0.640 0.701

rolea2 1.239 0.058 21.425 0.000 0.793 0.815

dec2 0.220 0.083 2.659 0.008 0.141 0.106

F2 =~

rolec1 1.000 0.759 0.689

rolec2 1.300 0.052 25.013 0.000 0.986 0.799

F3 =~

work1 1.000 0.893 0.743

work2 0.750 0.032 23.358 0.000 0.670 0.615

F4 =~

cclim1 1.000 0.333 0.616

cclim2 1.486 0.076 19.585 0.000 0.495 0.788

cclim3 0.963 0.055 17.369 0.000 0.321 0.650

cclim4 1.328 0.079 16.763 0.000 0.442 0.605

F5 =~

dec1 1.000 0.708 0.701

dec2 0.419 0.106 3.937 0.000 0.296 0.223

F6 =~

ssup1 1.000 1.074 0.863

ssup2 1.095 0.026 42.646 0.000 1.175 0.933

dec2 0.843 0.053 16.004 0.000 0.905 0.682

F7 =~

psup1 1.000 0.772 0.801

psup2 1.076 0.045 23.772 0.000 0.831 0.898

F8 =~

self1 1.000 0.341 0.766

self2 1.275 0.045 28.195 0.000 0.434 0.862

self3 1.356 0.057 23.737 0.000 0.462 0.848

F9 =~

elc1 1.000 0.427 0.685

elc2 0.849 0.042 20.327 0.000 0.363 0.579

elc3 0.953 0.041 23.242 0.000 0.407 0.743

elc4 0.914 0.047 19.266 0.000 0.391 0.646

elc5 1.123 0.050 22.431 0.000 0.480 0.745

F10 =~

ee1 1.000 1.143 0.873

ee2 1.020 0.019 53.572 0.000 1.166 0.927

ee3 0.970 0.023 42.991 0.000 1.108 0.854

```

##      F11 =~
##      dp1          1.000          0.970      0.887
##      dp2          0.894      0.042      21.346      0.000      0.868      0.734
##      F12 =~
##      pa1          1.000          0.747      0.824
##      pa2          1.028      0.037      27.478      0.000      0.768      0.803
##      pa3          0.958      0.040      23.943      0.000      0.716      0.746
##
## Regressions:
##      Estimate      Std.Err      z-value      P(>|z|)      Std.lv      Std.all
##      F8 ~
##      F5          0.566      0.072       7.887      0.000       1.177       1.177
##      F6         -0.205      0.035      -5.855      0.000      -0.648      -0.648
##      F7         -0.100      0.037      -2.682      0.007      -0.228      -0.228
##      F9 ~
##      F5         -0.125      0.029      -4.391      0.000      -0.208      -0.208
##      F2          0.189      0.028       6.836      0.000       0.336       0.336
##      F10 ~
##      F2         -8.852      6.563      -1.349      0.177      -5.875      -5.875
##      F3          8.261      5.565       1.484      0.138       6.453       6.453
##      F4         -0.777      0.714      -1.088      0.276      -0.226      -0.226
##      F11 ~
##      F2          0.176      0.052       3.408      0.001       0.138       0.138
##      F10         0.300      0.034       8.737      0.000       0.354       0.354
##      F4         -0.958      0.107      -8.961      0.000      -0.329      -0.329
##      F12 ~
##      F1          0.271      0.080       3.401      0.001       0.232       0.232
##      F8          0.494      0.092       5.370      0.000       0.225       0.225
##      F9         -0.166      0.055      -3.025      0.002      -0.095      -0.095
##      F10         0.013      0.029       0.441      0.659       0.020       0.020
##      F11        -0.202      0.032      -6.291      0.000      -0.262      -0.262
##      F5          0.432      0.072       6.036      0.000       0.410       0.410
##
## Covariances:
##      Estimate      Std.Err      z-value      P(>|z|)      Std.lv      Std.all
##      F1 ~~
##      F2          0.366      0.025      14.623      0.000       0.753       0.753
##      F3          0.423      0.027      15.478      0.000       0.740       0.740
##      F4         -0.063      0.008      -7.605      0.000      -0.297      -0.297
##      F5         -0.361      0.025     -14.213      0.000      -0.795      -0.795
##      F6         -0.386      0.030     -12.734      0.000      -0.561      -0.561
##      F7         -0.243      0.022     -10.958      0.000      -0.491      -0.491
##      F2 ~~
##      F3          0.669      0.035      19.187      0.000       0.988       0.988
##      F4         -0.083      0.010      -7.941      0.000      -0.329      -0.329
##      F5         -0.383      0.027     -13.945      0.000      -0.713      -0.713
##      F6         -0.426      0.032     -13.174      0.000      -0.523      -0.523
##      F7         -0.235      0.023     -10.388      0.000      -0.401      -0.401
##      F3 ~~
##      F4         -0.095      0.013      -7.377      0.000      -0.320      -0.320
##      F5         -0.461      0.030     -15.285      0.000      -0.730      -0.730

```

##	F6	-0.496	0.035	-14.205	0.000	-0.518	-0.518
##	F7	-0.278	0.026	-10.827	0.000	-0.403	-0.403
##	F4 ~~						
##	F5	0.101	0.011	9.556	0.000	0.427	0.427
##	F6	0.121	0.014	8.883	0.000	0.339	0.339
##	F7	0.056	0.009	5.964	0.000	0.216	0.216
##	F5 ~~						
##	F6	0.641	0.038	16.759	0.000	0.843	0.843
##	F7	0.393	0.028	14.065	0.000	0.718	0.718
##	F6 ~~						
##	F7	0.395	0.032	12.404	0.000	0.477	0.477
##							
##	Intercepts:						
##		Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
##	.rolea1	2.401	0.024	99.362	0.000	2.401	2.628
##	.rolea2	2.086	0.026	81.108	0.000	2.086	2.145
##	.dec2	4.242	0.035	120.842	0.000	4.242	3.196
##	.rolec1	3.015	0.029	103.524	0.000	3.015	2.738
##	.rolec2	3.018	0.033	92.468	0.000	3.018	2.445
##	.work1	3.240	0.032	101.996	0.000	3.240	2.697
##	.work2	2.243	0.029	77.885	0.000	2.243	2.060
##	.cclim1	2.964	0.014	207.379	0.000	2.964	5.484
##	.cclim2	2.723	0.017	163.890	0.000	2.723	4.334
##	.cclim3	2.928	0.013	224.532	0.000	2.928	5.938
##	.cclim4	3.053	0.019	157.758	0.000	3.053	4.172
##	.dec1	4.039	0.027	151.305	0.000	4.039	4.001
##	.ssup1	4.299	0.033	130.631	0.000	4.299	3.454
##	.ssup2	4.370	0.033	131.136	0.000	4.370	3.468
##	.psup1	4.571	0.026	179.200	0.000	4.571	4.739
##	.psup2	4.621	0.024	188.754	0.000	4.621	4.991
##	.self1	3.603	0.012	306.319	0.000	3.603	8.100
##	.self2	3.613	0.013	271.109	0.000	3.613	7.169
##	.self3	3.483	0.014	241.972	0.000	3.483	6.399
##	.elc1	2.918	0.016	176.985	0.000	2.918	4.680
##	.elc2	3.008	0.017	181.556	0.000	3.008	4.801
##	.elc3	2.801	0.014	193.300	0.000	2.801	5.112
##	.elc4	2.200	0.016	137.503	0.000	2.200	3.636
##	.elc5	2.483	0.017	145.731	0.000	2.483	3.854
##	.ee1	3.855	0.035	111.347	0.000	3.855	2.944
##	.ee2	3.530	0.033	106.201	0.000	3.530	2.808
##	.ee3	3.165	0.034	92.281	0.000	3.165	2.440
##	.dp1	2.319	0.029	80.113	0.000	2.319	2.119
##	.dp2	2.086	0.031	66.763	0.000	2.086	1.765
##	.pa1	5.748	0.024	238.172	0.000	5.748	6.337
##	.pa2	5.850	0.025	229.759	0.000	5.850	6.111
##	.pa3	5.815	0.025	228.188	0.000	5.815	6.065
##	F1	0.000				0.000	0.000
##	F2	0.000				0.000	0.000
##	F3	0.000				0.000	0.000
##	F4	0.000				0.000	0.000
##	F5	0.000				0.000	0.000

##	F6	0.000			0.000	0.000
##	F7	0.000			0.000	0.000
##	.F8	0.000			0.000	0.000
##	.F9	0.000			0.000	0.000
##	.F10	0.000			0.000	0.000
##	.F11	0.000			0.000	0.000
##	.F12	0.000			0.000	0.000
##						
##	Variances:					
##		Estimate	Std.Err	z-value	P(> z)	Std.lv Std.all
##	.rolea1	0.425	0.024	17.592	0.000	0.425 0.509
##	.rolea2	0.317	0.027	11.807	0.000	0.317 0.335
##	.dec2	0.593	0.033	17.914	0.000	0.593 0.337
##	.rolec1	0.638	0.029	22.099	0.000	0.638 0.526
##	.rolec2	0.552	0.036	15.280	0.000	0.552 0.362
##	.work1	0.646	0.030	21.402	0.000	0.646 0.448
##	.work2	0.738	0.035	20.979	0.000	0.738 0.622
##	.cclim1	0.181	0.008	22.705	0.000	0.181 0.620
##	.cclim2	0.150	0.010	14.952	0.000	0.150 0.379
##	.cclim3	0.140	0.007	19.316	0.000	0.140 0.577
##	.cclim4	0.340	0.015	22.080	0.000	0.340 0.634
##	.dec1	0.518	0.026	19.944	0.000	0.518 0.508
##	.ssup1	0.396	0.026	15.224	0.000	0.396 0.256
##	.ssup2	0.206	0.022	9.188	0.000	0.206 0.130
##	.psup1	0.334	0.027	12.236	0.000	0.334 0.359
##	.psup2	0.166	0.026	6.483	0.000	0.166 0.194
##	.self1	0.082	0.005	16.609	0.000	0.082 0.414
##	.self2	0.065	0.005	13.065	0.000	0.065 0.257
##	.self3	0.083	0.006	12.985	0.000	0.083 0.281
##	.elc1	0.206	0.010	20.745	0.000	0.206 0.531
##	.elc2	0.261	0.011	23.427	0.000	0.261 0.665
##	.elc3	0.134	0.007	18.157	0.000	0.134 0.448
##	.elc4	0.214	0.010	21.744	0.000	0.214 0.583
##	.elc5	0.185	0.010	18.663	0.000	0.185 0.446
##	.ee1	0.408	0.024	17.153	0.000	0.408 0.238
##	.ee2	0.221	0.019	11.598	0.000	0.221 0.140
##	.ee3	0.454	0.026	17.802	0.000	0.454 0.270
##	.dp1	0.256	0.043	5.927	0.000	0.256 0.214
##	.dp2	0.644	0.047	13.698	0.000	0.644 0.461
##	.pa1	0.264	0.021	12.474	0.000	0.264 0.321
##	.pa2	0.326	0.025	12.974	0.000	0.326 0.356
##	.pa3	0.407	0.024	17.292	0.000	0.407 0.443
##	F1	0.410	0.033	12.360	0.000	1.000 1.000
##	F2	0.575	0.041	13.944	0.000	1.000 1.000
##	F3	0.797	0.047	16.983	0.000	1.000 1.000
##	F4	0.111	0.010	10.822	0.000	1.000 1.000
##	F5	0.501	0.037	13.605	0.000	1.000 1.000
##	F6	1.153	0.061	19.028	0.000	1.000 1.000
##	F7	0.597	0.043	13.919	0.000	1.000 1.000
##	.F8	0.078	0.008	9.509	0.000	0.672 0.672
##	.F9	0.136	0.011	12.245	0.000	0.744 0.744

```
##      .F10      -0.441    0.792   -0.557    0.577   -0.338   -0.338
##      .F11      0.544    0.047   11.642    0.000    0.578    0.578
##      .F12      0.363    0.024   15.006    0.000    0.651    0.651
##
## R-Square:
##      Estimate
##      rolea1      0.491
##      rolea2      0.665
##      dec2        0.663
##      rolec1      0.474
##      rolec2      0.638
##      work1       0.552
##      work2       0.378
##      cclim1      0.380
##      cclim2      0.621
##      cclim3      0.423
##      cclim4      0.366
##      dec1        0.492
##      ssup1       0.744
##      ssup2       0.870
##      psup1       0.641
##      psup2       0.806
##      self1       0.586
##      self2       0.743
##      self3       0.719
##      elc1        0.469
##      elc2        0.335
##      elc3        0.552
##      elc4        0.417
##      elc5        0.554
##      ee1         0.762
##      ee2         0.860
##      ee3         0.730
##      dp1         0.786
##      dp2         0.539
##      pa1         0.679
##      pa2         0.644
##      pa3         0.557
##      F8          0.328
##      F9          0.256
##      F10         NA
##      F11         0.422
##      F12         0.349
```

Request MIs

We'll look again at the MIs for the regression paths. The largest and perhaps most meaningful MI (in this model, with this theory) is that of $F9 \sim F8$, which suggests that lower self-esteem is associated with greater external locus of control. We'll free this path in our next model.

```
modindices(fullsem4_fit,  
            sort = TRUE, # The sort argument allows us to sort the indices from largest  
to smallest  
            op = "~") # The op argument lets us ask for specific MIs
```

##	lhs	op	rhs	mi	epc	sepc.lv	sepc.all	sepc.nox
## 1060	F9	~	F8	38.685	-0.261	-0.208	-0.208	-0.208
## 1112	F7	~	F8	38.309	3.764	1.659	1.659	1.659
## 1055	F8	~	F12	37.409	0.302	0.662	0.662	0.662
## 1102	F6	~	F9	33.241	0.418	0.166	0.166	0.166
## 1063	F9	~	F12	30.392	-0.265	-0.464	-0.464	-0.464
## 1069	F10	~	F8	29.731	-1.048	-0.312	-0.312	-0.312
## 1052	F8	~	F9	27.775	-0.139	-0.175	-0.175	-0.175
## 1101	F6	~	F8	27.523	2.393	0.759	0.759	0.759
## 1054	F8	~	F11	26.182	-0.066	-0.189	-0.189	-0.189
## 1134	F3	~	F8	25.708	-0.127	-0.049	-0.049	-0.049
## 1053	F8	~	F10	23.651	-0.122	-0.408	-0.408	-0.408
## 1059	F8	~	F1	23.558	0.241	0.453	0.453	0.453
## 1123	F2	~	F8	21.412	0.095	0.043	0.043	0.043
## 1077	F11	~	F8	21.128	-0.396	-0.139	-0.139	-0.139
## 1088	F12	~	F3	20.382	0.291	0.348	0.348	0.348
## 1136	F3	~	F10	19.831	2.623	3.358	3.358	3.358
## 1091	F5	~	F9	19.076	-0.169	-0.102	-0.102	-0.102
## 1147	F4	~	F10	17.914	-2.699	-9.260	-9.260	-9.260
## 1087	F12	~	F2	16.845	0.267	0.271	0.271	0.271
## 1149	F4	~	F12	16.562	0.088	0.197	0.197	0.197
## 1076	F10	~	F1	15.485	2.586	1.448	1.448	1.448
## 1092	F5	~	F10	15.424	1.665	2.688	2.688	2.688
## 1073	F10	~	F5	15.282	-1.882	-1.166	-1.166	-1.166
## 1064	F9	~	F6	14.507	0.090	0.226	0.226	0.226
## 1090	F5	~	F8	14.370	-0.697	-0.335	-0.335	-0.335
## 1089	F12	~	F4	11.469	0.283	0.126	0.126	0.126
## 1067	F9	~	F4	9.530	-0.135	-0.106	-0.106	-0.106
## 1074	F10	~	F6	8.778	-0.665	-0.624	-0.624	-0.624
## 1156	F1	~	F8	8.442	0.297	0.158	0.158	0.158
## 1127	F2	~	F12	7.918	0.030	0.029	0.029	0.029
## 1146	F4	~	F9	7.303	-0.080	-0.102	-0.102	-0.102
## 1160	F1	~	F12	7.011	-0.118	-0.138	-0.138	-0.138
## 1094	F5	~	F12	5.403	0.088	0.093	0.093	0.093
## 1072	F10	~	F12	5.143	-0.225	-0.147	-0.147	-0.147
## 1068	F9	~	F1	5.036	0.100	0.150	0.150	0.150
## 1148	F4	~	F11	4.766	0.119	0.347	0.347	0.347
## 1080	F11	~	F5	4.621	-0.128	-0.093	-0.093	-0.093
## 1075	F10	~	F7	4.206	-0.592	-0.400	-0.400	-0.400
## 1158	F1	~	F10	4.159	-0.548	-0.979	-0.979	-0.979
## 1138	F3	~	F12	3.267	-0.027	-0.022	-0.022	-0.022
## 1062	F9	~	F11	3.108	0.027	0.061	0.061	0.061
## 1079	F11	~	F12	2.925	-0.142	-0.109	-0.109	-0.109
## 1093	F5	~	F11	2.672	-0.031	-0.043	-0.043	-0.043
## 1056	F8	~	F2	2.452	0.056	0.126	0.126	0.126
## 1081	F11	~	F6	2.364	-0.044	-0.049	-0.049	-0.049
## 1082	F11	~	F7	2.299	-0.056	-0.045	-0.045	-0.045
## 1084	F11	~	F1	2.295	0.120	0.079	0.079	0.079
## 1135	F3	~	F9	2.166	-0.015	-0.007	-0.007	-0.007
## 1124	F2	~	F9	1.512	0.011	0.006	0.006	0.006
## 1105	F6	~	F12	1.479	-0.078	-0.054	-0.054	-0.054

##	1125	F2	~	F10	1.455	0.488	0.735	0.735	0.735
##	1070	F10	~	F9	1.381	-0.092	-0.035	-0.035	-0.035
##	1145	F4	~	F8	1.349	0.070	0.071	0.071	0.071
##	1065	F9	~	F7	1.165	-0.027	-0.050	-0.050	-0.050
##	1078	F11	~	F9	1.058	0.074	0.033	0.033	0.033
##	1116	F7	~	F12	0.933	-0.038	-0.037	-0.037	-0.037
##	1137	F3	~	F11	0.906	-0.013	-0.015	-0.015	-0.015
##	1086	F12	~	F7	0.841	-0.043	-0.044	-0.044	-0.044
##	1103	F6	~	F10	0.826	0.328	0.349	0.349	0.349
##	1113	F7	~	F9	0.509	0.043	0.024	0.024	0.024
##	1066	F9	~	F3	0.458	-0.052	-0.108	-0.108	-0.108
##	1157	F1	~	F9	0.432	0.030	0.020	0.020	0.020
##	1058	F8	~	F4	0.276	0.027	0.026	0.026	0.026
##	1061	F9	~	F10	0.224	0.007	0.018	0.018	0.018
##	1071	F10	~	F11	0.141	0.037	0.032	0.032	0.032
##	1083	F11	~	F3	0.141	0.379	0.348	0.348	0.348
##	1126	F2	~	F11	0.122	0.004	0.005	0.005	0.005
##	1085	F12	~	F6	0.048	-0.012	-0.017	-0.017	-0.017
##	1057	F8	~	F3	0.038	0.007	0.019	0.019	0.019
##	1115	F7	~	F11	0.032	-0.005	-0.007	-0.007	-0.007
##	1114	F7	~	F10	0.006	-0.021	-0.032	-0.032	-0.032
##	1104	F6	~	F11	0.005	0.002	0.002	0.002	0.002
##	1159	F1	~	F11	0.004	-0.001	-0.002	-0.002	-0.002

Structural Model 5

```
fullsem5 <- '
# Measurement Model
F1 =~ rolea1 + rolea2 + dec2 #role ambiguity with DEC2 cross-loading
F2 =~ rolec1 + rolec2 #role conflict
F3 =~ work1 + work2 #work overload
F4 =~ cclim1 + cclim2 + cclim3 + cclim4 #classroom climate
F5 =~ dec1 + dec2 #decision-making
F6 =~ ssup1 + ssup2 + dec2 #superior support with DEC2 cross-loading
F7 =~ psup1 + psup2 #peer support
F8 =~ self1 + self2 + self3 #self-esteem
F9 =~ elc1 + elc2 + elc3 + elc4 + elc5 #external loc of control
F10 =~ ee1 + ee2 + ee3 #emotional exhaustion
F11 =~ dp1 + dp2 #depersonalization
F12 =~ pa1 + pa2 + pa3 #personal accomplishment

# Structural Model
F8 ~ F5 + F6 + F7
F9 ~ F5 + F2 + F8 # Adding the path from F2 to F9, and F8 to F9
F10 ~ F2 + F3 + F4
F11 ~ F2 + F10 + F4 #Adding here the path from F4 to F11
F12 ~ F1 + F8 + F9 + F10 + F11 + F5 #Adding here the path from F5 to F12
'
```

Fit the Model

We still get the warning about the negative variance.

```
# Estimate the Model
fullsem5_fit <-
  sem(model = fullsem5,
      data = teachers,
      estimator = "MLM",
      meanstructure = TRUE
  )
```

```
## Warning in lav_object_post_check(object): lavaan WARNING: some estimated lv
## variances are negative
```

Request the Output

Model fit continues improving. Some regression paths are also becoming significant while others are not.

```
summary(fullsem5_fit,
      fit.measures = TRUE,
      standardized = TRUE,
      rsquare = TRUE)
```

```

## lavaan 0.6-9 ended normally after 178 iterations
##
## Estimator ML
## Optimization method NLMINB
## Number of model parameters 137
##
## Number of observations 1430
##
## Model Test User Model:
## Standard Robust
## Test Statistic 1487.610 1323.061
## Degrees of freedom 423 423
## P-value (Chi-square) 0.000 0.000
## Scaling correction factor 1.124
## Satorra-Bentler correction
##
## Model Test Baseline Model:
##
## Test statistic 23532.624 19072.057
## Degrees of freedom 496 496
## P-value 0.000 0.000
## Scaling correction factor 1.234
##
## User Model versus Baseline Model:
##
## Comparative Fit Index (CFI) 0.954 0.952
## Tucker-Lewis Index (TLI) 0.946 0.943
##
## Robust Comparative Fit Index (CFI) 0.956
## Robust Tucker-Lewis Index (TLI) 0.948
##
## Loglikelihood and Information Criteria:
##
## Loglikelihood user model (H0) -47115.388 -47115.388
## Loglikelihood unrestricted model (H1) -46371.583 -46371.583
##
## Akaike (AIC) 94504.776 94504.776
## Bayesian (BIC) 95226.140 95226.140
## Sample-size adjusted Bayesian (BIC) 94790.938 94790.938
##
## Root Mean Square Error of Approximation:
##
## RMSEA 0.042 0.039
## 90 Percent confidence interval - lower 0.040 0.036
## 90 Percent confidence interval - upper 0.044 0.041
## P-value RMSEA <= 0.05 1.000 1.000
##
## Robust RMSEA 0.041
## 90 Percent confidence interval - lower 0.038
## 90 Percent confidence interval - upper 0.043
##

```

Standardized Root Mean Square Residual:

##

SRMR 0.039 0.039

##

Parameter Estimates:

##

Standard errors Robust.sem

Information Expected

Information saturated (h1) model Structured

##

Latent Variables:

Estimate Std.Err z-value P(>|z|) Std.lv Std.all

F1 =~

rolea1 1.000 0.640 0.701

rolea2 1.240 0.058 21.408 0.000 0.794 0.816

dec2 0.170 0.080 2.121 0.034 0.109 0.082

F2 =~

rolec1 1.000 0.759 0.689

rolec2 1.300 0.052 24.971 0.000 0.987 0.800

F3 =~

work1 1.000 0.896 0.746

work2 0.749 0.032 23.321 0.000 0.670 0.616

F4 =~

cclim1 1.000 0.333 0.617

cclim2 1.486 0.076 19.589 0.000 0.495 0.788

cclim3 0.962 0.055 17.370 0.000 0.321 0.650

cclim4 1.328 0.079 16.763 0.000 0.442 0.605

F5 =~

dec1 1.000 0.702 0.696

dec2 0.343 0.106 3.251 0.001 0.241 0.182

F6 =~

ssup1 1.000 1.074 0.863

ssup2 1.093 0.026 42.733 0.000 1.174 0.932

dec2 0.866 0.054 16.058 0.000 0.930 0.701

F7 =~

psup1 1.000 0.774 0.803

psup2 1.070 0.045 23.880 0.000 0.829 0.895

F8 =~

self1 1.000 0.340 0.765

self2 1.278 0.045 28.101 0.000 0.434 0.862

self3 1.358 0.057 23.650 0.000 0.462 0.848

F9 =~

elc1 1.000 0.426 0.683

elc2 0.848 0.042 20.359 0.000 0.361 0.576

elc3 0.956 0.041 23.313 0.000 0.407 0.743

elc4 0.919 0.048 19.267 0.000 0.391 0.647

elc5 1.132 0.050 22.565 0.000 0.482 0.748

F10 =~

ee1 1.000 1.143 0.873

ee2 1.020 0.019 53.564 0.000 1.165 0.927

ee3 0.970 0.023 42.987 0.000 1.108 0.854


```

##      F11 =~
##      dp1          1.000          0.970      0.886
##      dp2          0.894      0.042      21.362      0.000      0.868      0.734
##      F12 =~
##      pa1          1.000          0.748      0.824
##      pa2          1.029      0.037      27.613      0.000      0.770      0.804
##      pa3          0.958      0.040      24.050      0.000      0.717      0.747
##
## Regressions:
##      Estimate      Std.Err      z-value      P(>|z|)      Std.lv      Std.all
##      F8 ~
##      F5              0.591      0.078       7.547      0.000       1.221      1.221
##      F6             -0.220      0.039      -5.707      0.000      -0.696     -0.696
##      F7             -0.109      0.040      -2.727      0.006      -0.249     -0.249
##      F9 ~
##      F5             -0.076      0.028      -2.678      0.007      -0.125     -0.125
##      F2              0.174      0.027       6.456      0.000       0.310      0.310
##      F8             -0.257      0.049      -5.216      0.000      -0.205     -0.205
##      F10 ~
##      F2             -6.507      3.608      -1.803      0.071      -4.323     -4.323
##      F3              6.262      3.056       2.049      0.040       4.906      4.906
##      F4             -0.718      0.530      -1.355      0.175      -0.209     -0.209
##      F11 ~
##      F2              0.173      0.051       3.356      0.001       0.135      0.135
##      F10             0.302      0.034       8.818      0.000       0.356      0.356
##      F4             -0.959      0.107      -8.970      0.000      -0.329     -0.329
##      F12 ~
##      F1              0.259      0.079       3.296      0.001       0.222      0.222
##      F8              0.521      0.095       5.470      0.000       0.237      0.237
##      F9             -0.162      0.058      -2.807      0.005      -0.092     -0.092
##      F10             0.013      0.029       0.427      0.669       0.019      0.019
##      F11            -0.202      0.032      -6.304      0.000      -0.262     -0.262
##      F5              0.417      0.069       6.022      0.000       0.392      0.392
##
## Covariances:
##      Estimate      Std.Err      z-value      P(>|z|)      Std.lv      Std.all
##      F1 ~~
##      F2              0.366      0.025      14.600      0.000       0.752      0.752
##      F3              0.421      0.027      15.405      0.000       0.735      0.735
##      F4             -0.063      0.008      -7.608      0.000      -0.297     -0.297
##      F5             -0.359      0.025     -14.166      0.000      -0.797     -0.797
##      F6             -0.386      0.030     -12.736      0.000      -0.561     -0.561
##      F7             -0.243      0.022     -10.956      0.000      -0.490     -0.490
##      F2 ~~
##      F3              0.669      0.035      19.178      0.000       0.984      0.984
##      F4             -0.083      0.010      -7.903      0.000      -0.327     -0.327
##      F5             -0.378      0.027     -13.865      0.000      -0.710     -0.710
##      F6             -0.430      0.032     -13.231      0.000      -0.527     -0.527
##      F7             -0.236      0.023     -10.403      0.000      -0.402     -0.402
##      F3 ~~
##      F4             -0.095      0.013      -7.374      0.000      -0.319     -0.319

```

```

##      F5      -0.461    0.030   -15.288    0.000   -0.733   -0.733
##      F6      -0.500    0.035   -14.279    0.000   -0.520   -0.520
##      F7      -0.280    0.026   -10.902    0.000   -0.404   -0.404
## F4 ~~
##      F5      0.101    0.011    9.557    0.000    0.430    0.430
##      F6      0.121    0.014    8.907    0.000    0.339    0.339
##      F7      0.056    0.009    5.967    0.000    0.216    0.216
## F5 ~~
##      F6      0.650    0.038   16.904    0.000    0.862    0.862
##      F7      0.397    0.028   14.139    0.000    0.730    0.730
## F6 ~~
##      F7      0.398    0.032   12.466    0.000    0.478    0.478
##
## Intercepts:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      .rolea1    2.401   0.024   99.362   0.000    2.401    2.628
##      .rolea2    2.086   0.026   81.108   0.000    2.086    2.145
##      .dec2      4.242   0.035  120.842   0.000    4.242    3.196
##      .rolec1    3.015   0.029  103.524   0.000    3.015    2.738
##      .rolec2    3.018   0.033   92.468   0.000    3.018    2.445
##      .work1     3.240   0.032  101.996   0.000    3.240    2.697
##      .work2     2.243   0.029   77.885   0.000    2.243    2.060
##      .cclim1    2.964   0.014  207.379   0.000    2.964    5.484
##      .cclim2    2.723   0.017  163.890   0.000    2.723    4.334
##      .cclim3    2.928   0.013  224.532   0.000    2.928    5.938
##      .cclim4    3.053   0.019  157.758   0.000    3.053    4.172
##      .dec1      4.039   0.027  151.305   0.000    4.039    4.001
##      .ssup1     4.299   0.033  130.631   0.000    4.299    3.454
##      .ssup2     4.370   0.033  131.136   0.000    4.370    3.468
##      .psup1     4.571   0.026  179.200   0.000    4.571    4.739
##      .psup2     4.621   0.024  188.754   0.000    4.621    4.991
##      .self1     3.603   0.012  306.319   0.000    3.603    8.100
##      .self2     3.613   0.013  271.109   0.000    3.613    7.169
##      .self3     3.483   0.014  241.972   0.000    3.483    6.399
##      .elc1      2.918   0.016  176.985   0.000    2.918    4.678
##      .elc2      3.008   0.017  181.556   0.000    3.008    4.800
##      .elc3      2.801   0.014  193.300   0.000    2.801    5.109
##      .elc4      2.200   0.016  137.503   0.000    2.200    3.635
##      .elc5      2.483   0.017  145.731   0.000    2.483    3.852
##      .ee1       3.855   0.035  111.347   0.000    3.855    2.944
##      .ee2       3.530   0.033  106.201   0.000    3.530    2.808
##      .ee3       3.165   0.034   92.281   0.000    3.165    2.440
##      .dp1       2.319   0.029   80.113   0.000    2.319    2.119
##      .dp2       2.086   0.031   66.763   0.000    2.086    1.765
##      .pa1       5.748   0.024  238.172   0.000    5.748    6.330
##      .pa2       5.850   0.025  229.759   0.000    5.850    6.105
##      .pa3       5.815   0.025  228.188   0.000    5.815    6.059
##      F1         0.000         0.000    0.000
##      F2         0.000         0.000    0.000
##      F3         0.000         0.000    0.000
##      F4         0.000         0.000    0.000

```

##	F5	0.000			0.000	0.000
##	F6	0.000			0.000	0.000
##	F7	0.000			0.000	0.000
##	.F8	0.000			0.000	0.000
##	.F9	0.000			0.000	0.000
##	.F10	0.000			0.000	0.000
##	.F11	0.000			0.000	0.000
##	.F12	0.000			0.000	0.000
##						
##	Variances:					
##		Estimate	Std.Err	z-value	P(> z)	Std.lv Std.all
##	.rolea1	0.425	0.024	17.573	0.000	0.425 0.509
##	.rolea2	0.316	0.027	11.764	0.000	0.316 0.334
##	.dec2	0.596	0.033	17.828	0.000	0.596 0.338
##	.rolec1	0.636	0.029	22.037	0.000	0.636 0.525
##	.rolec2	0.548	0.036	15.042	0.000	0.548 0.360
##	.work1	0.641	0.030	21.309	0.000	0.641 0.444
##	.work2	0.737	0.035	20.951	0.000	0.737 0.621
##	.cclim1	0.181	0.008	22.703	0.000	0.181 0.620
##	.cclim2	0.150	0.010	14.957	0.000	0.150 0.379
##	.cclim3	0.140	0.007	19.319	0.000	0.140 0.577
##	.cclim4	0.340	0.015	22.081	0.000	0.340 0.634
##	.dec1	0.525	0.026	20.376	0.000	0.525 0.516
##	.ssup1	0.395	0.026	15.201	0.000	0.395 0.255
##	.ssup2	0.209	0.022	9.356	0.000	0.209 0.132
##	.psup1	0.331	0.027	12.186	0.000	0.331 0.356
##	.psup2	0.170	0.025	6.668	0.000	0.170 0.198
##	.self1	0.082	0.005	16.555	0.000	0.082 0.415
##	.self2	0.065	0.005	13.043	0.000	0.065 0.257
##	.self3	0.083	0.006	12.979	0.000	0.083 0.280
##	.elc1	0.208	0.010	20.924	0.000	0.208 0.533
##	.elc2	0.262	0.011	23.517	0.000	0.262 0.668
##	.elc3	0.135	0.007	18.263	0.000	0.135 0.448
##	.elc4	0.213	0.010	21.638	0.000	0.213 0.582
##	.elc5	0.183	0.010	18.569	0.000	0.183 0.440
##	.ee1	0.408	0.024	17.138	0.000	0.408 0.238
##	.ee2	0.222	0.019	11.616	0.000	0.222 0.140
##	.ee3	0.454	0.026	17.799	0.000	0.454 0.270
##	.dp1	0.257	0.043	5.941	0.000	0.257 0.214
##	.dp2	0.643	0.047	13.699	0.000	0.643 0.461
##	.pa1	0.265	0.021	12.507	0.000	0.265 0.321
##	.pa2	0.325	0.025	12.961	0.000	0.325 0.354
##	.pa3	0.407	0.024	17.275	0.000	0.407 0.442
##	F1	0.410	0.033	12.352	0.000	1.000 1.000
##	F2	0.577	0.041	13.944	0.000	1.000 1.000
##	F3	0.802	0.047	17.077	0.000	1.000 1.000
##	F4	0.111	0.010	10.824	0.000	1.000 1.000
##	F5	0.493	0.036	13.523	0.000	1.000 1.000
##	F6	1.154	0.061	19.045	0.000	1.000 1.000
##	F7	0.600	0.043	13.968	0.000	1.000 1.000
##	.F8	0.082	0.008	9.638	0.000	0.705 0.705

```
##      .F9          0.130    0.011   12.016    0.000    0.718    0.718
##      .F10        -0.171    0.449   -0.381    0.703   -0.131   -0.131
##      .F11         0.544    0.047   11.645    0.000    0.578    0.578
##      .F12         0.365    0.024   15.146    0.000    0.653    0.653
##
## R-Square:
##           Estimate
##      rolea1      0.491
##      rolea2      0.666
##      dec2        0.662
##      rolec1      0.475
##      rolec2      0.640
##      work1       0.556
##      work2       0.379
##      cclim1      0.380
##      cclim2      0.621
##      cclim3      0.423
##      cclim4      0.366
##      dec1        0.484
##      ssup1       0.745
##      ssup2       0.868
##      psup1       0.644
##      psup2       0.802
##      self1       0.585
##      self2       0.743
##      self3       0.720
##      elc1        0.467
##      elc2        0.332
##      elc3        0.552
##      elc4        0.418
##      elc5        0.560
##      ee1         0.762
##      ee2         0.860
##      ee3         0.730
##      dp1         0.786
##      dp2         0.539
##      pa1         0.679
##      pa2         0.646
##      pa3         0.558
##      F8          0.295
##      F9          0.282
##      F10         NA
##      F11         0.422
##      F12         0.347
```

Request MIs

We'll look again at the MIs for the regression paths. The largest and perhaps most meaningful MI (in this model, with this theory) is that of F10 ~ F8, which suggests that high levels of self-esteem

associated with low levels of emotional exhaustion. We'll free this in our next model.

```
modindices(fullsem5_fit,  
            sort = TRUE, # The sort argument allows us to sort the indices from largest  
            to smallest  
            op = "~") # The op argument lets us ask for specific MIs
```

##	lhs	op	rhs	mi	epc	sepc.lv	sepc.all	sepc.nox
## 1112	F7	~	F8	44.064	4.164	1.829	1.829	1.829
## 1101	F6	~	F8	31.635	2.552	0.808	0.808	0.808
## 1069	F10	~	F8	30.097	-1.068	-0.318	-0.318	-0.318
## 1055	F8	~	F11	25.670	-0.066	-0.188	-0.188	-0.188
## 1134	F3	~	F8	25.621	-0.175	-0.066	-0.066	-0.066
## 1060	F8	~	F1	25.474	0.261	0.491	0.491	0.491
## 1077	F11	~	F8	21.980	-0.404	-0.142	-0.142	-0.142
## 1123	F2	~	F8	21.296	0.129	0.058	0.058	0.058
## 1056	F8	~	F12	20.836	0.239	0.526	0.526	0.526
## 1054	F8	~	F10	20.767	-0.121	-0.406	-0.406	-0.406
## 1088	F12	~	F3	19.516	0.282	0.338	0.338	0.338
## 1147	F4	~	F10	18.842	-5.348	-18.346	-18.346	-18.346
## 1090	F5	~	F8	18.661	-0.903	-0.437	-0.437	-0.437
## 1136	F3	~	F10	18.445	4.939	6.303	6.303	6.303
## 1149	F4	~	F12	16.484	0.087	0.196	0.196	0.196
## 1087	F12	~	F2	16.370	0.261	0.265	0.265	0.265
## 1073	F10	~	F5	15.023	-1.368	-0.841	-0.841	-0.841
## 1076	F10	~	F1	14.115	1.838	1.030	1.030	1.030
## 1092	F5	~	F10	13.861	2.966	4.825	4.825	4.825
## 1089	F12	~	F4	11.572	0.284	0.127	0.127	0.127
## 1074	F10	~	F6	9.979	-0.534	-0.502	-0.502	-0.502
## 1146	F4	~	F9	8.703	-0.089	-0.114	-0.114	-0.114
## 1127	F2	~	F12	8.545	0.039	0.039	0.039	0.039
## 1067	F9	~	F4	7.836	-0.120	-0.094	-0.094	-0.094
## 1156	F1	~	F8	7.198	0.281	0.149	0.149	0.149
## 1160	F1	~	F12	6.159	-0.108	-0.126	-0.126	-0.126
## 1148	F4	~	F11	5.685	0.132	0.383	0.383	0.383
## 1072	F10	~	F12	5.342	-0.224	-0.146	-0.146	-0.146
## 1057	F8	~	F2	5.021	0.083	0.186	0.186	0.186
## 1075	F10	~	F7	4.518	-0.460	-0.312	-0.312	-0.312
## 1080	F11	~	F5	4.127	-0.119	-0.086	-0.086	-0.086
## 1102	F6	~	F9	4.087	0.205	0.081	0.081	0.081
## 1094	F5	~	F12	3.446	0.068	0.073	0.073	0.073
## 1093	F5	~	F11	3.437	-0.034	-0.047	-0.047	-0.047
## 1066	F9	~	F3	3.368	-0.135	-0.284	-0.284	-0.284
## 1158	F1	~	F10	3.179	-0.926	-1.653	-1.653	-1.653
## 1079	F11	~	F12	3.123	-0.145	-0.112	-0.112	-0.112
## 1063	F9	~	F12	3.096	-0.102	-0.178	-0.178	-0.178
## 1053	F8	~	F9	2.987	0.140	0.176	0.176	0.176
## 1068	F9	~	F1	2.647	0.072	0.108	0.108	0.108
## 1138	F3	~	F12	2.558	-0.032	-0.026	-0.026	-0.026
## 1084	F11	~	F1	2.472	0.124	0.082	0.082	0.082
## 1137	F3	~	F11	2.458	-0.029	-0.031	-0.031	-0.031
## 1081	F11	~	F6	2.414	-0.045	-0.049	-0.049	-0.049
## 1082	F11	~	F7	2.379	-0.057	-0.045	-0.045	-0.045
## 1064	F9	~	F6	1.942	0.035	0.088	0.088	0.088
## 1145	F4	~	F8	1.767	0.081	0.083	0.083	0.083
## 1078	F11	~	F9	1.658	0.093	0.041	0.041	0.041
## 1065	F9	~	F7	1.537	-0.031	-0.056	-0.056	-0.056
## 1061	F9	~	F10	1.492	-0.017	-0.047	-0.047	-0.047

##	1125	F2	~	F10	1.488	0.954	1.435	1.435	1.435
##	1135	F3	~	F9	1.352	-0.016	-0.007	-0.007	-0.007
##	1113	F7	~	F9	1.339	-0.074	-0.041	-0.041	-0.041
##	1103	F6	~	F10	1.201	0.765	0.815	0.815	0.815
##	1058	F8	~	F3	1.069	0.038	0.101	0.101	0.101
##	1124	F2	~	F9	1.003	0.012	0.007	0.007	0.007
##	1086	F12	~	F7	0.872	-0.044	-0.045	-0.045	-0.045
##	1116	F7	~	F12	0.760	-0.035	-0.033	-0.033	-0.033
##	1157	F1	~	F9	0.754	0.041	0.027	0.027	0.027
##	1070	F10	~	F9	0.658	-0.065	-0.024	-0.024	-0.024
##	1126	F2	~	F11	0.526	0.012	0.015	0.015	0.015
##	1059	F8	~	F4	0.510	0.038	0.037	0.037	0.037
##	1105	F6	~	F12	0.422	-0.042	-0.029	-0.029	-0.029
##	1062	F9	~	F11	0.383	0.009	0.021	0.021	0.021
##	1091	F5	~	F9	0.056	0.014	0.008	0.008	0.008
##	1104	F6	~	F11	0.055	0.008	0.007	0.007	0.007
##	1083	F11	~	F3	0.045	0.409	0.378	0.378	0.378
##	1071	F10	~	F11	0.045	0.021	0.017	0.017	0.017
##	1085	F12	~	F6	0.009	-0.005	-0.008	-0.008	-0.008
##	1159	F1	~	F11	0.007	-0.002	-0.003	-0.003	-0.003
##	1115	F7	~	F11	0.006	-0.002	-0.003	-0.003	-0.003
##	1114	F7	~	F10	0.000	-0.011	-0.017	-0.017	-0.017

Structural Model 6

```
fullsem6 <- '
# Measurement Model
F1 =~ rolea1 + rolea2 + dec2 #role ambiguity with DEC2 cross-loading
F2 =~ rolec1 + rolec2 #role conflict
F3 =~ work1 + work2 #work overload
F4 =~ cclim1 + cclim2 + cclim3 + cclim4 #classroom climate
F5 =~ dec1 + dec2 #decision-making
F6 =~ ssup1 + ssup2 + dec2 #superior support with DEC2 cross-loading
F7 =~ psup1 + psup2 #peer support
F8 =~ self1 + self2 + self3 #self-esteem
F9 =~ elc1 + elc2 + elc3 + elc4 + elc5 #external loc of control
F10 =~ ee1 + ee2 + ee3 #emotional exhaustion
F11 =~ dp1 + dp2 #depersonalization
F12 =~ pa1 + pa2 + pa3 #personal accomplishment

# Structural Model
F8 ~ F5 + F6 + F7
F9 ~ F5 + F2 + F8 # Adding the path from F2 to F9, and F8 to F9
F10 ~ F2 + F3 + F4 + F8 #Adding the path from F8 to F10
F11 ~ F2 + F10 + F4 #Adding here the path from F4 to F11
F12 ~ F1 + F8 + F9 + F10 + F11 + F5 #Adding here the path from F5 to F12
'
```

Fit the Model

We still get the warning about the negative variance.

```
# Estimate the Model
fullsem6_fit <-
  sem(model = fullsem6,
      data = teachers,
      estimator = "MLM",
      meanstructure = TRUE
  )
```

Request the Output

Model fit continues improving. Some regression paths are also becoming significant while others are not.

```
summary(fullsem6_fit,
  fit.measures = TRUE,
  standardized = TRUE,
  rsquare = TRUE)
```



```

## lavaan 0.6-9 ended normally after 134 iterations
##
## Estimator ML
## Optimization method NLMINB
## Number of model parameters 138
##
## Number of observations 1430
##
## Model Test User Model:
## Standard Robust
## Test Statistic 1447.637 1288.246
## Degrees of freedom 422 422
## P-value (Chi-square) 0.000 0.000
## Scaling correction factor 1.124
## Satorra-Bentler correction
##
## Model Test Baseline Model:
##
## Test statistic 23532.624 19072.057
## Degrees of freedom 496 496
## P-value 0.000 0.000
## Scaling correction factor 1.234
##
## User Model versus Baseline Model:
##
## Comparative Fit Index (CFI) 0.955 0.953
## Tucker-Lewis Index (TLI) 0.948 0.945
##
## Robust Comparative Fit Index (CFI) 0.958
## Robust Tucker-Lewis Index (TLI) 0.950
##
## Loglikelihood and Information Criteria:
##
## Loglikelihood user model (H0) -47095.401 -47095.401
## Loglikelihood unrestricted model (H1) -46371.583 -46371.583
##
## Akaike (AIC) 94466.803 94466.803
## Bayesian (BIC) 95193.432 95193.432
## Sample-size adjusted Bayesian (BIC) 94755.054 94755.054
##
## Root Mean Square Error of Approximation:
##
## RMSEA 0.041 0.038
## 90 Percent confidence interval - lower 0.039 0.036
## 90 Percent confidence interval - upper 0.044 0.040
## P-value RMSEA <= 0.05 1.000 1.000
##
## Robust RMSEA 0.040
## 90 Percent confidence interval - lower 0.038
## 90 Percent confidence interval - upper 0.043
##

```

Standardized Root Mean Square Residual:

##

SRMR 0.039 0.039

##

Parameter Estimates:

##

Standard errors Robust.sem

Information Expected

Information saturated (h1) model Structured

##

Latent Variables:

	Estimate	Std.Err	z-value	P(> z)	Std.lv	Std.all
--	----------	---------	---------	---------	--------	---------

F1 =~

rolea1	1.000				0.640	0.700
--------	-------	--	--	--	-------	-------

rolea2	1.232	0.057	21.472	0.000	0.788	0.811
--------	-------	-------	--------	-------	-------	-------

dec2	0.417	0.121	3.449	0.001	0.266	0.201
------	-------	-------	-------	-------	-------	-------

F2 =~

rolec1	1.000				0.762	0.692
--------	-------	--	--	--	-------	-------

rolec2	1.286	0.051	25.225	0.000	0.980	0.794
--------	-------	-------	--------	-------	-------	-------

F3 =~

work1	1.000				0.941	0.783
-------	-------	--	--	--	-------	-------

work2	0.729	0.032	22.823	0.000	0.686	0.630
-------	-------	-------	--------	-------	-------	-------

F4 =~

cclim1	1.000				0.334	0.618
--------	-------	--	--	--	-------	-------

cclim2	1.482	0.075	19.660	0.000	0.495	0.787
--------	-------	-------	--------	-------	-------	-------

cclim3	0.960	0.055	17.357	0.000	0.320	0.650
--------	-------	-------	--------	-------	-------	-------

cclim4	1.326	0.079	16.805	0.000	0.443	0.605
--------	-------	-------	--------	-------	-------	-------

F5 =~

dec1	1.000				0.735	0.728
------	-------	--	--	--	-------	-------

dec2	0.664	0.151	4.384	0.000	0.488	0.367
------	-------	-------	-------	-------	-------	-------

F6 =~

ssup1	1.000				1.073	0.863
-------	-------	--	--	--	-------	-------

ssup2	1.098	0.026	42.321	0.000	1.179	0.936
-------	-------	-------	--------	-------	-------	-------

dec2	0.771	0.060	12.914	0.000	0.827	0.623
------	-------	-------	--------	-------	-------	-------

F7 =~

psup1	1.000				0.771	0.799
-------	-------	--	--	--	-------	-------

psup2	1.081	0.046	23.401	0.000	0.833	0.900
-------	-------	-------	--------	-------	-------	-------

F8 =~

self1	1.000				0.340	0.765
-------	-------	--	--	--	-------	-------

self2	1.276	0.045	28.085	0.000	0.434	0.861
-------	-------	-------	--------	-------	-------	-------

self3	1.357	0.057	23.692	0.000	0.462	0.849
-------	-------	-------	--------	-------	-------	-------

F9 =~

elc1	1.000				0.425	0.682
------	-------	--	--	--	-------	-------

elc2	0.848	0.042	20.264	0.000	0.360	0.576
------	-------	-------	--------	-------	-------	-------

elc3	0.956	0.041	23.191	0.000	0.406	0.742
------	-------	-------	--------	-------	-------	-------

elc4	0.919	0.048	19.168	0.000	0.391	0.646
------	-------	-------	--------	-------	-------	-------

elc5	1.132	0.050	22.448	0.000	0.481	0.748
------	-------	-------	--------	-------	-------	-------

F10 =~

ee1	1.000				1.138	0.872
-----	-------	--	--	--	-------	-------

ee2	1.020	0.019	53.220	0.000	1.161	0.927
-----	-------	-------	--------	-------	-------	-------

ee3	0.971	0.023	42.707	0.000	1.105	0.854
-----	-------	-------	--------	-------	-------	-------

```

##      F11 =~
##      dp1          1.000          0.969      0.886
##      dp2          0.895      0.042      21.167      0.000      0.867      0.734
##      F12 =~
##      pa1          1.000          0.749      0.825
##      pa2          1.027      0.037      27.728      0.000      0.770      0.803
##      pa3          0.957      0.040      24.162      0.000      0.717      0.747
##
## Regressions:
##      Estimate      Std.Err      z-value      P(>|z|)      Std.lv      Std.all
##      F8 ~
##      F5              0.357      0.053       6.676      0.000      0.770      0.770
##      F6             -0.118      0.027      -4.351      0.000     -0.371     -0.371
##      F7             -0.014      0.028      -0.488      0.626     -0.031     -0.031
##      F9 ~
##      F5             -0.083      0.032      -2.574      0.010     -0.143     -0.143
##      F2              0.166      0.029       5.714      0.000      0.297      0.297
##      F8             -0.253      0.049      -5.153      0.000     -0.202     -0.202
##      F10 ~
##      F2             -1.168      0.429      -2.720      0.007     -0.782     -0.782
##      F3              1.554      0.362       4.296      0.000      1.285      1.285
##      F4             -0.568      0.139      -4.080      0.000     -0.167     -0.167
##      F8             -0.884      0.113      -7.803      0.000     -0.264     -0.264
##      F11 ~
##      F2              0.167      0.051       3.284      0.001      0.132      0.132
##      F10             0.307      0.034       8.968      0.000      0.360      0.360
##      F4             -0.945      0.106      -8.914      0.000     -0.326     -0.326
##      F12 ~
##      F1              0.368      0.093       3.967      0.000      0.314      0.314
##      F8              0.481      0.092       5.256      0.000      0.218      0.218
##      F9             -0.151      0.058      -2.607      0.009     -0.086     -0.086
##      F10            -0.014      0.028      -0.521      0.603     -0.022     -0.022
##      F11            -0.202      0.033      -6.206      0.000     -0.261     -0.261
##      F5              0.481      0.078       6.144      0.000      0.472      0.472
##
## Covariances:
##      Estimate      Std.Err      z-value      P(>|z|)      Std.lv      Std.all
##      F1 ~~
##      F2              0.382      0.026      14.854      0.000      0.784      0.784
##      F3              0.409      0.028      14.559      0.000      0.679      0.679
##      F4             -0.064      0.008      -7.608      0.000     -0.298     -0.298
##      F5             -0.391      0.027     -14.491      0.000     -0.832     -0.832
##      F6             -0.384      0.030     -12.671      0.000     -0.559     -0.559
##      F7             -0.243      0.022     -10.981      0.000     -0.494     -0.494
##      F2 ~~
##      F3              0.672      0.035      19.166      0.000      0.938      0.938
##      F4             -0.083      0.011      -7.894      0.000     -0.327     -0.327
##      F5             -0.412      0.029     -14.274      0.000     -0.735     -0.735
##      F6             -0.437      0.033     -13.377      0.000     -0.534     -0.534
##      F7             -0.241      0.023     -10.452      0.000     -0.410     -0.410
##      F3 ~~

```

```

##      F4      -0.096    0.013   -7.382    0.000   -0.306   -0.306
##      F5      -0.485    0.031  -15.449    0.000   -0.702   -0.702
##      F6      -0.488    0.037  -13.363    0.000   -0.483   -0.483
##      F7      -0.271    0.027  -10.130    0.000   -0.374   -0.374
## F4 ~~
##      F5       0.104    0.011    9.391    0.000    0.425    0.425
##      F6       0.121    0.014    8.836    0.000    0.336    0.336
##      F7       0.056    0.009    5.996    0.000    0.217    0.217
## F5 ~~
##      F6       0.637    0.038   16.566    0.000    0.808    0.808
##      F7       0.381    0.028   13.799    0.000    0.673    0.673
## F6 ~~
##      F7       0.392    0.032   12.294    0.000    0.474    0.474
##
## Intercepts:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      .rolea1    2.401   0.024   99.362   0.000    2.401    2.628
##      .rolea2    2.086   0.026   81.108   0.000    2.086    2.145
##      .dec2      4.242   0.035  120.842   0.000    4.242    3.196
##      .rolec1    3.015   0.029  103.524   0.000    3.015    2.738
##      .rolec2    3.018   0.033   92.468   0.000    3.018    2.445
##      .work1     3.240   0.032  101.996   0.000    3.240    2.697
##      .work2     2.243   0.029   77.885   0.000    2.243    2.060
##      .cclim1    2.964   0.014  207.379   0.000    2.964    5.484
##      .cclim2    2.723   0.017  163.890   0.000    2.723    4.334
##      .cclim3    2.928   0.013  224.532   0.000    2.928    5.938
##      .cclim4    3.053   0.019  157.758   0.000    3.053    4.172
##      .dec1      4.039   0.027  151.305   0.000    4.039    4.001
##      .ssup1     4.299   0.033  130.631   0.000    4.299    3.454
##      .ssup2     4.370   0.033  131.136   0.000    4.370    3.468
##      .psup1     4.571   0.026  179.200   0.000    4.571    4.739
##      .psup2     4.621   0.024  188.754   0.000    4.621    4.991
##      .self1     3.603   0.012  306.319   0.000    3.603    8.100
##      .self2     3.613   0.013  271.109   0.000    3.613    7.169
##      .self3     3.483   0.014  241.972   0.000    3.483    6.399
##      .elc1      2.918   0.016  176.985   0.000    2.918    4.683
##      .elc2      3.008   0.017  181.556   0.000    3.008    4.803
##      .elc3      2.801   0.014  193.300   0.000    2.801    5.115
##      .elc4      2.200   0.016  137.503   0.000    2.200    3.638
##      .elc5      2.483   0.017  145.731   0.000    2.483    3.856
##      .ee1       3.855   0.035  111.347   0.000    3.855    2.952
##      .ee2       3.530   0.033  106.201   0.000    3.530    2.816
##      .ee3       3.165   0.034   92.281   0.000    3.165    2.446
##      .dp1       2.319   0.029   80.113   0.000    2.319    2.121
##      .dp2       2.086   0.031   66.763   0.000    2.086    1.767
##      .pa1       5.748   0.024  238.172   0.000    5.748    6.327
##      .pa2       5.850   0.025  229.759   0.000    5.850    6.102
##      .pa3       5.815   0.025  228.188   0.000    5.815    6.057
##      F1         0.000                0.000    0.000
##      F2         0.000                0.000    0.000
##      F3         0.000                0.000    0.000

```

```

##          F4          0.000          0.000  0.000
##          F5          0.000          0.000  0.000
##          F6          0.000          0.000  0.000
##          F7          0.000          0.000  0.000
##          .F8          0.000          0.000  0.000
##          .F9          0.000          0.000  0.000
##          .F10         0.000          0.000  0.000
##          .F11         0.000          0.000  0.000
##          .F12         0.000          0.000  0.000
##
## Variances:
##          Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##          .rolea1    0.426   0.024  17.744  0.000   0.426   0.510
##          .rolea2    0.324   0.026  12.327  0.000   0.324   0.343
##          .dec2      0.580   0.033  17.681  0.000   0.580   0.329
##          .rolec1    0.632   0.029  21.925  0.000   0.632   0.521
##          .rolec2    0.563   0.037  15.137  0.000   0.563   0.370
##          .work1     0.558   0.033  17.129  0.000   0.558   0.387
##          .work2     0.716   0.036  19.925  0.000   0.716   0.603
##          .cclim1    0.181   0.008  22.705  0.000   0.181   0.618
##          .cclim2    0.150   0.010  15.018  0.000   0.150   0.380
##          .cclim3    0.141   0.007  19.346  0.000   0.141   0.578
##          .cclim4    0.339   0.015  22.100  0.000   0.339   0.634
##          .dec1      0.479   0.027  17.622  0.000   0.479   0.470
##          .ssup1     0.396   0.026  15.202  0.000   0.396   0.256
##          .ssup2     0.198   0.023   8.770  0.000   0.198   0.125
##          .psup1     0.336   0.028  12.225  0.000   0.336   0.362
##          .psup2     0.163   0.026   6.196  0.000   0.163   0.190
##          .self1     0.082   0.005  16.556  0.000   0.082   0.414
##          .self2     0.066   0.005  13.040  0.000   0.066   0.258
##          .self3     0.083   0.006  12.956  0.000   0.083   0.280
##          .elc1      0.208   0.010  20.924  0.000   0.208   0.534
##          .elc2      0.262   0.011  23.510  0.000   0.262   0.669
##          .elc3      0.135   0.007  18.248  0.000   0.135   0.449
##          .elc4      0.213   0.010  21.623  0.000   0.213   0.582
##          .elc5      0.183   0.010  18.561  0.000   0.183   0.441
##          .ee1       0.410   0.024  17.234  0.000   0.410   0.240
##          .ee2       0.222   0.019  11.737  0.000   0.222   0.142
##          .ee3       0.453   0.025  17.758  0.000   0.453   0.270
##          .dp1       0.257   0.043   5.924  0.000   0.257   0.215
##          .dp2       0.643   0.047  13.660  0.000   0.643   0.461
##          .pa1       0.264   0.021  12.477  0.000   0.264   0.319
##          .pa2       0.327   0.025  13.039  0.000   0.327   0.355
##          .pa3       0.408   0.023  17.353  0.000   0.408   0.442
##          F1         0.409   0.033  12.318  0.000   1.000   1.000
##          F2         0.581   0.042  13.971  0.000   1.000   1.000
##          F3         0.885   0.050  17.596  0.000   1.000   1.000
##          F4         0.111   0.010  10.844  0.000   1.000   1.000
##          F5         0.540   0.039  13.772  0.000   1.000   1.000
##          F6         1.152   0.061  19.002  0.000   1.000   1.000
##          F7         0.594   0.043  13.837  0.000   1.000   1.000

```

```
##      .F8          0.087    0.009   10.228    0.000    0.751    0.751
##      .F9          0.130    0.011   11.986    0.000    0.719    0.719
##      .F10         0.480    0.069    6.959    0.000    0.371    0.371
##      .F11         0.545    0.047   11.620    0.000    0.581    0.581
##      .F12         0.356    0.024   14.700    0.000    0.633    0.633
##
## R-Square:
##           Estimate
##      rolea1      0.490
##      rolea2      0.657
##      dec2        0.671
##      rolec1      0.479
##      rolec2      0.630
##      work1       0.613
##      work2       0.397
##      cclim1      0.382
##      cclim2      0.620
##      cclim3      0.422
##      cclim4      0.366
##      dec1        0.530
##      ssup1       0.744
##      ssup2       0.875
##      psup1       0.638
##      psup2       0.810
##      self1       0.586
##      self2       0.742
##      self3       0.720
##      elc1        0.466
##      elc2        0.331
##      elc3        0.551
##      elc4        0.418
##      elc5        0.559
##      ee1         0.760
##      ee2         0.858
##      ee3         0.730
##      dp1         0.785
##      dp2         0.539
##      pa1         0.681
##      pa2         0.645
##      pa3         0.558
##      F8          0.249
##      F9          0.281
##      F10         0.629
##      F11         0.419
##      F12         0.367
```

Request MIs

We'll look again at the MIs for the regression paths. The MIs are getting pretty small, and there are only a few to be made. The MI of F8 ~ F11 doesn't make sense because high self-esteem

shouldn't cause depersonalization. But we'll make one more addition of F12 ~ F2 because it makes sense that high role conflict is associated with reduced personal accomplishment.

```
modindices(fullsem6_fit,  
            sort = TRUE, # The sort argument allows us to sort the indices from largest  
            to smallest  
            op = "~") # The op argument lets us ask for specific MIs
```

##	lhs	op	rhs	mi	epc	sepc.lv	sepc.all	sepc.nox
## 1056	F8	~	F11	31.478	-0.076	-0.216	-0.216	-0.216
## 1087	F12	~	F2	22.794	0.339	0.345	0.345	0.345
## 1077	F11	~	F8	22.713	-0.409	-0.144	-0.144	-0.144
## 1088	F12	~	F3	21.857	0.259	0.325	0.325	0.325
## 1083	F11	~	F3	21.417	-0.937	-0.911	-0.911	-0.911
## 1137	F3	~	F11	21.099	-0.190	-0.196	-0.196	-0.196
## 1112	F7	~	F8	18.827	2.525	1.115	1.115	1.115
## 1149	F4	~	F12	17.279	0.091	0.204	0.204	0.204
## 1090	F5	~	F8	14.760	-0.390	-0.180	-0.180	-0.180
## 1057	F8	~	F12	14.757	0.193	0.426	0.426	0.426
## 1160	F1	~	F12	14.729	-0.172	-0.202	-0.202	-0.202
## 1146	F4	~	F9	10.983	-0.100	-0.128	-0.128	-0.128
## 1073	F10	~	F5	10.738	-0.348	-0.225	-0.225	-0.225
## 1089	F12	~	F4	9.404	0.263	0.117	0.117	0.117
## 1058	F8	~	F2	8.188	-0.102	-0.229	-0.229	-0.229
## 1072	F10	~	F12	8.146	-0.259	-0.171	-0.171	-0.171
## 1074	F10	~	F6	8.002	-0.130	-0.123	-0.123	-0.123
## 1068	F9	~	F4	7.786	-0.120	-0.094	-0.094	-0.094
## 1127	F2	~	F12	7.247	0.082	0.080	0.080	0.080
## 1126	F2	~	F11	6.814	0.076	0.097	0.097	0.097
## 1059	F8	~	F3	5.213	-0.057	-0.157	-0.157	-0.157
## 1060	F8	~	F4	4.953	0.090	0.089	0.089	0.089
## 1145	F4	~	F8	4.917	0.095	0.097	0.097	0.097
## 1102	F6	~	F9	3.829	0.179	0.071	0.071	0.071
## 1065	F9	~	F6	3.751	0.049	0.124	0.124	0.124
## 1064	F9	~	F12	3.573	-0.102	-0.180	-0.180	-0.180
## 1101	F6	~	F8	3.526	0.902	0.286	0.286	0.286
## 1123	F2	~	F8	3.415	-0.123	-0.055	-0.055	-0.055
## 1158	F1	~	F10	3.222	-0.082	-0.146	-0.146	-0.146
## 1080	F11	~	F5	3.091	-0.110	-0.083	-0.083	-0.083
## 1079	F11	~	F12	3.043	-0.143	-0.111	-0.111	-0.111
## 1081	F11	~	F6	2.724	-0.048	-0.053	-0.053	-0.053
## 1084	F11	~	F1	2.705	0.140	0.093	0.093	0.093
## 1055	F8	~	F10	2.533	-0.042	-0.139	-0.139	-0.139
## 1082	F11	~	F7	2.489	-0.059	-0.047	-0.047	-0.047
## 1075	F10	~	F7	2.295	-0.090	-0.061	-0.061	-0.061
## 1067	F9	~	F3	2.262	-0.087	-0.192	-0.192	-0.192
## 1124	F2	~	F9	2.201	0.064	0.036	0.036	0.036
## 1135	F3	~	F9	2.186	-0.075	-0.034	-0.034	-0.034
## 1076	F10	~	F1	2.151	0.289	0.162	0.162	0.162
## 1103	F6	~	F10	2.120	-0.095	-0.101	-0.101	-0.101
## 1071	F10	~	F11	1.916	-0.125	-0.106	-0.106	-0.106
## 1138	F3	~	F12	1.879	0.077	0.062	0.062	0.062
## 1078	F11	~	F9	1.833	0.098	0.043	0.043	0.043
## 1113	F7	~	F9	1.565	-0.079	-0.044	-0.044	-0.044
## 1148	F4	~	F11	1.398	0.065	0.188	0.188	0.188
## 1104	F6	~	F11	1.386	-0.042	-0.038	-0.038	-0.038
## 1092	F5	~	F10	1.275	-0.050	-0.078	-0.078	-0.078
## 1091	F5	~	F9	1.157	0.067	0.039	0.039	0.039
## 1066	F9	~	F7	1.142	-0.026	-0.047	-0.047	-0.047

##	1115	F7	~ F11	0.946	-0.029	-0.036	-0.036	-0.036
##	1136	F3	~ F10	0.794	-0.071	-0.086	-0.086	-0.086
##	1069	F9	~ F1	0.694	0.043	0.064	0.064	0.064
##	1063	F9	~ F11	0.677	0.012	0.028	0.028	0.028
##	1070	F10	~ F9	0.659	-0.063	-0.024	-0.024	-0.024
##	1062	F9	~ F10	0.539	-0.010	-0.028	-0.028	-0.028
##	1085	F12	~ F6	0.442	-0.036	-0.052	-0.052	-0.052
##	1125	F2	~ F10	0.300	0.028	0.042	0.042	0.042
##	1147	F4	~ F10	0.247	-0.022	-0.075	-0.075	-0.075
##	1157	F1	~ F9	0.221	0.022	0.014	0.014	0.014
##	1156	F1	~ F8	0.203	0.033	0.018	0.018	0.018
##	1061	F8	~ F1	0.137	-0.025	-0.046	-0.046	-0.046
##	1086	F12	~ F7	0.105	-0.014	-0.015	-0.015	-0.015
##	1093	F5	~ F11	0.094	-0.007	-0.010	-0.010	-0.010
##	1114	F7	~ F10	0.083	-0.015	-0.022	-0.022	-0.022
##	1105	F6	~ F12	0.056	-0.015	-0.010	-0.010	-0.010
##	1134	F3	~ F8	0.019	-0.013	-0.005	-0.005	-0.005
##	1054	F8	~ F9	0.009	-0.012	-0.015	-0.015	-0.015
##	1116	F7	~ F12	0.008	0.003	0.003	0.003	0.003
##	1159	F1	~ F11	0.007	-0.002	-0.003	-0.003	-0.003
##	1094	F5	~ F12	0.004	0.003	0.003	0.003	0.003

Structural Model 7

```
fullsem7 <- '
# Measurement Model
F1 =~ rolea1 + rolea2 + dec2 #role ambiguity with DEC2 cross-loading
F2 =~ rolec1 + rolec2 #role conflict
F3 =~ work1 + work2 #work overload
F4 =~ cclim1 + cclim2 + cclim3 + cclim4 #classroom climate
F5 =~ dec1 + dec2 #decision-making
F6 =~ ssup1 + ssup2 + dec2 #superior support with DEC2 cross-loading
F7 =~ psup1 + psup2 #peer support
F8 =~ self1 + self2 + self3 #self-esteem
F9 =~ elc1 + elc2 + elc3 + elc4 + elc5 #external loc of control
F10 =~ ee1 + ee2 + ee3 #emotional exhaustion
F11 =~ dp1 + dp2 #depersonalization
F12 =~ pa1 + pa2 + pa3 #personal accomplishment

# Structural Model
F8 ~ F5 + F6 + F7
F9 ~ F5 + F2 + F8 # Adding the path from F2 to F9, and F8 to F9
F10 ~ F2 + F3 + F4 + F8 #Adding the path from F8 to F10
F11 ~ F2 + F10 + F4 #Adding here the path from F4 to F11
F12 ~ F1 + F8 + F9 + F10 + F11 + F5 + F2 #Adding here the path from F5 to
F12, and F2 to F12
'
```

Fit the Model

We're no longer getting that negative variance warning.

```
# Estimate the Model
fullsem7_fit <-
  sem(model = fullsem7,
      data = teachers,
      estimator = "MLM",
      meanstructure = TRUE
  )
```

Request the Output

```
summary(fullsem7_fit,
      fit.measures = TRUE,
      standardized = TRUE,
      rsquare = TRUE)
```

```

## lavaan 0.6-9 ended normally after 132 iterations
##
## Estimator ML
## Optimization method NLMINB
## Number of model parameters 139
##
## Number of observations 1430
##
## Model Test User Model:
## Standard Robust
## Test Statistic 1424.353 1267.581
## Degrees of freedom 421 421
## P-value (Chi-square) 0.000 0.000
## Scaling correction factor 1.124
## Satorra-Bentler correction
##
## Model Test Baseline Model:
##
## Test statistic 23532.624 19072.057
## Degrees of freedom 496 496
## P-value 0.000 0.000
## Scaling correction factor 1.234
##
## User Model versus Baseline Model:
##
## Comparative Fit Index (CFI) 0.956 0.954
## Tucker-Lewis Index (TLI) 0.949 0.946
##
## Robust Comparative Fit Index (CFI) 0.958
## Robust Tucker-Lewis Index (TLI) 0.951
##
## Loglikelihood and Information Criteria:
##
## Loglikelihood user model (H0) -47083.760 -47083.760
## Loglikelihood unrestricted model (H1) -46371.583 -46371.583
##
## Akaike (AIC) 94445.519 94445.519
## Bayesian (BIC) 95177.414 95177.414
## Sample-size adjusted Bayesian (BIC) 94735.859 94735.859
##
## Root Mean Square Error of Approximation:
##
## RMSEA 0.041 0.037
## 90 Percent confidence interval - lower 0.039 0.035
## 90 Percent confidence interval - upper 0.043 0.040
## P-value RMSEA <= 0.05 1.000 1.000
##
## Robust RMSEA 0.040
## 90 Percent confidence interval - lower 0.037
## 90 Percent confidence interval - upper 0.042
##

```

Standardized Root Mean Square Residual:

##

SRMR 0.038 0.038

##

Parameter Estimates:

##

Standard errors Robust.sem

Information Expected

Information saturated (h1) model Structured

##

Latent Variables:

Estimate Std.Err z-value P(>|z|) Std.lv Std.all

F1 =~

rolea1 1.000 0.643 0.704

rolea2 1.236 0.058 21.462 0.000 0.795 0.817

dec2 0.364 0.116 3.143 0.002 0.234 0.176

F2 =~

rolec1 1.000 0.769 0.698

rolec2 1.268 0.050 25.470 0.000 0.975 0.790

F3 =~

work1 1.000 0.951 0.792

work2 0.721 0.032 22.605 0.000 0.685 0.629

F4 =~

cclim1 1.000 0.334 0.618

cclim2 1.482 0.075 19.672 0.000 0.495 0.787

cclim3 0.960 0.055 17.351 0.000 0.321 0.650

cclim4 1.326 0.079 16.797 0.000 0.443 0.605

F5 =~

dec1 1.000 0.731 0.725

dec2 0.601 0.147 4.079 0.000 0.440 0.331

F6 =~

ssup1 1.000 1.074 0.863

ssup2 1.098 0.026 42.364 0.000 1.178 0.935

dec2 0.787 0.059 13.301 0.000 0.845 0.636

F7 =~

psup1 1.000 0.771 0.799

psup2 1.081 0.046 23.477 0.000 0.833 0.900

F8 =~

self1 1.000 0.340 0.765

self2 1.277 0.045 28.071 0.000 0.434 0.862

self3 1.359 0.057 23.694 0.000 0.462 0.849

F9 =~

elc1 1.000 0.425 0.683

elc2 0.848 0.042 20.297 0.000 0.361 0.576

elc3 0.955 0.041 23.226 0.000 0.406 0.742

elc4 0.919 0.048 19.196 0.000 0.391 0.646

elc5 1.132 0.050 22.496 0.000 0.482 0.748

F10 =~

ee1 1.000 1.139 0.871

ee2 1.021 0.019 53.321 0.000 1.163 0.927

ee3 0.972 0.023 42.790 0.000 1.107 0.855

```

##      F11 =~
##      dp1          1.000          0.968      0.885
##      dp2          0.896      0.042      21.275      0.000      0.867      0.734
##      F12 =~
##      pa1          1.000          0.749      0.825
##      pa2          1.028      0.037      27.667      0.000      0.770      0.803
##      pa3          0.956      0.040      24.104      0.000      0.716      0.746
##
## Regressions:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      F8 ~
##      F5          0.363      0.053      6.836      0.000      0.782      0.782
##      F6         -0.121      0.027     -4.486      0.000     -0.382     -0.382
##      F7         -0.016      0.028     -0.557      0.578     -0.035     -0.035
##      F9 ~
##      F5         -0.082      0.033     -2.470      0.014     -0.141     -0.141
##      F2          0.164      0.030      5.433      0.000      0.297      0.297
##      F8         -0.251      0.049     -5.137      0.000     -0.201     -0.201
##      F10 ~
##      F2         -0.882      0.336     -2.624      0.009     -0.596     -0.596
##      F3          1.316      0.285      4.622      0.000      1.099      1.099
##      F4         -0.542      0.124     -4.378      0.000     -0.159     -0.159
##      F8         -0.897      0.110     -8.141      0.000     -0.268     -0.268
##      F11 ~
##      F2          0.176      0.051      3.467      0.001      0.140      0.140
##      F10         0.302      0.034      8.789      0.000      0.356      0.356
##      F4         -0.943      0.106     -8.911      0.000     -0.325     -0.325
##      F12 ~
##      F1          0.084      0.093      0.903      0.366      0.072      0.072
##      F8          0.398      0.093      4.284      0.000      0.181      0.181
##      F9         -0.211      0.060     -3.506      0.000     -0.120     -0.120
##      F10        -0.077      0.030     -2.559      0.010     -0.117     -0.117
##      F11        -0.211      0.033     -6.421      0.000     -0.273     -0.273
##      F5          0.490      0.076      6.463      0.000      0.479      0.479
##      F2          0.332      0.072      4.613      0.000      0.341      0.341
##
## Covariances:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      F1 ~~
##      F2          0.382      0.026     14.766      0.000      0.772      0.772
##      F3          0.401      0.028     14.253      0.000      0.657      0.657
##      F4         -0.065      0.008     -7.702      0.000     -0.300     -0.300
##      F5         -0.387      0.027    -14.396      0.000     -0.822     -0.822
##      F6         -0.383      0.030    -12.636      0.000     -0.555     -0.555
##      F7         -0.242      0.022    -10.933      0.000     -0.488     -0.488
##      F2 ~~
##      F3          0.678      0.035     19.322      0.000      0.927      0.927
##      F4         -0.082      0.011     -7.740      0.000     -0.318     -0.318
##      F5         -0.428      0.029    -14.635      0.000     -0.760     -0.760
##      F6         -0.444      0.033    -13.490      0.000     -0.537     -0.537
##      F7         -0.246      0.023    -10.587      0.000     -0.416     -0.416

```

```

##      F3 ~~
##      F4      -0.097    0.013   -7.393    0.000   -0.304   -0.304
##      F5      -0.494    0.032  -15.576    0.000   -0.711   -0.711
##      F6      -0.485    0.037  -13.133    0.000   -0.476   -0.476
##      F7      -0.270    0.027   -9.964    0.000   -0.369   -0.369
##      F4 ~~
##      F5      0.104    0.011    9.386    0.000    0.426    0.426
##      F6      0.121    0.014    8.844    0.000    0.337    0.337
##      F7      0.056    0.009    5.986    0.000    0.216    0.216
##      F5 ~~
##      F6      0.639    0.038   16.665    0.000    0.814    0.814
##      F7      0.381    0.027   13.866    0.000    0.675    0.675
##      F6 ~~
##      F7      0.393    0.032   12.314    0.000    0.475    0.475
##
## Intercepts:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      .rolea1    2.401   0.024   99.362   0.000    2.401    2.628
##      .rolea2    2.086   0.026   81.108   0.000    2.086    2.145
##      .dec2      4.242   0.035  120.842   0.000    4.242    3.196
##      .rolec1    3.015   0.029  103.524   0.000    3.015    2.738
##      .rolec2    3.018   0.033   92.468   0.000    3.018    2.445
##      .work1     3.240   0.032  101.996   0.000    3.240    2.697
##      .work2     2.243   0.029   77.885   0.000    2.243    2.060
##      .cclim1    2.964   0.014  207.379   0.000    2.964    5.484
##      .cclim2    2.723   0.017  163.890   0.000    2.723    4.334
##      .cclim3    2.928   0.013  224.532   0.000    2.928    5.938
##      .cclim4    3.053   0.019  157.758   0.000    3.053    4.172
##      .dec1      4.039   0.027  151.305   0.000    4.039    4.001
##      .ssup1     4.299   0.033  130.631   0.000    4.299    3.454
##      .ssup2     4.370   0.033  131.136   0.000    4.370    3.468
##      .psup1     4.571   0.026  179.200   0.000    4.571    4.739
##      .psup2     4.621   0.024  188.754   0.000    4.621    4.991
##      .self1     3.603   0.012  306.319   0.000    3.603    8.100
##      .self2     3.613   0.013  271.109   0.000    3.613    7.169
##      .self3     3.483   0.014  241.972   0.000    3.483    6.399
##      .elc1      2.918   0.016  176.985   0.000    2.918    4.682
##      .elc2      3.008   0.017  181.556   0.000    3.008    4.802
##      .elc3      2.801   0.014  193.300   0.000    2.801    5.113
##      .elc4      2.200   0.016  137.503   0.000    2.200    3.637
##      .elc5      2.483   0.017  145.731   0.000    2.483    3.855
##      .ee1       3.855   0.035  111.347   0.000    3.855    2.950
##      .ee2       3.530   0.033  106.201   0.000    3.530    2.814
##      .ee3       3.165   0.034   92.281   0.000    3.165    2.444
##      .dp1       2.319   0.029   80.113   0.000    2.319    2.121
##      .dp2       2.086   0.031   66.763   0.000    2.086    1.767
##      .pa1       5.748   0.024  238.172   0.000    5.748    6.328
##      .pa2       5.850   0.025  229.759   0.000    5.850    6.103
##      .pa3       5.815   0.025  228.188   0.000    5.815    6.058
##      F1         0.000         0.000    0.000    0.000    0.000    0.000
##      F2         0.000         0.000    0.000    0.000    0.000    0.000

```

##	F3	0.000			0.000	0.000
##	F4	0.000			0.000	0.000
##	F5	0.000			0.000	0.000
##	F6	0.000			0.000	0.000
##	F7	0.000			0.000	0.000
##	.F8	0.000			0.000	0.000
##	.F9	0.000			0.000	0.000
##	.F10	0.000			0.000	0.000
##	.F11	0.000			0.000	0.000
##	.F12	0.000			0.000	0.000
##						
##	Variances:					
##		Estimate	Std.Err	z-value	P(> z)	Std.lv Std.all
##	.rolea1	0.421	0.024	17.452	0.000	0.421 0.505
##	.rolea2	0.314	0.027	11.707	0.000	0.314 0.332
##	.dec2	0.585	0.033	17.859	0.000	0.585 0.332
##	.rolec1	0.622	0.029	21.733	0.000	0.622 0.513
##	.rolec2	0.573	0.037	15.350	0.000	0.573 0.376
##	.work1	0.539	0.033	16.262	0.000	0.539 0.373
##	.work2	0.717	0.036	19.950	0.000	0.717 0.604
##	.cclim1	0.181	0.008	22.703	0.000	0.181 0.618
##	.cclim2	0.150	0.010	15.044	0.000	0.150 0.380
##	.cclim3	0.140	0.007	19.343	0.000	0.140 0.578
##	.cclim4	0.339	0.015	22.089	0.000	0.339 0.634
##	.dec1	0.484	0.027	17.910	0.000	0.484 0.475
##	.ssup1	0.396	0.026	15.194	0.000	0.396 0.256
##	.ssup2	0.199	0.023	8.819	0.000	0.199 0.125
##	.psup1	0.337	0.027	12.258	0.000	0.337 0.362
##	.psup2	0.162	0.026	6.210	0.000	0.162 0.190
##	.self1	0.082	0.005	16.540	0.000	0.082 0.415
##	.self2	0.065	0.005	13.065	0.000	0.065 0.257
##	.self3	0.083	0.006	12.951	0.000	0.083 0.279
##	.elc1	0.207	0.010	20.920	0.000	0.207 0.534
##	.elc2	0.262	0.011	23.512	0.000	0.262 0.668
##	.elc3	0.135	0.007	18.272	0.000	0.135 0.450
##	.elc4	0.213	0.010	21.651	0.000	0.213 0.582
##	.elc5	0.183	0.010	18.582	0.000	0.183 0.441
##	.ee1	0.411	0.024	17.241	0.000	0.411 0.241
##	.ee2	0.222	0.019	11.758	0.000	0.222 0.141
##	.ee3	0.452	0.025	17.782	0.000	0.452 0.269
##	.dp1	0.258	0.043	5.984	0.000	0.258 0.216
##	.dp2	0.643	0.047	13.668	0.000	0.643 0.461
##	.pa1	0.264	0.021	12.413	0.000	0.264 0.320
##	.pa2	0.326	0.025	13.018	0.000	0.326 0.354
##	.pa3	0.408	0.023	17.418	0.000	0.408 0.443
##	F1	0.413	0.033	12.405	0.000	1.000 1.000
##	F2	0.591	0.042	14.150	0.000	1.000 1.000
##	F3	0.904	0.051	17.739	0.000	1.000 1.000
##	F4	0.111	0.010	10.844	0.000	1.000 1.000
##	F5	0.535	0.039	13.805	0.000	1.000 1.000
##	F6	1.153	0.061	19.009	0.000	1.000 1.000

```
##      F7      0.594    0.043   13.855    0.000    1.000    1.000
##      .F8      0.087    0.009   10.187    0.000    0.753    0.753
##      .F9      0.130    0.011   11.992    0.000    0.718    0.718
##      .F10     0.517    0.059    8.786    0.000    0.399    0.399
##      .F11     0.543    0.047   11.638    0.000    0.580    0.580
##      .F12     0.343    0.024   14.088    0.000    0.610    0.610
##
## R-Square:
##      Estimate
##      rolea1      0.495
##      rolea2      0.668
##      dec2        0.668
##      rolec1      0.487
##      rolec2      0.624
##      work1       0.627
##      work2       0.396
##      cclim1      0.382
##      cclim2      0.620
##      cclim3      0.422
##      cclim4      0.366
##      dec1        0.525
##      ssup1       0.744
##      ssup2       0.875
##      psup1       0.638
##      psup2       0.810
##      self1       0.585
##      self2       0.743
##      self3       0.721
##      elc1        0.466
##      elc2        0.332
##      elc3        0.550
##      elc4        0.418
##      elc5        0.559
##      ee1         0.759
##      ee2         0.859
##      ee3         0.731
##      dp1         0.784
##      dp2         0.539
##      pa1         0.680
##      pa2         0.646
##      pa3         0.557
##      F8          0.247
##      F9          0.282
##      F10         0.601
##      F11         0.420
##      F12         0.390
```

Request MIs

At this point, there isn't anything in the MIs that indicates we should make more modifications that

would be sensible for this model. We have two regression paths, however, that is non-significant ($F8 \sim F7$ and $F12 \sim F1$). We can delete them for parsimony.

```
modindices(fullsem7_fit,  
            sort = TRUE, # The sort argument allows us to sort the indices from largest  
            to smallest  
            op = "~") # The op argument lets us ask for specific MIs
```

##	lhs	op	rhs	mi	epc	sepc.lv	sepc.all	sepc.nox
## 1057	F8	~	F11	29.771	-0.075	-0.213	-0.213	-0.213
## 1078	F11	~	F8	22.293	-0.408	-0.143	-0.143	-0.143
## 1137	F3	~	F11	20.086	-0.188	-0.191	-0.191	-0.191
## 1084	F11	~	F3	18.434	-0.724	-0.711	-0.711	-0.711
## 1112	F7	~	F8	14.522	2.082	0.918	0.918	0.918
## 1090	F5	~	F8	12.694	-0.372	-0.173	-0.173	-0.173
## 1149	F4	~	F12	12.660	0.081	0.181	0.181	0.181
## 1146	F4	~	F9	12.283	-0.107	-0.136	-0.136	-0.136
## 1058	F8	~	F12	11.580	0.173	0.381	0.381	0.381
## 1069	F9	~	F4	8.592	-0.126	-0.099	-0.099	-0.099
## 1074	F10	~	F5	8.441	-0.292	-0.188	-0.188	-0.188
## 1126	F2	~	F11	7.563	0.082	0.103	0.103	0.103
## 1089	F12	~	F4	7.562	0.237	0.105	0.105	0.105
## 1075	F10	~	F6	7.182	-0.112	-0.106	-0.106	-0.106
## 1145	F4	~	F8	4.862	0.095	0.097	0.097	0.097
## 1101	F6	~	F8	4.732	1.052	0.333	0.333	0.333
## 1061	F8	~	F4	4.479	0.087	0.085	0.085	0.085
## 1066	F9	~	F6	4.126	0.053	0.134	0.134	0.134
## 1102	F6	~	F9	3.579	0.176	0.070	0.070	0.070
## 1158	F1	~	F10	3.352	-0.070	-0.124	-0.124	-0.124
## 1059	F8	~	F2	3.209	-0.073	-0.165	-0.165	-0.165
## 1138	F3	~	F12	2.963	0.097	0.076	0.076	0.076
## 1103	F6	~	F10	2.432	-0.086	-0.091	-0.091	-0.091
## 1081	F11	~	F5	2.352	-0.101	-0.076	-0.076	-0.076
## 1072	F10	~	F11	2.274	-0.140	-0.119	-0.119	-0.119
## 1082	F11	~	F6	2.260	-0.044	-0.049	-0.049	-0.049
## 1135	F3	~	F9	2.214	-0.085	-0.038	-0.038	-0.038
## 1091	F5	~	F9	2.132	0.092	0.053	0.053	0.053
## 1068	F9	~	F3	2.074	-0.079	-0.177	-0.177	-0.177
## 1083	F11	~	F7	2.026	-0.053	-0.042	-0.042	-0.042
## 1076	F10	~	F7	2.000	-0.076	-0.051	-0.051	-0.051
## 1124	F2	~	F9	1.869	0.066	0.037	0.037	0.037
## 1123	F2	~	F8	1.835	-0.095	-0.042	-0.042	-0.042
## 1060	F8	~	F3	1.739	-0.036	-0.100	-0.100	-0.100
## 1080	F11	~	F12	1.691	-0.102	-0.079	-0.079	-0.079
## 1113	F7	~	F9	1.627	-0.082	-0.045	-0.045	-0.045
## 1127	F2	~	F12	1.545	-0.057	-0.055	-0.055	-0.055
## 1079	F11	~	F9	1.527	0.089	0.039	0.039	0.039
## 1087	F12	~	F7	1.387	-0.053	-0.054	-0.054	-0.054
## 1085	F11	~	F1	1.349	0.096	0.064	0.064	0.064
## 1104	F6	~	F11	1.339	-0.041	-0.037	-0.037	-0.037
## 1056	F8	~	F10	1.263	-0.032	-0.106	-0.106	-0.106
## 1092	F5	~	F10	1.250	-0.042	-0.066	-0.066	-0.066
## 1070	F9	~	F1	1.106	0.050	0.076	0.076	0.076
## 1067	F9	~	F7	1.068	-0.025	-0.046	-0.046	-0.046
## 1115	F7	~	F11	0.866	-0.027	-0.034	-0.034	-0.034
## 1148	F4	~	F11	0.808	0.050	0.145	0.145	0.145
## 1064	F9	~	F11	0.685	0.012	0.028	0.028	0.028
## 1157	F1	~	F9	0.644	0.038	0.025	0.025	0.025
## 1136	F3	~	F10	0.635	-0.064	-0.077	-0.077	-0.077

```
## 1071 F10 ~ F9 0.634 -0.062 -0.023 -0.023 -0.023
## 1055 F8 ~ F9 0.598 0.103 0.129 0.129 0.129
## 1063 F9 ~ F10 0.460 -0.010 -0.026 -0.026 -0.026
## 1073 F10 ~ F12 0.314 0.065 0.043 0.043 0.043
## 1159 F1 ~ F11 0.260 -0.012 -0.018 -0.018 -0.018
## 1077 F10 ~ F1 0.194 0.073 0.041 0.041 0.041
## 1116 F7 ~ F12 0.178 -0.017 -0.017 -0.017 -0.017
## 1147 F4 ~ F10 0.164 -0.017 -0.059 -0.059 -0.059
## 1088 F12 ~ F3 0.136 -0.071 -0.090 -0.090 -0.090
## 1114 F7 ~ F10 0.127 -0.016 -0.023 -0.023 -0.023
## 1065 F9 ~ F12 0.126 -0.020 -0.035 -0.035 -0.035
## 1086 F12 ~ F6 0.119 -0.019 -0.027 -0.027 -0.027
## 1093 F5 ~ F11 0.118 -0.008 -0.011 -0.011 -0.011
## 1160 F1 ~ F12 0.084 0.020 0.023 0.023 0.023
## 1105 F6 ~ F12 0.038 -0.012 -0.009 -0.009 -0.009
## 1156 F1 ~ F8 0.021 0.011 0.006 0.006 0.006
## 1094 F5 ~ F12 0.002 -0.002 -0.002 -0.002 -0.002
## 1125 F2 ~ F10 0.001 0.001 0.002 0.002 0.002
## 1134 F3 ~ F8 0.000 0.002 0.001 0.001 0.001
## 1062 F8 ~ F1 0.000 0.000 0.000 0.000 0.000
```

Structural Model 8 (Final)

```
fullsem8 <- '
# Measurement Model
F1 =~ NA*rolea1 + rolea2 + dec2 #role ambiguity with DEC2 cross-loading
F2 =~ NA*rolec1 + rolec2 #role conflict
F3 =~ NA*work1 + work2 #work overload
F4 =~ NA*cclim1 + cclim2 + cclim3 + cclim4 #classroom climate
F5 =~ NA*dec1 + dec2 #decision-making
F6 =~ NA*ssup1 + ssup2 + dec2 #superior support with DEC2 cross-loading
F7 =~ NA*psup1 + psup2 #peer support
F8 =~ NA*self1 + self2 + self3 #self-esteem
F9 =~ NA*elc1 + elc2 + elc3 + elc4 + elc5 #external loc of control
F10 =~ NA*ee1 + ee2 + ee3 #emotional exhaustion
F11 =~ NA*dpl + dp2 #depersonalization
F12 =~ NA*pal + pa2 + pa3 #personal accomplishment

# Structural Model
F8 ~ F5 + F6 + 0*F7 # Deleting path from F7 to F8
F9 ~ F5 + F2 + F8 # Adding path from F2 to F9, and F8 to F9
F10 ~ F2 + F3 + F4 + F8 #Adding path from F8 to F10
F11 ~ F2 + F10 + F4 #Adding here path from F4 to F11
F12 ~ F8 + 0*F1 + F9 + F10 + F11 + F5 + F2
#Adding path from F5 to F12, and F2 to F12, deleting path from F1 to F12
'
```

Fit the Model

```
# Estimate the Model
fullsem8_fit <-
  sem(model = fullsem8,
      data = teachers,
      estimator = "MLM",
      meanstructure = TRUE,
      std.lv = TRUE
  )
```

Request the Output

```
summary(fullsem8_fit,
  fit.measures = TRUE,
  standardized = TRUE,
  rsquare = TRUE)
```

```

## lavaan 0.6-9 ended normally after 88 iterations
##
##      Estimator                      ML
##      Optimization method          NLMINB
##      Number of model parameters      137
##
##      Number of observations          1430
##
## Model Test User Model:
##
##              Standard      Robust
##      Test Statistic      1425.779    1268.075
##      Degrees of freedom           423          423
##      P-value (Chi-square)        0.000        0.000
##      Scaling correction factor          1.124
##      Satorra-Bentler correction
##
## Model Test Baseline Model:
##
##      Test statistic      23532.624    19072.057
##      Degrees of freedom           496          496
##      P-value              0.000        0.000
##      Scaling correction factor          1.234
##
## User Model versus Baseline Model:
##
##      Comparative Fit Index (CFI)      0.956      0.955
##      Tucker-Lewis Index (TLI)        0.949      0.947
##
##      Robust Comparative Fit Index (CFI)      0.959
##      Robust Tucker-Lewis Index (TLI)      0.951
##
## Loglikelihood and Information Criteria:
##
##      Loglikelihood user model (H0)      -47084.472    -47084.472
##      Loglikelihood unrestricted model (H1) -46371.583    -46371.583
##
##      Akaike (AIC)          94442.945    94442.945
##      Bayesian (BIC)         95164.309    95164.309
##      Sample-size adjusted Bayesian (BIC)  94729.107    94729.107
##
## Root Mean Square Error of Approximation:
##
##      RMSEA          0.041      0.037
##      90 Percent confidence interval - lower      0.038      0.035
##      90 Percent confidence interval - upper      0.043      0.040
##      P-value RMSEA <= 0.05      1.000      1.000
##
##      Robust RMSEA          0.040
##      90 Percent confidence interval - lower      0.037
##      90 Percent confidence interval - upper      0.042
##

```

```

## Standardized Root Mean Square Residual:
##
##      SRMR                      0.038          0.038
##
## Parameter Estimates:
##
##      Standard errors          Robust.sem
##      Information              Expected
##      Information saturated (h1) model    Structured
##
## Latent Variables:
##      Estimate  Std.Err  z-value  P(>|z|)  Std.lv  Std.all
## F1 =~
##   rolea1      0.644    0.026   24.851   0.000    0.644    0.704
##   rolea2      0.794    0.030   26.281   0.000    0.794    0.816
##   dec2        0.241    0.075    3.238   0.001    0.241    0.182
## F2 =~
##   rolec1      0.769    0.027   28.365   0.000    0.769    0.698
##   rolec2      0.973    0.030   32.854   0.000    0.973    0.789
## F3 =~
##   work1       0.952    0.027   35.551   0.000    0.952    0.792
##   work2       0.685    0.030   22.503   0.000    0.685    0.629
## F4 =~
##   cclim1      0.334    0.015   21.689   0.000    0.334    0.618
##   cclim2      0.495    0.016   31.571   0.000    0.495    0.787
##   cclim3      0.321    0.015   22.019   0.000    0.321    0.650
##   cclim4      0.443    0.022   20.590   0.000    0.443    0.605
## F5 =~
##   dec1        0.733    0.027   27.662   0.000    0.733    0.726
##   dec2        0.456    0.109    4.188   0.000    0.456    0.344
## F6 =~
##   ssup1       1.073    0.028   38.011   0.000    1.073    0.863
##   ssup2       1.179    0.027   44.086   0.000    1.179    0.935
##   dec2        0.835    0.064   13.045   0.000    0.835    0.629
## F7 =~
##   psup1       0.770    0.028   27.709   0.000    0.770    0.799
##   psup2       0.834    0.026   31.520   0.000    0.834    0.901
## F8 =~
##   self1       0.295    0.014   20.649   0.000    0.340    0.765
##   self2       0.377    0.015   25.549   0.000    0.434    0.862
##   self3       0.402    0.015   26.880   0.000    0.462    0.849
## F9 =~
##   elc1        0.360    0.015   23.973   0.000    0.425    0.683
##   elc2        0.306    0.016   19.620   0.000    0.361    0.576
##   elc3        0.344    0.013   26.483   0.000    0.406    0.742
##   elc4        0.331    0.014   23.069   0.000    0.391    0.646
##   elc5        0.408    0.014   28.766   0.000    0.482    0.748
## F10 =~
##   ee1         0.721    0.040   18.004   0.000    1.138    0.871
##   ee2         0.736    0.041   17.981   0.000    1.162    0.927
##   ee3         0.701    0.039   18.025   0.000    1.106    0.855

```

```

##      F11 =~
##      dp1          0.737    0.032   23.289    0.000    0.968    0.885
##      dp2          0.660    0.030   22.008    0.000    0.867    0.734
##      F12 =~
##      pa1          0.584    0.021   28.008    0.000    0.749    0.825
##      pa2          0.601    0.023   26.532    0.000    0.770    0.804
##      pa3          0.558    0.023   24.185    0.000    0.716    0.746
##
## Regressions:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      F8 ~
##      F5          0.861    0.095    9.047    0.000    0.748    0.748
##      F6         -0.428    0.089   -4.786    0.000   -0.371   -0.371
##      F7          0.000          0.000    0.000
##      F9 ~
##      F5         -0.164    0.067   -2.438    0.015   -0.139   -0.139
##      F2          0.353    0.065    5.392    0.000    0.299    0.299
##      F8         -0.206    0.039   -5.352    0.000   -0.201   -0.201
##      F10 ~
##      F2         -0.917    0.386   -2.377    0.017   -0.581   -0.581
##      F3          1.713    0.424    4.038    0.000    1.085    1.085
##      F4         -0.250    0.057   -4.375    0.000   -0.158   -0.158
##      F8         -0.370    0.047   -7.875    0.000   -0.270   -0.270
##      F11 ~
##      F2          0.184    0.053    3.443    0.001    0.140    0.140
##      F10         0.296    0.039    7.608    0.000    0.356    0.356
##      F4         -0.427    0.045   -9.512    0.000   -0.325   -0.325
##      F12 ~
##      F8          0.193    0.046    4.220    0.000    0.174    0.174
##      F1          0.000          0.000    0.000
##      F9         -0.131    0.038   -3.483    0.000   -0.120   -0.120
##      F10        -0.105    0.037   -2.847    0.004   -0.129   -0.129
##      F11        -0.269    0.041   -6.501    0.000   -0.275   -0.275
##      F5          0.574    0.083    6.928    0.000    0.448    0.448
##      F2          0.490    0.091    5.385    0.000    0.382    0.382
##
## Covariances:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      F1 ~~
##      F2          0.777    0.024   32.345    0.000    0.777    0.777
##      F3          0.657    0.029   22.347    0.000    0.657    0.657
##      F4         -0.302    0.033   -9.276    0.000   -0.302   -0.302
##      F5         -0.819    0.024  -33.545    0.000   -0.819   -0.819
##      F6         -0.555    0.029  -19.087    0.000   -0.555   -0.555
##      F7         -0.488    0.032  -15.153    0.000   -0.488   -0.488
##      F2 ~~
##      F3          0.926    0.019   48.327    0.000    0.926    0.926
##      F4         -0.317    0.034   -9.269    0.000   -0.317   -0.317
##      F5         -0.762    0.026  -29.723    0.000   -0.762   -0.762
##      F6         -0.537    0.026  -20.611    0.000   -0.537   -0.537
##      F7         -0.417    0.030  -13.736    0.000   -0.417   -0.417

```

```

##      F3 ~~
##      F4      -0.304    0.035   -8.765    0.000   -0.304   -0.304
##      F5      -0.710    0.029  -24.887    0.000   -0.710   -0.710
##      F6      -0.474    0.028  -16.748    0.000   -0.474   -0.474
##      F7      -0.368    0.031  -11.764    0.000   -0.368   -0.368
##      F4 ~~
##      F5      0.425    0.035   12.243    0.000    0.425    0.425
##      F6      0.337    0.030   11.118    0.000    0.337    0.337
##      F7      0.216    0.032    6.703    0.000    0.216    0.216
##      F5 ~~
##      F6      0.814    0.025   32.817    0.000    0.814    0.814
##      F7      0.667    0.028   23.843    0.000    0.667    0.667
##      F6 ~~
##      F7      0.475    0.030   15.584    0.000    0.475    0.475
##
## Intercepts:
##      Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##      .rolea1    2.401   0.024   99.362   0.000    2.401    2.628
##      .rolea2    2.086   0.026   81.108   0.000    2.086    2.145
##      .dec2      4.242   0.035  120.842   0.000    4.242    3.196
##      .rolec1    3.015   0.029  103.524   0.000    3.015    2.738
##      .rolec2    3.018   0.033   92.468   0.000    3.018    2.445
##      .work1     3.240   0.032  101.996   0.000    3.240    2.697
##      .work2     2.243   0.029   77.885   0.000    2.243    2.060
##      .cclim1    2.964   0.014  207.379   0.000    2.964    5.484
##      .cclim2    2.723   0.017  163.890   0.000    2.723    4.334
##      .cclim3    2.928   0.013  224.532   0.000    2.928    5.938
##      .cclim4    3.053   0.019  157.758   0.000    3.053    4.172
##      .dec1      4.039   0.027  151.305   0.000    4.039    4.001
##      .ssup1     4.299   0.033  130.631   0.000    4.299    3.454
##      .ssup2     4.370   0.033  131.136   0.000    4.370    3.468
##      .psup1     4.571   0.026  179.200   0.000    4.571    4.739
##      .psup2     4.621   0.024  188.754   0.000    4.621    4.991
##      .self1     3.603   0.012  306.319   0.000    3.603    8.100
##      .self2     3.613   0.013  271.109   0.000    3.613    7.169
##      .self3     3.483   0.014  241.972   0.000    3.483    6.399
##      .elc1      2.918   0.016  176.985   0.000    2.918    4.682
##      .elc2      3.008   0.017  181.556   0.000    3.008    4.802
##      .elc3      2.801   0.014  193.300   0.000    2.801    5.114
##      .elc4      2.200   0.016  137.503   0.000    2.200    3.637
##      .elc5      2.483   0.017  145.731   0.000    2.483    3.855
##      .ee1       3.855   0.035  111.347   0.000    3.855    2.951
##      .ee2       3.530   0.033  106.201   0.000    3.530    2.815
##      .ee3       3.165   0.034   92.281   0.000    3.165    2.445
##      .dp1       2.319   0.029   80.113   0.000    2.319    2.121
##      .dp2       2.086   0.031   66.763   0.000    2.086    1.767
##      .pa1       5.748   0.024  238.172   0.000    5.748    6.328
##      .pa2       5.850   0.025  229.759   0.000    5.850    6.103
##      .pa3       5.815   0.025  228.188   0.000    5.815    6.057
##      F1         0.000                0.000    0.000
##      F2         0.000                0.000    0.000

```


##	F3	0.000			0.000	0.000
##	F4	0.000			0.000	0.000
##	F5	0.000			0.000	0.000
##	F6	0.000			0.000	0.000
##	F7	0.000			0.000	0.000
##	.F8	0.000			0.000	0.000
##	.F9	0.000			0.000	0.000
##	.F10	0.000			0.000	0.000
##	.F11	0.000			0.000	0.000
##	.F12	0.000			0.000	0.000
##						
##	Variances:					
##		Estimate	Std.Err	z-value	P(> z)	Std.lv Std.all
##	.rolea1	0.421	0.024	17.397	0.000	0.421 0.504
##	.rolea2	0.316	0.027	11.794	0.000	0.316 0.334
##	.dec2	0.583	0.033	17.754	0.000	0.583 0.331
##	.rolec1	0.622	0.029	21.777	0.000	0.622 0.512
##	.rolec2	0.576	0.037	15.472	0.000	0.576 0.378
##	.work1	0.537	0.033	16.238	0.000	0.537 0.372
##	.work2	0.717	0.036	19.962	0.000	0.717 0.605
##	.cclim1	0.181	0.008	22.703	0.000	0.181 0.618
##	.cclim2	0.150	0.010	15.044	0.000	0.150 0.380
##	.cclim3	0.140	0.007	19.345	0.000	0.140 0.577
##	.cclim4	0.339	0.015	22.093	0.000	0.339 0.634
##	.dec1	0.481	0.027	17.704	0.000	0.481 0.473
##	.ssup1	0.396	0.026	15.194	0.000	0.396 0.256
##	.ssup2	0.199	0.023	8.788	0.000	0.199 0.125
##	.psup1	0.337	0.027	12.270	0.000	0.337 0.362
##	.psup2	0.162	0.026	6.163	0.000	0.162 0.189
##	.self1	0.082	0.005	16.528	0.000	0.082 0.415
##	.self2	0.065	0.005	13.060	0.000	0.065 0.257
##	.self3	0.083	0.006	12.942	0.000	0.083 0.279
##	.elc1	0.207	0.010	20.915	0.000	0.207 0.534
##	.elc2	0.262	0.011	23.511	0.000	0.262 0.669
##	.elc3	0.135	0.007	18.271	0.000	0.135 0.450
##	.elc4	0.213	0.010	21.653	0.000	0.213 0.582
##	.elc5	0.183	0.010	18.582	0.000	0.183 0.441
##	.ee1	0.411	0.024	17.240	0.000	0.411 0.241
##	.ee2	0.222	0.019	11.761	0.000	0.222 0.141
##	.ee3	0.452	0.025	17.784	0.000	0.452 0.270
##	.dp1	0.258	0.043	5.994	0.000	0.258 0.216
##	.dp2	0.642	0.047	13.668	0.000	0.642 0.461
##	.pa1	0.264	0.021	12.391	0.000	0.264 0.319
##	.pa2	0.325	0.025	13.009	0.000	0.325 0.354
##	.pa3	0.409	0.023	17.423	0.000	0.409 0.444
##	F1	1.000				1.000 1.000
##	F2	1.000				1.000 1.000
##	F3	1.000				1.000 1.000
##	F4	1.000				1.000 1.000
##	F5	1.000				1.000 1.000
##	F6	1.000				1.000 1.000

```
##      F7      1.000      1.000      1.000
##      .F8      1.000      0.755      0.755
##      .F9      1.000      0.718      0.718
##      .F10     1.000      0.401      0.401
##      .F11     1.000      0.580      0.580
##      .F12     1.000      0.608      0.608
##
## R-Square:
##      Estimate
##      rolea1      0.496
##      rolea2      0.666
##      dec2        0.669
##      rolec1      0.488
##      rolec2      0.622
##      work1       0.628
##      work2       0.395
##      cclim1      0.382
##      cclim2      0.620
##      cclim3      0.423
##      cclim4      0.366
##      dec1        0.527
##      ssup1       0.744
##      ssup2       0.875
##      psup1       0.638
##      psup2       0.811
##      self1       0.585
##      self2       0.743
##      self3       0.721
##      elc1        0.466
##      elc2        0.331
##      elc3        0.550
##      elc4        0.418
##      elc5        0.559
##      ee1         0.759
##      ee2         0.859
##      ee3         0.730
##      dp1         0.784
##      dp2         0.539
##      pa1         0.681
##      pa2         0.646
##      pa3         0.556
##      F8          0.245
##      F9          0.282
##      F10         0.599
##      F11         0.420
##      F12         0.392
```

Model Comparisons

In lavaan, you can do a scaled chi-square difference test by using the anova function. Note that

this must be the anova function from lavaan and not from other packages like stats, as the function is comparing lavaan objects.

```
lavaan::anova(  
  fullsem1_fit,  
  fullsem2_fit,  
  fullsem3_fit,  
  fullsem4_fit,  
  fullsem5_fit,  
  fullsem6_fit,  
  fullsem7_fit,  
  fullsem8_fit  
)
```

```
## Warning in lavTestLRT(object = object, ..., model.names = NAMES): lavaan WARNING:  
some restricted models fit better than less  
##   restricted models; either these models are not nested, or  
##   the less restricted model failed to reach a global optimum.
```

```
## Warning in lavTestLRT(object = object, ..., model.names = NAMES): lavaan  
## WARNING: some models have the same degrees of freedom
```

```
## Scaled Chi-Squared Difference Test (method = "satorra.bentler.2001")  
##  
## lavaan NOTE:  
##   The "Chisq" column contains standard test statistics, not the  
##   robust test that should be reported per model. A robust difference  
##   test is a function of two standard (not robust) statistics.  
##  
##           Df    AIC    BIC  Chisq Chisq diff Df diff Pr(>Chisq)  
## fullsem7_fit 421 94446 95177 1424.4  
## fullsem6_fit 422 94467 95193 1447.6      20.346      1 6.463e-06 ***  
## fullsem5_fit 423 94505 95226 1487.6      28.646      1 8.689e-08 ***  
## fullsem8_fit 423 94443 95164 1425.8     -61.831      0  
## fullsem4_fit 424 94542 95258 1526.8      67.119      1 2.557e-16 ***  
## fullsem3_fit 425 94584 95295 1571.0      45.295      1 1.695e-11 ***  
## fullsem2_fit 426 94632 95337 1620.4      49.394      1 2.094e-12 ***  
## fullsem1_fit 427 94746 95447 1737.1      58.820      1 1.728e-14 ***  
## ---  
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```