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# Projet de STA211

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$$u(x) \approx U_h = \sum_{j=1}^N c_j \varphi_j(x)$$

$$u''(x_i) \approx \frac{1}{h^2} [u(x_{i+1}) - 2u(x_i) + u(x_{i-1}))]$$

## Résumé

### 1. Introduction

### 2. Chargement des données et analyses préliminaires

Cette partie est consacrée au chargement des données et à la sélection des variables liées au ménage. Certaines variables qui sont codées comme des variables numériques mais qui en réalité sont qualitatives seront recordées en variables facteurs.

#### 2.1 Chargement des données

Après le chargement des données, l'étape suivante est l'analyse univariée. On peut regarder les statistiques descriptives simples avec la fonction **summary** et la fonction **describe**.

```
## Sexe      Diplome_Max  Type_Prof Occupation Source_ppale_Res Structure_menage
## 1: 549      4           :454  1: 36      1:777      1:845           1: 398
## 2:1018      8           :175  2: 70      2: 80      2: 87           2: 103
##           1           :171  3:435      3: 50      3:493           3:1053
##           9           :168  4:391      4:541      4: 71           4: 13
##           6           :157  5:297      5: 45      5: 71
##           5           :137  6:316      6: 74
##           (Other):305    7: 22

##      Age      Revenus      TYPEMEN Nb_Enfants_sup_10 Nb_Enfants_inf_10
## Min.    :18.00  Min.    : 535  1:190  Min.    :0.0000  Min.    :0.0000
## 1st Qu.:41.00  1st Qu.:1799  2:144  1st Qu.:0.0000  1st Qu.:0.0000
## Median :52.00  Median :2349  3: 75  Median :0.0000  Median :0.0000
## Mean    :51.87  Mean    :2573  4:301  Mean    :0.4359  Mean    :0.3165
## 3rd Qu.:61.50  3rd Qu.:2899  5:114  3rd Qu.:1.0000  3rd Qu.:0.0000
## Max.    :89.00  Max.    :7600  6:228  Max.    :3.0000  Max.    :3.0000
##                                     7:515

## Description of .
##
## Numeric
##
##      mean median min  max      var      sd
## Age      51.87     52  18   89    209.91  14.49
```

```

## Revenus          2573.20   2349 535 7600 1967644.23 1402.73
## Nb_Enfants_sup_10    0.44      0  0   3      0.67   0.82
## Nb_Enfants_inf_10    0.32      0  0   3      0.48   0.70
##
## Factor
##
## Sexe              2      1
##   Count    1018.00 549.00
##   Percent    64.96 35.04
## Mode 2
##
## Diplome_Max        4      8      1      9      6      5      7      3      2
##   Count    454.00 175.00 171.00 168.00 157.00 137.00 132.00 117.00 56.00
##   Percent   28.97 11.17 10.91 10.72 10.02  8.74  8.42  7.47 3.57
## Mode 4
##
## Type_Prof         3      4      6      5      2      1      7
##   Count    435.00 391.00 316.00 297.00 70.00 36.0 22.0
##   Percent   27.76 24.95 20.17 18.95  4.47  2.3  1.4
## Mode 3
##
## Occupation        1      4      2      6      3      5
##   Count    777.00 541.00 80.00 74.00 50.00 45.00
##   Percent   49.59 34.52  5.11  4.72  3.19  2.87
## Mode 1
##
## Source_ppale_Res    1      3      2      4      5
##   Count    845.00 493.00 87.00 71.00 71.00
##   Percent   53.92 31.46  5.55  4.53  4.53
## Mode 1
##
## Structure_menage    3      1      2      4
##   Count    1053.0 398.0 103.00 13.00
##   Percent   67.2 25.4  6.57  0.83
## Mode 3

```

```
##
## TYPEMEN      7      4      6      1      2      5      3
## Count    515.00 301.00 228.00 190.00 144.00 114.00 75.00
## Percent   32.87  19.21  14.55  12.13   9.19   7.28   4.79
## Mode 7
```

## 2.2 Analyse descriptive des variables quantitatives

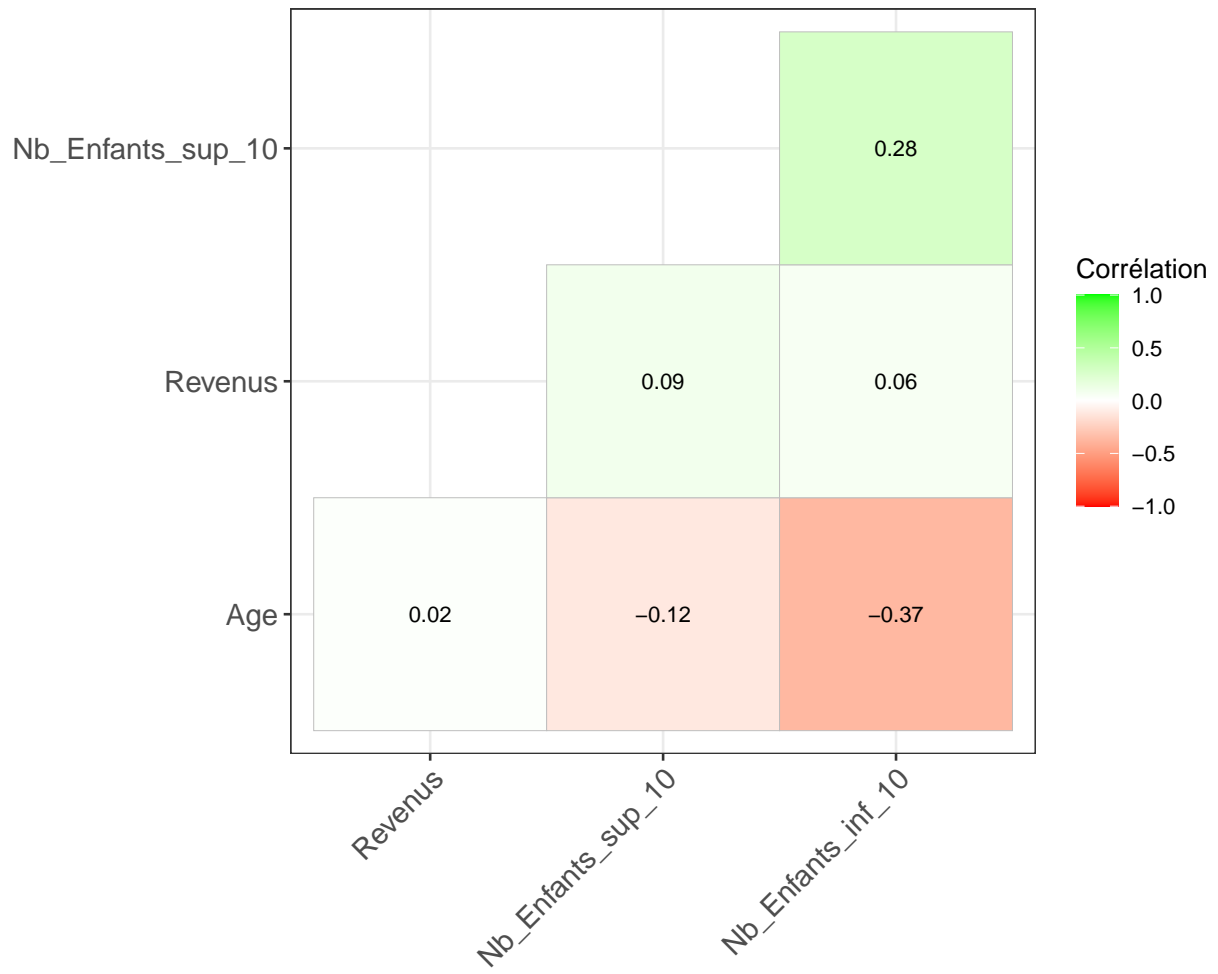
### 2.2.1 Analyse univarié

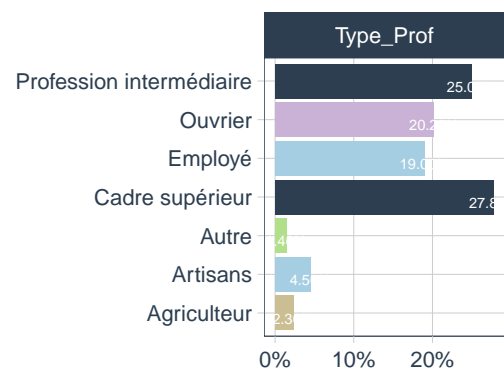
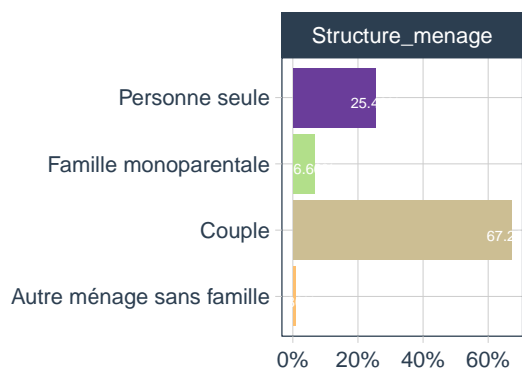
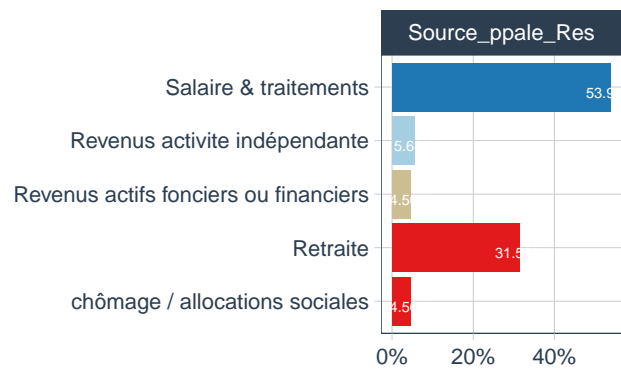
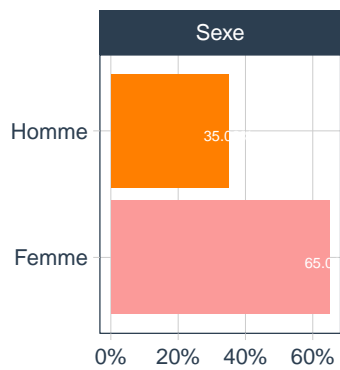
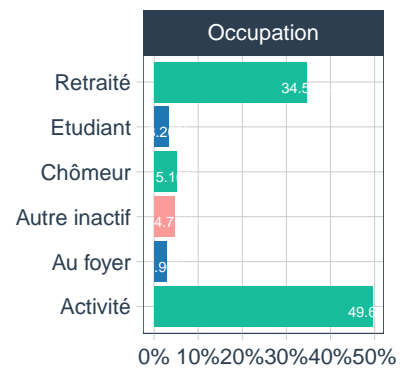
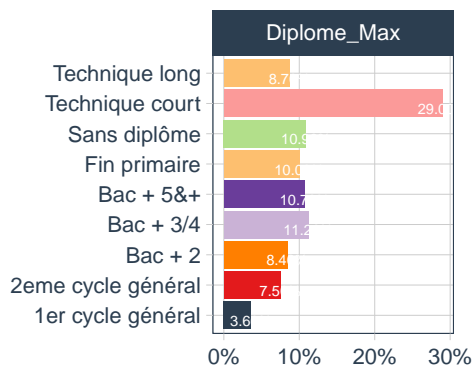
Variables	Moyenne	Médiane	Min	Maximum	Variance	Ecart-type
Age	51.87	52	18	89	209.91	14.49
Revenus	2 573.20	2 349	535	7 600	1 967 644.23	1 402.73
Nombre d'enfants dont âge > 10 ans	0.44	0	0	3	0.67	0.82
Nombre d'enfants dont âge <= 10 ans	0.32	0	0	3	0.48	0.70

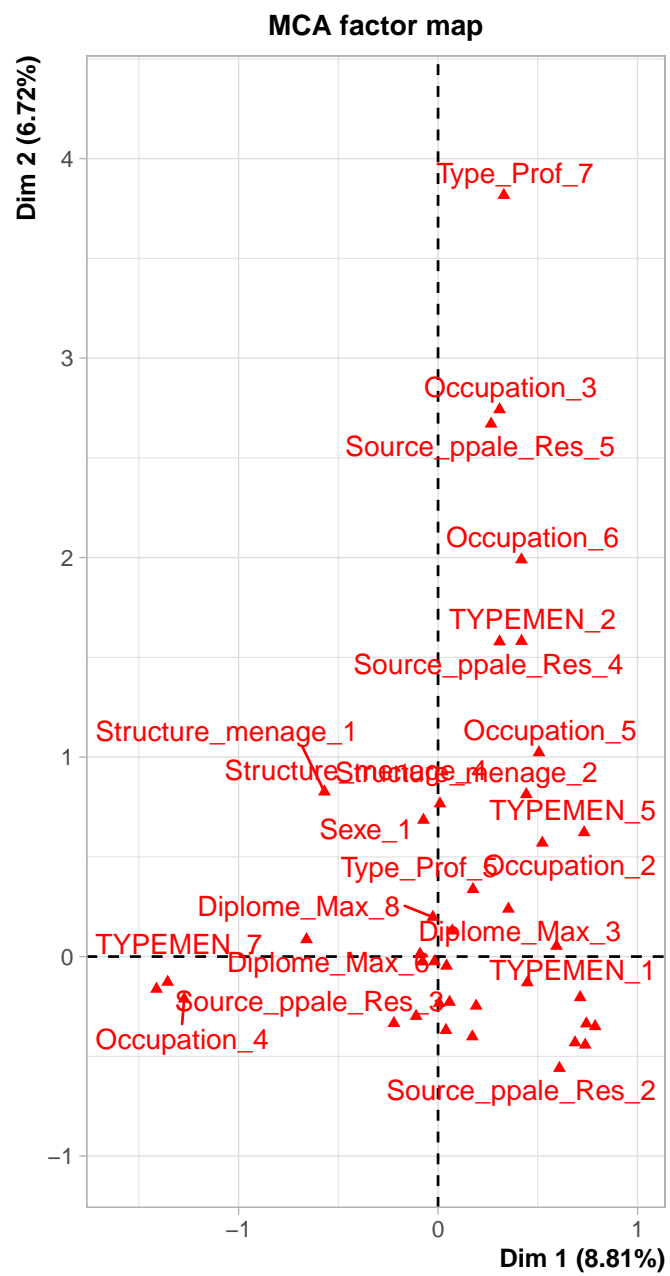
TABLE 1 – Statistiques descriptives des variables quantitatives

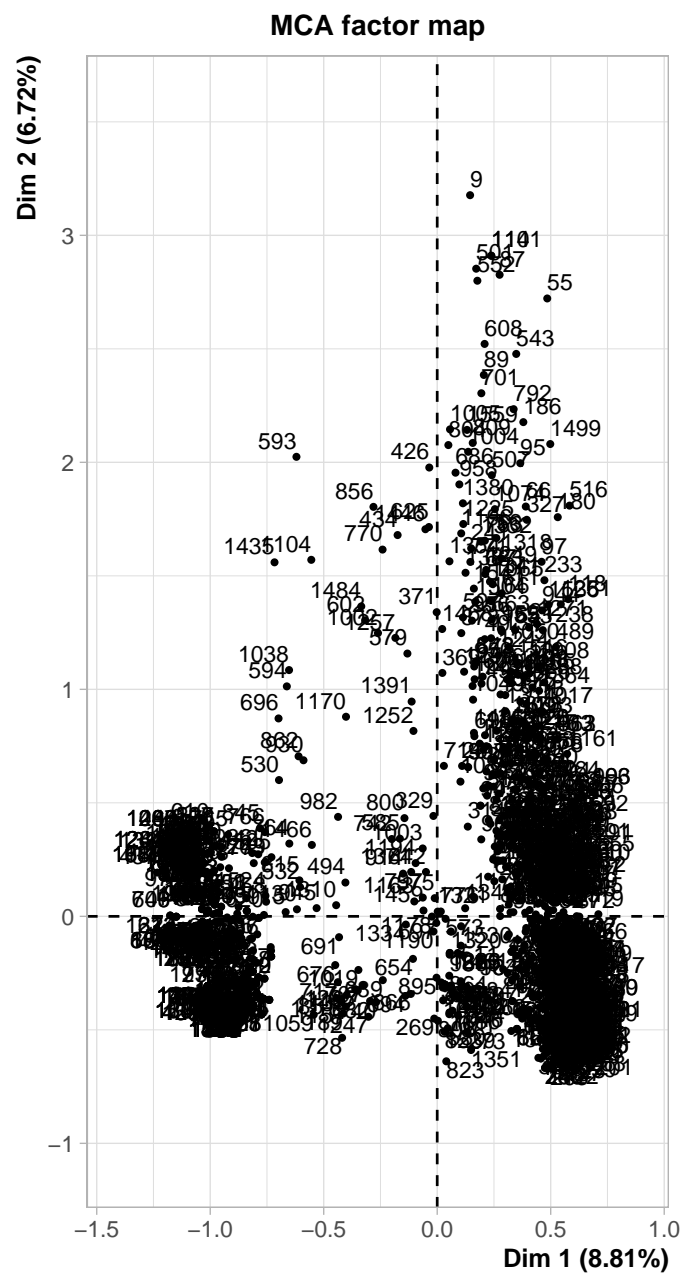
### 2.2.2 Analyse bivariée : Etudes des liaisons entre les différentes variables quantitatives

Matrice des corrélations

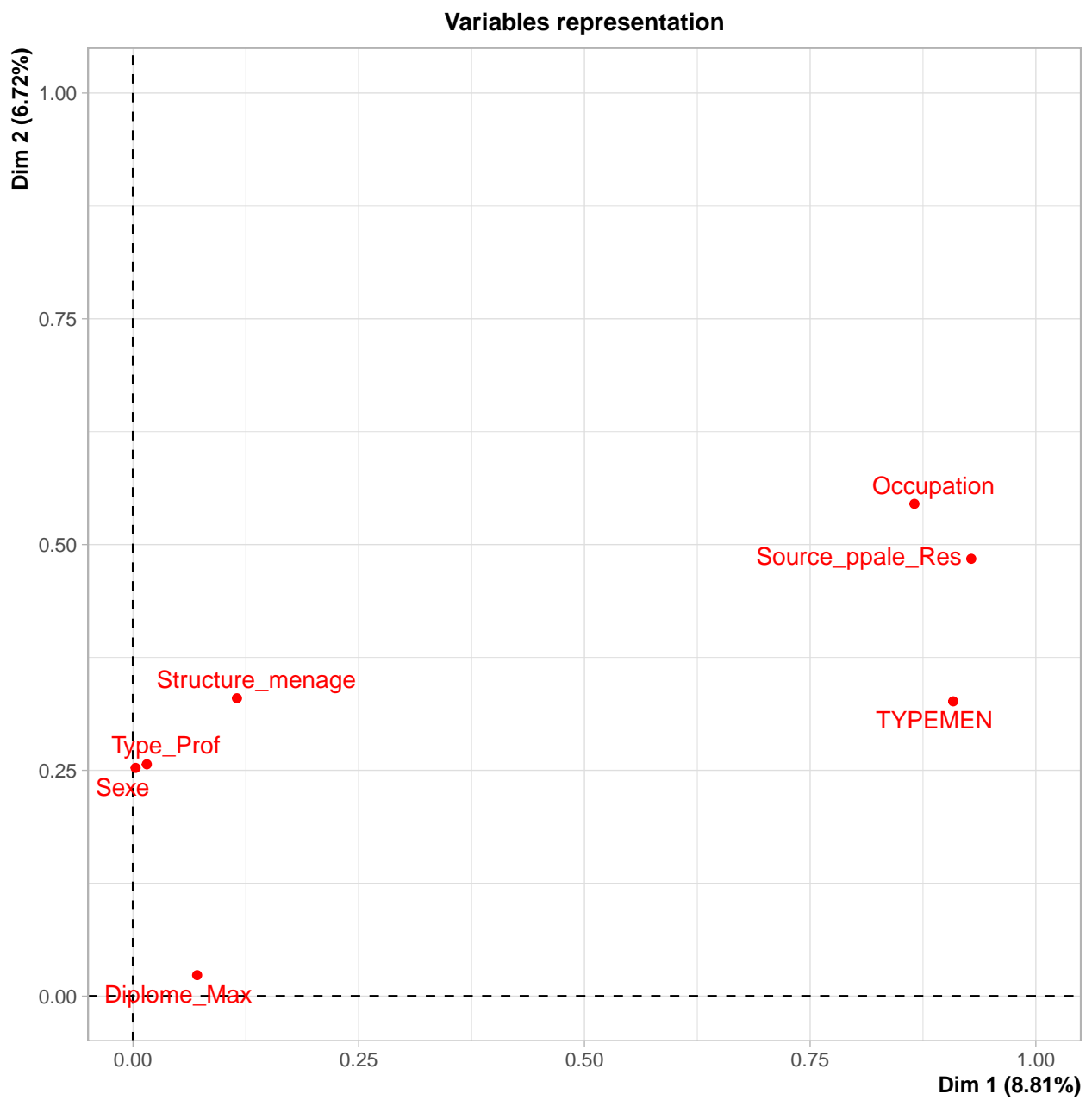


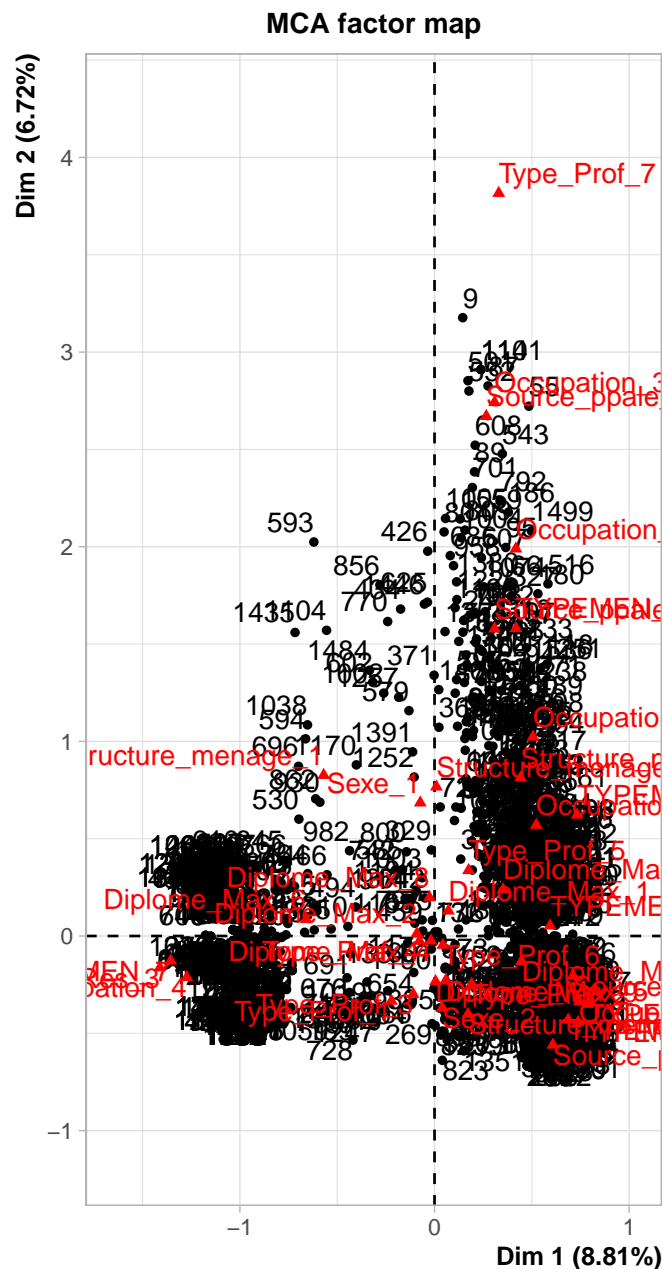












```
## [1] "-----Sexe    CONTRE    Diplome_Max-----"
##
##  Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 20.566, df = 8, p-value = 0.008393
##
## [1] "-----Sexe    CONTRE    Type_Prof-----"
##
##  Pearson's Chi-squared test
```

```

##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 41.855, df = 6, p-value = 1.964e-07
##
## [1] "-----Sexe CONTRE Occupation-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 112.29, df = 5, p-value < 2.2e-16
##
## [1] "-----Sexe CONTRE Source_ppale_Res-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 28.434, df = 4, p-value = 1.019e-05
##
## [1] "-----Sexe CONTRE Structure_menage-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 191.39, df = 3, p-value < 2.2e-16
##
## [1] "-----Sexe CONTRE TYPEMEN-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 146.96, df = 6, p-value < 2.2e-16
##
## [1] "-----Diplome_Max CONTRE Sexe-----"
##
## Pearson's Chi-squared test

```

```

##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 20.566, df = 8, p-value = 0.008393
##
## [1] "-----Diplome_Max CONTRE Type_Prof-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 193.54, df = 48, p-value < 2.2e-16
##
## [1] "-----Diplome_Max CONTRE Occupation-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 83.567, df = 40, p-value = 6.568e-05
##
## [1] "-----Diplome_Max CONTRE Source_ppale_Res-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 74.595, df = 32, p-value = 2.969e-05
##
## [1] "-----Diplome_Max CONTRE Structure_menage-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 26.415, df = 24, p-value = 0.3324
##
## [1] "-----Diplome_Max CONTRE TYPEMEN-----"
##
## Pearson's Chi-squared test

```

```

##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 95.833, df = 48, p-value = 4.999e-05
##
## [1] "-----Type_Prof  CONTRE  Sexe-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 41.855, df = 6, p-value = 1.964e-07
##
## [1] "-----Type_Prof  CONTRE  Diplome_Max-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 193.54, df = 48, p-value < 2.2e-16
##
## [1] "-----Type_Prof  CONTRE  Occupation-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 440.03, df = 30, p-value < 2.2e-16
##
## [1] "-----Type_Prof  CONTRE  Source_ppale_Res-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 208.64, df = 24, p-value < 2.2e-16
##
## [1] "-----Type_Prof  CONTRE  Structure_menage-----"
##
## Pearson's Chi-squared test

```

```

##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 43.018, df = 18, p-value = 0.0007957
##
## [1] "-----Type_Prof CONTRE TYPEMEN-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 125.82, df = 36, p-value = 6.912e-12
##
## [1] "-----Occupation CONTRE Sexe-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 112.29, df = 5, p-value < 2.2e-16
##
## [1] "-----Occupation CONTRE Diplome_Max-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 83.567, df = 40, p-value = 6.568e-05
##
## [1] "-----Occupation CONTRE Type_Prof-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 440.03, df = 30, p-value < 2.2e-16
##
## [1] "-----Occupation CONTRE Source_ppale_Res-----"
##
## Pearson's Chi-squared test

```

```

##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 1989.8, df = 20, p-value < 2.2e-16
##
## [1] "-----Occupation  CONTRE  Structure_menage-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 104.78, df = 15, p-value = 1.61e-15
##
## [1] "-----Occupation  CONTRE  TYPEMEN-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 1263.4, df = 30, p-value < 2.2e-16
##
## [1] "-----Source_ppale_Res  CONTRE  Sexe-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 28.434, df = 4, p-value = 1.019e-05
##
## [1] "-----Source_ppale_Res  CONTRE  Diplome_Max-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 74.595, df = 32, p-value = 2.969e-05
##
## [1] "-----Source_ppale_Res  CONTRE  Type_Prof-----"
##
## Pearson's Chi-squared test

```

```

##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 208.64, df = 24, p-value < 2.2e-16
##
## [1] "-----Source_ppale_Res  CONTRE  Occupation-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 1989.8, df = 20, p-value < 2.2e-16
##
## [1] "-----Source_ppale_Res  CONTRE  Structure_menage-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 163.62, df = 12, p-value < 2.2e-16
##
## [1] "-----Source_ppale_Res  CONTRE  TYPEMEN-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 1420.4, df = 24, p-value < 2.2e-16
##
## [1] "-----Structure_menage  CONTRE  Sexe-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 191.39, df = 3, p-value < 2.2e-16
##
## [1] "-----Structure_menage  CONTRE  Diplome_Max-----"
##
## Pearson's Chi-squared test

```



```

##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 26.415, df = 24, p-value = 0.3324
##
## [1] "-----Structure_menage  CONTRE  Type_Prof-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 43.018, df = 18, p-value = 0.0007957
##
## [1] "-----Structure_menage  CONTRE  Occupation-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 104.78, df = 15, p-value = 1.61e-15
##
## [1] "-----Structure_menage  CONTRE  Source_ppale_Res-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 163.62, df = 12, p-value < 2.2e-16
##
## [1] "-----Structure_menage  CONTRE  TYPEMEN-----"
##
## Pearson's Chi-squared test
##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 502.74, df = 18, p-value < 2.2e-16
##
## [1] "-----TYPEMEN  CONTRE  Sexe-----"
##
## Pearson's Chi-squared test

```

```

##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 146.96, df = 6, p-value < 2.2e-16
##
## [1] "-----TYPEMEN CONTRE Diplome_Max-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 95.833, df = 48, p-value = 4.999e-05
##
## [1] "-----TYPEMEN CONTRE Type_Prof-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 125.82, df = 36, p-value = 6.912e-12
##
## [1] "-----TYPEMEN CONTRE Occupation-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 1263.4, df = 30, p-value < 2.2e-16
##
## [1] "-----TYPEMEN CONTRE Source_ppale_Res-----"
##
## Pearson's Chi-squared test
##
## data: data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 1420.4, df = 24, p-value < 2.2e-16
##
## [1] "-----TYPEMEN CONTRE Structure_menage-----"
##
## Pearson's Chi-squared test

```

```

##
## data:  data_cat_plots[, i] and data_cat_plots[, j]
## X-squared = 502.74, df = 18, p-value < 2.2e-16

## [1] "-----Sexe  CONTRE  Diplome_Max-----"
##
##              X^2 df  P(> X^2)
## Likelihood Ratio 20.349  8 0.0090948
## Pearson          20.566  8 0.0083931
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.114
## Cramer's V        : 0.115
## [1] "-----Sexe  CONTRE  Type_Prof-----"
##
##              X^2 df  P(> X^2)
## Likelihood Ratio 40.765  6 3.2213e-07
## Pearson          41.855  6 1.9637e-07
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.161
## Cramer's V        : 0.163
## [1] "-----Sexe  CONTRE  Occupation-----"
##
##              X^2 df P(> X^2)
## Likelihood Ratio 114.46  5      0
## Pearson          112.29  5      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.259
## Cramer's V        : 0.268
## [1] "-----Sexe  CONTRE  Source_ppale_Res-----"
##
##              X^2 df  P(> X^2)
## Likelihood Ratio 27.358  4 1.6825e-05
## Pearson          28.434  4 1.0187e-05
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.133

```

```

## Cramer's V          : 0.135
## [1] "-----Sexe  CONTRE  Structure_menage-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 187.89  3      0
## Pearson          191.39  3      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.33
## Cramer's V        : 0.349
## [1] "-----Sexe  CONTRE  TYPemen-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 145.00  6      0
## Pearson          146.96  6      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.293
## Cramer's V        : 0.306
## [1] "-----Diplome_Max  CONTRE  Sexe-----"
##              X^2 df  P(> X^2)
## Likelihood Ratio 20.349  8 0.0090948
## Pearson          20.566  8 0.0083931
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.114
## Cramer's V        : 0.115
## [1] "-----Diplome_Max  CONTRE  Type_Prof-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 189.51 48      0
## Pearson          193.54 48      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.332
## Cramer's V        : 0.143
## [1] "-----Diplome_Max  CONTRE  Occupation-----"
##              X^2 df  P(> X^2)

```

```

## Likelihood Ratio 84.207 40 5.4822e-05
## Pearson          83.567 40 6.5676e-05
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.225
## Cramer's V        : 0.103
## [1] "-----Diplome_Max  CONTRE  Source_ppale_Res-----"
##              X^2 df    P(> X^2)
## Likelihood Ratio 76.358 32 1.7224e-05
## Pearson          74.595 32 2.9694e-05
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.213
## Cramer's V        : 0.109
## [1] "-----Diplome_Max  CONTRE  Structure_menage-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 27.771 24 0.26983
## Pearson          26.415 24 0.33245
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.129
## Cramer's V        : 0.075
## [1] "-----Diplome_Max  CONTRE  TYPEMEN-----"
##              X^2 df    P(> X^2)
## Likelihood Ratio 96.543 48 4.1295e-05
## Pearson          95.833 48 4.9992e-05
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.24
## Cramer's V        : 0.101
## [1] "-----Type_Prof  CONTRE  Sexe-----"
##              X^2 df    P(> X^2)
## Likelihood Ratio 40.765 6 3.2213e-07
## Pearson          41.855 6 1.9637e-07
##

```

```

## Phi-Coefficient      : NA
## Contingency Coeff.: 0.161
## Cramer's V           : 0.163
## [1] "-----Type_Prof  CONTRE  Diplome_Max-----"
##
##              X^2 df P(> X^2)
## Likelihood Ratio 189.51 48      0
## Pearson          193.54 48      0
##
## Phi-Coefficient      : NA
## Contingency Coeff.: 0.332
## Cramer's V           : 0.143
## [1] "-----Type_Prof  CONTRE  Occupation-----"
##
##              X^2 df P(> X^2)
## Likelihood Ratio 291.71 30      0
## Pearson          440.03 30      0
##
## Phi-Coefficient      : NA
## Contingency Coeff.: 0.468
## Cramer's V           : 0.237
## [1] "-----Type_Prof  CONTRE  Source_ppale_Res-----"
##
##              X^2 df P(> X^2)
## Likelihood Ratio 156.66 24      0
## Pearson          208.64 24      0
##
## Phi-Coefficient      : NA
## Contingency Coeff.: 0.343
## Cramer's V           : 0.182
## [1] "-----Type_Prof  CONTRE  Structure_menage-----"
##
##              X^2 df  P(> X^2)
## Likelihood Ratio 41.670 18 0.00122949
## Pearson          43.018 18 0.00079568
##
## Phi-Coefficient      : NA
## Contingency Coeff.: 0.163
## Cramer's V           : 0.096

```

```

## [1] "-----Type_Prof  CONTRE  TYPEMEN-----"
##
##          X^2 df    P(> X^2)
## Likelihood Ratio 121.03 36 3.9728e-11
## Pearson          125.82 36 6.9120e-12
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.273
## Cramer's V        : 0.116
## [1] "-----Occupation  CONTRE  Sexe-----"
##
##          X^2 df    P(> X^2)
## Likelihood Ratio 114.46  5      0
## Pearson          112.29  5      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.259
## Cramer's V        : 0.268
## [1] "-----Occupation  CONTRE  Diplome_Max-----"
##
##          X^2 df    P(> X^2)
## Likelihood Ratio 84.207 40 5.4822e-05
## Pearson          83.567 40 6.5676e-05
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.225
## Cramer's V        : 0.103
## [1] "-----Occupation  CONTRE  Type_Prof-----"
##
##          X^2 df    P(> X^2)
## Likelihood Ratio 291.71 30      0
## Pearson          440.03 30      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.468
## Cramer's V        : 0.237
## [1] "-----Occupation  CONTRE  Source_ppale_Res-----"
##
##          X^2 df    P(> X^2)
## Likelihood Ratio 1811.8 20      0

```

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## Pearson          1989.8 20          0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.748
## Cramer's V        : 0.563
## [1] "-----Occupation  CONTRE  Structure_menage-----"
##
##              X^2 df    P(> X^2)
## Likelihood Ratio 100.46 15 1.0658e-14
## Pearson          104.78 15 1.6653e-15
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.25
## Cramer's V        : 0.149
## [1] "-----Occupation  CONTRE  TYPEMEN-----"
##
##              X^2 df P(> X^2)
## Likelihood Ratio 1376.8 30          0
## Pearson          1263.4 30          0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.668
## Cramer's V        : 0.402
## [1] "-----Source_ppale_Res  CONTRE  Sexe-----"
##
##              X^2 df    P(> X^2)
## Likelihood Ratio 27.358  4 1.6825e-05
## Pearson          28.434  4 1.0187e-05
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.133
## Cramer's V        : 0.135
## [1] "-----Source_ppale_Res  CONTRE  Diplome_Max-----"
##
##              X^2 df    P(> X^2)
## Likelihood Ratio 76.358 32 1.7224e-05
## Pearson          74.595 32 2.9694e-05
##
## Phi-Coefficient   : NA

```



```

## Contingency Coeff.: 0.213
## Cramer's V          : 0.109
## [1] "-----Source_ppale_Res  CONTRE  Type_Prof-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 156.66 24      0
## Pearson          208.64 24      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.343
## Cramer's V        : 0.182
## [1] "-----Source_ppale_Res  CONTRE  Occupation-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 1811.8 20      0
## Pearson          1989.8 20      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.748
## Cramer's V        : 0.563
## [1] "-----Source_ppale_Res  CONTRE  Structure_menage-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 165.35 12      0
## Pearson          163.62 12      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.307
## Cramer's V        : 0.187
## [1] "-----Source_ppale_Res  CONTRE  TYPEMEN-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 1608.1 24      0
## Pearson          1420.4 24      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.69
## Cramer's V        : 0.476
## [1] "-----Structure_menage  CONTRE  Sexe-----"

```

```

##              X^2 df P(> X^2)
## Likelihood Ratio 187.89 3      0
## Pearson          191.39 3      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.33
## Cramer's V        : 0.349
## [1] "-----Structure_menage  CONTRE  Diplome_Max-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 27.771 24  0.26983
## Pearson          26.415 24  0.33245
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.129
## Cramer's V        : 0.075
## [1] "-----Structure_menage  CONTRE  Type_Prof-----"
##              X^2 df  P(> X^2)
## Likelihood Ratio 41.670 18 0.00122949
## Pearson          43.018 18 0.00079568
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.163
## Cramer's V        : 0.096
## [1] "-----Structure_menage  CONTRE  Occupation-----"
##              X^2 df  P(> X^2)
## Likelihood Ratio 100.46 15 1.0658e-14
## Pearson          104.78 15 1.6653e-15
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.25
## Cramer's V        : 0.149
## [1] "-----Structure_menage  CONTRE  Source_ppale_Res-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 165.35 12      0
## Pearson          163.62 12      0

```

```

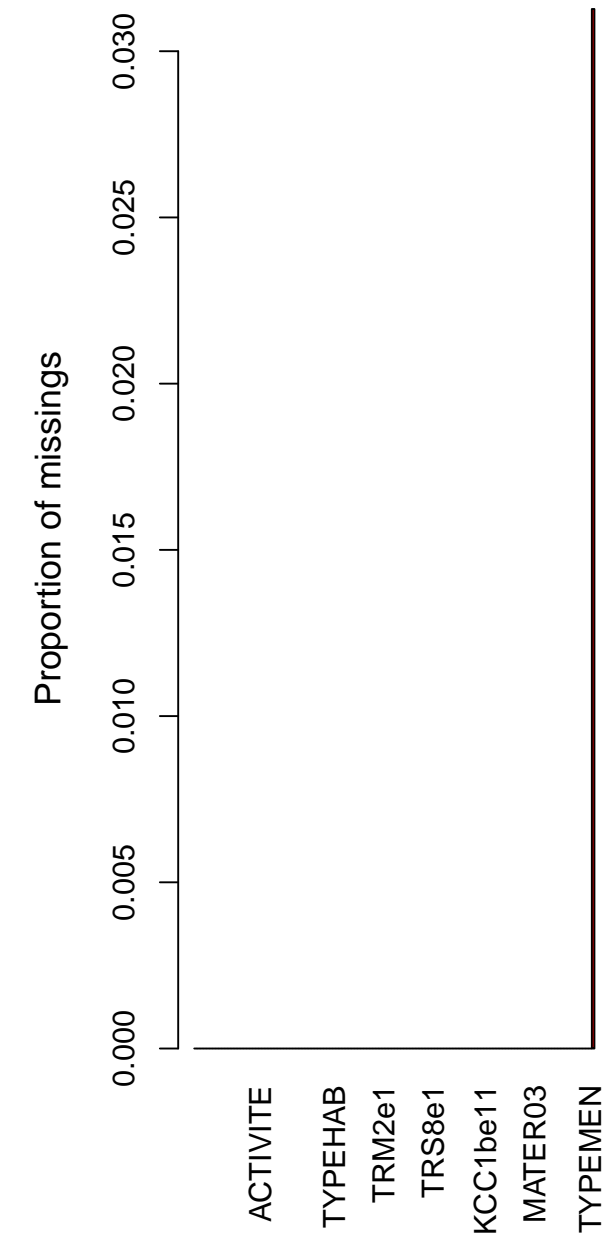
##
## Phi-Coefficient      : NA
## Contingency Coeff.: 0.307
## Cramer's V          : 0.187
## [1] "-----Structure_menage  CONTRE  TYPEMEN-----"
##
##              X^2 df P(> X^2)
## Likelihood Ratio 479.07 18      0
## Pearson          502.74 18      0
##
## Phi-Coefficient      : NA
## Contingency Coeff.: 0.493
## Cramer's V          : 0.327
## [1] "-----TYPEMEN  CONTRE  Sexe-----"
##
##              X^2 df P(> X^2)
## Likelihood Ratio 145.00  6      0
## Pearson          146.96  6      0
##
## Phi-Coefficient      : NA
## Contingency Coeff.: 0.293
## Cramer's V          : 0.306
## [1] "-----TYPEMEN  CONTRE  Diplome_Max-----"
##
##              X^2 df   P(> X^2)
## Likelihood Ratio 96.543 48 4.1295e-05
## Pearson          95.833 48 4.9992e-05
##
## Phi-Coefficient      : NA
## Contingency Coeff.: 0.24
## Cramer's V          : 0.101
## [1] "-----TYPEMEN  CONTRE  Type_Prof-----"
##
##              X^2 df   P(> X^2)
## Likelihood Ratio 121.03 36 3.9728e-11
## Pearson          125.82 36 6.9120e-12
##
## Phi-Coefficient      : NA
## Contingency Coeff.: 0.273

```

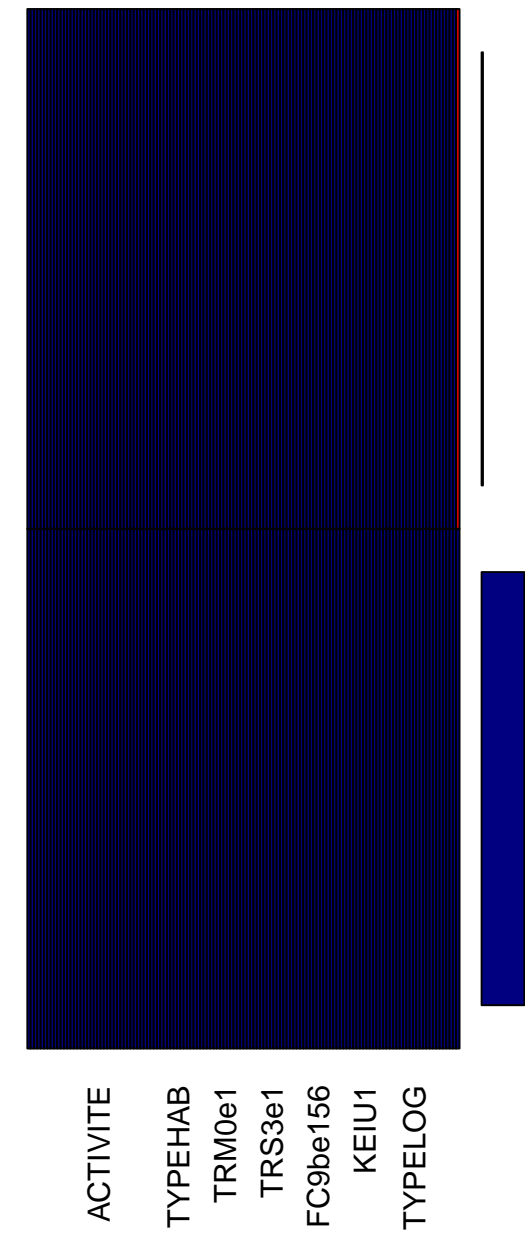
```

## Cramer's V          : 0.116
## [1] "-----TYPEMEN  CONTRE  Occupation-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 1376.8 30      0
## Pearson          1263.4 30      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.668
## Cramer's V        : 0.402
## [1] "-----TYPEMEN  CONTRE  Source_ppale_Res-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 1608.1 24      0
## Pearson          1420.4 24      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.69
## Cramer's V        : 0.476
## [1] "-----TYPEMEN  CONTRE  Structure_menage-----"
##              X^2 df P(> X^2)
## Likelihood Ratio 479.07 18      0
## Pearson          502.74 18      0
##
## Phi-Coefficient   : NA
## Contingency Coeff.: 0.493
## Cramer's V        : 0.327

```

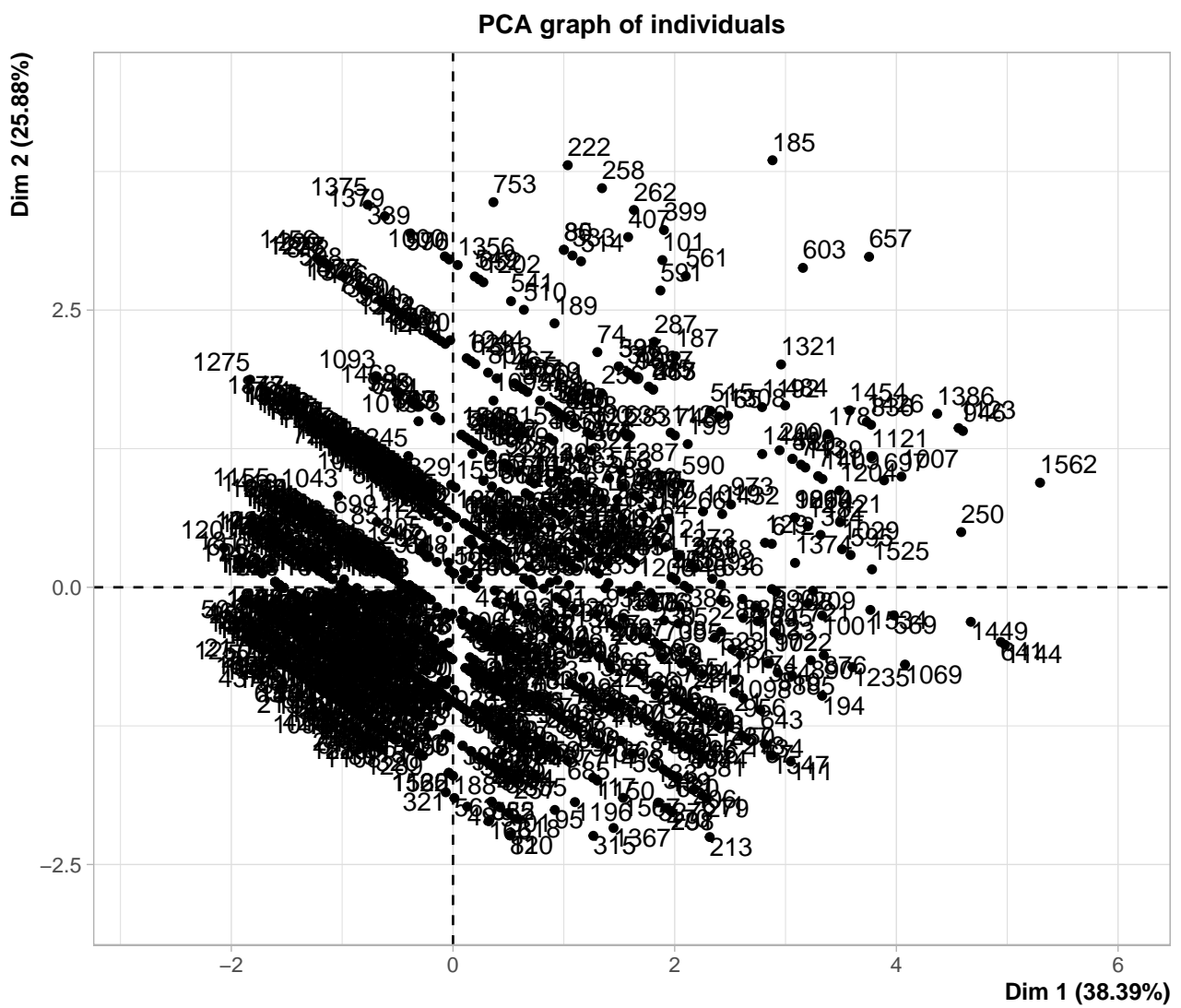


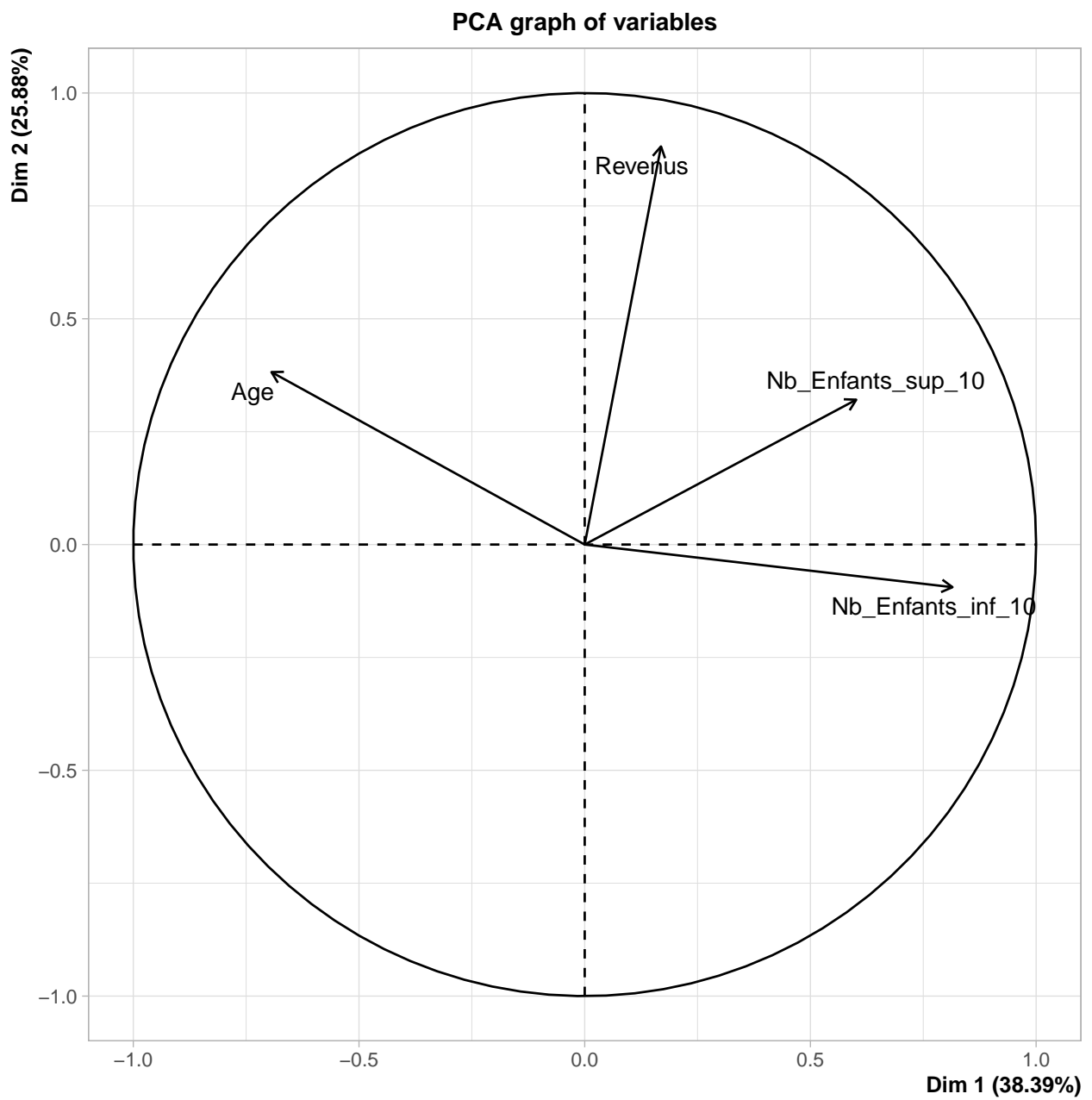
Combinations



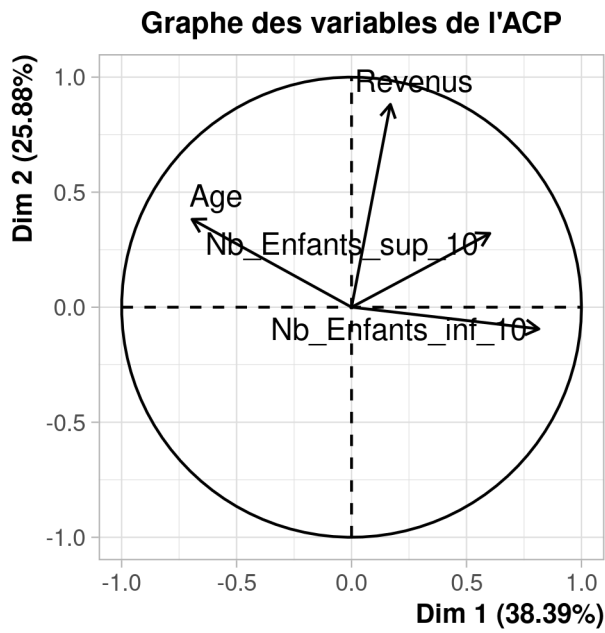
##														
##	iter	imp	variable											
##	1	1	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	1	2	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	1	3	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	1	4	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	1	5	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	2	1	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	2	2	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	2	3	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	2	4	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q

##	2	5	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	3	1	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	3	2	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	3	3	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	3	4	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	3	5	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	4	1	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	4	2	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	4	3	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	4	4	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	4	5	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	5	1	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	5	2	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	5	3	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	5	4	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q
##	5	5	LVLb	ICOS1	ICOS2	ICOS3	ICOS4	ICOS5	QPE1b	QPE2b	QPD1b	QPD2b	QPP1b	Q



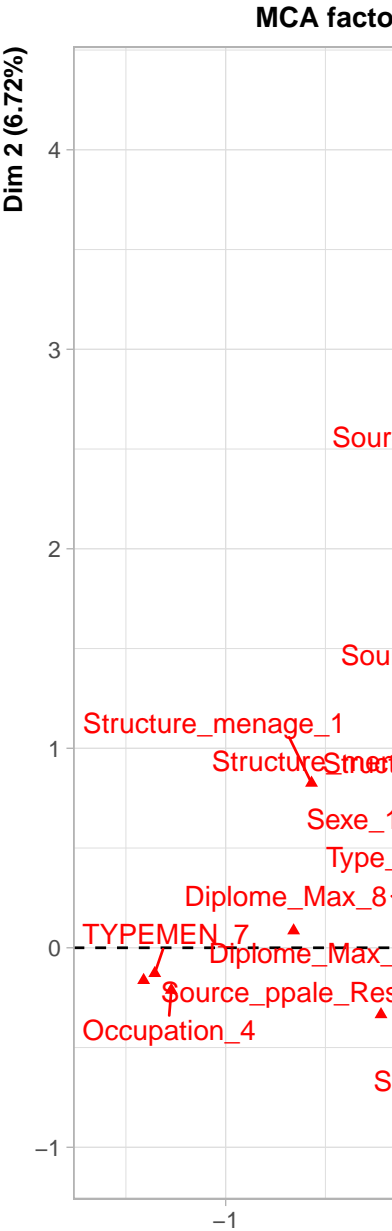






Les 2 premiers axes de l'ACP expriment 64.27% de l'inertie totale du jeu de données; cela signifie que 64.27% de la variabilité totale du nuage est représentée dans ce plan. C'est un pourcentage assez important, et le premier plan représente donc convenablement la variabilité contenue dans une grande part du jeu de données constitué des variables numériques. Cette valeur est supérieure à la valeur référence de 52.76%, la variabilité expliquée par ce plan est donc significative (cette inertie de référence est le quantile 0.95-quantile de la distribution des pourcentages d'inertie obtenue en simulant 2779 jeux de données aléatoires de dimensions comparables sur la base d'une distribution normale).

Du fait de ces observations, il serait tout de même probablement préférable de considérer également dans



l'analyse les dimensions supérieures ou égales à la troisième.



