Special Courses in Statistics
Department of Statistics and Quantitative Methods
PhD program in Statistics and Mathematical Finance

8-9 May 2017
9:30 - 13:00
De Lillo Room
Building U7 - Second Floor

Analysis of Clustered Categorical Data

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Purpose

The main objective of this course is to introduce attendees to the most important methods for analyzing clustered categorical data. Such data are common in practice: in longitudinal studies (for which each cluster is a set of observations on a person over time), with survey data that have multivariate responses such as several variations of the same question with the same outcome categories, and with sampling methods that use clustering, such as samples that produce multilevel data. The course's main emphasis is on introducing appropriate models and their interpretations, emphasizing generalizations of logistic regression. The course will show examples of the use of R and SAS for performing the analyses. Through examples, the attendees will learn how to use the models and weigh the advantages and disadvantages of the various model types.

Day 1

Models for Matched Pairs (Comparing dependent proportions, McNemar test and generalizations, conditional vs marginal models for binary matched pairs, comparing margins of square contingency tables)

Marginal Models (Marginal logit models for repeated binary response, maximum likelihood (ML) and its limitations, generalized estimating equations (GEE) approach, cumulative logit modeling of repeated ordinal responses)

Day 2

GLMs with Random Effects (conditional logistic regression of clustered binary data, generalized linear mixed models (GLMMs), ML fitting and inference, logistic GLMMs for clustered binary data)

Additional topics about Mixture Models (GLMMs for clustered ordinal data, random intercepts and random slopes, beta-binomial model for clustered binary data, multilevel models)

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