Simplifying ego-centered network analysis in R with egonetR

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Abstract

Ego-centered network analysis is tricky because most often you have n+many networks which you want to analyse simultaneously and performing multivariate analyses, where network data and attributional data of ego are combined. An ego-centered network is commonly known as the network of a focal actor (ego), including the relationships of ego to alters and the relationships between these alters. Analysis can be conducted on two different levels: On the alter level the analysis focusses on the qualities of the ego-alter-relationships e.g. provision of support or contact frequency. The network level analysis focuses the structure and composition of the ego-centered network. The most reasonable way to analyse multiple ego-centered networks is to use R because it allows both the calculation of various network measures for n+many networks simultaneously (e.g. what is the density of all networks) and multivariate analysis of network and attributional data (e.g. how does density vary between men and women). The workshop focuses the analysis of ego-centered networks using data from current research projects. We introduce the R-package "egonetR" which simplifies the import and manipulation of ego, alter and network-level data in different formats and allows to calculate a range of network measures. Using "egonetR" users will be enabled to conduct ego-centered network analysis with very basic R programming knowledge.
After a short introduction into data management and data import to R we calculate network measures on alter level (e.g. multiplexity, homophily) and network level (size, density, EI-Index, diversity, components, proportions of ties with specific attributes). Afterwards we go on with multivariate analyses, both on alter and the network level. For both levels we exemplify explorative and hypothesis testing procedures using additional packages in R (e.g. cluster, lme4, FactoMineR): On the network level we focus cluster analysis and standard regression. With cluster analysis we present a way to typologize ego-networks along network-level information. In standard regression analysis, network measures can be used as dependent or independent variables, just as any other characteristic of ego e.g. to test whether network size differs by gender or age. On the level of the analysis of ego-alter dyads we demonstrate multivariate correspondance analysis and give a short introduction to multilevel analysis. Multivariate correspondence analysis is used to explore the dependencies between categorial alter-level variables using visualisations. Multilevel analysis is used to treat with the nested nature of alter level data when dependent variables lies on the alter level.

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Major parts of the workshop will be "hands-on" utilizing R (R-Studio). A short intro into the basics of R will be given in the beginning while prior knowledge in R is preferable.

For more in depth introductions to R it is recommended to visit the workshop Introduction to ego-network analysis with R" by Raffaele Vacca, where data collection, data management and data transformation between different levels of data are discussed in detail and Michal Bojanowski's "Introduction to R and Social Network Analysis with igraph" for a general introduction to (whole) network analysis with igraph in R.

Further information will be available on (http://rego.tillt.net).

Technology Needs: Laptops with internet access. Installation of R (http://cran.r-project.org/) and R-Studio (www.rstudio.com) before the workshop is required.

Workshop Length: whole day (6 hours)
Attendance Limit: 30

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