The qgraph package for network visualizations of psychometric data

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The use of graphs to visualize statistical models (e.g., factor models, structural equation models) has a long history in psychometrics. We present the qgraph package for R which provides an interface to visualize psychometric data and models through representation algorithms taken from network theory (Fruchterman & Reingold, 1991). First, qgraph represents standard psychometric modeling results; this includes DIF-analyses in eRm (Mair, Hatzinger, & Maier, 2010), EFA results, and visualization of models in the SEM package (Fox, 2010). Second, qgraph offers visualization possibilities—which are novel in psychometrics—by using network modeling techniques. For instance, a correlation matrix can be visualized as a network in which each item is a node and each correlation an edge. By varying the width and color of the nodes and edges as a function of statistical properties, a clear picture of the structure of the correlation matrix can be generated. This is especially useful for very large sets of variables. Similar possibilities exist for the representation of partial correlations, results of search algorithms for causal structures, and dependency relations in time series. Finally, qgraph automatically produces interactive graphs by means of the RSVGTipsDevice package (Plate, 2009). We will explain how to use these functions to explore empirical data.

References

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