



**SensoMineR : the free software to perform
sensory analysis**

François Husson & Sébastien Lê

What is ?

- A free software, more and more used in all the world
- Easy to install on Windows, Linux, Mac
- With a lot of libraries (more than 1700 libraries)
- Continuous development of the software, new methods and methodologies immediately available
- Graphs and outputs easy to export
- Possibility to make programs and to use pre-define functions
- Available with a Graphical User Interface
- Available from Excel (or Openoffice)

Why **SensoMineR** ?

- To have a software to perform sensory analysis
- To make available the most classical methods to analyse sensory data
- To make available the new methodologies developed in sensory analysis
- For teaching, research and development
- Free and available for all students in their internships or their jobs ... and all people interested by sensometry
- Easy to use with a GUI or from Excel

SensoMineR

- Characterizing products
- Relating sensory data and instrumental data
- Assessing panel performances
- Mapping consumers' preferences
- Holistic approaches
- Triangle tests

use

FACTOMINER

- PCA
- Correspondence Analysis (and Multiple CA)
- Multiple Factor Analysis

SensoMineR

Microsoft Excel - Biscuits.xls

Fichier Edition Affichage Insertion Format Outils Données Fenêtre RExcel ? Adobe PDF

R File Data Statistics Graphs Models Distributions Tools Help SensoMineR FactoMineR Dataset: Frer

Biscuits Panelist

	E	F	G	H	I	J	K
161	2	2	2	2	7	8	
162	9	6	2	3	0	2	
163	3	1	8	0	10	8	
164	3	8	9	7	9	7	
165	10	6	10	10	7	7	
166	6	1	3	5	10	8	
167	5	5	6	7	3	9	
168	3	2	10	10	8	9	
169	2	1	3	7	10	9	
170	3	1	6	1	8	8	

- Optimal design
- Characterization products
- Panel performance
- Relating Preference and sensory data
- Triangle tests
- Panels comparison
- Holistic approaches
- Tools functions

Comparing sensory profiles provided by several panels: application to a **cross-cultural** study



The data

- 8 biscuits (4 French, 4 Pakistani)

	Sooper	Gala	Candi Lite	Milco
Pakistani biscuits				
French biscuits	Petit Brun	Petit Beurre	Palet Breton	Sprits
				

- 2 panels
 - one French
 - one Pakistani

The data

French

- 12 panelists
- Training: 2 sessions
- (16+7) descriptors
- 1 replication

Pakistani

- 11 panelists
- Training: 6 sessions
- 16 descriptors
- No replication

How to compare the two panels?

- Have a quick look at each panel *via* its respective products space
 - from a one-dimensional point of view
 - from a multi-dimensional point of view
- and performance at a
 - panel level
 - panelist level
- Immerse the two products spaces into one in order to compare them
 - with Multiple Factor Analysis, Indcal model, Procrustes analysis
 - by taking into account the individual variability

How to compare the two panels?

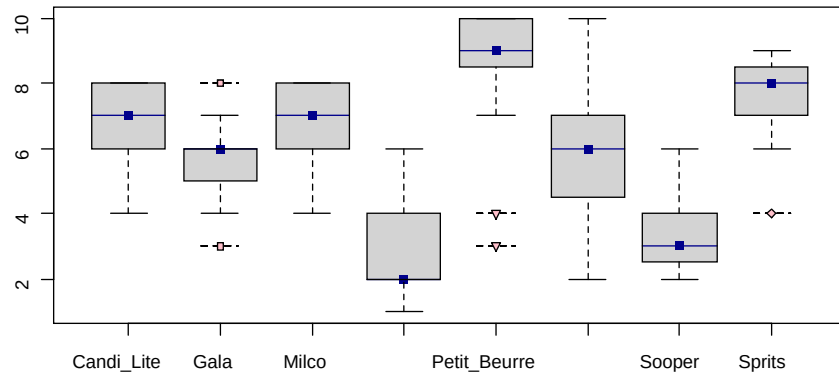
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The Pakistani data

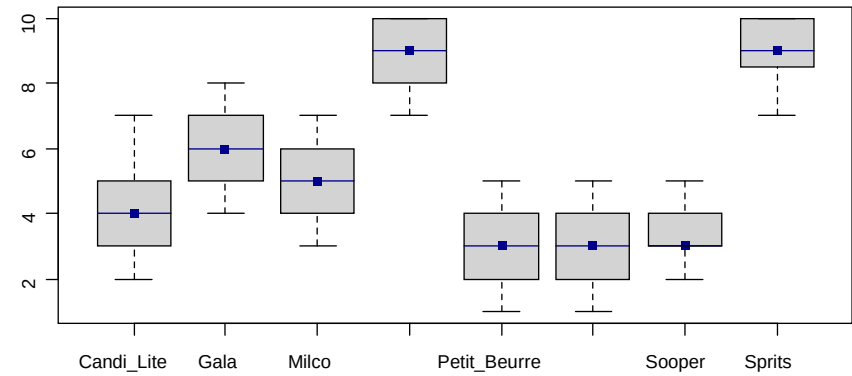
Rank	Panelist	Product	Color	Thickness	O_Egg	O_Milk	O_Butter	O_Vanilla	Softness
1	A	Sprits	0	10	0	0	10	0	5
2	A	Petit_Beurre	10	0	0	0	0	0	10
3	A	Candi_Lite	5	10		10	0	10	10
4	A	Palet_Breton	0	10	0	0	10	10	5
5	A	Milco	0	10	10	10	0	0	0
6	A	Petit_Brun	0	0	0	10	0	10	10
7	A	Gala	0	5	0	10	0	10	10
8	A	Sooper	0	0	10	10	10	10	10
1	B	Sprits	8	10	2	1	2	4	5
2	B	Petit_Beurre	9	6	0	6	3	10	4
3	B	Candi_Lite	8	4	4	2	0	10	8
4	B	Palet_Breton	5	10	0	1	4	3	1
5	B	Milco	7	4	7	3	0	0	2
6	B	Petit_Brun	5	4	0	3	0	10	5
7	B	Gala	1	4	0	2	2	10	3
8	B	Sooper	6	3	9	7	1	3	5
1	C	Sprits	5	10	5	6	5	5	4
2	C	Petit_Beurre	8	1	0	0	0	0	3
3	C	Candi_Lite	7	3	9	9	5	5	6
4	C	Palet_Breton	7	10	2	3	1	2	3
5	C	Milco	7	3	8	8	2	2	0
6	C	Petit_Brun	7	4	4	4	2	2	2
7	C	Gala	0	2	0	0	0	4	1
8	C	Sooper	2	1	7	7	8	7	3
1	D	Sprits	8	10	0	8	0	0	0
2	D	Petit_Beurre	9	4	0	0	0	4	0
3	D	Candi_Lite	6	5	8	2	0	0	0

The Pakistani data

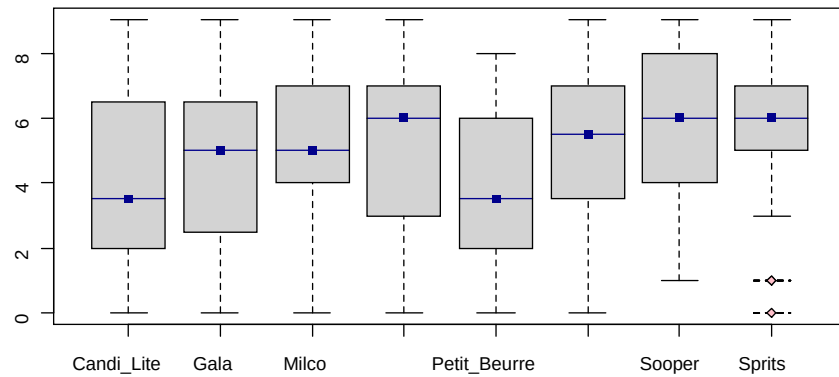
Color



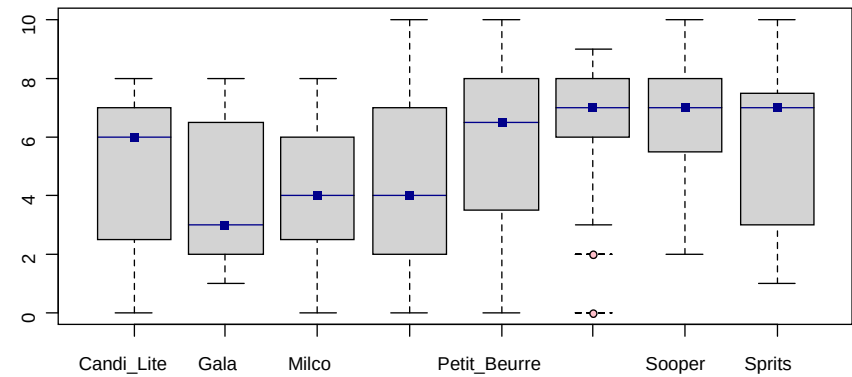
Thickness



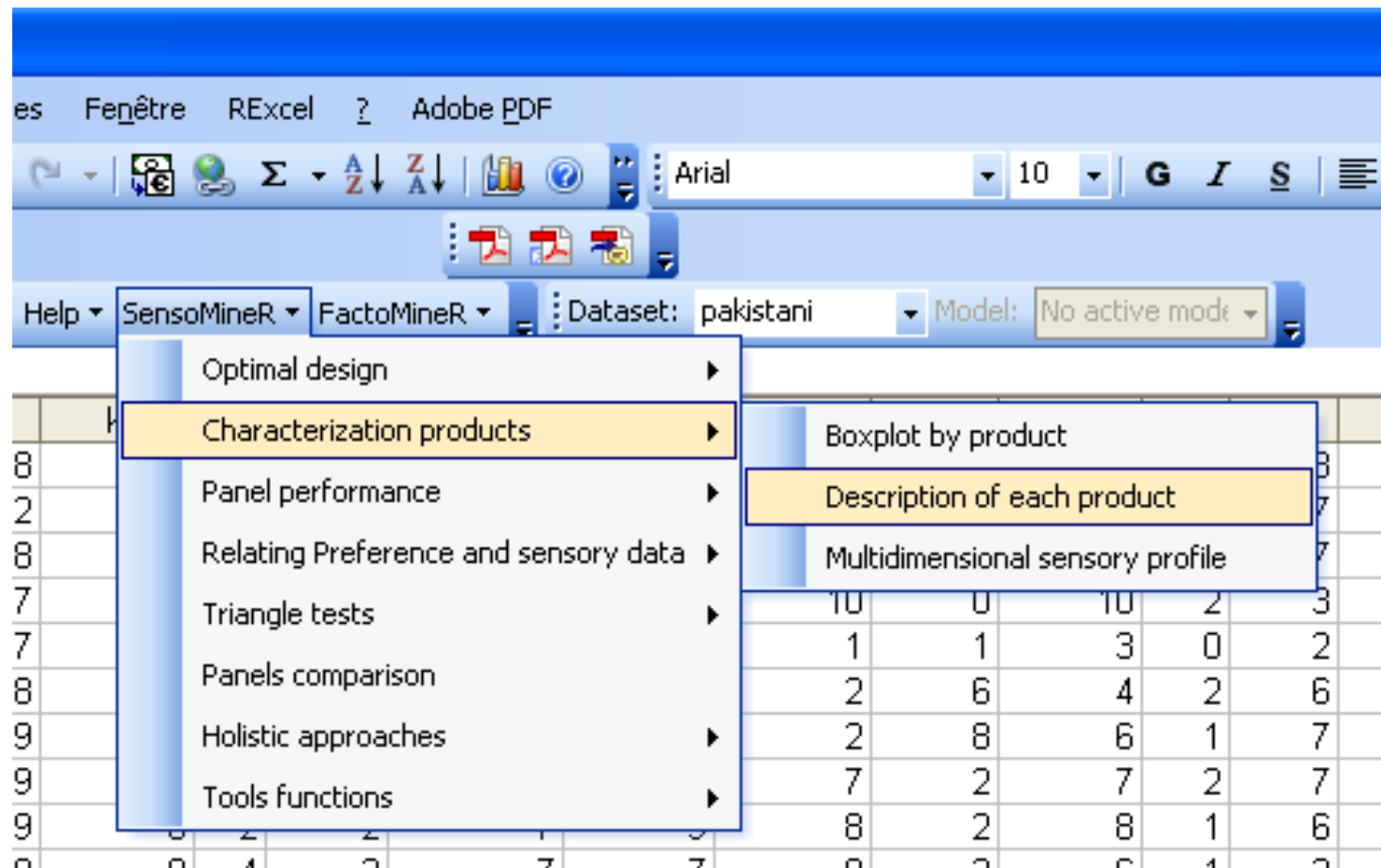
O_Egg



O_Milk



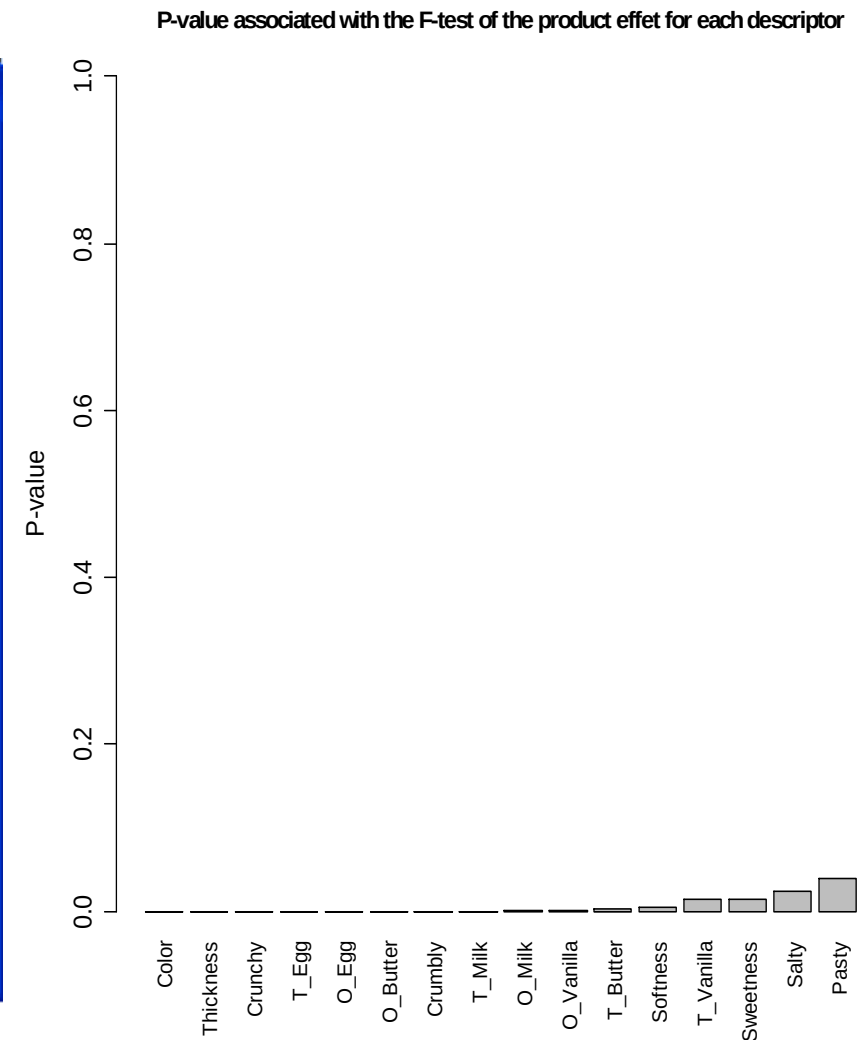
- Have a quick look at each panel *via* its respective products space
— from a one-dimensional point of view



from a one-dimensional point of view

Define your anova model

The screenshot shows the 'Decat' software window. On the left, under 'Factors (pick one or more) (double-click)', a list contains 'Panelist' and 'Product'. The 'Model Formula' field displays 'Product+Panelist'. Below this, under 'Select descriptors (by default, all descriptors are selected)', a list contains 'Color', 'Thickness', 'O_Egg', 'O_Milk', 'O_Butter', 'O_Vanilla', 'Softness', 'Crumbly', 'Crunchy', and 'Pasty'. A dialog box in the center shows 'The significance level for the AOV model: 0.05' and 'Keep the results in: results'. At the bottom are buttons for 'Submit', 'OK', 'Cancel', 'Help', and 'Didacticiel'.

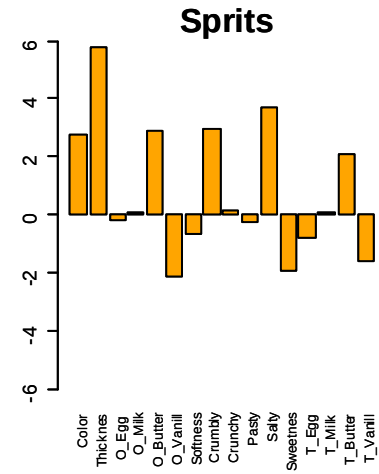
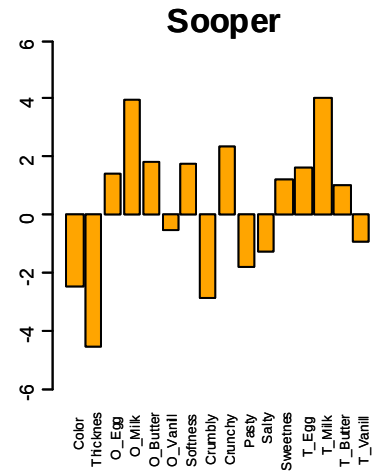
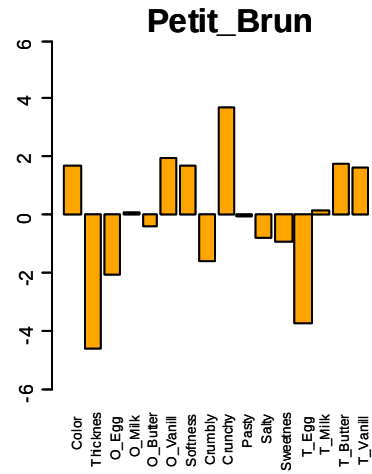
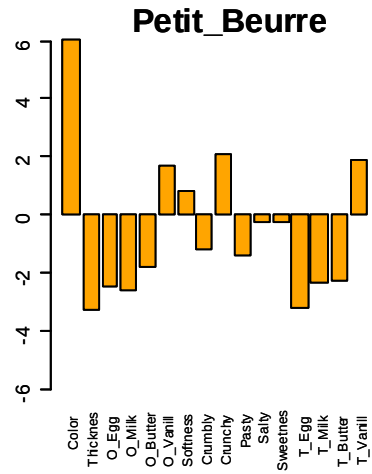
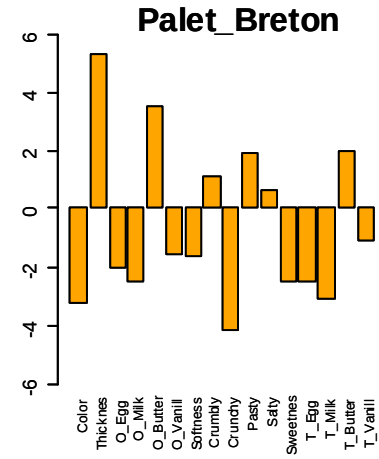
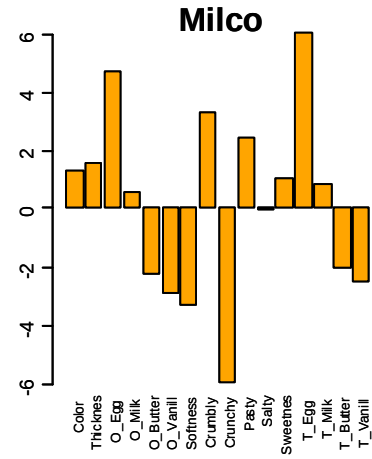
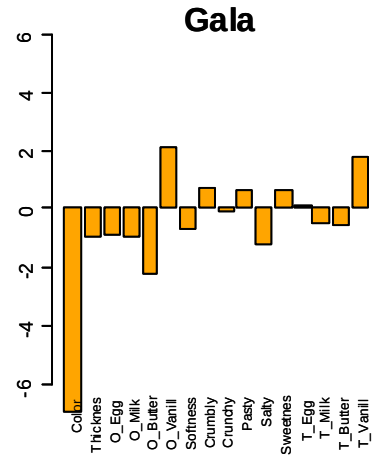
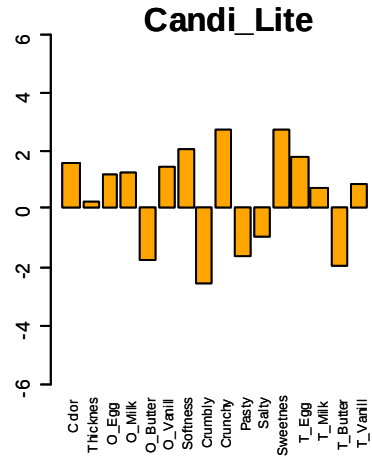


from a one-dimensional point of view

	Crumbly	Thickness	Pasty	Salty	O_Butter	O_Egg	T_Egg	T_Butter	Color	O_Milk	T_Milk	Sweetness	S_Vanilla	O_Vanilla	Crunchy	Softness
Milco	6.091	6.727	3.727	0.5455	0.1818	7.091	8.455	0.5455	6.091	4.091	5	7.091	0.6364	0.4545	2.091	2.273
Palet_Breton	4.182	9.182	3.364	0.8182	4.545	1.364	1.727	4.182	3.577	1.636	1.818	5.545	1.909	1.636	3.545	3.455
Sprits	5.727	9.455	2	2	4	2.818	3	4.273	6.909	3.727	4.364	5.818	1.455	1.182	6.455	4.091
Gala	3.909	5.364	2.545	0.09091	0.1818	2.273	3.636	1.909	1	2.909	3.909	6.909	4.364	4.636	6.273	4.091
Sooper	1	3.182	1	0.09091	3.182	4.091	4.727	3.273	4.091	6.909	7.636	7.182	2.091	2.455	7.818	5.727
Petit_Beurre	2.364	4	1.273	0.4545	0.5455	0.8584	1.182	0.3636	9	1.545	2.455	6.545	4.455	4.273	7.636	5.091
Petit_Brun	2	3.001	2.091	0.2727	1.569	1.273	0.7273	4	6.273	3.727	4.455	6.273	4.182	4.545	8.727	5.636
Candi_Lite	1.182	6	1.091	0.1818	0.5455	4.003	4.818	0.6364	6.273	4.636	4.909	7.818	3.545	4.091	8.091	5.909

If $\hat{\alpha}_i \neq 0$ (significantly) $\Rightarrow$ color the cell
 if $\hat{\alpha}_i < 0$ in red
 if $\hat{\alpha}_i > 0$ in blue

from a one-dimensional point of view



from a one-dimensional point of view

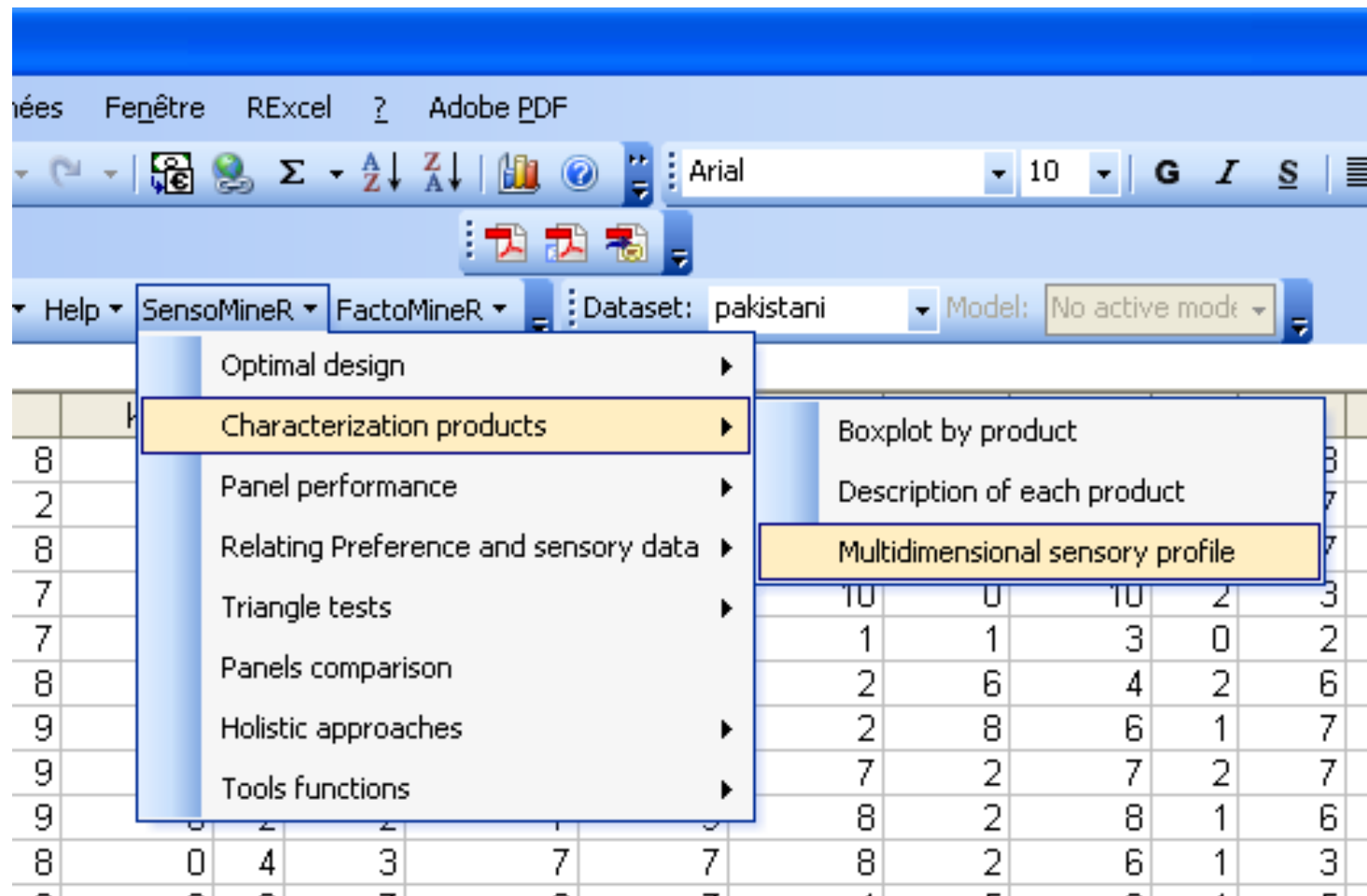
```
R Console
File Edit Misc Packages Windows Help

> results$resT
$Candi_Lite
      Coeff Adjust mean      P-value      Vtest
Crunchy  1.761364      8.090909 0.005747669  2.761840
Sweetness 1.170455      7.818182 0.007758064  2.662422
Softness  1.375000      5.909091 0.041750239  2.036001
Crumbly  -2.125000      1.181818 0.009094752 -2.608472

$Gala
      Coeff Adjust mean      P-value      Vtest
O_Vanilla 1.727273      4.6363636 3.831754e-02  2.071442
O_Butter  -1.662013      0.1818182 2.489359e-02 -2.243050
Color     -4.401623      1.0000000 2.813870e-12 -6.986720

$Milco
      Coeff Adjust mean      P-value      Vtest
T_Egg     4.920455      8.4545455 1.552282e-09  6.038838
O_Egg     4.119558      7.0909091 2.306150e-06  4.724559
Crumbly   2.784091      6.0909091 7.749664e-04  3.361584
Pasty     1.590909      3.7272727 1.489651e-02  2.434885
T_Butter  -1.852273      0.5454545 4.047358e-02 -2.048883
O_Butter  -1.662013      0.1818182 2.489359e-02 -2.243050
T_Vanilla -2.193182      0.6363636 1.109871e-02 -2.539576
```

- Have a quick look at each panel *via* its respective products space
 - from a multi-dimensional point of view



from a multi-dimensional point of view

Panelist	Product	Color	Thickness	O_Egg	O_Milk	O_Butter	O_Vanilla
A	Sprits	0	10	0	0	10	0
A	Petit_Beurre	10	0	0	0	0	0
A	Candi_Lite	5	10		10	0	10
A	Palet_Breton	0	10	0	0	10	10
A	Milco	0	10	10	10	0	0
A	Petit_Brun	0	0	0	10	0	10
A	Gala	0	5	0	10	0	10
A	Sooper	0	0	10	10	10	10
B	Sprits	8	10	2	1	2	4
B	Petit_Beurre	9	6	0	6	3	10
B	Candi_Lite	8	4	4	2	0	10
B	Palet_Breton	5	10	0	1	4	3
B	Milco	7	4	7	3	0	0
B	Petit_Brun	5	4	0	3	0	10
B	Gala	1	4	0	2	2	10
B	Sooper	6	3	9	7	1	3
C	Sprits	5	10	5	6	5	5
C	Petit_Beurre	8	1	0	0	0	0
C	Candi_Lite	7	3	9	9	5	5
C	Palet_Breton	7	10	2	3	1	2
C	Milco	7	3	8	8	2	2
C	Petit_Brun	7	4	4	4	2	2
C	Gala	0	2	0	0	0	4
C	Sooper	2	1	7	7	8	7
D	Sprits	8	10	0	8	0	0
D	Petit_Beurre	9	4	0	0	0	4
D	Candi_Lite	6	5	8	2	0	0
D	Palet_Breton	5	8	0	0	8	0
D	Milco	8	7	7	0	0	0
D	Petit_Brun	5	3	0	0	5	0
D	Gala	1	6	5	0	0	0
D	Sooper	7	4	0	10	0	0
E	Sprits	10	10	5	3	8	0
F	Petit_Beurre	10	4	5	5	0	9



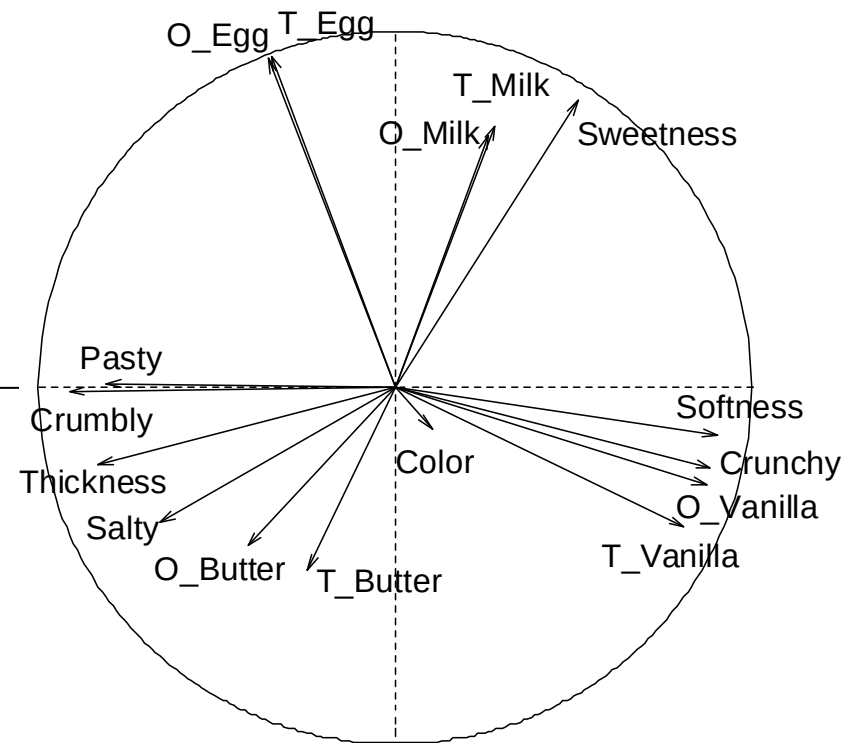
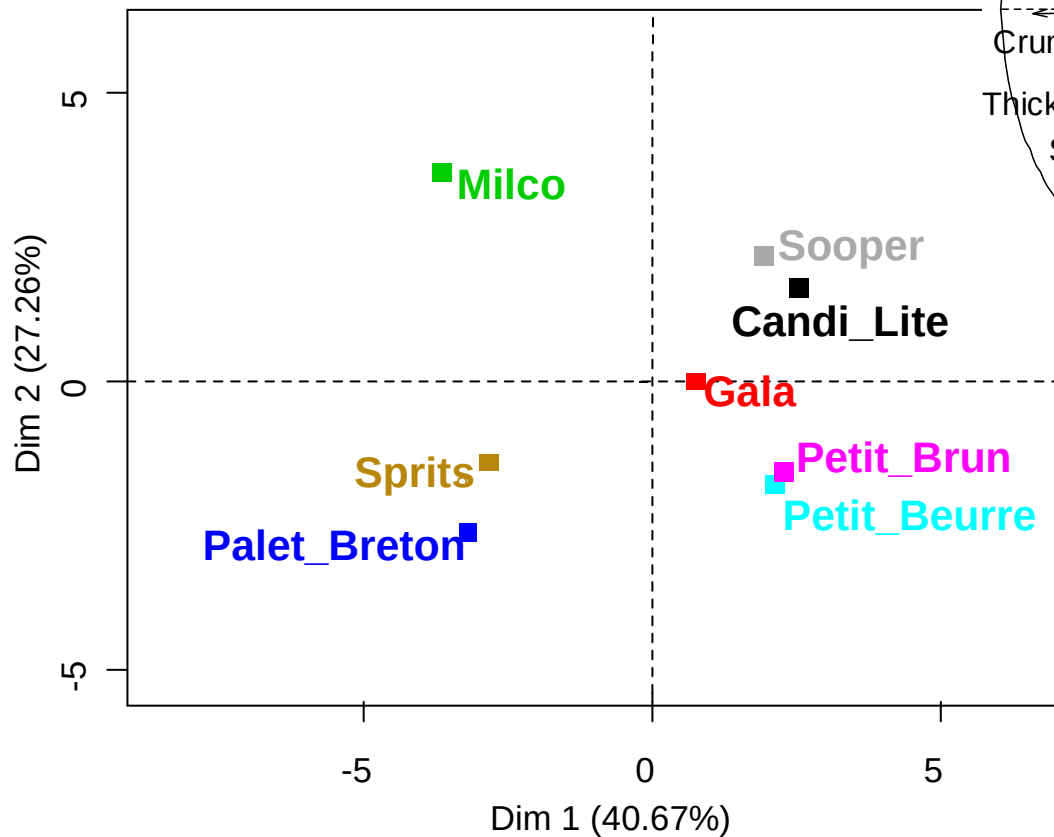
Products

Attributes

Average data table
 $p \times k$

from a multi-dimensional point of view

Average data table
 $p \times k$

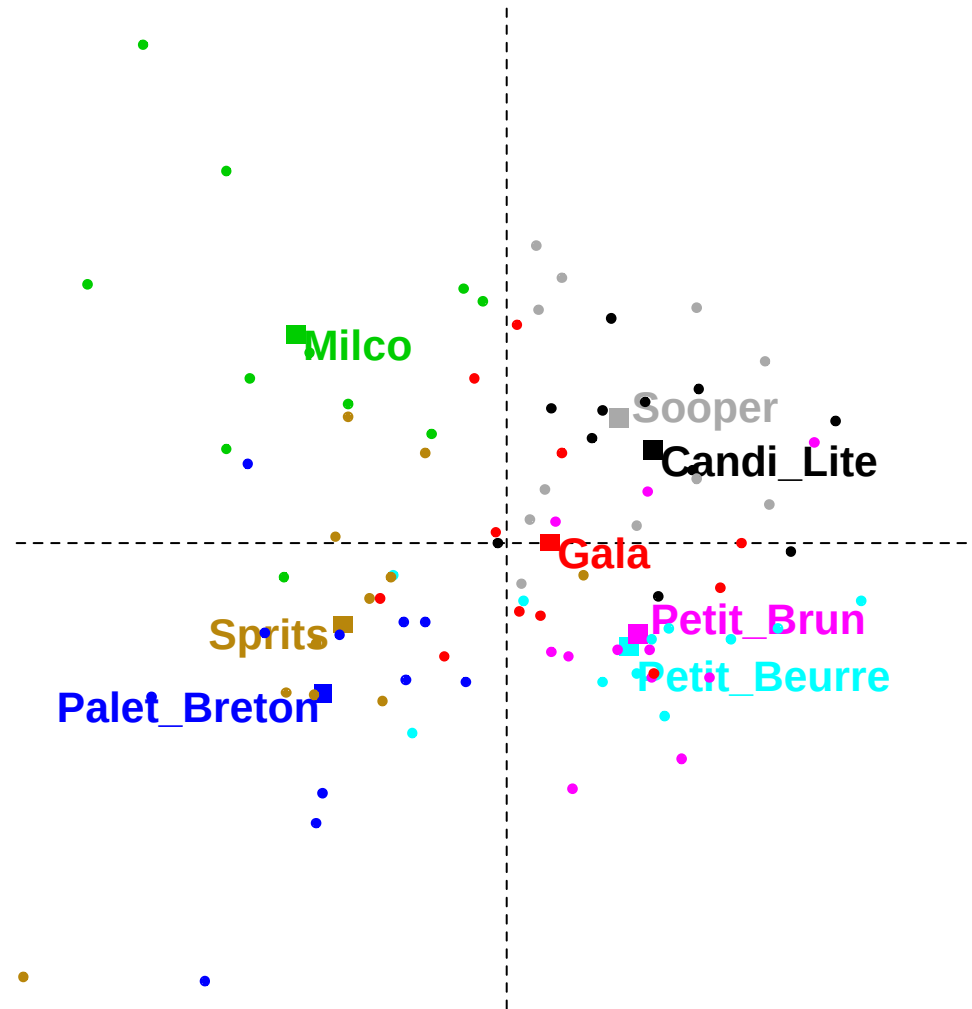


from a multi-dimensional point of view

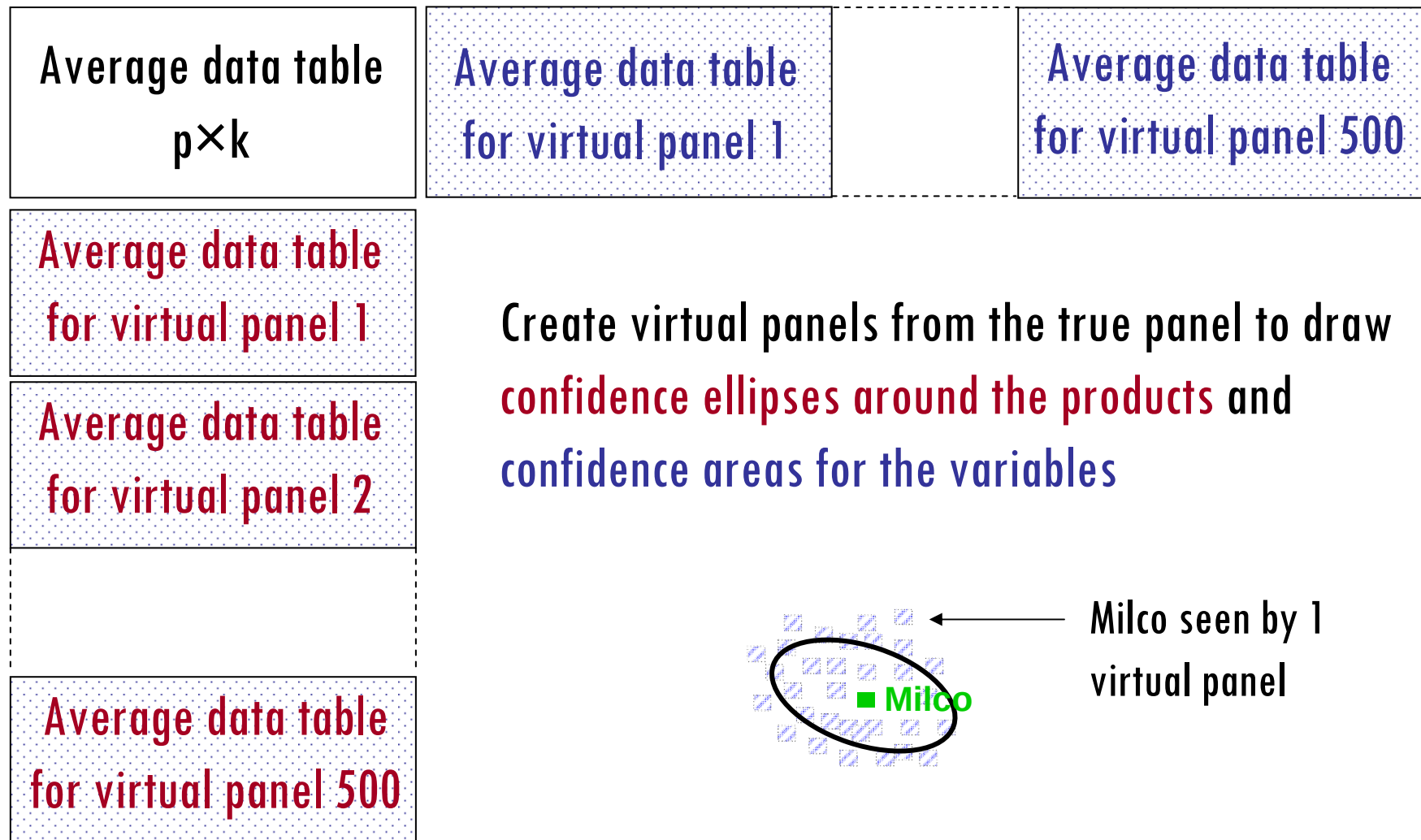
p products
k descriptors
j panelists

Average data table
 $p \times k$

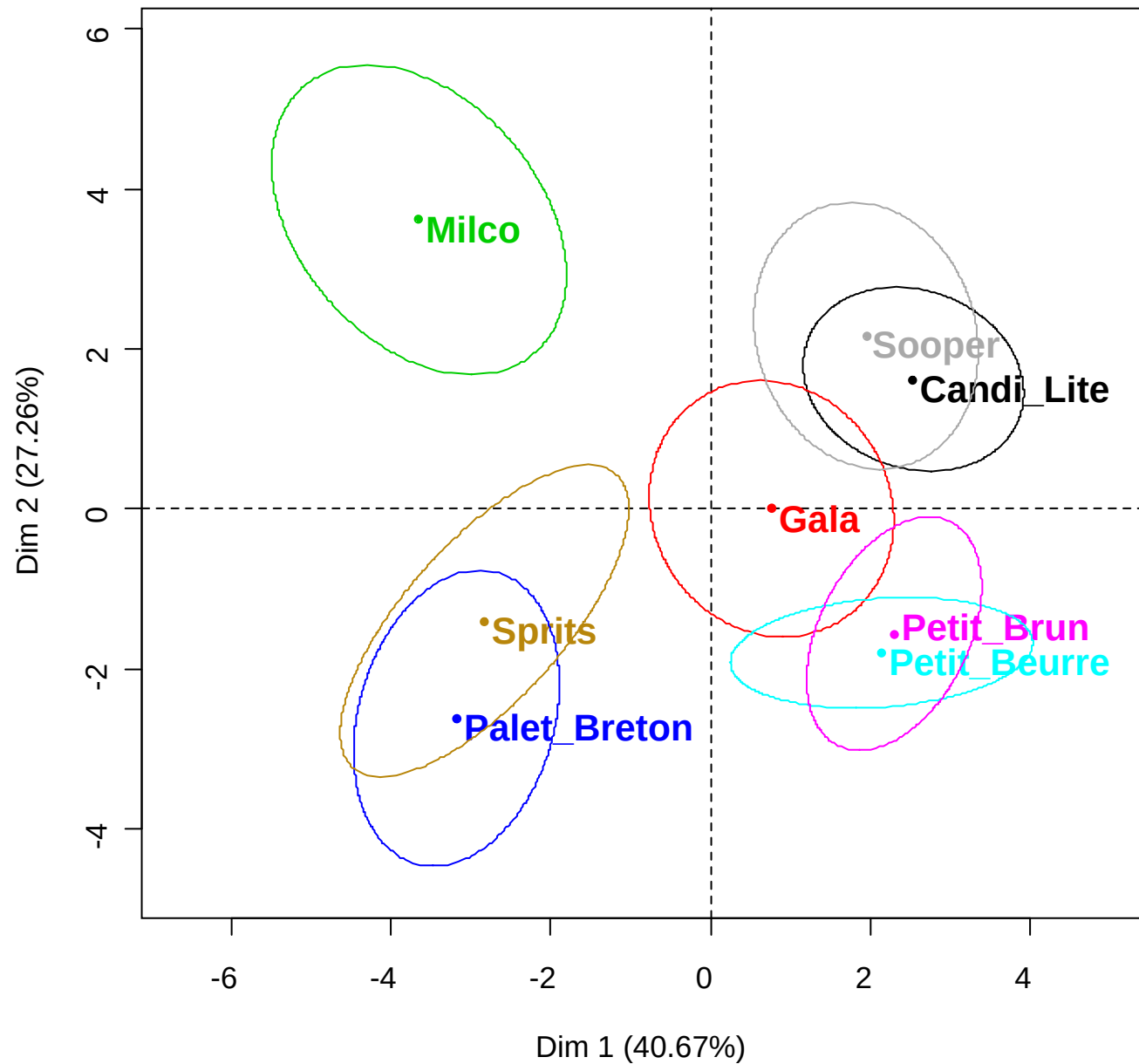
Individual scores
 $(p \times j) \times k$



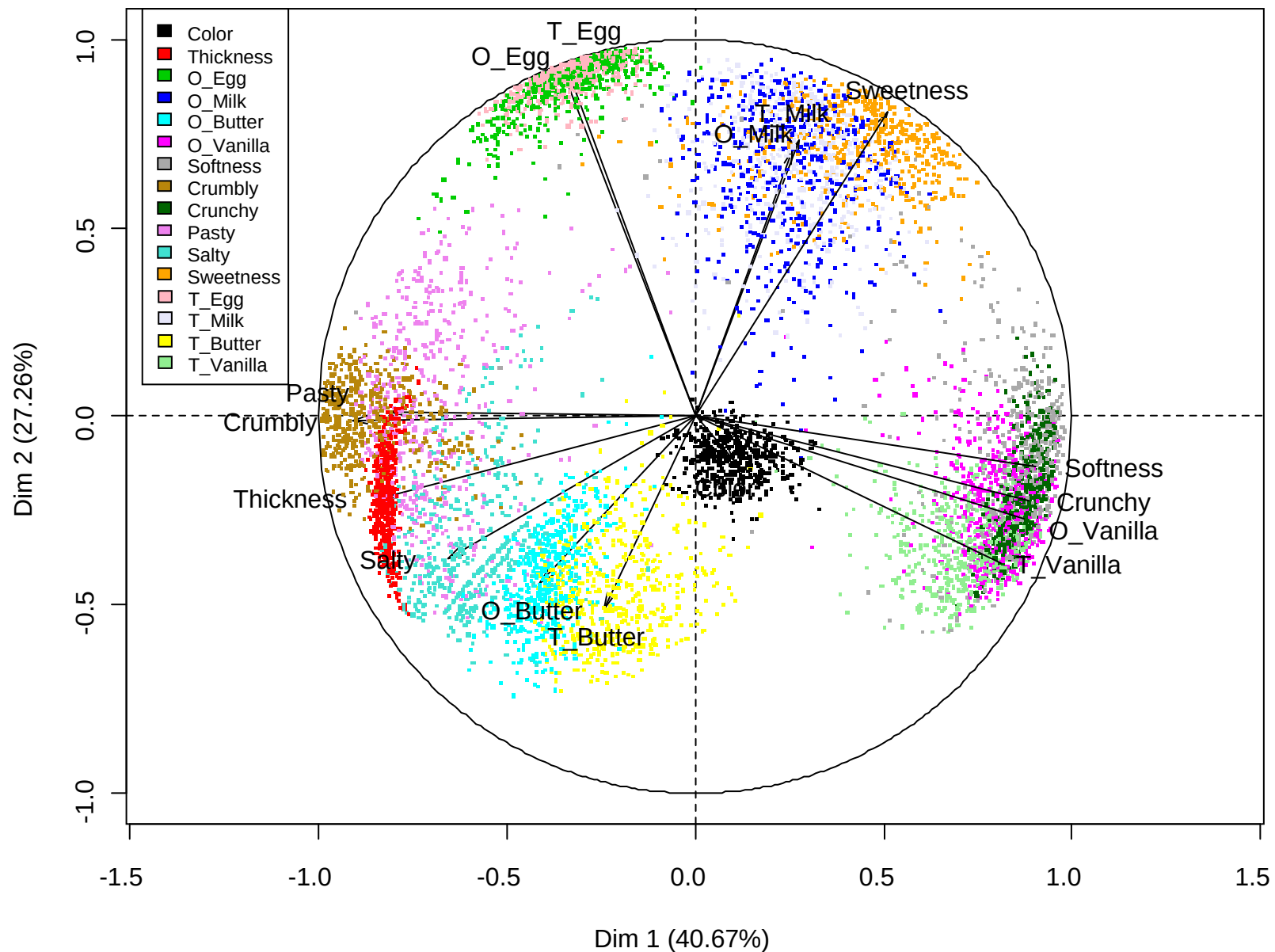
from a multi-dimensional point of view



from a multi-dimensional point of view



from a multi-dimensional point of view



from a multi-dimensional point of view

	Candi_Lite	Gala	Milco	Palet_Breton	Petit_Beurre	Petit_Brun	Sooper	Sprits
Candi_Lite	1	0.0146	4.12e-06	2.488e-07	1.173e-05	0.001278	0.595	3.778e-05
Gala	0.0146	1	0.0001198	0.0001172	0.02361	0.03115	0.02655	0.004233
Milco	4.12e-06	0.0001198	1	4.818e-05	6.943e-07	2.241e-07	1.554e-05	0.0004243
Palet_Breton	2.488e-07	0.0001172	4.818e-05	1	7.571e-05	6.291e-07	7.492e-07	0.5267
Petit_Beurre	1.173e-05	0.02361	6.943e-07	7.571e-05	1	0.928	7.291e-05	6.374e-05
Petit_Brun	0.001278	0.03115	2.241e-07	6.291e-07	0.928	1	0.001077	8.561e-07
Sooper	0.595	0.02655	1.554e-05	7.492e-07	7.291e-05	0.001077	1	0.0001138
Sprits	3.778e-05	0.004233	0.0004243	0.5267	6.374e-05	8.561e-07	0.0001138	1

How to compare the two panels?

- Have a quick look at each panel *via* its respective products space
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 - from a multi-dimensional point of view
- **and performance at a**
 - panel level
 - panelist level
- Immerse the two products spaces into one in order to compare them
 - with Multiple Factor Analysis, Indcal model, Procrustes analysis
 - by taking into account the individual variability

at a panel level (French panel)

	Product	Panelist	Session	Product:Panelist	Product:Session	Panelist:Session	median
Epaisseur	2.872e-40	2.171e-11	0.09113	0.03066	0.9944	0.08525	0.05796
Couleur	2.747e-23	0.02466	0.2171	0.02287	0.295	0.3323	0.1209
Croquant	1.754e-21	6.639e-09	0.3272	5.054e-05	0.2666	0.302	0.1333
Friable	1.319e-19	3.843e-07	0.6439	0.006	0.9792	0.2222	0.1141
O_Beurre	1.202e-13	1.492e-07	0.2636	0.01488	0.8134	0.4352	0.1392
Granuleux	2.022e-13	0.001812	0.5011	0.287	0.8561	0.8181	0.3941
G_Citron	1.389e-12	5.841e-18	0.2457	4.829e-09	0.7454	0.1091	0.05456
O_Vanille	2.739e-12	8.207e-12	0.1077	0.05278	0.05812	0.06779	0.05545
G_Beurre	2.173e-10	5.978e-11	0.5907	0.001021	0.5095	0.305	0.153
Dur	4.784e-09	0.001899	0.4962	0.000379	0.02478	0.003109	0.002504
O_Citron	1.242e-07	9.674e-14	0.8524	0.0006258	0.3996	0.05736	0.02899
O_Caramel	5.642e-07	6.721e-21	0.2933	6.347e-05	0.05962	0.03022	0.01514
G_Caramel	5.756e-07	6.446e-06	0.8919	0.03492	0.1263	0.07475	0.05483
G_Vanille	6.138e-06	2.479e-17	0.5489	0.002604	0.2198	0.06154	0.03207
Farineux	1.743e-05	3.074e-08	0.0364	0.02786	0.4746	0.4209	0.03213
Fondant	1.944e-05	0.0001661	0.1939	0.007427	0.6312	0.8952	0.1007
O_Lait	5.319e-05	3.877e-15	0.8845	0.005673	0.554	0.9091	0.2798
Sucre	0.0001791	0.0002652	0.3111	0.01045	0.873	0.1179	0.0642
Pateux	0.000207	0.000103	0.6692	0.0008153	0.6082	0.05273	0.02677
G_Lait	0.0009906	8.146e-15	0.3163	0.007507	0.4161	0.02945	0.01848
Sale	0.003395	1.525e-24	0.1755	0.0005912	0.502	0.4062	0.08943
Goeuf	0.01356	7.387e-15	0.04308	0.0001011	0.02146	0.4038	0.01751
O_Oeuf	0.07613	7.456e-18	0.5048	1.496e-05	0.2402	0.723	0.1582

at a panelist level

	Epaisseur	Crquant	G_Citron
Renaud Grellet	0.9699	0.9649	0.8899

Agreement between panelists

	Epaisseur	Crquant	G_Citron	Fritelle	Couleur	Granuleux	O_Beurre	O_Vanille	O_Citron	G_Caramel	Dur	G_Beurre	O_Caramel	G_Vanille	Forineux	Pateux	Fondant	O_Lait	G_Lait	Sucre	Sale	Gout	O_Oeuf	median
Renaud Grellet	0.9699	0.9649	0.8899	0.8533	0.9802	0.8657	0.9038	0.9295	0.8286	0.8107	0.831	0.7537	0.8376	0.7576	0.8566	0.6613	0.2116	0.7602	0.4331	0.4188	0.4681	0.3999	0.4916	0.8286
Richard	0.9856	0.9097	0.7735	0.9488	0.9171	0.9506	0.9005	0.9106	0.6746	0.9469	0.7883	0.917	0.7709	0.8684	0.6339	0.7082	0.6608	0.8176	0.6028	0.4677	0.4852	0.754	0.842	0.8176
Blavy	0.962	0.5706	0.969	0.9219	0.7803	0.9845	0.5359	0.9507	0.9028	0.8185	0.7869	0.4741	0.373	0.7668	0.3521	0.8389	0.9383	0.5753	0.5289	0.6356	0.4628	0.551	0.549	0.7688
Cécile Bertrand	0.9875	0.9727	0.9082	0.9996	0.8285	0.9298	0.9168	0.7753	0.7854	0.006221	0.8605	0.7354	0.3207	0.7526	0.1042	0.3451	0.7316	0.5285	0.7516	0.3588	0.78	-0.00857	0.2663	0.7526
Elodie	0.9595	0.9898	0.9394	0.9829	0.9558	0.7551	0.7525	0.8773	0.1048	0.8553	0.7524	0.9161	0.5982	0.8828	0.7229	0.2034	0.643	0.6727	0.6897	0.7864	0.6467	0.4008	0.2862	0.7525
Bosseant	0.9784	0.8884	0.969	0.9488	0.8276	0.8659	0.7731	0.9575	0.966	0.6466	0.5414	0.7348	0.7344	0.8652	0.3381	0.3054	0.7201	0.7753	0.5688	0.3161	0.7213	0.2173	0.5258	0.7348
Audrey Dion	0.9533	0.8243	0.9112	0.3527	0.9946	0.9593	0.7734	0.6381	0.2876	0.8156	0.9011	0.6852	0.8116	0.4061	0.703	0.6596	0.4779	0.7378	0.884	0.5597	0.854	0.2438	-0.2153	0.703
Rouyer	0.9826	0.9078	0.9764	0.8927	0.8953	0.8293	0.9137	0.8864	0.9316	0.7485	0.3046	0.7598	0.6447	0.5815	0.6741	0.6851	0.2476	0.6047	0.1662	0.4536	0.1345	0.2128	0.4729	0.6851
Virginie	0.9628	0.6598	-0.05902	0.9454	0.9185	0.7525	0.895	0.5594	0.8669	0.1066	0.5353	0.9721	0.6746	0.452	0.76	0.6301	0.6049	0.47	0.7082	0.947	-0.2167	0.8611	0.4653	0.6746
Amury	0.9688	0.9222	0.763	0.8792	0.9668	0.8881	0.6675	0.4389	0.7974	0.527	0.6888	0.8169	0.7557	0.6315	0.7114	-0.1107	0.6013	0.1572	-0.4315	0.6469	0.372	0.64	0.1402	0.6675
Florie Gilbert	0.9476	0.9695	0.9687	0.8726	0.8294	0.8118	0.8881	0.6115	0.9102	0.3128	0.6266	0.7382	0.64	-0.1002	0.4712	0.625	0.531	0.04992	0.318	0.8876	0.8079	0.2489	-0.204	0.64
Andriamihason	0.9553	0.9775	0.365	0.7886	0.9479	0.2122	0.382	0.6054	0.5973	0.9245	0.7632	0.4761	0.728	0.2513	0.8479	0.7879	0.7479	0.5092	0.2343	0.1346	0.3206	0.8248	0.256	0.6054
median	0.9694	0.9164	0.9097	0.9073	0.9062	0.8426	0.8308	0.8263	0.813	0.7796	0.7578	0.7459	0.7013	0.6921	0.6886	0.6448	0.624	0.59	0.5494	0.5137	0.4766	0.4003	0.3757	0.7189

at a panelist level

	Epaisseur	Couleur	C
Cécile Bertrand	0.004124	0.011	5

P-value of the F-test (by panelist)

	Epaisseur	Couleur	Croquant	Fritable	G_Citron	O_Beurre	G_Beurre	O_Caramel	Dur	O_Vanille	Granuleux	Farinoux	G_Vanille	O_Citron	O_Ouf	Pâteux	Sucré	O_Lait	G_Lait	Fondant	Gout	G_Caramel	Sale	median
Cécile Bertrand	0.004124	0.011	5.653e-05	0.0002073	0.001223	0.1027	0.003332	0.0228	0.1743	0.004274	0.005974	0.01139	0.04277	0.005489	0.8206	0.0005688	0.0484	0.6376	0.3152	0.0553	0.6383	0.373	0.004064	0.01139
Richard	7.197e-05	0.004246	0.03649	0.001602	9.772e-07	0.001378	0.3371	0.008131	0.09528	0.1619	0.001924	0.02508	0.01006	0.05201	0.01059	0.0356	0.2024	0.1488	0.2405	0.0132	0.3124	0.005221	0.3977	0.02503
Audrey Dion	2.026e-05	0.01422	0.03997	0.2171	0.08021	0.04032	5.564e-07	0.1014	0.05424	0.08573	0.518	0.2139	0.01783	0.2159	0.2468	0.00309	0.6466	0.0383	0.006445	0.0003638	0.1767	0.008291	0.2288	0.06021
Bossant	0.004002	0.0004054	0.00038	0.0695	1.054e-07	0.0007417	0.007048	0.06802	0.1431	0.0001872	0.07947	0.1197	0.4815	0.006329	0.09447	0.3213	0.005272	0.1292	0.09983	0.05225	0.005386	0.2002	0.1075	0.06226
Andriamihelsson	0.0002607	0.003316	0.0001717	0.001952	0.04381	0.1947	0.06316	0.02669	0.02737	0.508	0.7994	0.08042	0.2205	0.06961	0.2432	0.04343	0.07353	0.1586	0.0293	0.1736	0.04807	0.2203	0.7289	0.06961
Renaud Grellet	8.124e-05	8.407e-06	0.000945	0.001534	0.0303	0.04937	0.03077	0.06857	0.002479	0.2079	0.12	0.09103	0.07778	0.5	0.1014	0.03289	0.2134	0.5819	0.1098	0.3841	0.1129	0.3771	5.85e-05	0.07778
Florie Gilbert	0.007618	0.2339	0.000494	0.01936	2.685e-05	0.002633	0.1431	0.3092	0.5	0.1036	0.03206	0.07837	0.03293	0.003384	0.408	0.03683	0.02545	0.08394	0.3293	0.4291	0.2266	0.9321	0.2135	0.08394
Virginie	0.0001756	0.0068	0.1109	0.07901	0.8264	0.000394	0.0001979	0.03293	0.1281	0.09969	0.4631	0.1335	0.1149	0.5	0.0402	0.2203	0.006605	0.006459	0.09245	0.3942	0.02971	0.31	0.009544	0.09969
Royer	6.581e-05	0.007386	0.01627	0.003942	0.007912	0.3016	0.06481	0.1572	0.03673	0.0366	0.09501	0.04888	0.1255	0.1612	0.000157	0.2878	0.4105	0.1724	0.4472	0.2266	0.43	0.01038	0.6171	0.09501
Elodie	2.234e-05	0.006127	0.000175	0.000866	0.0004172	0.03646	0.05737	0.1534	0.006016	0.187	0.4436	0.2065	0.1463	0.7779	0.6216	0.7452	0.09173	0.001988	0.5269	0.1927	0.2871	0.03305	0.1005	0.1005
Blay	0.002305	0.00088	0.1014	0.01507	0.5	0.04966	0.1804	0.07484	0.2103	0.09563	0.0001883	0.9012	0.1019	0.5	0.01066	0.2399	0.4804	0.003035	0.08351	0.4523	0.008961	0.6819	0.5	0.1014
Amoury	4.652e-06	0.001318	1.868e-05	0.03223	0.2765	0.01261	0.09774	0.03809	0.003936	0.2834	0.1054	0.1631	0.3386	0.08504	0.1313	0.8791	0.1764	0.6431	0.9064	0.01075	0.9436	0.01284	0.2605	0.1054
median	0.0001284	0.006463	0.008606	0.009154	0.01911	0.03839	0.06006	0.06629	0.07526	0.09666	0.1002	0.1053	0.1084	0.1154	0.1164	0.1319	0.134	0.139	0.1752	0.1831	0.2017	0.2153	0.2211	0.08086

How to compare the two panels?

- Have a quick look at each panel *via* its respective products space
 - from a one-dimensional point of view
 - from a multi-dimensional point of view
- and performance at a
 - panel level
 - panelist level
- Immerse the two products spaces into one in order to compare them
 - with Multiple Factor Analysis, Indcal model, Procrustes analysis
 - by taking into account the individual variability

How to compare the two panels?

The screenshot shows the SensoryMineR software interface. The menu bar includes 'Help', 'SensoryMineR', and 'FactoMineR'. The 'SensoryMineR' menu is open, displaying a list of options: 'Optimal design', 'Characterization products', 'Panel performance', 'Relating Preference and sensory data', 'Triangle tests', 'Panels comparison' (highlighted in yellow), 'Holistic approaches', and 'Tools functions'. The background shows a data table with columns labeled P, Q, R, and S, and rows of numerical data.

	P	Q	R	S
9	1	1	3	
2	6	4		
2	8	6		
7	2	8	6	
9	7	2	7	
8	8	2	8	
8	8	2	6	
9	4	5	6	
6	3	5	2	
9	9	4	8	
6	7	6	6	

Immersion of the two products spaces



Multiple Factor Analysis, Indscal model, Generalized Procrustean Analysis

- Existence of a common structure
- Comparison of the partial representations
- Study of the homologous descriptors

Average data table
 $p \times k_1$

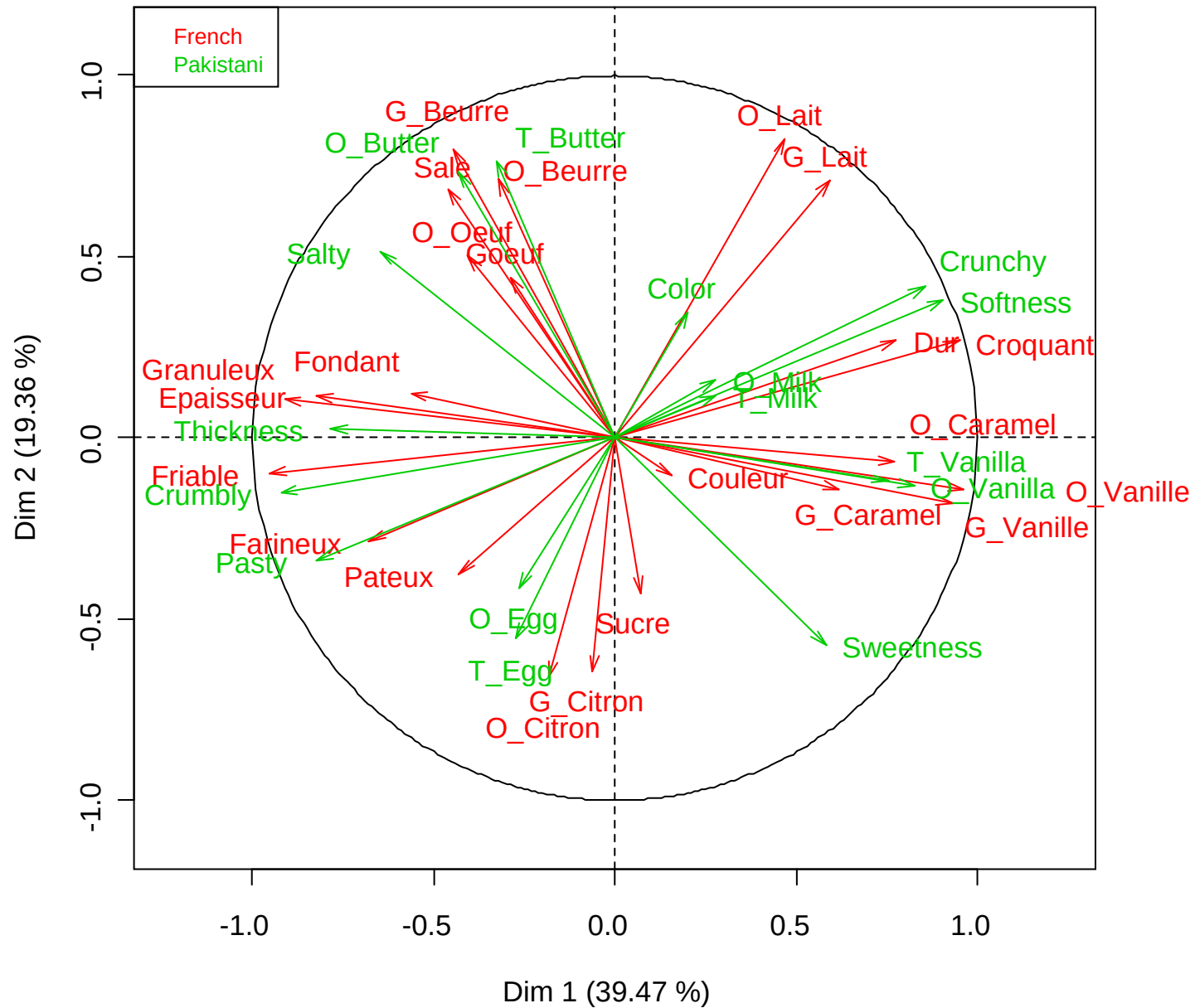
Average data table
 $p \times k_2$

Individual scores
 $(p \times j_1) \times k_1$

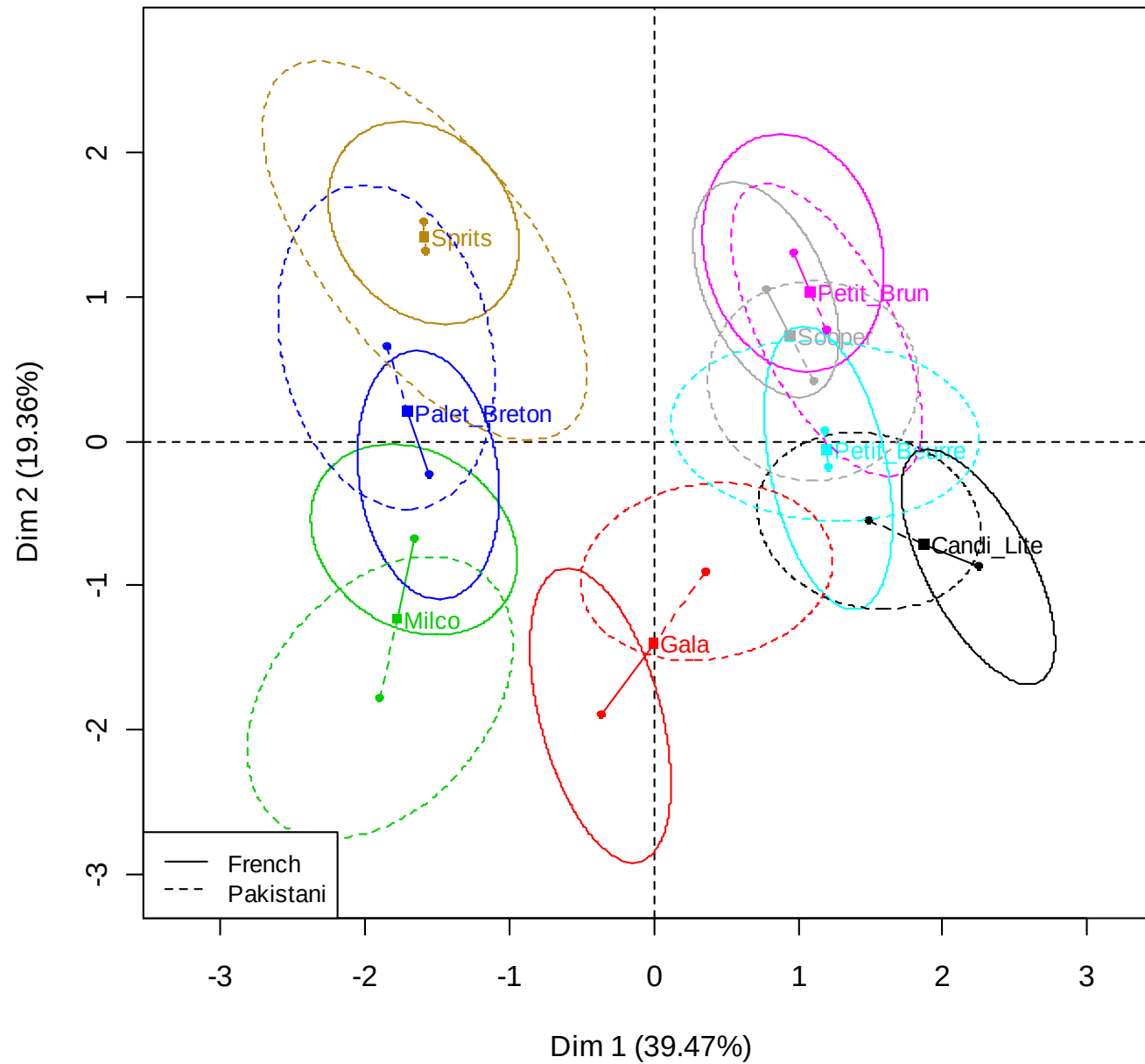
Individual scores
 $(p \times j_2) \times k_2$

MFA or HMFA
+
Resampling techniques

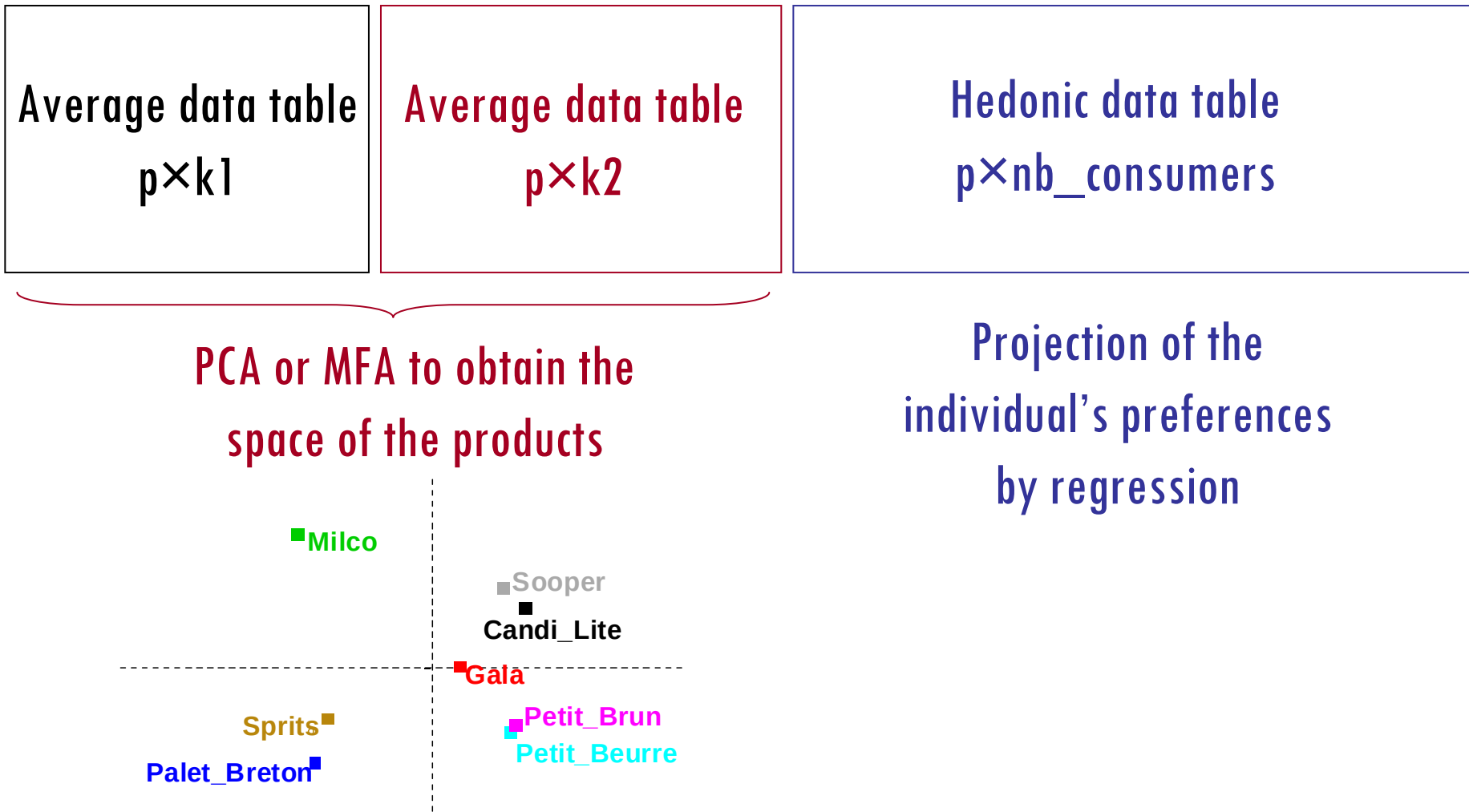
Immersion of the two products spaces



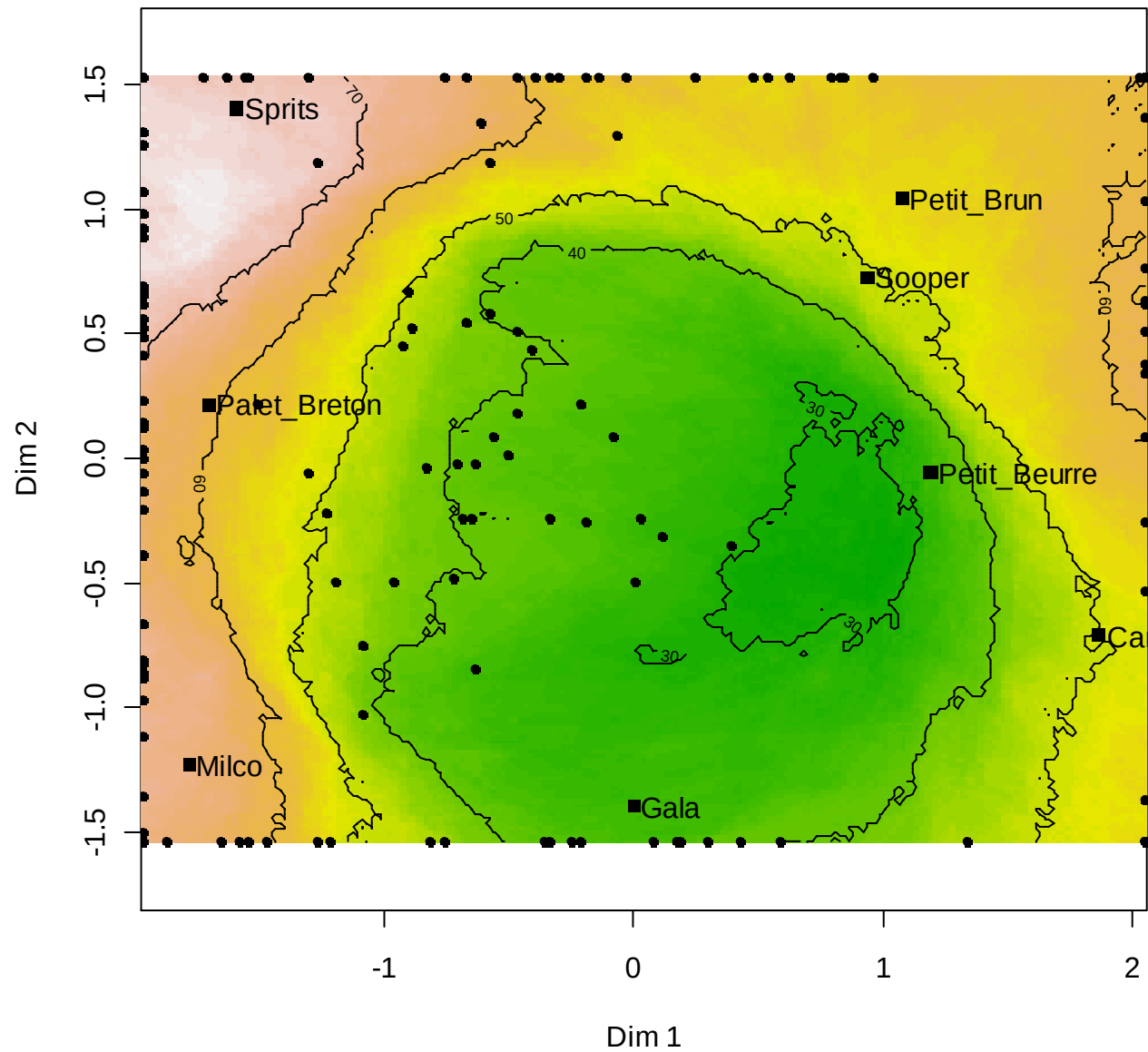
Immersion of the two products spaces



Preference mapping



Preference mapping





<http://sensominer.free.fr>

Journal of sensory studies **SensoMineR** a package for sensory data analysis