# Social Networks Analysis Data

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*SNAData* contains `graphNEL` objects of the social networks analysis data available in Appendix B of Wasserman. S. and Faust. K. (1994). *Social Network Analysis*. New York: Cambridge University Press. The descriptions of the data available here are based on the information in Appendix B.

```
>  library(graph)
>  library(Rgraphviz)
>  library(SNAData)
>
```

## Krackhardt's High-tech Managers

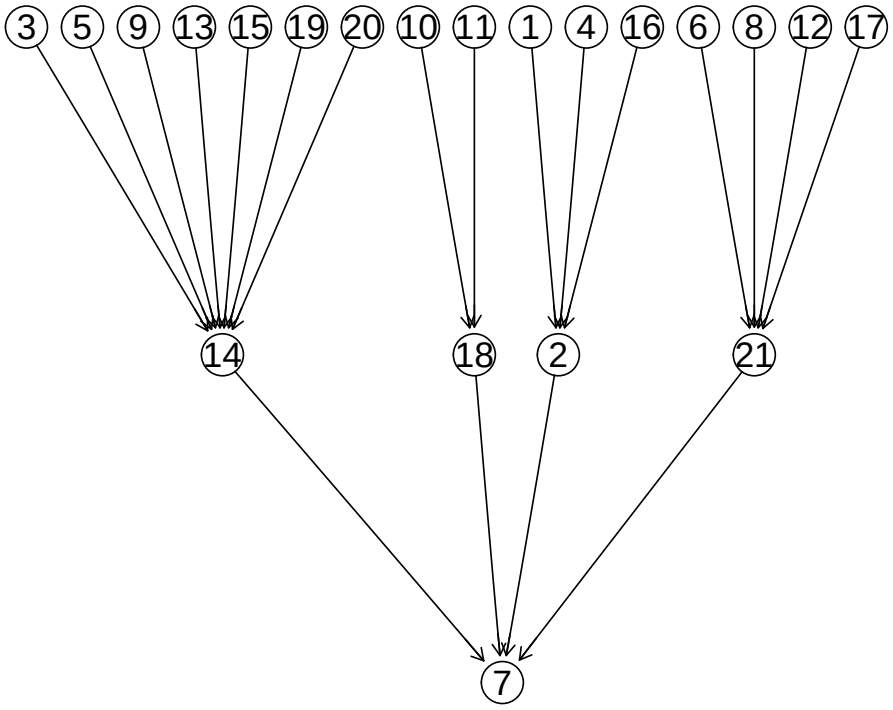
Tables B.1 - B.3 in Wasserman and Faust contain data for three directed relations between Krackhardt's 21 high-tech managers: advice, friendship, reports to. Table B.4 contains a table of four attributes for the managers: age (in years), tenure (length of time employed by the company, in years), level in corporate hierarchy (coded 1,2,3), department of the company (coded 1,2,3,4).

| Relation | W & F Table No. | *SNAData* object |
|---|---|---|
| **Graphs:** | | |
| advice | B.1 | `advice` |
| friendship | B.2 | `friendship` |
| reports to | B.3 | `reportsTo` |
| **Attributes:** | | |
| attributes | B.4 | `krackhardtAttrs` |

```
> data(advice)
> data(friendship)
> data(reportsTo)
> data(krackhardtAttrs)
> advice
```

```
A graphNEL graph with directed edges
Number of Nodes = 21
Number of Edges = 190
```

```
> friendship

A graphNEL graph with directed edges
Number of Nodes = 21
Number of Edges = 102

> reportsTo

A graphNEL graph with directed edges
Number of Nodes = 21
Number of Edges = 20

> krackhardtAttrs

   Age Tenure Level Dept
1   33  9.333     3    4
2   42 19.583     2    4
3   40 12.750     3    2
4   33  7.500     3    4
5   32  3.333     3    2
6   59 28.000     3    1
7   55 30.000     1    0
8   34 11.333     3    1
9   62  5.417     3    2
10  37  9.250     3    3
11  46 27.000     3    3
12  34  8.917     3    1
13  48  0.250     3    2
14  43 10.417     2    2
15  40  8.417     3    2
16  27  4.667     3    4
17  30 12.417     3    1
18  33  9.083     2    3
19  32  4.833     3    2
20  38 11.667     3    2
21  36 12.500     2    1

> plot(reportsTo)
>
```




## Padgett's Florentine Families

Tables B.5 - B.6 contain data for two undirected relations between 16 of Padgett's Florentine families: business, marital. Table B.7 contains a table of three attributes for the families: wealth (net wealth, measured in 1427, in thousands of lira), number of priorates (number of seats on the Civic Council held between 1282 and 1344), number of ties (number of business or marital ties in the total network of 116 families).

| Relation | W & F Table No. | *SNAData* object |
|---|---|---|
| **Graphs:** | | |
| business | B.5 | `business` |
| marital | B.6 | `marital` |
| **Attributes:** | | |
| attributes | B.7 | `florentineAttrs` |

```
> data(business)
> data(marital)
> data(florentineAttrs)
> business

A graphNEL graph with undirected edges
Number of Nodes = 16
Number of Edges = 15

> marital

A graphNEL graph with undirected edges
Number of Nodes = 16
Number of Edges = 20

> florentineAttrs

             Wealth NumberPriorates NumberTies
Acciaiuoli       10              53          2
Albizzi          36              65          3
Barbadori        55              NA         14
Bischeri         44              12          9
Castellani       20              22         18
Ginori           32              NA          9
Guadagni          8              21         14
Lamberteschi     42               0         14
Medici          103              53         54
Pazzi            48              NA          7
Peruzzi          49              42         32
Pucci             3               0          1
Ridolfi          27              38          4
Salviati         10              35          5
Strozzi         146              74         29
Tornabuoni       48              NA          7

> adj(business,"Bischeri")
```

```
$Bischeri
[1] "Guadagni"     "Lamberteschi" "Peruzzi"

> adj(marital,"Bischeri")

$Bischeri
[1] "Guadagni" "Peruzzi"  "Strozzi"

>
```

## Freeman's EIES Network

Tables B.8 - B.10 contain data for three directed, weighted relations between 32 of Freeman's EIES researchers: acquaintanceship at time 1, January 1978, the start of the study; acquaintanceship at time 2, September 1978, the end of the study; the number of messages sent. The acquaintanceship relations are valued as follows: 4=close personal friend, 3=friend, 2=person I've met, 1=person I've heard of, but not met, 0=unknown name or no reply. Table B.11 contains a table of four attributes for the researchers: original ID as reported in Freeman and Freeman (1979), number of citations in 1978, discipline (coded 1,2,3), discipline itself.

| Relation | W & F Table No. | *SNAData* object |
|---|---|---|
| **Graphs:** | | |
| acquaintanceship at time 1 | B.8 | `acqTime1` |
| acquaintanceship at time 2 | B.9 | `acqTime2` |
| messages | B.10 | `messages` |
| **Attributes:** | | |
| attributes | B.11 | `freemanAttrs` |

```
> data(acqTime1)
> data(acqTime2)
> data(messages)
> data(freemanAttrs)
> acqTime1

A graphNEL graph with directed edges
Number of Nodes = 32
Number of Edges = 650

> acqTime2
```

```
A graphNEL graph with directed edges
Number of Nodes = 32
Number of Edges = 759

> messages

A graphNEL graph with directed edges
Number of Nodes = 32
Number of Edges = 460

> freemanAttrs[1:5,]

  OriginalID Citations DisciplineCode    Discipline
1          1        19              1     Sociology
2          2         3              2  Anthropology
3          3       170              4 Communication
4          6        23              1     Sociology
5          8        16              4    Psychology

> edgeL(acqTime1,6)

$`6`
$`6`$edges
[1]  1  8 14 16 19 21 27 29 31

> edgeL(acqTime2,6)

$`6`
$`6`$edges
 [1]  1  2  8 10 11 14 15 16 19 21 24 26 27 28 29 31 32

> edgeL(messages,6)

$`6`
$`6`$edges
 [1]  1  2  4  6  8 10 11 15 16 17 24 27 28 29 30 31

>
```

## Countries Trade Data

Tables B.12 - B.16 contain data for five directed trade relations between 24 countries: basic manufactured goods; food and live animals; crude materials, excluding food; minerals, fuels, and other petroleum products; exchange of diplomats. Table B.17 contains a table of four attributes for the countries: average annual population growth between 1970 and 1981; average GNP growth rate per capita between 1970 and 1981; secondary school enrollment ratio in 1980; energy consumption per capita in 1980, in kilo coal equivalents.

| Relation | W & F Table No. | *SNAData* object |
|---|---|---|
| **Graphs:** | | |
| basic manufactured goods | B.12 | `basicGoods` |
| food and live animals | B.13 | `food` |
| crude materials, excluding food | B.14 | `crudeMaterials` |
| minerals, fuels, and other petroleum products | B.15 | `minerals` |
| exchange of diplomats | B.16 | `diplomats` |
| **Attributes:** | | |
| attributes | B.17 | `countriesAttrs` |

```
> data(basicGoods)
> data(food)
> data(crudeMaterials)
> data(minerals)
> data(diplomats)
> data(countriesAttrs)
> basicGoods

A graphNEL graph with directed edges
Number of Nodes = 24
Number of Edges = 310

> food

A graphNEL graph with directed edges
Number of Nodes = 24
Number of Edges = 307

> crudeMaterials

A graphNEL graph with directed edges
Number of Nodes = 24
Number of Edges = 307

> minerals
```

```
A graphNEL graph with directed edges
Number of Nodes = 24
Number of Edges = 135
```

```
> diplomats
```

```
A graphNEL graph with directed edges
Number of Nodes = 24
Number of Edges = 369
```

```
> countriesAttrs[1:5,]
```

```
    PopGrowth GNP Schools Energy
Alg       3.3 3.0      33    814
Arg       1.6 0.3      56   2161
Bra       2.1 5.3      32   1101
Chi       1.5  NA      43    618
Cze       0.7  NA      44   6847
```

```
> degree(basicGoods)
```

```
$inDegree
Alg Arg Bra Chi Cze Ecu Egy Eth Fin Hon Ind Isr Jap Lib Mad  NZ Pak Spa Swi Syr
 13  10  11  15  13   9  12  10  15   9  14  10  17   9   6  14  14  17  15  12
Tai  UK  US Yug
 15  16  19  15

$outDegree
Alg Arg Bra Chi Cze Ecu Egy Eth Fin Hon Ind Isr Jap Lib Mad  NZ Pak Spa Swi Syr
  4  13  21  21  21   2   9   2  21   1  14  11  23   0   1  11  13  22  23   0
Tai  UK  US Yug
 14  22  23  18
```

```
> degree(diplomats)
```

```
$inDegree
Alg Arg Bra Chi Cze Ecu Egy Eth Fin Hon Ind Isr Jap Lib Mad  NZ Pak Spa Swi Syr
 16  19  19  21  18  12  19   7  16   7  18  13  23   6   4   6  14  20  22  12
Tai  UK  US Yug
 13  22  23  19

$outDegree
Alg Arg Bra Chi Cze Ecu Egy Eth Fin Hon Ind Isr Jap Lib Mad  NZ Pak Spa Swi Syr
 15  17  19  20  15  13  18  14  13   9  16   8  23  10   8  11  15  18  17  13
Tai  UK  US Yug
 15  21  23  18
```

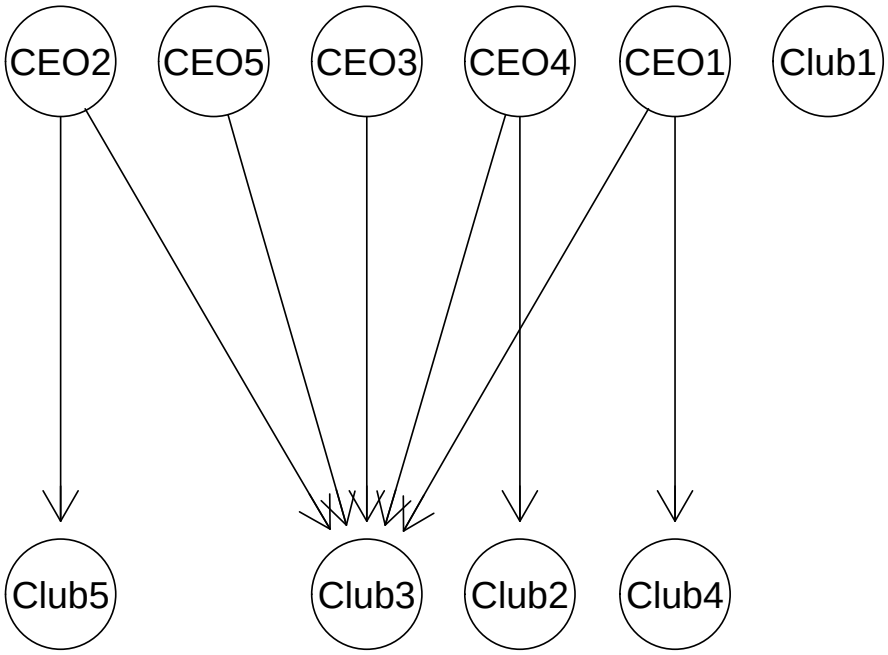
```
>
```

## Galaskiewicz's CEO and Clubs Network

Table B.18 contains information about the membership of the chief executive officers from 26 corporations in 15 clubs. *SNAData* contains both a graph and affiliation matrix representation of these data. The rows of the affiliation matrix represent CEOs and the columns represent clubs. The graph is a bipartite graph which contains two sets of nodes for the CEOs and clubs, and directed edges connect the CEOs to the clubs of which they are members.

| Relation | W & F Table No. | *SNAData* object |
|---|---|---|
| **Graph:** | | |
| club membership | B.18 | `CEOclubsBPG` |
| **Affiliation Matrix:** | | |
| club membership | B.18 | `CEOclubsAM` |

```
> data(CEOclubsBPG)
> data(CEOclubsAM)
> CEOclubsBPG

A graphNEL graph with directed edges
Number of Nodes = 41
Number of Edges = 98

> CEOclubsAM[1:5,1:5]

     Club1 Club2 Club3 Club4 Club5
CEO1     0     0     1     1     0
CEO2     0     0     1     0     1
CEO3     0     0     1     0     0
CEO4     0     1     1     0     0
CEO5     0     0     1     0     0

> cc5 <- c(paste("CEO",1:5,sep=""),paste("Club",1:5,sep=""))
> subG <- subGraph(cc5,CEOclubsBPG)
> edgemode(subG) <- "directed"
> plot(subG)
>
```


CEO2
CEO5
CEO3
CEO4
CEO1
Club1
Club5
Club3
Club2
Club4