Network Diagnostic Notes

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Brief SELF-DIAGNOSIS
(mindful of reliability problems and benchmark network metrics)

Evaluate self
Evaluate boss, subordinate, colleague, or potential hire
Evaluate job, leadership, organization (e.g. project, JV)

How would you characterize your network? Are you positioned more for top-line growth (brokerage) or to improve efficiency (closure)? Is that what you were hired/want to do?

Where is your contact diversity? That is where you are likely to have good ideas. Diversity could be contacts of different ages, different functional areas, different companies, etc. Is your area of greatest diversity the area in which you were hired to have good ideas? If yes, great. If no, look for more varied contacts in the target area (e.g., head of engineering).

Where is your greatest network constraint? Constraint could be in the form of a bottleneck contact or a cluster of homogeneous, interconnected contacts. Is the constraint affecting your ability to deliver on good ideas? If no, great. If yes, look for more varied contacts to erode the constraint (e.g., dense commercial bank), but be careful to appear to conform to social norms in the dense cluster constraining you.

Is anything missing that could enhance your value? The report shows how you see your job. What is missing that might be obvious to a new hire outside your area, or from another company (e.g., head of engineering)?

Do you need a strategic partner to coordinate with any critical source of support? If yes, who is your partner? If no, who could you bring in? Any unnecessary partners?

How does the network around you today position you for your next project? Is your position a springboard or more of a holding tank (e.g., bow-tie network)?
The Situation Can Be Difficult To Self-Diagnose

Without network metrics, people rely on self-diagnosis — which is unreliable for various data and ego-preserving reasons. If no one contradicts the assumption that your network is fine, who’s to say it isn’t?

Kinds of Networks Are Similarly Likely across Kinds of Managers

\( \chi^2 = 0.15, 2 \text{ d.f., } P = .93 \)

(In other words, pick a network for what it can do, not for the kind of people who picked it in the past.)

Kinds of Networks Have Different Consequences for Kinds of Managers

\( F = 3.77, 5-278 \text{ d.f., } P < .01 \)

from Burt, "Gender of social capital" (1998, *Rationality and Society*) and Figure 7.4 in *Neighbor Networks.*
Which Is a General Problem with Network Self-Diagnosis

Without network metrics, people rely on self-diagnosis — which is unreliable for various data and ego-preserving reasons. If no one contradicts the assumption that your network is fine, who’s to say it isn’t?

“Everything considered, my personal network is as effective as any at my level within the company.”

Kinds of Networks Have Consequences for Manager Promotions

(b = -0.84, t = -2.55, P ~ .01; F = 3.30, 2-281 d.f., P ~ .04)

But Managers Typically Believe They Have an Effective Network

($\chi^2 = 0.20, 2$ d.f., $P ~ .91$)

(and no association between early promotion and manager's belief that his or her network is effective; 0.88 t-test, $P = .38$)
The quality of the relationships between you and your contacts is a good indicator of their willingness to help when you need it, whereas their diversity affects the breadth of the resources and information they might be able to provide. Yet, both the contact’s willingness to help and the breadth of that help may be also shaped by the structure of your network—that is, by the pattern of relationships between your contacts. The link between the structure of your network and the social capital of this network, however, is not obvious. To understand it, we need to take a more analytical view at the pattern of your contacts.

**Structure of your network**

A way to grasp the structure of your network is to visualize it. Below is a graphic representation of your network. Each shape represents one of your contacts, and you are the large light-blue circle. Shapes and colors represent the diversity of your contacts along the dimension chosen for this report. Lines between shapes represent social ties. The thickness of the line corresponds to the strength of the relationship between the people connected, so the thickest line corresponds to “especially close” relationships and the thinnest line to “distant” relationships you’ll see only if necessary.

To grasp the intuition behind network density and centralization, imagine a friendship network. The more friends are also friends with one another, the higher the density of the network. The more one of the friends is also a friend of the others, while these are not friends among themselves, the more the network is centralized on this particularly well-connected friend. Look at the diagram of your network below: the more lines connecting your contacts, the higher the density of your network. The more these lines go to one single person among your contacts, the higher its centralization.

The density and centralization indexes vary from 100 for a perfectly dense (or centralized) network to 0 for a perfectly sparse (or flat) network. In the next section, we report the scores for your network. We also explain what these values mean by comparing them with those of the people in your reference group and discussing how they define “styles” of social capital.
In Sum, There Are Three Network Forms of Social Capital

See page 15 for network metrics, Appendix III on seeming contradiction between strategic partners and secondhand brokerage.

An asterisk here indicates a page in the "Brokerage" handout for the first class session.

from Burt, "Gender of social capital" (1998, Rationality & Society)
Assign Network to Three Broad Categories

Broker (lower left)

Clique (lower right)

Partner (top half)

Graph is Figure 4.8 in Burt (1992), Structural Holes

**Figure 4.8** Constraint, hierarchy, and kinds of manager networks. (The bold horizontal line marks the mean of hierarchy and the bold vertical line marks the mean of aggregate constraint.)
These graphs are based on last year’s MBA data. The vertical axis is the measure of network centralization used in the INSEAD instrument. Network density is here computed from continuous-strength data on relations (vs the binary relations used in the INSEAD instrument). Network constraint is computed from continuous-strength data on relations in the usual manner.
Thirty Days as Director of Engineering in a Billion-Dollar Business

This is the discussion network 30 days after the new director began. Dot radius is proportional to brokerage (inversely proportional to network constraint).

- Engineer
- Production Division
- Advanced Progs
- Bus. Devel.
These are the senior leaders in a large commercial bank.

Lines indicate people who have frequent and substantial face-to-face contact. Average such connection is embedded in 28 mutual friends (0 minimum, 63 maximum).

What are the implications of such a dense network for bank operations? Customer service? Employee engagement? Bank adaptation to the changing business environment?
Common Network Forms
What Is the Active Ingredient in Closure that is the Advantage for Outsiders?

Broker
C = 23.6
(.07 density, .05 hierarchy)

Partner
C = 51.7
(.40 density, .21 hierarchy)

Bowtie
C = 46.3
(.40 density, .00 hierarchy)

Clique
C = 54.0
(.80 density, .00 hierarchy)

from Burt, "Sometimes they don't want to hear it from a person like you," (2012, L'Impresa)
Hermina Ibarra’s (2003) book, *Working Identity*, is a helpful and accessible discussion for network brokers transitioning to new identities (also see her note in the course packet, "How leaders create and use networks"). In the book, Hermi elaborates nine points of advice (below). Note the similarities to our discussion of tactical issues in establishing brokerage in an organization (second session). If you feel trapped in a closed network, then you might find it useful to read Helen Ebaugh’s (1988) book, *Becoming an Ex*, on her transition from being a nun (and similarly difficult transitions).

1: **Act your way into a new way of thinking and being.** You cannot discover yourself by introspection. Start by changing what you do. Try different paths. Take action, and then use the feedback from your actions to figure out what you think, feel, and want. Don’t try to analyze or plan your way into a new career. Conventional strategies advocated by self-assessment manuals and traditional career counselors would have you start by looking inside. Start instead by stepping out.

2: **Stop trying to find your one true self.** Focus your attention on which of your many possible selves you want to test and learn more about. Reflection is important. But we can use it as a defense against testing reality; reflecting on who we are is less important than probing whether we really want what we think we want. Acting in the world gives us the opportunity to see our selves through our behaviors and allows us to adjust our expectations as we learn. In failing to act, we hide from ourselves.

3: **Allow yourself a transition period in which it is okay to oscillate between holding on and letting go.** Better to live the contradictions than come to premature resolution. The years preceding a career change necessarily involve difficulty, turmoil, confusion, and uncertainty. One of the hardest tasks of reinvention is staying the course when it feels like you are coming undone. Those who try to short-circuit the process often just end up taking longer.

4: **Resist the temptation to start by making a big decision that will change everything in one fell swoop.** Focus on small wins, in which incremental gains lead you to more profound changes in the basic assumptions that define your work and life. Accept the crooked path. Small steps lead to big changes, so don’t waste time, energy, and money on finding the "answer" or the "lever" that, when pushed, will have dramatic effects. Almost no one gets change right on the first try.

5: **Identify projects that can help you get a feel for a new line of work or style of working.** Try to do these as side projects, temporary assignments, or parallel paths so that you can experiment seriously without binding decisions. Pursue these activities seriously, but delay commitment. Just make sure that you vary your experiments, so that you can compare and contrast experiences before you narrow your options.

6: **Don’t just focus on the work.** Find people who are what you want to be and who can provide support for the transition. But don’t expect to find them in your same old social circles. Break out of your established network. Branch out. Look for role models—people who give you glimpses of what you might become and who are living examples of different ways of working and living.

7: **Don’t wait for a cataclysmic moment when the truth is revealed.** Use everyday occurrences to find meaning in the changes you are going through. Practice telling and retelling your story. Over time, it will clarify. Major career transitions take three to five years. The big "turning point," if there is one, tends to come late in the story. In the interim, make use of anything as a trigger. Don’t wait for a catalyst.

8: **Step back, but not for too long.** When you get stuck and are short on insight, take time to step back from the fray to reflect on how and why you are changing. Only through interaction and active engagement in the real world do we discover ourselves.

9: **Change happens in bursts and starts.** There are times when you are open to big change and times when you are not. Take advantage of any natural windows (e.g., the period just after an educational program or assuming a new position; a milestone birthday) to start off on the right foot. Communicate to others that you have changed (and will be making more changes). Don’t let unanswered questions bog you down; move on, even if to an interim commitment.
NetDraw Quick Start

Making your own sociograms and computing network metrics for a group, project, organization, or market

1. DOWNLOAD THE FREE NETWORK SOFTWARE, NETDRAW (https://sites.google.com/site/netdrawsoftware/download, then click on the "Exe only" option)

2. DOWNLOAD "example1.txt" FROM MY TEACHING WEBSITE AND RENAME THE EXTENSION ".vna" The 21 lines in the file (listed to the left) are a roster of people in the network followed by a roster of relations (e.g., ego has a relation to person A at strength 1). These data define the network illustrating network constraint on page 51 in the "Brokerage" handout (see next page of this handout).

3. LOAD THE .vna FILE INTO NETDRAW (“File” menu, “open” option, then “VNA text file” and “Complete”)

4. GENERATE A SPATIAL DISPLAY OF THE NETWORK (“Layout” menu, “graph theoretic layout” option, then “spring embedding”). YOU SHOULD GET THE SOCIOGRAM BELOW.

To learn the wide capabilities of the software, play around with the data. Click and drag a node to move it and its relations around. Remove arrows by clicking on the arrow button to the right of the row of command buttons just above the sociogram display. Save the sociogram to a file for editing, pasting, and printing (“File” menu, “save diagram as” option, then “metafile”).

For more complex work, such as computing network metrics (“Analysis” menu, “structural holes” option, then “ego network model” and save the data), see the short user guide you can download on the page where you clicked "Exe only." If you are not comfortable using new software, it might be wise to bring in someone who can play with the software then brief you. FOR TEXT EXPLAINING THE NETWORK METRICS, see Appendix II in the "Brokerage" handout. Caution: Some versions of NetDraw compute incorrect values of network constraint for isolates. Network constraint is infinite for isolates, so constraint should be its maximum of one. Some versions of NetDraw report a value of zero for infinity.

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Constraint measures the extent to which a network doesn't span structural holes.

Network constraint measures the extent to which your network time and energy is concentrated in a single group. There are two components: (direct) a contact consumes a large proportion of your network time and energy, and (indirect) a contact controls other people who consume a large proportion of your network time and energy. The proportion of i’s network time and energy allocated to j, $p_{ij}$, is the ratio of $z_{ij}$ to the sum of i’s relations, where $z_{ij}$ is the strength of connection between i and j, here simplified to zero versus one.

$$c_{ij} = (p_{ij} + \sum_q p_{iq}p_{qj})^2$$

$\sum_{q \neq i,j} c_{ij}$ = aggregate constraint ($C = \Sigma_j c_{ij}$)

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Network Brokers Tend To Be Recognized Leaders

But are you broker enough for your job rank? Senior people are punished for closed networks. Constraint and status here are computed from work discussion networks around twelve hundred managers in four organizations.

A. In the formal organization

Most Senior Job Ranks
(29.5 mean network constraint)

Next-Lower, Senior Ranks
(41.9 mean constraint)

Next-Lower, Middle Ranks
(56.4 mean constraint)

B. And in the informal organization

Network Status (S)

\( r^2 = .61 \)

from in Burt (2020, Structural Holes in Virtual Worlds)
Network Metrics

Reminder

Network Constraint decreases with number of contacts (size), increases with strength of connections between contacts (density), and increases with sharing the network (hierarchy).

For discussion, see Appendix II in the "Brokerage" handout (cf., Figure B.2 in Neighbor Networks). Graph above plots density and hierarchy for 1,989 networks observed in six management populations (aggregated in Figure 2.4 in Neighbor Networks to illustrate returns to brokerage). Dot-circles are executives (MD or more in finance, VP or more otherwise). Hollow circles are lower ranks. Executives have significantly larger, less dense, and less hierarchical networks.

To keep the diagrams simple, relations with ego are not presented.