

# Social Network Analysis

## 2: Research design

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Mechanisms, processes, network

Research design

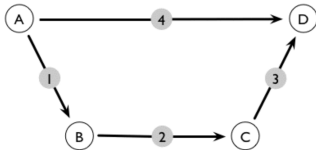
Sociocentric vs. egocentric

Let's get practical!

Background

# Mechanisms, processes, network

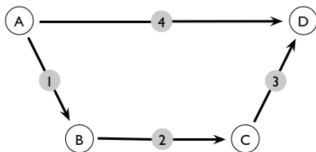
## Social mechanisms



Coleman (1994)

- ▶ Social network research doesn't commit to any particular paradigm
- ▶ Basic assumption: actors' intentionality
- ▶ *Analytical* approach to sociology: Explaining macro-level social phenomena through micro-level causal mechanisms (Hedström and Bearman 2009)
- ▶ Network analysis: testing *relational* processes implied by hypothetical causal mechanisms
- ▶ Mechanisms > relational processes (behaviour)

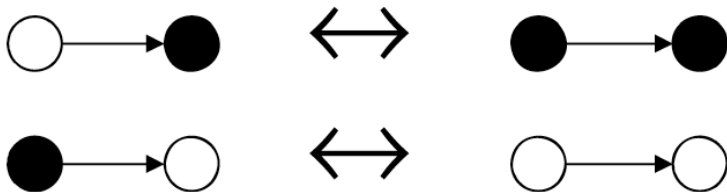
## Network processes



- ▶ Social *influence*: Networks shape actors' opportunities to:
  - ▶ interact with others
  - ▶ access resources controlled by others (e.g., material goods, information), inc. being exposed to others' behaviour, opinions, beliefs, values (culture)
- ▶ Social *selection*: Actors choose interaction partners among those available according to their:
  - ▶ beliefs
  - ▶ desires
  - ▶ preferences
  - ▶ ...

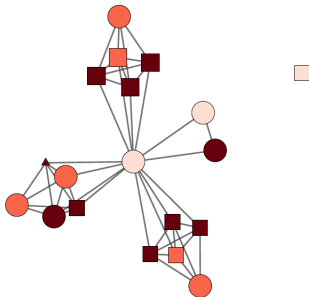
## Research design

## Network as *explanans*



- ▶ Social networks can be studied as predictors ( $X$ ) of certain outcomes ( $Y$ )
- ▶ Estimating the effect of actors' social network positions ( $X_i$ ) on other individual properties ( $Y_i$ )

## Complexity of personal networks on cognitive decline

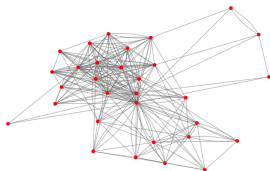


Bianchi et al. (2021)

- ▶ Research question: Does complexity of personal networks ( $X$ ) mitigate older adults' cognitive decline ( $Y$ )?
- ▶ Mechanism: Interacting with people of different clusters implies behaving within different normative and cultural frames, which keeps the brain active and mitigates older adults' neurophysiological ageing
- ▶ Hypothesis: Negative effect of number of clusters on MMSE (Mini-Mental State Examination)



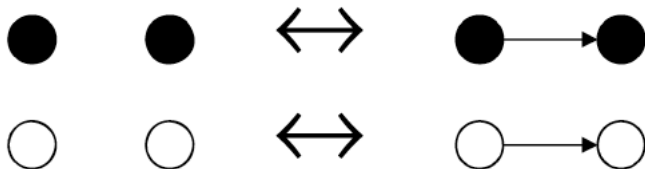
## Peers' influence on academic aspirations



Vit et al. (2021)

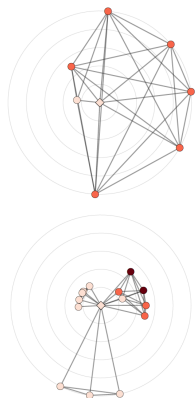
- ▶ Research question: Do high-school students adjust their academic aspirations to their school friends'?
- ▶ Mechanism: Teenagers are especially sensitive to peer pressure from their classmates, which pushes them towards conformity to avoid psychological stress and the risk of being ostracized, which then brings them to adapt their aspirations to their peers
- ▶ Hypothesis: Positive effect of average aspiration level in reading and maths of one's school friends on own aspirations over time

## Networks as *outcomes*



- ▶ Social networks can be explained as outcomes (*explanandum*) ( $Y$ ) of certain individual-level predictors ( $X$ )
- ▶ Estimating the effect of actors' properties (e.g., physical traits, beliefs, preferences, behaviour, etc.) ( $X_i$ ) on their network position ( $Y_i$ )

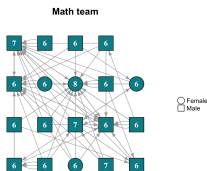
## Age and intergenerational contact



Vacca et al. (2021)

- ▶ Research question: Does age increase the likelihood of intergenerational contacts?
- ▶ Mechanism: High mortality of same-age friends and acquaintances increase the relative degree of opportunities to physically interact with younger-generation individuals.
- ▶ Hypothesis: Positive effect of age on the proportion of younger contact partners in older adults' personal networks

## Gender and STEM ability attribution

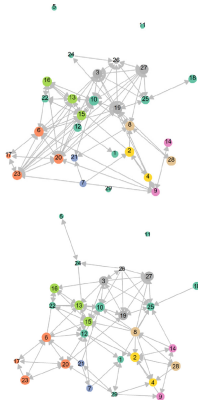


De Gioannis, Bianchi, and Squazzoni (2021)

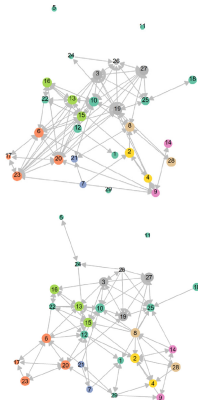
- ▶ Research question: Do high-school students underestimate females' abilities in maths?
- ▶ Mechanism: Perception of social status based on unobservable skills is affected by stereotyped beliefs, which leads high-school students to underestimate females' abilities in maths
- ▶ Hypothesis: Negative effect of being female on the net likelihood of being nominated as maths expert, despite actual performance.

## More complex design?

► Bianchi, Casnici, and Squazzoni (2018)

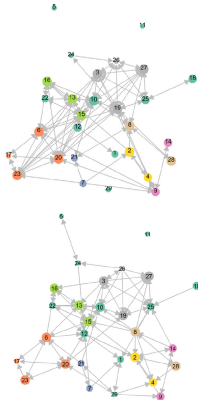


## More complex design?



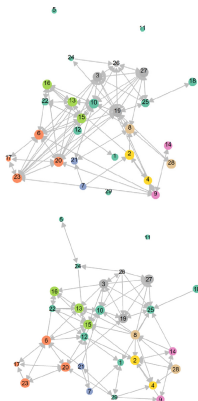
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- ▶ Can support expectations emerge from professional collaboration relationships?

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- ▶ Are networks predictors or outcomes? Is there anything as a purely structural process?

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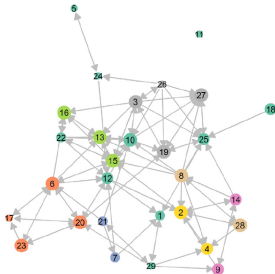


- ▶ Bianchi, Casnici, and Squazzoni (2018)
- ▶ Can support expectations emerge from professional collaboration relationships?
- ▶ Are networks predictors or outcomes? Is there anything as a purely structural process?
- ▶ Mechanism: Risky, informal economic exchange allows actors to learn each other' trustworthiness, which eventually generates expectations of receiving social support (Molm, Collett, and Schaefer 2007)



## Sociocentric vs. egocentric

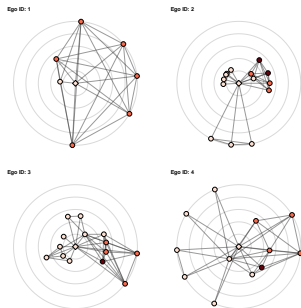
# Whole-network design



- ▶ Synonyms: *full-network* or *sociocentric* design
- ▶ Studying the set of links among all pairs of nodes in a given set
- ▶ Problem: network boundaries!

Bianchi, Casnici, and  
Squazzoni (2018)

## Personal-network design



- ▶ Synonyms: *ego-centred* or *egocentric* design or *ego-network*
- ▶ *Personal network*: the set of links that a focal actor has with a set of other actors
- ▶ A *personal-network study* is the study of the personal networks of a **sample of egos**

Vacca et al. (2021)

## (Difficult) decisions

- ▶ Research question: Do friends' gender-based stereotypes affect female secondary school students' decisions on university career paths?
- ▶ Ego-network or whole-network?

Let's get practical!

## SOCIABLE research project

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- ▶ Research question: Does complexity of personal networks ( $X$ ) mitigate older adults' cognitive decline ( $Y$ )?
- ▶ Network-variable: complexity of personal networks
- ▶ Personal-network design



## Actual questionnaire

Name:

1. the members of your household
2. your children's and their spouses' names
3. other relatives
4. neighbours
5. former colleagues
6. civic organizations, church, volunteering
7. other friends or acquaintances
8. other

Name only those people with whom you have frequent contacts and perceive as important

For every nomination, report contact frequency: 1-8 scale

## Personal-network data collection

Ego



Alter



Ego-alter tie



Alter-alter tie



- ▶ Sampling a target population
- ▶ Name generators: questionnaire items that ask respondents to nominate other nodes of the network (in this case, *alters*)
- ▶ Questions need to stimulate *recall*

Mechanisms, processes, network  
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## Reading

Borgatti, Everett, and Johnson (2013), Ch. 1

Robins (2015), Ch. 3-5

## References I

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<https://doi.org/10.1086/517900>.
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