Projet Analyse de Donnée

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R Markdown

Chargement du jeux de donnée:

```
## Le chargement a nécessité le package : ggplot2
```

```
## 'data.frame':    542 obs. of  39 variables:
##  $ T1_1H_R1: num  -0.205 -0.62 0.309 0.192 0.108 ...
##  $ T1_2H_R1: num  -0.689 -0.856 0.817 0.148 0.288 ...
##  $ T1_3H_R1: num  -0.1811 -0.0211 -0.5615 0.2424 -0.1975 ...
##  $ T1_4H_R1: num  -0.06657 -0.14456 0.18148 0.56182 -0.00155 ...
##  $ T1_5H_R1: num  0.5217 0.4934 -0.337 0.0453 -0.2274 ...
##  $ T1_6H_R1: num  0.448 0.454 -0.373 -0.635 -0.571 ...
##  $ T2_1H_R1: num  -0.449 -0.572 -0.209 0.526 0.34 ...
##  $ T2_2H_R1: num  -1.5144 -1.4755 -1.29 1.4315 -0.0468 ...
##  $ T2_3H_R1: num  -3.815 -3.079 -2.633 1.842 -0.327 ...
##  $ T2_4H_R1: num  -2.5 -2.22 -2.4 1.83 -0.47 ...
##  $ T2_5H_R1: num  -2.9144 -2.2659 -2.4397 1.9242 0.0153 ...
##  $ T2_6H_R1: num  -3.57 -3.36 -2.03 2.19 2.17 ...
##  $ T3_1H_R1: num  -0.6645 -0.5427 -0.2709 0.4127 -0.0402 ...
##  $ T3_2H_R1: num  -2.522 -2.281 -1.176 1.688 0.179 ...
##  $ T3_3H_R1: num  -1.797 -1.597 -3.018 1.812 -0.192 ...
##  $ T3_4H_R1: num  -2.967 -2.635 -2.953 1.868 -0.553 ...
##  $ T3_5H_R1: num  -2.99182 -2.42474 -2.96356 2.14249 -0.00553 ...
##  $ T3_6H_R1: num  -2.84 -2.54 -2.49 2.1 2.09 ...
##  $ T1_1H_R2: num  -0.25 -0.527 0.303 -0.234 -0.33 ...
##  $ T1_2H_R2: num  -0.2376 -0.3474 0.5477 -0.2899 0.0044 ...
##  $ T1_3H_R2: num  -0.741 -0.64 0.589 0.725 0.171 ...
##  $ T1_4H_R2: num  0.504 0.274 -0.908 -0.488 -0.53 ...
##  $ T1_5H_R2: num  0.355 0.347 -1.428 -0.289 -0.481 ...
##  $ T1_6H_R2: num  0.698 0.663 -0.699 -0.649 -0.714 ...
##  $ T2_1H_R2: num  -0.671 -0.67 0.163 0.272 -0.373 ...
##  $ T2_2H_R2: num  -2.489 -2.416 -2.307 1.47 -0.109 ...
##  $ T2_3H_R2: num  -2.4 -2.21 -2.32 1.83 0.13 ...
##  $ T2_4H_R2: num  -2.552 -2.198 -3.294 1.618 -0.453 ...
##  $ T2_5H_R2: num  -2.474 -2.238 -2.967 2.191 0.888 ...
##  $ T2_6H_R2: num  -3.14 -2.47 -3.18 2.19 2.18 ...
##  $ T3_1H_R2: num  -0.62 -0.842 -0.195 0.17 -0.446 ...
##  $ T3_2H_R2: num  -2.7064 -2.4478 -2.1068 1.5124 0.0384 ...
##  $ T3_3H_R2: num  -2.828 -2.552 -2.624 2.051 -0.111 ...
##  $ T3_4H_R2: num  -2.849 -2.484 -3.024 1.559 -0.222 ...
```

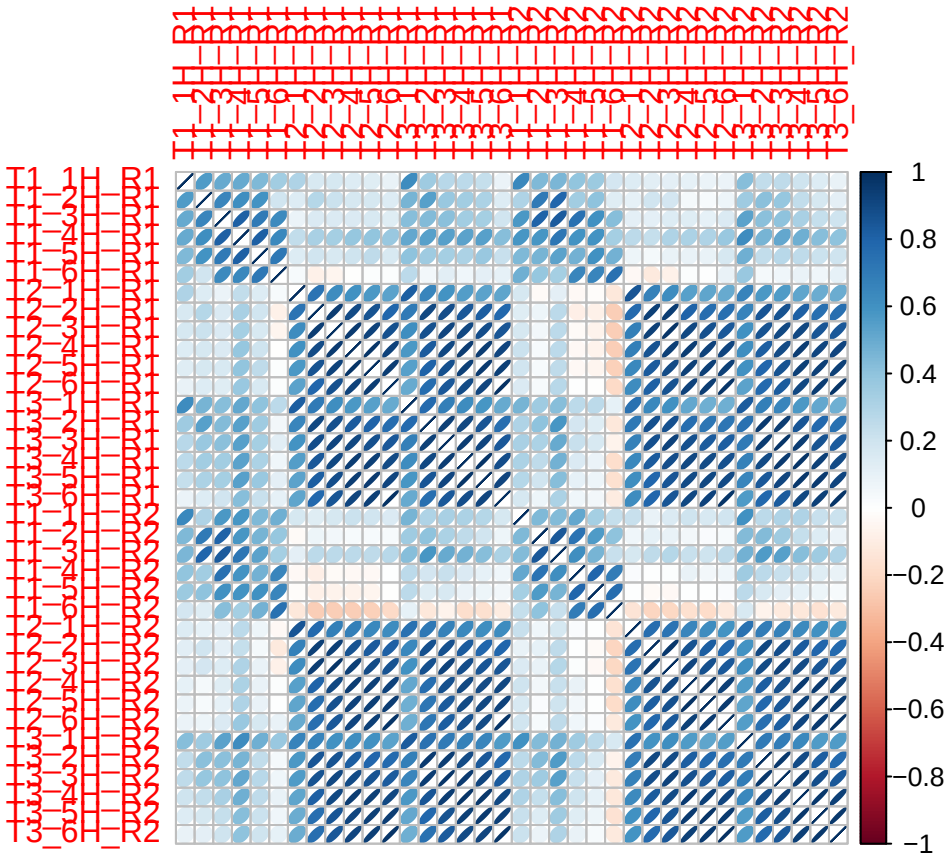
```
##  $ T3_5H_R2: num  -2.94 -2.46 -2.81 2.32 1.19 ...
##  $ T3_6H_R2: num  -3.39 -2.97 -2.7 2.16 1.95 ...
##  $ ExpT1   : chr  "Non" "Non" "Non" "Non" ...
##  $ ExpT2   : chr  "Sous" "Sous" "Sous" "Sur" ...
##  $ ExpT3   : chr  "Sous" "Sous" "Sous" "Sur" ...
```

```
##     T1_1H_R1           T1_2H_R1          T1_3H_R1           T1_4H_R1
##  Min.   :-3.58436   Min.   :-4.3034   Min.   :-2.26607   Min.   :-2.56731
##  1st Qu.:-0.22978   1st Qu.:-0.1404   1st Qu.:-0.28249   1st Qu.:-0.42895
##  Median :-0.03631   Median : 0.1420   Median :-0.05927   Median : 0.16867
##  Mean   :-0.02951   Mean   : 0.1767   Mean   : 0.04103   Mean   : 0.05281
##  3rd Qu.: 0.12204   3rd Qu.: 0.3904   3rd Qu.: 0.15839   3rd Qu.: 0.44483
##  Max.   : 5.06654   Max.   : 7.2821   Max.   : 6.61788   Max.   : 6.87671
##     T1_5H_R1           T1_6H_R1           T2_1H_R1           T2_2H_R1
##  Min.   :-5.5106   Min.   :-2.9759   Min.   :-4.30401   Min.   :-4.5825
##  1st Qu.:-0.4788   1st Qu.:-0.6124   1st Qu.:-0.43935   1st Qu.:-0.9932
##  Median :-0.1984   Median :-0.3724   Median : 0.13065   Median : 0.3289
##  Mean   :-0.1585   Mean   :-0.2416   Mean   : 0.06039   Mean   : 0.4714
##  3rd Qu.: 0.2077   3rd Qu.: 0.2413   3rd Qu.: 0.46011   3rd Qu.: 1.9464
##  Max.   : 5.8582   Max.   : 4.1009   Max.   : 8.66345   Max.   : 8.7483
##     T2_3H_R1           T2_4H_R1            T2_5H_R1           T2_6H_R1
##  Min.   :-6.6293   Min.   :-5.813548   Min.   :-5.8017   Min.   :-5.6784
##  1st Qu.:-2.0451   1st Qu.:-2.406108   1st Qu.:-2.4172   1st Qu.:-2.5552
##  Median : 0.3733   Median : 0.008421   Median : 0.7556   Median : 1.8857
##  Mean   : 0.3805   Mean   : 0.197409   Mean   : 0.1521   Mean   : 0.2313
##  3rd Qu.: 2.7644   3rd Qu.: 2.699218   3rd Qu.: 2.5236   3rd Qu.: 2.7235
##  Max.   : 8.9881   Max.   : 7.503939   Max.   : 7.0606   Max.   : 8.8815
##     T3_1H_R1           T3_2H_R1           T3_3H_R1           T3_4H_R1
##  Min.   :-2.9561   Min.   :-4.9884   Min.   :-5.8280   Min.   :-6.0789
##  1st Qu.:-0.4409   1st Qu.:-1.1066   1st Qu.:-1.5925   1st Qu.:-2.4930
##  Median : 0.1573   Median : 0.6914   Median : 0.9585   Median : 0.9982
##  Mean   : 0.1714   Mean   : 0.5878   Mean   : 0.6387   Mean   : 0.2736
##  3rd Qu.: 0.6673   3rd Qu.: 2.3016   3rd Qu.: 2.7533   3rd Qu.: 2.7854
##  Max.   : 8.6849   Max.   : 8.6560   Max.   : 8.0950   Max.   : 7.0103
##     T3_5H_R1          T3_6H_R1           T1_1H_R2           T1_2H_R2
##  Min.   :-6.910   Min.   :-4.7625   Min.   :-2.11580   Min.   :-2.75004
##  1st Qu.:-2.487   1st Qu.:-2.0911   1st Qu.:-0.28225   1st Qu.:-0.27271
##  Median : 1.156   Median : 1.8690   Median :-0.02432   Median :-0.04075
##  Mean   : 0.258   Mean   : 0.3913   Mean   :-0.04445   Mean   : 0.10717
##  3rd Qu.: 2.709   3rd Qu.: 2.4879   3rd Qu.: 0.15670   3rd Qu.: 0.25383
##  Max.   : 6.529   Max.   : 8.6398   Max.   : 4.70943   Max.   : 7.03638
##     T1_3H_R2           T1_4H_R2           T1_5H_R2           T1_6H_R2
##  Min.   :-3.2539   Min.   :-3.50770   Min.   :-3.3307   Min.   :-2.4863
##  1st Qu.:-0.1229   1st Qu.:-0.51001   1st Qu.:-0.6437   1st Qu.:-0.9686
##  Median : 0.2674   Median :-0.27091   Median :-0.3845   Median :-0.7215
##  Mean   : 0.3033   Mean   :-0.02457   Mean   :-0.2410   Mean   :-0.3082
##  3rd Qu.: 0.5068   3rd Qu.: 0.27652   3rd Qu.: 0.1442   3rd Qu.: 0.5814
##  Max.   : 7.1995   Max.   : 6.52284   Max.   : 5.2469   Max.   : 3.9054
##     T2_1H_R2           T2_2H_R2           T2_3H_R2           T2_4H_R2
##  Min.   :-2.38587   Min.   :-5.8266   Min.   :-4.6135   Min.   :-6.4553
##  1st Qu.:-0.48477   1st Qu.:-1.2309   1st Qu.:-1.4511   1st Qu.:-2.3416
##  Median : 0.03105   Median : 0.6644   Median : 0.5351   Median : 0.5323
##  Mean   : 0.08932   Mean   : 0.4684   Mean   : 0.5999   Mean   : 0.1279
##  3rd Qu.: 0.61495   3rd Qu.: 2.1298   3rd Qu.: 2.5954   3rd Qu.: 2.4618
```

```
##  Max.   : 8.59820   Max.   : 8.8928   Max.   : 8.4956   Max.   : 8.0010
##     T2_5H_R2          T2_6H_R2          T3_1H_R2          T3_2H_R2
##  Min.   :-6.1685   Min.   :-6.2234   Min.   :-3.22436   Min.   :-6.0944
##  1st Qu.:-2.4058   1st Qu.:-2.6251   1st Qu.:-0.61705   1st Qu.:-1.3567
##  Median : 1.0892   Median : 2.0014   Median : 0.07589   Median : 0.7670
##  Mean   : 0.1411   Mean   : 0.1572   Mean   : 0.11618   Mean   : 0.5725
##  3rd Qu.: 2.5033   3rd Qu.: 2.5375   3rd Qu.: 0.76673   3rd Qu.: 2.3150
##  Max.   : 7.4521   Max.   : 8.7777   Max.   : 8.77729   Max.   : 8.6354
##     T3_3H_R2          T3_4H_R2          T3_5H_R2          T3_6H_R2
##  Min.   :-6.0135   Min.   :-6.0345   Min.   :-6.8294   Min.   :-7.24672
##  1st Qu.:-1.8079   1st Qu.:-2.2277   1st Qu.:-2.5646   1st Qu.:-2.80051
##  Median : 1.1183   Median : 1.1769   Median : 1.6539   Median : 1.92082
##  Mean   : 0.5828   Mean   : 0.3157   Mean   : 0.1338   Mean   : 0.05484
##  3rd Qu.: 2.8892   3rd Qu.: 2.6455   3rd Qu.: 2.5664   3rd Qu.: 2.46450
##  Max.   : 8.2637   Max.   : 7.4777   Max.   : 6.9137   Max.   : 8.69285
##   ExpT1       ExpT2       ExpT3
##  Non :441   Non : 11   Non :  7
##  Sous: 57   Sous:247   Sous:247
##  Sur : 44   Sur :284   Sur :288
##
##
##
```

```
## Le chargement a nécessité le package : corrplot
```

```
## corrplot 0.95 loaded
```

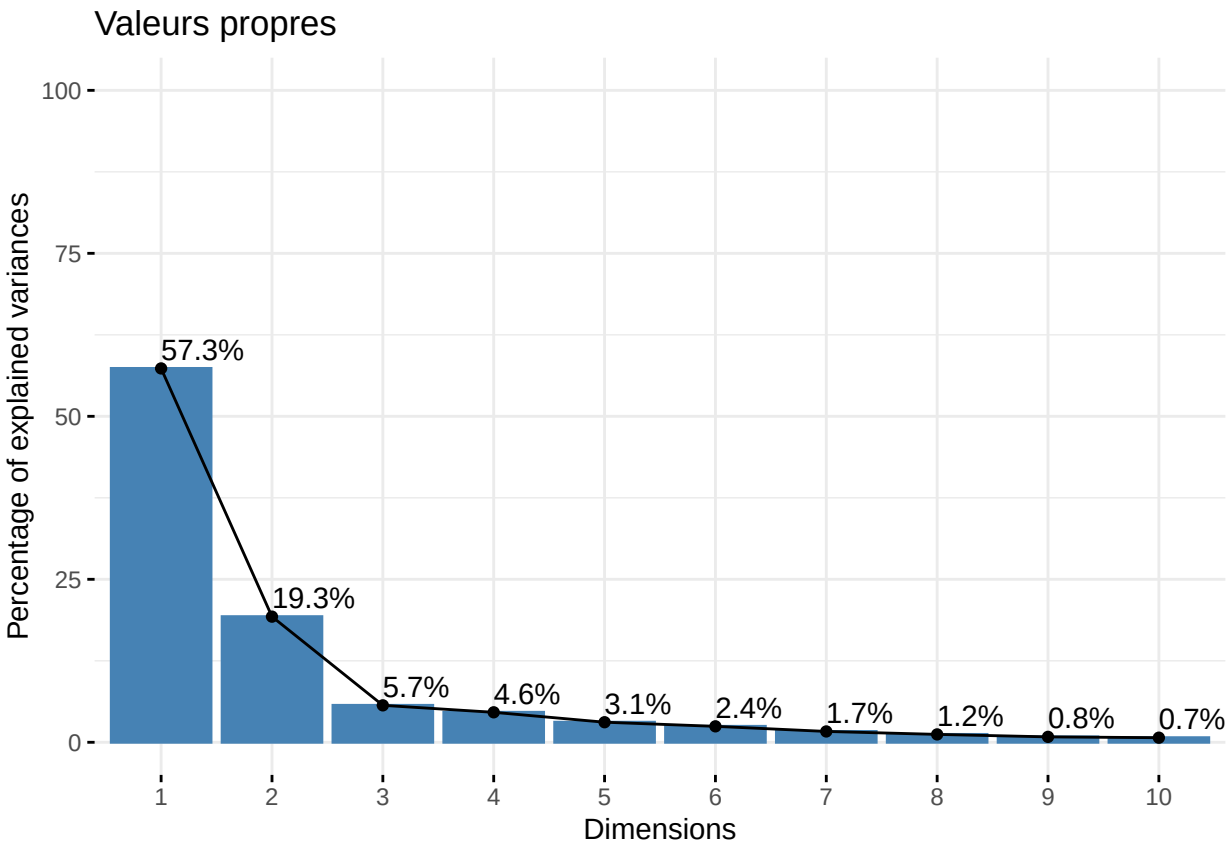


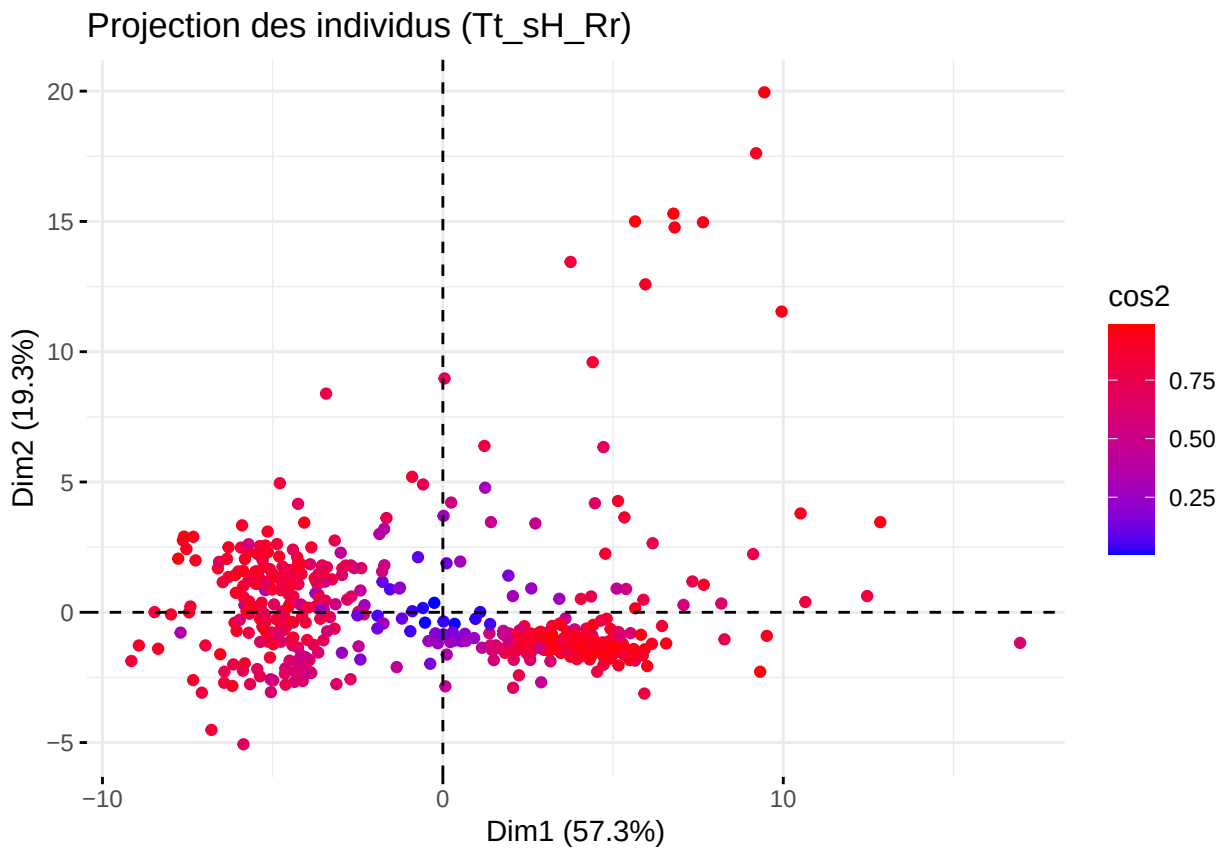
```
## Le chargement a nécessité le package : FactoMineR

## Le chargement a nécessité le package : factoextra

## Welcome! Want to learn more? See two factoextra-related books at https://goo.gl/ve3WBa
```

	eigenvalue	percentage of variance	cumulative percentage of variance
comp 1	20.643727183	57.34368662	57.34369
comp 2	6.938281435	19.27300398	76.61669
comp 3	2.041274447	5.67020680	82.28690
comp 4	1.656135505	4.60037640	86.88727
comp 5	1.109348959	3.08152489	89.96880
comp 6	0.881791877	2.44942188	92.41822
comp 7	0.599431245	1.66508679	94.08331
comp 8	0.436409980	1.21224994	95.29556
comp 9	0.300326182	0.83423939	96.12980
comp 10	0.254557652	0.70710459	96.83690
comp 11	0.195646575	0.54346271	97.38036
comp 12	0.114623243	0.31839790	97.69876
comp 13	0.113438274	0.31510632	98.01387
comp 14	0.098934866	0.27481907	98.28869
comp 15	0.084015374	0.23337604	98.52206
comp 16	0.075403512	0.20945420	98.73152
comp 17	0.068914101	0.19142806	98.92295
comp 18	0.060357899	0.16766083	99.09061
comp 19	0.056624240	0.15728956	99.24790
comp 20	0.045538131	0.12649481	99.37439
comp 21	0.037080890	0.10300247	99.47739
comp 22	0.032099053	0.08916404	99.56656
comp 23	0.026356683	0.07321301	99.63977
comp 24	0.021809019	0.06058061	99.70035
comp 25	0.015239265	0.04233129	99.74268
comp 26	0.014299054	0.03971959	99.78240
comp 27	0.011721521	0.03255978	99.81496
comp 28	0.010954844	0.03043012	99.84539
comp 29	0.009729805	0.02702724	99.87242
comp 30	0.009492364	0.02636768	99.89879
comp 31	0.008089909	0.02247197	99.92126
comp 32	0.006904142	0.01917817	99.94044
comp 33	0.006571646	0.01825457	99.95869
comp 34	0.005669160	0.01574767	99.97444
comp 35	0.004995223	0.01387562	99.98831
comp 36	0.004206745	0.01168540	100.00000


Valeurs propres
Percentage of explained variances
100
75
50
25
0
57.3%
19.3%
5.7%
4.6%
3.1%
2.4%
1.7%
1.2%
0.8%
0.7%
1
2
3
4
5
6
7
8
9
10
Dimensions

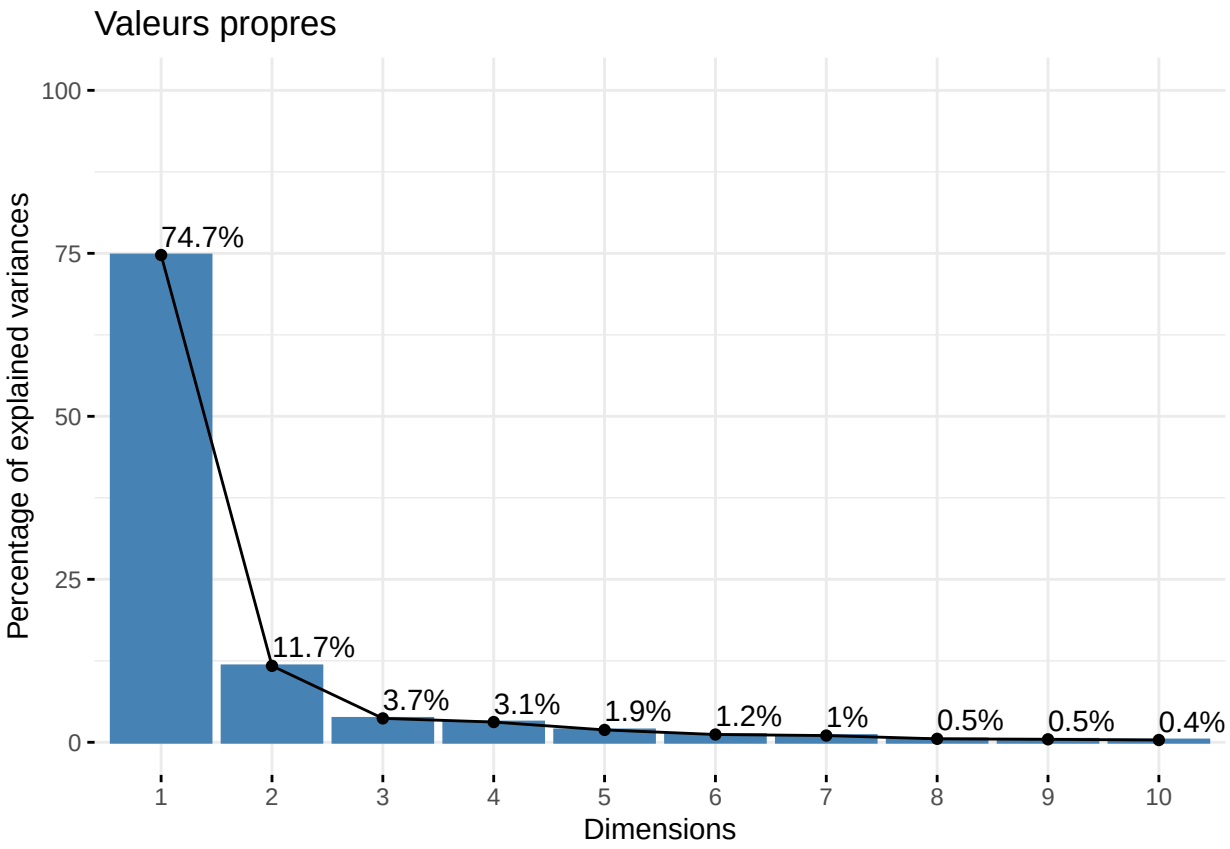


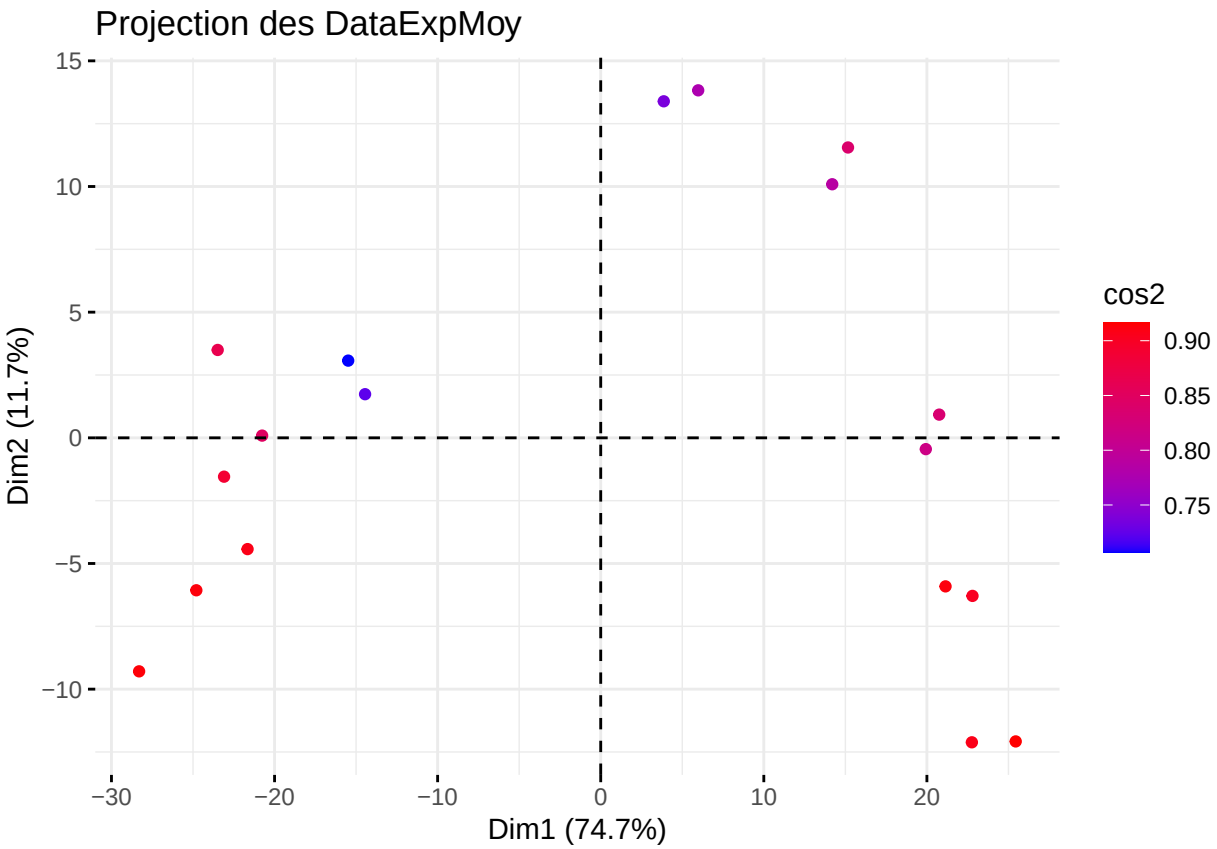

```
## [1] 542  18
```

```
## Warning in mean.default(DataExpMoy_full[DataExpMoy_full$ExpT1 == "Sur", :
## l'argument n'est ni numérique, ni logique : renvoi de NA
```

```
## [1] NA
```

```
##          eigenvalue percentage of variance cumulative percentage of variance
## comp 1  405.0981814            74.74136189                           74.74136
## comp 2   63.5464399            11.72443541                           86.46580
## comp 3   19.8878459             3.66934427                           90.13514
## comp 4   16.8479751             3.10848248                           93.24362
## comp 5   10.2927617             1.89903352                           95.14266
## comp 6    6.4759341             1.19482180                           96.33748
## comp 7    5.5998433             1.03318142                           97.37066
## comp 8    2.8740502             0.53026756                           97.90093
## comp 9    2.4754020             0.45671624                           98.35764
## comp 10   1.9014013             0.35081205                           98.70846
## comp 11   1.6037165             0.29588865                           99.00435
## comp 12   1.4238320             0.26269962                           99.26704
## comp 13   1.1833848             0.21833668                           99.48538
## comp 14   0.9911234             0.18286410                           99.66825
## comp 15   0.7400607             0.13654256                           99.80479
## comp 16   0.5887171             0.10861938                           99.91341
## comp 17   0.4693307             0.08659237                          100.00000
```


Valeurs propres
Percentage of explained variances
100
75
50
25
0
74.7%
11.7%
3.7%
3.1%
1.9%
1.2%
1%
0.5%
0.5%
0.4%
1
2
3
4
5
6
7
8
9
10
Dimensions


Projection des DataExpMoy
15
10
5
0
−5
−10
Dim2 (11.7%)
−30
−20
−10
0
10
20
Dim1 (74.7%)
cos2
0.90
0.85
0.80
0.75