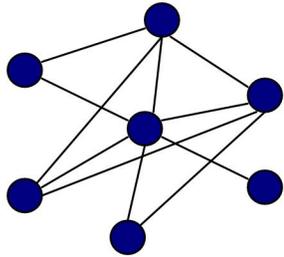


Social Network Analysis

What is a network?



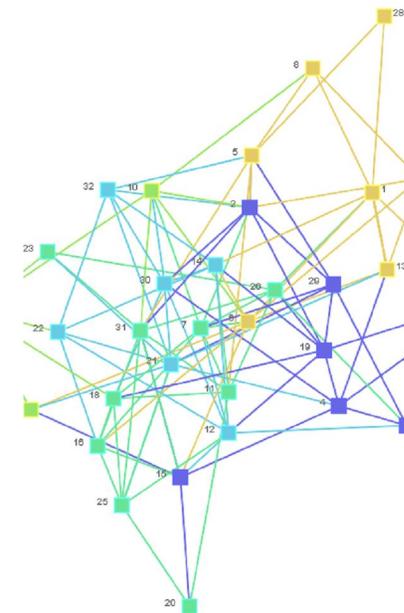
- Nodes represent nouns like people or places
- Lines connecting the nodes indicate some relationship or activity such as an email correspondence or membership to an organization
- The combination of nodes and connections yields a social network that indicates the interactions between a certain group of people



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Evaluating different display types of graphic representations



The problem is not gathering the data, it is the analysis and making sense of it...

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Cadets

Andrea Edgar & Jeffrey Tegman

Working with graphical representations of a network



Social Network Analysis (SNA)

Against conventional thinking, networks are not merely hierarchal systems. Many times other connections exist that result in a more dynamic, complex, and intricate social network. Understanding how people are interconnected through various channels can provide a great deal of information as to how a specific network functions and operates.

The advantage that a social network diagram has is that it can provide a graphical representation of where key actors are located and what their role in the network is.

Sophisticated computer software allows for quantifiable measures of the interactions between individuals and groups through mathematical analysis and displays them graphically.

What's the problem?

While a well trained analyst can find these patterns through the mathematical algorithms, we are interested in finding the best way to display these social interaction patterns in a graphical representation, allowing someone who has little or no training in SNA to find the key leaders in a network.

Hypothesis

Based on signal detection theory and the amount of noise created by the many edges displayed in a dense graph, there will be a higher correlation between node size and the selection of key leaders from the graphs.

Testing

Using participants from the US Military Academy who have no previous interactions with SNA, we evaluated four variations of graphical representations of a data set network. Graphs were created using the ORA SNA software. These graphs depicted varying "weighting" or emphasis on connection edges and the nodes. The task of this experiment was for each participant to look at each of the four graphs and answer the same question for each: "Who are the top three leaders in this group?"

Results

Our hypothesis that users would intuitively pick key actors based on node size was unsupported. On the contrary, there was significant evidence to show that

there is a correlation between edge weight and selection of key leaders.

Conclusions

Inexperienced users will pay more attention to information displayed in the thickness of the lines than size of the nodes.

The results allow for development of conventions and standards in a relatively new field of study.

Future Research

This experiment opens up to further research. Future research can be conducted in which we can:

- Test users with a higher understanding and interaction with SNA
- Test users against the mathematically derived "correct" answers
- Test and develop more methods of conveying information in the nodes and edges besides merely weighting them
- Apply new experiments with different SNA software programs instead of solely using ORA