

Key Actor Analysis in R

Integrating SNA and Statistics

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Purpose and Outline

- SNA is often used to identify central or key actors within a social group
- Given the **dynamic nature** of social groups the identification of key players may be critical in any attempt to influence the behavior of the network

Purpose At the end of the session the participants are expected to understand and replicate the procedures followed to conduct key actor analysis in R.

We will use two centrality measures and linear regression procedures to conduct the analysis.

Quick review of centrality measures

To identify key actor SNA relies on:

- Degree:** Number of connections an actor has
- Betweenness:** Number of shortest paths an actor is on which makes this actor important in controlling the flow of information in the network.
- Closeness:** Relative distance of one actor to all other actors
- Eigenvector:** A measure of how central an actor is and how central the ties of this actors are in the network.

- **Methodologically**, all these measures come from the same matrices and to some extent share **mathematical properties**
- Consequently, these measures are expected to have linear relationships

Building upon linear relationships of centrality measures

Plotting centrality measures...

- A method for using centrality metrics to identify key actors is to plot actors' scores for Eigenvector centrality versus Betweenness
- Although these measures are correlated, they are not perfectly linear
- In this sense, we can use these non-linear outliers to enrich our knowledge of the social relationships in the network

Conceptual implications

- 1 An actor with very high betweenness but low EC may be a critical gatekeeper to a central actor
- 2 Likewise, an actor with low betweenness but high EC may have unique access to central actors

How it looks like?

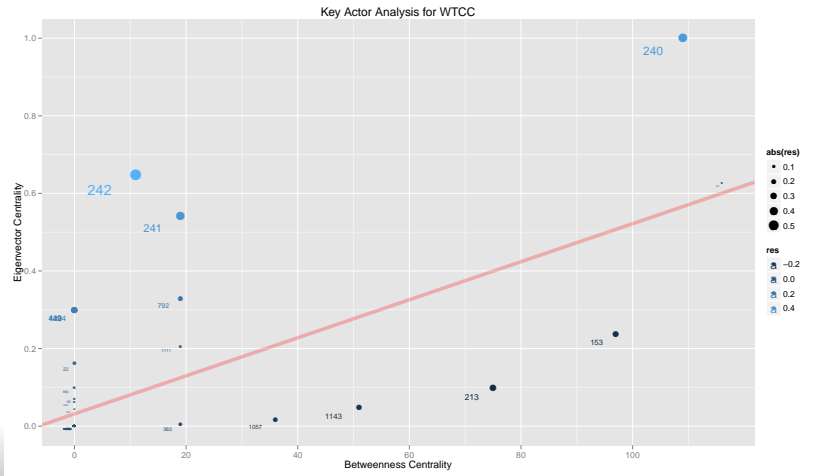


Figure 1: Key Actor analysis, this is part of what we will replicate today!

Adding these measures as attributes in a sociogram

Using the centrality measures to highlight key actors

- Using our network data we will identify the location of the key actors from the previous analysis
- Theoretically, our interpretation should completely be congruent to what was found in the bivariate plot
- We can use the regression residuals if want to, or simply use eigenvector or betweenness centralities as attributes and conditional on what we want the sociogram to show.

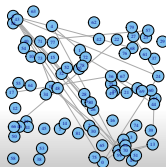


Figure 2: As usual, the default option is not revealing much!

A more SNA based, yet novel approach

Kek Actor Analysis

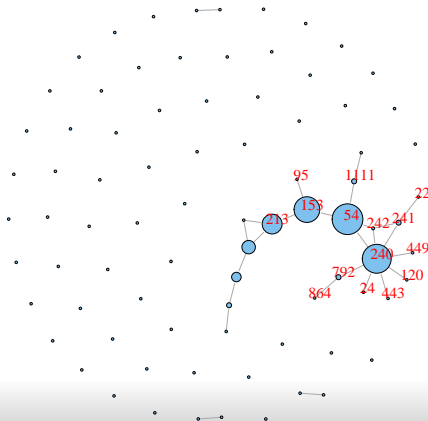


Figure 3: Key actors weighted by eigenvector and betweenness centrality

Starting R...

Thank you!

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