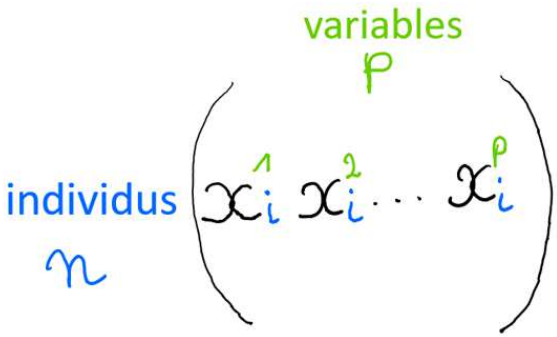
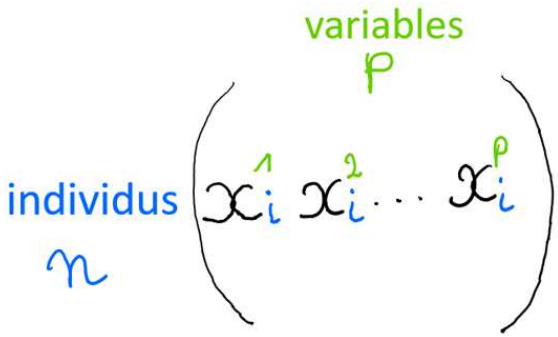
Analyse en Composantes Principales

Etude de cas

Analyse duale



Représentation des individus



Représentation des variables

Les données (X)

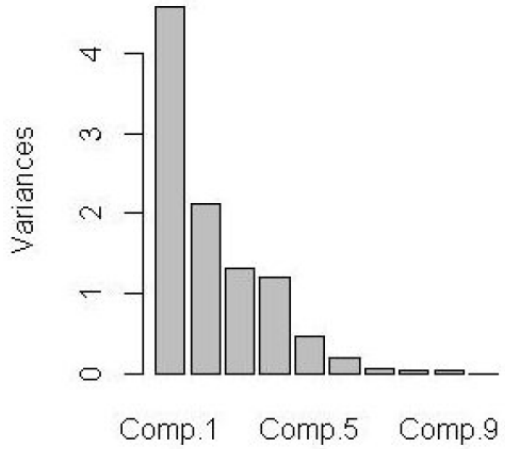
	PROF	TRAN	MENA	ENFA	COUR	TOIL	REPA	SOMM	TELE	LOIS
HAUS	610.	140.	60.	10.	120.	95.	115.	760.	175.	315.
FAUS	475.	90.	250.	30.	140.	120.	100.	775.	115.	305.
FNAU	10.	0.	495.	110.	170.	110.	130.	785.	160.	430.
HMUS	615.	140.	65.	10.	115.	90.	115.	765.	180.	305.
FMUS	179.	29.	421.	87.	161.	112.	119.	776.	143.	373.
HCUS	585.	115.	50.	0.	150.	105.	100.	760.	150.	385.
FCUS	482.	94.	196.	18.	141.	130.	96.	775.	132.	336.
HAWE	653.	100.	95.	7.	57.	85.	150.	808.	115.	330.
FAWE	511.	70.	307.	30.	80.	95.	142.	816.	87.	262.
FNAW	20.	7.	568.	87.	112.	90.	180.	843.	125.	368.
HMWE	656.	97.	97.	10.	52.	85.	152.	808.	122.	321.
FMWE	168.	22.	528.	69.	102.	83.	174.	824.	119.	311.
HCWE	643.	105.	72.	0.	62.	77.	140.	813.	100.	388.
FCWE	429.	34.	262.	14.	92.	97.	147.	849.	84.	392.
HAYO	650.	140.	120.	15.	85.	90.	105.	760.	70.	365.
FAYO	560.	105.	375.	45.	90.	90.	95.	745.	60.	235.
FNAY	10.	10.	710.	55.	145.	85.	130.	815.	60.	380.
HMYO	650.	145.	112.	15.	85.	90.	105.	760.	80.	358.
FMYO	260.	52.	576.	59.	116.	85.	117.	775.	65.	295.
HCYO	615.	125.	95.	0.	115.	90.	85.	760.	40.	475.
FCYO	433.	89.	318.	23.	112.	96.	102.	774.	45.	408.
HAES	650.	142.	122.	22.	76.	94.	100.	764.	96.	334.
FAES	578.	106.	338.	42.	106.	94.	92.	752.	64.	228.
FNAE	24.	8.	594.	72.	158.	92.	128.	840.	86.	398.
HMES	652.	133.	134.	22.	68.	94.	102.	763.	122.	310.
FMES	436.	79.	433.	60.	119.	90.	107.	772.	73.	231.

- PROF : temps en heures sur 100 jours passé au travail,
- TRAN : temps en heures sur 100 jours passé dans les transports principalement pour aller au travail,
- MENA : temps en heures sur 100 jours passé à faire du ménage,
- ENFA : temps en heures sur 100 jours passé à s'occuper des enfants,
- COUR : temps en heures sur 100 jours passé à faire les courses,
- TOIL : temps en heures sur 100 jours passé à faire la toilette,
- REPA : temps en heures sur 100 jours passé à prendre ses repas (préparation du repas exclue),
- SOMM : temps en heures sur 100 jours passé à dormir,
- TELE : temps en heures sur 100 jours passé à regarder la télévision,
- LOIS : temps en heures sur 100 jours consacré aux loisirs.

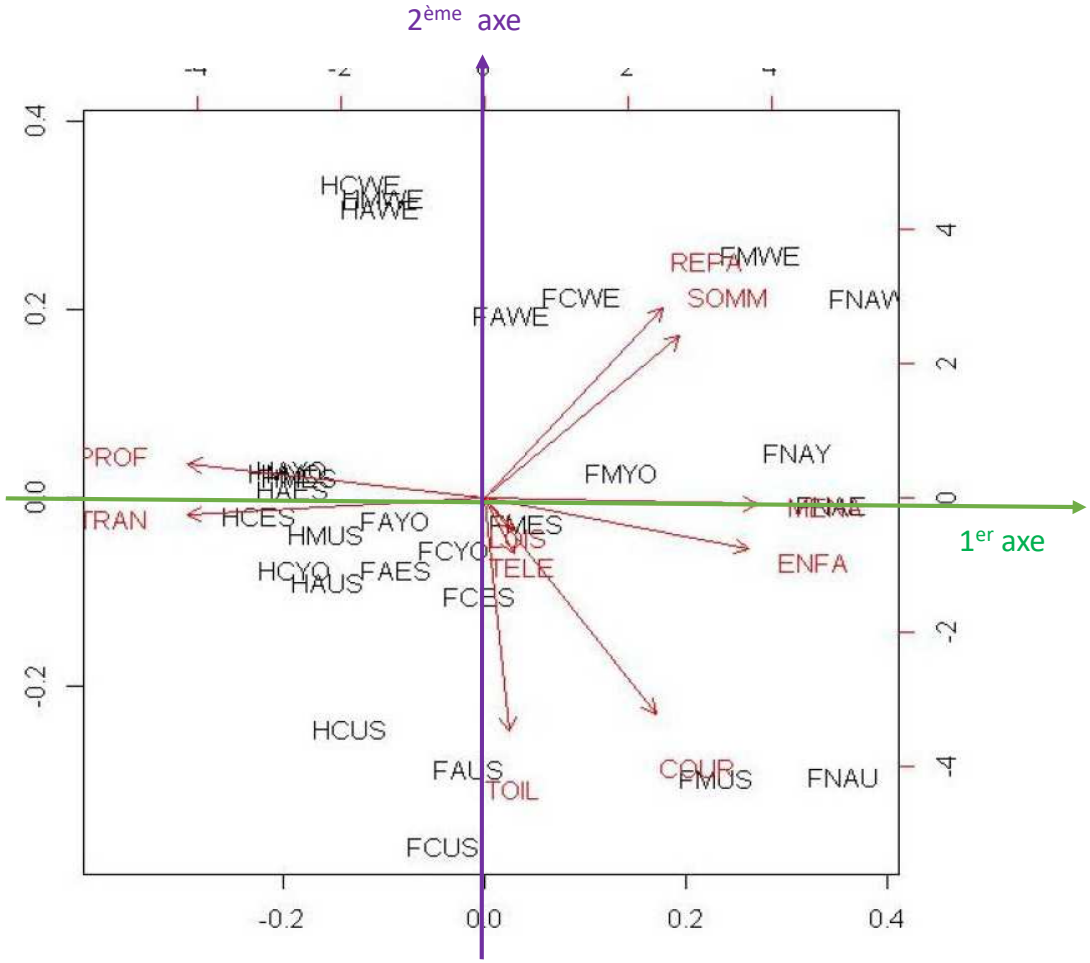
- H ou F : hommes ou femmes
- C ou M : célibataires ou marié(e)s
- A ou NA : actifs (actives) ou non actives (dans cette étude seules les femmes peuvent être non actives)
- U (US) : USA, Y (YO) : ex Yougoslavie, W (WE) : Europe de l'ouest, E (ES) : Europe de l'est

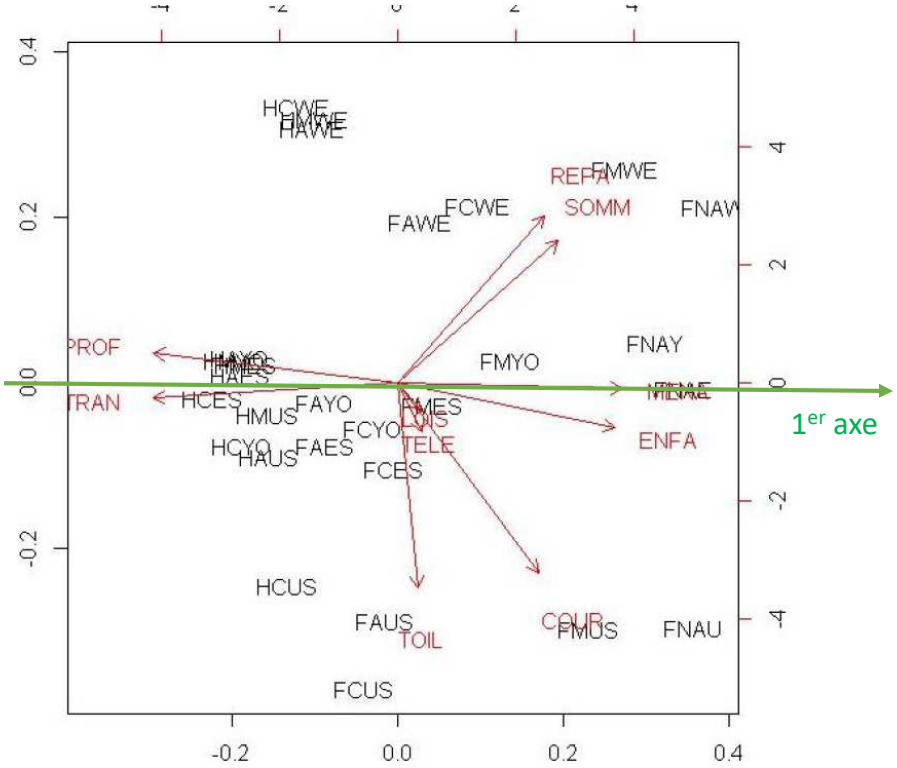
Les axes factoriels

	inertie	%	% cumulé
axe 1	4.58867	45.887	45.887
axe 2	2.11984	21.198	67.085
axe 3	1.32098	13.210	80.295
axe 4	1.19526	11.953	92.247
axe 5	0.46841	4.684	96.932
axe 6	0.19905	1.990	98.922
axe 7	0.04681	0.468	99.390
axe 8	0.03707	0.371	99.761
axe 9	0.02392	0.239	100.000
axe 10	0.00000	0.000	100.000



1er plan factoriel (axe 1 x axe 2)





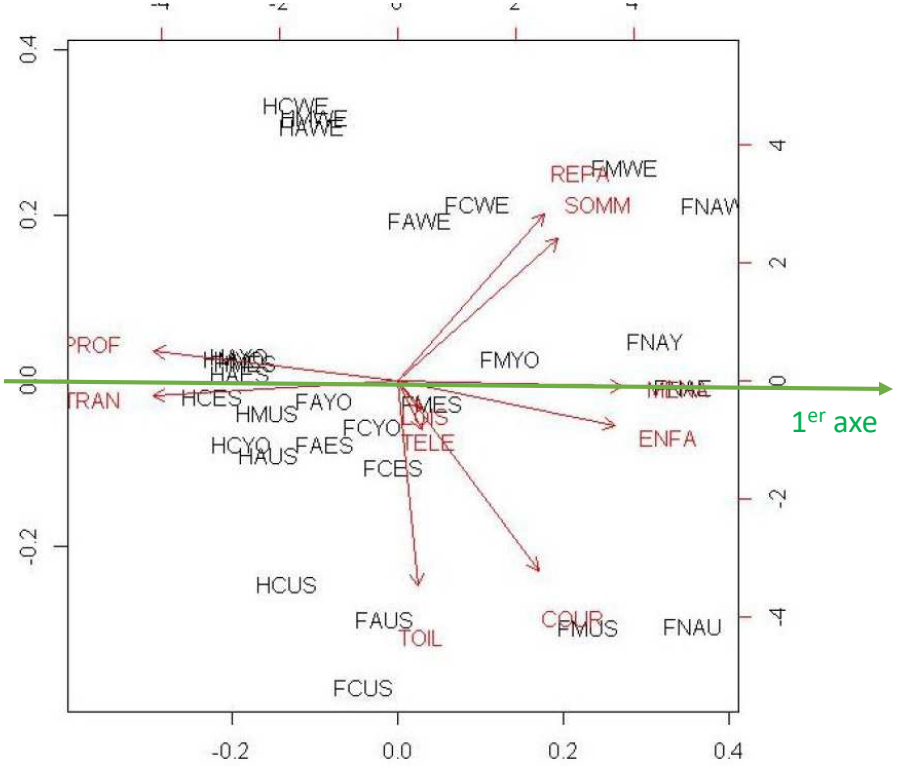
Corrélations des variables

	axe 1	axe 2	axe 3	axe 4	axe 5
PROF	-0.977	0.121	-0.085	0.067	0.096
TRAN	-0.980	-0.058	-0.008	0.046	-0.111
MENA	0.900	-0.023	0.362	0.214	0.004
ENFA	0.872	-0.179	0.084	0.294	-0.190
COUR	0.564	-0.761	-0.005	-0.121	-0.085
TOIL	0.080	-0.818	-0.302	-0.064	0.448
REPA	0.588	0.669	-0.426	0.014	0.002
SOMM	0.644	0.569	-0.191	-0.312	0.313
TELE	0.099	-0.193	-0.930	0.151	-0.241
LOIS	0.092	-0.110	0.030	-0.957	-0.215

Contributions des individus

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
HAUS	-1.773	-0.686	-1.871	0.575	-0.854	-0.666	-0.011	-0.107	0.108	0
FAUS	-0.172	-2.215	-0.661	0.438	1.252	-0.048	-0.059	-0.050	0.134	0
FNAU	4.053	-2.278	-1.061	-0.520	-1.037	0.902	0.014	0.222	-0.161	0
HMUS	-1.779	-0.293	-1.885	0.733	-1.038	-0.830	0.185	-0.084	-0.005	0
FMUS	2.614	-2.285	-0.797	0.108	-0.371	0.573	-0.061	0.238	-0.069	0
HCUS	-1.503	-1.892	-1.363	-0.782	-0.354	-0.797	-0.312	0.162	-0.055	0
FCUS	-0.465	-2.844	-1.296	-0.148	1.617	0.125	-0.104	-0.328	-0.005	0
HAWE	-1.176	2.368	-1.117	-0.046	0.232	0.141	-0.151	0.089	-0.046	0
FAWE	0.312	1.495	-0.272	0.943	1.248	0.013	-0.017	0.090	0.096	0
FNAW	4.323	1.633	-0.890	-0.144	-0.228	0.451	0.034	-0.213	0.346	0
HMWE	-1.125	2.464	-1.286	0.150	0.218	0.247	-0.122	0.080	-0.132	0
FMWE	3.131	1.989	-0.588	0.735	-0.345	0.011	-0.254	-0.101	0.142	0
HCWE	-1.370	2.572	-0.526	-1.023	-0.287	-0.132	0.085	0.182	-0.121	0
FCWE	1.099	1.655	-0.543	-1.496	1.430	-0.112	-0.019	0.204	-0.228	0
HAYO	-2.163	0.241	0.709	-0.239	-0.324	0.355	-0.125	0.005	0.252	0
FAYO	-1.005	-0.180	1.616	2.132	-0.045	0.240	-0.095	0.024	-0.156	0
FNAY	3.537	0.377	1.635	-0.530	-0.276	-0.801	-0.191	-0.411	-0.177	0
HMYO	-2.221	0.212	0.483	-0.110	-0.397	0.301	-0.035	-0.055	0.260	0
FMYO	1.540	0.216	1.621	1.166	-0.439	-0.184	-0.217	-0.177	-0.189	0
HCYO	-2.135	-0.581	1.610	-2.178	-0.554	-0.025	-0.255	0.265	0.038	0
FCYO	-0.336	-0.418	1.491	-1.025	0.120	0.188	-0.315	-0.142	0.006	0
HAES	-2.147	0.069	0.131	0.322	-0.148	0.529	0.318	-0.157	0.024	0
FAES	-0.988	-0.585	1.365	2.040	0.267	-0.086	0.020	0.233	0.008	0
FNAE	3.919	-0.049	0.672	-0.975	-0.002	-0.643	0.595	0.116	0.052	0
HMES	-2.077	0.170	-0.425	0.792	-0.216	0.527	0.365	-0.280	-0.350	0
FMES	0.490	-0.204	1.184	2.013	0.043	-0.290	0.162	0.343	0.127	0
HCES	-2.529	-0.147	1.063	-1.963	-0.352	0.383	0.260	-0.196	0.040	0
FCES	-0.055	-0.804	1.002	-0.968	0.842	-0.371	0.305	0.049	0.066	0

Contributions des individus



Corrélations des variables

	axe 1	axe 2	axe 3	axe 4	axe 5
PROF	-0.977	0.121	-0.085	0.067	0.096
TRAN	-0.980	-0.058	-0.008	0.046	-0.111
MENA	0.900	-0.023	0.362	0.214	0.004
ENFA	0.872	-0.179	0.084	0.294	-0.190
COUR	0.564	-0.761	-0.005	-0.121	-0.085
TOIL	0.080	-0.818	-0.302	-0.064	0.448
REPA	0.588	0.669	-0.426	0.014	0.002
SOMM	0.644	0.569	-0.191	-0.312	0.313
TELE	0.099	-0.193	-0.930	0.151	-0.241
LOIS	0.092	-0.110	0.030	-0.957	-0.215

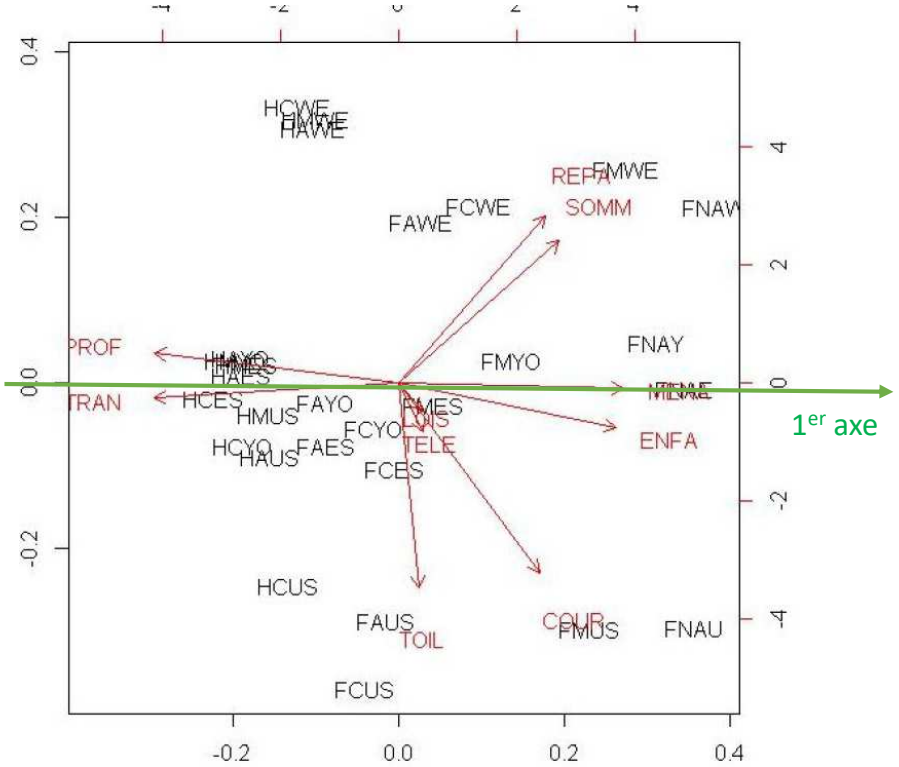
Part d'inertie des individus pour chaque axe

	A1	A2	A3	A4	A5
HAUS	2.4	0.8	9.5	1.0	5.6
FAUS	0.0	8.3	1.2	0.6	11.9
FNAU	12.8	8.7	3.0	0.8	8.2
HMUS	2.5	0.1	9.6	1.6	8.2
FMUS	5.3	8.8	1.7	0.0	1.0
HCUS	1.8	6.0	5.0	1.8	1.0
FCUS	0.2	13.6	4.5	0.1	19.9
HAWE	1.1	9.4	3.4	0.0	0.4
FAWE	0.1	3.8	0.2	2.7	11.9
FNAW	14.5	4.5	2.1	0.1	0.4
HMWE	1.0	10.2	4.5	0.1	0.4
FMWE	7.6	6.7	0.9	1.6	0.9
HCWE	1.5	11.1	0.7	3.1	0.6
FCWE	0.9	4.6	0.8	6.7	15.6
HAYO	3.6	0.1	1.4	0.2	0.8
FAYO	0.8	0.1	7.1	13.6	0.0
FNAY	9.7	0.2	7.2	0.8	0.6
HMYO	3.8	0.1	0.6	0.0	1.2
FMYO	1.8	0.1	7.1	4.1	1.5
HCYO	3.5	0.6	7.0	14.2	2.3
FCYO	0.1	0.3	6.0	3.1	0.1
HAES	3.6	0.0	0.0	0.3	0.2
FAES	0.8	0.6	5.0	12.4	0.5
FNAE	12.0	0.0	1.2	2.8	0.0
HMES	3.4	0.0	0.5	1.9	0.4
FMES	0.2	0.1	3.8	12.1	0.0
HCES	5.0	0.0	3.1	11.5	0.9
FCES	0.0	1.1	2.7	2.8	5.4

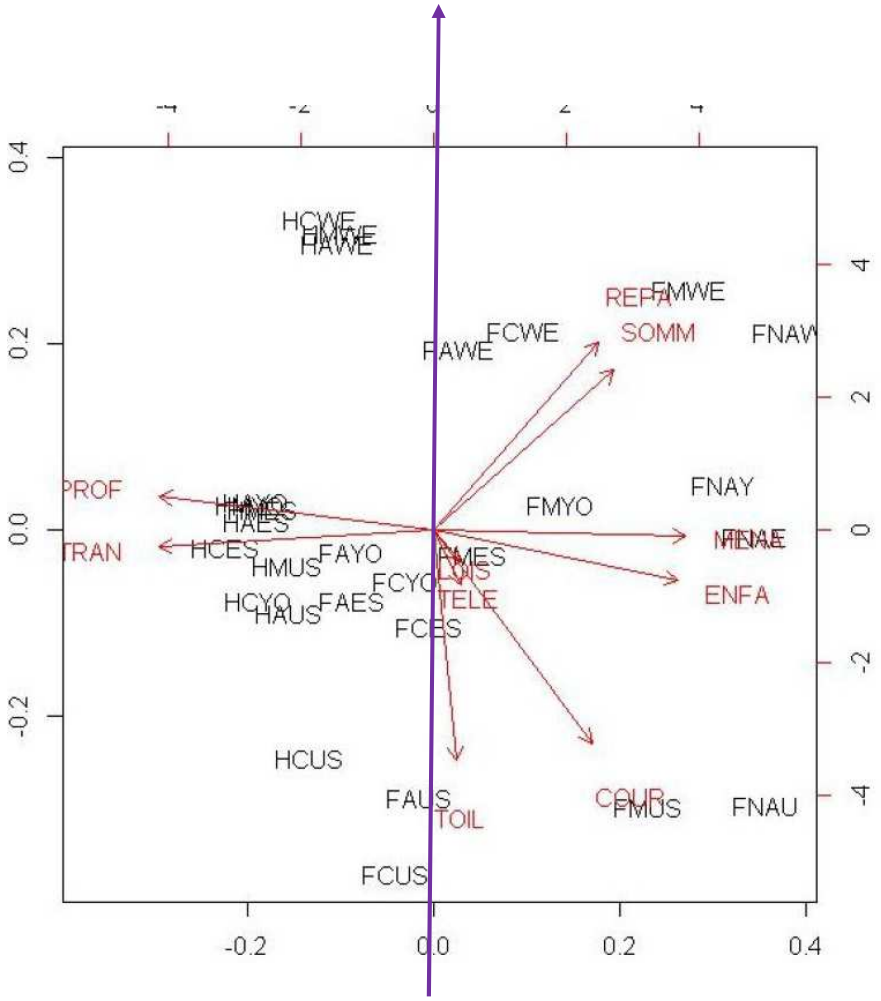
Si les contributions des individus étaient uniformes elles vaudraient 100/28 (3.57).

Qualité de la projection des individus pour chaque axe (cos 2)

	A1	A2	A3	A4
HAUS	0.364	0.054	0.405	0.038
FAUS	0.004	0.686	0.061	0.027
FNAU	0.658	0.208	0.045	0.011
HMUS	0.346	0.009	0.388	0.059
FMUS	0.516	0.395	0.048	0.001
HCUS	0.246	0.389	0.202	0.067
FCUS	0.017	0.634	0.132	0.002
HAWE	0.166	0.672	0.149	0.000
FAWE	0.020	0.459	0.015	0.183
FNAW	0.827	0.118	0.035	0.001
HMWE	0.138	0.663	0.180	0.002
FMWE	0.660	0.266	0.023	0.036
HCWE	0.188	0.663	0.028	0.105
FCWE	0.140	0.317	0.034	0.259
HAYO	0.834	0.010	0.090	0.010
FAYO	0.122	0.004	0.315	0.548
FNAY	0.755	0.009	0.161	0.017
HMYO	0.890	0.008	0.042	0.002
FMYO	0.351	0.007	0.390	0.201
HCYO	0.360	0.027	0.204	0.374
FCYO	0.030	0.047	0.596	0.282
HAES	0.893	0.001	0.003	0.020
FAES	0.130	0.046	0.249	0.557
FNAE	0.875	0.000	0.026	0.054
HMES	0.743	0.005	0.031	0.108
FMES	0.040	0.007	0.234	0.677
HCES	0.543	0.002	0.096	0.327
FCES	0.001	0.183	0.284	0.265



2ème axe factoriel



Corrélations des variables

	axe 1	axe 2
PROF	-0.977	0.121
TRAN	-0.980	-0.058
MENA	0.900	-0.023
ENFA	0.872	-0.179
COUR	0.564	-0.761
TOIL	0.080	-0.818
REPA	0.588	0.669
SOMM	0.644	0.569
TELE	0.099	-0.193
LOIS	0.092	-0.110

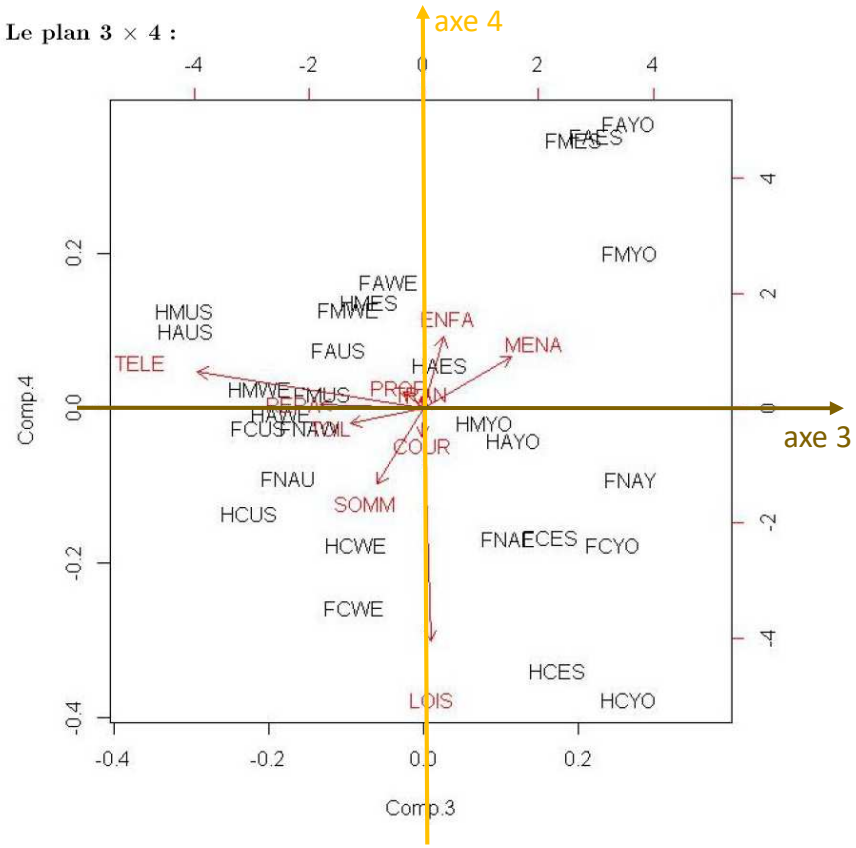
Contributions des individus

	A1	A2
HAUS	-1.773	-0.686
FAUS	-0.172	-2.215
FNAU	4.053	-2.278
HMUS	-1.779	-0.293
FMUS	2.614	-2.285
HCUS	-1.503	-1.892
FCUS	-0.465	-2.844
HAWE	-1.176	2.368
FAWE	0.312	1.495
FNAW	4.323	1.633
HMWE	-1.125	2.464
FMWE	3.131	1.989
HCWE	-1.370	2.572
FCWE	1.099	1.655
HAYO	-2.163	0.241
FAYO	-1.005	-0.180
FNAY	3.537	0.377
HMYO	-2.221	0.212
FMYO	1.540	0.216
HCYO	-2.135	-0.581
FCYO	-0.336	-0.418
HAES	-2.147	0.069
FAES	-0.988	-0.585
FNAE	3.919	-0.049
HMES	-2.077	0.170
FMES	0.490	-0.204
HCES	-2.529	-0.147
FCES	-0.055	-0.804

Part d'inertie

	A1	A2
HAUS	2.4	0.8
FAUS	0.0	8.3
FNAU	12.8	8.7
HMUS	2.5	0.1
FMUS	5.3	8.8
HCUS	1.8	6.0
FCUS	0.2	13.6
HAWE	1.1	9.4
FAWE	0.1	3.8
FNAW	14.5	4.5
HMWE	1.0	10.2
FMWE	7.6	6.7
HCWE	1.5	11.1
FCWE	0.9	4.6
HAYO	3.6	0.1
FAYO	0.8	0.1
FNAY	9.7	0.2
HMYO	3.8	0.1
FMYO	1.8	0.1
HCYO	3.5	0.6
FCYO	0.1	0.3
HAES	3.6	0.0
FAES	0.8	0.6
FNAE	12.0	0.0
HMES	3.4	0.0
FMES	0.2	0.1
HCES	5.0	0.0
FCES	0.0	1.1

Plan factoriel (axe 3 x axe 4)



Corrélations des variables

	axe 1	axe 2	axe 3	axe 4	axe 5
PROF	-0.977	0.121	-0.085	0.067	0.096
TRAN	-0.980	-0.058	-0.008	0.046	-0.111
MENA	0.900	-0.023	0.362	0.214	0.004
ENFA	0.872	-0.179	0.084	0.294	-0.190
COUR	0.564	-0.761	-0.005	-0.121	-0.085
TOIL	0.080	-0.818	-0.302	-0.064	0.448
REPA	0.588	0.669	-0.426	0.014	0.002
SOMM	0.644	0.569	-0.191	-0.312	0.313
TELE	0.099	-0.193	-0.930	0.151	-0.241
LOIS	0.092	-0.110	0.030	-0.957	-0.215

Part d'inertie

	A1	A2	A3	A4	A5
HAUS	2.4	0.8	9.5	1.0	5.6
FAUS	0.0	8.3	1.2	0.6	11.9
FNAU	12.8	8.7	3.0	0.8	8.2
HMUS	2.5	0.1	9.6	1.6	8.2
FMUS	5.3	8.8	1.7	0.0	1.0
HCUS	1.8	6.0	5.0	1.8	1.0
FCUS	0.2	13.6	4.5	0.1	19.9
HAWE	1.1	9.4	3.4	0.0	0.4
FAWE	0.1	3.8	0.2	2.7	11.9
FNAW	14.5	4.5	2.1	0.1	0.4
HMWE	1.0	10.2	4.5	0.1	0.4
FMWE	7.6	6.7	0.9	1.6	0.9
HCWE	1.5	11.1	0.7	3.1	0.6
FCWE	0.9	4.6	0.8	6.7	15.6
HAYO	3.6	0.1	1.4	0.2	0.8
FAYO	0.8	0.1	7.1	13.6	0.0
FNAY	9.7	0.2	7.2	0.8	0.6
HMYO	3.8	0.1	0.6	0.0	1.2
FMYO	1.8	0.1	7.1	4.1	1.5
HCYO	3.5	0.6	7.0	14.2	2.3
FCYO	0.1	0.3	6.0	3.1	0.1
HAES	3.6	0.0	0.0	0.3	0.2
FAES	0.8	0.6	5.0	12.4	0.5
FNAE	12.0	0.0	1.2	2.8	0.0
HMES	3.4	0.0	0.5	1.9	0.4
FMES	0.2	0.1	3.8	12.1	0.0
HCES	5.0	0.0	3.1	11.5	0.9
FCES	0.0	1.1	2.7	2.8	5.4

Contributions des individus

	A1	A2	A3	A4
HAUS	-1.773	-0.686	-1.871	0.575
FAUS	-0.172	-2.215	-0.661	0.438
FNAU	4.053	-2.278	-1.061	-0.520
HMUS	-1.779	-0.293	-1.885	0.733
FMUS	2.614	-2.285	-0.797	0.108
HCUS	-1.503	-1.892	-1.363	-0.782
FCUS	-0.465	-2.844	-1.296	-0.148
HAWE	-1.176	2.368	-1.117	-0.046
FAWE	0.312	1.495	-0.272	0.943
FNAW	4.323	1.633	-0.890	-0.144
HMWE	-1.125	2.464	-1.286	0.150
FMWE	3.131	1.989	-0.588	0.735
HCWE	-1.370	2.572	-0.526	-1.023
FCWE	1.099	1.655	-0.543	-1.496
HAYO	-2.163	0.241	0.709	-0.239
FAYO	-1.005	-0.180	1.616	2.132
FNAY	3.537	0.377	1.635	-0.530
HMYO	-2.221	0.212	0.483	-0.110
FMYO	1.540	0.216	1.621	1.166
HCYO	-2.135	-0.581	1.610	-2.178
FCYO	-0.336	-0.418	1.491	-1.025
HAES	-2.147	0.069	0.131	0.322
FAES	-0.988	-0.585	1.365	2.040
FNAE	3.919	-0.049	0.672	-0.975
HMES	-2.077	0.170	-0.425	0.792
FMES	0.490	-0.204	1.184	2.013
HCES	-2.529	-0.147	1.063	-1.963
FCES	-0.055	-0.804	1.002	-0.968