

Network centrality

Modeling Intensive Longitudinal Data

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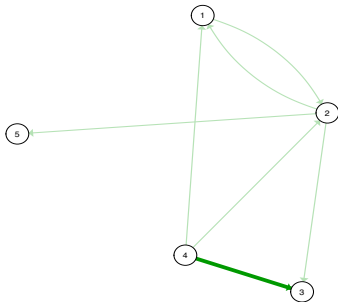
Centrality in social networks

- ▶ Being structurally important
- ▶ Linton C Freeman (undirected/unweighted)
- ▶ Opsahl (weighted positive)



Network analyses: centrality

Besides visualization of the relations between nodes, we can also analyze the network



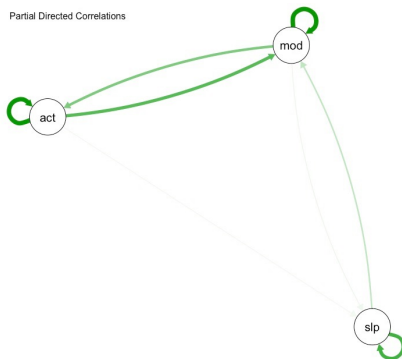
Centrality:

- ▶ Outdegree
- ▶ Indegree
- ▶ Betweenness

Network analyses

Network of self-reported mood – activity – sleep

Graphs created with [Epskamp et al., 2012]



What do you advise the patient?



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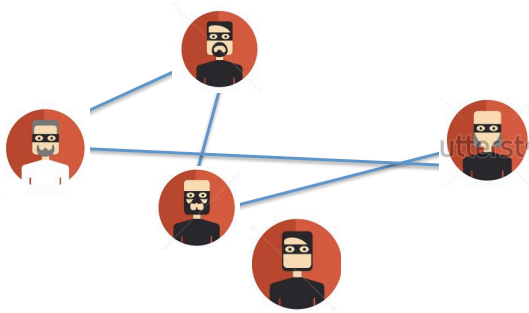
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Bringmann, L. F., Elmer, T., Epskamp, S., Krause, R. W.,
Schoch, D., Wichers, M. C., ... & Snippe, E. (2019). What do
centrality measures measure in psychological networks.
Journal of Abnormal Psychology.

Assumptions of centrality measures: Betweenness

- ▶ Negative edges
- ▶ Does it anyway make sense to talk about distances in symptom networks?
- ▶ Is there anything flowing?

Conceptual clarity



Ways forward?


- ▶ Using new centrality measures
- ▶ Reconsidering the old measures of importance in the statistical models that underlie psychological networks
 - For correlation and regression there are lots of relative importance measures (dominance analyses and squared semi-partial correlation)
 - Impulse response function
- ▶ Leaving the whole idea of centrality completely behind



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Sharing science,
shaping tomorrow

Citations I

-  Epskamp, S., Cramer, A., Waldorp, L. J., Schmittmann, V. D., and Borsboom, D. (2012).
Qgraph: Network visualizations of relationships in psychometric data.
Journal of Statistical Software, 48(4):1–18.