

Session MCA

Rules for interpretation

In this session, we see how to apply the FactoMineR MCA function by obtaining the results presented in the theoretical session (on an example extracted from PetitBIS.Rdata). The rules for interpreting the results are detailed hereafter.

Note that the interpretation process is similar to both interpretation processes for PCA and CA.

MCA step has to be completed by a clustering step, as in the case of PCA.

We have I individuals, p variables with a total of K categories.

1. Inertia of the factors

Eigenvalues and diagram/chart of eigenvalues:

The total inertia is equal to $((K/J) - 1)$. This value has no relationship with the data structure. We recall that the eigenvalues are always inferior or equal to 1.

In general, the eigenvalues slowly decrease.

The eigenvalue associated to a factor (or factorial axis) is equal to the mean of the correlation ratios between the factor and each active variable.

The eigenvalues are usually weak in ACM.

Eigenvalues and proportions of inertia have little influence in MCA results interpretation.

How many factors to retain?

2. Interpretation of the factors

Contributions of individuals and categories

In order to find possible predominant elements, the analysis of the results of a ACM begins by the study of the contributions of the individuals.

It is possible that the first or the firsts factors are due to few categories. It occurs when it exists categories presented by the same few individuals. The individuals associated to these categories also present a high contribution. As this kind of factor, which underlines specific situations are not interesting, they have to be eliminated by either “ventilating” the rare categories or giving a supplementary role to the individuals who are concerned or grouping categories.

Contributions of variables

The contribution of a variable is the sum of the contributions of its categories. The variables can be ranked from their contribution.

Coordinates of categories and individuals

Generally, the analysis of the categories coordinates comes first.

As in the other methods, the process consists in studying axis by axis and plane by plane, successively from the point of view of every set of elements (rows and columns).

In the case of ordered categories, it is very important to look for the axes that conserve their order. On the graphics, the categories have to be linked by segments.

Interpret all the axes that you have retained.

Illustrate your comments with the graphical results.

3. Synthesis of the MCA through a clustering step

Provide a brief synthesis of the results through clustering the individuals.