Qualitative variables

Qualitative variables refer to information grasped through modalities.

For *category* variables, these modalities do not have any quantitative meaning and there is no ordering relationship between them. This is the case for example for the gender or the social category at individual level, the political colour of the municipal council at the municipal level, or the status of prefecture at the level of cities. When it has only two modalities, the variable is said *dichotomous*.

The most classical ways of processing this type of information are the frequency tables, which consist in counting the number of individuals per modality, and the cross tabulations, which allow to study the relationship between two qualitative variables (chi-square test). In a multivariate perspective, the interrelationships inside a set of qualitative variables may be described by means of data analysis methods (correspondence analysis and ascending hierarchical classification with chi-square distance), or differences of modalities among individuals may be explained on basis of a statistical model.

A category qualitative variable may result from the transformation of a quantitative variable through splitting into classes. There exists then an underlying quantitative variable but this information is not integrated in the processing. A qualitative variable may also result from a previous multivariate processing. An ascending hierarchical classification, either made on initial qualitative or quantitative variables, gives as output a typology whose different classes represent modalities of a qualitative variable (click on illustration to see an example).

For *ordinal* variables, there is an order relationship between modalities, but the difference between two successive modalities is not quantifiable, it always corresponds to one unit. A quantitative variable may be transformed into an ordinal variable by attributing ranks to different values of the variable distribution, in descending order. Comparing the initial variable and the transformed variable gives information about the hierarchical organisation of the distribution under study. The most classical example in geography concerns the representation rank (in abscissa) - size (in ordinate) of the number of inhabitants per city of a given region or country.

Bibliographie