

BACS HW16

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prepare data set

```
sec = read.csv("/home/johnbjohn/Documents/git-repos/bacs-hw/hw16/security_data_sem.csv")
```

Question 1

a. Create a PLS path model using SEMinR

i. Create a measurement model

```
sec_mm <- constructs(  
  composite('TRUST', multi_items('TRST', 1:4)),  
  composite('SEC', multi_items('PSEC', 1:4)),  
  composite('REP', multi_items('PREP', 1:4)),  
  composite('INV', multi_items('PINV', 1:3)),  
  composite('POL', multi_items('PPSS', 1:3)),  
  composite('FAML', single_item('FAML1')),  
  interaction_term(iv='REP', moderator='POL', method=orthogonal)  
)
```

ii. Create a structural model

```
sec_sm <- relationships(  
  paths(from = c("REP", "INV", "POL", "FAML", "REP*POL"), to = "SEC"),  
  paths(from = "SEC", to = "TRUST")  
)
```

```
pls <- estimate_pls(  
  data = sec,  
  measurement_model = sec_mm,  
  structural_model = sec_sm  
)
```

```
## Generating the seminr model
```

```
## All 405 observations are valid.
```

```
pls_report <- summary(pls)
```

```
pls_report
```

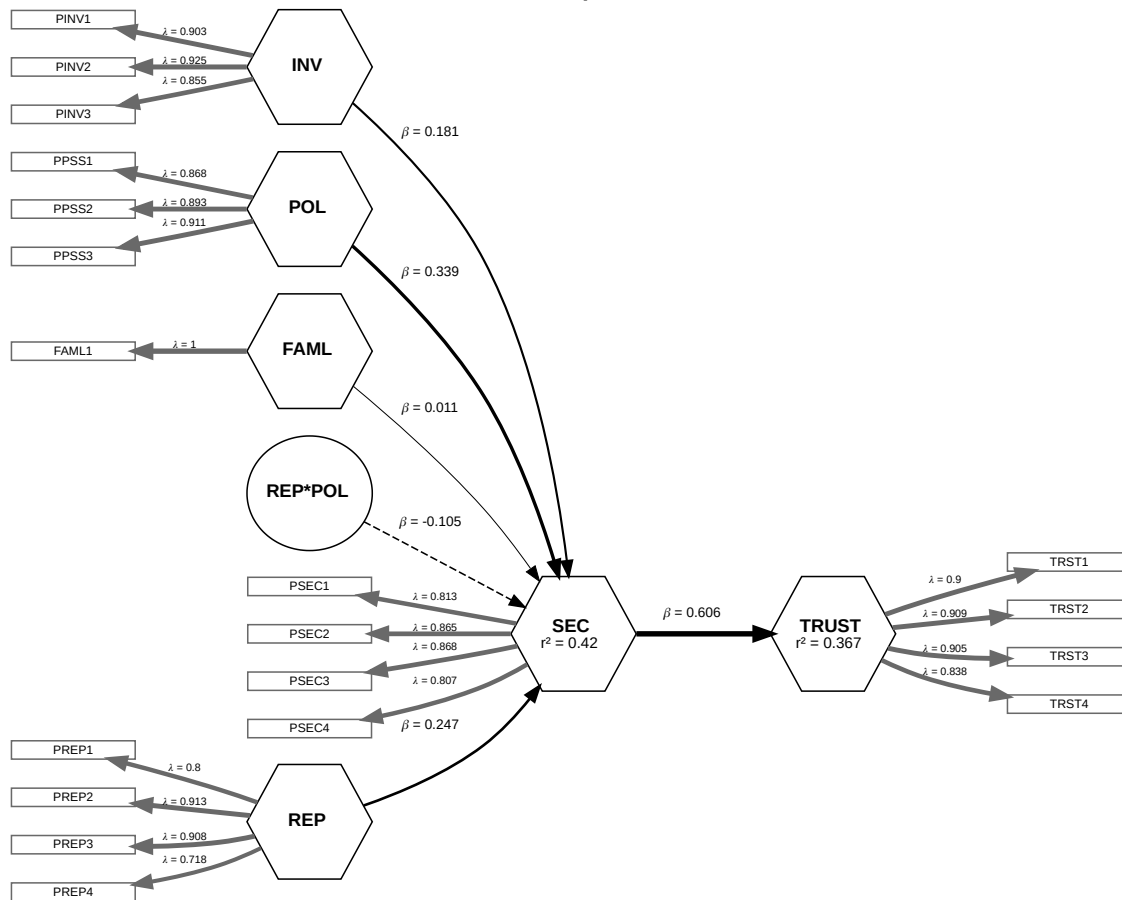
```
##
## Results from package seminr (2.1.0)
##
## Path Coefficients:
##          SEC TRUST
## R^2      0.420 0.367
## AdjR^2   0.412 0.365
## REP      0.247    .
## INV      0.181    .
## POL      0.339    .
## FAML      0.011    .
## REP*POL  -0.105    .
## SEC      . 0.606
##
## Reliability:
##      alpha rhoC  AVE rhoA
## REP    0.857 0.904 0.704 0.882
## INV    0.875 0.923 0.801 0.879
## POL    0.870 0.920 0.794 0.872
## FAML    1.000 1.000 1.000 1.000
## REP*POL 0.938 0.853 0.352 1.000
## SEC    0.859 0.905 0.704 0.862
## TRUST   0.911 0.937 0.789 0.911
##
## Alpha, rhoC, and rhoA should exceed 0.7 while AVE should exceed 0.5
```

b. Show the results in table format

i. plot a figure of the estimated model

```
plot(pls, title="PLS plot")
```

PLS plot



ii. Weights and loadings of composites

Weight of composites

```
pls_report$weights
```

##	REP	INV	POL	FAML	REP*POL	SEC	TRUST
## TRST1	0.000	0.000	0.000	0.000	0.000	0.000	0.282
## TRST2	0.000	0.000	0.000	0.000	0.000	0.000	0.280
## TRST3	0.000	0.000	0.000	0.000	0.000	0.000	0.286
## TRST4	0.000	0.000	0.000	0.000	0.000	0.000	0.278
## PSEC1	0.000	0.000	0.000	0.000	0.000	0.277	0.000
## PSEC2	0.000	0.000	0.000	0.000	0.000	0.315	0.000
## PSEC3	0.000	0.000	0.000	0.000	0.000	0.307	0.000
## PSEC4	0.000	0.000	0.000	0.000	0.000	0.292	0.000
## PREP1	0.215	0.000	0.000	0.000	0.000	0.000	0.000
## PREP2	0.334	0.000	0.000	0.000	0.000	0.000	0.000
## PREP3	0.349	0.000	0.000	0.000	0.000	0.000	0.000
## PREP4	0.287	0.000	0.000	0.000	0.000	0.000	0.000
## PINV1	0.000	0.363	0.000	0.000	0.000	0.000	0.000
## PINV2	0.000	0.395	0.000	0.000	0.000	0.000	0.000
## PINV3	0.000	0.358	0.000	0.000	0.000	0.000	0.000
## PPSS1	0.000	0.000	0.360	0.000	0.000	0.000	0.000
## PPSS2	0.000	0.000	0.395	0.000	0.000	0.000	0.000
## PPSS3	0.000	0.000	0.367	0.000	0.000	0.000	0.000
## FAML1	0.000	0.000	0.000	1.000	0.000	0.000	0.000
## PREP1*PPSS1	0.000	0.000	0.000	0.000	0.239	0.000	0.000
## PREP1*PPSS2	0.000	0.000	0.000	0.000	0.031	0.000	0.000
## PREP1*PPSS3	0.000	0.000	0.000	0.000	0.021	0.000	0.000
## PREP2*PPSS1	0.000	0.000	0.000	0.000	0.046	0.000	0.000
## PREP2*PPSS2	0.000	0.000	0.000	0.000	-0.104	0.000	0.000
## PREP2*PPSS3	0.000	0.000	0.000	0.000	-0.228	0.000	0.000
## PREP3*PPSS1	0.000	0.000	0.000	0.000	-0.341	0.000	0.000
## PREP3*PPSS2	0.000	0.000	0.000	0.000	0.095	0.000	0.000
## PREP3*PPSS3	0.000	0.000	0.000	0.000	0.108	0.000	0.000
## PREP4*PPSS1	0.000	0.000	0.000	0.000	0.443	0.000	0.000
## PREP4*PPSS2	0.000	0.000	0.000	0.000	0.382	0.000	0.000
## PREP4*PPSS3	0.000	0.000	0.000	0.000	0.271	0.000	0.000

Loading of composites

```
pls_report$loadings
```

##	REP	INV	POL	FAML	REP*POL	SEC	TRUST
## TRST1	0.000	0.000	0.000	0.000	-0.000	0.000	0.900
## TRST2	0.000	0.000	0.000	0.000	-0.000	0.000	0.909
## TRST3	0.000	0.000	0.000	0.000	-0.000	0.000	0.905
## TRST4	0.000	0.000	0.000	0.000	-0.000	0.000	0.838
## PSEC1	0.000	0.000	0.000	0.000	-0.000	0.813	0.000
## PSEC2	0.000	0.000	0.000	0.000	-0.000	0.865	0.000
## PSEC3	0.000	0.000	0.000	0.000	-0.000	0.868	0.000
## PSEC4	0.000	0.000	0.000	0.000	-0.000	0.807	0.000
## PREP1	0.800	0.000	0.000	0.000	0.000	0.000	0.000
## PREP2	0.913	0.000	0.000	0.000	0.000	0.000	0.000
## PREP3	0.908	0.000	0.000	0.000	0.000	0.000	0.000
## PREP4	0.718	0.000	0.000	0.000	0.000	0.000	0.000
## PINV1	0.000	0.903	0.000	0.000	-0.000	0.000	0.000
## PINV2	0.000	0.925	0.000	0.000	-0.000	0.000	0.000
## PINV3	0.000	0.855	0.000	0.000	-0.000	0.000	0.000
## PPSS1	0.000	0.000	0.868	0.000	0.000	0.000	0.000
## PPSS2	0.000	0.000	0.893	0.000	0.000	0.000	0.000
## PPSS3	0.000	0.000	0.911	0.000	0.000	0.000	0.000
## FAML1	0.000	0.000	0.000	1.000	-0.000	0.000	0.000
## PREP1*PPSS1	-0.000	-0.000	-0.000	-0.000	0.581	-0.000	-0.000
## PREP1*PPSS2	-0.000	-0.000	0.000	-0.000	0.510	-0.000	-0.000
## PREP1*PPSS3	-0.000	-0.000	-0.000	-0.000	0.506	-0.000	-0.000
## PREP2*PPSS1	-0.000	-0.000	-0.000	-0.000	0.509	-0.000	-0.000
## PREP2*PPSS2	-0.000	-0.000	0.000	-0.000	0.421	0.000	0.000
## PREP2*PPSS3	-0.000	-0.000	-0.000	0.000	0.336	0.000	0.000
## PREP3*PPSS1	-0.000	-0.000	-0.000	0.000	0.236	0.000	0.000
## PREP3*PPSS2	-0.000	-0.000	0.000	-0.000	0.555	-0.000	-0.000
## PREP3*PPSS3	-0.000	-0.000	-0.000	0.000	0.466	-0.000	-0.000
## PREP4*PPSS1	0.000	-0.000	0.000	0.000	0.900	-0.000	-0.000
## PREP4*PPSS2	-0.000	-0.000	-0.000	-0.000	0.836	-0.000	0.000
## PREP4*PPSS3	0.000	-0.000	0.000	0.000	0.859	-0.000	0.000

iii. Regression coefficients of paths between factors

```
pls_report$paths
```

##	SEC	TRUST
## R^2	0.420	0.367
## AdjR^2	0.412	0.365
## REP	0.247	.
## INV	0.181	.
## POL	0.339	.
## FAML	0.011	.
## REP*POL	-0.105	.
## SEC	.	0.606

iv. Bootstrapped path coefficients: t-values, 95% CI

```
boot_pls <- bootstrap_model(pls, nboot=1000)
```

```
## Bootstrapping model using seminr...
```

```
## SEminR Model successfully bootstrapped
```

```
summary(boot_pls)
```

```

##
## Results from Bootstrap resamples: 1000
##
## Bootstrapped Structural Paths:
##
## Original Est. Bootstrap Mean Bootstrap SD T Stat. 2.5% CI
## REP -> SEC 0.247 0.245 0.058 4.224 0.126
## INV -> SEC 0.181 0.186 0.057 3.167 0.074
## POL -> SEC 0.339 0.342 0.055 6.106 0.231
## FAML -> SEC 0.011 0.009 0.058 0.182 -0.108
## REP*POL -> SEC -0.105 -0.016 0.127 -0.825 -0.198
## SEC -> TRUST 0.606 0.610 0.034 17.765 0.542
##
## 97.5% CI
## REP -> SEC 0.356
## INV -> SEC 0.295
## POL -> SEC 0.446
## FAML -> SEC 0.122
## REP*POL -> SEC 0.191
## SEC -> TRUST 0.676
##
## Bootstrapped Weights:
##
## Original Est. Bootstrap Mean Bootstrap SD T Stat.
## TRST1 -> TRUST 0.282 0.281 0.015 18.596
## TRST2 -> TRUST 0.280 0.280 0.015 18.600
## TRST3 -> TRUST 0.286 0.284 0.016 17.965
## TRST4 -> TRUST 0.278 0.278 0.020 13.663
## PSEC1 -> SEC 0.277 0.277 0.016 17.863
## PSEC2 -> SEC 0.315 0.315 0.018 17.635
## PSEC3 -> SEC 0.307 0.307 0.016 18.872
## PSEC4 -> SEC 0.292 0.291 0.018 16.213
## PREP1 -> REP 0.215 0.215 0.026 8.432
## PREP2 -> REP 0.334 0.334 0.018 18.739
## PREP3 -> REP 0.349 0.348 0.022 15.780
## PREP4 -> REP 0.287 0.287 0.025 11.365
## PINV1 -> INV 0.363 0.363 0.025 14.387
## PINV2 -> INV 0.395 0.395 0.025 15.770
## PINV3 -> INV 0.358 0.358 0.027 13.120
## PPSS1 -> POL 0.360 0.360 0.023 15.426
## PPSS2 -> POL 0.395 0.395 0.023 16.808
## PPSS3 -> POL 0.367 0.367 0.020 18.792
## FAML1 -> FAML 1.000 1.000 0.000 .
## PREP1*PPSS1 -> REP*POL 0.239 0.090 0.158 1.513
## PREP1*PPSS2 -> REP*POL 0.031 0.062 0.091 0.344
## PREP1*PPSS3 -> REP*POL 0.021 0.061 0.114 0.186
## PREP2*PPSS1 -> REP*POL 0.046 0.085 0.110 0.419
## PREP2*PPSS2 -> REP*POL -0.104 0.059 0.165 -0.633
## PREP2*PPSS3 -> REP*POL -0.228 0.050 0.238 -0.958
## PREP3*PPSS1 -> REP*POL -0.341 0.019 0.308 -1.106
## PREP3*PPSS2 -> REP*POL 0.095 0.093 0.140 0.680
## PREP3*PPSS3 -> REP*POL 0.108 0.095 0.134 0.812
## PREP4*PPSS1 -> REP*POL 0.443 0.104 0.288 1.540
## PREP4*PPSS2 -> REP*POL 0.382 0.099 0.272 1.407
## PREP4*PPSS3 -> REP*POL 0.271 0.085 0.189 1.436
##
## 2.5% CI 97.5% CI

```

##	TRST1	->	TRUST	0.252	0.311
##	TRST2	->	TRUST	0.250	0.309
##	TRST3	->	TRUST	0.256	0.316
##	TRST4	->	TRUST	0.238	0.318
##	PSEC1	->	SEC	0.249	0.308
##	PSEC2	->	SEC	0.280	0.350
##	PSEC3	->	SEC	0.278	0.341
##	PSEC4	->	SEC	0.255	0.327
##	PREP1	->	REP	0.162	0.261
##	PREP2	->	REP	0.301	0.371
##	PREP3	->	REP	0.305	0.391
##	PREP4	->	REP	0.238	0.337
##	PINV1	->	INV	0.313	0.413
##	PINV2	->	INV	0.346	0.444
##	PINV3	->	INV	0.305	0.417
##	PPSS1	->	POL	0.312	0.403
##	PPSS2	->	POL	0.355	0.449
##	PPSS3	->	POL	0.329	0.405
##	FAML1	->	FAML	1.000	1.000
##	PREP1*PPSS1	->	REP*POL	-0.225	0.372
##	PREP1*PPSS2	->	REP*POL	-0.165	0.224
##	PREP1*PPSS3	->	REP*POL	-0.205	0.256
##	PREP2*PPSS1	->	REP*POL	-0.163	0.283
##	PREP2*PPSS2	->	REP*POL	-0.291	0.369
##	PREP2*PPSS3	->	REP*POL	-0.415	0.448
##	PREP3*PPSS1	->	REP*POL	-0.579	0.672
##	PREP3*PPSS2	->	REP*POL	-0.245	0.342
##	PREP3*PPSS3	->	REP*POL	-0.195	0.355
##	PREP4*PPSS1	->	REP*POL	-0.469	0.561
##	PREP4*PPSS2	->	REP*POL	-0.428	0.593
##	PREP4*PPSS3	->	REP*POL	-0.301	0.406

##

Bootstrapped Loadings:

##		Original	Est.	Bootstrap Mean	Bootstrap SD	T Stat.
##	TRST1 -> TRUST	0.900		0.900	0.016	58.041
##	TRST2 -> TRUST	0.909		0.910	0.019	46.845
##	TRST3 -> TRUST	0.905		0.905	0.021	42.560
##	TRST4 -> TRUST	0.838		0.840	0.031	27.079
##	PSEC1 -> SEC	0.813		0.814	0.025	32.601
##	PSEC2 -> SEC	0.865		0.866	0.025	34.448
##	PSEC3 -> SEC	0.868		0.868	0.021	40.705
##	PSEC4 -> SEC	0.807		0.807	0.025	32.555
##	PREP1 -> REP	0.800		0.800	0.039	20.388
##	PREP2 -> REP	0.913		0.914	0.016	58.273
##	PREP3 -> REP	0.908		0.908	0.020	45.925
##	PREP4 -> REP	0.718		0.718	0.032	22.099
##	PINV1 -> INV	0.903		0.904	0.025	36.348
##	PINV2 -> INV	0.925		0.925	0.022	43.016
##	PINV3 -> INV	0.855		0.855	0.027	31.167
##	PPSS1 -> POL	0.868		0.867	0.024	35.705
##	PPSS2 -> POL	0.893		0.894	0.014	64.146
##	PPSS3 -> POL	0.911		0.911	0.016	56.224
##	FAML1 -> FAML	1.000		1.000	0.000	.
##	PREP1*PPSS1 -> REP*POL	0.581		0.577	0.268	2.169

##	PREP1*PPSS2	->	REP*POL	0.510	0.561	0.252	2.021
##	PREP1*PPSS3	->	REP*POL	0.506	0.573	0.272	1.859
##	PREP2*PPSS1	->	REP*POL	0.509	0.616	0.279	1.824
##	PREP2*PPSS2	->	REP*POL	0.421	0.587	0.292	1.439
##	PREP2*PPSS3	->	REP*POL	0.336	0.588	0.342	0.981
##	PREP3*PPSS1	->	REP*POL	0.236	0.500	0.335	0.703
##	PREP3*PPSS2	->	REP*POL	0.555	0.612	0.283	1.958
##	PREP3*PPSS3	->	REP*POL	0.466	0.593	0.302	1.543
##	PREP4*PPSS1	->	REP*POL	0.900	0.570	0.372	2.416
##	PREP4*PPSS2	->	REP*POL	0.836	0.492	0.362	2.311
##	PREP4*PPSS3	->	REP*POL	0.859	0.542	0.346	2.482
##				2.5% CI	97.5% CI		
##	TRST1	->	TRUST	0.867	0.927		
##	TRST2	->	TRUST	0.865	0.941		
##	TRST3	->	TRUST	0.857	0.938		
##	TRST4	->	TRUST	0.774	0.894		
##	PSEC1	->	SEC	0.761	0.859		
##	PSEC2	->	SEC	0.810	0.907		
##	PSEC3	->	SEC	0.824	0.905		
##	PSEC4	->	SEC	0.754	0.851		
##	PREP1	->	REP	0.717	0.866		
##	PREP2	->	REP	0.880	0.941		
##	PREP3	->	REP	0.864	0.939		
##	PREP4	->	REP	0.653	0.777		
##	PINV1	->	INV	0.847	0.943		
##	PINV2	->	INV	0.878	0.958		
##	PINV3	->	INV	0.793	0.899		
##	PPSS1	->	POL	0.814	0.905		
##	PPSS2	->	POL	0.866	0.919		
##	PPSS3	->	POL	0.873	0.936		
##	FAML1	->	FAML	1.000	1.000		
##	PREP1*PPSS1	->	REP*POL	-0.062	0.919		
##	PREP1*PPSS2	->	REP*POL	-0.042	0.879		
##	PREP1*PPSS3	->	REP*POL	-0.098	0.899		
##	PREP2*PPSS1	->	REP*POL	-0.120	0.942		
##	PREP2*PPSS2	->	REP*POL	-0.176	0.930		
##	PREP2*PPSS3	->	REP*POL	-0.314	0.976		
##	PREP3*PPSS1	->	REP*POL	-0.343	0.933		
##	PREP3*PPSS2	->	REP*POL	-0.106	0.942		
##	PREP3*PPSS3	->	REP*POL	-0.177	0.945		
##	PREP4*PPSS1	->	REP*POL	-0.302	0.982		
##	PREP4*PPSS2	->	REP*POL	-0.342	0.905		
##	PREP4*PPSS3	->	REP*POL	-0.288	0.937		
##							
##	Bootstrapped HTMT:						
##				Original Est.	Bootstrap Mean	Bootstrap SD	2.5% CI 97.5% CI
##	REP	->	INV	0.705	0.704	0.048	0.608 0.792
##	REP	->	POL	0.543	0.545	0.056	0.431 0.645
##	REP	->	FAML	0.599	0.600	0.052	0.500 0.701
##	REP	->	REP*POL	0.000	0.000	0.000	0.000 0.000
##	REP	->	SEC	0.595	0.595	0.043	0.512 0.678
##	REP	->	TRUST	0.682	0.683	0.043	0.600 0.765
##	INV	->	POL	0.498	0.498	0.057	0.385 0.601
##	INV	->	FAML	0.494	0.494	0.054	0.385 0.595

```
## INV -> REP*POL      0.085      0.106      0.034      0.054      0.181
## INV -> SEC          0.568      0.569      0.048      0.473      0.659
## INV -> TRUST        0.563      0.562      0.051      0.456      0.659
## POL -> FAML          0.596      0.597      0.050      0.492      0.684
## POL -> REP*POL       0.000      0.000      0.000      0.000      0.000
## POL -> SEC          0.622      0.623      0.052      0.514      0.716
## POL -> TRUST        0.458      0.461      0.061      0.335      0.569
## FAML -> REP*POL      0.046      0.064      0.023      0.031      0.125
## FAML -> SEC          0.455      0.455      0.050      0.354      0.551
## FAML -> TRUST        0.471      0.472      0.052      0.369      0.567
## REP*POL -> SEC       0.059      0.083      0.020      0.051      0.131
## REP*POL -> TRUST     0.044      0.072      0.017      0.045      0.110
## SEC -> TRUST         0.685      0.686      0.036      0.614      0.754
##
## Bootstrapped Total Paths:
##                               Original Est. Bootstrap Mean Bootstrap SD 2.5% CI 97.5% CI
## REP -> SEC                  0.247          0.245          0.058      0.126      0.356
## REP -> TRUST                0.150          0.149          0.038      0.077      0.222
## INV -> SEC                  0.181          0.186          0.057      0.074      0.295
## INV -> TRUST                0.109          0.114          0.036      0.043      0.180
## POL -> SEC                  0.339          0.342          0.055      0.231      0.446
## POL -> TRUST                0.205          0.209          0.036      0.137      0.275
## FAML -> SEC                 0.011          0.009          0.058     -0.108      0.122
## FAML -> TRUST               0.006          0.005          0.035     -0.063      0.076
## REP*POL -> SEC              -0.105         -0.016          0.127     -0.198      0.191
## REP*POL -> TRUST            -0.063         -0.009          0.078     -0.125      0.118
## SEC -> TRUST                0.606          0.610          0.034      0.542      0.676
```

Question 2

a. Create a common factor model using SEMinR

i. Respecify all the constructs using reflective() function

```
cfm_mm <- constructs(
  reflective('TRUST', multi_items('TRST', 1:4)),
  reflective('SEC', multi_items('PSEC', 1:4)),
  reflective('REP', multi_items('PREP', 1:4)),
  reflective('INV', multi_items('PINV', 1:3)),
  reflective('POL', multi_items('PPSS', 1:3)),
  reflective('FAML', single_item('FAML1')),
  interaction_term(iv='REP', moderator='POL', method=orthogonal)
)
```

ii. Use the same structural model as before

```
cfm_sm <- relationships(  
  paths(from = c("REP","INV","POL","FAML","REP*POL"), to = "SEC"),  
  paths(from = "SEC", to = "TRUST")  
)
```

b. Show the result

```
cfm_pls <- estimate_cbsem(  
  data = sec,  
  measurement_model = cfm_mm,  
  structural_model = cfm_sm  
)
```

```
## Generating the semnr model for CBSEM
```

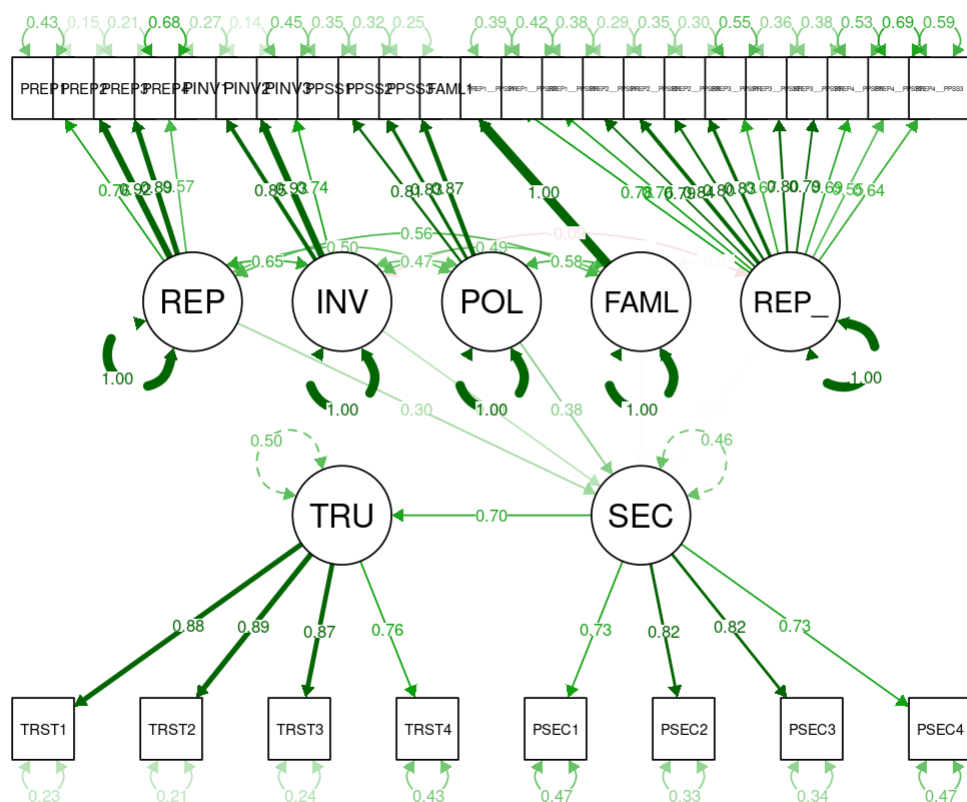
```
cfm_pls_report <- summary(cfm_pls)  
cfm_pls_report
```

```
##
## Results from package seminr (2.1.0)
## Estimation used package seminr (2.1.0)
##
## Fit metrics:
##      npar      fmin      pnfi      logl      aic      bic      ntotal
##      77.000    3.529    0.663 -17296.241  34746.482  35054.781  405.000
##      bic2      rmr      srmr      crmr      gfi      agfi      pgfi
##  34810.451    0.116    0.063    0.065    0.742    0.694    0.627
##      mfi      ecvi
##      0.049    7.439
##
##      metric      scaled robust
## cfi      0.764    0.772  0.799
## tli      0.738    0.747  0.777
## nnfi     0.738    0.747  0.777
## rni      0.764    0.772  0.799
## rmsea     0.120    0.072  0.107
## rmsea.ci.lower  0.116    0.069  0.100
## rmsea.ci.upper  0.124    0.075  0.114
## rmsea.pvalue   0.000    0.000    .
## chisq      2858.871 1303.538    .
## df         419.000  419.000    .
## pvalue      0.000    0.000    .
## baseline.chisq 10812.133 4340.588    .
## baseline.df    465.000  465.000    .
## baseline.pvalue 0.000    0.000    .
## rfi         0.707    0.667    .
## nfi         0.736    0.700    .
## ifi         0.765    0.774    .
##
## Reliability:
##      rhoC  AVE
## TRUST 0.91 0.72
## SEC   0.86 0.60
## REP   0.87 0.63
## INV   0.88 0.71
## POL   0.87 0.70
## FAML  1.00 1.00
##
## Path Coefficients:
##      SEC TRUST
## R^2    0.54 0.50
## REP    0.30    .
## INV    0.21    .
## POL    0.38    .
## FAML   -0.01    .
## REP_x_POL 0.01    .
## SEC     . 0.70
```

i. Plot the model

```
plot(cfm_pls, title="Common-Factor Models using CB-SEM")
```

```
## Plotting of lavaan models using semPlot.
```



```
## NULL
```

ii. Loadings of composites

```
cfm_pls_report$loadings
```

```
##          TRUST      SEC      REP      INV      POL  FAML
## TRST1 0.8800240      NA      NA      NA      NA   NA
## TRST2 0.8886342      NA      NA      NA      NA   NA
## TRST3 0.8690644      NA      NA      NA      NA   NA
## TRST4 0.7575988      NA      NA      NA      NA   NA
## PSEC1      NA 0.7308766      NA      NA      NA   NA
## PSEC2      NA 0.8173481      NA      NA      NA   NA
## PSEC3      NA 0.8151708      NA      NA      NA   NA
## PSEC4      NA 0.7260444      NA      NA      NA   NA
## PREP1      NA      NA 0.7551328      NA      NA   NA
## PREP2      NA      NA 0.9199208      NA      NA   NA
## PREP3      NA      NA 0.8871362      NA      NA   NA
## PREP4      NA      NA 0.5650059      NA      NA   NA
## PINV1      NA      NA      NA 0.8520004      NA   NA
## PINV2      NA      NA      NA 0.9257476      NA   NA
## PINV3      NA      NA      NA 0.7388750      NA   NA
## PPSS1      NA      NA      NA      NA 0.8051533   NA
## PPSS2      NA      NA      NA      NA 0.8272576   NA
## PPSS3      NA      NA      NA      NA 0.8674335   NA
## FAML1      NA      NA      NA      NA      NA    1
```

iii. Regression coefficients and P-values

```
cfm_pls_report$paths
```

```
## $coefficients
##          SEC      TRUST
## R^2      0.540381651 0.4951084
## REP      0.299536782      NA
## INV      0.214253245      NA
## POL      0.376401499      NA
## FAML     -0.008837653      NA
## REP_x_POL 0.008355287      NA
## SEC      NA 0.7036394
##
## $pvalues
##          SEC TRUST
## REP      3.817182e-05 NA
## INV      3.534482e-03 NA
## POL      4.380975e-09 NA
## FAML      8.996836e-01 NA
## REP_x_POL 8.516847e-01 NA
## SEC      NA      0
```