Contribution ID: **135** Type: **Oral Presentation**

Exploratory Bayesian Nonparametric Methods in Psychological Sciences

Friday 25 July 2025 08:45 (15 minutes)

Oral presentation

Exploratory Bayesian Nonparametric Methods in Psychological Sciences

Author

Giuseppe Mignemi

Affiliation

Bocconi University

Abstract

Discrete Bayesian nonparametric (BNP) priors have received increasing attention in recent decades. They characterize a broad class of flexible models in which inference is drawn under minimal distributional assumption and latent clusters are naturally accommodated by the structure of these priors. This makes the BNP models an appealing statistical solution for modeling individuals'heterogeneity in psychological sciences in which overdispersion of participants'variability in real data poses serious concerns. Moreover, the verification of distributional assumptions under the parametric models might not be straightforward and the estimates might be severely affected by model misspecification. The BNP models overcome these issues as they estimate the parameters'density distribution from the data under less strict assumptions. Despite the flexibility of these methods, their applications in psychological sciences have been poorly investigated. Their theoretical complexity and the difficult implementation of the algorithms for the posterior computation have made these priors less considered than other Bayesian solutions within the most common models for social sciences, such as multilevel models and Item Response Theory (IRT) models. Significant theoretical and methodological progress has recently been made, and the application of these methods is now more straightforward. We propose some real case examples in which discrete BNP priors are a convenient solution to explore latent individual similarities and prevent inferences from overdispersion and model misspecification issues. Limitations and future directions are discussed, and user-friendly tutorial codes are provided to enhance a more direct and practical use of these methods in applied social and psychological sciences.

Keywords

Bayesian nonparametric priors; hierarchical models.

Primary author: MIGNEMI, Giuseppe (Bocconi University)

Co-authors: Prof. SPOTO, Andrea (University of Padova); Dr PANZERI, Anna (University of Padova); Dr BRUNO, Giovanni (University of Padova)

Presenter: MIGNEMI, Giuseppe (Bocconi University)

Session Classification: Session 5 : "Bayesian methods in Psychology and Statistics"

Track Classification: Statistical analyses: Statistical analyses