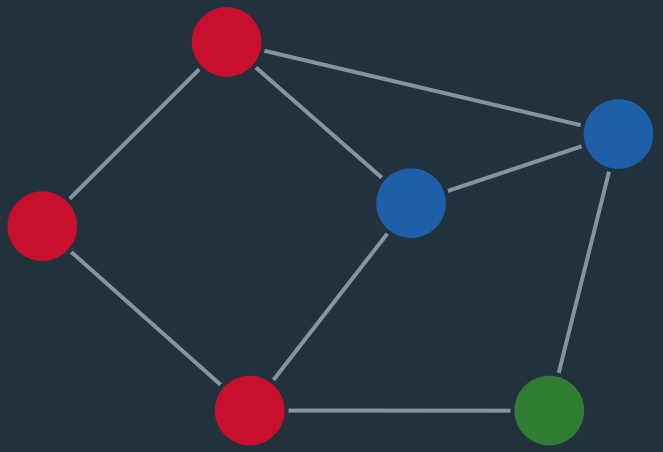
One complete analysis: status in the law firm

Course C · Day 5, afternoon, option B: the capstone

Chapter 29 · about three hours, with a break

Instructors are free to use, adapt and share these slides.



This afternoon: five blocks, one break

0:00	**1 The question, the theory and the expectations**	35 min
0:35	**2 QAP and an ERGM with friendship**	40 min
1:15	Break	15 min
1:30	**3 Whose choices carry the status effect?**	30 min
2:00	**4 Partnership or seniority, and a sensitivity run**	40 min
2:40	**5 Synthesis**	20 min

What the morning established

The advice model

Reciprocity, closure, homophily and status, estimated together. In the final model partners send at 2.28 and are asked at 1.49 times the odds of associates, net of the other terms.

Its limits

The fit misses the spread of the out-degrees (two lawyers name 33 and 37 colleagues) and the shared partners. A coefficient is a conditional association, not a mechanism.

Today

Use these tools for one argument: state what would count against each expectation before fitting anything, then ask whose choices carry an effect.

The question: do the lawyers seek advice from those above them, and what about status carries the pattern?

Before we start

```
. nwwebuse lazega, nwclear
. which nwergm
. summarize seniority
```

Every fit uses seed(12345), so results repeat. The ERGMs take under a minute each; the QAP with 1,000 permutations a little longer.

Networks

lazega_adv (advice, 892 arcs, directed), lazega_fr (friendship), lazega_cow (co-work).

Attributes

office, practice, status (partner or associate), seniority (rank 1 to 71), yrs_frm.

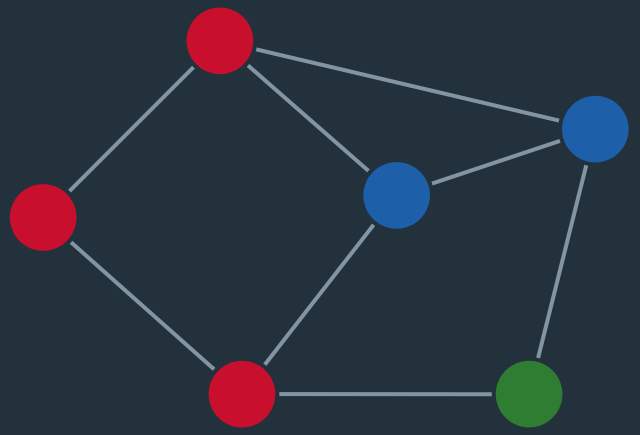
Open the do-file

The book's do-file for Chapter 29 holds every command of this afternoon.

1

The question, the theory and the expectations

35 min · Chapter 29: research question, data and measurement, description



One question, followed through the whole process

A collegial organization

A law partnership: the partners own the firm together, and formally no partner is another's superior. The associates are employees who hope to become partners.

Advice carries status

To ask a colleague for advice is to acknowledge his or her competence, so advice tends to go to colleagues of higher standing: a status order among formal equals (Lazega 2001).

A reanalysis, not a test

The account was developed from these same observations. Agreement shows consistency with the data it came from, not confirmation the way new data would.

Do the lawyers seek advice from those above them? Facts collected one chapter at a time do not yet make an argument.

Two readings of a status order, two ways of measuring it

Hierarchy

Advice runs up: associates defer to partners and take their questions to them.

Collegial order

The exchange that matters takes place among the partners, who consult one another as peers and compete for standing.

Partnership is a step

One promotion that changes a lawyer's title overnight.

Seniority is a slope

A rank that grows with every year in the firm.

Four expectations, each with what would count against it

Expectation	Against it
1 Sought for standing: partners are asked for advice more than associates, net of office, practice, friendship, reciprocity and closure	no receiver effect of partner status in that model
2 Up the hierarchy: associates take their requests to partners	associate-to-partner arcs no more likely than associate-to-associate arcs, once niches, reciprocity and closure are held fixed
3 Among partners: a partner's arc to another partner is more likely than a partner's arc to an associate	no difference between the two
4 A step, not a slope: partners are sought because they are partners, not only because they are senior	a partner receiver effect that vanishes once each lawyer's seniority rank is in the model

Data and measurement, and one check fixed in advance

Boundary and relation

71 lawyers in three offices; advice from outside the firm is invisible. Directed, close to a roster, one wave. Outdegrees run from 2 to 37.

Status and seniority

Status: partner or associate. Seniority: rank by years in the firm, 1 (most senior) to 71.

Friendship

Enters the models as a directed dyadic covariate: part of the niches that status is held against.

Sensitivity run, stated with the expectations

Every advice tie is reported by the lawyer who asks, and the fit check of the morning found two lawyers who name 33 and 37 colleagues. If both are partners, a partners ask more result could be a reporting style. The models that answer expectations 2, 3 and 4 are therefore refitted without the two most active advice-seekers.

Advice density by the status of sender and receiver

```
. nwwebuse lazega, nwclear
. preserve
. quietly nwtoedge lazega_adv, egovars(status) ///
>     altervars(status)
. drop if _ego == _alter
. table status_ego status_alter, ///
>     statistic(mean lazega_adv) nformat(%5.3f)
. restore
```

Asks \ asked	associate	partner	Total
associate	0.096	**0.129**	0.113
partner	**0.171**	**0.317**	0.244
Total	0.135	0.223	0.179

Partners asking partners is the densest block by far: 0.317, more than three times the density among associates (0.096). Partners ask associates (0.171) more often than associates ask partners (0.129): advice does not simply run up the hierarchy.

Partners are more active, and partnership cuts the ranking

```
. quietly nwdegree lazega_adv, generate(adv_out adv_in)
. tabstat adv_in adv_out seniority, by(status) ///
>     statistics(mean min max) format(%5.1f)
```

Status	adv_in mean	adv_out mean	adv_out max	seniority range
associate	9.4	7.9	26	37 to 71
partner	15.6	17.1	37	1 to 36
Total	12.6	12.6	37	1 to 71

Whether advice follows the cut or the ranking can only be asked in a model that contains both.

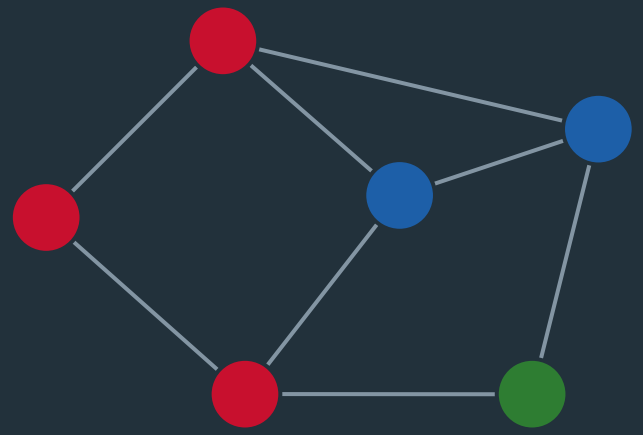
Why a model is needed

On average a partner names 17.1 advisors and an associate 7.9, so partners are also asked back more: a raw count of advice received mixes being sought with reciprocity. The partners hold ranks 1 to 36 and the associates 37 to 71, so partnership is a cut through the seniority ranking.

2

QAP and an ERGM with friendship

40 min · Chapter 29: QAP regression, ERGM, goodness of fit



QAP: status for the asker and for the lawyer asked

```
. generate byte partner_i = partner
. generate byte partner_j = partner_i
. set seed 12345
. nwqap lazega_adv lazega_fr office practice partner_i partner_j, ///
>     mode(same same sender receiver) permutations(1000)
            lazega_adv |      Coef.    P-value
-----------------------+------------------------
            lazega_fr |      2.296     .001
          same_office |      1.261     .001
        same_practice |       .848     .001
      sender_partner_i |      1.241     .001
    receiver_partner_j |       .803     .001
                 _cons |     -4.396
```

All five coefficients reach the smallest p-value that 1,000 permutations allow, 0.001. The status effect is larger on the sending than on the receiving side.

As odds ratios

A partner asks at 3.5 and is asked at 2.2 times the odds of an associate; friendship 9.9, shared office 3.5, shared practice 2.3.

No term for reciprocity or closure

partners ask more, so are asked back more.

ERGM: status net of niches, reciprocity and closure

```
. nwergm lazega_adv, edges mutual nodematch(office practice) ///
>     nodeofactor(status) nodeifactor(status) gwesp(.5) ///
>     edgecov(lazega_fr) seed(12345)
                edges |  -4.936175   .1942816   -25.41   0.000
               mutual |   .9610379   .1330374     7.22   0.000
     nodematch_office |    .870444   .0918231     9.48   0.000
   nodematch_practice |    .587187   .0815955     7.20   0.000
nodeofactor_status_2 |   .9526282   .0972638     9.79   0.000
nodeifactor_status_2 |   .4298931   .0992834     4.33   0.000
    edgecov_lazega_fr |   2.232245   .1092394    20.43   0.000
             gwesp_.5 |   .5433037    .109251     4.97   0.000
MCMLE converged after 6 iteration(s).
```

240.6

smallest effective sample size of the final simulation: enough by the working rule of 200

The specification of the morning, with friendship added as a dyadic covariate (edgecov), the term the niche argument calls for. Fit stored with estimates store firm.

Reading the ERGM: expectation 1 holds

Term	Coefficient	Odds ratio	Compares
`nodeofactor_status_2`	0.953	2.6	arc sent by a partner / by an associate
`nodeifactor_status_2`	0.430	1.5	arc received by a partner / by an associate
`edgecov_lazega_fr`	2.232	9.3	friendship named by the asker / not
`mutual`	0.961	2.6	reverse arc exists / does not
`nodematch_office`	0.870	2.4	same office / different
`nodematch_practice`	0.587	1.8	same practice / different

The rivals are strong, yet net of all of them partners are sought more: expectation 1 holds.

It says

Given everything else in the model, including friendship, reciprocity and closure, an advice arc to a partner has about 1.5 times the odds of an arc to an associate.

It does not say

That the asker defers to the partner, or that the partner is more competent.

The status effects do not fall when friendship enters

Term	QAP	Ch. 21 final ERGM	ERGM with friendship
partner sends	1.241	0.824	0.953
partner is asked	0.803	0.402	0.430
same office	1.261	1.017	0.870
same practice	0.848	0.757	0.587
friendship	2.296	not in model	2.232

Friendship overlaps with office and practice: the smaller office coefficient is the part of the office effect not carried by friendship, not the whole of it.

Not a share of an effect

Differently specified models condition on different things, and their logit coefficients are not on a common scale. The status effects are smaller than in QAP, so they depend on whether reciprocity and closure are in the model, and stay positive when they are.

Fit: the model's statistics yes, local clustering only in part

0.82+

all MC p-values of the model statistics: reproduced, as they must be

34 | 7.5

arcs with 10 shared partners: observed | simulated mean

95 | 159

arcs with 2 shared partners: fewer than simulated

Same failure as without friendship

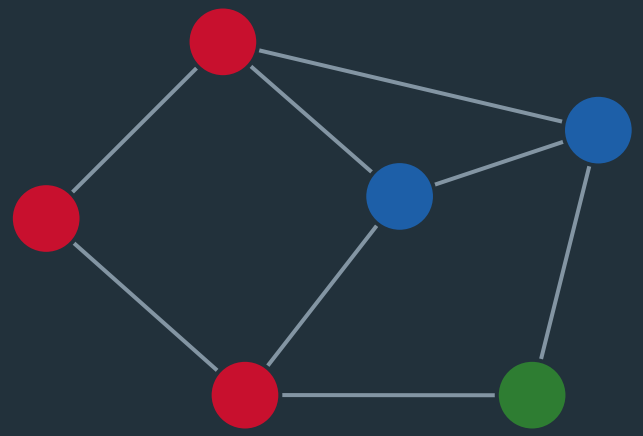
17 arcs with 12 shared partners against 1.8; fewer pairs at distance 2 (3,074 against 3,292 on average). The firm's advice is more tightly clustered than the model can produce.

Conditional associations

The status effects are estimated in a model that captures the status counts exactly and the local clustering only in part: state them as conditional associations, and watch whether they move when the specification changes.

Break

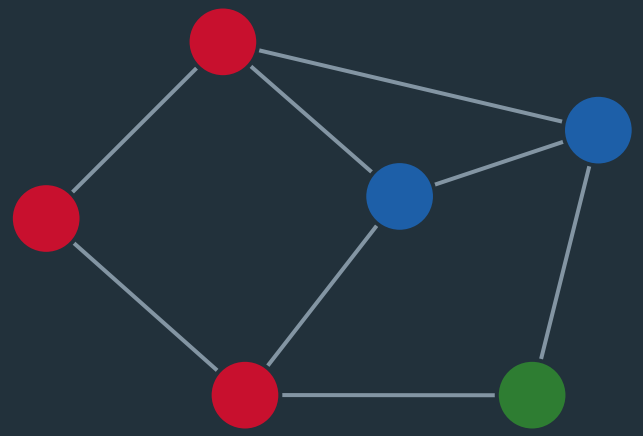
15 minutes



3

Whose choices carry the status effect?

30 min · Chapter 29: nodemix()



Sender and receiver effects add up by construction

Sender asks	Associate asked	Partner asked
Associate	0 (the base)	receiver effect
Partner	sender effect	sender + receiver

The cell names give the sender's level first, with associates as 1 and partners as 2: nodemix_status_1_2 is an associate asking a partner.

nodemix(status)

Gives each combination of sender and receiver status its own coefficient, against associates asking associates, the first cell, which is left out.

Why it matters

Expectations 2 and 3 compare particular blocks: associate to partner, partner to partner, partner to associate. The additive model cannot show which block carries the effect.

The mixing model: partners' choices carry the effect

```
. quietly nwergm lazega_adv, edges mutual nodematch(office practice) ///
>     nodemix(status) gwesp(.5) edgecov(lazega_fr) seed(12345)
. estimates store mix
. estimates table firm mix, b(%7.3f) se(%7.3f) stats(converged) ///
>     varwidth(22)
. lincom nodemix_status_2_2 - nodemix_status_2_1
 (1) |   .5704871   .1214654     4.70   0.000   .3324193   .8085548
```

Block (asks, asked)	Coefficient	Std. err.	Odds ratio
associate, partner (1_2)	0.215	0.151	1.24
partner, associate (2_1)	0.750	0.142	2.1
partner, partner (2_2)	1.321	0.138	3.7

Partner to partner against partner to associate

lincom: 0.570 (standard error 0.121), 4.7 standard errors from zero: e to the 0.570, about 1.8 times the odds. The other coefficients barely move.

Expectation 3 holds; expectation 2 fails

It says
Advice concentrates among the partners: a partner's arc to another partner has 1.8 times the odds of a partner's arc to an associate (4.7 standard errors).

It does not say
That associates defer to partners. An associate's arc to a partner has 1.24 times the odds of one to another associate, 1.4 standard errors from zero: not clearly more likely, once niches, reciprocity and closure are held fixed.

Associates do name partners

162 times in the data (Exercise 1), but no more often than they name other associates, once the rest is held fixed.

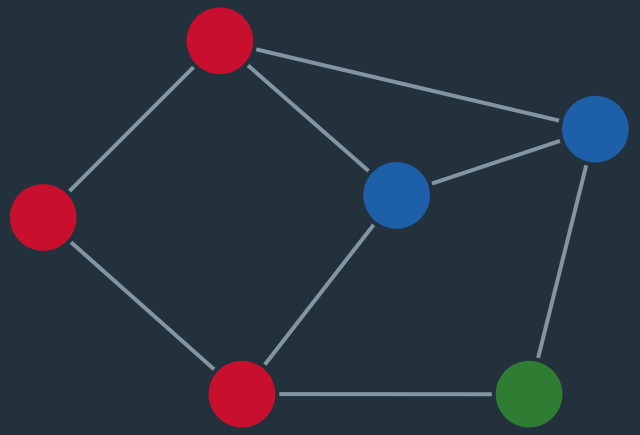
The collegial reading

The status effect of the firm's advice network lies in the partners' choices, not in the associates'.

4

Partnership or seniority, and a sensitivity run

40 min · Chapter 29: nodeicov(), nodeocov(), nwdrop



Put partnership and seniority rank in one model

```
. quietly nwergm lazega_adv, edges mutual nodematch(office practice) ///
>     nodeofactor(status) nodeifactor(status) nodeocov(seniority) ///
>     nodeicov(seniority) gwesp(.5) edgecov(lazega_fr) seed(12345)
. estimates store senior
. estimates table firm senior, b(%7.3f) se(%7.3f) ///
>     stats(converged) varwidth(22)
```

Term	firm	senior
nodeofactor_status_2	0.953 (0.097)	0.900 (0.169)
nodeifactor_status_2	0.430 (0.099)	**0.095 (0.180)**
nodeocov_seniority		-0.001 (0.004)
nodeicov_seniority		**-0.010 (0.004)**

Both terms, one model

nodeicov(seniority) adds the receiver's rank to the log-odds of an arc, nodeocov(seniority) the sender's, next to the two status terms. Partnership is a cut through the ranking: the data can say whether the chance of being asked jumps at the cut or rises along the ranking.

On the receiving side the step gives way to the slope

0.095

partner receiver effect with seniority in the model, from 0.430 (standard error 0.180)

−0.010

per place of rank: about 1 percent higher odds of being asked per place more senior

1.4

over the 35.5 places between the average partner and associate: close to the 1.5 of the partner effect alone

Sending: nothing of the kind

The sender's rank has no effect (−0.001) and the partner sender effect stays at 0.900. Partners ask more because they are partners.

A step is not ruled out

The receiver standard error doubles when both are in the model; 0.43 lies 1.9 standard errors above 0.095. The data do not need a step; they do not rule one out. By its own counter-criterion, expectation 4 fails.

Sensitivity: refit without the two most active advice-seekers

```
. list _nwnode office status seniority adv_out adv_in ///
>     if adv_out >= 30, clean
   8.       n16   Boston   partner         16        33       20
  17.       n24   Boston   partner         24        37       20
. nwdrop lazega_fr if adv_out >= 33
. nwdrop lazega_adv if adv_out >= 33, clean
. quietly nwergm lazega_adv, edges mutual nodematch(office practice) ///
>     nodemix(status) gwesp(.5) edgecov(lazega_fr) seed(12345)
. estimates store mix_d2
```

The same is done for the seniority model, stored as sen_d2. Both networks are cut to the remaining 69 lawyers, friendship first.

Both are Boston partners

n16 and n24 name 33 and 37 colleagues. If reporting style inflated the partners' choices, removing them should shrink the partner blocks.

Sensitivity: no answer changes

Term	mix	mix_d2	senior	sen_d2
nodemix_status_2_1	0.750	0.689		
nodemix_status_1_2	0.215	0.248		
nodemix_status_2_2	1.321	1.243		
nodeofactor_status_2			0.900	0.752
nodeifactor_status_2			0.095	0.083
nodeocov_seniority			-0.001	-0.003
nodeicov_seniority			-0.010	-0.010

The check changes no answer to the four expectations. It does not touch the misfit of the local clustering.

Partner blocks shrink only a little

Partner to partner 1.243 against 1.321, partner to associate 0.689 against 0.750; associate to partner stays small (0.248).

Seniority model

Receiver's rank stays at −0.010, the partner receiver effect near zero (0.083); the partner sender effect falls from 0.900 to 0.752, less than one standard error.

Hands-on (15 min)

Ch. 29, Ex. 4

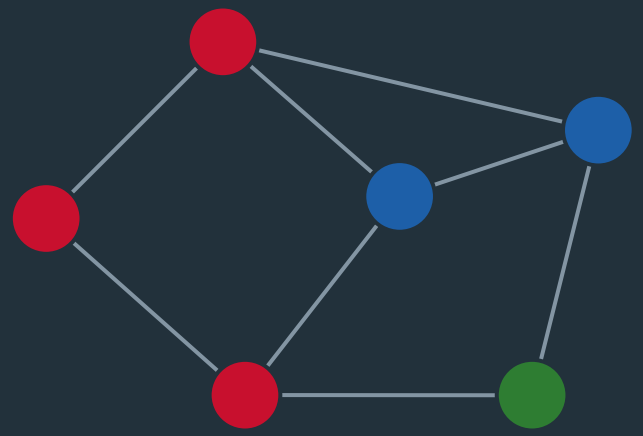
In the seniority model the receiver's rank has a coefficient of −0.010. Convert it into the odds ratio for a lawyer ten places more senior, and for the 35.5 places between the average partner and the average associate. Then say why the second number can be compared with the odds ratio of the partner receiver effect in firm (1.5), and why the comparison is only rough.

Hint A smaller rank number means more senior, so ten places more senior multiplies the odds by e to the power −0.010 × (−10). For the comparison, the two numbers describe the same difference between an average partner and an average associate in two ways, a step and a slope; ask whether every partner is 35.5 places above every associate.

5

Synthesis

20 min · Chapter 29: what the firm's advice network shows



The four expectations against the evidence

Expectation	Evidence	Reading
Sought for standing	Arc to a partner: odds ratio 1.5, net of friendship, office, practice, reciprocity and closure	**Holds**
Up the hierarchy	Raw density: associates to partners 0.129, partners to associates 0.171. Net: associate to partner 1.24 times the odds of associate to associate, 1.4 standard errors	**Fails**
Among partners	Partner to partner 1.8 times the odds of partner to associate, 4.7 standard errors	**Holds**
A step, not a slope	With seniority rank in the model the partner receiver effect falls from 0.43 to 0.10 (standard error 0.18); rank −0.010 per place	**Fails for being asked**

What the network shows, is consistent with, and leaves open

Shows

The status order runs through the partners' choices: partners ask more and ask one another most; associates, once niches and returned advice are accounted for, do not favor partners. Being asked follows seniority: about 1 percent higher odds per place. The rivals are real: friendship, office and practice each go with advice net of the others (9.3, 2.4, 1.8).

Consistent with

Lazega's account of a status competition among formal equals. Both status competition and deference, and also competence and work assigned by the firm, would produce a receiver effect. A slope is what accumulated experience would produce, and also standing that grows with tenure.

Stays open

The mechanism (data on what lawyers ask about and why). The direction: one wave cannot say whether partners attract advice because they are partners or became partners because they were sought. The boundary: advice from outside the firm and from clients is not in the data.

What can go wrong

Mistake	Instead
Reading a receiver effect of status as deference	It shows only that partners are sought more
Stopping at sender and receiver effects	They add up by construction; nodemix() gives each pair of groups its own coefficient
Reading a status effect as an effect of the title when status and rank overlap	A model with both says whether the data need a step at the boundary, not why lawyers choose
Counting the same finding three times	The density table, the QAP model and the ERGM use the same 892 arcs: one piece of evidence under three sets of assumptions
Choosing the sensitivity runs after seeing the results	State them with the expectations

The analysis in seven commands

Question	Command	Look at
Does advice run toward or away from a status group?	`nwtoedge, table`	density by sender and receiver group
How active are the groups, and how do two measures overlap?	`nwdegree, tabstat`	by(), statistics(mean min max)
Which attributes go with advice, by direction?	`nwqap`	mode(same sender receiver)
Do they hold net of reciprocity and closure?	`nwergm`	nodeofactor(), nodeifactor(), edgecov(), gwesp()
Which pairs of groups carry the effect?	`nwergm, lincom`	nodemix()
A step at a boundary or a slope along a rank?	`nwergm`	nodeicov(), nodeocov() next to the factor terms
Does the result depend on a few nodes?	`nwdrop, estimates table`	refit without them; keep(), stats(converged)

A complete analysis starts from a theory and states its expectations, with what would count against each, before the first model is fitted.

To read after the session

Chapter 29 · A complete network analysis

Next: Chapter 30 (reproducible and responsible research)

Exercises not done today: Ch. 29, Ex. 1 to 3 and 5 to 9

Do-files and teaching material: nwcommands.org/book

Instructors are free to use, adapt and share these slides.

