BACS - HW15

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Please download the data file security_data_sem.csv from Canvas – there might be differences in file from previous weeks. This file shows you results of a survey about website security.

We will create a model similar to the one we saw in class, with several important differences. We will have several new constructs, and also include a single-item construct.

```
data = read.csv("security_data_sem.csv")
```

Question 1) Composite Path Models using PLS-PM

a. Create a PLS path model using SEMinR, with all the following characteristics:

i. Measurement model – all constructs are measured as composites:

1. Trust in website (TRUST): items TRST1 - TRST4
2. Perceived security of website (SEC): items PSEC1 - PSEC4
3. Reputation of website (REP): items PREP1 - PREP4
4. Investment in website (INV): items PINV1 - PINV3
5. Perception of privacy policies (POL): items PPSS1 - PPSS3
6. Familiarity with website (FAML): item FAML1 (see the documentation of SEMinR for making single item constructs)
7. Interaction between REP and POL (use orthogonalized product terms)

```
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("REP", "POL", method=orthogonal)
)
```

ii. Structural Model – paths between constructs as shown in this causal model:

REP + INV + POL + FAML + (REP*POL) → SEC → TRUST

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

```
sec_pls = estimate_pls(data=data, measurement_model=sec_mm, structural_model=sec_sm)
```

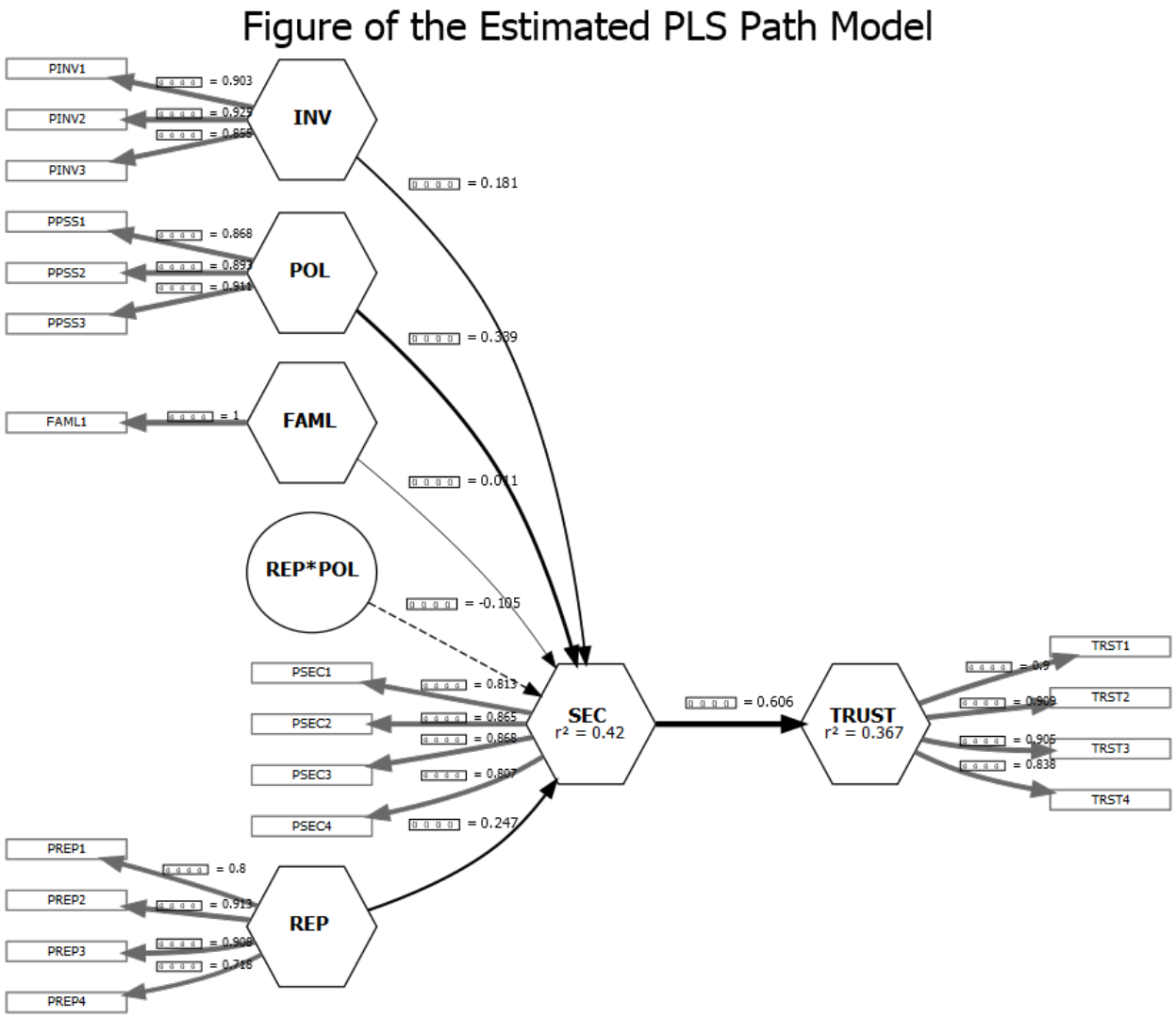
```
## Generating the seminr model
```

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

b. Show us the following results in table or figure formats:

i. Plot a figure of the estimated model

```
plot(sec_pls, title="Figure of the Estimated PLS Path Model")
```



ii. Weights and loadings of composites

```
summary(sec_pls)$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
```

```
summary(sec_pls)$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

```
summary(sec_pls)$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(sec_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          0.242        0.057   4.335   0.127
## INV  ->  SEC             0.181          0.187        0.057   3.154   0.072
## POL  ->  SEC             0.339          0.343        0.054   6.286   0.234
## FAML  ->  SEC            0.011          0.009        0.059   0.178  -0.105
```

```
## REP*POL  ->  SEC        -0.105         -0.016        0.124  -0.842  -0.196
## SEC  ->  TRUST           0.606          0.608        0.035  17.378   0.536
##                  97.5% CI
## REP  ->  SEC        0.349
## INV  ->  SEC        0.292
## POL  ->  SEC        0.445
## FAML  ->  SEC       0.134
## REP*POL  ->  SEC    0.188
## SEC  ->  TRUST      0.674
##
## Bootstrapped Weights:
##                          Original Est. Bootstrap Mean Bootstrap SD T Stat.
## TRST1  ->  TRUST                 0.282          0.282        0.015  18.540
## TRST2  ->  TRUST                 0.280          0.281        0.015  18.114
## TRST3  ->  TRUST                 0.286          0.284        0.016  17.860
## TRST4  ->  TRUST                 0.278          0.278        0.020  13.679
## PSEC1  ->  SEC                   0.277          0.277        0.015  18.508
## PSEC2  ->  SEC                   0.315          0.314        0.017  18.671
## PSEC3  ->  SEC                   0.307          0.308        0.016  19.577
## PSEC4  ->  SEC                   0.292          0.291        0.018  16.533
## PREP1  ->  REP                   0.215          0.213        0.027   7.970
## PREP2  ->  REP                   0.334          0.334        0.019  17.870
## PREP3  ->  REP                   0.349          0.351        0.023  15.426
## PREP4  ->  REP                   0.287          0.286        0.025  11.268
## PINV1  ->  INV                   0.363          0.363        0.025  14.525
## PINV2  ->  INV                   0.395          0.394        0.026  14.967
## PINV3  ->  INV                   0.358          0.358        0.028  12.822
## PPSS1  ->  POL                   0.360          0.360        0.022  16.046
## PPSS2  ->  POL                   0.395          0.395        0.023  16.970
## PPSS3  ->  POL                   0.367          0.367        0.018  20.955
## FAML1  ->  FAML                  1.000          1.000        0.000       .
## PREP1*PPSS1  ->  REP*POL         0.239          0.094        0.155   1.539
## PREP1*PPSS2  ->  REP*POL         0.031          0.069        0.089   0.350
## PREP1*PPSS3  ->  REP*POL         0.021          0.068        0.113   0.187
## PREP2*PPSS1  ->  REP*POL         0.046          0.078        0.107   0.431
## PREP2*PPSS2  ->  REP*POL        -0.104          0.051        0.156  -0.669
## PREP2*PPSS3  ->  REP*POL        -0.228          0.043        0.236  -0.966
## PREP3*PPSS1  ->  REP*POL        -0.341          0.011        0.307  -1.109
## PREP3*PPSS2  ->  REP*POL         0.095          0.089        0.148   0.641
## PREP3*PPSS3  ->  REP*POL         0.108          0.093        0.128   0.850
## PREP4*PPSS1  ->  REP*POL         0.443          0.126        0.275   1.613
## PREP4*PPSS2  ->  REP*POL         0.382          0.097        0.277   1.381
## PREP4*PPSS3  ->  REP*POL         0.271          0.098        0.184   1.478
##                          2.5% CI 97.5% CI
## TRST1  ->  TRUST           0.252    0.311
## TRST2  ->  TRUST           0.249    0.310
## TRST3  ->  TRUST           0.252    0.317
## TRST4  ->  TRUST           0.241    0.321
## PSEC1  ->  SEC             0.249    0.308
## PSEC2  ->  SEC             0.281    0.348
## PSEC3  ->  SEC             0.279    0.341
## PSEC4  ->  SEC             0.258    0.328
## PREP1  ->  REP             0.150    0.260
## PREP2  ->  REP             0.300    0.374
```

```
## PREP3  ->  REP             0.306    0.396
## PREP4  ->  REP             0.240    0.338
## PINV1  ->  INV             0.315    0.413
## PINV2  ->  INV             0.346    0.446
## PINV3  ->  INV             0.305    0.413
## PPSS1  ->  POL             0.313    0.402
## PPSS2  ->  POL             0.351    0.446
## PPSS3  ->  POL             0.330    0.401
## FAML1  ->  FAML            1.000    1.000
## PREP1*PPSS1  ->  REP*POL  -0.254    0.371
## PREP1*PPSS2  ->  REP*POL  -0.136    0.232
## PREP1*PPSS3  ->  REP*POL  -0.183    0.280
## PREP2*PPSS1  ->  REP*POL  -0.170    0.271
## PREP2*PPSS2  ->  REP*POL  -0.262    0.335
## PREP2*PPSS3  ->  REP*POL  -0.385    0.446
## PREP3*PPSS1  ->  REP*POL  -0.581    0.680
## PREP3*PPSS2  ->  REP*POL  -0.251    0.349
## PREP3*PPSS3  ->  REP*POL  -0.214    0.313
## PREP4*PPSS1  ->  REP*POL  -0.428    0.545
## PREP4*PPSS2  ->  REP*POL  -0.467    0.569
## PREP4*PPSS3  ->  REP*POL  -0.292    0.408
##
## Bootstrapped Loadings:
##                          Original Est. Bootstrap Mean Bootstrap SD T Stat.
## TRST1  ->  TRUST                 0.900          0.900        0.015  58.378
## TRST2  ->  TRUST                 0.909          0.909        0.021  43.800
## TRST3  ->  TRUST                 0.905          0.904        0.022  41.060
## TRST4  ->  TRUST                 0.838          0.840        0.032  26.443
## PSEC1  ->  SEC                   0.813          0.814        0.024  33.473
## PSEC2  ->  SEC                   0.865          0.866        0.025  35.091
## PSEC3  ->  SEC                   0.868          0.870        0.021  40.456
## PSEC4  ->  SEC                   0.807          0.807        0.025  31.808
## PREP1  ->  REP                   0.800          0.797        0.041  19.548
## PREP2  ->  REP                   0.913          0.913        0.016  55.752
## PREP3  ->  REP                   0.908          0.910        0.019  48.186
## PREP4  ->  REP                   0.718          0.717        0.033  21.986
## PINV1  ->  INV                   0.903          0.904        0.024  37.168
## PINV2  ->  INV                   0.925          0.925        0.022  42.540
## PINV3  ->  INV                   0.855          0.854        0.025  34.104
## PPSS1  ->  POL                   0.868          0.868        0.024  35.724
## PPSS2  ->  POL                   0.893          0.893        0.014  65.091
## PPSS3  ->  POL                   0.911          0.911        0.016  55.784
## FAML1  ->  FAML                  1.000          1.000        0.000       .
## PREP1*PPSS1  ->  REP*POL         0.581          0.584        0.264   2.200
## PREP1*PPSS2  ->  REP*POL         0.510          0.568        0.247   2.065
## PREP1*PPSS3  ->  REP*POL         0.506          0.582        0.263   1.925
## PREP2*PPSS1  ->  REP*POL         0.509          0.613        0.281   1.815
## PREP2*PPSS2  ->  REP*POL         0.421          0.578        0.290   1.450
## PREP2*PPSS3  ->  REP*POL         0.336          0.584        0.336   0.999
## PREP3*PPSS1  ->  REP*POL         0.236          0.496        0.343   0.687
## PREP3*PPSS2  ->  REP*POL         0.555          0.609        0.283   1.961
## PREP3*PPSS3  ->  REP*POL         0.466          0.594        0.294   1.586
## PREP4*PPSS1  ->  REP*POL         0.900          0.587        0.356   2.527
## PREP4*PPSS2  ->  REP*POL         0.836          0.501        0.358   2.335
```

```
## PREP4*PPSS3  ->  REP*POL         0.859          0.560        0.331   2.595
##                          2.5% CI 97.5% CI
## TRST1  ->  TRUST           0.867    0.926
## TRST2  ->  TRUST           0.864    0.943
## TRST3  ->  TRUST           0.853    0.938
## TRST4  ->  TRUST           0.766    0.894
## PSEC1  ->  SEC             0.765    0.861
## PSEC2  ->  SEC             0.809    0.907
## PSEC3  ->  SEC             0.824    0.908
## PSEC4  ->  SEC             0.755    0.851
## PREP1  ->  REP             0.706    0.870
## PREP2  ->  REP             0.877    0.940
## PREP3  ->  REP             0.869    0.939
## PREP4  ->  REP             0.648    0.775
## PINV1  ->  INV             0.852    0.943
## PINV2  ->  INV             0.878    0.958
## PINV3  ->  INV             0.803    0.900
## PPSS1  ->  POL             0.815    0.906
## PPSS2  ->  POL             0.864    0.918
## PPSS3  ->  POL             0.874    0.938
## FAML1  ->  FAML            1.000    1.000
## PREP1*PPSS1  ->  REP*POL  -0.055    0.924
## PREP1*PPSS2  ->  REP*POL  -0.060    0.880
## PREP1*PPSS3  ->  REP*POL  -0.079    0.899
## PREP2*PPSS1  ->  REP*POL  -0.161    0.948
## PREP2*PPSS2  ->  REP*POL  -0.184    0.931
## PREP2*PPSS3  ->  REP*POL  -0.291    0.973
## PREP3*PPSS1  ->  REP*POL  -0.372    0.924
## PREP3*PPSS2  ->  REP*POL  -0.111    0.937
## PREP3*PPSS3  ->  REP*POL  -0.172    0.941
## PREP4*PPSS1  ->  REP*POL  -0.295    0.988
## PREP4*PPSS2  ->  REP*POL  -0.388    0.917
## PREP4*PPSS3  ->  REP*POL  -0.256    0.942
##
## Bootstrapped HTMT:
##                    Original Est. Bootstrap Mean Bootstrap SD 2.5% CI 97.5% CI
## REP  ->  INV               0.705          0.703        0.050   0.600    0.794
## REP  ->  POL               0.543          0.544        0.053   0.434    0.644
## REP  ->  FAML              0.599          0.602        0.052   0.492    0.700
## REP  ->  REP*POL           0.000          0.000        0.000   0.000    0.000
## REP  ->  SEC               0.595          0.593        0.044   0.503    0.672
## REP  ->  TRUST             0.682          0.682        0.042   0.595    0.764
## INV  ->  POL               0.498          0.496        0.055   0.389    0.603
## INV  ->  FAML              0.494          0.493        0.056   0.384    0.607
## INV  ->  REP*POL           0.085          0.105        0.033   0.056    0.180
## INV  ->  SEC               0.568          0.567        0.048   0.465    0.655
## INV  ->  TRUST             0.563          0.561        0.051   0.460    0.654
## POL  ->  FAML              0.596          0.593        0.052   0.488    0.688
## POL  ->  REP*POL           0.000          0.000        0.000   0.000    0.000
## POL  ->  SEC               0.622          0.622        0.050   0.521    0.716
## POL  ->  TRUST             0.458          0.460        0.057   0.339    0.564
## FAML  ->  REP*POL          0.046          0.065        0.025   0.032    0.123
## FAML  ->  SEC              0.455          0.453        0.053   0.345    0.555
## FAML  ->  TRUST            0.471          0.472        0.052   0.367    0.572
```

```
## REP*POL  ->  SEC           0.059          0.082        0.020   0.049    0.125
## REP*POL  ->  TRUST         0.044          0.072        0.017   0.043    0.112
## SEC  ->  TRUST             0.685          0.685        0.037   0.609    0.754
##
## Bootstrapped Total Paths:
##                     Original Est. Bootstrap Mean Bootstrap SD 2.5% CI 97.5% CI
## REP  ->  SEC               0.247          0.242        0.057   0.127    0.349
## REP  ->  TRUST             0.150          0.148        0.037   0.078    0.220
## INV  ->  SEC               0.181          0.187        0.057   0.072    0.292
## INV  ->  TRUST             0.109          0.114        0.036   0.047    0.182
## POL  ->  SEC               0.339          0.343        0.054   0.234    0.445
## POL  ->  TRUST             0.205          0.209        0.035   0.138    0.277
## FAML  ->  SEC              0.011          0.009        0.059  -0.105    0.134
## FAML  ->  TRUST            0.006          0.005        0.036  -0.063    0.080
## REP*POL  ->  SEC          -0.105         -0.016        0.124  -0.196    0.188
## REP*POL  ->  TRUST        -0.063         -0.010        0.076  -0.119    0.117
## SEC  ->  TRUST             0.606          0.608        0.035   0.536    0.674
```

Question 2) Common-Factor Models using CB-SEM

a. Create a common factor model using SEMinR, with the following characteristics:

i. Either respecify all the constructs as being reflective(), or use the as.reflective() function to convert your earlier measurement model to being entirely reflective.

ii. Use the same structural model as before (you can just reuse it again!)

```
sec_cf_mm = constructs(
  as.reflective(composite("TRUST", multi_items("TRST", 1:4))),
  as.reflective(composite("SEC", multi_items("PSEC", 1:4))),
  as.reflective(composite("REP", multi_items("PREP", 1:4))),
  as.reflective(composite("INV", multi_items("PINV", 1:3))),
  as.reflective(composite("POL", multi_items("PPSS", 1:3))),
  as.reflective(composite("FAML", single_item("FAML1"))),
  as.reflective(interaction_term("REP", "POL", method=orthogonal))
)
```

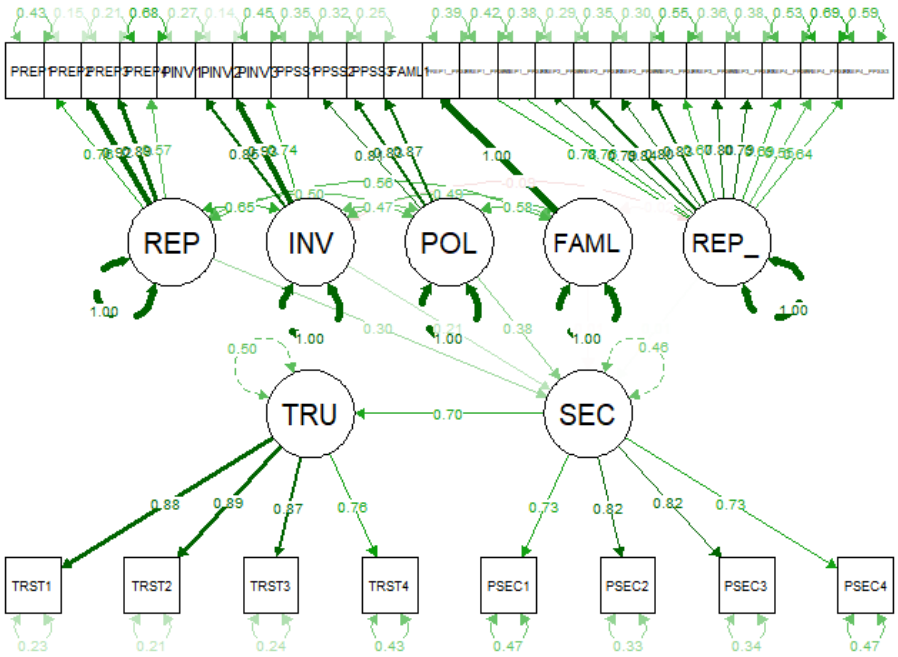
```
sec_cf_pls = estimate_cbsem(data=data, measurement_model=sec_cf_mm, structural_model=sec_sm)
```

```
## Generating the seminr model for CBSEM
```

b. Show us the following results in table or figure formats

i. Plot a figure of the estimated model (it will look different from your PLS model!)

```
plot(sec_cf_pls, title="Figure of the Estimated Common Factor Model")
```



ii. Loadings of composites

```
summary(sec_cf_pls)$loadings
```

```
## $coefficients
##            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
##
## $significance
##                          Std Estimate         SE      t-Value   2.5% CI
## TRUST -> TRST1              0.8800240 0.02272091 0.000000e+00 0.8354919
```

```
## TRUST -> TRST2                0.8886342 0.03330783 0.000000e+00 0.8233521
## TRUST -> TRST3                0.8690644 0.03749444 0.000000e+00 0.7955767
## TRUST -> TRST4                0.7575988 0.04846748 0.000000e+00 0.6626042
## SEC -> PSEC1                  0.7308766 0.03679205 0.000000e+00 0.6587655
## SEC -> PSEC2                  0.8173481 0.04480183 0.000000e+00 0.7295381
## SEC -> PSEC3                  0.8151708 0.03728082 0.000000e+00 0.7421017
## SEC -> PSEC4                  0.7260444 0.03811841 0.000000e+00 0.6513337
## REP -> PREP1                  0.7551328 0.04464916 0.000000e+00 0.6676220
## REP -> PREP2                  0.9199208 0.02635333 0.000000e+00 0.8682692
## REP -> PREP3                  0.8871362 0.04015103 0.000000e+00 0.8084416
## REP -> PREP4                  0.5650059 0.04585583 0.000000e+00 0.4751302
## INV -> PINV1                  0.8520004 0.04489927 0.000000e+00 0.7639994
## INV -> PINV2                  0.9257476 0.04556425 0.000000e+00 0.8364433
## INV -> PINV3                  0.7388750 0.04511601 0.000000e+00 0.6504492
## POL -> PPSS1                  0.8051533 0.04355300 0.000000e+00 0.7197910
## POL -> PPSS2                  0.8272576 0.02807169 0.000000e+00 0.7722381
## POL -> PPSS3                  0.8674335 0.03273664 0.000000e+00 0.8032708
## FAML -> FAML1                 1.0000000 0.00000000           NA 1.0000000
## REP_x_POL -> PREP1_x_PPSS1    0.7781584 0.05799871 0.000000e+00 0.6644831
## REP_x_POL -> PREP1_x_PPSS2    0.7597768 0.05931838 0.000000e+00 0.6435149
## REP_x_POL -> PREP1_x_PPSS3    0.7879106 0.05013554 0.000000e+00 0.6896467
## REP_x_POL -> PREP2_x_PPSS1    0.8447368 0.03649041 0.000000e+00 0.7732169
## REP_x_POL -> PREP2_x_PPSS2    0.8034561 0.03639411 0.000000e+00 0.7321250
## REP_x_POL -> PREP2_x_PPSS3    0.8342444 0.03536430 0.000000e+00 0.7649317
## REP_x_POL -> PREP3_x_PPSS1    0.6736451 0.12948899 1.967998e-07 0.4198514
## REP_x_POL -> PREP3_x_PPSS2    0.8011944 0.03780427 0.000000e+00 0.7270994
## REP_x_POL -> PREP3_x_PPSS3    0.7902063 0.06416741 0.000000e+00 0.6644405
## REP_x_POL -> PREP4_x_PPSS1    0.6854770 0.06906812 0.000000e+00 0.5501059
## REP_x_POL -> PREP4_x_PPSS2    0.5531922 0.06212434 0.000000e+00 0.4314307
## REP_x_POL -> PREP4_x_PPSS3    0.6405843 0.05794028 0.000000e+00 0.5270235
##                              97.5% CI
## TRUST -> TRST1              0.9245562
## TRUST -> TRST2              0.9539164
## TRUST -> TRST3              0.9425522
## TRUST -> TRST4              0.8525933
## SEC -> PSEC1                0.8029877
## SEC -> PSEC2                0.9051581
## SEC -> PSEC3                0.8882399
## SEC -> PSEC4                0.8007551
## REP -> PREP1                0.8426435
## REP -> PREP2                0.9715724
## REP -> PREP3                0.9658307
## REP -> PREP4                0.6548817
## INV -> PINV1                0.9400013
## INV -> PINV2                1.0150518
## INV -> PINV3                0.8273007
## POL -> PPSS1                0.8905156
## POL -> PPSS2                0.8822771
## POL -> PPSS3                0.9315961
## FAML -> FAML1               1.0000000
## REP_x_POL -> PREP1_x_PPSS1 0.8918338
## REP_x_POL -> PREP1_x_PPSS2 0.8760387
## REP_x_POL -> PREP1_x_PPSS3 0.8861744
## REP_x_POL -> PREP2_x_PPSS1 0.9162567
```

```
## REP_x_POL -> PREP2_x_PPSS2 0.8747873
## REP_x_POL -> PREP2_x_PPSS3 0.9035572
## REP_x_POL -> PREP3_x_PPSS1 0.9274389
## REP_x_POL -> PREP3_x_PPSS2 0.8752894
## REP_x_POL -> PREP3_x_PPSS3 0.9159721
## REP_x_POL -> PREP4_x_PPSS1 0.8208480
## REP_x_POL -> PREP4_x_PPSS2 0.6749536
## REP_x_POL -> PREP4_x_PPSS3 0.7541452
```

iii. Regression coefficients of paths between factors, and their p-values

```
summary(sec_cf_pls)$paths$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
```

```
summary(sec_cf_pls)$paths$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
```