

# Social Network Analysis of Personal and Group Networks

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*SocioWorks: Integrated Web  
Platform for Applications of  
Social Network Analysis*

A Small Business Innovation Research (SBIR) Phase II  
Competing Renewal project (R44 AG 038316) supported by the  
National Institute on Aging

# SocioWorks Team

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# Technology Architecture

## SocioWorks

EgoNet  
- Question authoring  
- Data collection  
- Data processing

Visualyzer  
- Data entry  
- Interactive display  
- SNA algorithms

Data Management  
- Merging  
- Processing  
- Sharing

Clinical Research Management System (CRMS) Modules  
- Subject Recruitment  
- Subject & Protocol Registry  
- Protocol Schema & Patient Calendar  
- Financial Management  
- Form Builder  
- Specimen Tracking  
- Data Warehouse

MDLogix Health Science Process Framework (HSPF) web technology architecture

Rich web-applications – standard central databases – horizontal server scaling  
Client-Centered Agile Methodology – Test Driven Development – Integrated Quality Assurance  
Ruby on Rails – Ajax – Domain Specific Languages – XSB



Number crunching



Central Integration Bus  
- HL7  
- Web services  
- REST

Other systems

# CRMS Platform

- CRMS – Clinical Research Management System:
  - Subject Recruitment
  - Subject & Protocol Registry
  - Protocol Schema & Subject Calendar
  - Financial Management
  - Case Report Forms
  - Specimen Tracking
  - CRMS Integration Bus
  - Reporting Services
- Used enterprise-wide at Johns Hopkins School of Medicine
  - 4,246 studies
  - 50,660 enrolled subjects
  - 57,890 total subjects
  - 30-50 new studies added per month
  - 30% increase in studies with 5% increase in staff
  - Staff report higher productivity AND increased quality of life
  - Numerous distinct staff roles as system users
- Ruby on Rails, Ajax, standard databases
- Architecture based on HL7, CDISC, caBIG
- Client-centered User Story driven development
- Best practices for clinical research

# SocioWorks Project Structure

- Three years (Sep 2010 – Sep 2013)
- User Community
  - Science and Product Advisory Board
  - Web application software engineers
  - End users:
    - SNA scientists
    - Clinical care, public health, patient safety
    - Families, providers, administrators
- User Workshops
  - Twice annually, two days duration, Baltimore
  - First Workshop March 31-April 1
  - Public sessions

# SocioWorks Precursors

- Supported by SBIR awards (R43, R44) from the National Institute of Drug Abuse (NIDA)
- 2000 to 2006
  - Guided by Tom Valente and Chris McCarty
  - Original vision for an integrated platform
- Windows applications
  - LinkAlyzer
  - VisuaLyzer
  - EgoNet

# The Plan for Today

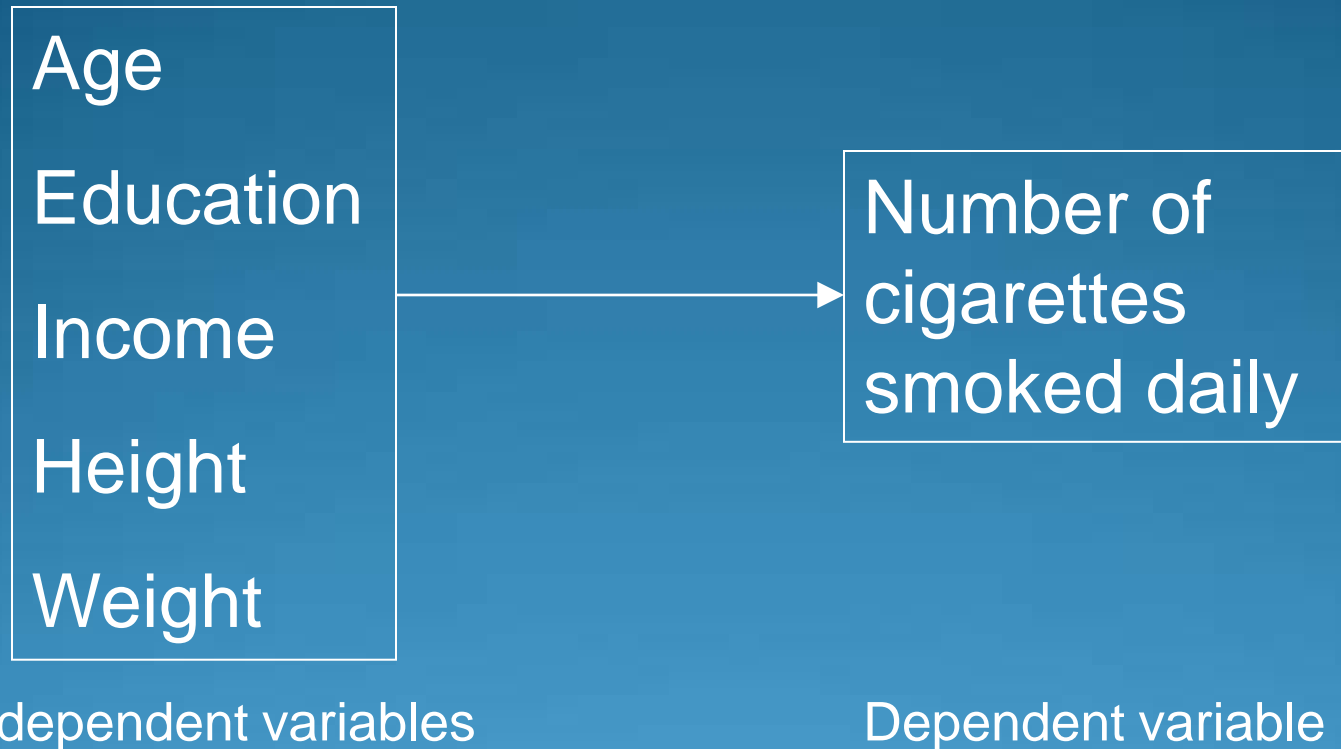
1. Introduction to social networks. (1 hr)
  - i. Why investigate social networks?
  - ii. History and definition.
  - iii. What exactly are we measuring?
2. Designing a social network study (goals, design, sampling, bias, name generators) ( $\frac{1}{2}$  hr)
3. EgoNet workshop (1  $\frac{1}{2}$  hrs)
  - Introduction to EgoNet screens.
  - Collect your own 25-alter ego network.
  - Demonstrate visualization interview.
  - Demonstrate aggregation and modeling.



# 1. Introduction to Social Networks (i).

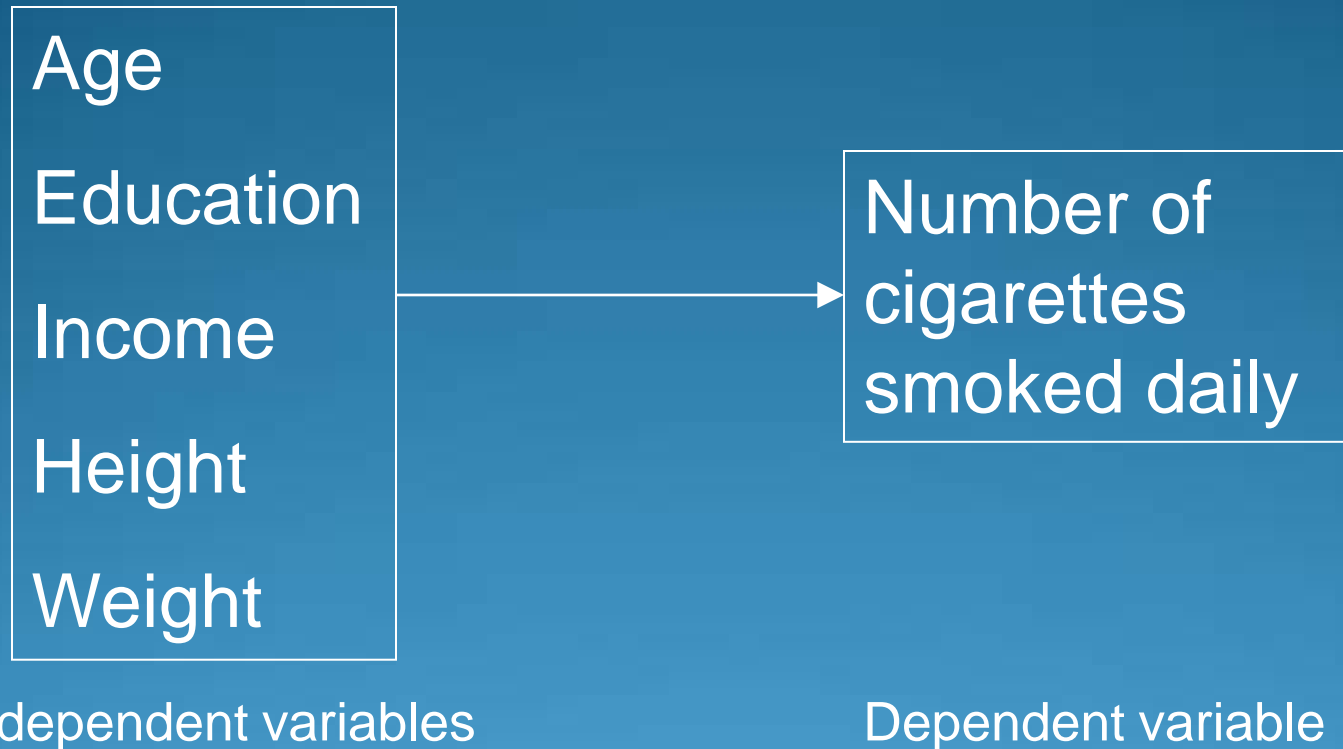
Why investigate social networks?

# Example of a Research Design in Social and Behavioral Sciences



A scientist can gather information on a sample of 500 respondents and attempt to predict their smoking behavior using variability across a variety of demographic & biological variables.

# Conclusion



The scientist concludes that age, education and income are good predictors of number of cigarettes smoked daily, but weight and height are not good predictors.

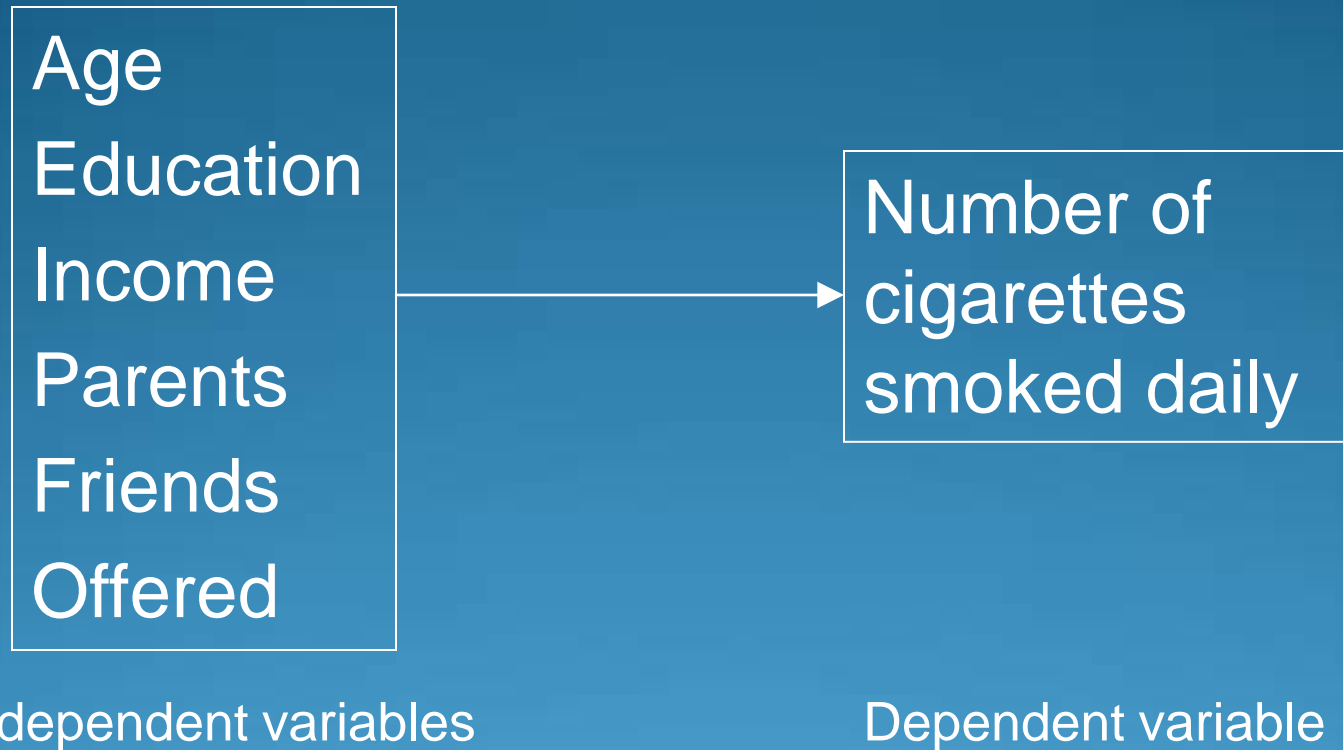
# Social Influences

- Social scientists think that some outcomes or dependent variables are influenced by social factors.
- For example, it is commonly accepted that adolescents start smoking because of their peers.
- Since peer influence is not easily observed directly, social scientists design questions that can be used as proxies for peer influence.

# Questions (Proxy Measures)

- Do your parents smoke? Parents)
- Do most of your friends smoke? (Friends)
- Have any of your friends ever offered you cigarettes?  
(Offered)

# Predictive Power of Social Influence



Researchers have discovered that these measures explain part of the variance that was previously unexplained by age, education or income.

# Questions about These Results

- Would knowing more details about the social influences around a person provide greater explanatory power?
- If so, what questions could we ask to acquire these details?
- Does social network analysis provide the kind of details we're looking for?

# Social influence Intervention

- National Cancer Institute funded 15 year, \$15 million study (40 school districts (grades 3-12, half control))
- Endpoints were daily smoking at grade 12 and 2 years after high school (n = 8,388 students)
- Intervention: Identify & resist social influences; information; motivation; self-confidence; family support
- Differences in daily smoking at grade 12 and 2 years after high school not significant (higher after 2 years)
- Differences by gender not significant



# Intervention too Generic?

## Factors that make social influence non-generic

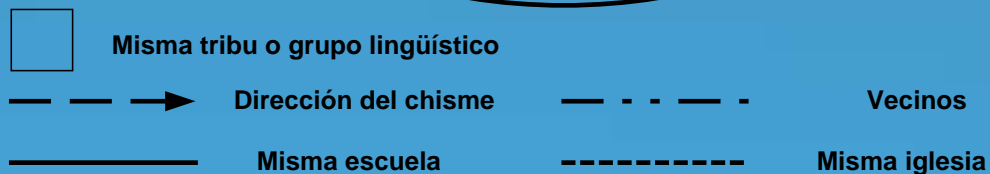
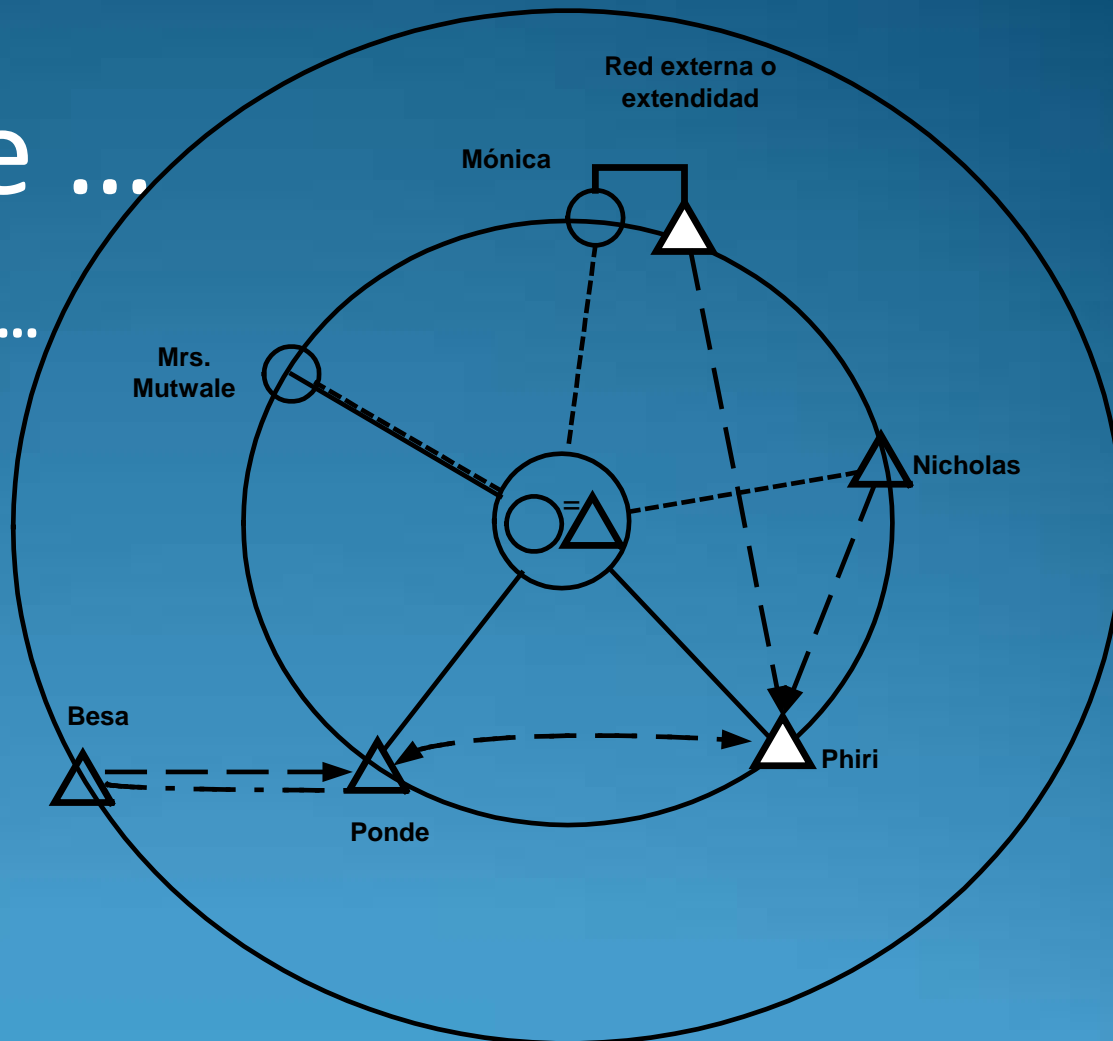
- Variability in the characteristics of influential people
- Variability in the structure of the network of influential people
- Variability in the characteristics of structurally important people

# 1. Introduction to Social Networks (ii). Definitions

# For instance ...

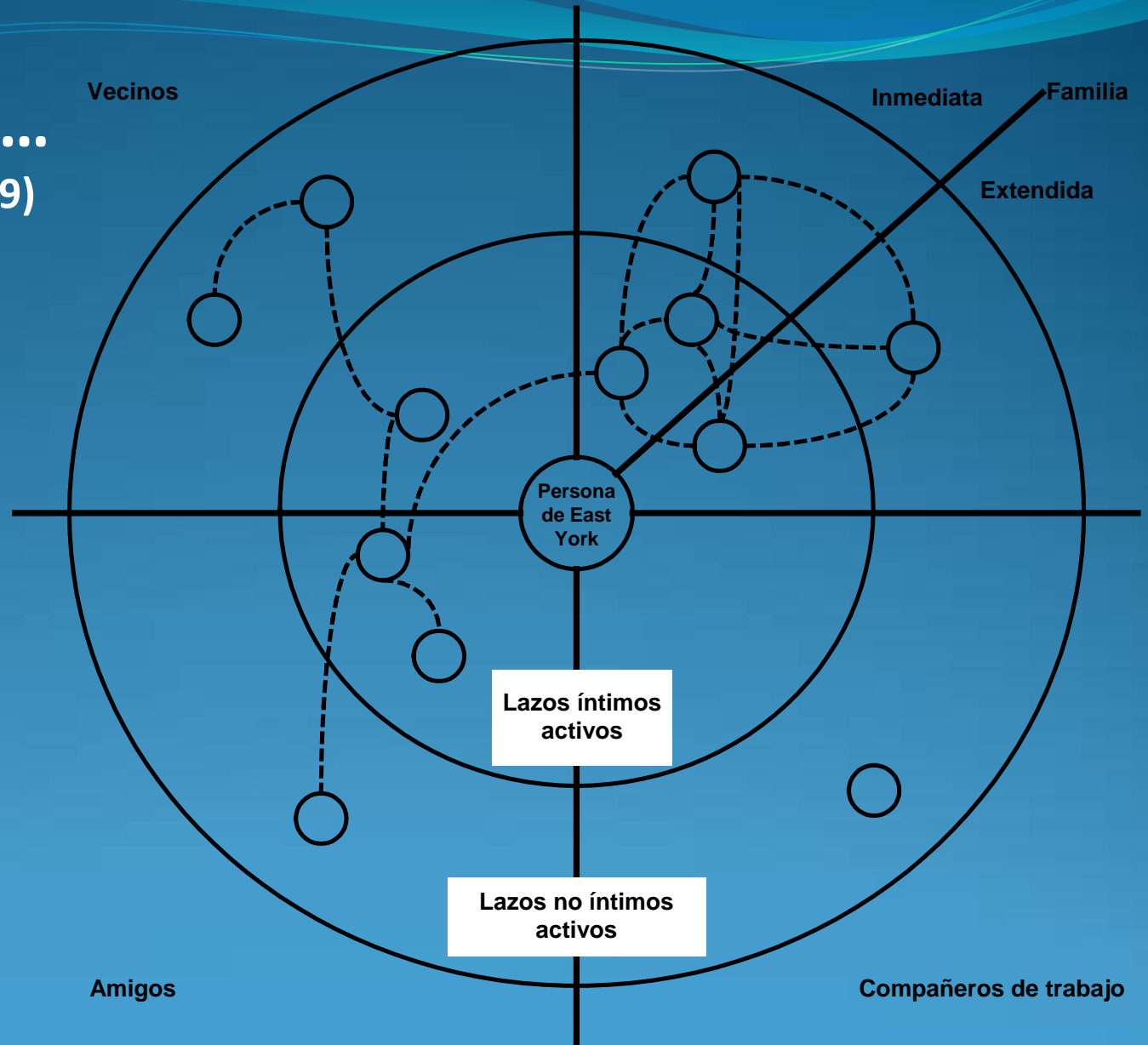
## Gossip network ...

(Epstein, 1957)



# East York ...

(Wellman, 1999)



# Munich ... (2010)

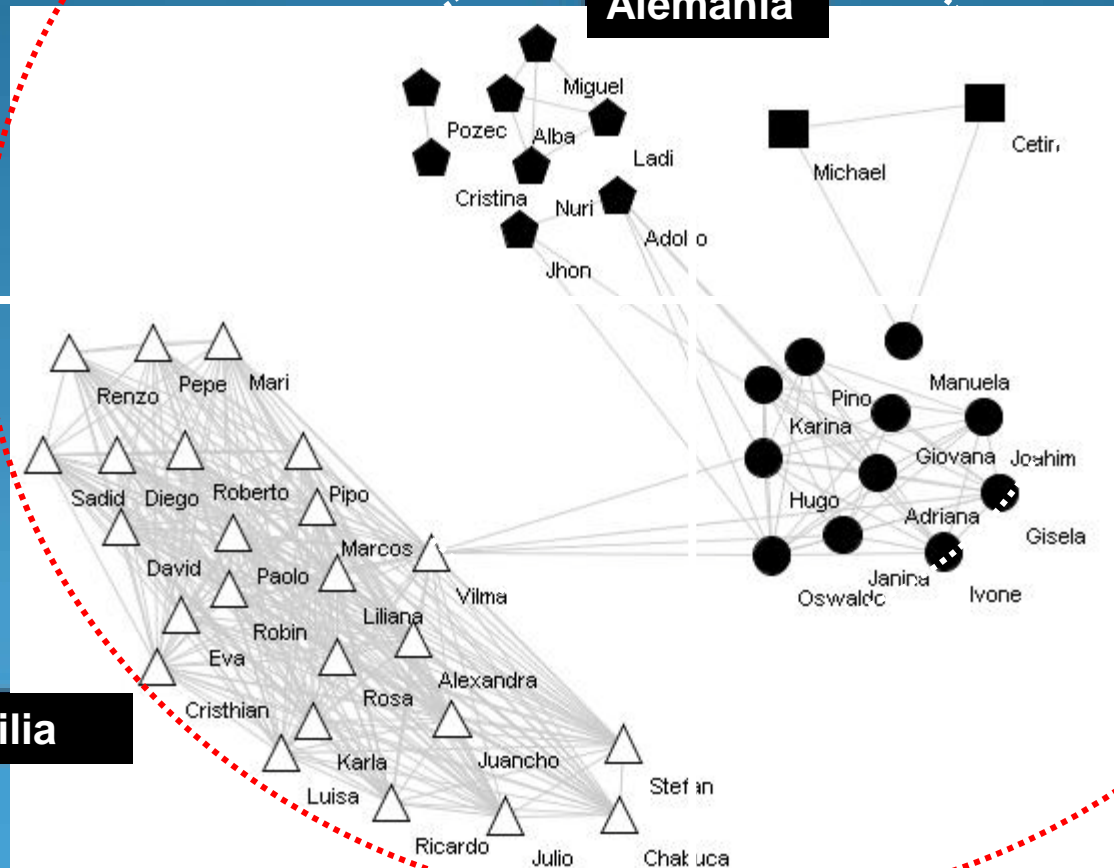
Personal network of a  
Peruvian migrant in  
Munich

**Vecindario**

**Perú**

**Trabajo**

**Alemania**



**Familia**

**Amigos**

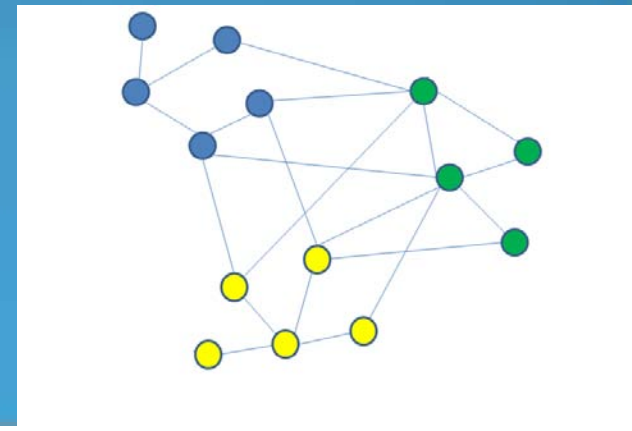
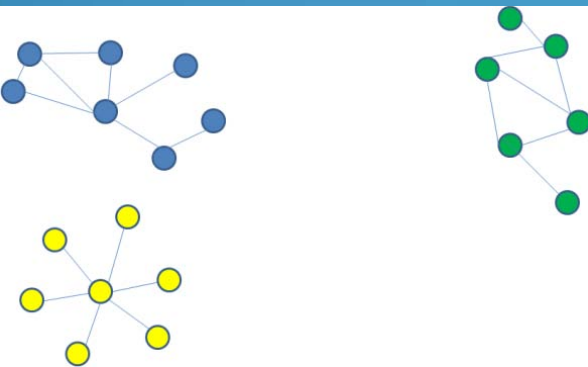
# Two kinds of social network analysis

## Personal (Egocentric)

- Effects of social context on individual attitudes, behaviors and conditions
- Collect data from respondent (ego) about interactions with network members (alters) in **all** social settings.

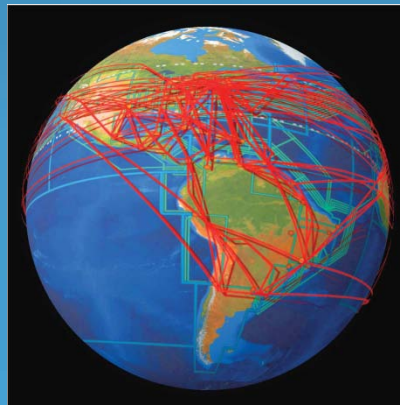
## Whole (Complete or Sociocentric)

- Interaction within a socially or geographically bounded group
- Collect data from group members about their ties to other group members in a **selected** social setting.



# Not a Simple Dichotomy

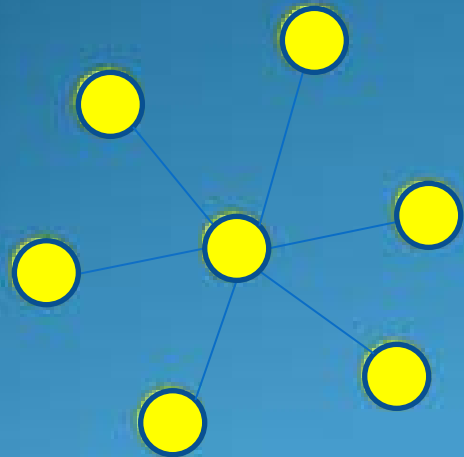
- The world is one large (un-measurable) whole network
- Personal and whole networks are part of a spectrum of social observations
- Different objectives require different network “lenses”



# Personal Networks: Unbounded Social Phenomena



**Example:** Predict depression among seniors using the cohesiveness of their personal network

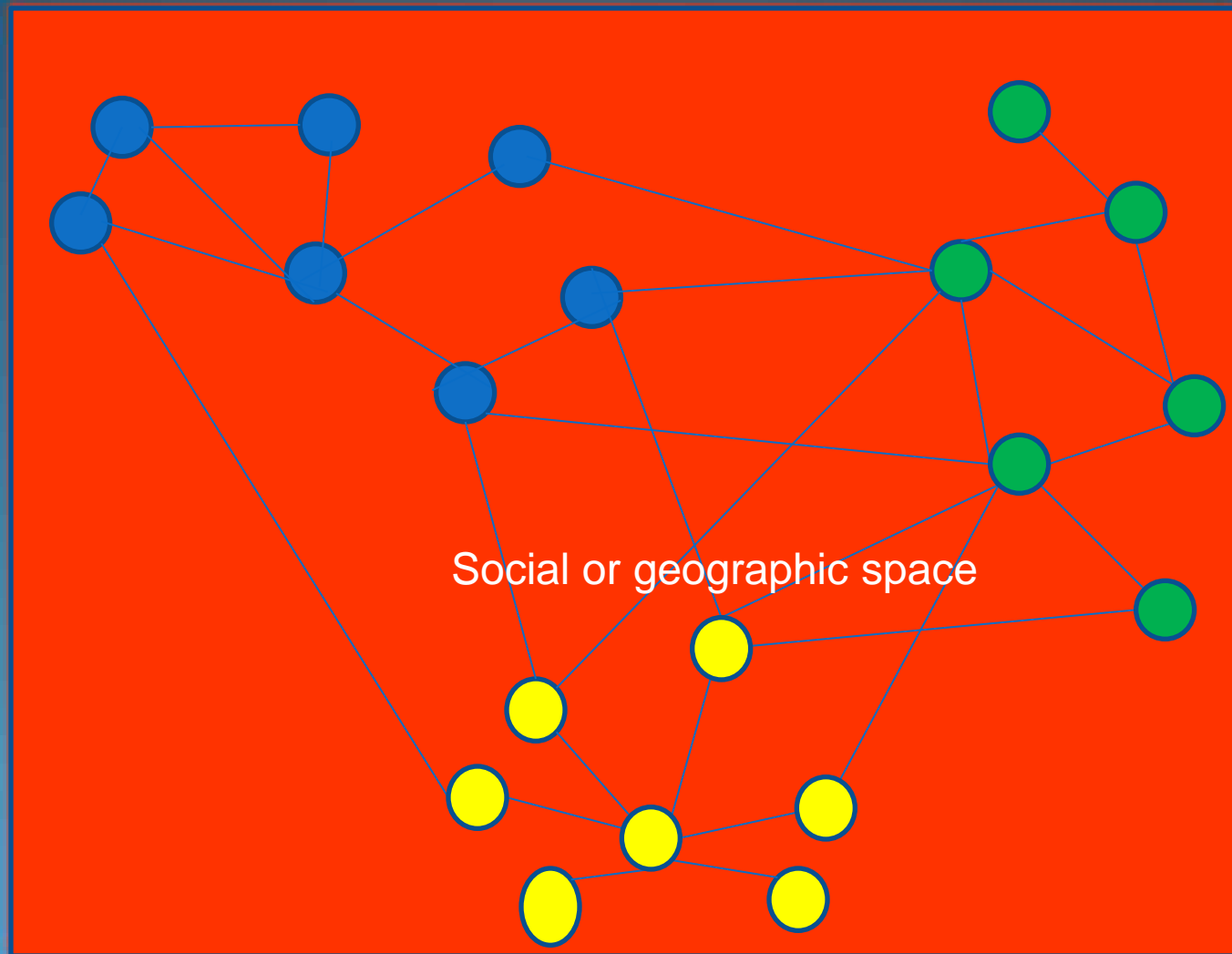


- Social influence spans social domains
- Network variables are treated as attributes of respondents
- These are used to predict outcomes (or treated as outcomes)



# Whole network: Bounded Social Phenomena

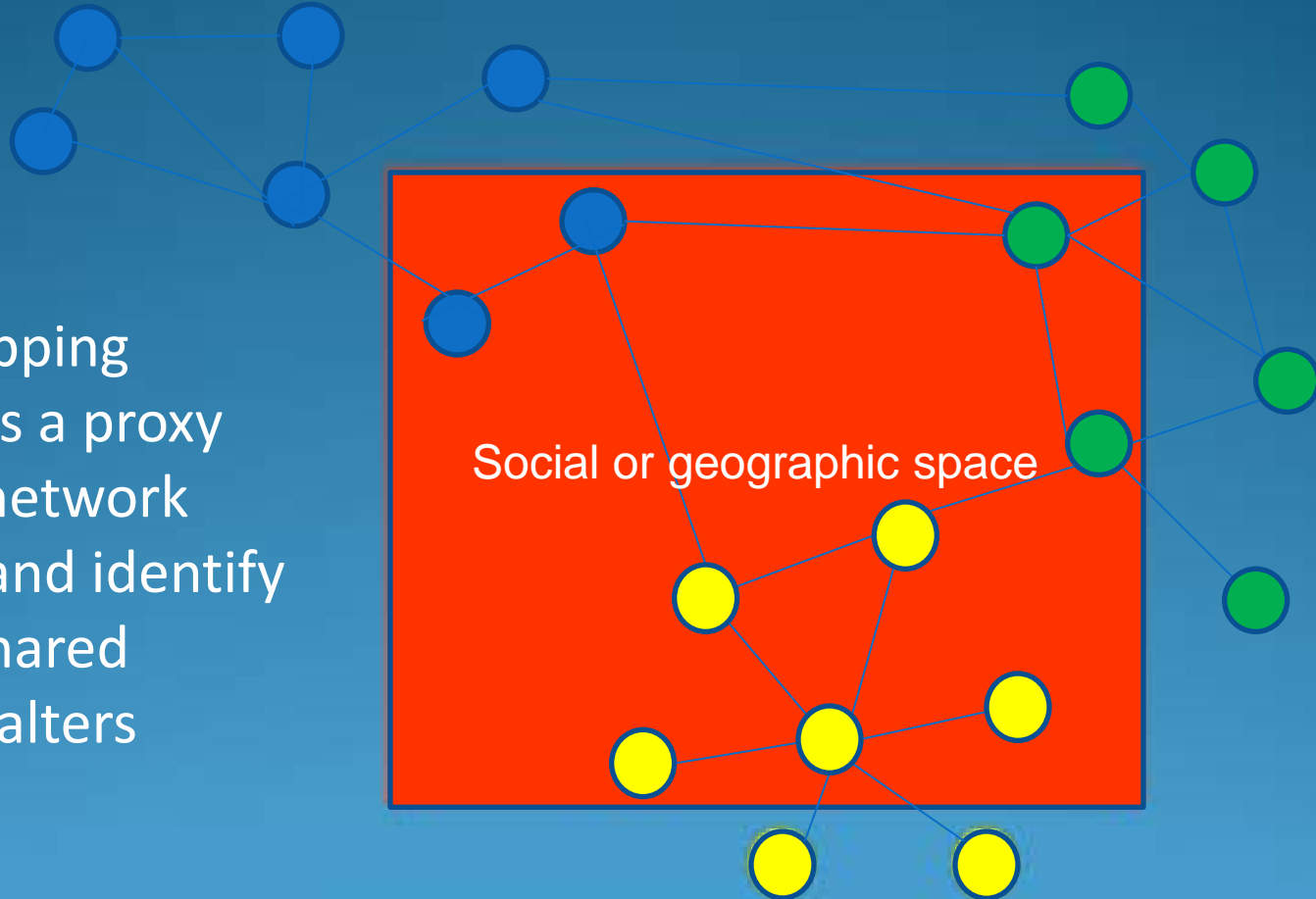
Focus on  
social  
position  
within the  
space



**Example:** Predict depression among seniors using social position in a **Retirement Home**

# Overlapping personal networks: Bounded and Unbounded Social Phenomena

Use overlapping networks as a proxy for whole network structure, and identify mutually shared peripheral alters



**Example:** Predict depression among seniors based on social position within a **Retirement Home** and contacts with alters **outside the home**

# A note on the term “Egocentric”

- Egocentric means “focused on Ego”.
- You can do an egocentric analysis **within a whole network**
  - See much of Ron Burt’s work on structural holes
  - See the Ego Networks option in Ucinet
- *Personal networks* are egocentric networks within the whole network of the World (but not within a typical, theoretically bounded whole network).

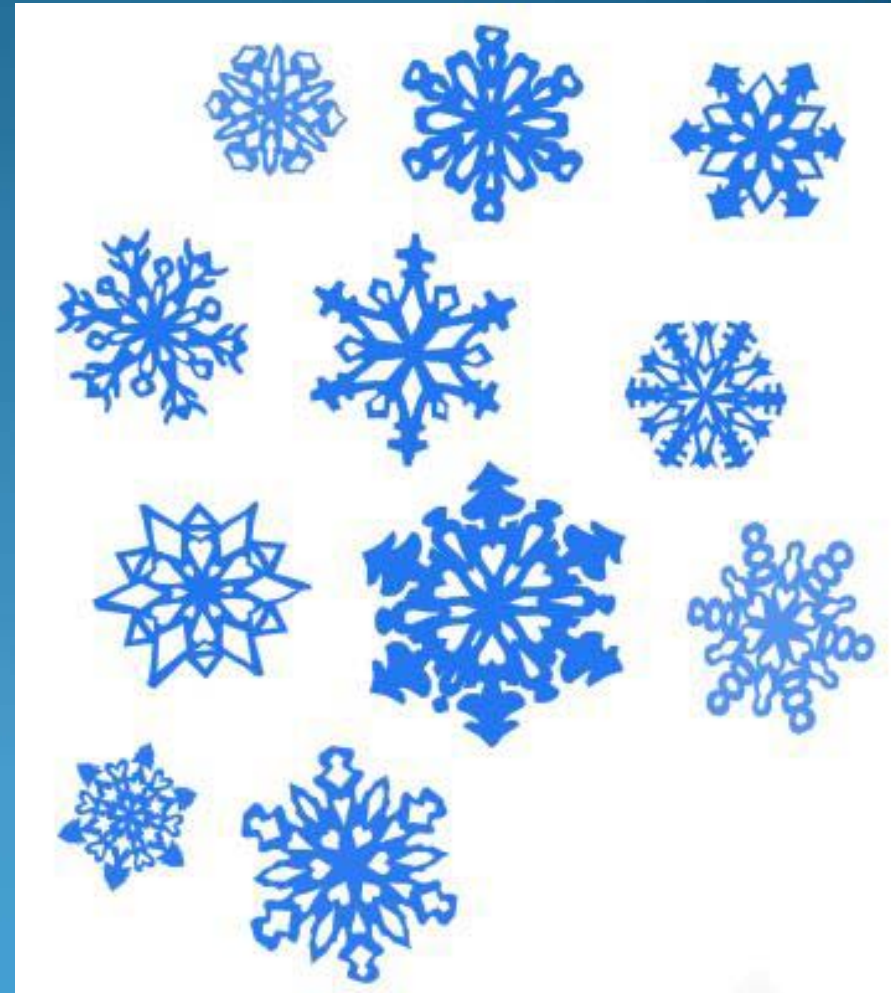
# Summary so far

- **When to use social networks**
  - If the phenomenon appears to have social influences whose mechanisms are not well understood
- **When to use whole networks**
  - If the phenomenon of interest occurs within a socially or geographically bounded space.
  - If members of the population not independent, tend to interact.
- **When to use personal networks**
  - If the phenomena of interest affects people irrespective of a particular bounded space.
  - If the members of population are independent of one another.
- **When to use both**
  - When members of the population are not independent and tend to interact, but influences from outside may also be important.

# **1. Introduction to Social Networks (iii). What are we measuring?**

# Social networks are unique

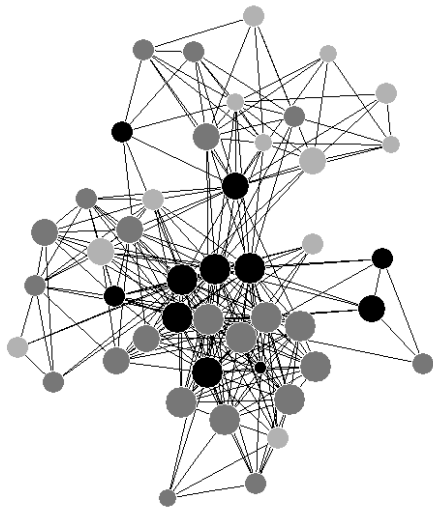
- No two networks are exactly alike
- Social contexts may share attributes, but combinations of attributes and ties make each one different
- We assume that differences across respondents influence attitudes, behaviors and conditions



# Content and shape of a social network may be influenced by many variables

- **Ascribed characteristics**
  - Sex
  - Age
  - Race
  - Place of birth
  - Family ties
  - Genetic attributes
- **Chosen characteristics**
  - Income
  - Occupation
  - Hobbies
  - Religion
  - Location of home
  - Amount of travel

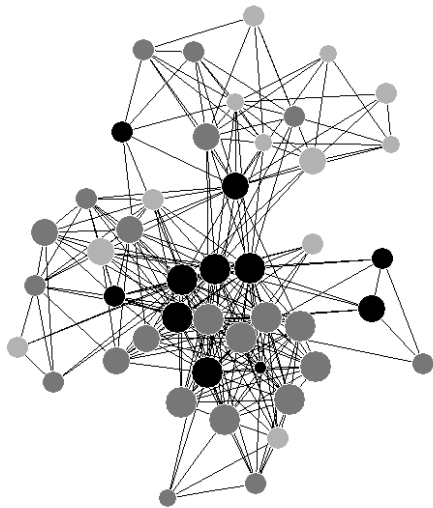
# How a whole network is formed



- Formal responsibilities
- Ascribed characteristics (e.g., sex) and chosen characteristics (e.g., hobby) may interact with culture to effectively screen potential alters
- Ascribed characteristics may influence chosen characteristics, but not the reverse



# How a personal network is formed



- Social responsibilities
- Ascribed characteristics (e.g., sex) and chosen characteristics (e.g., hobby) may interact with culture to effectively screen potential alters
- Ascribed characteristics may influence chosen characteristics, but not the reverse

# Types of social network data

- **Composition:** Variables that summarize the attributes of people in a network.
  - Proportion with a given responsibility.
  - Proportion who are women.
  - Proportion that provide emotional support.
- **Structure:** Metrics that summarize structure.
  - Number of components.
  - Betweenness centralization.
  - Subgroups.
- **Composition and Structure:** Variables that capture both.
  - Sobriety of most between alter.
  - Is person with highest degree & betweenness the same?

# Personal Network Composition

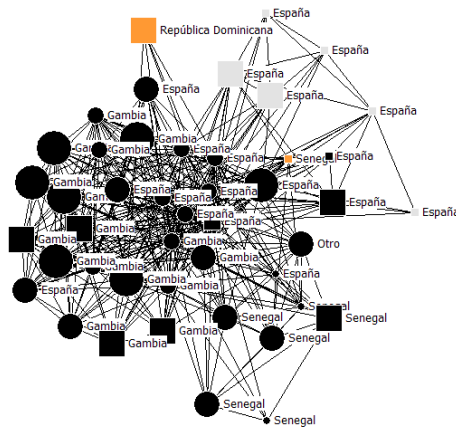
## Attribute summary file

Name	Closeness	Relation	Sex	Age	Race	Where Live	Year_Met
Joydip_K	5	14	1	25	1	1	1994
Shikha_K	4	12	0	34	1	1	2001
Candice_A	5	2	0	24	3	2	1990
Brian_N	2	3	1	23	3	2	2001
Barbara_A	3	3	0	42	3	1	1991
Matthew_A	2	3	1	20	3	2	1991
Kavita_G	2	3	0	22	1	3	1991
Ketki_G	3	3	0	54	1	1	1991
Kiran_G	1	3	1	23	1	1	1991
Kristin_K	4	2	0	24	3	1	1986
Keith_K	2	3	1	26	3	1	1995
Gail_C	4	3	0	33	3	1	1992
Allison_C	3	3	0	19	3	1	1992
Vicki_K	1	3	0	34	3	1	2002
Neha_G	4	2	0	24	1	2	1990
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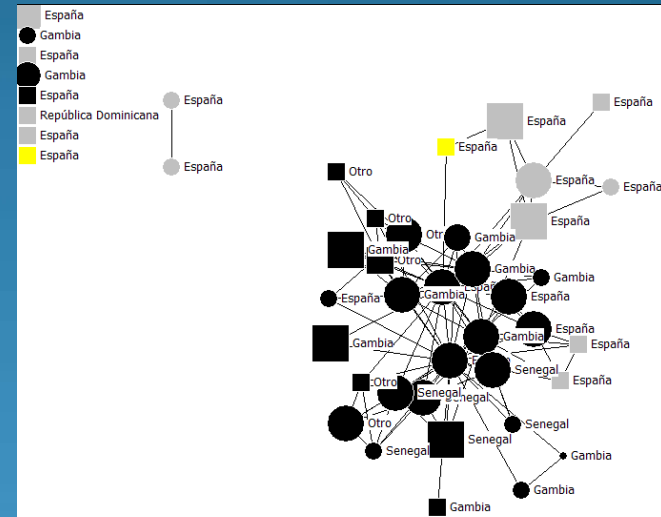
# Social network composition variables

- \* Proportion of social network that are women ...
- \* Average age of network ...
- \* Proportion of strong ties ...
- \* Average number of years knowing each other ...

# Percent of alters from host country (personal networks)



36 Percent Host Country



44 Percent Host Country

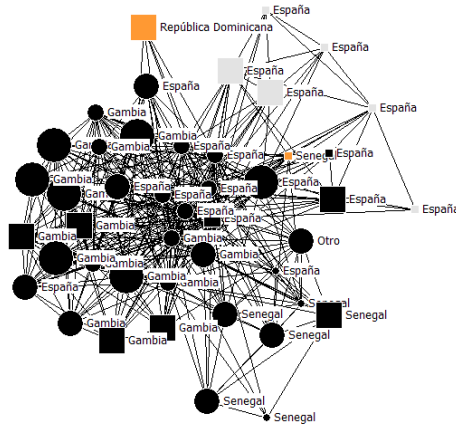
- Percent from host country captures composition
- Does not capture structure



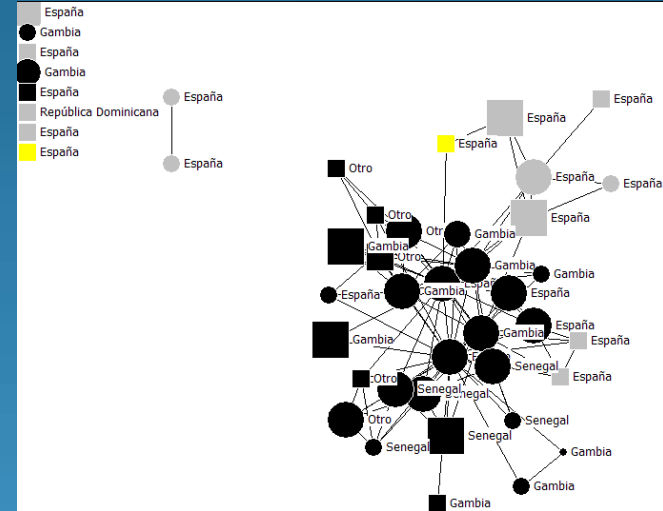
# Some Network Structural Metrics

- Degree Centrality is the number of alters any given alter is directly connected to.
- Degree Centralization is the extent to which the network structure is dominated by a single alter in terms of degree.
- Closeness Centrality is the inverse of the distance from that alter to all other alters.
- Closeness Centralization is the extent to which the network structure is dominated by a single alter in terms of closeness.
- Betweenness centrality for a given alter is the number of geodesics (shortest paths) between all alters that the alter is on.
- Betweenness Centralization is the extent to which the network structure is dominated by a single alter in terms of betweenness.
- Components are connected graphs within a network.
- Cliques are maximally complete subgraphs.
- Isolates are alters who are not tied to anybody else.

# Components



Components 1

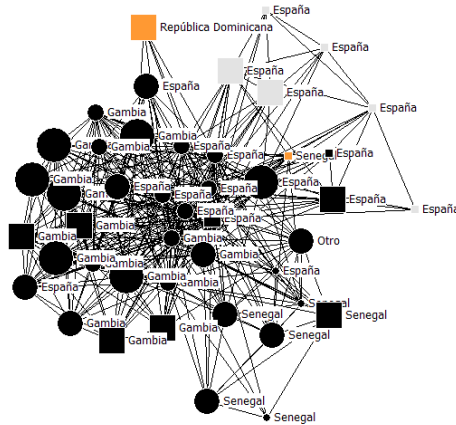


Components 10

- Components captures separately maintained groups (network structure)
- It does not capture type of groups (network composition)

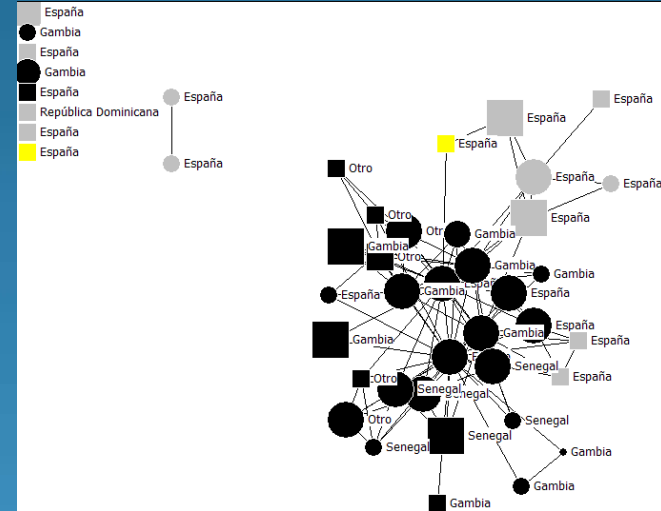


# Average Betweenness Centrality



Average Betweenness 12.7

SD 26.5

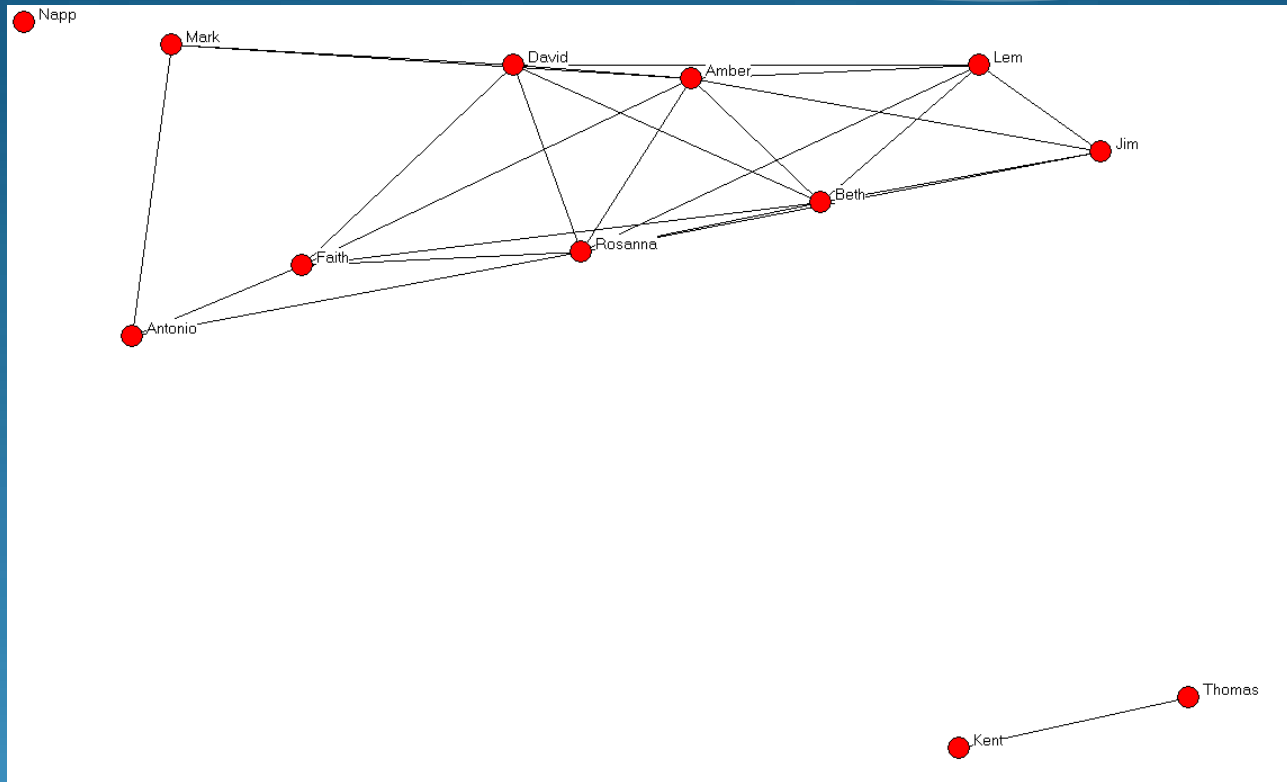


Average Betweenness 14.6

SD 40.5

- Betweenness centrality captures bridging between groups
- It does not capture the types of groups that are bridged

# Structural measures



- Three network components
- Beth is most degree central
- Amber is most between central
- Thomas and Kent are structurally equivalent
- Removal of David maximizes network fragmentation

# Interventions?

- People often have little choice over who is in a **whole network**
- By showing people how the whole network functions, changes can be made to benefit the group
- Individuals may use the knowledge of their social position to their advantage
- People often have a lot of choice over who is in their **personal network** (but they may not know it)
- Based on ascribed characteristics and chosen characteristics, some people may make conscious choices about the type of people they meet and who they introduce

# Some applications of sociocentric network analysis

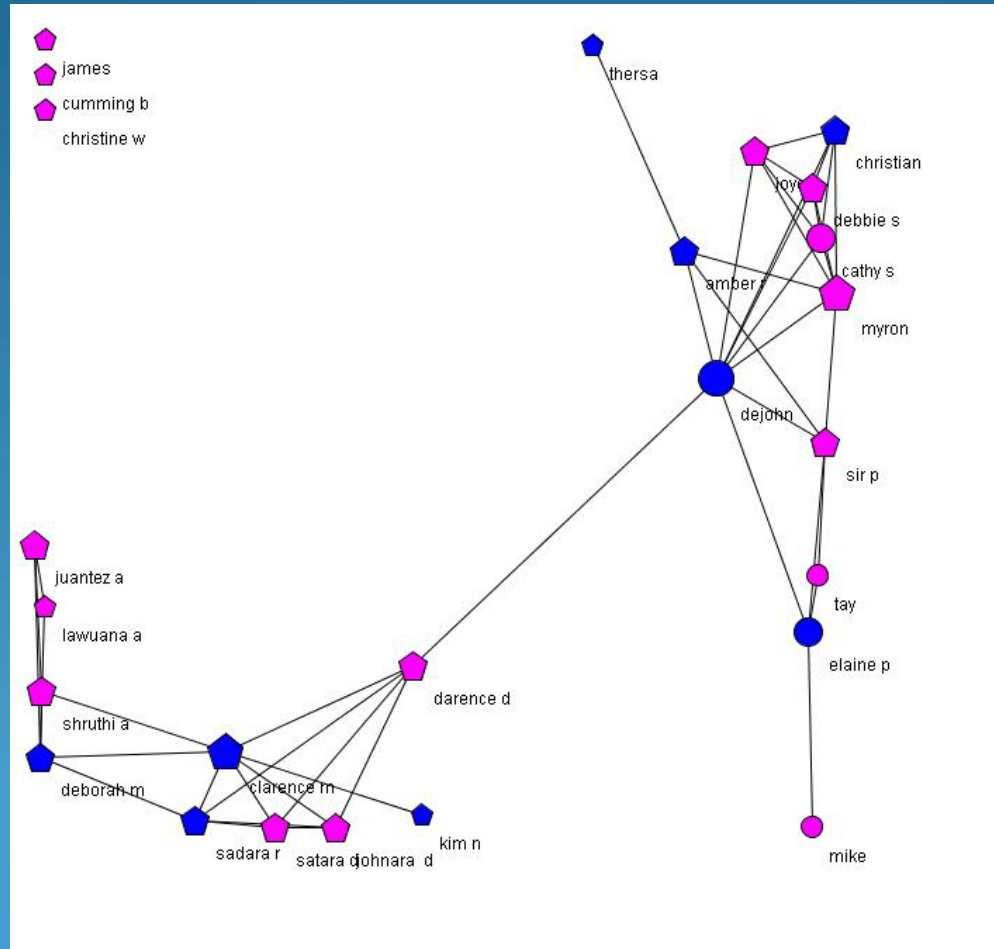
- Structure within organizations
- Structure between organizations
- Terrorist networks
- Diffusion of innovations

# Many variables of interest to social scientists thought to be influenced by personal networks

- Social outcomes
  - Personality
  - Acculturation
  - Well-being
  - Social capital
  - Social support
- Health outcomes
  - Smoking
  - Depression
  - Fertility
  - Obesity



# How could we intervene in this network?



## **2. Designing a Social Network Study**

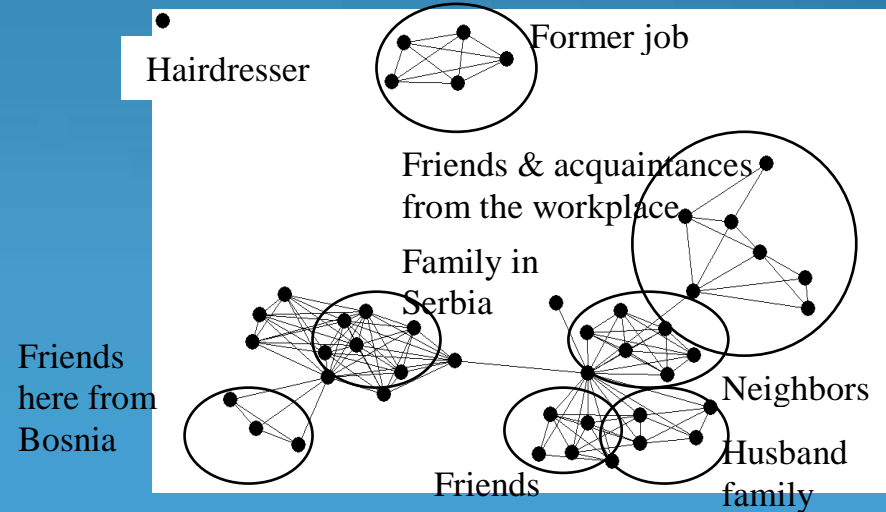
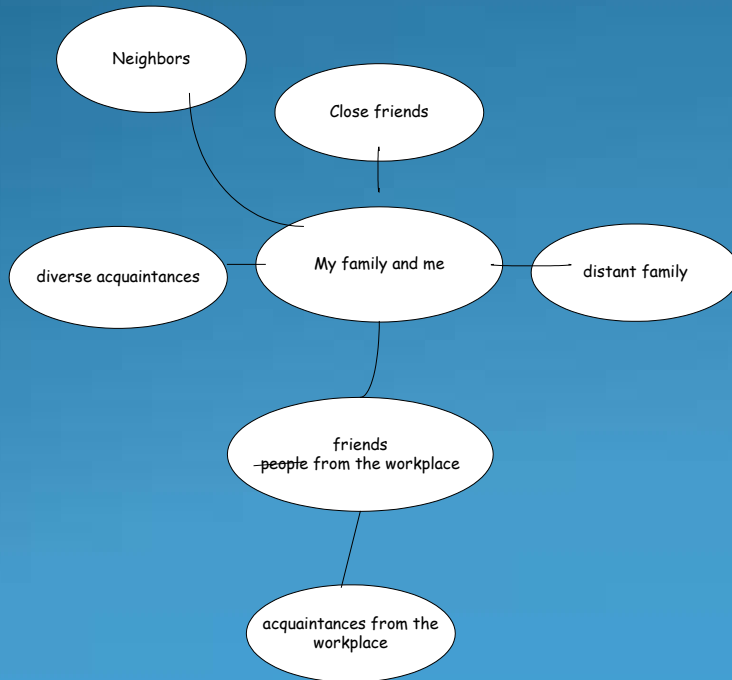
**Goals, design, sampling, bias & name  
generators**

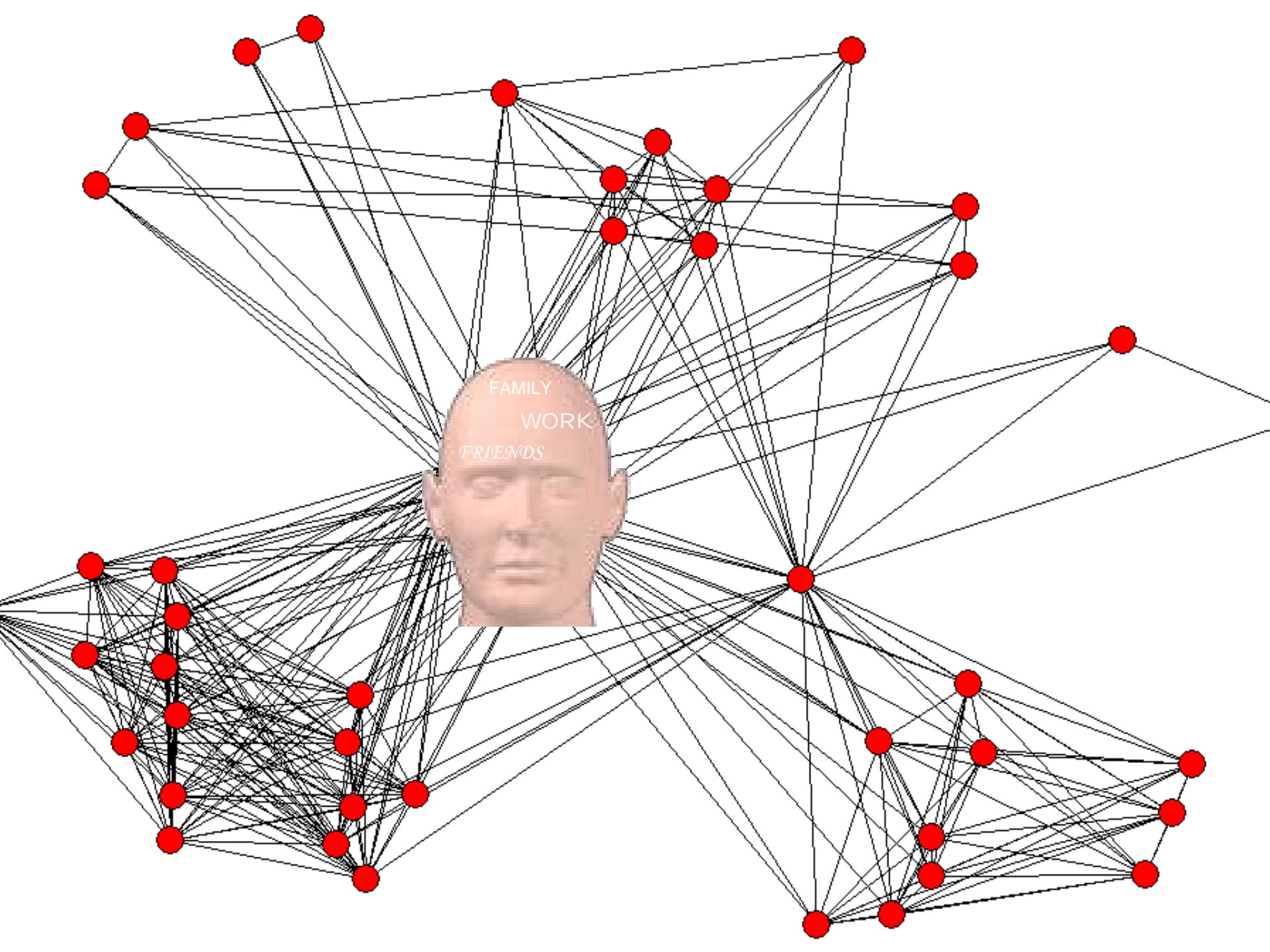
# Make sure you need a network study!

- Personal network data are time-consuming and difficult to collect with high respondent burden
- Sometime network concepts can be represented with proxy questions
  - Example: “Do most of your friends smoke?”
- By doing a network study you assume that the detailed data will explain some unique portion of variance not accounted for by proxies
- It is difficult for proxy questions to capture structural properties of networks



# Sometimes the way we think and talk about who we know does not accurately reflect the social context





# Prevalence vs. Relationships

- Estimate the prevalence of a personal-network characteristic in a population
  - Sampling should be as random and representative as possible.
  - Sample size should be selected to achieve an acceptable margin of error.
  - Example: Sample 411 personal networks to estimate the proportion of supportive alters with a five percent margin of error.
- Analyze the relationship between personal-network characteristic and something you want to predict?
  - Sampling should maximize the range of values across variables to achieve statistical power.
  - Example: Sample 200 personal networks of depressed and 200 of not depressed seniors to test whether the number of isolates predicts depression.

# Sociocentric network data collection

- Matrix representing ties between network members
- Observed data (e-mail transactions, telephone calls, attendance at events)
- Ask network members to evaluate tie (Scale of 0 to 5, how well do you know, how close are you)

# Steps to a personal network survey

## Part of any survey

1. Identify a population.
2. Select a sample of respondents.
3. Ask questions about respondent.

## Unique to personal network survey

4. Elicit network members (name generator).
5. Ask questions about each network member (name interpreter).
6. Ask respondent to evaluate alter-alter ties.
7. Discover with the informant new insights about her personal network (through visualization + interview).

# Selecting a Population

- Choose wisely, define properly – this largely will determine your *modes* of data collection and the *sampling frame* you will use to select respondents.
- Certain populations tend to cluster spatially, or have lists available, while others do not
- Race and ethnicity may seem like good clustering parameters, but are increasingly difficult to define.

# Modes of Survey Research

- Face-to-face, telephone, mail, and Web (*listed here in order of decreasing cost*)
- The majority of costs are not incurred in actually interviewing the respondent, but in finding available and willing respondents
- Depending on the population there may be no convenient or practical *sample frame* for making telephone, mail, or email contact
- Data management can be particularly costly

# Sample Frames

- This can be thought of as a list representing, as closely as possible, all of the people in the population you wish to study.
- The combination of population definition and survey mode suggests the sample frames available.
- Sample frames may be census tracts, lists of addresses, membership rosters, or individuals who respond to an advertisement.



# Writing Questions

- Be mindful of *levels of measurement* and the limitations/advantages each provides (nominal, ordinal, interval and ratio)
- Ensure that your questions are *valid*, brief, and are not *double-barreled* or *leading*
- You can ensure survey efficiency by utilizing questionnaire authoring software with *skip logic*

# Name generators

- Only ego knows who is in his or her network.
- Name generators are questions used to elicit alter names.
- Elicitation will always be biased because:
  - Names are not stored randomly in memory
  - Many variables can impact the way names are recalled
  - Respondents have varying levels of energy and interest

# Acculturation Example

- Our prompt (pretested) for freelisting 45 alters:

*“You know them and they know you by sight or by name. You have had some contact with them in the past two years, either in person, by phone, by mail or by e-mail, and you could contact them again if you had to.”*

- Still, migrants often didn't understand that alters who didn't live in the host country could be listed

# Other Elicitation Options

- You may want to let alters keep listing names to get a network size variable, but it is hard to know why people stop listing alters (fatigue, memory, etc.)
- More likely, you will want less alters named, since personal network data collection is very intensive
- You can use specialized prompts to more randomly elicit fewer alters or only ask questions about every  $N$ th alter named, but keep in mind that eliciting fewer alters will *unintentionally* bias your sample

# Variables that might impact how names are recalled

- **The setting**
  - Home
  - Work
- **The use of external aids**
  - Phone
  - Address book
  - Facebook
  - Others sitting nearby
- **Serial effects to naming**
  - Alters with similar names
  - Alters in groups
- **Chronology**
  - Frequency of contact
  - Duration

# Ways to control (select) bias

- **Large sample of alters**
  - Name 45 alters.
- **Force chronology**
  - List alters you saw most recently.
  - Diary.
- **Force structure**
  - Name as many unrelated pairs and isolates.
- **Force closeness**
  - Name people you talk to about important matters.
- **Attempt randomness**
  - Name people with specific first names.

# Limited or unlimited

- **Many reasons respondents stop listing alters.**
  - They list all relevant alters.
  - Memory.
  - Fatigue.
  - Motivation.
- **The number of alters listed is not a good proxy for network size**
- **There are other ways to get network size.**
  - RSW.
  - Network Scale-up Method.
- **Structural metrics with different numbers of alters requires normalization.**
- **Sometimes is preferable to have respondents do the same amount of work.**

# Names or initials

- Some Human Subjects Review Boards do not like alter names being listed.
  - Personal health information.
  - Revealing illegal or dangerous activity.
- With many alters ego will need a name that they recognize later in the interview.
- First and last name is preferable or *WilSha* for William Shakespeare.



# Personal Network Peculiarities

- Respondents may want to list dead people, long-lost friends, TV characters, or celebrities
- They may have compromised memories
- You may want to limit alters to people who provide respondents specific kinds of support

# Asking Questions about Alters

- Try to avoid having respondents make uninformed guesses about people they know
- Still, some researchers argue it is really the respondents' *perception* of their alters that influences their own attitudes and behaviors
- Figuring out how well a person knows their alters and the nature of their relationships is the most challenging interpretive activity

# How well do you know...

- Find out long the respondent has known the alter (duration) as well as their frequency and main mode of contact
- Research suggests that tie strength is best assessed using questions about *closeness*
- People tend to be less close to people they do not like, even though they may know a lot about them
- Asking *how* respondents know someone is also helpful – “How did you meet?” (school, work, etc.)

# Acculturation Example

*45 alters*

*x 13 questions about each*

*= 585 total items*

- Demographics (age, sex, CoO, distance, etc.)
- Closeness of respondent/alters relationship (1-5)
- How they met (family, work, neighbor, school)
- Communication (modes, intimacy, trust )
- Do they smoke?

# Analyzing Compositional Data

- Create a summary of each variable for each respondent, keeping in mind their levels of measurement
- Merge the summarized variables onto the respondent-level data to explain characteristics of respondents
- Measure the extent to which alter characteristics match the respondent (*ego correspondence, homophily*)
- You can then perform frequencies, cross tabulations, and create *dummy variables* to be used in regressions

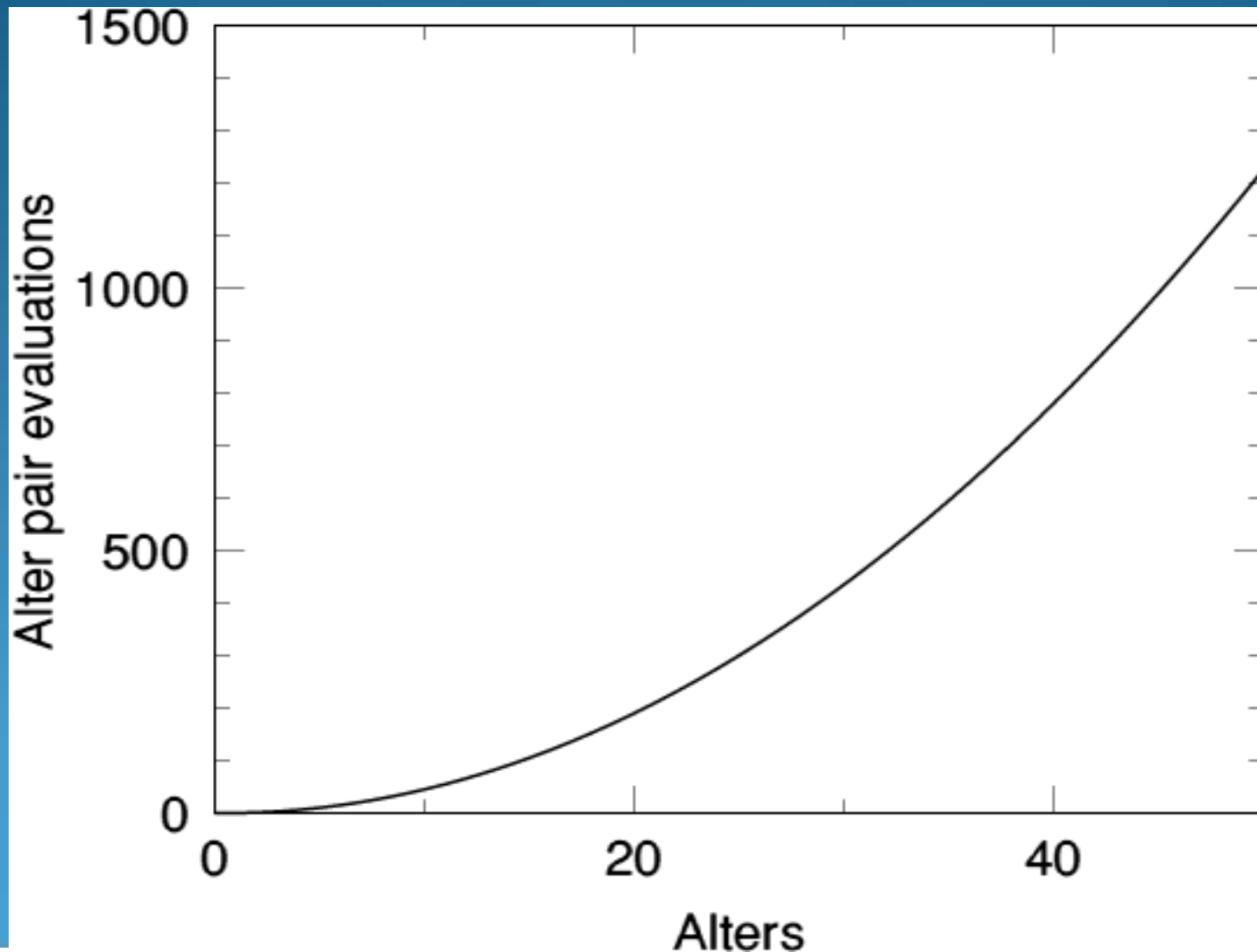
# Effect of compositional variables on migrant smoking

Composition Variable	% Does Not Smoke	% Smoke
Proportion of alters with listed tie strength		
Level 1	.12	.10
Level 2	.24	.26
Level 3**	.23	.27
Level 4	.18	.17
Level 5	.22	.20
Proportion of alters of listed sex		
Male***	.52	.57
Female ***	.47	.42
Proportion of alters that are confidantes		
Yes***	.39	.47
No***	.61	.53
Proportion of alters that are smokers		
Yes***	.19	.35
No***	.81	.65

# Asking about Ties Between Alters

- This is a time consuming process... however,
- If you limit yourself to network composition, you assume the effects of social context on attitudes, behaviors and conditions are more about who occupies a personal network than about how they are structurally arranged around the respondent
- Still, keep in mind the exponential nature of your chosen alter sample size...

*“How likely is it that Alter A and Alter B talk to each other when you are not around? That is, how likely is it that they have a relationship independent of you?”*





# Questions about Accuracy

- Some researchers do not believe respondents can report alter-tie data with any accuracy... *We do*
- It is easier for respondents to report on the existence of ties between alters they know from *different social domains* than on ties between people they may not know well from *a single domain*
- Personal networks are more attuned to the larger structures of different groups and bridging between groups than subtle interactions within groups

# Acculturation Example

Network Structural Metric	Does not smoke	Smokes
Average degree centrality***	29	23
Average closeness centrality	142	149
Average betweenness centrality	1.5	1.7
Components	1.4	1.5
Isolates*	4	6

- migrants with denser networks are more likely to smoke
- but wait... does smoking cause the structural differences or do the structural differences cause smoking?

# Some Network Structural Procedures

- *Multi-dimensional scaling* is a procedure used to determine the number and type of dimensions in a data set.
- *Factor Analysis* (also called principal components) is a procedure that attempts to construct groups based on the variability of the alter ties. Also used in survey research.
- *Cluster analysis* is a family of statistical procedures designed to group objects of similar kinds into categories.
- *Quadratic Assignment Procedure* is a *bootstrap method* used to determine whether two networks are different.

# Combining Composition and Structure

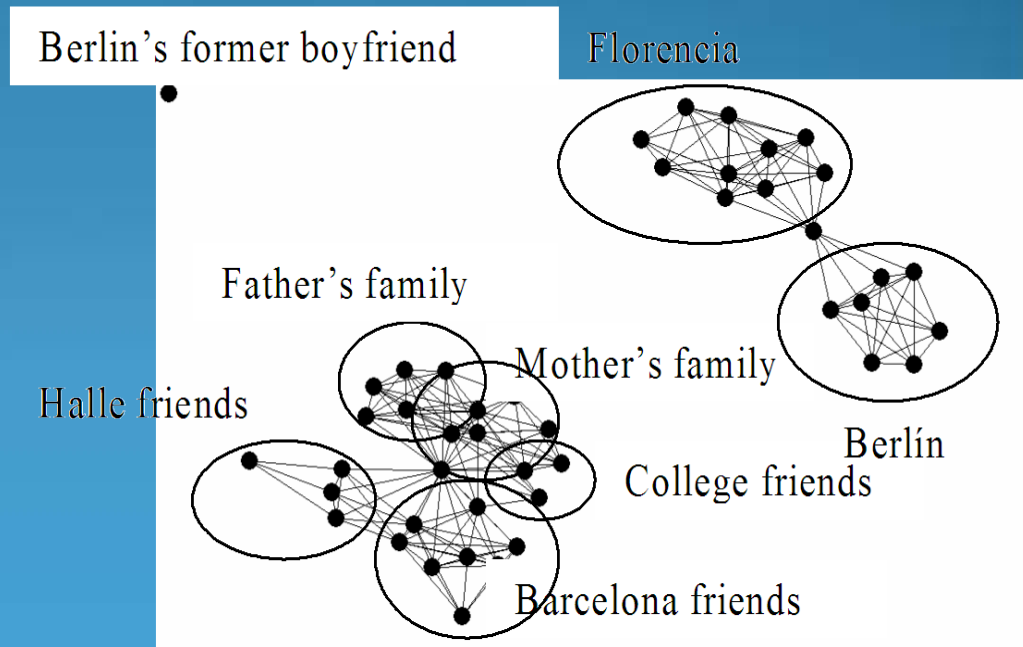
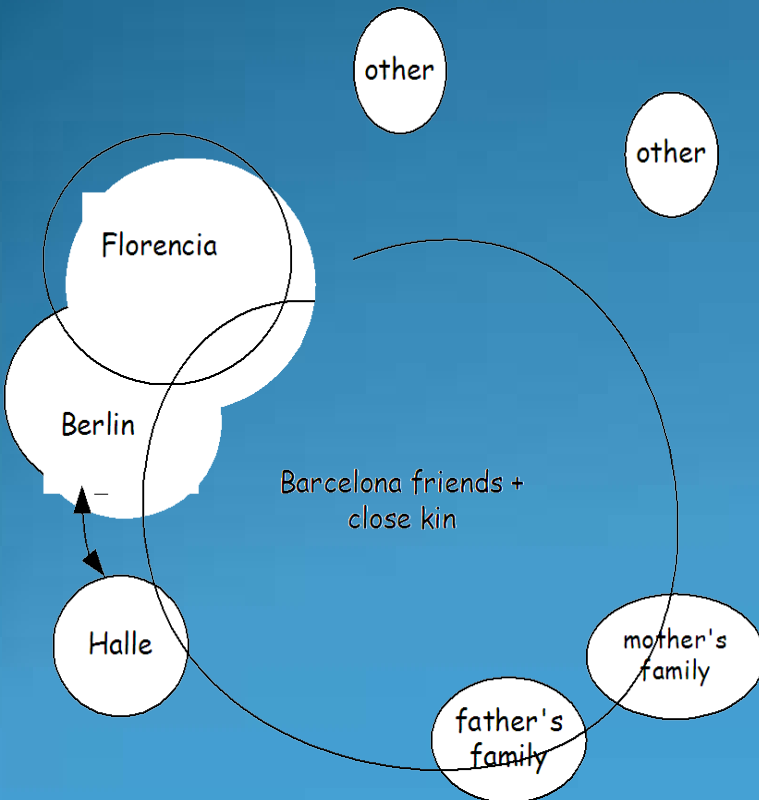
- Treating each variable independently assumes composition and structure do not interact
- You can only combine structural variables with compositional variables when they are calculated at the level of the alter...
  - Centrality Scores
  - Density
  - whether or not the alter is an isolate

# Personal Network Visualizations

Hand-Drawn

vs.

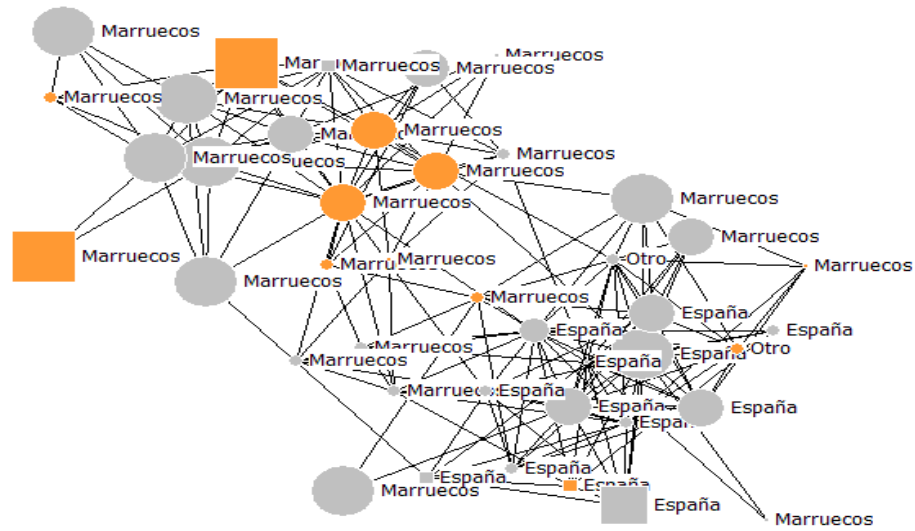
Structural



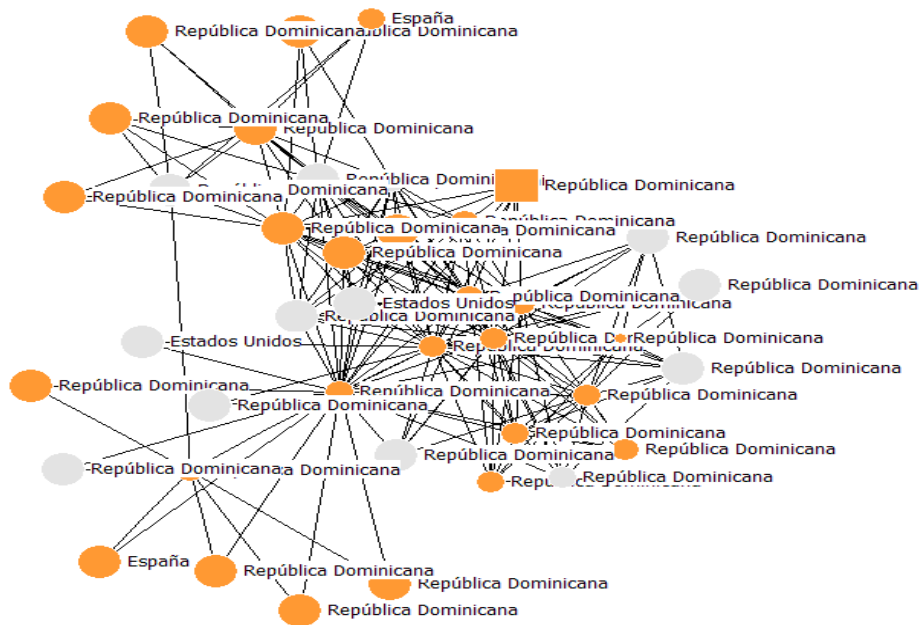
# Some Notes on Visualization

- Network visualization lets you quickly identify relationships between several compositional and structural variables simultaneously
- Visualization should be guided by research question
- The way different software algorithms places nodes with respect to one another is meaningful
- Nodes and ties can often be sized, shaped, and colored in various ways to convey information

● España



- República Dominicana
- República Dominicana
- República Dominicana
- República Dominicana
- República Dominicana



- Break!!



# 3. Workshop with EgoNet

# EgoNet

- Egonet is a program for the collection and analysis of egocentric network data.
- It helps you create the questionnaire, collect data, and provide global network measures and matrices.
- It also provides the means to export data that can be used for further analysis by other software.

# EgonetQB Design Screenshot

The screenshot displays the EgoNetQB 2.0 software interface. The window title is "EgoNetQB 2.0 - EgoNet.gdb". The menu bar includes "File", "Study", and "Help". A warning message at the top right states: "SURVEY DESIGN HAS NOT BEEN FINALIZED FOR DATA COLLECTION Sample study".

**Left Panel (Tree View):**

- Select Study: [Dropdown menu]
- All Studies
  - Sample study
    - Questions about Ego
      - E1 - How old are you?
      - E2 - Please select you
    - Name Generator(s)
      - Good friends - Please
    - Questions about Alters
      - A1 - What gender is \$
    - Alter tie evaluation
      - AT1 - Does \$\$ socializ

**Main Panel (Form Fields):**

- General:** Study Name: Sample study
- Nominee List:** Number of Nominees: 1000 for each interview. Alter Symbol: \$\$  
[ ] nominees from each interview
- Alter/Alter Tie Display:** Alter Question Order Option: All Q's for one alter first; Alter Tie Question Order Option: All Q's for one alter pair first
- Validation and Finalizing:** [Empty text area]

# Study design

- When you create a new Study, the database is saved in a file named **EgoNet.gdb** (see next slide).
- The study has four modules:
  - Ego description,
  - Ego-Alters' name generator,
  - Alters description
  - Alter-Alter relationship.

# EgonetQB Design Screenshot

EgoNetQB 2.0 - EgoNet.gdb

File Study Help

Select Study:

- All Studies
  - Sample study
    - Questions about Ego
      - E1 - How old are you?**
      - E2 - Please select you
    - Name Generator(s)
      - Good friends - Please
    - Questions about Alters
      - A1 - What gender is \$
    - Alter tie evaluation
      - AT1 - Does \$\$ socializ

**SURVEY DESIGN HAS NOT BEEN FINALIZED FOR DATA COLLECTION**

Question Details

Text: How old are you?

Variable Name: E1  
5-character limit for older versions of SPSS

Answer Details

Answer Type: Numeric (dropdown) Selections... (button)

Auto-Add Answer  Refused to answer Edit Auto Choices... (button)

Question Logic

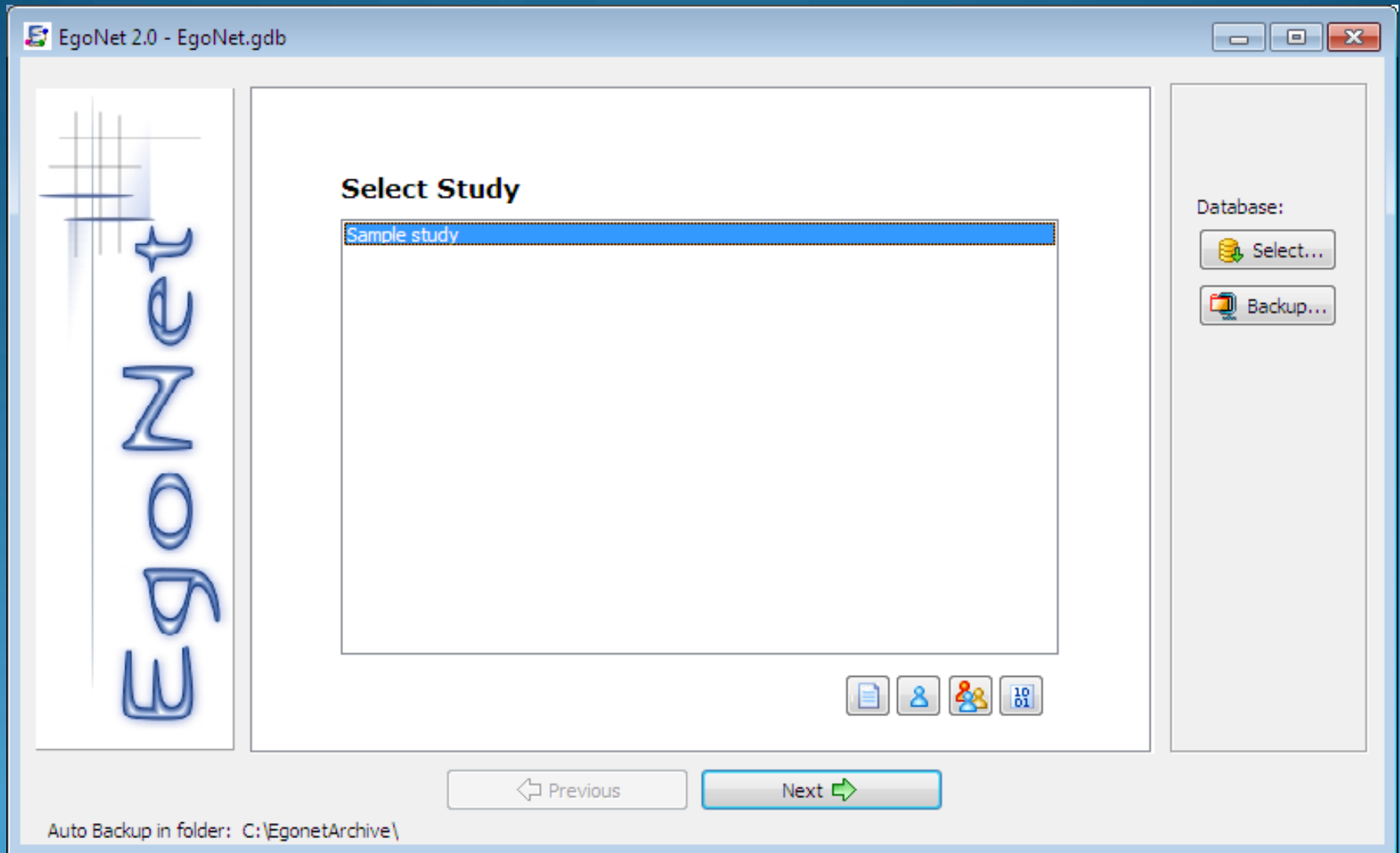
No skip logic  
 Define skip logic

If answer: (dropdown) (text box)

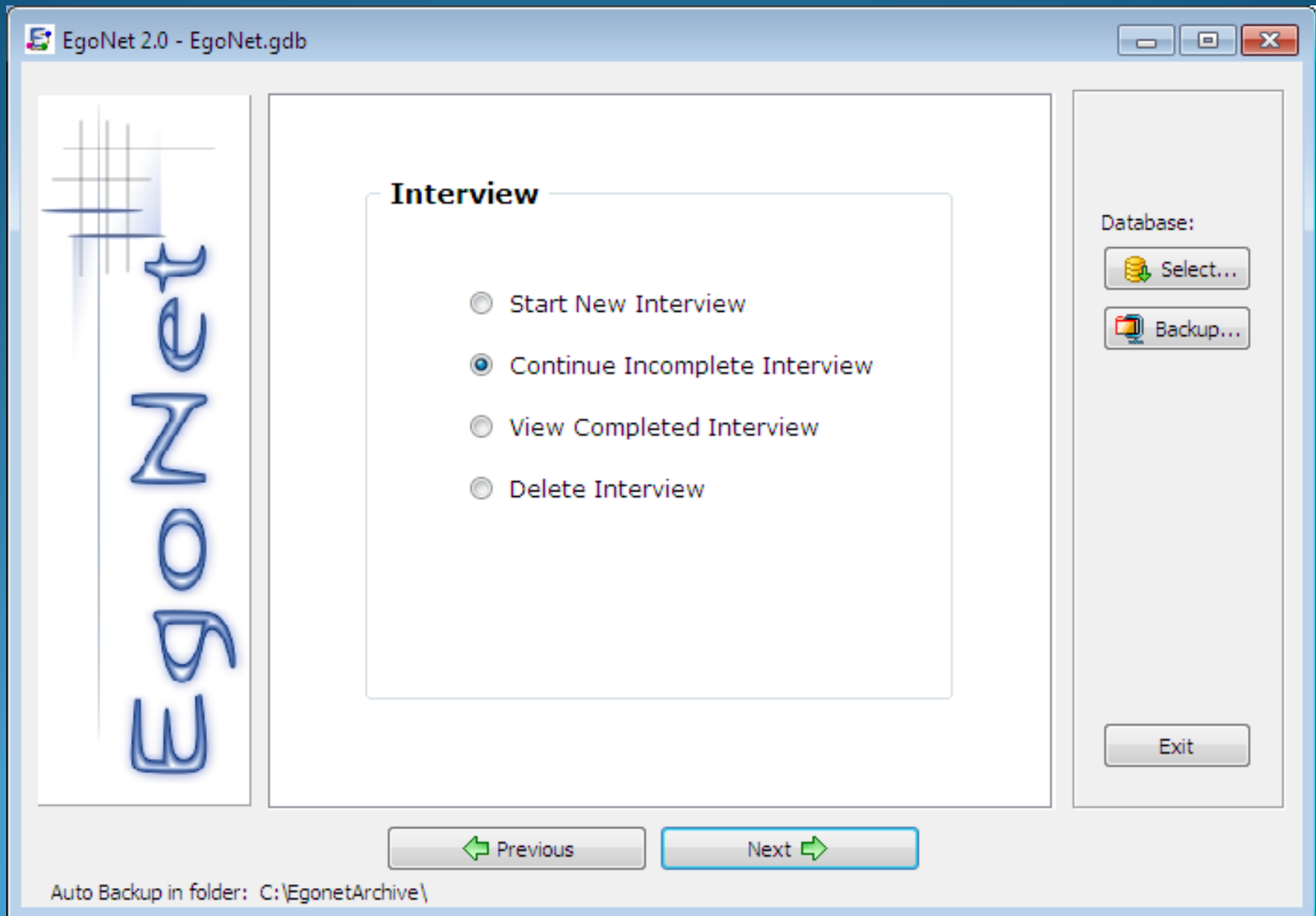
Then:  
 Go to Question (dropdown)  
 End Section

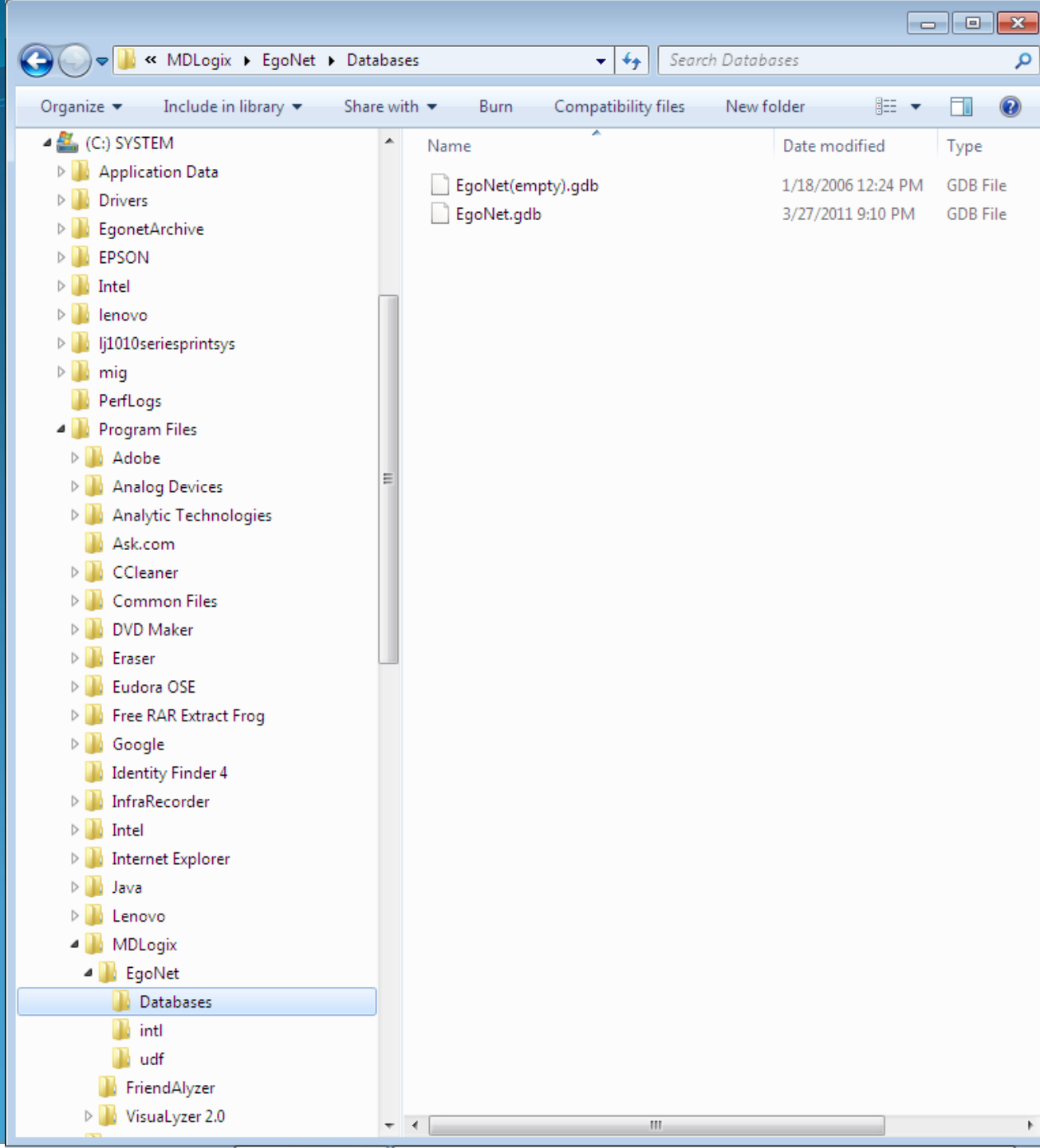
Create New Ego Item Delete this Ego Item

# Egonet Design Screenshot



# Egonet Design Screenshot







# Tutorial in EgoNet

# Design Your Own Study

- Ego question or two
- Alter elicitation question
- Alter attribute questions (relational and direct attributes)
- Alter tie question

# Analysis in EgoNet

Personal network of 123 - don smith

File Display Analysis Windows Help

Sample study

- Questions about Ego
- Name Generator(s)
- Questions about Alters
- A1 - What gender (selected)
- Alter tie evaluation

What gender is **bob dillon**?

Node Centrality

The graph is not connected !  
The graph is undirected.

Node types: actor  
Current relations: "Does \$\$ socialize with \$?"

Node	Degree	Degree normalized
alan howe	2	50.000%
bob dillon	1	25.000%
eric kickton	1	25.000%
jane doe	1	25.000%
doris dayton	1	25.000%

Select Relation/Type

Relation (type of link)

Does \$\$ socialize with \$?

Link attribute: Rating

Select attribute value(s):

Don't know  
 No  
 Yes

Network Properties

The graph is not connected !  
The graph is undirected.

Node types: actor  
Total nodes: 5  
Enabled nodes: 5  
Isolates: 0  
Dyads: 1  
Components 3+: 1  
Groups: 0

Relations: "Does \$\$ socialize with \$?"  
Current relations: "Does \$\$ socialize with \$?"  
Total links: 10  
Current links: 3  
Current enabled links: 3

Link weight summary:

* link type:	AVG	STD	MIN	MAX
Does \$\$ socialize with \$?	1.000	0.000	1.000	

Diameter: 2  
Average geodesic (distance): 1.2500  
Density: 0.3000  
Degree Centralization: 116.667%  
Closeness Centralization: 427.778%  
Betweenness Centralization: 16.667%

Node attributes summary:

* numeric:	AVG	STD	MIN	MAX
A1				
Male	3	60.000%		
Female	2	40.000%		

Link attributes summary:

* numeric:	AVG	STD	MIN	MAX
Rating				
Yes	3	100.000%		

bob dillon

eric kickton

doris dayton

alan howe

jane doe

Question

Nodes: 5 Links: 3 Use Dbl-click to add or edit a node/link; right button - add link/access menu; left button - drag/select/disable node(s).

Thanks!