SensoMineR: a package for sensory data analysis with R

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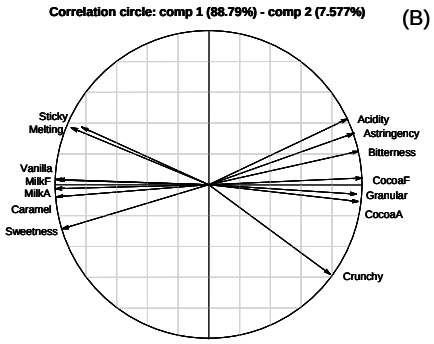
Sensory analysis is both a very lively and competitive field as can testify congresses such as Pangborn or Sensometrics. Consequently, users or practitioners can be disconcerted with the increasing number of methods at their disposal. We propose a new package, the SensoMineR package, conceived and programmed in R language; SensoMineR is completely free and can be downloaded at the following address: http://sensominer.free.fr. SensoMineR collects very classic methods used when analyzing sensory data as well as methods developed in our laboratory. SensoMineR provides numerous graphical outputs easy to interpret, as well as syntheses of results issuing from various analysis of variance models or from various factor analysis methods accompanied with confidence ellipses. SensoMineR tackles the following problems: characterizing products, relating sensory data and instrumental data, mapping consumers' preferences, assessing panel's performances, comparing panels' performances. During this presentation we will focus on the characterization of products and we will present two functions, the "decat" function or how to get unidimensional profiles of products synthesized in a single table, the "panellipse" function or how to get multidimensional profiles of products with confidence ellipses obtained by resampling techniques (bootstrap). The example that will be presented is provided with the package.

(A)

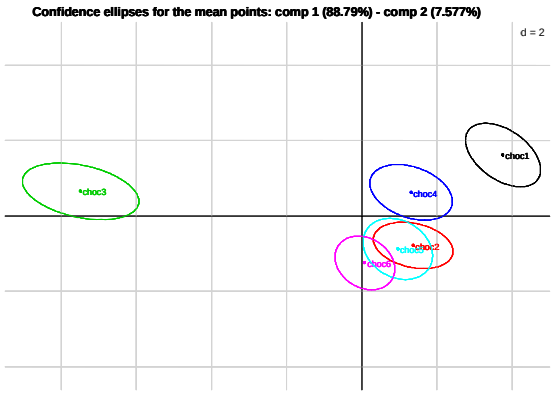
Average by chocolate

	CocoaF	Bitterness	CocoaA	Granular	Astringency	Acidity	Crunchy	Sticky	Melting	Sweetness	Vanilla	Caramel	MilkA	MilkF
choc1	8.069	7.069	7.086	3.448	4.759	4.655	5.966	3.759	4.741	3.138	1.103	1.672	3.586	1.569
choc2	6.914	4.948	6.552	3.155	3.155	3.138	7.707	3.828	4.328	4.621	1.81	2.776	4	2.379
choc4	6.69	5.19	6.259	3.552	3.69	3.931	6.103	4.103	4.379	4.293	2.121	2.672	4.103	2.586
choc5	6.793	4.879	6.793	3.069	3.103	3.086	6.638	3.224	4.741	5.224	1.793	3.414	4.172	3.121
choc6	6.224	4.19	6.362	3.172	2.759	2.672	7.328	3.931	4.207	5.621	1.914	3.259	4.569	3.362
choc3	3.379	1.397	4.672	1.603	1.207	1.569	2.983	5.034	7.31	7.603	3.672	6.328	6.052	7.707

(B)



(C)



(D)

P-values for the Hotelling's T2 tests

	choc1	choc2	choc3	choc4	choc5	choc6
choc1	1	4.199e-12	2.213e-24	5.377e-07	8.1e-13	2.319e-17
choc2	4.199e-12	1	7.884e-17	0.0008818	0.6708	0.00759
choc3	2.213e-24	7.884e-17	1	1.912e-17	1.599e-16	1.934e-15
choc4	5.377e-07	0.0008818	1.912e-17	1	0.0007292	3.787e-07
choc5	8.1e-13	0.6708	1.599e-16	0.0007292	1	0.06995
choc6	2.319e-17	0.00759	1.934e-15	3.787e-07	0.06995	1

Figure (A) shows the structure on the average data table: cells are colored if the mean of the product is significantly different from the overall mean (blue, if it is higher and pink if it is lower). Figure (C) represents the space products with confidence ellipses around the products. Figure (D) gives the p-values associated with the T square Hotelling test in order to test differences between sensory profiles of two products.