

# Introduction to Ego Network Analysis

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## Goals for Today

1. Introduce the network perspective
  - How is ego-centric analysis different from socio-centric analysis?
  - When and why ego network analysis?
  - What theories are ego-centric?
2. Research design and data collection
3. Data analysis
4. Review and demo of software tools
  - Egonet, E-Net

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## What is Unique about Social Network Analysis?

- Phenomenon studied
  - Distinctive type of data,
  - It's about relations & structure
- How we study it
  - Distinctive tool
  - Typical statistical methods may not apply
- How we understand it
  - One “network perspective”
  - Based on multiple theories (Simmel, Blau)

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## Mainstream Logical Data Structure

- 2-mode rectangular matrix in which rows (cases) are entities or objects and columns (variables) are attributes of the cases
- Analysis consists of correlating columns
  - Emphasis on explaining one variable

ID	Age	Education	Salary
1			
2			
3			
4			

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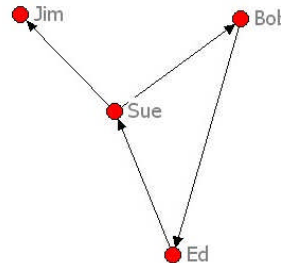
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## Network Logical Data Structures

Friendship

	Ed	Sue	Jim	Bob
Ed	-	1	0	0
Sue	0	-	1	1
Jim	0	0	-	0
Bob	1	0	0	-



Email Communication

	Ed	Sue	Jim	Bob
Ed	-	4	0	2
Sue	0	-	5	1
Jim	0	0	-	0
Bob	3	0	4	-

- Individual characteristics only half the story...**RELATIONS MATTER!**
- People influence each other, ideas & material flow
- Values are assigned to pairs of actors
- Hypotheses can be phrased in terms of correlations between relations

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## Relational Data & Attribute Data

	Ed	Sue	Jim	Bob
Ed	-	1	0	0
Sue	0	-	1	1
Jim	0	0	-	0
Bob	1	0	0	-

Relational Data

	Gender	Education	Salary
Ed	0	14	50000
Sue	1	15	99000
Jim	0	12	65000
Bob	0	8	15000

Attribute Data

SNA provides the ability to combine relational data with attribute data (e.g., homophily, heterogeneity, etc)

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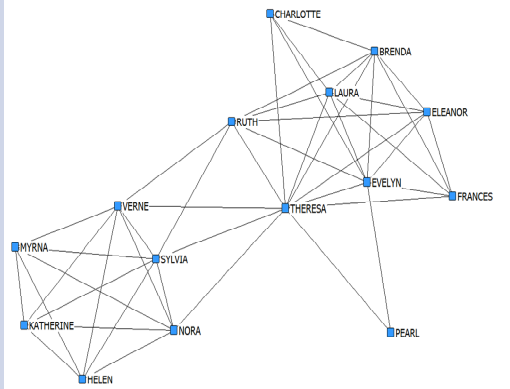
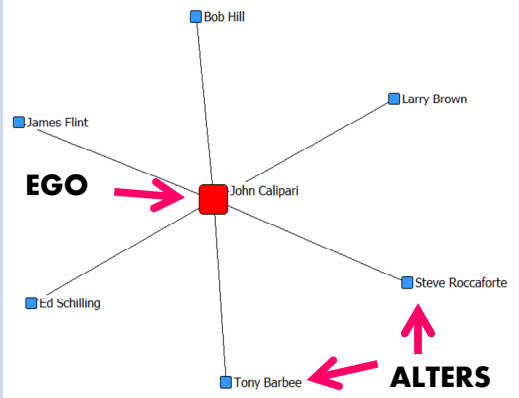


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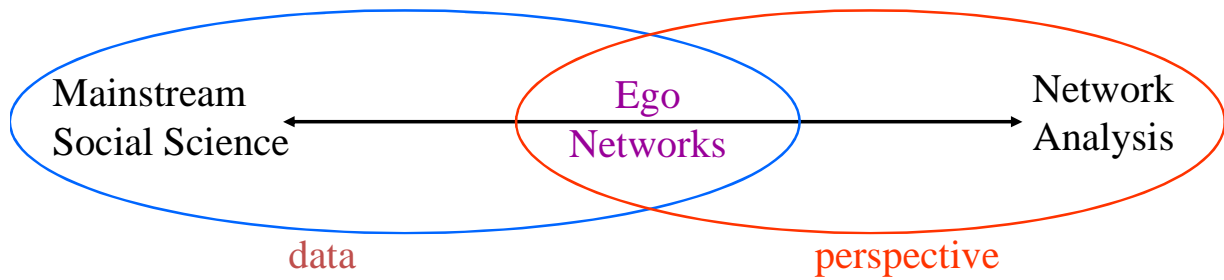


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# Introduction to Ego Network Analysis

<b>Socio-centric (Whole/ Complete network)</b>	<b>Ego-centric (Ego/Personal network)</b>
	
<ul style="list-style-type: none"><li>•Focus on the whole group<ul style="list-style-type: none"><li>○ Global structure</li></ul></li><li>•Patterns of interaction used to explain:<ul style="list-style-type: none"><li>○ Concentration of power</li><li>○ Flow of information or resources</li><li>○ Status structures</li></ul></li><li>•Cases are complete networks<ul style="list-style-type: none"><li>○ Generalized to other networks</li></ul></li></ul>	<ul style="list-style-type: none"><li>•Focus on individual ego networks<ul style="list-style-type: none"><li>○ Structure</li><li>○ Composition</li><li>○ Shape</li></ul></li><li>•Cases are individual ego networks<ul style="list-style-type: none"><li>○ Generalized to other ego networks</li></ul></li></ul>

# Ego Network Analysis



- Combines the perspective of network analysis with the data of mainstream social science

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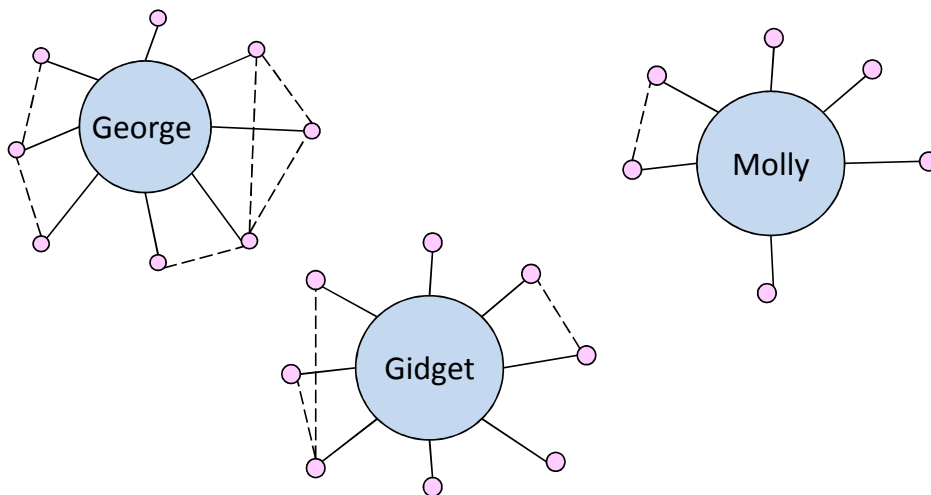
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## Each Ego Network is Treated as its Own World



Or in more typical language, each ego network is treated as a separate case

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## Why Study Ego Networks?

Ego's network is a source of:

- Information
- Social support
- Access to resources
- Sense-making
- Normative pressures
- Influence
- etc.

All of which can influence Ego's behavior

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## When to use Ego Network Analysis

- If your research question is about phenomena of or affecting individual entities across different settings (networks) use the ego-centric approach
  - Individual people, organizations, nations, etc.
- If your research question is about different patterns of interaction within defined groups (networks), use the socio-centric approach
  - E.g., who are the key players in a group? How do ideas diffuse through a group?

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## Which Theories are Ego-centric?

- Most theories under the rubric of social capital are ego-centric
- Topological
  - Structural holes / Brokerage
  - Embeddedness
- Compositional
  - Size
  - Alter attributes

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## Steps to a SNA study

1. Identify the population
  - Sampling, gaining access
2. Determine the data sources
  - Surveys, interviews, observations, archival
3. Collect the data
  - Instrument design

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## Step 1. Identify the Population

- Sampling Criteria
  - Determined by research question
    - High tech entrepreneurs
    - Alumni of defunct organizations
    - Basketball coaches
    - First time mothers returning to the workforce
    - Baseball Hall of Fame inductees
    - Contingent workers
    - People with invisible stigmatized identities

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## Step 1. Identify the Population

- Gaining Access
  - Same concerns as other research
    - It depends on the sensitivity of the questions that you are asking
    - Length of interview can be daunting
      - Depends on the number of alters

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## Step 2: Determine Data Sources

- Surveys
- Interviews
- Observations
- Archival data

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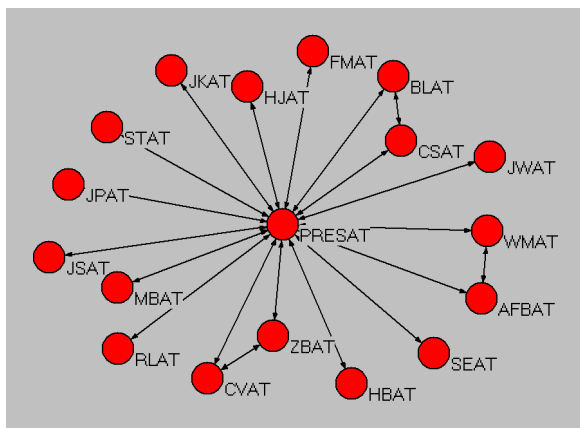
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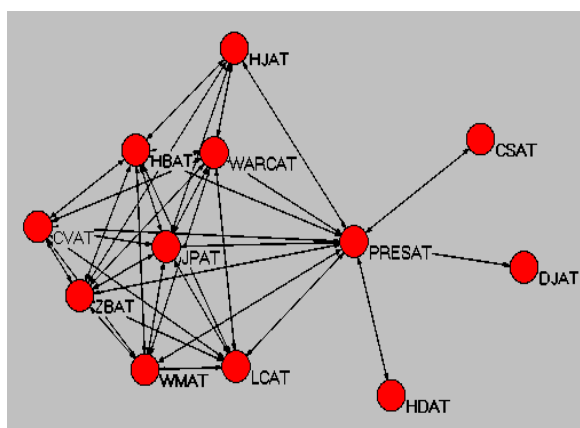


## White House Diary Data, Carter Presidency



Year 1

Data courtesy of Michael Link



Year 4

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## Step 3: Collect the Data

- What data should you collect?
  - What questions need to be answered?
- How to format your data collection instrument (e.g., a survey, spreadsheet, database, etc.)?

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## What Questions to Ask?

- **IT DEPENDS!!!**
  - Ego’s relations to alters form variables. Size of ego’s social support network is to ego network analysis what “attitude toward gun-control” is to traditional case based research.
- It is the researcher who defines the relations of interest. What’s relevant for the phenomena in question?
  - What influences an employee’s turn-over intention?
  - What influences one’s likelihood of adoption of a new technology?

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## How to ask: Tick or Rate?

- Record yes/no decisions or quantitative assessment?
  - Yes/no are cognitively easier to determine (therefore reliable, believable)
  - Yes/no \*much\* faster to administer
  - But yes/no provides no discrimination among levels
- One quantitative rating can replace a series of binaries
  - “How often do you see each person?”
    - 1 = once a year; 2 = once a month; 3 = once a week; etc.
  - Instead of three questions:
    - Who do you see at least once a year?
    - Who do you see at least once a month?
    - Who do you see at least once a week?
  - However, if categories are too similar it may be difficult to differentiate

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## Question Wording Issues

- “Friendship” does not mean the same thing to everyone
  - Especially across national cultures
- Some helpful practices
  - Use one word label plus two or three sentence description, plus have full paragraph detailed explanation available
  - Use homogeneous samples

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## Ethnographic Sandwich

- Ethnography at front end helps to ...
  - Select the right questions to ask
  - Word the questions appropriately
  - Create enough trust to get the questions answered
- Ethnography at the back end helps to ...
  - Interpret the results
  - Can sometimes use respondents as collaborators

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## Instrument Design: Paper or Plastic?

- Paper medium
  - Reliable
  - Reassuring to respondents
  - Errors in data entry
  - Data entry is time-consuming
- Electronic
  - Span distances, time zones
  - Harder to lose
  - Fewer data handling errors
  - Lower response rate
  - Emailed documents vs. survey instruments

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## Data Collection in an Ego-centric Study

1. Attributes about Ego
2. Name generator
  - Obtain a list of alters
3. Name interpreter
  - Assess ego's relationships with generated list of alters?
4. Alter Attributes
  - Collect data on the list of alters
5. Alter – Alter Relationships
  - Determine whether the listed alters are connected

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## Attributes about Ego

- Typical variables for case based analysis
  - Age
  - Gender
  - Education
  - Profession
  - SES
  - Etc.

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## Sample Name Interpreter

- Questions that deal with ego's relationship with [or perception of] each alter
  - How close are you with <alter>?
  - How frequently do you interact with <alter>?
  - How long have you known <alter>?
- All of these questions will be asked for each alter named in the previous section

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## Sample Alter Attribute Questions

- As far as you know, what is <alter>' s highest level of education? (Adapted from Burt, 1984)
  - Age, occupation, race, gender, nationality, salary, drug use habits, etc
  
- Some approaches do not distinguish between name interpreters and alter attribute questions

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## Sample Alter-Alter Relationship Questions

- Think about the relationship between <alter1> and <alter2>. Would you say that they are strangers, just friends, or especially close?  
(Adapted from Burt, 1998)
- Note: this question is asked for each unique alter-alter pair. E.g., if there are 20 alters, there are 190 alter-alter relationship questions!
  - Typically, we only ask one alter-alter relationship question

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## Why Ego-Centric Analysis

- Asks different questions than whole network analysis.
- In fact, many of the various approaches to “Social Capital” lend themselves particularly to the analysis of Ego-Centric or Personal networks

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## Kinds of Analyses

- In Ego-Centric Network analyses we are typically looking to use network-derived measures as variables in more traditional case-based analyses
  - E.g., instead of just age, education, and family SES to predict earning potential, we might also include heterogeneity of network or brokerage statistics
  - Many different kinds of network measures, the simplest is degree (size)

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## Data Analysis of Ego Networks

### 1. Size

- How many contacts does Ego have?

### 2. Composition

- What types of resources does ego have access to? (e.g., quality )
- Does ego interact with others like him/herself? (e.g., homophily)
- Are ego's alters all alike? (e.g., homogeneity?)

### 3. Structure

- Does ego connect otherwise unconnected alters? (e.g., brokerage, density, etc)
- Does ego have ties with non-redundant alters (e.g., effective size, efficiency, constraint)

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## Composition: Content

- The attributes (resources) of others to whom I am connected affect my success or opportunities
  - Access to resources or information
  - Probability of exposure to/experience with
- Paris Hilton..Why is she a celebrity?



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## Composition: Homophily

- A CFO who surrounds herself with all finance people
  
- A Politician who surrounds himself with all members of the same political party

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## Composition: Dissimilarity Between Ego & Alter

- Heterophily
  - We may posit that a relationship exists between some phenomenon and a difference between ego and alters along some attribute
    - Mentoring tends to be heterophilous with age

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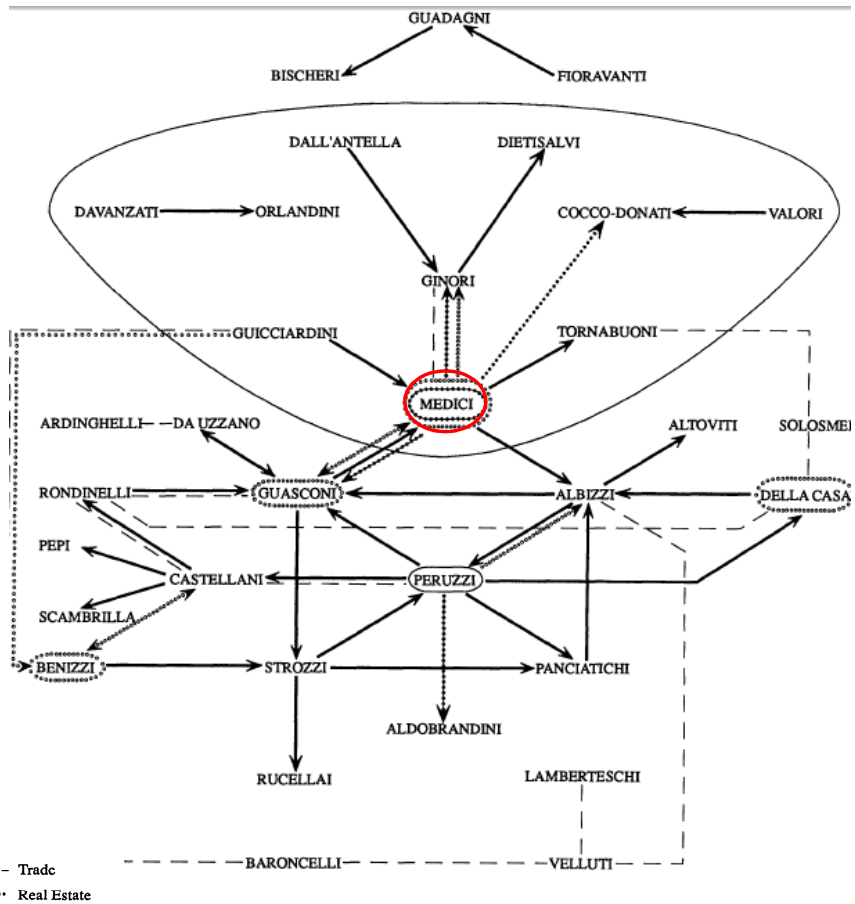








Power



(Padgett & Ansell, 1993)







## Constraint: The Basic Idea

- Constraint is a summary measure that taps the extent to which ego's connections are to others who are connected to one another.
- If ego's boyfriend bowls with her brother and father every Wednesday night, she may be constrained in terms of distancing herself from him, even if they break up.
- There's a normative bias in much of the literature that less constraint is good

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# Demo

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