

# Social Network Analysis

## Data structures

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# Case-by-variable matrix

case	Y	X1	X2
1	-0.97	-0.63	-0.82
2	2.51	0.18	0.49
3	-0.19	-0.84	0.74
4	6.53	1.60	0.58
5	1.00	0.33	-0.31

- ▶ matrices are made by *vectors*
- ▶ vectors can either be *row-* or *column-vectors*
- ▶ each single piece of information is represented as a *scalar*
- ▶ each row-vector contains data of one *observation* (case)
- ▶ each column-vector contains *variables* (factors, features...), i.e. data observed across observations

# Adjacency matrix

	A	B	C	D	E	F	G	H	I
A	0	1	1	1	0	0	0	0	0
B	1	0	0	0	1	1	0	0	0
C	1	0	0	1	0	0	1	0	0
D	1	0	1	0	0	0	1	1	0
E	0	1	0	0	0	0	0	0	1
F	0	1	0	0	0	0	0	0	0
G	0	0	1	1	0	0	0	0	0
H	0	0	0	1	0	0	0	0	0
I	0	0	0	0	1	0	0	0	0

- ▶ *sociomatrix* (synonym for social network data)
- ▶ square matrix (# of rows = # of columns)
- ▶ both row- and vector-columns relate to observations (i.e., nodes)
- ▶ where are then variables?
- ▶ the whole matrix is a (network-)variable

## Weighted networks

	P	J	A	M
Peter		2	0	1
John	0		0	1
Anna	0	0		3
Mary	1	1	1	

# Edge list

Peter	→	John	2
Peter	→	Mary	1
John	→	Mary	1
Anna	→	Mary	3
Mary	→	Peter	1
Mary	→	John	1
Mary	→	Anna	1

- ▶ A list of all the edges in a network ( $x_{ij} \neq 0$ )
- ▶ two (or three) columns:
  - ▶ sender  $i$
  - ▶ receiver  $j$
  - ▶ value of the edge

Robins (2015), Ch. 4

Robins, Garry. 2015. *Doing Social Network Research. Network-Based Research Design for Social Scientists*. London: Sage.