

Ego Networks and E-NET

Normally

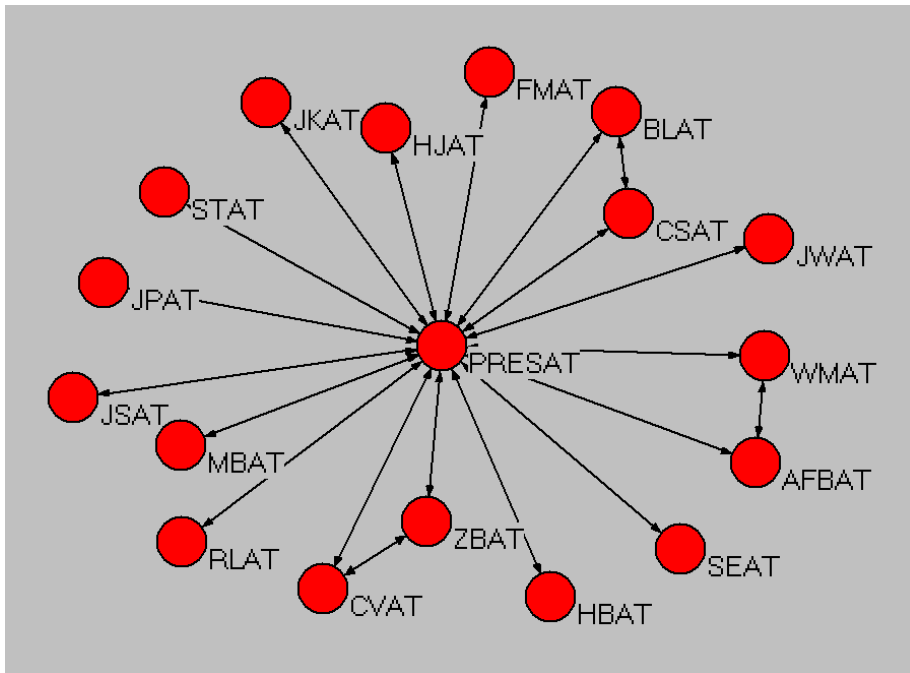
- Egos selected at random or using some criteria
 - Entrepreneurs
 - Football coaches
 - First time parents
 - Single youths
- Alter attributes and preferably alter connections

Data sources

- Surveys
- Interviews
- Observation
- Archival data
 - Ego very often provides all the data
 - Consequently ego perceived networks

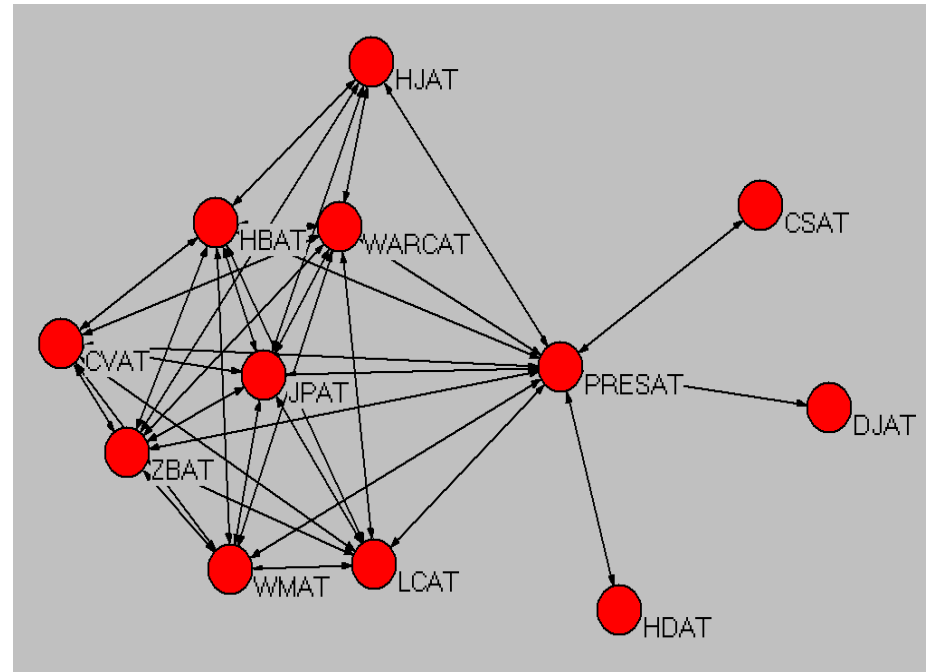
White House Diary Data

Carter Administration meetings



Year 1

Data courtesy of Michael Link



Year 4

Analysis

- Qualitative- vizualization
- Descriptive measurements
 - Number of alters
 - Density
 - Homophily
- Measures used in standard statistics

Ego v Alter Attributes

- Homophily same as ego. Eg Politician who only has friends from the same party
- Heterophily different from ego. Eg Social support network.
- E-I index $(E-I)/(E+I)$
 - 1 homophily to +1 heterophily
- For continuous use standard deviation

Blau Heterogeneity

Measures similarity of alters to each other but ignores ego (Categorical data)

$$1 - \sum P_i^2$$

P_i is proportion of actors in category i

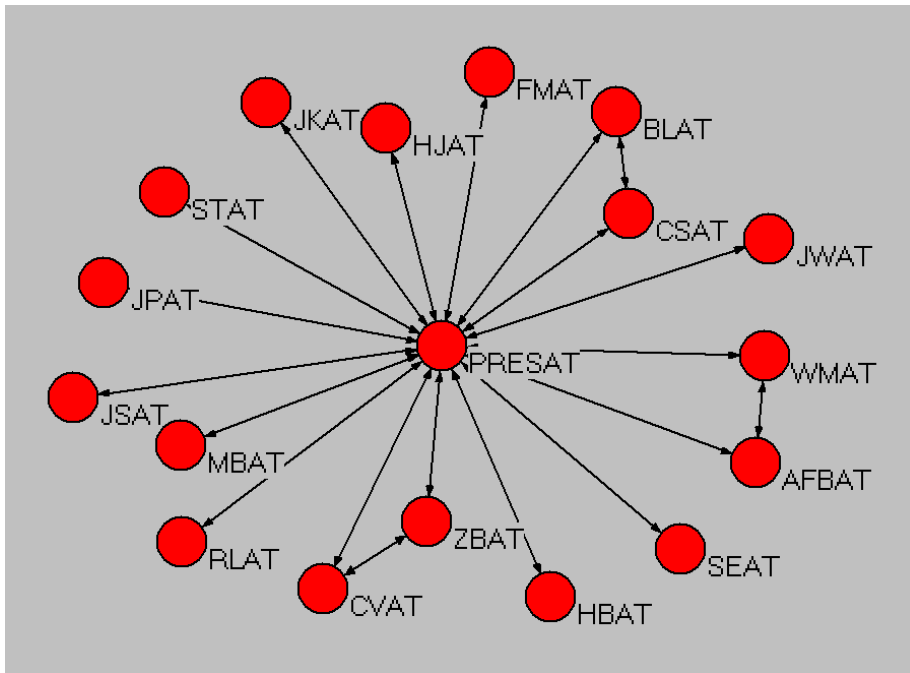
Ranges from 0 to $1 - 1/n$

Burt's Structural Holes

- Really just brokerage or betweenness
- Lack of ties between alters benefits ego
- Burt introduced some new measures
- Developed the idea
- Provided some convincing evidence
- Some notational errors

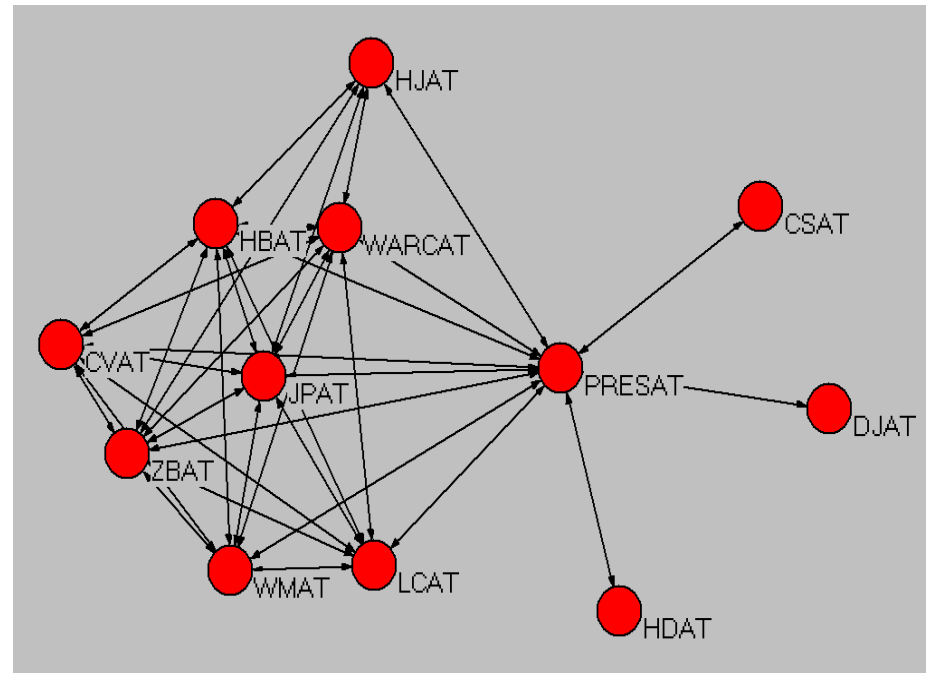
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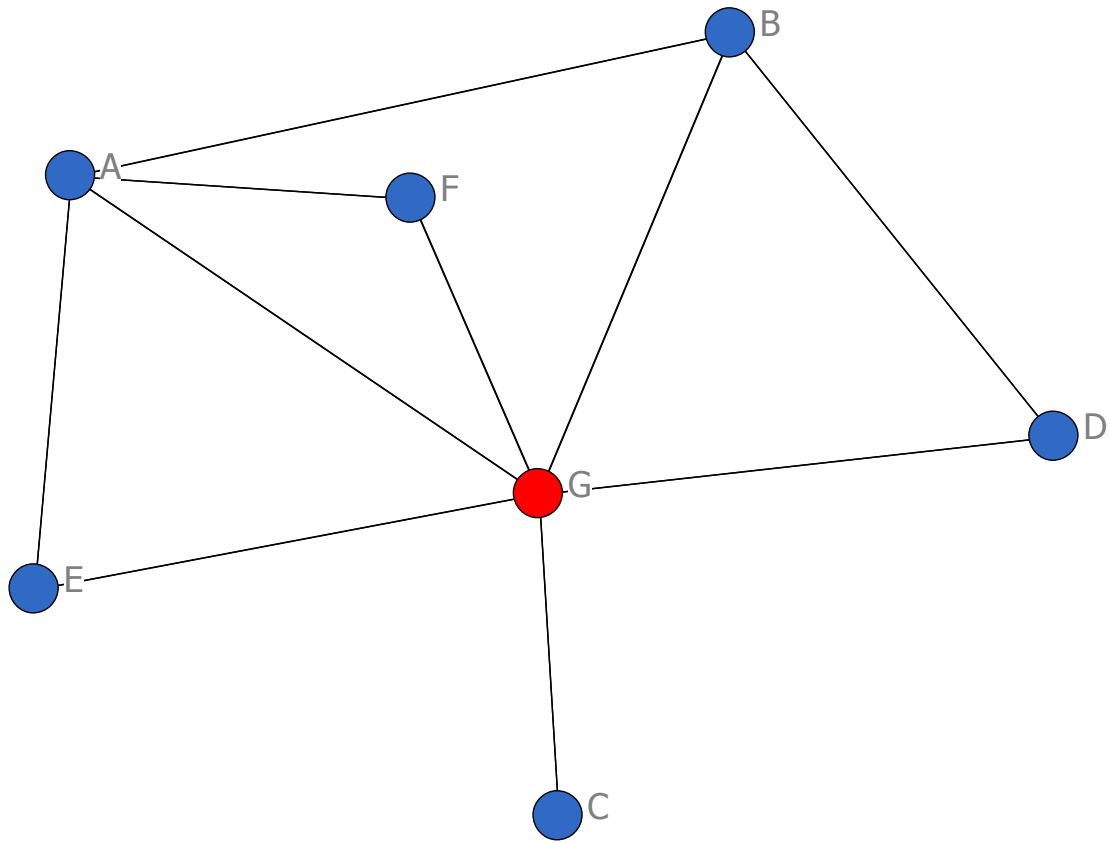
Year 4

Burt's measures

- Effective Size
- Efficiency
- Constraint
- Hierarchy

Effective Size and Efficiency

- Effective Size = Degree – average degree of alters (ignoring ties to ego)
- Efficiency = Effective Size / Degree
- Can be extended to valued data



Ego Degree = 6 Sum alter Degree = 8

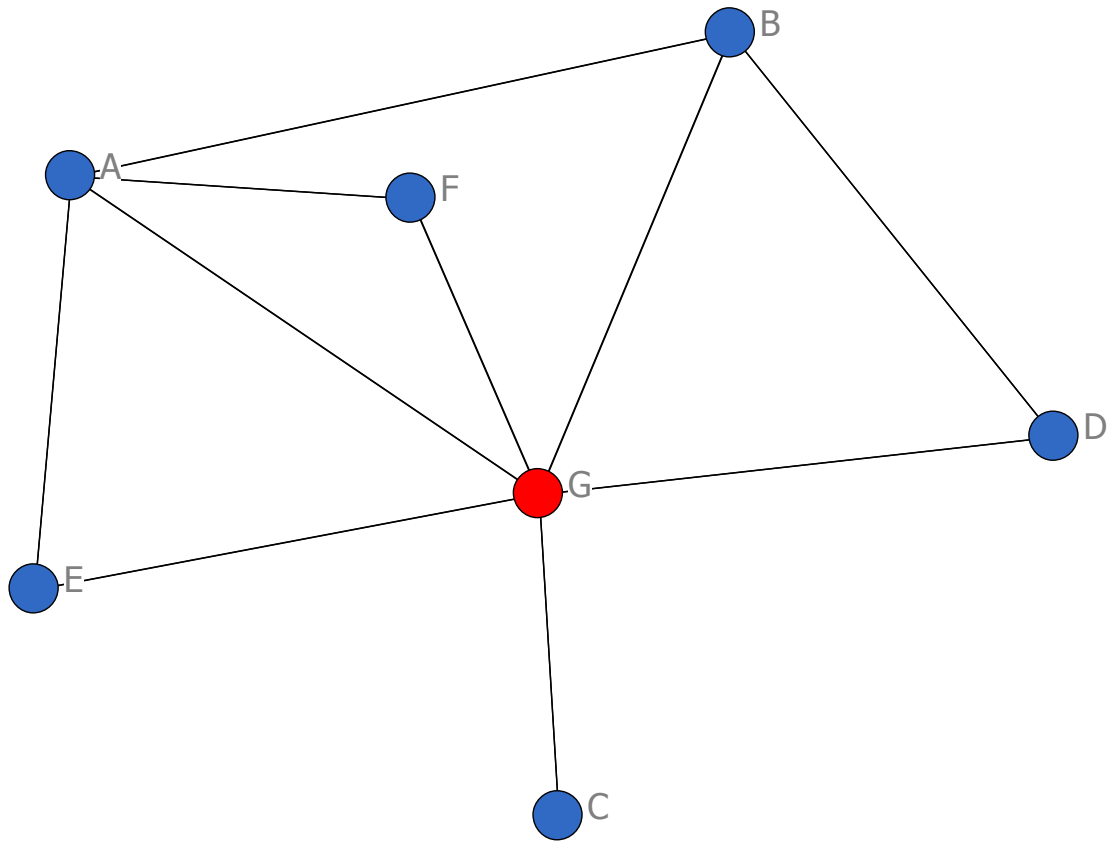
Effective Size = $6 - 8/6 = 4.6666$

Efficiency = $4.6666/6 = 0.78$

Constraint and Hierarchy

- Measure the extent to which ego connects to alters that are connected to each other
- Looks at the proportion of time ego invests in alters that invest in each other
- Alters that are well connected constrain opportunities as they have alternatives

$$(P_{ab} + \sum P_{ac} P_{cb})^2$$



$$P_{GE}=1/6 ; P_{GA}=1/6 P_{AE}=1/4$$

$$\text{Constraint for E} = (1/6+1/6*1/4)^2= 0.0434$$

Constraint = sum of all alters constraint

- Hierarchy is an adjusted version of constraint which takes into account the extent to which the constraint is with a single alter

UCINET and Ego Nets

- Analyzes whole networks in terms of ego net of each actor
- Put all ego nets in one dataset
- Submit this dataset then select ego
- Use attributes to define egos

E-net

- Free beta version
- Treats each ego as a case
- Visualization
- Ego stats easily produced
- Special data structures uses excel, vna and ucinet data