

# Workshop on EXPLORATORY AND CONFIRMATORY FACTOR ANALYSIS

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## OBJECTIVE

This Workshop aims at dealing with the methodological principles of the techniques related to factor analysis that are most often used in real application when extracting knowledge from multidimensional data structures. Factor analysis and related methods allow the study of complex systems characterized by numerous quantitative and/or categorical variables with the objective of exploring, describing, visualizing and synthesizing the relationships between the observed variables when limited (exploratory analysis) or uncertain (confirmatory analysis) information is available on the domain of interest so that structural and typological factors need to be identified.

When using a statistical technique, it is very important to have an intuitive understanding of its objectives, of its assumptions, of the key steps in the procedure, of how to interpret the results, of possible pitfalls and of the mathematical model constituting the working hypothesis and the condition of applicability.

Therefore, the theoretical and methodological presentation is accompanied by practical examples analyzed by means of the following statistical software:

- IBM SPSS Statistics 19.0 (*Statistical Package for Social Sciences*)
- XLSTAT 2011 (a comprehensive data analysis solution in the Excel environment)
- IBM AMOS 19.0 (Analysis of Moment Structures)

## CONTENT

Principal Component Analysis

Exploratory Factor Analysis

Confirmatory Factor Analysis

Discriminant Analysis:

Factorial Discriminant Analysis

Bayesian Discriminant Analysis

## MAIN REFERENCES

- Addinsoft (2009): XLSTAT 2009, Addinsoft, France (on line tutorials at [www.xlstat.com](http://www.xlstat.com)).
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- Rencher, A.C. (1995): *Methods of multivariate analysis*, John Wiley & Sons, New York.