



Contribution ID : 38

Type : Contribution in Organized Session

## Specifying attribute effects in statistical models for groups – A game theoretical approach

*martedì 2 maggio 2023 16:15 (15)*

The composition of self-assembled social groups is believed to reflect the biological imperatives, personal preferences, and strategies of the group members. A handful of statistical models have recently been proposed to explain the composition of social groups and uncover the mechanisms driving their formation. However, it remains unclear whether these models can be used to test theories of group formation and, if so, how they should be specified. One major issue is that many theories related to preferences (or propensities) for particular partners are defined at the individual rather than the group level. That is, preferences are stated for individual traits of partners, not for distributions of traits in a group.

In this work, we apply methods from game theory to inform the choice of statistics in the Exponential Random Partition Model (ERPM), a recently proposed model for partitions of individuals. Building on previous work bridging ERGM and cooperative game theory, we define a coalition formation game in which the coalition values (i.e., the utilities of the groups that individuals join) are functions of the partition statistics in the ERPM. We describe how the model statistics are linked to individual-level mechanisms driving the formation of groups and show how theoretical expectations of individual behavior can be formalized in the ERPM. We discuss how these findings help interpret the model's parameters and illustrate the proposed method by exploring different specifications of homophily (i.e., the tendency of individuals to form homogeneous groups).

### Keywords

statistical models; social groups; partitions; model specification; game theory

### Topics

- Statistical methods and models for network analysis

**Primary author(s)** : HOFFMAN, Marion (Institute for Advanced Study in Toulouse, University of Zürich); Dr. BAYER, Péter (Institute for Advanced Study in Toulouse); Dr. KEIJZER, Marijn (Institute for Advanced Study in Toulouse); Dr. AMATI, Viviana (University Milano Bicocca)

**Presenter(s)** : HOFFMAN, Marion (Institute for Advanced Study in Toulouse, University of Zürich)

**Session Classification** : Statistical models for networks

**Track Classification** : Statistical models for networks