Fiche de modélisations n°6

Variables et classes latentes

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Table des matières

1 Objectif

L'objectif de cette sixième série de modèles est de ...

2 Analyses

TODO

3 Code et résultats

```
#chargement des packages
library(knitr)
library(dplyr) #manipuler les bases de données
library(psych) #EFA
library(lavaan) #CFA et SEM
library(semPlot) #path draw CFA SEM
library(poLCA) #pour les Latent Categorical Variables
library(ade4) #pour la fonction s5 de plot des classes de CAH
```

```
library(RColorBrewer) #palettes de couleur
library(ggplot2) #graphiques corrplot
library(tidyr) #pour pivot_longer / wider
library(tibble) #pour rownames_to_column
```

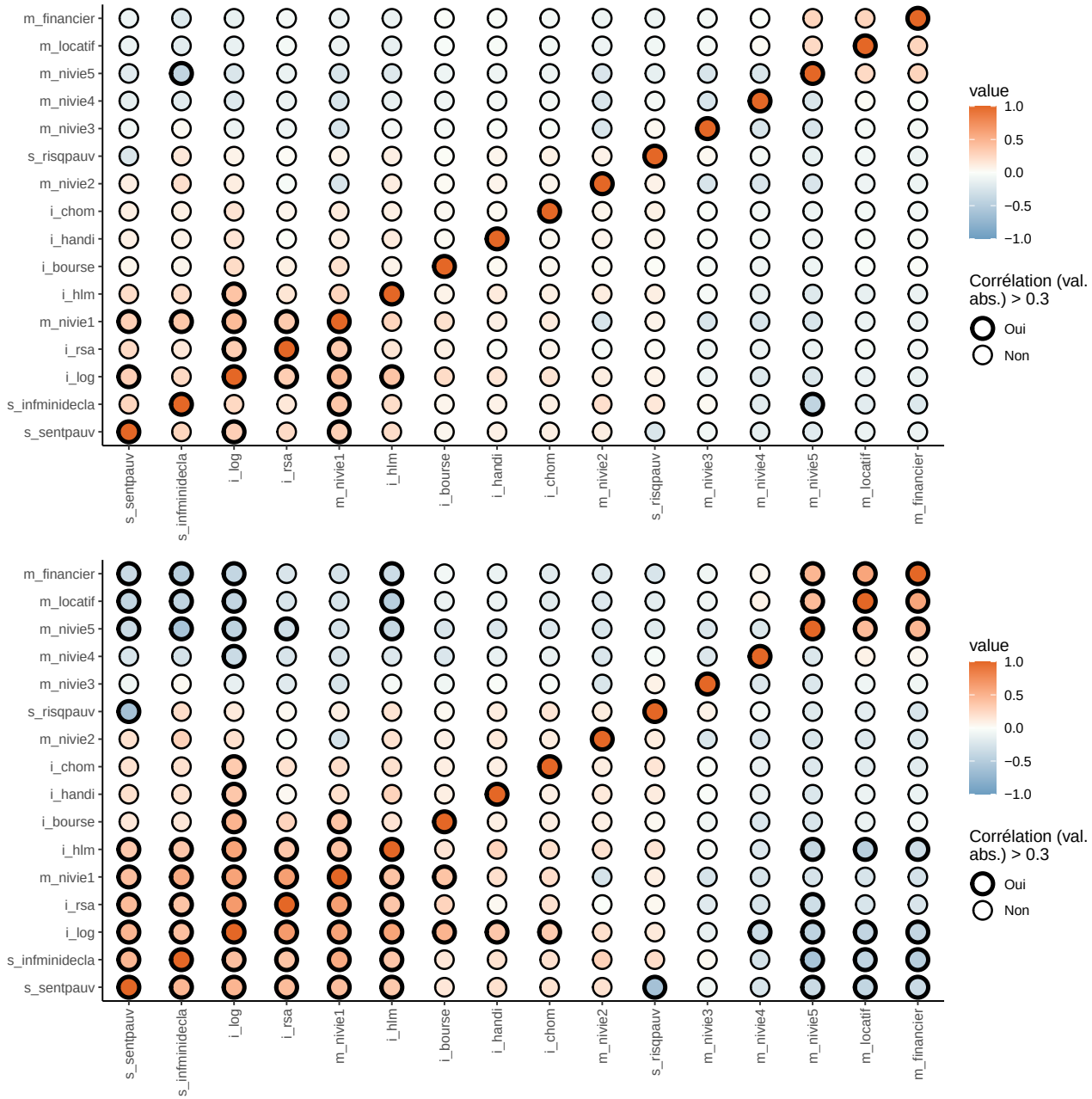
3.1 Correlation coefficients

A correlation coefficient suited for dichotomous data and based on this underlying normal strategy is the tetrachoric correlation. It gives us a single number describing the degree of dependence in the table above with the extreme values of 1 if the off-diagonals are 0 and -1 if the diagonals are 0. In addition, we get estimates for the thresholds tau1 and tau2. polycholoric existe aussi pour deux items polytomous.

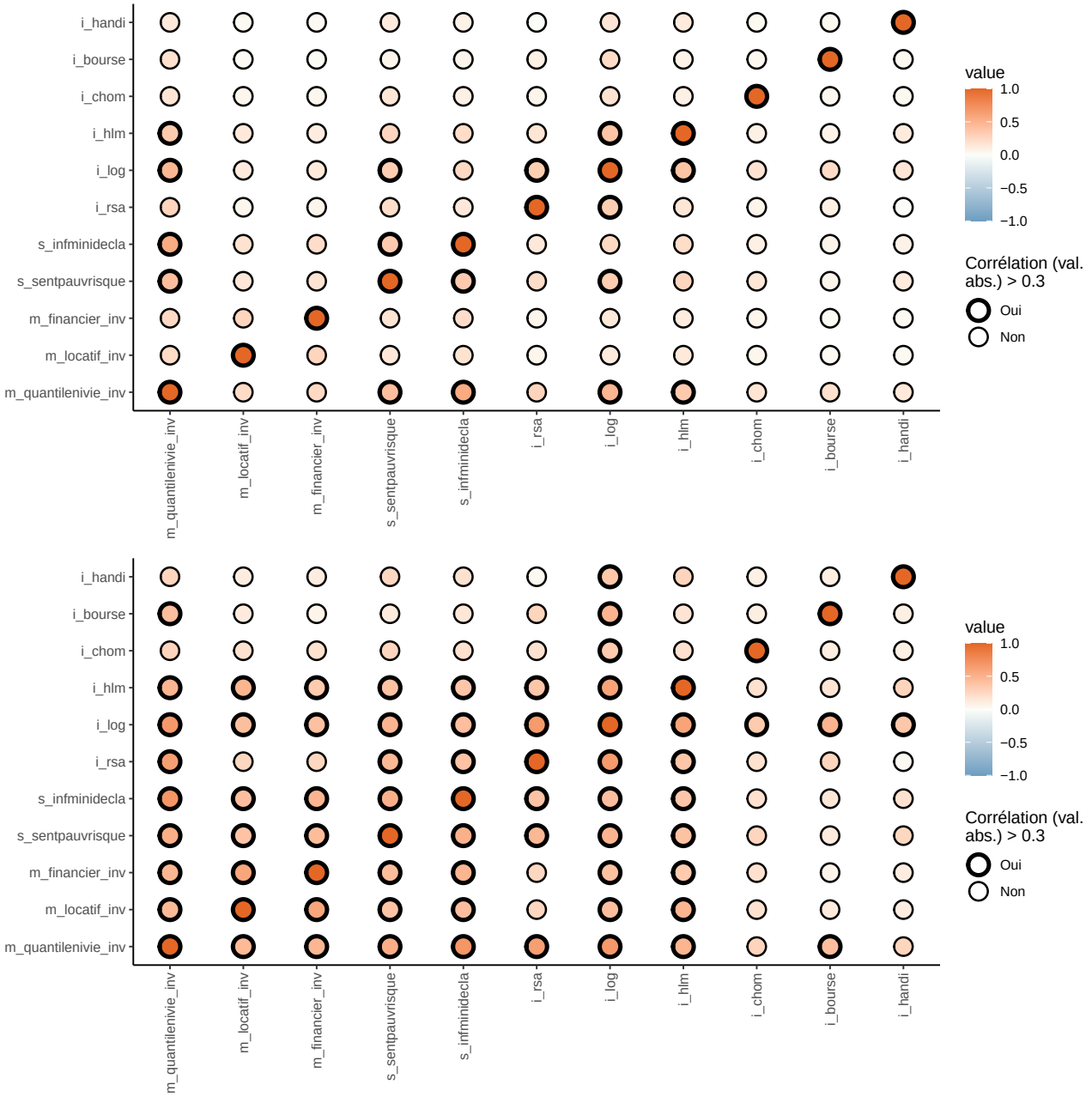
We print out the last six eigenvalues and see that the last eigenvalue is negative. Thus, this matrix does not fulfill the properties of a correlation matrix. The trick is now to apply some smoothing on the correlations.

The final criterion is interpretability.

3.1.1 Indicatrices



3.1.2 Variables catégorielles (plus de 2 modalités possibles)

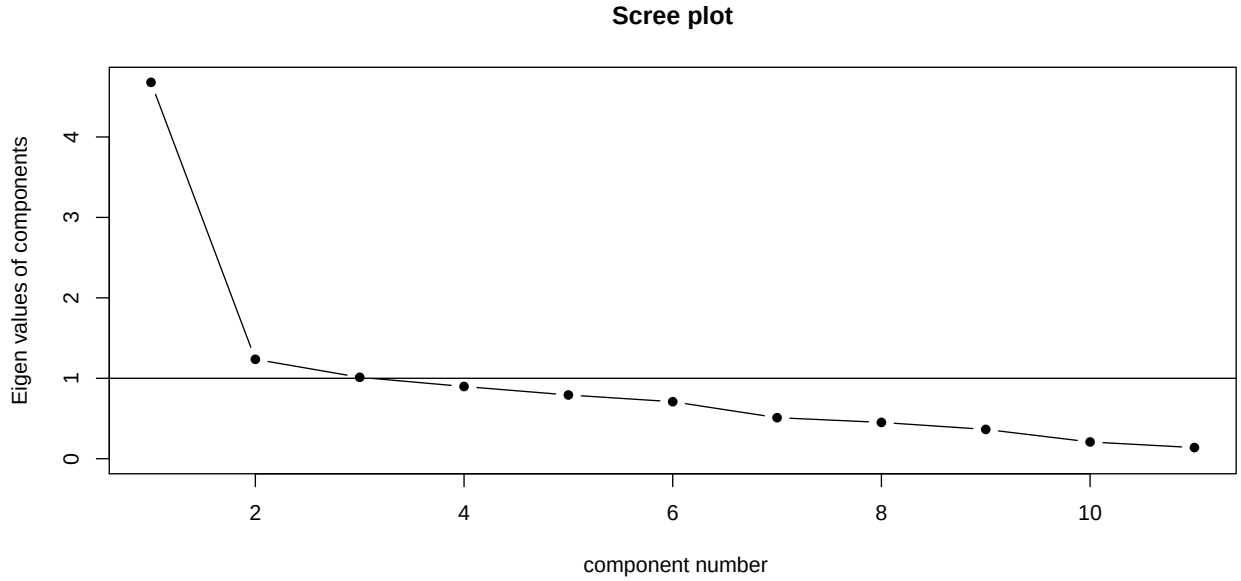


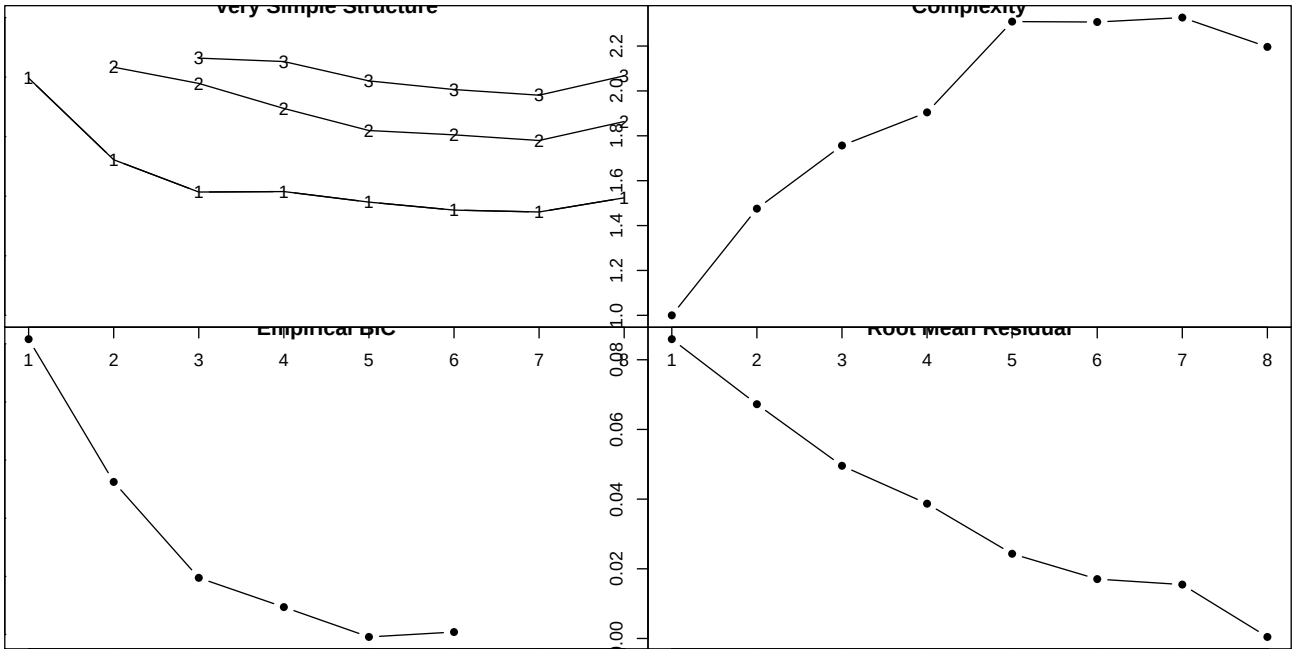
3.2 Exploratory Factor Analysis (EFA)

However, in order to get an even clearer picture, in EFA we typically apply a rotation on the loadings matrix. Such a rotation does not change the fit of the model; it is only done for interpretation purposes by transforming the loadings. We distinguish between two basic types of rotations: orthogonal (qui implique que les facteurs sont indépendants) and nonorthogonal rotation (comme oblimin).

In practice, EFA with oblique rotation is often used prior to a CFA in order to explore whether the underlying latent structure theory is reflected by the data.

```
 [1] 42.54 11.24  9.20  8.16  7.20  6.44  4.64  4.10  3.31  1.90  1.26
```






```
$scores
NULL

$weights
                          ML2          ML1
s_sentpauvrisque     0.124328013 2.101368e-03
s_infminidecla       0.381013391 3.394757e-06
m_quantilenivie_inv  0.334620586 6.776220e-03
m_locatif_inv        0.102441677 1.342346e-03
m_financier_inv      0.126410549 1.068562e-03
i_log               -0.006909332 9.819798e-01
i_rsa                0.059356859 5.200322e-03
```

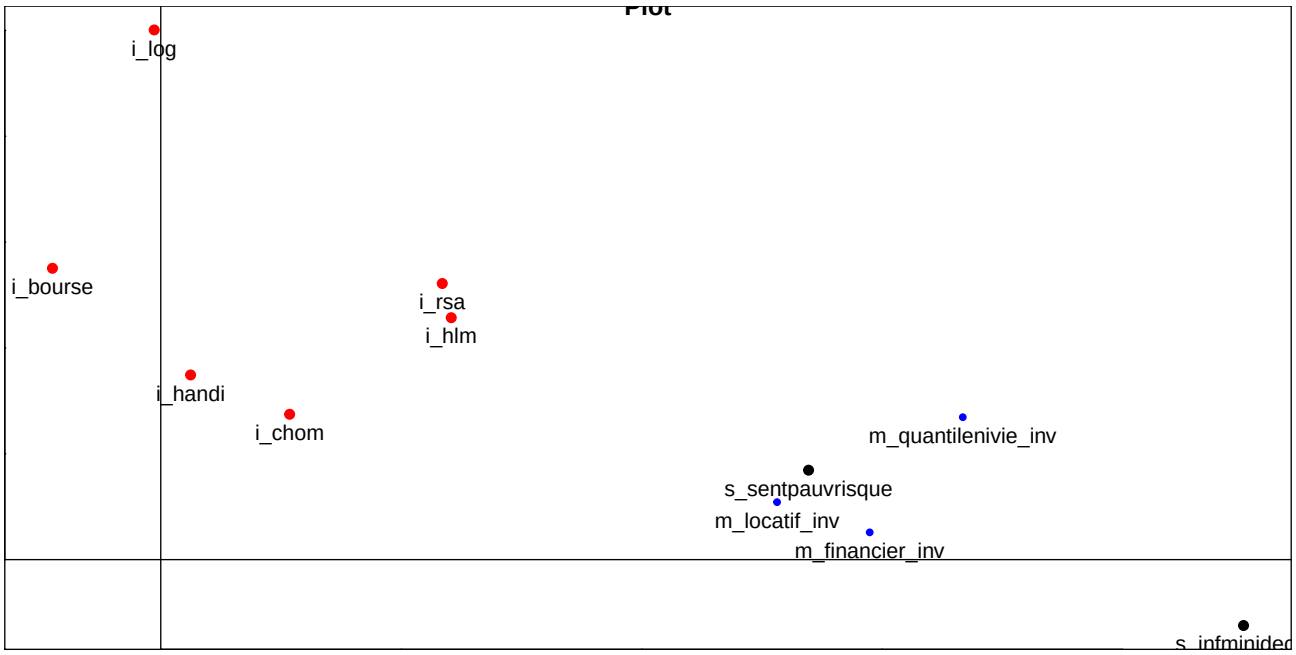
```
i_chom               0.016238551 1.620456e-03
i_handi              0.004025149 1.995196e-03
i_bourse            -0.015258729 3.523381e-03
i_hlm                0.053560993 4.032462e-03

$r.scores
          ML2       ML1
ML2 1.0000000 0.6577487
ML1 0.6577487 1.0000000

$R2
      ML2       ML1
0.8689771 0.9950905
```

```
Factor analysis with Call: fa(r = bdd_poLCA_poly$rho, nfactors = 2, rotate = "oblimin",
    scores = "regression", missing = TRUE, impute = "median",
    fm = "ml", cor = "poly")

Test of the hypothesis that 2 factors are sufficient.
The degrees of freedom for the model is 34  and the objective function was  0.81

The root mean square of the residuals (RMSA) is  0.07
The df corrected root mean square of the residuals is  0.09

 With factor correlations of
     ML2  ML1
ML2 1.00 0.61
ML1 0.61 1.00
```

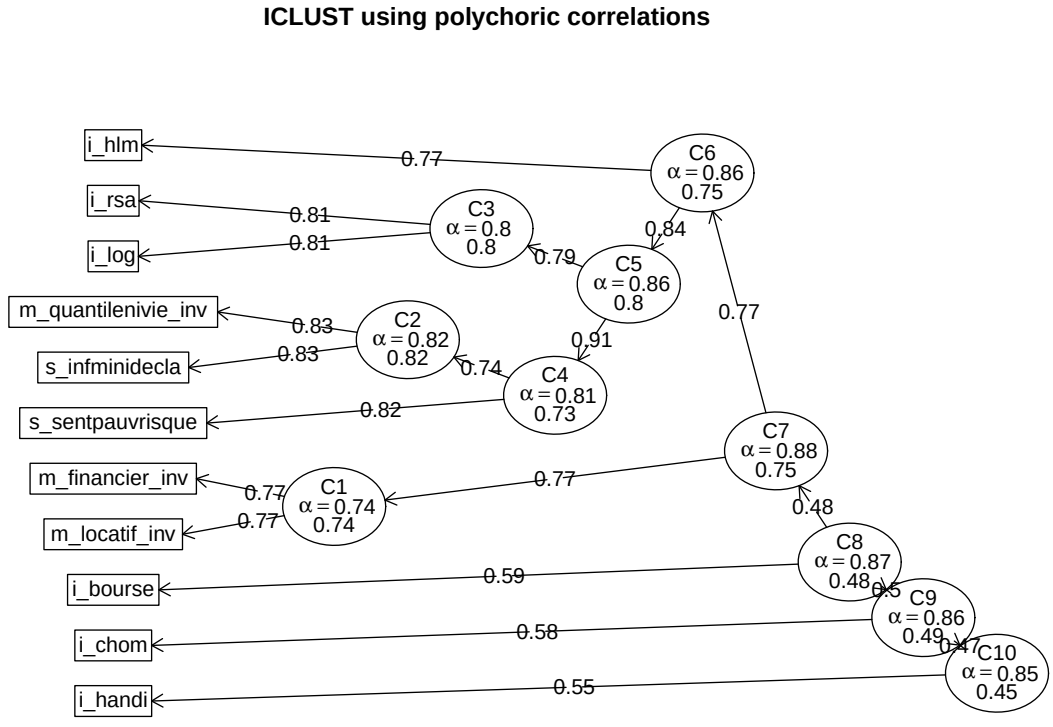
```
Loadings:
                     ML2    ML1
s_sentpauvrisque     0.539
s_infminidecla       0.901
m_quantilenivie_inv  0.668
m_locatif_inv        0.513
m_financier_inv      0.590
i_log                       1.001
i_rsa                       0.522
i_chom
i_handi                     0.349
i_bourse                    0.550
i_hlm                       0.457

                 ML2   ML1
SS loadings    2.294 2.114
Proportion Var 0.209 0.192
Cumulative Var 0.209 0.401
```

```
   s_sentpauvrisque      s_infminidecla m_quantilenivie_inv       m_locatif_inv
               0.43                0.69                0.74                0.34
```

```
m_financier_inv                i_log                i_rsa                i_chom
           0.39                 1.00                 0.48                 0.12
      i_handi            i_bourse             i_hlm
           0.13                 0.25                 0.40
```



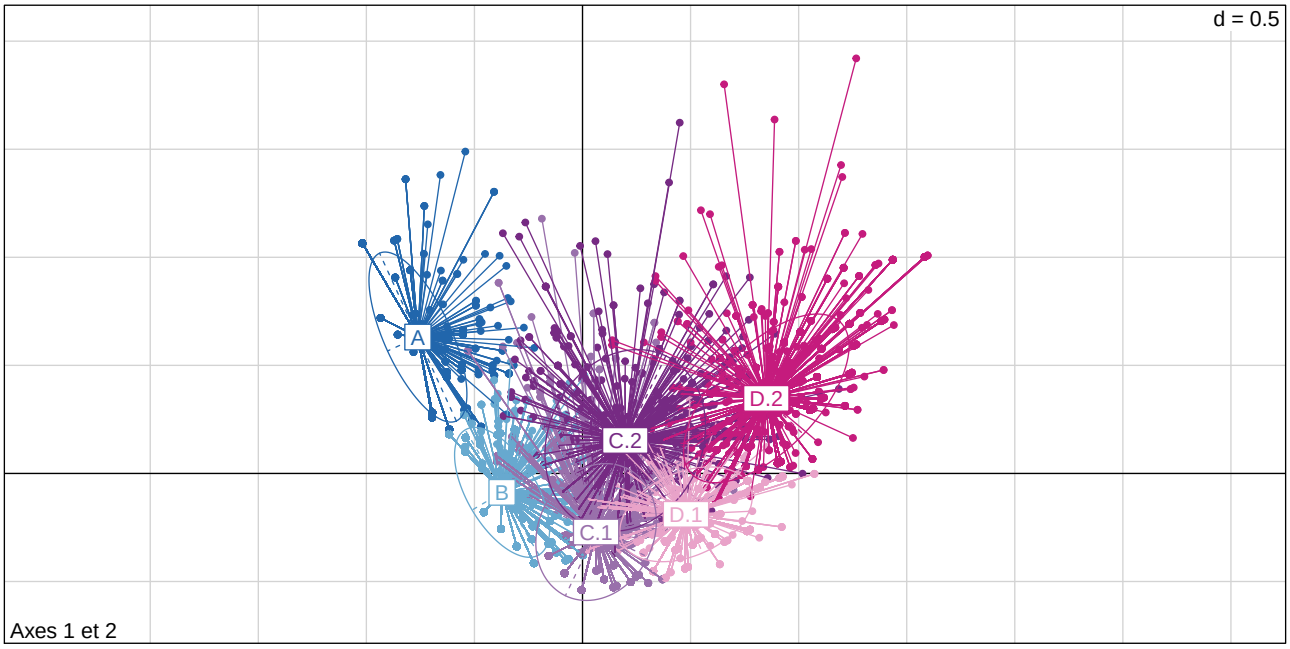
Premier type de clustering (de variables et non d'individus) avec iclust



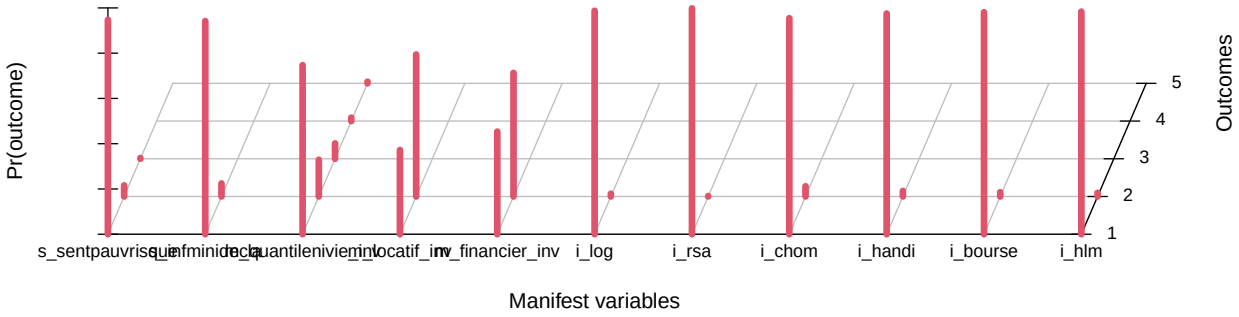
3.3 Latent Categorical Variables

Source : https://m-clark.github.io/sem/mixture-models.html

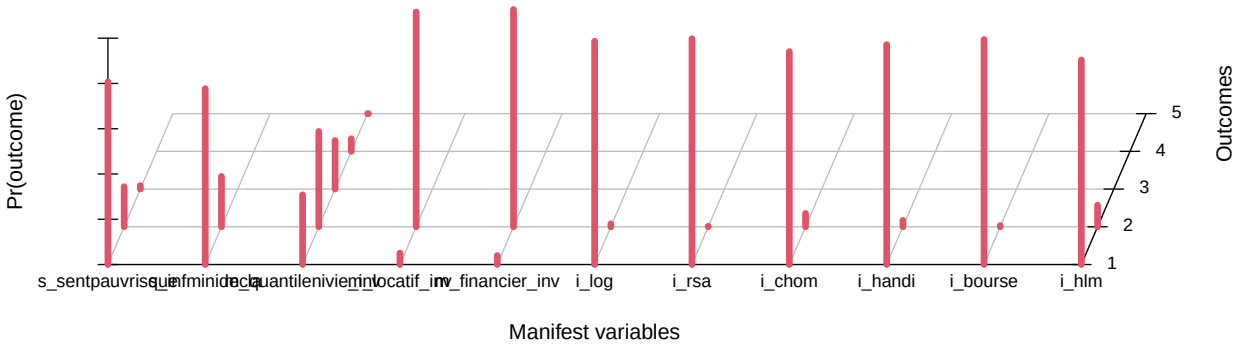
Documentation https://raw.githubusercontent.com/dlinzer/poLCA/master/inst/doc/poLCA-manual-1-4.pdf



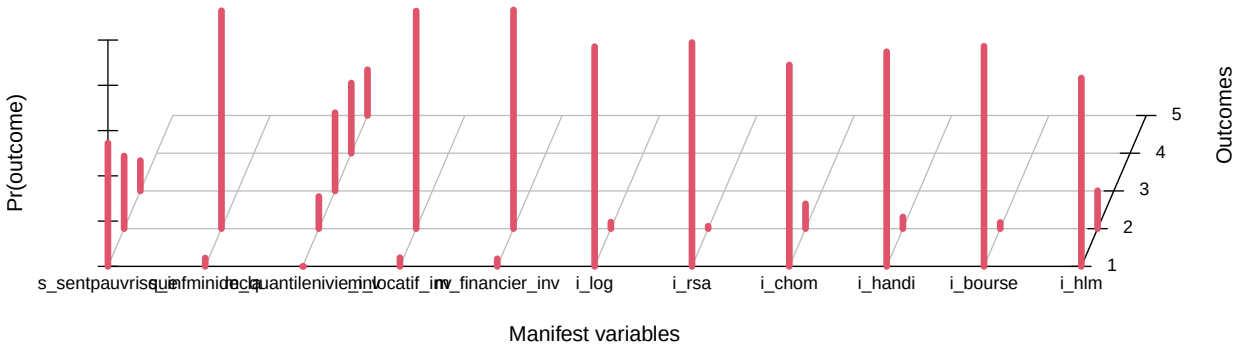
Classe A : part de la population = 12.8 %



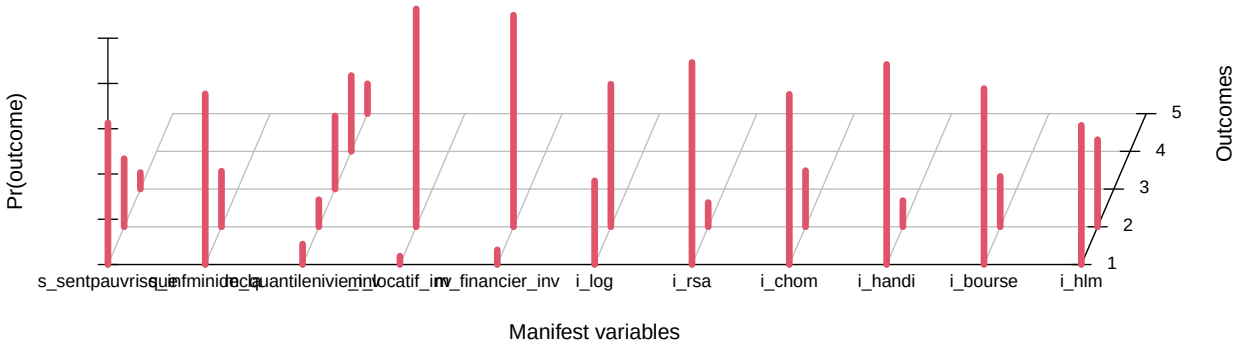
Classe B : part de la population = 30.5 %



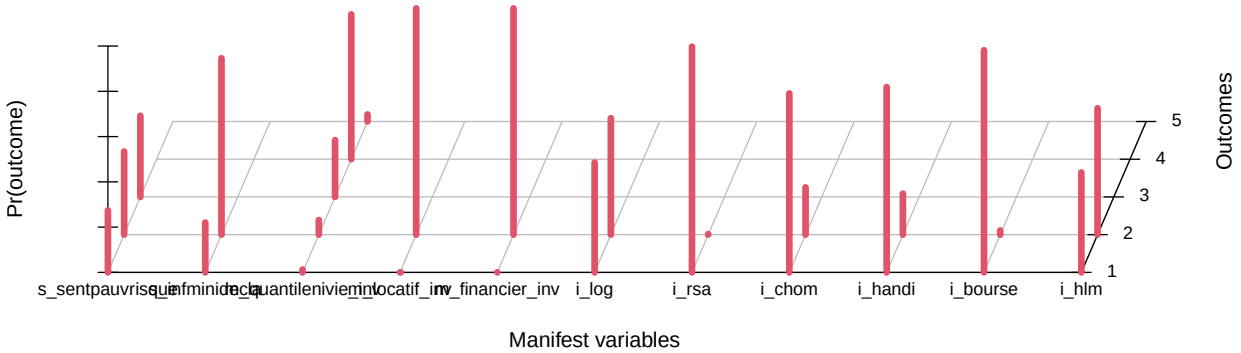
Classe C.1 : part de la population = 23.3 %

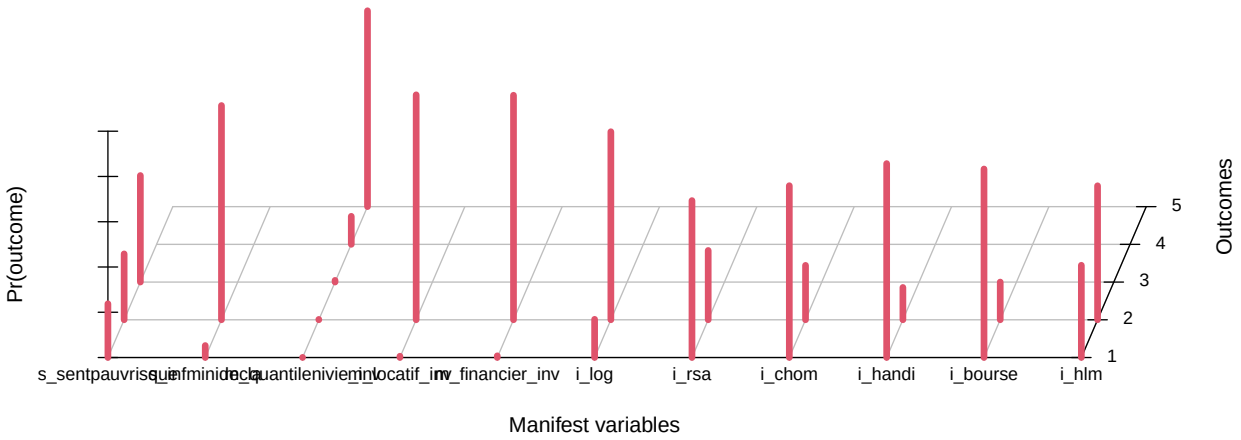


Classe C.2 : part de la population = 7.2 %



Classe D.1 : part de la population = 9.9 %

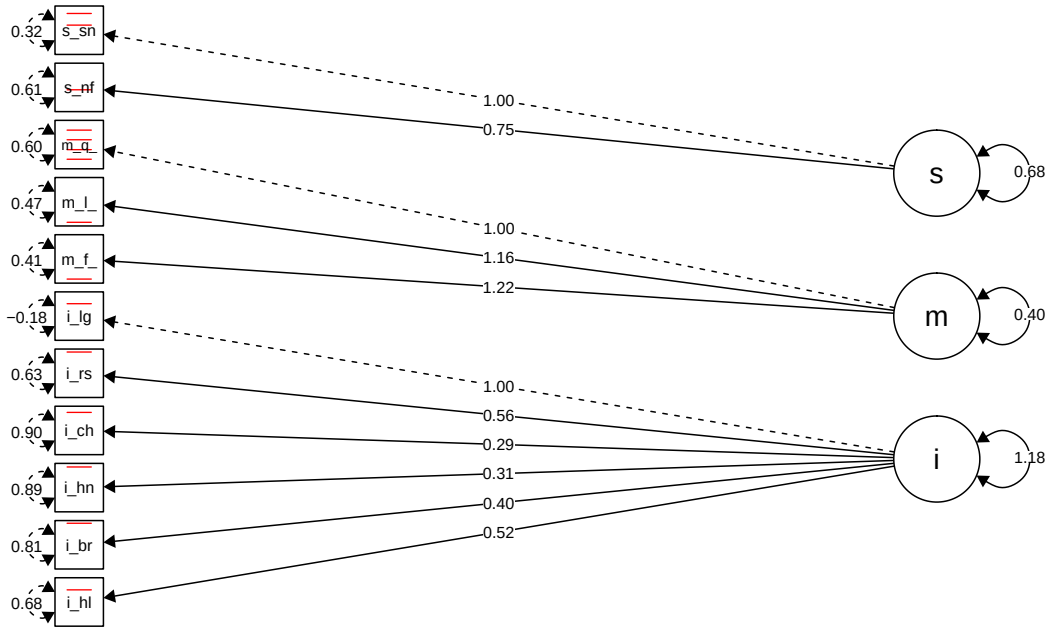




3.4 Confirmatory factor analysis (CFA) des dimensions de la pauvreté

EFA and CFA are mathematically very similar, since we have the same fundamental equation in both cases.

3.4.1 Modèle avec 3 dimensions de la pauvreté (i,m,s) ORTHOGONALES + SANS hiérarchie



s_sentpauvrisque	s_infminidecla	m_quantilenivie_inv	m_locatif_inv
0.3178626	0.6126669	0.6049934	0.4710046
m_financier_inv	i_log	i_rsa	i_chom
0.4145454	-0.1836324	0.6344999	0.9035775

```
           i_handi            i_bourse               i_hlm
         0.8875130           0.8072829           0.6818843
```

```
                        s     m     i
s_sentpauvrisque    1.000 0.000 0.000
s_infminidecla      0.754 0.000 0.000
m_quantilenivie_inv 0.000 1.000 0.000
m_locatif_inv       0.000 1.157 0.000
m_financier_inv     0.000 1.217 0.000
i_log               0.000 0.000 1.000
i_rsa               0.000 0.000 0.556
i_chom              0.000 0.000 0.285
i_handi             0.000 0.000 0.308
i_bourse            0.000 0.000 0.404
i_hlm               0.000 0.000 0.518
```

```
                        s     m     i
s_sentpauvrisque    0.826 0.000 0.000
s_infminidecla      0.622 0.000 0.000
m_quantilenivie_inv 0.000 0.628 0.000
m_locatif_inv       0.000 0.727 0.000
m_financier_inv     0.000 0.765 0.000
i_log               0.000 0.000 1.088
i_rsa               0.000 0.000 0.605
i_chom              0.000 0.000 0.311
i_handi             0.000 0.000 0.335
i_bourse            0.000 0.000 0.439
i_hlm               0.000 0.000 0.564
```

```
  s     m     i
s 0.682
m 0.000 0.395
i 0.000 0.000 1.184
```

```
  s m i
s 1
m 0 1
i 0 0 1
```

```
                  lhs  op                 rhs    est se  z pvalue ci.lower
1                   s  =~    s_sentpauvrisque  1.000  0 NA     NA    1.000
2                   s  =~      s_infminidecla  0.754 NA NA     NA       NA
3                   m  =~ m_quantilenivie_inv  1.000  0 NA     NA    1.000
4                   m  =~       m_locatif_inv  1.157 NA NA     NA       NA
5                   m  =~     m_financier_inv  1.217 NA NA     NA       NA
6                   i  =~               i_log  1.000  0 NA     NA    1.000
7                   i  =~               i_rsa  0.556 NA NA     NA       NA
8                   i  =~              i_chom  0.285 NA NA     NA       NA
9                   i  =~             i_handi  0.308 NA NA     NA       NA
10                  i  =~            i_bourse  0.404 NA NA     NA       NA
11                  i  =~               i_hlm  0.518 NA NA     NA       NA
```

12	s_sentpauvrisque	|	t1	0.267	NA	NA	NA	NA
13	s_sentpauvrisque	|	t2	1.020	NA	NA	NA	NA
14	s_infminidecla	|	t1	-0.123	NA	NA	NA	NA
15	m_quantilenivie_inv	|	t1	-0.852	NA	NA	NA	NA
16	m_quantilenivie_inv	|	t2	-0.266	NA	NA	NA	NA
17	m_quantilenivie_inv	|	t3	0.252	NA	NA	NA	NA
18	m_quantilenivie_inv	|	t4	0.836	NA	NA	NA	NA
19	m_locatif_inv	|	t1	-1.435	NA	NA	NA	NA
20	m_financier_inv	|	t1	-1.380	NA	NA	NA	NA
21	i_log	|	t1	0.693	NA	NA	NA	NA
22	i_rsa	|	t1	1.543	NA	NA	NA	NA
23	i_chom	|	t1	1.139	NA	NA	NA	NA
24	i_handi	|	t1	1.451	NA	NA	NA	NA
25	i_bourse	|	t1	1.593	NA	NA	NA	NA
26	i_hlm	|	t1	0.675	NA	NA	NA	NA
27	s_sentpauvrisque	~~	s_sentpauvrisque	0.318	0	NA	NA	0.318
28	s_infminidecla	~~	s_infminidecla	0.613	0	NA	NA	0.613
29	m_quantilenivie_inv	~~	m_quantilenivie_inv	0.605	0	NA	NA	0.605
30	m_locatif_inv	~~	m_locatif_inv	0.471	0	NA	NA	0.471
31	m_financier_inv	~~	m_financier_inv	0.415	0	NA	NA	0.415
32	i_log	~~	i_log	-0.184	0	NA	NA	-0.184
33	i_rsa	~~	i_rsa	0.634	0	NA	NA	0.634
34	i_chom	~~	i_chom	0.904	0	NA	NA	0.904
35	i_handi	~~	i_handi	0.888	0	NA	NA	0.888
36	i_bourse	~~	i_bourse	0.807	0	NA	NA	0.807
37	i_hlm	~~	i_hlm	0.682	0	NA	NA	0.682
38	s	~~	s	0.682	NA	NA	NA	NA
39	m	~~	m	0.395	NA	NA	NA	NA
40	i	~~	i	1.184	NA	NA	NA	NA
41	s	~~	m	0.000	0	NA	NA	0.000
42	s	~~	i	0.000	0	NA	NA	0.000
43	m	~~	i	0.000	0	NA	NA	0.000
44	s_sentpauvrisque	~*~	s_sentpauvrisque	1.000	0	NA	NA	1.000
45	s_infminidecla	~*~	s_infminidecla	1.000	0	NA	NA	1.000
46	m_quantilenivie_inv	~*~	m_quantilenivie_inv	1.000	0	NA	NA	1.000
47	m_locatif_inv	~*~	m_locatif_inv	1.000	0	NA	NA	1.000
48	m_financier_inv	~*~	m_financier_inv	1.000	0	NA	NA	1.000
49	i_log	~*~	i_log	1.000	0	NA	NA	1.000
50	i_rsa	~*~	i_rsa	1.000	0	NA	NA	1.000
51	i_chom	~*~	i_chom	1.000	0	NA	NA	1.000
52	i_handi	~*~	i_handi	1.000	0	NA	NA	1.000
53	i_bourse	~*~	i_bourse	1.000	0	NA	NA	1.000
54	i_hlm	~*~	i_hlm	1.000	0	NA	NA	1.000
55	s_sentpauvrisque	~1		0.000	0	NA	NA	0.000
56	s_infminidecla	~1		0.000	0	NA	NA	0.000
57	m_quantilenivie_inv	~1		0.000	0	NA	NA	0.000
58	m_locatif_inv	~1		0.000	0	NA	NA	0.000
59	m_financier_inv	~1		0.000	0	NA	NA	0.000
60	i_log	~1		0.000	0	NA	NA	0.000

```
61               i_rsa  ~1                       0.000  0 NA     NA    0.000
62              i_chom  ~1                       0.000  0 NA     NA    0.000
63             i_handi  ~1                       0.000  0 NA     NA    0.000
64            i_bourse  ~1                       0.000  0 NA     NA    0.000
65               i_hlm  ~1                       0.000  0 NA     NA    0.000
66                   s  ~1                       0.000  0 NA     NA    0.000
67                   m  ~1                       0.000  0 NA     NA    0.000
68                   i  ~1                       0.000  0 NA     NA    0.000
   ci.upper std.lv std.all std.nox
1     1.000  0.826   0.826   0.826
2        NA  0.622   0.622   0.622
3     1.000  0.628   0.628   0.628
4        NA  0.727   0.727   0.727
5        NA  0.765   0.765   0.765
6     1.000  1.088   1.088   1.088
7        NA  0.605   0.605   0.605
8        NA  0.311   0.311   0.311
9        NA  0.335   0.335   0.335
10       NA  0.439   0.439   0.439
11       NA  0.564   0.564   0.564
12       NA  0.267   0.267   0.267
13       NA  1.020   1.020   1.020
14       NA -0.123  -0.123  -0.123
15       NA -0.852  -0.852  -0.852
16       NA -0.266  -0.266  -0.266
17       NA  0.252   0.252   0.252
18       NA  0.836   0.836   0.836
19       NA -1.435  -1.435  -1.435
20       NA -1.380  -1.380  -1.380
21       NA  0.693   0.693   0.693
22       NA  1.543   1.543   1.543
23       NA  1.139   1.139   1.139
24       NA  1.451   1.451   1.451
25       NA  1.593   1.593   1.593
26       NA  0.675   0.675   0.675
27    0.318  0.318   0.318   0.318
28    0.613  0.613   0.613   0.613
29    0.605  0.605   0.605   0.605
30    0.471  0.471   0.471   0.471
31    0.415  0.415   0.415   0.415
32   -0.184 -0.184  -0.184  -0.184
33    0.634  0.634   0.634   0.634
34    0.904  0.904   0.904   0.904
35    0.888  0.888   0.888   0.888
36    0.807  0.807   0.807   0.807
37    0.682  0.682   0.682   0.682
38       NA  1.000   1.000   1.000
39       NA  1.000   1.000   1.000
40       NA  1.000   1.000   1.000
```

```
41    0.000  0.000   0.000   0.000
42    0.000  0.000   0.000   0.000
43    0.000  0.000   0.000   0.000
44    1.000  1.000   1.000   1.000
45    1.000  1.000   1.000   1.000
46    1.000  1.000   1.000   1.000
47    1.000  1.000   1.000   1.000
48    1.000  1.000   1.000   1.000
49    1.000  1.000   1.000   1.000
50    1.000  1.000   1.000   1.000
51    1.000  1.000   1.000   1.000
52    1.000  1.000   1.000   1.000
53    1.000  1.000   1.000   1.000
54    1.000  1.000   1.000   1.000
55    0.000  0.000   0.000   0.000
56    0.000  0.000   0.000   0.000
57    0.000  0.000   0.000   0.000
58    0.000  0.000   0.000   0.000
59    0.000  0.000   0.000   0.000
60    0.000  0.000   0.000   0.000
61    0.000  0.000   0.000   0.000
62    0.000  0.000   0.000   0.000
63    0.000  0.000   0.000   0.000
64    0.000  0.000   0.000   0.000
65    0.000  0.000   0.000   0.000
66    0.000  0.000   0.000   0.000
67    0.000  0.000   0.000   0.000
68    0.000  0.000   0.000   0.000

lavaan 0.6-8 ended normally after 28 iterations

  Estimator                                         DWLS
  Optimization method                              NLMINB
  Number of model parameters                           26

  Number of observations                            13359

Model Test User Model:
                                                 Standard      Robust
  Test Statistic                                40598.470   40598.470
  Degrees of freedom                               44          44
  P-value (Chi-square)                              0.000       0.000
  Scaling correction factor                                        NA
  Shift parameter
                                                                Robust

Model Test Baseline Model:

  Test statistic                                53597.773   43159.977
```

```
  Degrees of freedom                                55          55
  P-value                                        0.000       0.000
  Scaling correction factor                                  1.242

User Model versus Baseline Model:

  Comparative Fit Index (CFI)                    0.243       0.059
  Tucker-Lewis Index (TLI)                       0.053      -0.176

  Robust Comparative Fit Index (CFI)                            NA
  Robust Tucker-Lewis Index (TLI)                               NA

Root Mean Square Error of Approximation:

  RMSEA                                          0.263       0.263
  90 Percent confidence interval - lower         0.261       0.261
  90 Percent confidence interval - upper         0.265       0.265
  P-value RMSEA <= 0.05                          0.000       0.000

  Robust RMSEA                                                  NA
  90 Percent confidence interval - lower                        NA
  90 Percent confidence interval - upper                        NA

Standardized Root Mean Square Residual:

  SRMR                                           0.286       0.286

Parameter Estimates:

  Standard errors                             Robust.sem
  Information                                   Expected
  Information saturated (h1) model          Unstructured

Latent Variables:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
  s =~
    s_sentpauvrisq    1.000                               1.000    1.000
    s_infminidecla    0.754       NA                         NA       NA
  m =~
    m_quantilnv_nv    1.000                               1.000    1.000
    m_locatif_inv     1.157       NA                         NA       NA
    m_financier_nv    1.217       NA                         NA       NA
  i =~
    i_log             1.000                               1.000    1.000
    i_rsa             0.556       NA                         NA       NA
    i_chom            0.285       NA                         NA       NA
    i_handi           0.308       NA                         NA       NA
    i_bourse          0.404       NA                         NA       NA
    i_hlm             0.518       NA                         NA       NA
```

```
   Std.lv  Std.all

    0.826    0.826
    0.622    0.622

    0.628    0.628
    0.727    0.727
    0.765    0.765

    1.088    1.088
    0.605    0.605
    0.311    0.311
    0.335    0.335
    0.439    0.439
    0.564    0.564

Covariances:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
  s ~~
    m                 0.000                              0.000    0.000
    i                 0.000                              0.000    0.000
  m ~~
    i                 0.000                              0.000    0.000
   Std.lv  Std.all

    0.000    0.000
    0.000    0.000

    0.000    0.000

Intercepts:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
   .s_sentpauvrisq    0.000                              0.000    0.000
   .s_infminidecla    0.000                              0.000    0.000
   .m_quantilnv_nv    0.000                              0.000    0.000
   .m_locatif_inv     0.000                              0.000    0.000
   .m_financier_nv    0.000                              0.000    0.000
   .i_log             0.000                              0.000    0.000
   .i_rsa             0.000                              0.000    0.000
   .i_chom            0.000                              0.000    0.000
   .i_handi           0.000                              0.000    0.000
   .i_bourse          0.000                              0.000    0.000
   .i_hlm             0.000                              0.000    0.000
    s                 0.000                              0.000    0.000
    m                 0.000                              0.000    0.000
    i                 0.000                              0.000    0.000
   Std.lv  Std.all
    0.000    0.000
    0.000    0.000
```

```
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000

Thresholds:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
    s_sentpvrsq|t1    0.267       NA                           NA       NA
    s_sentpvrsq|t2    1.020       NA                           NA       NA
    s_infmindcl|t1   -0.123       NA                           NA       NA
    m_qntlnv_nv|t1   -0.852       NA                           NA       NA
    m_qntlnv_nv|t2   -0.266       NA                           NA       NA
    m_qntlnv_nv|t3    0.252       NA                           NA       NA
    m_qntlnv_nv|t4    0.836       NA                           NA       NA
    m_locatf_nv|t1   -1.435       NA                           NA       NA
    m_finncr_nv|t1   -1.380       NA                           NA       NA
    i_log|t1          0.693       NA                           NA       NA
    i_rsa|t1          1.543       NA                           NA       NA
    i_chom|t1         1.139       NA                           NA       NA
    i_handi|t1        1.451       NA                           NA       NA
    i_bourse|t1       1.593       NA                           NA       NA
    i_hlm|t1          0.675       NA                           NA       NA
   Std.lv  Std.all
    0.267    0.267
    1.020    1.020
   -0.123   -0.123
   -0.852   -0.852
   -0.266   -0.266
    0.252    0.252
    0.836    0.836
   -1.435   -1.435
   -1.380   -1.380
    0.693    0.693
    1.543    1.543
    1.139    1.139
    1.451    1.451
    1.593    1.593
    0.675    0.675

Variances:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
```

```
   .s_sentpauvrisq    0.318                                0.318    0.318
   .s_infminidecla    0.613                                0.613    0.613
   .m_quantilnv_nv    0.605                                0.605    0.605
   .m_locatif_inv     0.471                                0.471    0.471
   .m_financier_nv    0.415                                0.415    0.415
   .i_log            -0.184                               -0.184   -0.184
   .i_rsa             0.634                                0.634    0.634
   .i_chom            0.904                                0.904    0.904
   .i_handi           0.888                                0.888    0.888
   .i_bourse          0.807                                0.807    0.807
   .i_hlm             0.682                                0.682    0.682
    s                 0.682       NA                          NA       NA
    m                 0.395       NA                          NA       NA
    i                 1.184       NA                          NA       NA
   Std.lv  Std.all
    0.318    0.318
    0.613    0.613
    0.605    0.605
    0.471    0.471
    0.415    0.415
   -0.184   -0.184
    0.634    0.634
    0.904    0.904
    0.888    0.888
    0.807    0.807
    0.682    0.682
    1.000    1.000
    1.000    1.000
    1.000    1.000

Scales y*:
                  Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
    s_sentpauvrisq    1.000                                1.000    1.000
    s_infminidecla    1.000                                1.000    1.000
    m_quantilnv_nv    1.000                                1.000    1.000
    m_locatif_inv     1.000                                1.000    1.000
    m_financier_nv    1.000                                1.000    1.000
    i_log             1.000                                1.000    1.000
    i_rsa             1.000                                1.000    1.000
    i_chom            1.000                                1.000    1.000
    i_handi           1.000                                1.000    1.000
    i_bourse          1.000                                1.000    1.000
    i_hlm             1.000                                1.000    1.000
   Std.lv  Std.all
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
```

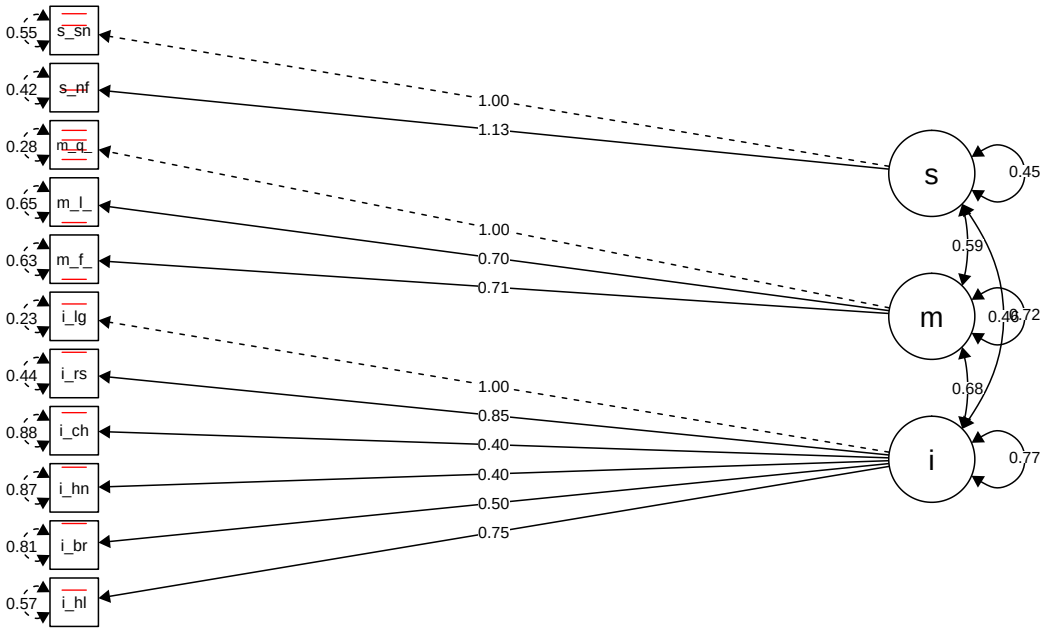
```
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
```

Règles pour être un modèle acceptable :

- p-valeur du test du chi-2 de 0, très mauvais car un résultat non significatif veut dire que le modèle "fits" mais il ne faut pas faire très attention à cette statistique car elle est très souvent significative quand l'échantillon est grand, c'est-à-dire dans notre cas
- Le CFI doit être supérieur à 0,95.
- Le RMSEA doit être dans l'intervalle [0.05,0.10].
- Le SRMR doit être inférieur à 0.08.

=> Le modèle avec les dimensions de la pauvreté orthogonales peut être qualifié de très mauvais. C'est pourquoi on teste juste après le même modèle avec rotation oblique.

3.4.2 Modèle avec 3 dimensions de la pauvreté (i,m,s) OBLIQUES + SANS hiérarchie




```
lavaan 0.6-8 ended normally after 22 iterations

  Estimator                                         DWLS
  Optimization method                           NLMINB
  Number of model parameters                        29

  Number of observations                         13359

Model Test User Model:
                                              Standard      Robust
  Test Statistic                               792.116     979.597
```

```
  Degrees of freedom                                41          41
  P-value (Chi-square)                           0.000       0.000
  Scaling correction factor                                  0.811
  Shift parameter                                            2.975
       simple second-order correction

Model Test Baseline Model:

  Test statistic                             53597.773   43159.977
  Degrees of freedom                            55          55
  P-value                                        0.000       0.000
  Scaling correction factor                                  1.242

User Model versus Baseline Model:

  Comparative Fit Index (CFI)                    0.986       0.978
  Tucker-Lewis Index (TLI)                       0.981       0.971

  Robust Comparative Fit Index (CFI)                            NA
  Robust Tucker-Lewis Index (TLI)                               NA

Root Mean Square Error of Approximation:

  RMSEA                                          0.037       0.041
  90 Percent confidence interval - lower         0.035       0.039
  90 Percent confidence interval - upper         0.039       0.044
  P-value RMSEA <= 0.05                          1.000       1.000

  Robust RMSEA                                                  NA
  90 Percent confidence interval - lower                        NA
  90 Percent confidence interval - upper                        NA

Standardized Root Mean Square Residual:

  SRMR                                           0.073       0.073

Parameter Estimates:

  Standard errors                             Robust.sem
  Information                                   Expected
  Information saturated (h1) model          Unstructured

Latent Variables:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
  s =~
    s_sentpauvrisq    1.000                               1.000    1.000
    s_infminidecla    1.132    0.018   63.490    0.000    1.097    1.167
  m =~
    m_quantilnv_nv    1.000                               1.000    1.000
```

```
    m_locatif_inv     0.698    0.019   36.523    0.000    0.660    0.735
    m_financier_nv    0.714    0.018   39.366    0.000    0.679    0.750
  i =~
    i_log             1.000                               1.000    1.000
    i_rsa             0.847    0.015   55.299    0.000    0.817    0.878
    i_chom            0.401    0.017   23.587    0.000    0.368    0.435
    i_handi           0.403    0.020   20.465    0.000    0.364    0.442
    i_bourse          0.497    0.020   25.268    0.000    0.458    0.535
    i_hlm             0.746    0.013   56.923    0.000    0.720    0.772
   Std.lv  Std.all

    0.674    0.674
    0.763    0.763

    0.846    0.846
    0.590    0.590
    0.604    0.604

    0.880    0.880
    0.746    0.746
    0.353    0.353
    0.355    0.355
    0.437    0.437
    0.656    0.656

Covariances:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
  s ~~
    m                 0.589    0.008   74.532    0.000    0.574    0.605
    i                 0.462    0.009   50.563    0.000    0.444    0.480
  m ~~
    i                 0.681    0.008   90.677    0.000    0.667    0.696
   Std.lv  Std.all

    1.034    1.034
    0.779    0.779

    0.916    0.916

Intercepts:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
   .s_sentpauvrisq    0.000                               0.000    0.000
   .s_infminidecla    0.000                               0.000    0.000
   .m_quantilnv_nv    0.000                               0.000    0.000
   .m_locatif_inv     0.000                               0.000    0.000
   .m_financier_nv    0.000                               0.000    0.000
   .i_log             0.000                               0.000    0.000
   .i_rsa             0.000                               0.000    0.000
   .i_chom            0.000                               0.000    0.000
```

```
   .i_handi           0.000                             0.000    0.000
   .i_bourse          0.000                             0.000    0.000
   .i_hlm             0.000                             0.000    0.000
    s                 0.000                             0.000    0.000
    m                 0.000                             0.000    0.000
    i                 0.000                             0.000    0.000
   Std.lv  Std.all
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000

Thresholds:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
    s_sentpvrsq|t1    0.267    0.011   24.326    0.000    0.246    0.289
    s_sentpvrsq|t2    1.020    0.013   77.484    0.000    0.994    1.046
    s_infmindcl|t1   -0.123    0.011  -11.357    0.000   -0.145   -0.102
    m_qntlnv_nv|t1   -0.852    0.012  -68.664    0.000   -0.876   -0.827
    m_qntlnv_nv|t2   -0.266    0.011  -24.223    0.000   -0.288   -0.245
    m_qntlnv_nv|t3    0.252    0.011   22.964    0.000    0.230    0.273
    m_qntlnv_nv|t4    0.836    0.012   67.760    0.000    0.812    0.860
    m_locatf_nv|t1   -1.435    0.016  -89.369    0.000   -1.467   -1.404
    m_finncr_nv|t1   -1.380    0.016  -88.614    0.000   -1.410   -1.349
    i_log|t1          0.693    0.012   58.531    0.000    0.670    0.717
    i_rsa|t1          1.543    0.017   90.111    0.000    1.510    1.577
    i_chom|t1         1.139    0.014   82.368    0.000    1.112    1.167
    i_handi|t1        1.451    0.016   89.539    0.000    1.419    1.483
    i_bourse|t1       1.593    0.018   90.139    0.000    1.558    1.627
    i_hlm|t1          0.675    0.012   57.238    0.000    0.652    0.698
   Std.lv  Std.all
    0.267    0.267
    1.020    1.020
   -0.123   -0.123
   -0.852   -0.852
   -0.266   -0.266
    0.252    0.252
    0.836    0.836
   -1.435   -1.435
   -1.380   -1.380
```

```
    0.693    0.693
    1.543    1.543
    1.139    1.139
    1.451    1.451
    1.593    1.593
    0.675    0.675

Variances:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
   .s_sentpauvrisq    0.546                              0.546    0.546
   .s_infminidecla    0.418                              0.418    0.418
   .m_quantilnv_nv    0.285                              0.285    0.285
   .m_locatif_inv     0.652                              0.652    0.652
   .m_financier_nv    0.635                              0.635    0.635
   .i_log             0.226                              0.226    0.226
   .i_rsa             0.444                              0.444    0.444
   .i_chom            0.875                              0.875    0.875
   .i_handi           0.874                              0.874    0.874
   .i_bourse          0.809                              0.809    0.809
   .i_hlm             0.569                              0.569    0.569
    s                 0.454    0.012   37.338    0.000    0.430    0.478
    m                 0.715    0.015   46.200    0.000    0.685    0.745
    i                 0.774    0.014   55.899    0.000    0.747    0.801
   Std.lv  Std.all
    0.546    0.546
    0.418    0.418
    0.285    0.285
    0.652    0.652
    0.635    0.635
    0.226    0.226
    0.444    0.444
    0.875    0.875
    0.874    0.874
    0.809    0.809
    0.569    0.569
    1.000    1.000
    1.000    1.000
    1.000    1.000

Scales y*:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
    s_sentpauvrisq    1.000                              1.000    1.000
    s_infminidecla    1.000                              1.000    1.000
    m_quantilnv_nv    1.000                              1.000    1.000
    m_locatif_inv     1.000                              1.000    1.000
    m_financier_nv    1.000                              1.000    1.000
    i_log             1.000                              1.000    1.000
    i_rsa             1.000                              1.000    1.000
    i_chom            1.000                              1.000    1.000
```

```
    i_handi           1.000                                1.000    1.000
    i_bourse          1.000                                1.000    1.000
    i_hlm             1.000                                1.000    1.000
   Std.lv  Std.all
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
```

Confirmément à ce à quoi on s'attendait, fit2 a des indicateurs de qualité du modèle bien meilleurs que fit1 : il faut introduire des corrélations entre facteurs (oblique).

```
          chisq df pvalue       cfi        tli      rmsea       srmr
fit2   792.1158 41      0 0.9859717 0.98118151 0.03703316 0.07278575
fit1 40598.4704 44      0 0.2425781 0.05322258 0.26267716 0.28620014
```

Ci-dessous quelques moyens de voir comment on pourrait améliorer le modèles pour le rendre encore meilleur.

- Les résidus qui ont une covariance supérieure à 0.1 peuvent être à regarder de plus près : (i_handi, i_rsa), (i_hlm, i_rsa), (i_log, i_bourse), (i_bourse, m_foncier), (i_rsa, m_foncier), (m_foncier, m_locatif), (i_rsa, m_locatif), (i_bourse, s_infminidecla),
- Il semblerait que d'intégrer le sentiment de pauvreté non pas dans la dimension subjective mais dans les 3 dimensions de la pauvreté améliorerait potentiellement le modèle... Ce qui interroge sur le statut de cette variable. Idem un peu plus bas pour s_infminidecla qui pourrait loadé m et i...
- Il faudrait également éventuellement corréler s_infminidecla avec m_quantilenivie, on a vu dans les stats desc que c'était 2 variables très corrélées ensemble et ce ne serait effectivement pas idiot de le faire !

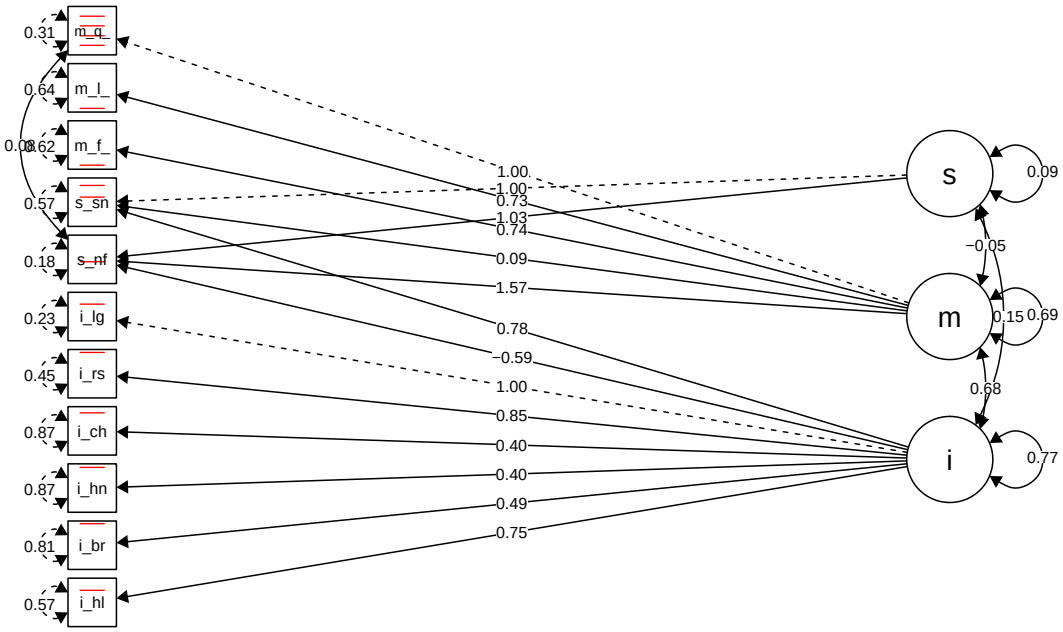
```
                    s_sntp s_nfmn m_qnt_ m_lct_ m_fnn_ i_log  i_rsa  i_chom
s_sentpauvrisque     0.000
s_infminidecla       0.000  0.000
m_quantilenivie_inv -0.054  0.033  0.000
m_locatif_inv       -0.014 -0.040 -0.042  0.000
m_financier_inv      0.025  0.010 -0.030  0.200  0.000
i_log                0.037 -0.093 -0.008 -0.048 -0.062  0.000
i_rsa                0.078 -0.046  0.055 -0.121 -0.128  0.007  0.000
i_chom               0.080 -0.020  0.004  0.002 -0.008  0.027 -0.085  0.000
i_handi              0.069 -0.023  0.002 -0.060 -0.077  0.049 -0.248 -0.031
i_bourse            -0.096 -0.101  0.093 -0.129 -0.175  0.118 -0.051 -0.029
i_hlm                0.058 -0.012 -0.021  0.134 -0.011  0.027 -0.123 -0.044
                    i_hand i_bors i_hlm
s_sentpauvrisque
```

```
s_infminidecla
m_quantilenivie_inv
m_locatif_inv
m_financier_inv
i_log
i_rsa
i_chom
i_handi              0.000
i_bourse            -0.035  0.000
i_hlm                0.055 -0.104  0.000
```

```
               lhs            rhs obs.prop est.prop
1 s_sentpauvrisque s_infminidecla    0.352    0.354
2 s_sentpauvrisque s_infminidecla    0.078    0.074
3 s_sentpauvrisque s_infminidecla    0.021    0.023
4 s_sentpauvrisque s_infminidecla    0.253    0.251
5 s_sentpauvrisque s_infminidecla    0.163    0.167
6 s_sentpauvrisque s_infminidecla    0.133    0.131
```

```
                 lhs  op                 rhs        mi    epc sepc.lv sepc.all
44  s_sentpauvrisque ~*~    s_sentpauvrisque 32617.545 47.544  47.544    1.000
1                 s  =~    s_sentpauvrisque 32617.545 47.544  32.032   32.032
78                m  =~    s_sentpauvrisque 12979.550 13.128  11.101   11.101
86                i  =~    s_sentpauvrisque  3597.071  3.394   2.986    2.986
101   s_infminidecla  ~~ m_quantilenivie_inv   926.292  0.378   0.378    1.097
45    s_infminidecla ~*~      s_infminidecla   657.697  0.587   0.587    1.000
    sepc.nox
44     1.000
1     32.032
78    11.101
86     2.986
101    1.097
45     1.000
```

Juste pour l'expérience on teste ces modifications pour voir !



lavaan 0.6-8 ended normally after 43 iterations

Estimator	DWLS
Optimization method	NLMINB
Number of model parameters	34
Number of observations	13359

Model Test User Model:

	Standard	Robust
Test Statistic	618.909	618.909
Degrees of freedom	36	36
P-value (Chi-square)	0.000	0.000
Scaling correction factor		NA
Shift parameter		
		Robust

Model Test Baseline Model:

Test statistic	53597.773	43159.977
Degrees of freedom	55	55
P-value	0.000	0.000
Scaling correction factor		1.242

User Model versus Baseline Model:

Comparative Fit Index (CFI)	0.989	0.986
Tucker-Lewis Index (TLI)	0.983	0.979
Robust Comparative Fit Index (CFI)		NA

```
  Robust Tucker-Lewis Index (TLI)                                NA

Root Mean Square Error of Approximation:

  RMSEA                                          0.035       0.035
  90 Percent confidence interval - lower         0.032       0.032
  90 Percent confidence interval - upper         0.037       0.037
  P-value RMSEA <= 0.05                          1.000       1.000

  Robust RMSEA                                                  NA
  90 Percent confidence interval - lower                        NA
  90 Percent confidence interval - upper                        NA

Standardized Root Mean Square Residual:

  SRMR                                           0.071       0.071

Parameter Estimates:

  Standard errors                             Robust.sem
  Information                                   Expected
  Information saturated (h1) model          Unstructured

Latent Variables:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
  s =~
    s_sentpauvrisq    1.000                               1.000    1.000
    s_infminidecla    1.034       NA                         NA       NA
  m =~
    m_quantilnv_nv    1.000                               1.000    1.000
    m_locatif_inv     0.725       NA                         NA       NA
    m_financier_nv    0.742       NA                         NA       NA
    s_sentpauvrisq    0.094       NA                         NA       NA
    s_infminidecla    1.566       NA                         NA       NA
  i =~
    i_log             1.000                               1.000    1.000
    i_rsa             0.846       NA                         NA       NA
    i_chom            0.403       NA                         NA       NA
    i_handi           0.404       NA                         NA       NA
    i_bourse          0.495       NA                         NA       NA
    i_hlm             0.746       NA                         NA       NA
    s_sentpauvrisq    0.782       NA                         NA       NA
    s_infminidecla   -0.586       NA                         NA       NA
   Std.lv  Std.all

    0.302    0.302
    0.312    0.312

    0.829    0.829
```

```
    0.601    0.601
    0.615    0.615
    0.078    0.078
    1.297    1.297

    0.880    0.880
    0.745    0.745
    0.354    0.354
    0.355    0.355
    0.435    0.435
    0.656    0.656
    0.688    0.688
   -0.515   -0.515

Covariances:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
 .s_infminidecla ~~
   .m_quantilnv_nv     0.076       NA                           NA       NA
  s ~~
    m                -0.052       NA                           NA       NA
    i                -0.150       NA                           NA       NA
  m ~~
    i                 0.678       NA                           NA       NA
   Std.lv  Std.all

    0.076    0.317

   -0.207   -0.207
   -0.563   -0.563

    0.930    0.930

Intercepts:
                  Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
   .s_sentpauvrisq    0.000                                0.000    0.000
   .s_infminidecla    0.000                                0.000    0.000
   .m_quantilnv_nv    0.000                                0.000    0.000
   .m_locatif_inv     0.000                                0.000    0.000
   .m_financier_nv    0.000                                0.000    0.000
   .i_log             0.000                                0.000    0.000
   .i_rsa             0.000                                0.000    0.000
   .i_chom            0.000                                0.000    0.000
   .i_handi           0.000                                0.000    0.000
   .i_bourse          0.000                                0.000    0.000
   .i_hlm             0.000                                0.000    0.000
    s                 0.000                                0.000    0.000
    m                 0.000                                0.000    0.000
    i                 0.000                                0.000    0.000
   Std.lv  Std.all
```

```
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000
    0.000    0.000

Thresholds:
                   Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
    s_sentpvrsq|t1    0.267       NA                          NA       NA
    s_sentpvrsq|t2    1.020       NA                          NA       NA
    s_infmindcl|t1   -0.123       NA                          NA       NA
    m_qntlnv_nv|t1   -0.852       NA                          NA       NA
    m_qntlnv_nv|t2   -0.266       NA                          NA       NA
    m_qntlnv_nv|t3    0.252       NA                          NA       NA
    m_qntlnv_nv|t4    0.836       NA                          NA       NA
    m_locatf_nv|t1   -1.435       NA                          NA       NA
    m_finncr_nv|t1   -1.380       NA                          NA       NA
    i_log|t1          0.693       NA                          NA       NA
    i_rsa|t1          1.543       NA                          NA       NA
    i_chom|t1         1.139       NA                          NA       NA
    i_handi|t1        1.451       NA                          NA       NA
    i_bourse|t1       1.593       NA                          NA       NA
    i_hlm|t1          0.675       NA                          NA       NA
   Std.lv  Std.all
    0.267    0.267
    1.020    1.020
   -0.123   -0.123
   -0.852   -0.852
   -0.266   -0.266
    0.252    0.252
    0.836    0.836
   -1.435   -1.435
   -1.380   -1.380
    0.693    0.693
    1.543    1.543
    1.139    1.139
    1.451    1.451
    1.593    1.593
    0.675    0.675
```

Variances:

	Estimate	Std.Err	z-value	P(>|z|)	ci.lower	ci.upper	Std.lv	Std.all
.s_sentpauvrisq	0.573				0.573	0.573	0.573	0.573
.s_infminidecla	0.183				0.183	0.183	0.183	0.183
.m_quantilnv_nv	0.313				0.313	0.313	0.313	0.313
.m_locatif_inv	0.639				0.639	0.639	0.639	0.639
.m_financier_nv	0.622				0.622	0.622	0.622	0.622
.i_log	0.226				0.226	0.226	0.226	0.226
.i_rsa	0.445				0.445	0.445	0.445	0.445
.i_chom	0.874				0.874	0.874	0.874	0.874
.i_handi	0.874				0.874	0.874	0.874	0.874
.i_bourse	0.811				0.811	0.811	0.811	0.811
.i_hlm	0.569				0.569	0.569	0.569	0.569
s	0.091	NA			NA	NA	1.000	1.000
m	0.687	NA			NA	NA	1.000	1.000
i	0.774	NA			NA	NA	1.000	1.000

Scales y*:

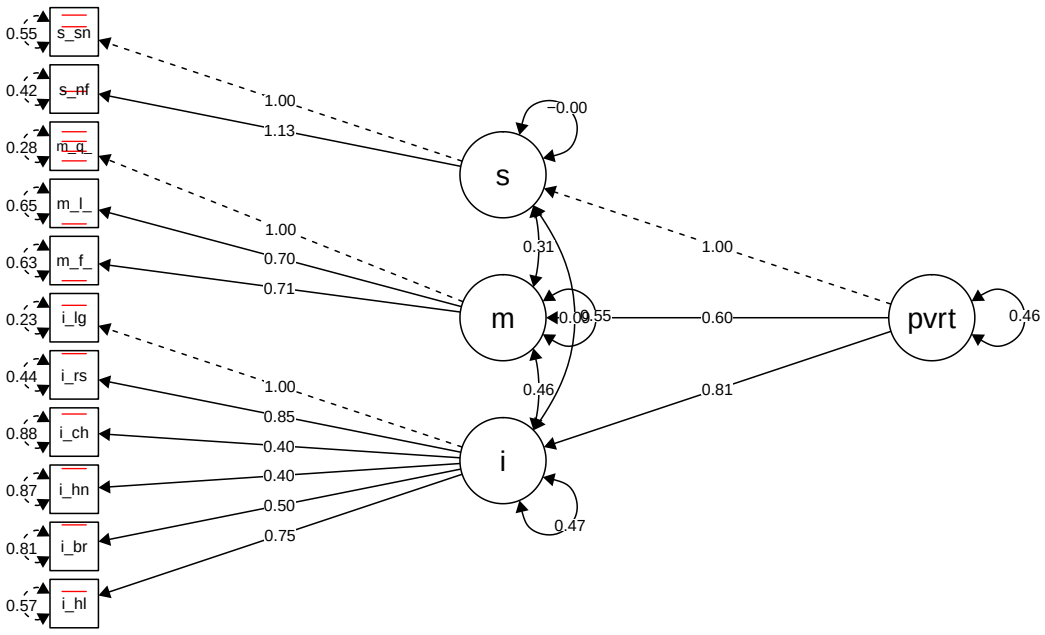
	Estimate	Std.Err	z-value	P(>|z|)	ci.lower	ci.upper	Std.lv	Std.all
s_sentpauvrisq	1.000				1.000	1.000	1.000	1.000
s_infminidecla	1.000				1.000	1.000	1.000	1.000
m_quantilnv_nv	1.000				1.000	1.000	1.000	1.000
m_locatif_inv	1.000				1.000	1.000	1.000	1.000
m_financier_nv	1.000				1.000	1.000	1.000	1.000
i_log	1.000				1.000	1.000	1.000	1.000
i_rsa	1.000				1.000	1.000	1.000	1.000
i_chom	1.000				1.000	1.000	1.000	1.000
i_handi	1.000				1.000	1.000	1.000	1.000
i_bourse	1.000				1.000	1.000	1.000	1.000
i_hlm	1.000				1.000	1.000	1.000	1.000

```
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
    1.000    1.000
[1] "fit2_mi : "
       chisq           df       pvalue          cfi          tli        rmsea
618.90870317  36.00000000   0.00000000   0.98911321   0.98336741   0.03481595
        srmr
  0.07098518
[1] "fit2 : "
       chisq           df       pvalue          cfi          tli        rmsea
792.11575286  41.00000000   0.00000000   0.98597167   0.98118151   0.03703316
        srmr
  0.07278575
```

Ce nouveau modèle étrange est effectivement meilleur !

3.4.3 Modèle avec 3 dimensions de la pauvreté (i,m,s) OBLIQUES + AVEC hiérarchie

Il y a un problème avec le modèle, avec des NA pour les standard-error. Comme si le modèle n'était pas bien identifié... Cela semble être dû à l'intégration des corrélations entre s,m et i.




```
lavaan 0.6-8 ended normally after 21 iterations

  Estimator                                         DWLS
```

```
  Optimization method                           NLMINB
  Number of model parameters                        32

  Number of observations                         13359

Model Test User Model:
                                              Standard      Robust
  Test Statistic                               792.116     792.116
  Degrees of freedom                                38          38
  P-value (Chi-square)                           0.000       0.000
  Scaling correction factor                                     NA
  Shift parameter
                                                             Robust

Model Test Baseline Model:

  Test statistic                             53597.773   43159.977
  Degrees of freedom                                55          55
  P-value                                        0.000       0.000
  Scaling correction factor                                   1.242

User Model versus Baseline Model:

  Comparative Fit Index (CFI)                    0.986       0.983
  Tucker-Lewis Index (TLI)                       0.980       0.975

  Robust Comparative Fit Index (CFI)                            NA
  Robust Tucker-Lewis Index (TLI)                               NA

Root Mean Square Error of Approximation:

  RMSEA                                          0.039       0.039
  90 Percent confidence interval - lower         0.036       0.036
  90 Percent confidence interval - upper         0.041       0.041
  P-value RMSEA <= 0.05                          1.000       1.000

  Robust RMSEA                                                  NA
  90 Percent confidence interval - lower                        NA
  90 Percent confidence interval - upper                        NA

Standardized Root Mean Square Residual:

  SRMR                                           0.073       0.073

Parameter Estimates:

  Standard errors                            Robust.sem
  Information                                  Expected
  Information saturated (h1) model         Unstructured
```

Latent Variables:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
s =~						
s_sentpauvrisq	1.000				0.674	0.674
s_infminidecla	1.132	NA			0.763	0.763
m =~						
m_quantilnv_nv	1.000				0.846	0.846
m_locatif_inv	0.698	NA			0.590	0.590
m_financier_nv	0.714	NA			0.604	0.604
i =~						
i_log	1.000				0.880	0.880
i_rsa	0.847	NA			0.746	0.746
i_chom	0.401	NA			0.353	0.353
i_handi	0.403	NA			0.355	0.355
i_bourse	0.497	NA			0.437	0.437
i_hlm	0.746	NA			0.656	0.656
pauvrete =~						
s	1.000				1.005	1.005
m	0.599	NA			0.479	0.479
i	0.814	NA			0.626	0.626

Covariances:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
.s ~~						
.m	0.315	NA			6.356	6.356
.i	0.089	NA			1.934	1.934
.m ~~						
.i	0.458	NA			0.900	0.900

Intercepts:

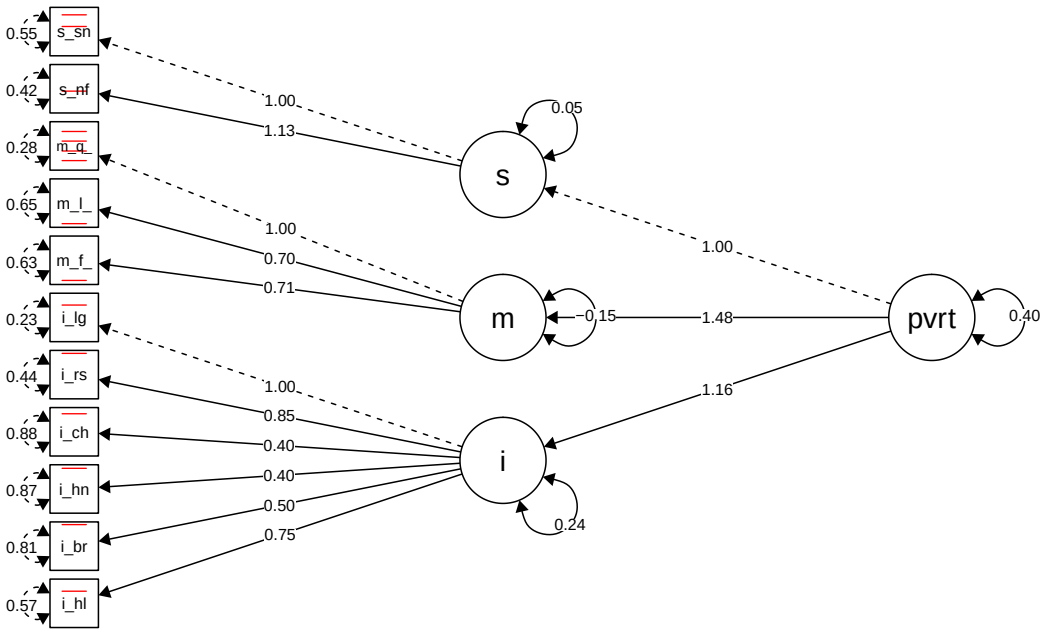
	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
.s_sentpauvrisq	0.000				0.000	0.000
.s_infminidecla	0.000				0.000	0.000
.m_quantilnv_nv	0.000				0.000	0.000
.m_locatif_inv	0.000				0.000	0.000
.m_financier_nv	0.000				0.000	0.000
.i_log	0.000				0.000	0.000
.i_rsa	0.000				0.000	0.000
.i_chom	0.000				0.000	0.000
.i_handi	0.000				0.000	0.000
.i_bourse	0.000				0.000	0.000
.i_hlm	0.000				0.000	0.000
.s	0.000				0.000	0.000
.m	0.000				0.000	0.000
.i	0.000				0.000	0.000
pauvrete	0.000				0.000	0.000

Thresholds:

```
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
    s_sentpvrsq|t1    0.267       NA                      0.267    0.267
    s_sentpvrsq|t2    1.020       NA                      1.020    1.020
    s_infmindcl|t1   -0.123       NA                     -0.123   -0.123
    m_qntlnv_nv|t1   -0.852       NA                     -0.852   -0.852
    m_qntlnv_nv|t2   -0.266       NA                     -0.266   -0.266
    m_qntlnv_nv|t3    0.252       NA                      0.252    0.252
    m_qntlnv_nv|t4    0.836       NA                      0.836    0.836
    m_locatf_nv|t1   -1.435       NA                     -1.435   -1.435
    m_finncr_nv|t1   -1.380       NA                     -1.380   -1.380
    i_log|t1          0.693       NA                      0.693    0.693
    i_rsa|t1          1.543       NA                      1.543    1.543
    i_chom|t1         1.139       NA                      1.139    1.139
    i_handi|t1        1.451       NA                      1.451    1.451
    i_bourse|t1       1.593       NA                      1.593    1.593
    i_hlm|t1          0.675       NA                      0.675    0.675

Variances:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
   .s_sentpauvrisq    0.546                               0.546    0.546
   .s_infminidecla    0.418                               0.418    0.418
   .m_quantilnv_nv    0.285                               0.285    0.285
   .m_locatif_inv     0.652                               0.652    0.652
   .m_financier_nv    0.635                               0.635    0.635
   .i_log             0.226                               0.226    0.226
   .i_rsa             0.444                               0.444    0.444
   .i_chom            0.875                               0.875    0.875
   .i_handi           0.874                               0.874    0.874
   .i_bourse          0.809                               0.809    0.809
   .i_hlm             0.569                               0.569    0.569
   .s                -0.004       NA                     -0.010   -0.010
   .m                 0.551       NA                      0.770    0.770
   .i                 0.470       NA                      0.608    0.608
    pauvrete          0.458       NA                      1.000    1.000

Scales y*:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
    s_sentpauvrisq    1.000                               1.000    1.000
    s_infminidecla    1.000                               1.000    1.000
    m_quantilnv_nv    1.000                               1.000    1.000
    m_locatif_inv     1.000                               1.000    1.000
    m_financier_nv    1.000                               1.000    1.000
    i_log             1.000                               1.000    1.000
    i_rsa             1.000                               1.000    1.000
    i_chom            1.000                               1.000    1.000
    i_handi           1.000                               1.000    1.000
    i_bourse          1.000                               1.000    1.000
    i_hlm             1.000                               1.000    1.000
```

3.4.4 Modèle avec 3 dimensions de la pauvreté (i,m,s) ORTHOGONALES + AVEC hiérarchie

Du coup on enlève les corrélations entre i,m et s pour voir ce que ça donne... Le modèle est pas mal. Je pense que le fait d'intégrer une hiérarchie intègre de fait une corrélation entre les dimensions s,m et i et que si on les rajoute en plus le modèle n'a plus de sens.




```
lavaan 0.6-8 ended normally after 30 iterations

  Estimator                                         DWLS
  Optimization method                           NLMINB
  Number of model parameters                        29

  Number of observations                         13359

Model Test User Model:
                                              Standard      Robust
  Test Statistic                               792.116     979.597
  Degrees of freedom                                41          41
  P-value (Chi-square)                           0.000       0.000
  Scaling correction factor                                  0.811
  Shift parameter                                            2.975
       simple second-order correction

Model Test Baseline Model:

  Test statistic                             53597.773   43159.977
  Degrees of freedom                                55          55
  P-value                                        0.000       0.000
  Scaling correction factor                                  1.242
```

```
User Model versus Baseline Model:

  Comparative Fit Index (CFI)                    0.986       0.978
  Tucker-Lewis Index (TLI)                       0.981       0.971

  Robust Comparative Fit Index (CFI)                            NA
  Robust Tucker-Lewis Index (TLI)                               NA

Root Mean Square Error of Approximation:

  RMSEA                                          0.037       0.041
  90 Percent confidence interval - lower         0.035       0.039
  90 Percent confidence interval - upper         0.039       0.044
  P-value RMSEA <= 0.05                          1.000       1.000

  Robust RMSEA                                                  NA
  90 Percent confidence interval - lower                        NA
  90 Percent confidence interval - upper                        NA

Standardized Root Mean Square Residual:

  SRMR                                           0.073       0.073

Parameter Estimates:

  Standard errors                             Robust.sem
  Information                                   Expected
  Information saturated (h1) model          Unstructured

Latent Variables:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
  s =~
    s_sentpauvrisq    1.000                               0.674    0.674
    s_infminidecla    1.132    0.018   63.490    0.000    0.763    0.763
  m =~
    m_quantilnv_nv    1.000                               0.846    0.846
    m_locatif_inv     0.698    0.019   36.523    0.000    0.590    0.590
    m_financier_nv    0.714    0.018   39.366    0.000    0.604    0.604
  i =~
    i_log             1.000                               0.880    0.880
    i_rsa             0.847    0.015   55.299    0.000    0.746    0.746
    i_chom            0.401    0.017   23.587    0.000    0.353    0.353
    i_handi           0.403    0.020   20.465    0.000    0.355    0.355
    i_bourse          0.497    0.020   25.268    0.000    0.437    0.437
    i_hlm             0.746    0.013   56.923    0.000    0.656    0.656
  pauvrete =~
    s                 1.000                               0.938    0.938
    m                 1.476    0.026   57.362    0.000    1.103    1.103
    i                 1.156    0.019   62.405    0.000    0.830    0.830
```

Intercepts:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
.s_sentpauvrisq	0.000				0.000	0.000
.s_infminidecla	0.000				0.000	0.000
.m_quantilnv_nv	0.000				0.000	0.000
.m_locatif_inv	0.000				0.000	0.000
.m_financier_nv	0.000				0.000	0.000
.i_log	0.000				0.000	0.000
.i_rsa	0.000				0.000	0.000
.i_chom	0.000				0.000	0.000
.i_handi	0.000				0.000	0.000
.i_bourse	0.000				0.000	0.000
.i_hlm	0.000				0.000	0.000
.s	0.000				0.000	0.000
.m	0.000				0.000	0.000
.i	0.000				0.000	0.000
pauvrete	0.000				0.000	0.000

Thresholds:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
s_sentpvrsq|t1	0.267	0.011	24.326	0.000	0.267	0.267
s_sentpvrsq|t2	1.020	0.013	77.484	0.000	1.020	1.020
s_infmindcl|t1	-0.123	0.011	-11.357	0.000	-0.123	-0.123
m_qntlnv_nv|t1	-0.852	0.012	-68.664	0.000	-0.852	-0.852
m_qntlnv_nv|t2	-0.266	0.011	-24.223	0.000	-0.266	-0.266
m_qntlnv_nv|t3	0.252	0.011	22.964	0.000	0.252	0.252
m_qntlnv_nv|t4	0.836	0.012	67.760	0.000	0.836	0.836
m_locatf_nv|t1	-1.435	0.016	-89.369	0.000	-1.435	-1.435
m_finncr_nv|t1	-1.380	0.016	-88.614	0.000	-1.380	-1.380
i_log|t1	0.693	0.012	58.531	0.000	0.693	0.693
i_rsa|t1	1.543	0.017	90.111	0.000	1.543	1.543
i_chom|t1	1.139	0.014	82.368	0.000	1.139	1.139
i_handi|t1	1.451	0.016	89.539	0.000	1.451	1.451
i_bourse|t1	1.593	0.018	90.139	0.000	1.593	1.593
i_hlm|t1	0.675	0.012	57.238	0.000	0.675	0.675

Variances:

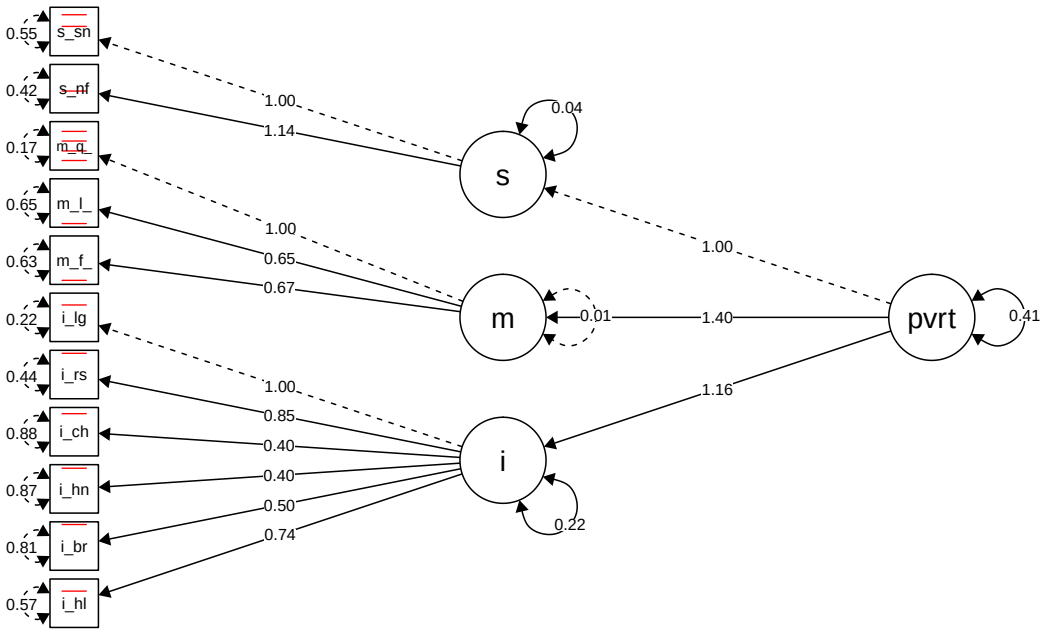
	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
.s_sentpauvrisq	0.546				0.546	0.546
.s_infminidecla	0.418				0.418	0.418
.m_quantilnv_nv	0.285				0.285	0.285
.m_locatif_inv	0.652				0.652	0.652
.m_financier_nv	0.635				0.635	0.635
.i_log	0.226				0.226	0.226
.i_rsa	0.444				0.444	0.444
.i_chom	0.875				0.875	0.875
.i_handi	0.874				0.874	0.874
.i_bourse	0.809				0.809	0.809

```
   .i_hlm             0.569                                  0.569    0.569
   .s                 0.055    0.010    5.614    0.000    0.120    0.120
   .m                -0.155    0.018   -8.516    0.000   -0.216   -0.216
   .i                 0.240    0.013   17.828    0.000    0.310    0.310
    pauvrete          0.399    0.011   36.427    0.000    1.000    1.000

Scales y*:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
    s_sentpauvrisq    1.000                                1.000    1.000
    s_infminidecla    1.000                                1.000    1.000
    m_quantilnv_nv    1.000                                1.000    1.000
    m_locatif_inv     1.000                                1.000    1.000
    m_financier_nv    1.000                                1.000    1.000
    i_log             1.000                                1.000    1.000
    i_rsa             1.000                                1.000    1.000
    i_chom            1.000                                1.000    1.000
    i_handi           1.000                                1.000    1.000
    i_bourse          1.000                                1.000    1.000
    i_hlm             1.000                                1.000    1.000
```

fit_hier1 semble être équivalent à fit2 !

```
             chisq df pvalue       cfi       tli      rmsea       srmr
fit_hier1 792.1158 41      0 0.9859717 0.9811815 0.03703316 0.07278576
fit2      792.1158 41      0 0.9859717 0.9811815 0.03703316 0.07278575
```

Il y a juste une variance négative (Heywood case) que nous corrigeons en remplaçant la variance légèrement négative de m par une variance légèrement positive (la variance nulle fait aussi bugger le modèle). Le modèle n'est que légèrement moins bien mais permet d'estimer les scores des facteurs latents (avec la fonction predict)




```
lavaan 0.6-8 ended normally after 30 iterations
```

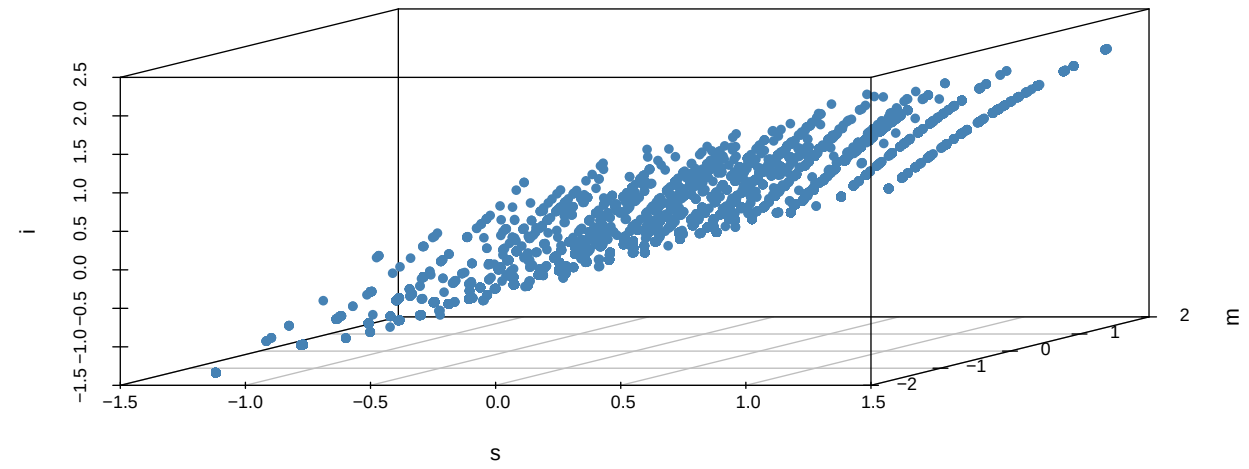
```
  Estimator                                      DWLS
  Optimization method                           NLMINB
  Number of model parameters                        29

  Number of observations                         13359

Model Test User Model:
                                              Standard      Robust
  Test Statistic                               792.116     979.597
  Degrees of freedom                                41          41
  P-value (Chi-square)                           0.000       0.000
  Scaling correction factor                                  0.811
  Shift parameter                                            2.975
       simple second-order correction

Model Test Baseline Model:

  Test statistic                             53597.773   43159.977
  Degrees of freedom                                55          55
  P-value                                        0.000       0.000
  Scaling correction factor                                  1.242

User Model versus Baseline Model:

  Comparative Fit Index (CFI)                    0.986       0.978
  Tucker-Lewis Index (TLI)                       0.981       0.971

  Robust Comparative Fit Index (CFI)                            NA
  Robust Tucker-Lewis Index (TLI)                               NA

Root Mean Square Error of Approximation:

  RMSEA                                          0.037       0.041
  90 Percent confidence interval - lower         0.035       0.039
  90 Percent confidence interval - upper         0.039       0.044
  P-value RMSEA <= 0.05                          1.000       1.000

  Robust RMSEA                                                  NA
  90 Percent confidence interval - lower                        NA
  90 Percent confidence interval - upper                        NA

Standardized Root Mean Square Residual:

  SRMR                                           0.073       0.073

Parameter Estimates:

  Standard errors                             Robust.sem
```

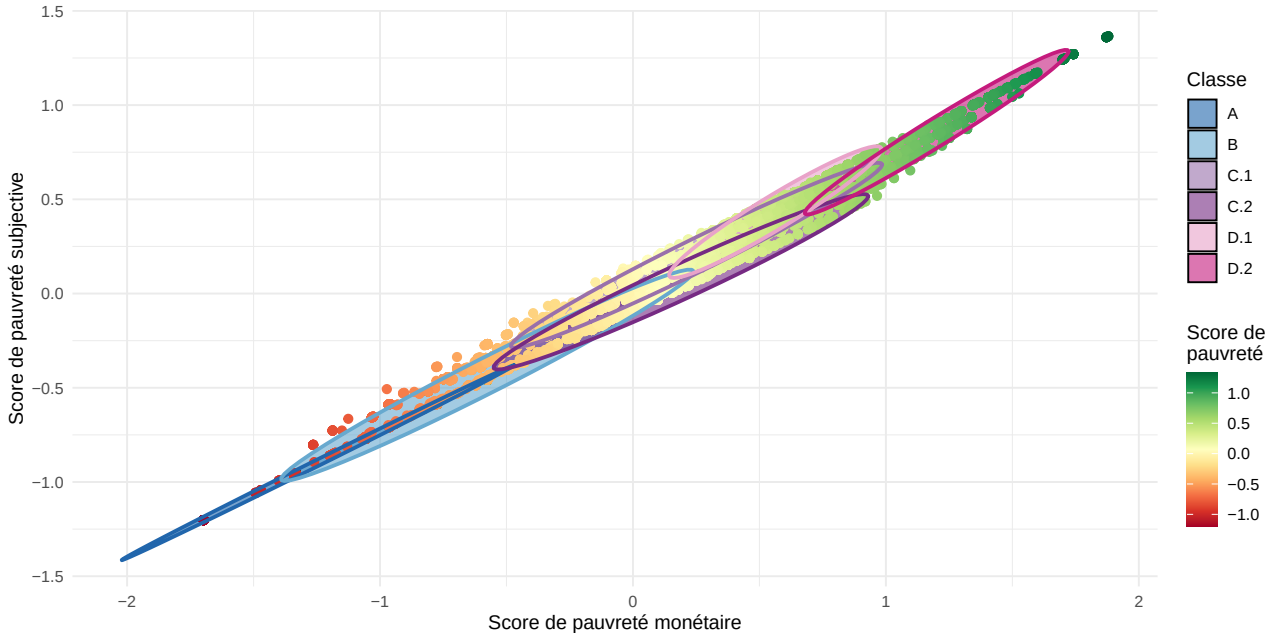
```
  Information                                 Expected
  Information saturated (h1) model        Unstructured

Latent Variables:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
  s =~
    s_sentpauvrisq    1.000                               0.674    0.674
    s_infminidecla    1.132    0.018   63.490    0.000    0.763    0.763
  m =~
    m_quantilnv_nv    1.000                               0.846    0.846
    m_locatif_inv     0.698    0.019   36.523    0.000    0.590    0.590
    m_financier_nv    0.714    0.018   39.366    0.000    0.604    0.604
  i =~
    i_log             1.000                               0.880    0.880
    i_rsa             0.847    0.015   55.299    0.000    0.746    0.746
    i_chom            0.401    0.017   23.587    0.000    0.353    0.353
    i_handi           0.403    0.020   20.465    0.000    0.355    0.355
    i_bourse          0.497    0.020   25.268    0.000    0.437    0.437
    i_hlm             0.746    0.013   56.923    0.000    0.656    0.656
  pauvrete =~
    s                 1.000                               0.938    0.938
    m                 1.476    0.026   57.362    0.000    1.103    1.103
    i                 1.156    0.019   62.405    0.000    0.830    0.830

Intercepts:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
   .s_sentpauvrisq    0.000                               0.000    0.000
   .s_infminidecla    0.000                               0.000    0.000
   .m_quantilnv_nv    0.000                               0.000    0.000
   .m_locatif_inv     0.000                               0.000    0.000
   .m_financier_nv    0.000                               0.000    0.000
   .i_log             0.000                               0.000    0.000
   .i_rsa             0.000                               0.000    0.000
   .i_chom            0.000                               0.000    0.000
   .i_handi           0.000                               0.000    0.000
   .i_bourse          0.000                               0.000    0.000
   .i_hlm             0.000                               0.000    0.000
   .s                 0.000                               0.000    0.000
   .m                 0.000                               0.000    0.000
   .i                 0.000                               0.000    0.000
    pauvrete          0.000                               0.000    0.000

Thresholds:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
    s_sentpvrsq|t1    0.267    0.011   24.326    0.000    0.267    0.267
    s_sentpvrsq|t2    1.020    0.013   77.484    0.000    1.020    1.020
    s_infmindcl|t1   -0.123    0.011  -11.357    0.000   -0.123   -0.123
    m_qntlnv_nv|t1   -0.852    0.012  -68.664    0.000   -0.852   -0.852
    m_qntlnv_nv|t2   -0.266    0.011  -24.223    0.000   -0.266   -0.266
```

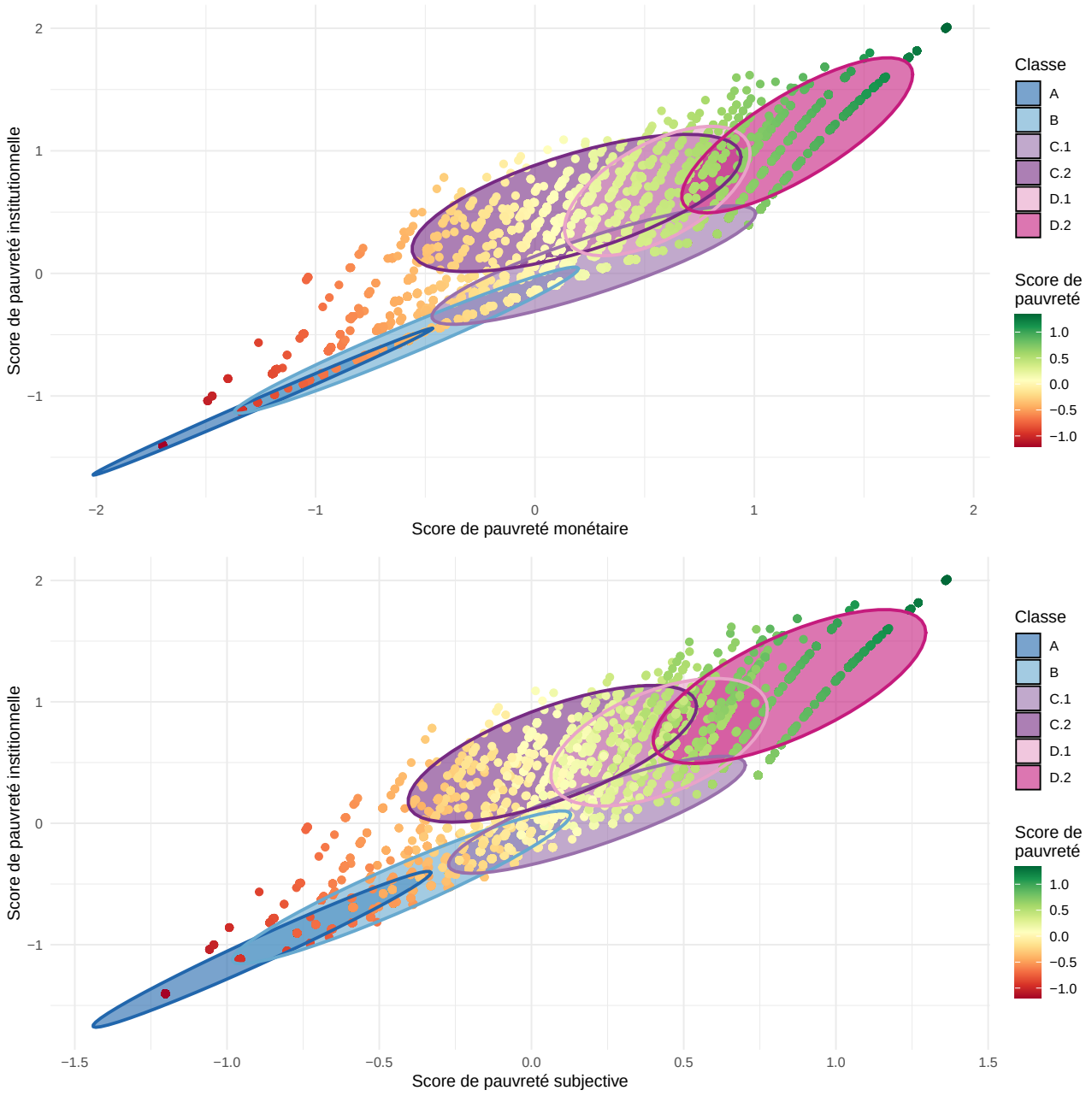
```
    m_qntlnv_nv|t3    0.252    0.011   22.964    0.000    0.252    0.252
    m_qntlnv_nv|t4    0.836    0.012   67.760    0.000    0.836    0.836
    m_locatf_nv|t1   -1.435    0.016  -89.369    0.000   -1.435   -1.435
    m_finncr_nv|t1   -1.380    0.016  -88.614    0.000   -1.380   -1.380
    i_log|t1          0.693    0.012   58.531    0.000    0.693    0.693
    i_rsa|t1          1.543    0.017   90.111    0.000    1.543    1.543
    i_chom|t1         1.139    0.014   82.368    0.000    1.139    1.139
    i_handi|t1        1.451    0.016   89.539    0.000    1.451    1.451
    i_bourse|t1       1.593    0.018   90.139    0.000    1.593    1.593
    i_hlm|t1          0.675    0.012   57.238    0.000    0.675    0.675

Variances:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
   .s_sentpauvrisq    0.546                                0.546    0.546
   .s_infminidecla    0.418                                0.418    0.418
   .m_quantilnv_nv    0.285                                0.285    0.285
   .m_locatif_inv     0.652                                0.652    0.652
   .m_financier_nv    0.635                                0.635    0.635
   .i_log             0.226                                0.226    0.226
   .i_rsa             0.444                                0.444    0.444
   .i_chom            0.875                                0.875    0.875
   .i_handi           0.874                                0.874    0.874
   .i_bourse          0.809                                0.809    0.809
   .i_hlm             0.569                                0.569    0.569
   .s                 0.055    0.010    5.614    0.000    0.120    0.120
   .m                -0.155    0.018   -8.516    0.000   -0.216   -0.216
   .i                 0.240    0.013   17.828    0.000    0.310    0.310
    pauvrete          0.399    0.011   36.427    0.000    1.000    1.000

Scales y*:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
    s_sentpauvrisq    1.000                                1.000    1.000
    s_infminidecla    1.000                                1.000    1.000
    m_quantilnv_nv    1.000                                1.000    1.000
    m_locatif_inv     1.000                                1.000    1.000
    m_financier_nv    1.000                                1.000    1.000
    i_log             1.000                                1.000    1.000
    i_rsa             1.000                                1.000    1.000
    i_chom            1.000                                1.000    1.000
    i_handi           1.000                                1.000    1.000
    i_bourse          1.000                                1.000    1.000
    i_hlm             1.000                                1.000    1.000

                  chisq df pvalue       cfi       tli      rmsea       srmr
fit_hier1      792.1158 41      0 0.9859717 0.9811815 0.03703316 0.07278576
fit_hier1_corr 853.0737 42      0 0.9848519 0.9801631 0.03802199 0.07212445
```

Graphiques des résultats où on projette les scores latents de tous les individus. On a bien une corrélation très directe entre s et m, et légèrement plus floue entre i et m (et donc i et s).

J'affiche aussi les anciennes classes latentes pour montrer que les résultats sont conformes à l'intuition.







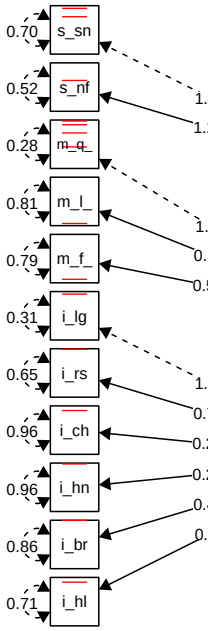
3.4.5 CFA avec des covariables (MIMIC)

MIMIC stands for multiple indicators multiple independent causes (Jöreskog and Goldberger, 1975) and is a general structural latent variable concept where CFA is extended in terms of linking covariates with latent variables. MIMIC models can be used to control for sociodemographic or other types of covariates in CFA and more general SEM specifications.

Remarque : ne marche qu'avec les covariates exogènes de moins de 2 facteurs (c'est pourquoi nous avons transformé toutes les covariate en indicatrices du type : indicatrice d'être un couple sans enfant, etc.)

Remarque : le contrôle "Propriétaire" n'a pas été ajouté en raison de sa colinéarité avec l'indicateur de pauvreté institutionnelle de locataire d'un HLM. L'intégrer ne permettait pas aux modèles de

converger.



3.4.5.1 Ajout des contrôles uniquement sur l'indicateur global de pauvreté

```
lavaan 0.6-8 ended normally after 46 iterations

  Estimator                                         DWLS
  Optimization method                           NLMINB
  Number of model parameters                        51

  Number of observations                         13359

Model Test User Model:
                                              Standard      Robust
  Test Statistic                              4218.320    3553.749
  Degrees of freedom                           272         272
  P-value (Chi-square)                          0.000       0.000
  Scaling correction factor                                 1.213
  Shift parameter                                          75.106
       simple second-order correction

Model Test Baseline Model:

  Test statistic                             18958.386   16425.107
  Degrees of freedom                            55          55
  P-value                                       0.000       0.000
  Scaling correction factor                                 1.155

User Model versus Baseline Model:

  Comparative Fit Index (CFI)                   0.791       0.800
  Tucker-Lewis Index (TLI)                      0.958       0.959
```

```
  Robust Comparative Fit Index (CFI)                            NA
  Robust Tucker-Lewis Index (TLI)                               NA

Root Mean Square Error of Approximation:

  RMSEA                                          0.033       0.030
  90 Percent confidence interval - lower         0.032       0.029
  90 Percent confidence interval - upper         0.034       0.031
  P-value RMSEA <= 0.05                          1.000       1.000

  Robust RMSEA                                                  NA
  90 Percent confidence interval - lower                        NA
  90 Percent confidence interval - upper                        NA

Standardized Root Mean Square Residual:

  SRMR                                           0.088       0.088

Parameter Estimates:

  Standard errors                             Robust.sem
  Information                                   Expected
  Information saturated (h1) model          Unstructured

Latent Variables:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
  s =~
    s_sentpauvrisq    1.000                               0.745    0.666
    s_infminidecla    1.255    0.027   46.387    0.000    0.935    0.791
  m =~
    m_quantilnv_nv    1.000                               1.209    0.917
    m_locatif_inv     0.506    0.018   27.500    0.000    0.612    0.561
    m_financier_nv    0.534    0.017   30.629    0.000    0.646    0.587
  i =~
    i_log             1.000                               1.072    0.887
    i_rsa             0.717    0.021   33.612    0.000    0.768    0.691
    i_chom            0.231    0.019   12.357    0.000    0.247    0.244
    i_handi           0.254    0.022   11.556    0.000    0.272    0.268
    i_bourse          0.443    0.023   19.156    0.000    0.475    0.455
    i_hlm             0.644    0.017   37.987    0.000    0.690    0.633
  pauvrete =~
    s                 1.000                               0.947    0.947
    m                 1.708    0.037   46.525    0.000    0.997    0.997
    i                 1.350    0.033   41.155    0.000    0.888    0.888

Regressions:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
  pauvrete ~
```

cov_sexe_femme	0.055	0.012	4.736	0.000	0.078	0.039
cov_diplom_sns	0.276	0.016	17.648	0.000	0.391	0.196
cv_dplm_bcpls2	-0.156	0.019	-8.239	0.000	-0.221	-0.079
cv_dplm_bcpls3	-0.323	0.020	-16.141	0.000	-0.458	-0.175
cv_prf_sttt_c_	0.806	0.029	27.693	0.000	1.142	0.297
cv_prf_sttt_c_	0.302	0.024	12.641	0.000	0.428	0.137
cv_prf_sttt_c_	0.043	0.032	1.373	0.170	0.061	0.011
cv_prf_sttt_c_	0.259	0.022	11.708	0.000	0.367	0.130
cv_prf_sttt_c_	0.803	0.029	27.701	0.000	1.139	0.310
cv_prf_sttt_c_	0.627	0.034	18.532	0.000	0.890	0.180
cv_prf_sttt_c_	-0.164	0.025	-6.698	0.000	-0.233	-0.066
cv_prf_sttt_c_	0.249	0.030	8.256	0.000	0.354	0.161
cv_prf_sttt_c_	0.124	0.072	1.715	0.086	0.176	0.013
cv_g_trnc_1829	0.043	0.019	2.225	0.026	0.061	0.023
cv_g_trnc_4049	-0.075	0.018	-4.156	0.000	-0.106	-0.041
cv_g_trnc_5059	-0.203	0.019	-10.444	0.000	-0.287	-0.108
cv_g_trnc_6069	-0.299	0.029	-10.214	0.000	-0.424	-0.165
cov_g_trnch_70	-0.430	0.033	-12.943	0.000	-0.609	-0.203
cov_vie_fam_mn	0.797	0.027	29.418	0.000	1.130	0.297
cov_vie_fam_sl	0.411	0.016	25.624	0.000	0.583	0.276
cov_vi_fm_cpnf	0.308	0.018	17.473	0.000	0.436	0.190
cov_vie_fam_tr	0.366	0.041	9.024	0.000	0.519	0.059
cov_vie_fam_nf	0.003	0.028	0.121	0.904	0.005	0.001

Intercepts:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
.s_sentpauvrisq	0.000				0.000	0.000
.s_infminidecla	0.000				0.000	0.000
.m_quantilnv_nv	0.000				0.000	0.000
.m_locatif_inv	0.000				0.000	0.000
.m_financier_nv	0.000				0.000	0.000
.i_log	0.000				0.000	0.000
.i_rsa	0.000				0.000	0.000
.i_chom	0.000				0.000	0.000
.i_handi	0.000				0.000	0.000
.i_bourse	0.000				0.000	0.000
.i_hlm	0.000				0.000	0.000
.s	0.000				0.000	0.000
.m	0.000				0.000	0.000
.i	0.000				0.000	0.000
.pauvrete	0.000				0.000	0.000

Thresholds:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
s_sentpvrsq|t1	0.746	0.055	13.681	0.000	0.746	0.667
s_sentpvrsq|t2	1.608	0.056	28.699	0.000	1.608	1.436
s_infmindcl|t1	0.352	0.056	6.331	0.000	0.352	0.298
m_qntlnv_nv|t1	-0.137	0.049	-2.811	0.005	-0.137	-0.104
m_qntlnv_nv|t2	0.623	0.048	12.869	0.000	0.623	0.473

```
    m_qntlnv_nv|t3    1.305    0.049   26.538    0.000    1.305    0.990
    m_qntlnv_nv|t4    2.064    0.050   41.267    0.000    2.064    1.566
    m_locatf_nv|t1   -1.696    0.093  -18.184    0.000   -1.696   -1.556
    m_finncr_nv|t1   -1.454    0.081  -18.021    0.000   -1.454   -1.322
    i_log|t1          1.618    0.069   23.340    0.000    1.618    1.339
    i_rsa|t1          2.339    0.112   20.802    0.000    2.339    2.103
    i_chom|t1         1.309    0.074   17.694    0.000    1.309    1.293
    i_handi|t1        2.118    0.096   21.962    0.000    2.118    2.088
    i_bourse|t1       2.779    0.125   22.179    0.000    2.779    2.662
    i_hlm|t1          1.297    0.063   20.666    0.000    1.297    1.188

Variances:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
   .m                 0.010                              0.007    0.007
   .s_sentpauvrisq    0.698                              0.698    0.557
   .s_infminidecla    0.524                              0.524    0.375
   .m_quantilnv_nv    0.275                              0.275    0.158
   .m_locatif_inv     0.814                              0.814    0.685
   .m_financier_nv    0.793                              0.793    0.655
   .i_log             0.311                              0.311    0.213
   .i_rsa             0.646                              0.646    0.522
   .i_chom            0.963                              0.963    0.940
   .i_handi           0.956                              0.956    0.928
   .i_bourse          0.865                              0.865    0.793
   .i_hlm             0.714                              0.714    0.600
   .s                 0.057    0.010    5.622    0.000    0.103    0.103
   .i                 0.243    0.020   12.078    0.000    0.211    0.211
   .pauvrete          0.245    0.009   26.456    0.000    0.492    0.492

Scales y*:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
    s_sentpauvrisq    1.000                              1.000    1.000
    s_infminidecla    1.000                              1.000    1.000
    m_quantilnv_nv    1.000                              1.000    1.000
    m_locatif_inv     1.000                              1.000    1.000
    m_financier_nv    1.000                              1.000    1.000
    i_log             1.000                              1.000    1.000
    i_rsa             1.000                              1.000    1.000
    i_chom            1.000                              1.000    1.000
    i_handi           1.000                              1.000    1.000
    i_bourse          1.000                              1.000    1.000
    i_hlm             1.000                              1.000    1.000

[1] "fit_mimic_global : "

       chisq           df       pvalue          cfi          tli        rmsea
4.218320e+03 2.720000e+02 0.000000e+00 7.912374e-01 9.577870e-01 3.295649e-02
        srmr
8.833453e-02
```

```
[1] "fit_hier1_corr : "
```

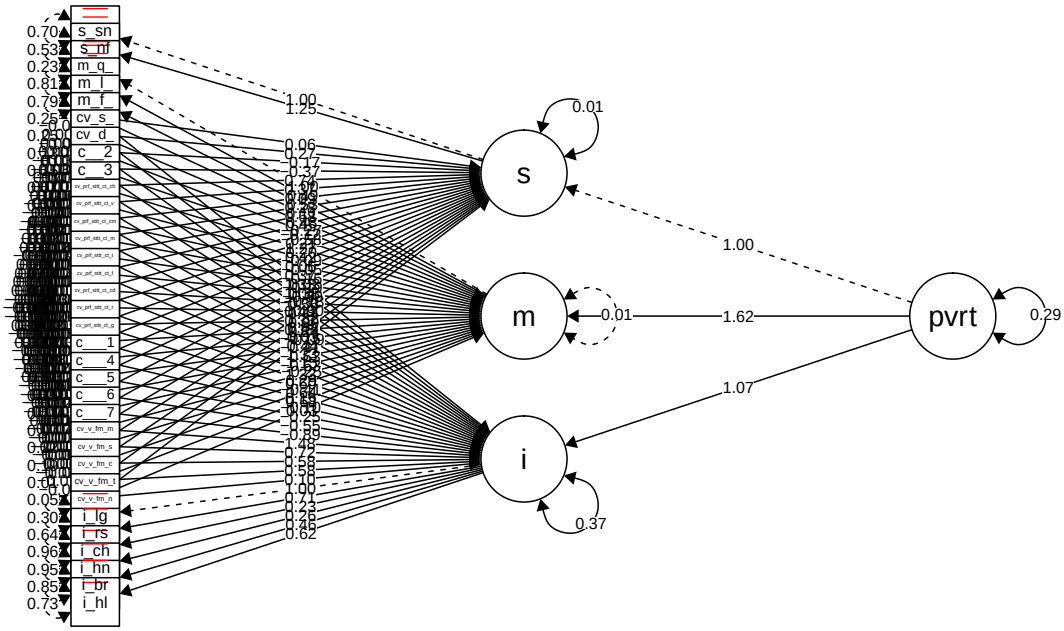
```
       chisq           df       pvalue          cfi          tli        rmsea
853.07372962  42.00000000   0.00000000   0.98485185   0.98016314   0.03802199
        srmr
  0.07212445
```

Le modèle avec contrôles devient moins bien que le précédent.

Voici le détail de l'effet des différents contrôles sur la pauvreté :

lhs	variable	estimateur
pauvrete	prof_statut_act_chom	0.81***
pauvrete	prof_statut_act_autrinac	0.8***
pauvrete	vie_fam_mono	0.8***
pauvrete	prof_statut_act_foyer	0.63***
pauvrete	vie_fam_seul	0.41***
pauvrete	vie_fam_autre	0.37***
pauvrete	vie_fam_coupenf	0.31***
pauvrete	prof_statut_act_ouv	0.3***
pauvrete	diplome_sans	0.28***
pauvrete	prof_statut_act_employ	0.26***
pauvrete	prof_statut_act_retr	0.25***
pauvrete	prof_statut_act_agri	0.12
pauvrete	sexe_femme	0.06***
pauvrete	age_tranche_1829	0.04*
pauvrete	prof_statut_act_commer	0.04
pauvrete	vie_fam_enf	0
pauvrete	age_tranche_4049	-0.08***
pauvrete	diplome_bacplus2	-0.16***
pauvrete	prof_statut_act_cadre	-0.16***
pauvrete	age_tranche_5059	-0.2***
pauvrete	age_tranche_6069	-0.3***
pauvrete	diplome_bacplus3	-0.32***
pauvrete	age_tranche_70	-0.43***

3.4.5.2 Ajout des contrôles sur les indicateurs de pauvretés i,m et s uniquement




```
lavaan 0.6-8 ended normally after 126 iterations

  Estimator                                         DWLS
  Optimization method                           NLMINB
  Number of model parameters                        97

  Number of observations                         13359

Model Test User Model:
                                              Standard      Robust
  Test Statistic                              3446.741    2944.033
  Degrees of freedom                               226         226
  P-value (Chi-square)                           0.000       0.000
  Scaling correction factor                                  1.195
  Shift parameter                                           59.085
       simple second-order correction

Model Test Baseline Model:

  Test statistic                             18958.386   16425.107
  Degrees of freedom                                55          55
  P-value                                        0.000       0.000
  Scaling correction factor                                  1.155

User Model versus Baseline Model:

  Comparative Fit Index (CFI)                    0.830       0.834
  Tucker-Lewis Index (TLI)                       0.959       0.960
```

```
  Robust Comparative Fit Index (CFI)                            NA
  Robust Tucker-Lewis Index (TLI)                               NA

Root Mean Square Error of Approximation:

  RMSEA                                          0.033       0.030
  90 Percent confidence interval - lower         0.032       0.029
  90 Percent confidence interval - upper         0.034       0.031
  P-value RMSEA <= 0.05                          1.000       1.000

  Robust RMSEA                                                  NA
  90 Percent confidence interval - lower                        NA
  90 Percent confidence interval - upper                        NA

Standardized Root Mean Square Residual:

  SRMR                                           0.086       0.086

Parameter Estimates:

  Standard errors                             Robust.sem
  Information                                   Expected
  Information saturated (h1) model          Unstructured

Latent Variables:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
  s =~
    s_sentpauvrisq    1.000                               0.720    0.653
    s_infminidecla    1.250    0.026   47.542    0.000    0.900    0.779
  m =~
    m_quantilnv_nv    1.000                               1.211    0.929
    m_locatif_inv     0.492    0.018   27.209    0.000    0.596    0.551
    m_financier_nv    0.526    0.017   30.437    0.000    0.637    0.583
  i =~
    i_log             1.000                               1.189    0.909
    i_rsa             0.714    0.022   32.936    0.000    0.849    0.727
    i_chom            0.228    0.018   12.684    0.000    0.271    0.266
    i_handi           0.260    0.021   12.213    0.000    0.309    0.302
    i_bourse          0.462    0.023   20.104    0.000    0.549    0.512
    i_hlm             0.617    0.017   37.081    0.000    0.734    0.651
  pauvrete =~
    s                 1.000                               0.746    0.746
    m                 1.619    0.043   37.623    0.000    0.718    0.718
    i                 1.073    0.028   37.692    0.000    0.485    0.485

Regressions:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
  i ~
    cov_sexe_femme    0.031    0.027    1.158    0.247    0.026    0.013
```

cov_diplom_sns	0.379	0.034	11.197	0.000	0.318	0.159
cv_dplm_bcpls2	-0.179	0.044	-4.076	0.000	-0.151	-0.054
cv_dplm_bcpls3	-0.301	0.046	-6.572	0.000	-0.253	-0.097
cv_prf_sttt_c_	1.316	0.054	24.339	0.000	1.107	0.287
cv_prf_sttt_c_	0.442	0.051	8.613	0.000	0.372	0.119
cv_prf_sttt_c_	0.027	0.080	0.333	0.739	0.022	0.004
cv_prf_sttt_c_	0.442	0.049	8.997	0.000	0.372	0.132
cv_prf_sttt_c_	1.334	0.056	23.949	0.000	1.122	0.305
cv_prf_sttt_c_	1.154	0.070	16.451	0.000	0.971	0.197
cv_prf_sttt_c_	-0.252	0.065	-3.867	0.000	-0.212	-0.060
cv_prf_sttt_c_	0.285	0.070	4.049	0.000	0.240	0.109
cv_prf_sttt_c_	-0.411	0.230	-1.790	0.073	-0.346	-0.025
cv_g_trnc_1829	0.148	0.041	3.594	0.000	0.124	0.047
cv_g_trnc_4049	-0.101	0.040	-2.556	0.011	-0.085	-0.033
cv_g_trnc_5059	-0.254	0.043	-5.947	0.000	-0.214	-0.080
cv_g_trnc_6069	-0.546	0.066	-8.312	0.000	-0.460	-0.179
cov_g_trnch_70	-0.887	0.078	-11.392	0.000	-0.746	-0.249
cov_vie_fam_mn	1.479	0.054	27.376	0.000	1.244	0.328
cov_vie_fam_sl	0.722	0.037	19.627	0.000	0.608	0.288
cov_vi_fm_cpnf	0.585	0.041	14.318	0.000	0.492	0.214
cov_vie_fam_tr	0.579	0.092	6.274	0.000	0.487	0.056
cov_vie_fam_nf	0.097	0.062	1.567	0.117	0.081	0.018
m ~						
cov_sexe_femme	0.114	0.021	5.489	0.000	0.094	0.047
cov_diplom_sns	0.480	0.028	17.434	0.000	0.396	0.198
cv_dplm_bcpls2	-0.273	0.034	-8.141	0.000	-0.226	-0.081
cv_dplm_bcpls3	-0.582	0.034	-17.250	0.000	-0.481	-0.184
cv_prf_sttt_c_	1.273	0.048	26.462	0.000	1.051	0.273
cv_prf_sttt_c_	0.419	0.044	9.624	0.000	0.346	0.111
cv_prf_sttt_c_	0.055	0.054	1.016	0.310	0.045	0.008
cv_prf_sttt_c_	0.366	0.040	9.103	0.000	0.302	0.107
cv_prf_sttt_c_	1.331	0.048	27.800	0.000	1.099	0.299
cv_prf_sttt_c_	1.040	0.059	17.747	0.000	0.859	0.174
cv_prf_sttt_c_	-0.306	0.043	-7.179	0.000	-0.253	-0.072
cv_prf_sttt_c_	0.491	0.052	9.465	0.000	0.406	0.184
cv_prf_sttt_c_	0.333	0.138	2.417	0.016	0.275	0.020
cv_g_trnc_1829	0.149	0.038	3.974	0.000	0.123	0.047
cv_g_trnc_4049	-0.150	0.034	-4.443	0.000	-0.124	-0.048
cv_g_trnc_5059	-0.406	0.035	-11.484	0.000	-0.335	-0.126
cv_g_trnc_6069	-0.526	0.050	-10.415	0.000	-0.434	-0.169
cov_g_trnch_70	-0.627	0.056	-11.170	0.000	-0.518	-0.173
cov_vie_fam_mn	1.329	0.042	31.302	0.000	1.098	0.289
cov_vie_fam_sl	0.604	0.026	23.644	0.000	0.499	0.237
cov_vi_fm_cpnf	0.637	0.030	21.265	0.000	0.526	0.228
cov_vie_fam_tr	0.677	0.074	9.123	0.000	0.559	0.064
cov_vie_fam_nf	0.027	0.050	0.545	0.586	0.022	0.005
s ~						
cov_sexe_femme	0.061	0.017	3.580	0.000	0.085	0.042
cov_diplom_sns	0.266	0.022	12.003	0.000	0.370	0.185

cv_dplm_bcpls2	-0.169	0.027	-6.163	0.000	-0.235	-0.084
cv_dplm_bcpls3	-0.371	0.029	-12.782	0.000	-0.516	-0.197
cv_prf_sttt_c_	0.741	0.039	18.829	0.000	1.030	0.267
cv_prf_sttt_c_	0.374	0.035	10.832	0.000	0.520	0.166
cv_prf_sttt_c_	0.094	0.046	2.038	0.042	0.131	0.024
cv_prf_sttt_c_	0.280	0.032	8.832	0.000	0.389	0.138
cv_prf_sttt_c_	0.678	0.039	17.354	0.000	0.943	0.257
cv_prf_sttt_c_	0.451	0.047	9.676	0.000	0.626	0.127
cv_prf_sttt_c_	-0.117	0.037	-3.180	0.001	-0.162	-0.046
cv_prf_sttt_c_	0.212	0.043	4.899	0.000	0.294	0.134
cv_prf_sttt_c_	0.198	0.100	1.972	0.049	0.275	0.020
cv_g_trnc_1829	-0.093	0.029	-3.231	0.001	-0.130	-0.049
cv_g_trnc_4049	-0.051	0.026	-1.933	0.053	-0.071	-0.027
cv_g_trnc_5059	-0.157	0.028	-5.568	0.000	-0.219	-0.082
cv_g_trnc_6069	-0.194	0.042	-4.608	0.000	-0.270	-0.105
cov_g_trnch_70	-0.391	0.047	-8.297	0.000	-0.543	-0.181
cov_vie_fam_mn	0.563	0.034	16.336	0.000	0.783	0.206
cov_vie_fam_sl	0.439	0.021	20.465	0.000	0.610	0.289
cov_vi_fm_cpnf	0.094	0.025	3.809	0.000	0.131	0.057
cov_vie_fam_tr	0.244	0.065	3.728	0.000	0.338	0.039
cov_vie_fam_nf	-0.088	0.041	-2.115	0.034	-0.122	-0.027

Intercepts:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
.s_sentpauvrisq	0.000				0.000	0.000
.s_infminidecla	0.000				0.000	0.000
.m_quantilnv_nv	0.000				0.000	0.000
.m_locatif_inv	0.000				0.000	0.000
.m_financier_nv	0.000				0.000	0.000
.i_log	0.000				0.000	0.000
.i_rsa	0.000				0.000	0.000
.i_chom	0.000				0.000	0.000
.i_handi	0.000				0.000	0.000
.i_bourse	0.000				0.000	0.000
.i_hlm	0.000				0.000	0.000
.s	0.000				0.000	0.000
.m	0.000				0.000	0.000
.i	0.000				0.000	0.000
pauvrete	0.000				0.000	0.000

Thresholds:

	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
s_sentpvrsq|t1	0.746	0.055	13.681	0.000	0.746	0.677
s_sentpvrsq|t2	1.608	0.056	28.699	0.000	1.608	1.459
s_infmindcl|t1	0.352	0.056	6.331	0.000	0.352	0.305
m_qntlnv_nv|t1	-0.137	0.049	-2.811	0.005	-0.137	-0.105
m_qntlnv_nv|t2	0.623	0.048	12.869	0.000	0.623	0.478
m_qntlnv_nv|t3	1.305	0.049	26.538	0.000	1.305	1.001
m_qntlnv_nv|t4	2.064	0.050	41.267	0.000	2.064	1.583

```
    m_locatf_nv|t1   -1.696    0.093  -18.184    0.000   -1.696   -1.569
    m_finncr_nv|t1   -1.454    0.081  -18.021    0.000   -1.454   -1.331
    i_log|t1          1.618    0.069   23.340    0.000    1.618    1.236
    i_rsa|t1          2.339    0.112   20.802    0.000    2.339    2.003
    i_chom|t1         1.309    0.074   17.694    0.000    1.309    1.286
    i_handi|t1        2.118    0.096   21.962    0.000    2.118    2.069
    i_bourse|t1       2.779    0.125   22.179    0.000    2.779    2.590
    i_hlm|t1          1.297    0.063   20.666    0.000    1.297    1.150

Variances:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
   .m                 0.010                              0.007    0.007
   .s_sentpauvrisq    0.696                              0.696    0.573
   .s_infminidecla    0.526                              0.526    0.394
   .m_quantilnv_nv    0.233                              0.233    0.137
   .m_locatif_inv     0.814                              0.814    0.696
   .m_financier_nv    0.788                              0.788    0.660
   .i_log             0.299                              0.299    0.174
   .i_rsa             0.643                              0.643    0.472
   .i_chom            0.964                              0.964    0.929
   .i_handi           0.953                              0.953    0.909
   .i_bourse          0.850                              0.850    0.738
   .i_hlm             0.733                              0.733    0.576
   .s                 0.015    0.011    1.359    0.174    0.029    0.029
   .i                 0.369    0.021   17.713    0.000    0.261    0.261
    pauvrete          0.289    0.012   24.947    0.000    1.000    1.000

Scales y*:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
    s_sentpauvrisq    1.000                              1.000    1.000
    s_infminidecla    1.000                              1.000    1.000
    m_quantilnv_nv    1.000                              1.000    1.000
    m_locatif_inv     1.000                              1.000    1.000
    m_financier_nv    1.000                              1.000    1.000
    i_log             1.000                              1.000    1.000
    i_rsa             1.000                              1.000    1.000
    i_chom            1.000                              1.000    1.000
    i_handi           1.000                              1.000    1.000
    i_bourse          1.000                              1.000    1.000
    i_hlm             1.000                              1.000    1.000

[1] "fit_mimic_inter : "

       chisq           df       pvalue          cfi          tli        rmsea
3.446741e+03 2.260000e+02 0.000000e+00 8.296210e-01 9.585361e-01 3.266276e-02
        srmr
8.573439e-02

[1] "fit_mimic_global : "

       chisq           df       pvalue          cfi          tli        rmsea
```

```
4.218320e+03 2.720000e+02 0.000000e+00 7.912374e-01 9.577870e-01 3.295649e-02
        srmr
8.833453e-02
```

Le modèle avec contrôles à un niveau intermédiaire est meilleur que le modèle avec contrôles globaux selon les indicateurs de performance. Il y a aussi moins de degrés de liberté.

Voici le détail de l'effet des différents contrôles sur la pauvreté :

variable	m	i	s
sexe_femme	0.11***	0.03	0.06***
diplome_sans	0.48***	0.38***	0.27***
diplome_bacplus2	-0.27***	-0.18***	-0.17***
diplome_bacplus3	-0.58***	-0.3***	-0.37***
prof_statut_act_chom	1.27***	1.32***	0.74***
prof_statut_act_ouv	0.42***	0.44***	0.37***
prof_statut_act_commer	0.06	0.03	0.09*
prof_statut_act_employ	0.37***	0.44***	0.28***
prof_statut_act_autrinac	1.33***	1.33***	0.68***
prof_statut_act_foyer	1.04***	1.15***	0.45***
prof_statut_act_cadre	-0.31***	-0.25***	-0.12**
prof_statut_act_retr	0.49***	0.29***	0.21***
prof_statut_act_agri	0.33*	-0.41	0.2*
age_tranche_1829	0.15***	0.15***	-0.09**
age_tranche_4049	-0.15***	-0.1*	-0.05
age_tranche_5059	-0.41***	-0.25***	-0.16***
age_tranche_6069	-0.53***	-0.55***	-0.19***
age_tranche_70	-0.63***	-0.89***	-0.39***
vie_fam_mono	1.33***	1.48***	0.56***
vie_fam_seul	0.6***	0.72***	0.44***
vie_fam_coupenf	0.64***	0.58***	0.09***
vie_fam_autre	0.68***	0.58***	0.24***
vie_fam_enf	0.03	0.1	-0.09*

En général pour tous les contrôles : effet sur s < effet sur i < effet sur m

Sexe

Effet non significatif dans la dimension institutionnelle mais significatif et positif dans dimension monétaire (le montant des salaires a un rôle mais pas le fait de toucher une prestation)

Diplôme

RAS, effet assez constant

Vie professionnelle

- Chômeur : tout est très élevé mais c'est eux qui ont le s le plus élevé de toutes les variables sociodémo. Fort ressenti subjectif
- Ouvrier : subjectif très fort, presque au même niveau que m et i. Idem pour employé dans une moindre mesure.

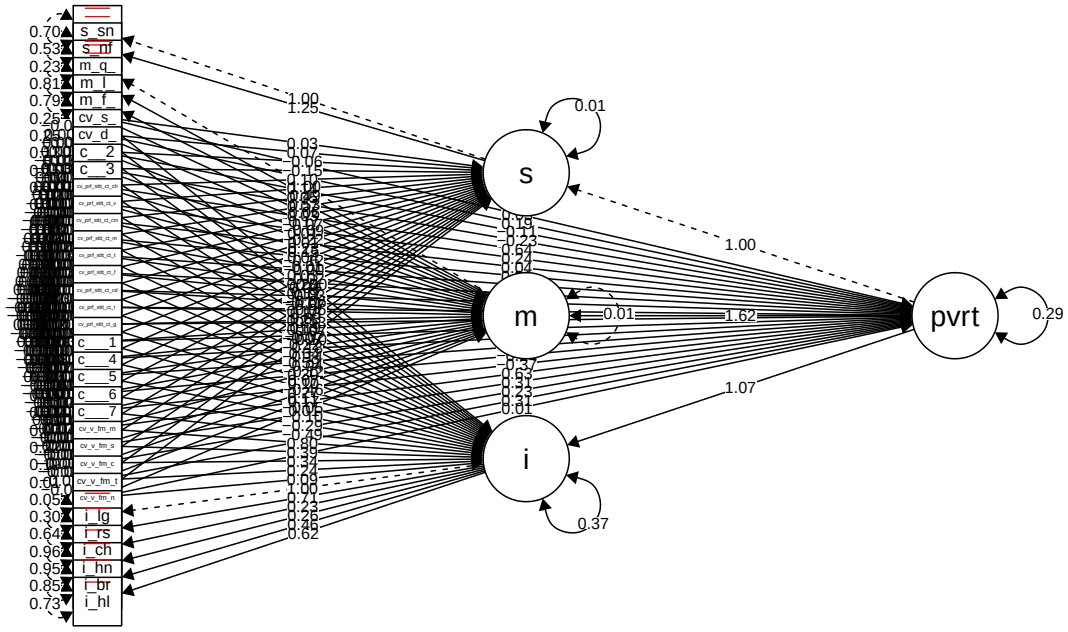
Âge (ref : 30-39)

— 18-29 : effet positif pour m et i et négatif pour s (les jeunes ne se sentent pas pauvres).
— 70 : effet très négatif de i (touchent peu de prestations sociales)

Structure familiale (ref : couple sans enfant)

— mono : effet bien moins fort du subjectif (on l'avait vu pour la variable s_infminidecla surtout).
— vit seul : c'est l'inverse subjectif presque aussi fort que les deux autres.
— couple avec enfants : subjectif quasiment nul par rapport à couple sans enfant.

3.4.5.3 Ajout des contrôles sur les indicateurs de pauvretés i,m et s ET à un niveau global



bal

```
lavaan 0.6-8 ended normally after 107 iterations

  Estimator                                         DWLS
  Optimization method                              NLMINB
  Number of model parameters                          120

  Number of observations                            13359

Model Test User Model:
                                              Standard      Robust
  Test Statistic                              3446.741    3446.741
  Degrees of freedom                               203         203
  P-value (Chi-square)                           0.000       0.000
  Scaling correction factor                                     NA
  Shift parameter
                                                             Robust

Model Test Baseline Model:

  Test statistic                             18958.386   16425.107
  Degrees of freedom                                55          55
```

```
  P-value                                        0.000       0.000
  Scaling correction factor                                  1.155

User Model versus Baseline Model:

  Comparative Fit Index (CFI)                    0.828       0.802
  Tucker-Lewis Index (TLI)                       0.954       0.946

  Robust Comparative Fit Index (CFI)                            NA
  Robust Tucker-Lewis Index (TLI)                               NA

Root Mean Square Error of Approximation:

  RMSEA                                          0.035       0.035
  90 Percent confidence interval - lower         0.034       0.034
  90 Percent confidence interval - upper         0.036       0.036
  P-value RMSEA <= 0.05                          1.000       1.000

  Robust RMSEA                                                  NA
  90 Percent confidence interval - lower                        NA
  90 Percent confidence interval - upper                        NA

Standardized Root Mean Square Residual:

  SRMR                                           0.086       0.086

Parameter Estimates:

  Standard errors                             Robust.sem
  Information                                   Expected
  Information saturated (h1) model          Unstructured

Latent Variables:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
  s =~
    s_sentpauvrisq    1.000                                0.720    0.653
    s_infminidecla    1.250       NA                       0.900    0.779
  m =~
    m_quantilnv_nv    1.000                                1.211    0.929
    m_locatif_inv     0.492       NA                       0.596    0.551
    m_financier_nv    0.526       NA                       0.637    0.583
  i =~
    i_log             1.000                                1.189    0.909
    i_rsa             0.714       NA                       0.849    0.727
    i_chom            0.228       NA                       0.271    0.266
    i_handi           0.260       NA                       0.309    0.302
    i_bourse          0.462       NA                       0.549    0.512
    i_hlm             0.617       NA                       0.734    0.651
  pauvrete =~
```

```
    s                 1.000                                    0.921    0.921
    m                 1.619       NA                           0.886    0.886
    i                 1.073       NA                           0.598    0.598

Regressions:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
  i ~
    cov_sexe_femme   -0.003       NA                       -0.002   -0.001
    cov_diplom_sns    0.173       NA                        0.145    0.073
    cv_dplm_bcpls2   -0.059       NA                       -0.050   -0.018
    cv_dplm_bcpls3   -0.059       NA                       -0.049   -0.019
    cv_prf_sttt_c_    0.626       NA                        0.526    0.137
    cv_prf_sttt_c_    0.188       NA                        0.158    0.051
    cv_prf_sttt_c_   -0.016       NA                       -0.014   -0.003
    cv_prf_sttt_c_    0.222       NA                        0.186    0.066
    cv_prf_sttt_c_    0.640       NA                        0.538    0.147
    cv_prf_sttt_c_    0.593       NA                        0.499    0.101
    cv_prf_sttt_c_   -0.119       NA                       -0.100   -0.029
    cv_prf_sttt_c_    0.074       NA                        0.062    0.028
    cv_prf_sttt_c_   -0.463       NA                       -0.389   -0.029
    cv_g_trnc_1829    0.115       NA                        0.096    0.037
    cv_g_trnc_4049   -0.049       NA                       -0.041   -0.016
    cv_g_trnc_5059   -0.102       NA                       -0.086   -0.032
    cv_g_trnc_6069   -0.290       NA                       -0.244   -0.095
    cov_g_trnch_70   -0.495       NA                       -0.416   -0.139
    cov_vie_fam_mn    0.799       NA                        0.672    0.177
    cov_vie_fam_sl    0.386       NA                        0.325    0.154
    cov_vi_fm_cpnf    0.340       NA                        0.286    0.124
    cov_vie_fam_tr    0.245       NA                        0.206    0.024
    cov_vie_fam_nf    0.085       NA                        0.072    0.016
  m ~
    cov_sexe_femme    0.063       NA                        0.052    0.026
    cov_diplom_sns    0.169       NA                        0.140    0.070
    cv_dplm_bcpls2   -0.092       NA                       -0.076   -0.027
    cv_dplm_bcpls3   -0.217       NA                       -0.179   -0.068
    cv_prf_sttt_c_    0.232       NA                        0.192    0.050
    cv_prf_sttt_c_    0.036       NA                        0.030    0.010
    cv_prf_sttt_c_   -0.010       NA                       -0.008   -0.002
    cv_prf_sttt_c_    0.032       NA                        0.027    0.009
    cv_prf_sttt_c_    0.283       NA                        0.234    0.064
    cv_prf_sttt_c_    0.193       NA                        0.159    0.032
    cv_prf_sttt_c_   -0.105       NA                       -0.087   -0.025
    cv_prf_sttt_c_    0.172       NA                        0.142    0.065
    cv_prf_sttt_c_    0.254       NA                        0.210    0.015
    cv_g_trnc_1829    0.099       NA                        0.082    0.031
    cv_g_trnc_4049   -0.072       NA                       -0.059   -0.023
    cv_g_trnc_5059   -0.176       NA                       -0.146   -0.055
    cv_g_trnc_6069   -0.139       NA                       -0.114   -0.044
    cov_g_trnch_70   -0.035       NA                       -0.029   -0.010
```

```
  cov_vie_fam_mn    0.303       NA                    0.250    0.066
  cov_vie_fam_sl    0.097       NA                    0.080    0.038
  cov_vi_fm_cpnf    0.267       NA                    0.221    0.096
  cov_vie_fam_tr    0.173       NA                    0.143    0.016
  cov_vie_fam_nf    0.010       NA                    0.008    0.002
s ~
  cov_sexe_femme    0.030       NA                    0.041    0.021
  cov_diplom_sns    0.074       NA                    0.103    0.052
  cv_dplm_bcpls2   -0.058       NA                   -0.080   -0.029
  cv_dplm_bcpls3   -0.145       NA                   -0.202   -0.077
  cv_prf_sttt_c_    0.098       NA                    0.137    0.035
  cv_prf_sttt_c_    0.138       NA                    0.191    0.061
  cv_prf_sttt_c_    0.054       NA                    0.075    0.014
  cv_prf_sttt_c_    0.074       NA                    0.103    0.036
  cv_prf_sttt_c_    0.032       NA                    0.044    0.012
  cv_prf_sttt_c_   -0.072       NA                   -0.100   -0.020
  cv_prf_sttt_c_    0.007       NA                    0.010    0.003
  cv_prf_sttt_c_    0.015       NA                    0.021    0.009
  cv_prf_sttt_c_    0.149       NA                    0.207    0.015
  cv_g_trnc_1829   -0.124       NA                   -0.173   -0.066
  cv_g_trnc_4049   -0.003       NA                   -0.004   -0.001
  cv_g_trnc_5059   -0.016       NA                   -0.022   -0.008
  cv_g_trnc_6069    0.045       NA                    0.062    0.024
  cov_g_trnch_70   -0.025       NA                   -0.035   -0.012
  cov_vie_fam_mn   -0.071       NA                   -0.098   -0.026
  cov_vie_fam_sl    0.125       NA                    0.174    0.083
  cov_vi_fm_cpnf   -0.134       NA                   -0.186   -0.081
  cov_vie_fam_tr   -0.068       NA                   -0.094   -0.011
  cov_vie_fam_nf   -0.098       NA                   -0.137   -0.030
pauvrete ~
  cov_sexe_femme    0.031       NA                    0.047    0.024
  cov_diplom_sns    0.192       NA                    0.289    0.145
  cv_dplm_bcpls2   -0.112       NA                   -0.168   -0.060
  cv_dplm_bcpls3   -0.226       NA                   -0.341   -0.130
  cv_prf_sttt_c_    0.643       NA                    0.970    0.252
  cv_prf_sttt_c_    0.237       NA                    0.357    0.114
  cv_prf_sttt_c_    0.040       NA                    0.061    0.011
  cv_prf_sttt_c_    0.206       NA                    0.310    0.110
  cv_prf_sttt_c_    0.647       NA                    0.976    0.266
  cv_prf_sttt_c_    0.523       NA                    0.789    0.160
  cv_prf_sttt_c_   -0.124       NA                   -0.187   -0.053
  cv_prf_sttt_c_    0.197       NA                    0.297    0.135
  cv_prf_sttt_c_    0.048       NA                    0.073    0.005
  cv_g_trnc_1829    0.031       NA                    0.046    0.018
  cv_g_trnc_4049   -0.049       NA                   -0.073   -0.028
  cv_g_trnc_5059   -0.142       NA                   -0.214   -0.080
  cv_g_trnc_6069   -0.239       NA                   -0.361   -0.140
  cov_g_trnch_70   -0.366       NA                   -0.552   -0.184
  cov_vie_fam_mn    0.634       NA                    0.956    0.252
```

```
    cov_vie_fam_sl    0.313       NA                    0.473    0.224
    cov_vi_fm_cpnf    0.228       NA                    0.344    0.149
    cov_vie_fam_tr    0.311       NA                    0.470    0.054
    cov_vie_fam_nf    0.011       NA                    0.016    0.004

Intercepts:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
   .s_sentpauvrisq    0.000                               0.000    0.000
   .s_infminidecla    0.000                               0.000    0.000
   .m_quantilnv_nv    0.000                               0.000    0.000
   .m_locatif_inv     0.000                               0.000    0.000
   .m_financier_nv    0.000                               0.000    0.000
   .i_log             0.000                               0.000    0.000
   .i_rsa             0.000                               0.000    0.000
   .i_chom            0.000                               0.000    0.000
   .i_handi           0.000                               0.000    0.000
   .i_bourse          0.000                               0.000    0.000
   .i_hlm             0.000                               0.000    0.000
   .s                 0.000                               0.000    0.000
   .m                 0.000                               0.000    0.000
   .i                 0.000                               0.000    0.000
   .pauvrete          0.000                               0.000    0.000

Thresholds:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
    s_sentpvrsq|t1    0.746       NA                    0.746    0.677
    s_sentpvrsq|t2    1.608       NA                    1.608    1.459
    s_infmindcl|t1    0.352       NA                    0.352    0.305
    m_qntlnv_nv|t1   -0.137       NA                   -0.137   -0.105
    m_qntlnv_nv|t2    0.623       NA                    0.623    0.478
    m_qntlnv_nv|t3    1.305       NA                    1.305    1.001
    m_qntlnv_nv|t4    2.064       NA                    2.064    1.583
    m_locatf_nv|t1   -1.696       NA                   -1.696   -1.569
    m_finncr_nv|t1   -1.454       NA                   -1.454   -1.331
    i_log|t1          1.618       NA                    1.618    1.236
    i_rsa|t1          2.339       NA                    2.339    2.003
    i_chom|t1         1.309       NA                    1.309    1.286
    i_handi|t1        2.118       NA                    2.118    2.069
    i_bourse|t1       2.779       NA                    2.779    2.590
    i_hlm|t1          1.297       NA                    1.297    1.150

Variances:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
   .m                 0.010                               0.007    0.007
   .s_sentpauvrisq    0.696                               0.696    0.573
   .s_infminidecla    0.526                               0.526    0.394
   .m_quantilnv_nv    0.233                               0.233    0.137
   .m_locatif_inv     0.814                               0.814    0.696
   .m_financier_nv    0.788                               0.788    0.660
```

```
   .i_log            0.299                                  0.299    0.174
   .i_rsa            0.643                                  0.643    0.472
   .i_chom           0.964                                  0.964    0.929
   .i_handi          0.953                                  0.953    0.909
   .i_bourse         0.850                                  0.850    0.738
   .i_hlm            0.733                                  0.733    0.576
   .s                0.015       NA                         0.029    0.029
   .i                0.369       NA                         0.261    0.261
   .pauvrete         0.289       NA                         0.657    0.657

Scales y*:
                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
    s_sentpauvrisq    1.000                                1.000    1.000
    s_infminidecla    1.000                                1.000    1.000
    m_quantilnv_nv    1.000                                1.000    1.000
    m_locatif_inv     1.000                                1.000    1.000
    m_financier_nv    1.000                                1.000    1.000
    i_log             1.000                                1.000    1.000
    i_rsa             1.000                                1.000    1.000
    i_chom            1.000                                1.000    1.000
    i_handi           1.000                                1.000    1.000
    i_bourse          1.000                                1.000    1.000
    i_hlm             1.000                                1.000    1.000

[1] "fit_mimic_inter : "

       chisq           df       pvalue          cfi          tli        rmsea
3.446741e+03 2.260000e+02 0.000000e+00 8.296210e-01 9.585361e-01 3.266276e-02
        srmr
8.573439e-02

[1] "fit_mimic_inter_global : "

       chisq           df       pvalue          cfi          tli        rmsea
3.446741e+03 2.030000e+02 0.000000e+00 8.284043e-01 9.535085e-01 3.458632e-02
        srmr
8.573443e-02
```

Le modèle est légèrement moins bien que précédemment.

Par ailleurs les intervalles de confiance ne sont plus estimés (The information matrix could not be inverted. It may be a symptom that the model is not identified). Comme si cela posait un problème méthodologique d'ajouter les mêmes contrôles aux 2 niveaux. De la même manière que cela posait problème d'ajouter des corrélations entre les 3 dimensions de la pauvreté tout à l'heure.

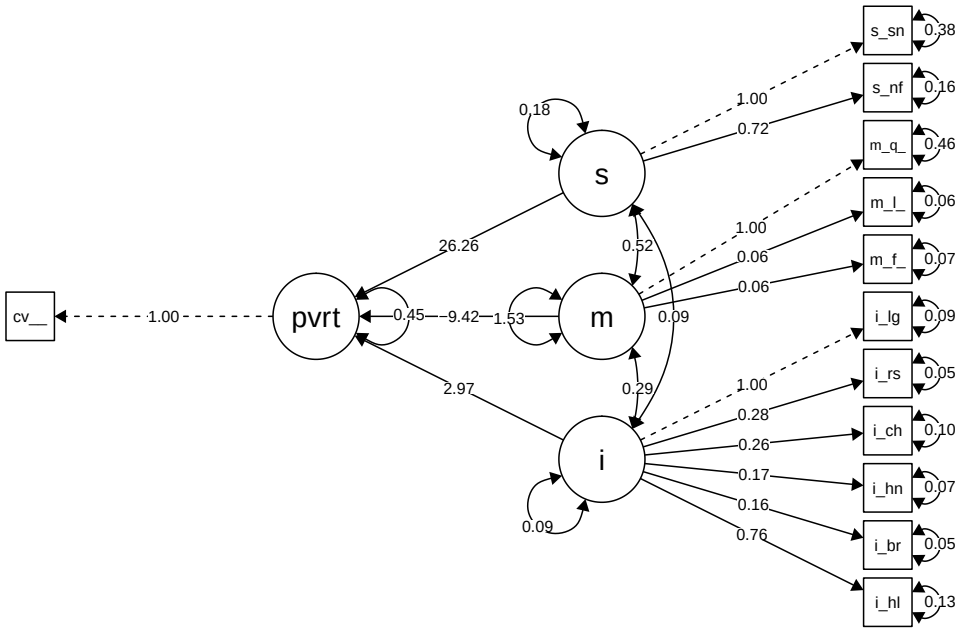
3.5 Structural equation models (SEM) [pas utilisé dans le mémoire]

Structural equation models (SEM) integrate confirmatory factor analysis (CFA) into a larger path analytic framework. Formally, we extend the basic CFA expression (measurement model) by an additional linear specification reflecting dependencies among the latent variables (structural model).

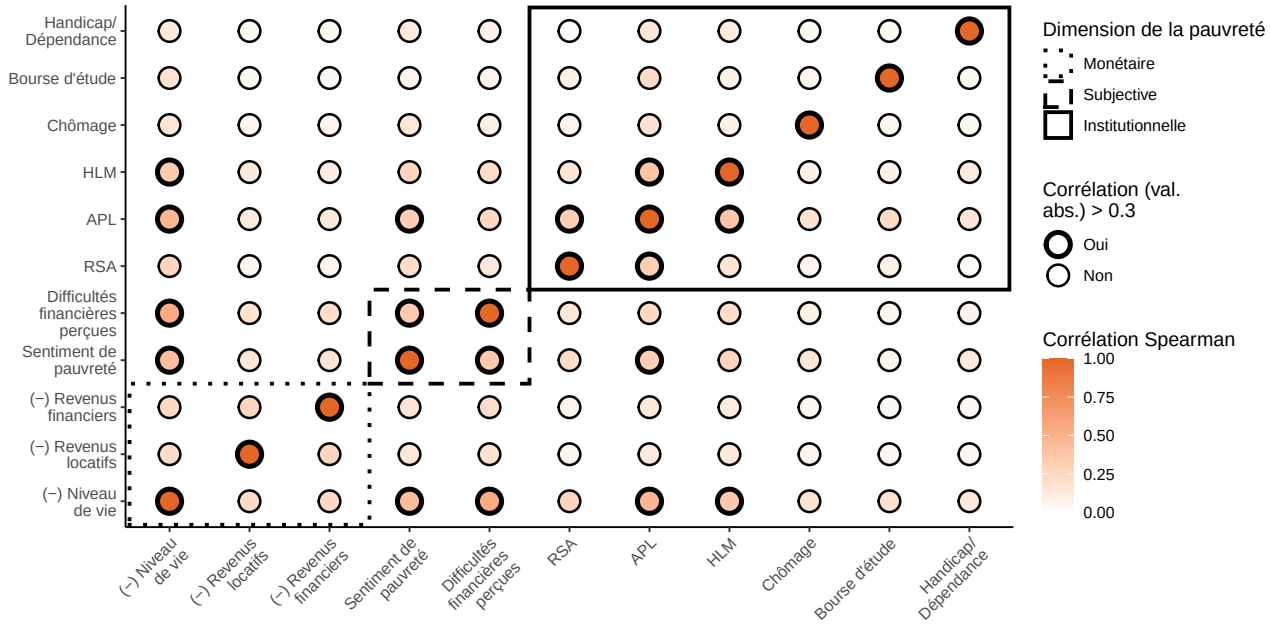
Remarque : ne marche pas pour les facteurs non ordonnés (en gros, considère les facteurs comme des

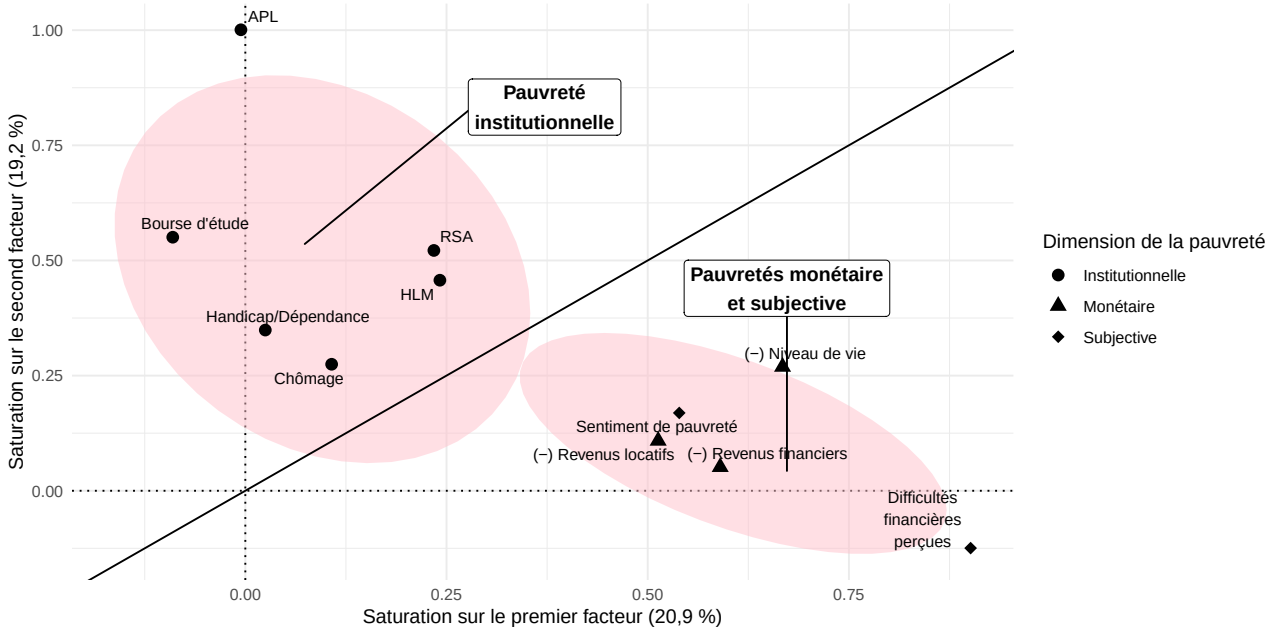
variables numériques)

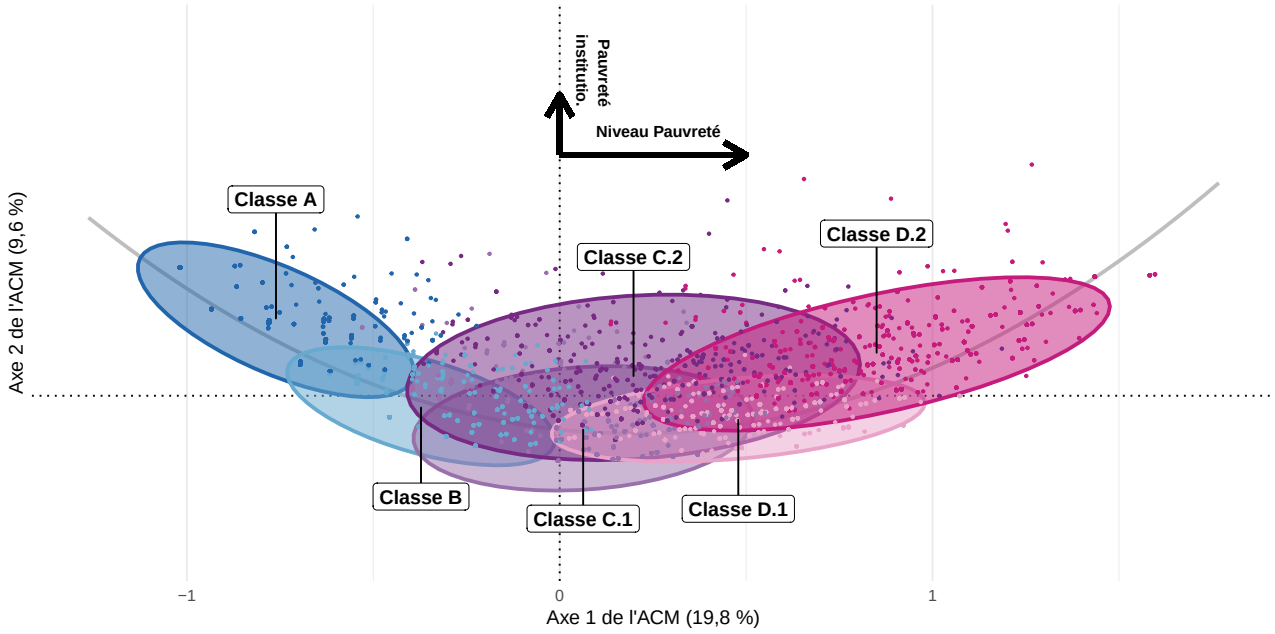
Remarque : estimator ML for ordered data is not supported yet. Use WLSMV instead.

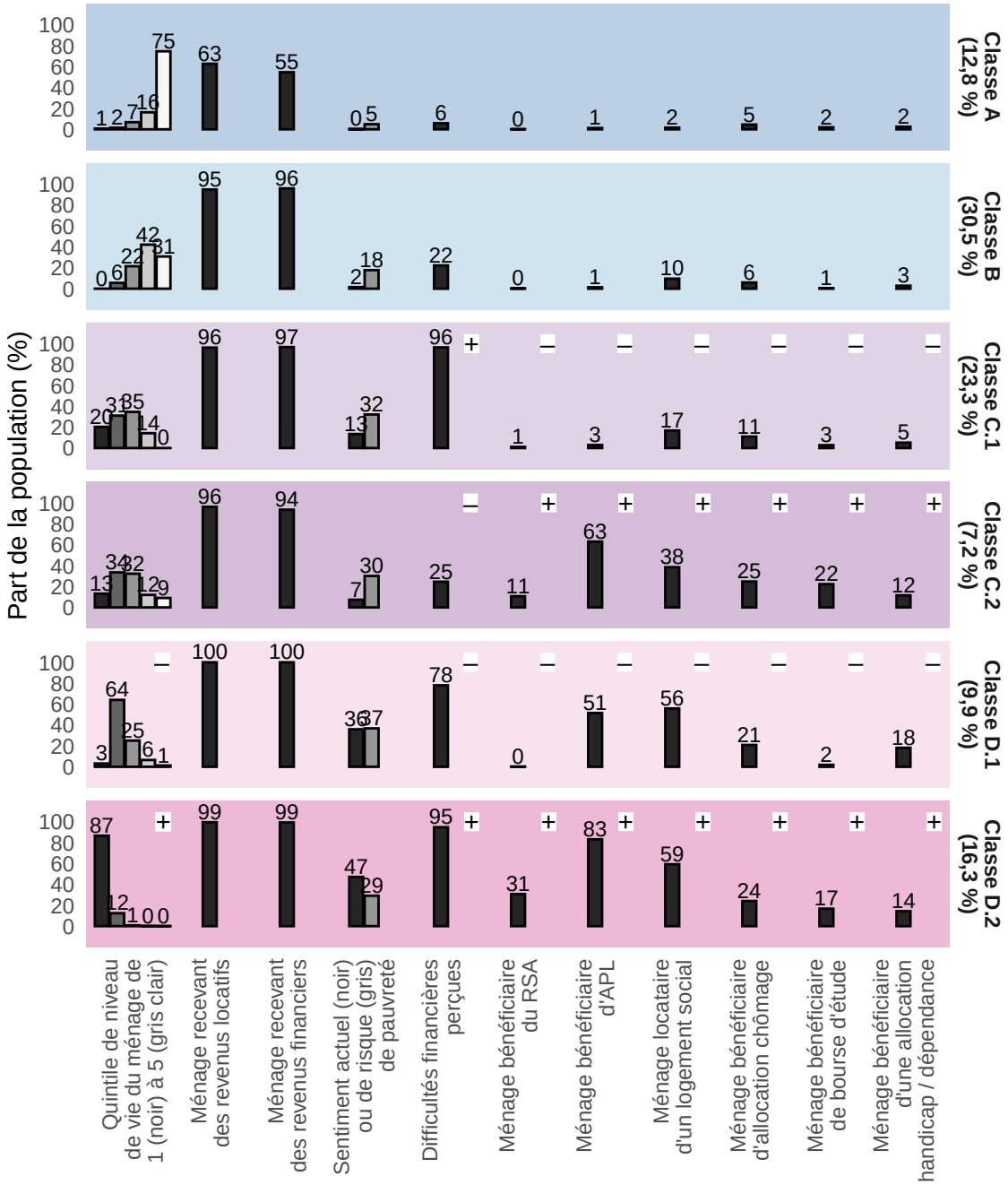


3.6 Figures rapport




APL
Pauvreté institutionnelle
Bourse d'étude
RSA
HLM
Handicap/Dépendance
Chômage
Pauvretés monétaire et subjective
(−) Niveau de vie
Sentiment de pauvreté
(−) Revenus locatifs
(−) Revenus financiers
Difficultés financières perçues
Saturation sur le second facteur (19,2 %)
Saturation sur le premier facteur (20,9 %)
Dimension de la pauvreté
Institutionnelle
Monétaire
Subjective


Pauvreté institutio.
Niveau Pauvreté
Classe A
Classe B
Classe C.1
Classe C.2
Classe D.1
Classe D.2
Axe 2 de l'ACM (9,6 %)
Axe 1 de l'ACM (19,8 %)



4 Notes méthodologiques

Pour ces modèles cinq vagues du Baromètre ont été empilées : 2015, 2016, 2017, 2018 et 2019 (15 137 observations). Le nombre d'observations utilisées est différent dans chaque modèle, il s'agit uniquement des individus où toutes les variables utilisées dans les modèles sont renseignées (voir notes en bas des tableaux).

Bibliographie

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- En bouquins : https://books.google.es/books?hl=fr&lr=&id=qKrumJ4CsboC&oi=fnd&pg=PT180&ots=TDmmzvQP5X&sig=7gFjzxbPC49Tz7IkGT-4gXMzx8U&redir_esc=y#v=onepage&q&f=false et slides https://slideplayer.com/slide/5080/
- https://m-clark.github.io/posts/2020-04-10-psych-explained/
- https://cran.r-project.org/web/packages/psychTools/vignettes/factor.pdf
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