Coordinating across the Enterprise:

Finding a Balance Between Brokerage and Closure

Returning to Where We Began . . .

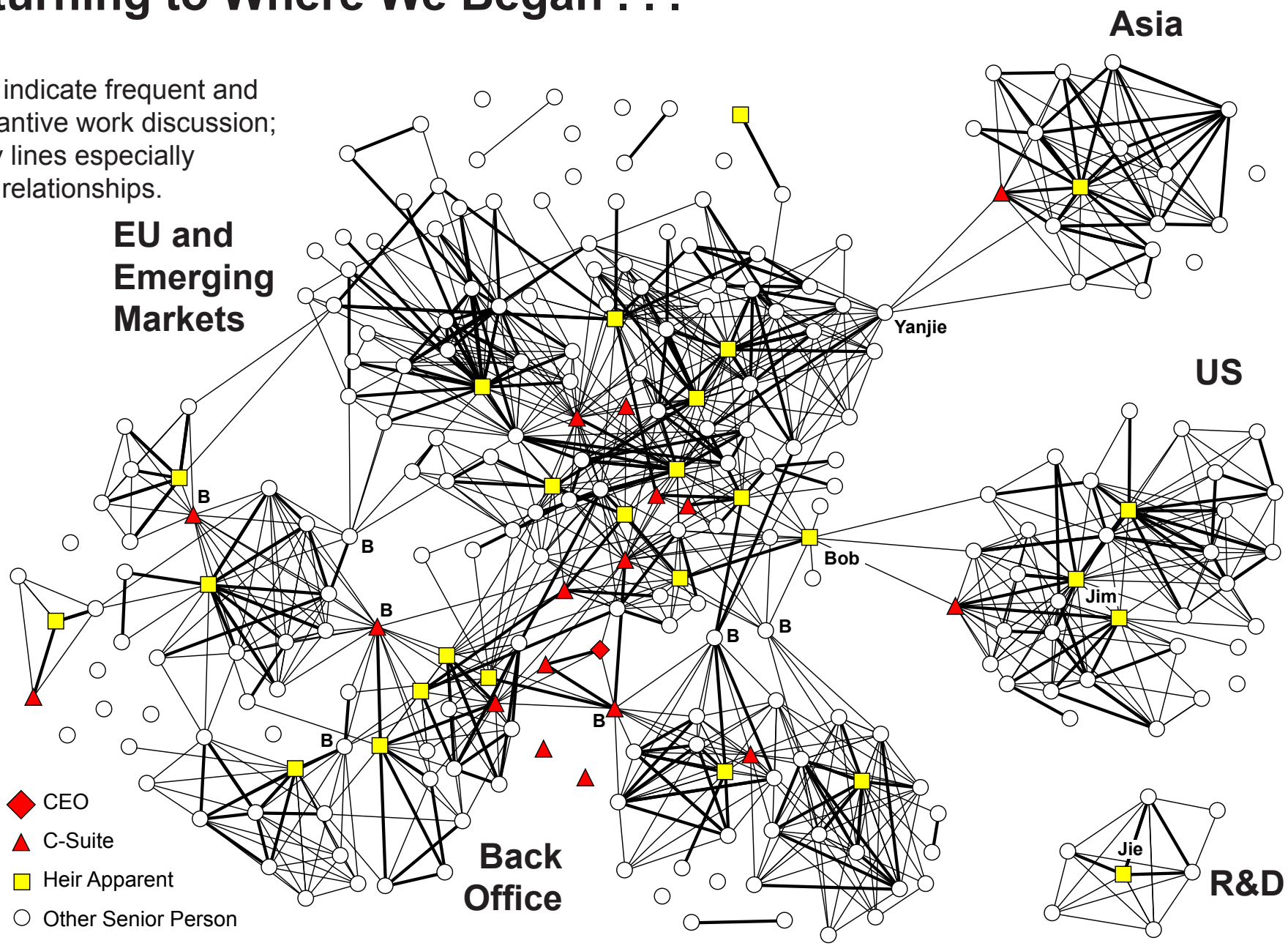


Figure 1 in Burt and Soda, "The social origins of great strategies" (*Strategy Science*, 2017)

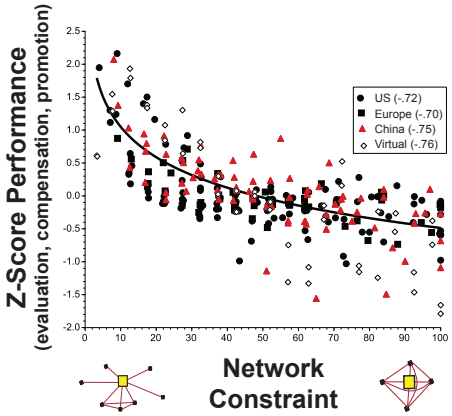
Strategic Leadership in the Management Network

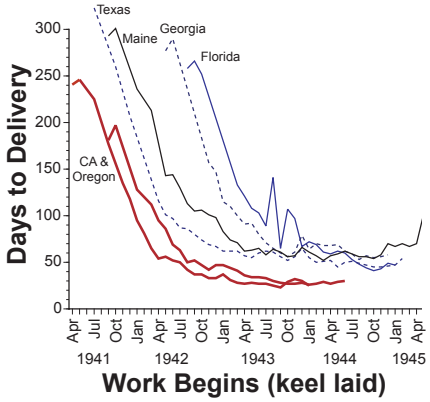
TOP-LINE GROWTH

New Services, New Processes, New Business

MECHANISM

Information breadth, timing, and arbitrage advantges in detecting and developing good ideas





BOTTOM-LINE GROWTH

Efficient Use of Resources (labor, supervision, speed)

MECHANISM

Alignment from peer comparison and reputation cost for deviant opinion/ behavior enforced by echoed stories in colleague gossip

Brokerage

Bridging Structural Holes between Clusters

Closure

Closing Structural Holes within Cluster

PATHOLOGY

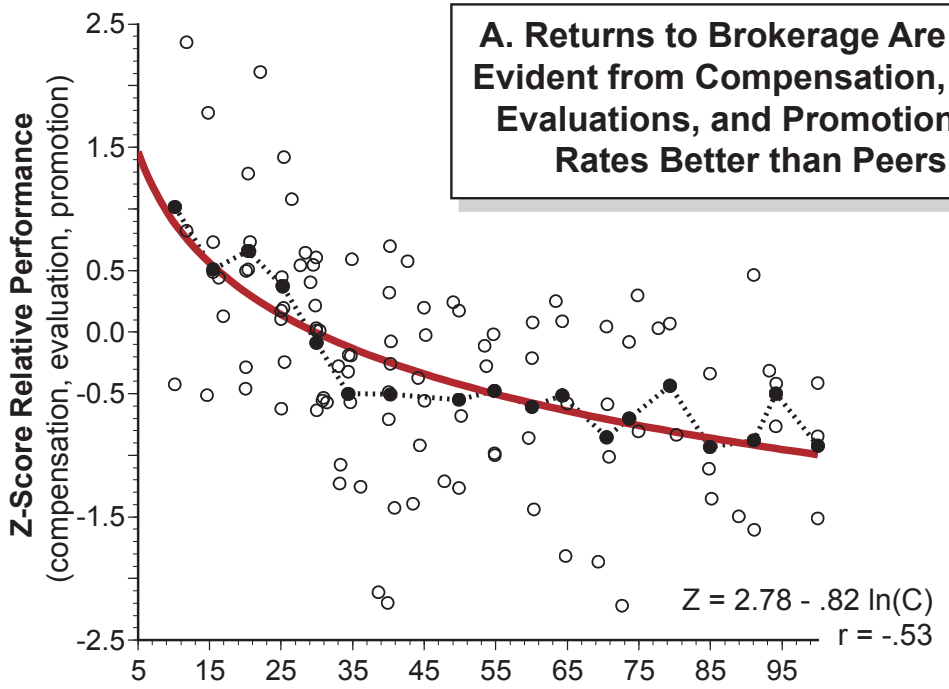
Inefficiency, Agency Costs, Chaos

PATHOLOGY

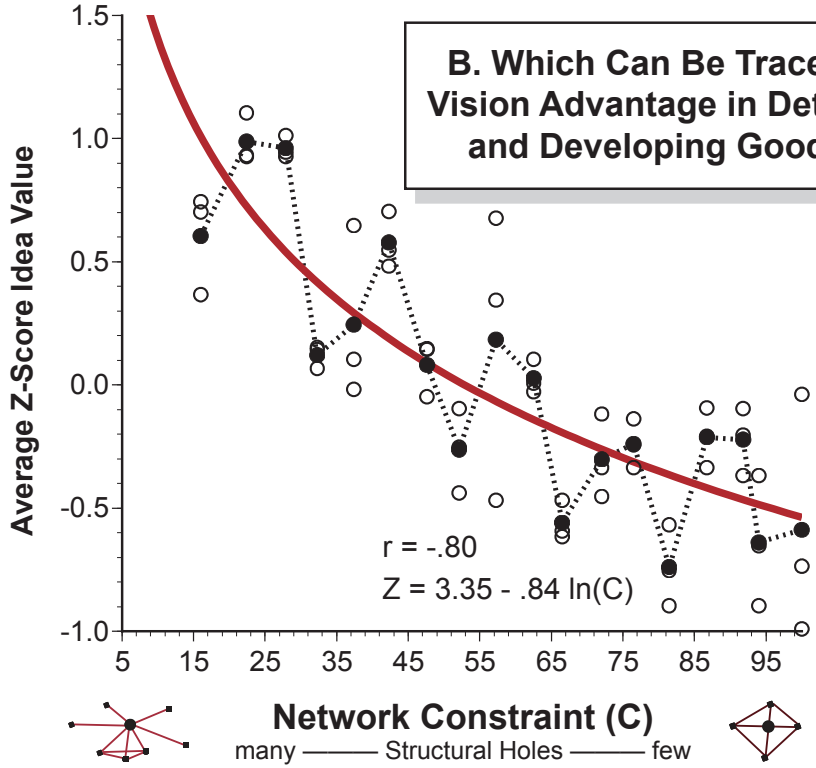
Ignorant Certainty, Agentic State, Groupthink, Insider vs. Outsider

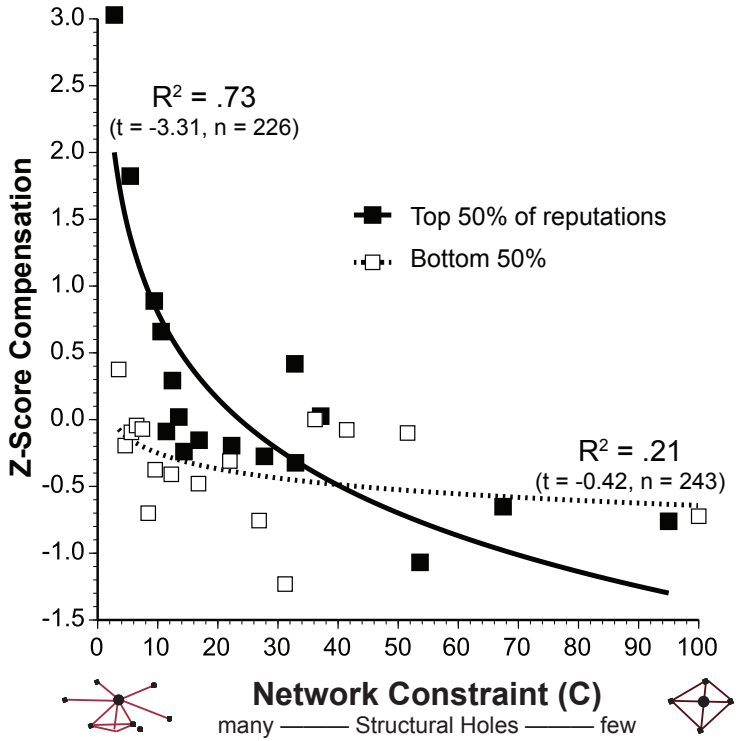
Graphs are akin to Figures 1.8 and 3.7 in Burt (2005) *Brokerage and Closure*.

A. Returns to Brokerage Are Evident from Compensation, Evaluations, and Promotion Rates Better than Peers



B. Which Can Be Traced To a Vision Advantage in Detecting and Developing Good Ideas

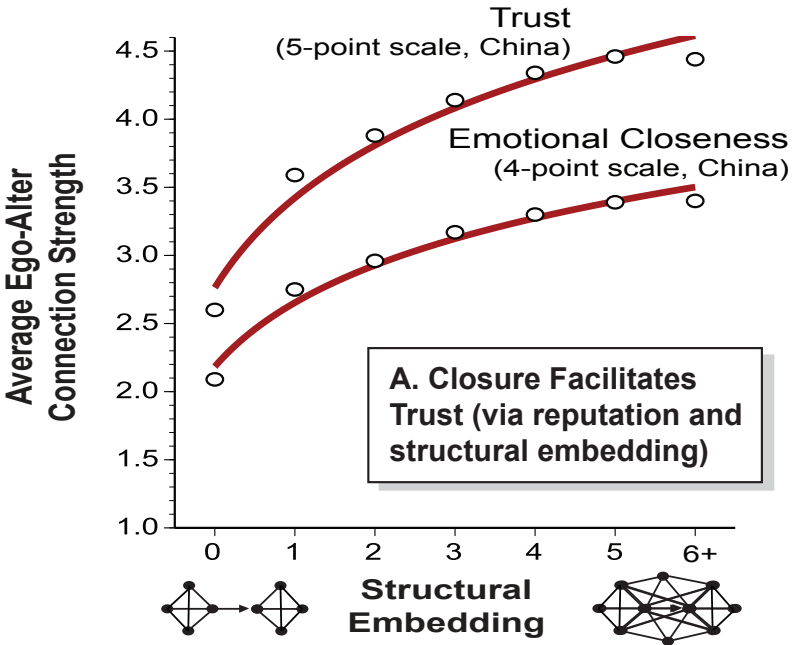


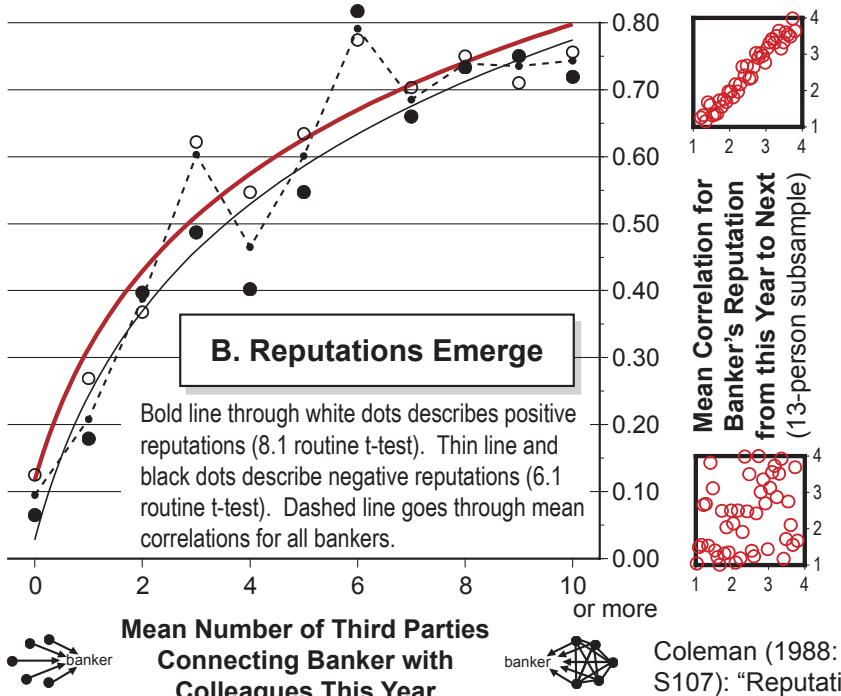


C. But Returns to Brokerage Are Contingent on a Would-Be Broker's Social Standing in the Group to Which He or She Makes a Proposal.

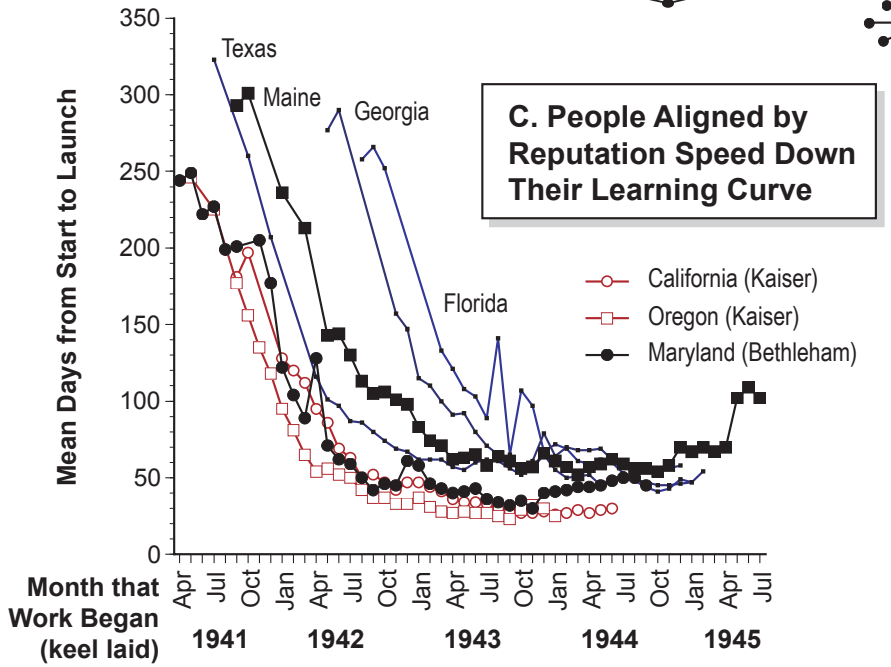
Brokerage for Top-Line Growth

Circles are average scores on the vertical axis (Z) for a five-point interval of network constraint (C) within each study population. Dashed line goes through mean values of Z for intervals of C. Bold line is performance predicted by the natural logarithm of C. The study populations include bankers and managers in Asia, Europe, and the US (see Figures 1.8 and 2.3 in *Brokerage and Closure*).





Coleman (1988: S107): "Reputation cannot arise in an open structure."



Closure for Bottom-Line Growth

Graph A describes 46,231 colleague relations with analysts and investment bankers. Graph B describes 262 subsample correlations between reputation this year and next for the bankers. Graph C describes "liberty" ship production times.

Graph C is from Figure 3.7 and graph B is from Figure 4.6 in *Brokerage and Closure*. Graph A is from Figure 5.6 in "Closure and Stability," (cf. Figure 4.8 in *Brokerage and Closure*).

Balance via Multiple Regression

Collaborative Brokerage, Generative Creativity, and Creative Success

Lee Fleming
Santiago Mingo
David Chen
Harvard University

2007
Administrative Science Quarterly

Analyzing data on utility patents from 1975 to 2002 in the careers of 35,400 collaborative inventors, this study examines the influence of brokered versus cohesive collaborative social structures on an individual's creativity. We test the hypothesis that brokerage—direct ties to collaborators who themselves do not have direct ties to each other—leads to greater collaborative creativity. We then test interaction hypotheses on the marginal benefits of cohesion, when collaborators have independent ties between themselves that do not include the individual. We identify the moderators of brokerage and argue for contingent benefits, based on the interaction of structure with the attributes, career experiences, and extended networks of individuals and their collaborators. Using a social definition of creative success, we also trace the development of creative ideas from their generation through future use by others. We test the hypothesis that brokered ideas are less likely to be used in future creative efforts. The results illustrate how collaborative brokerage can aid in the generation of an idea but then hamper its diffusion and use by others.●

Combating the chaos of collaboration on social media

From Zhu et al. in *Telematics and Informatics* (2025)

ABSTRACT

Collaborative content generation, in which multiple creators work together as teams to produce original content, is increasingly prevalent on social media platforms. Despite this growing popularity, our understanding of what team compositions can enhance the performance of collaboratively generated content remains largely underexplored. Drawing on social capital theory, this study investigates the effects of bonding and bridging social capital of creator teams on viewer engagement with their collaboratively generated content. Moreover, this study examines how these effects are contingent on team size and content length. To empirically test the research model, the researchers collected 1343 collaboratively generated videos from Bilibili, a leading video-sharing platform in China. By employing social network analysis and ordinary least squares regression, the results indicated that bonding and bridging social capital, derived from prior collaborative relationships, had positive effects on viewer engagement. Furthermore, the impact of bonding social capital was more pronounced in larger teams than in smaller teams, whereas the effect of bridging social capital was stronger for shorter content than for longer content. Overall, this study enhances the understanding of how to harness the power of collaborative content generation to achieve desirable content performance. The theoretical and practical implications of the findings are discussed.

Balance on a Case-by-Case Basis

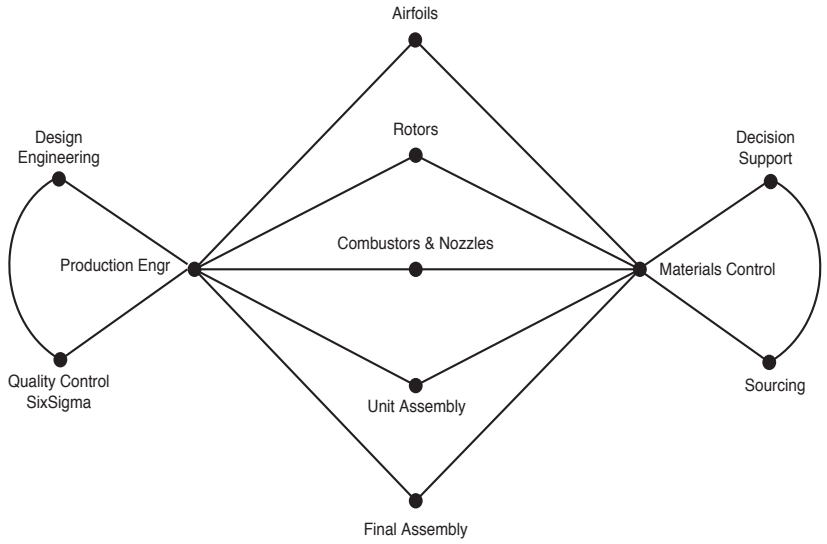
Problems in Our Steam Turbine Production

Joe: Please put everything aside and get down to our Oklahoma manufacturing plant. I don't know what is wrong down there, but that operation is killing us. The plant is hemorrhaging cash and losing us future orders. Almost every order involves substantial re-work, late-delivery penalties, and costly service calls after delivery. We've had a SixSigma team down there for ten months and the problem has only gotten worse with finger-pointing and mounting tension.

See if you can figure out what is going on. If we can't fix it, we have to rethink our decision about keeping the plant.

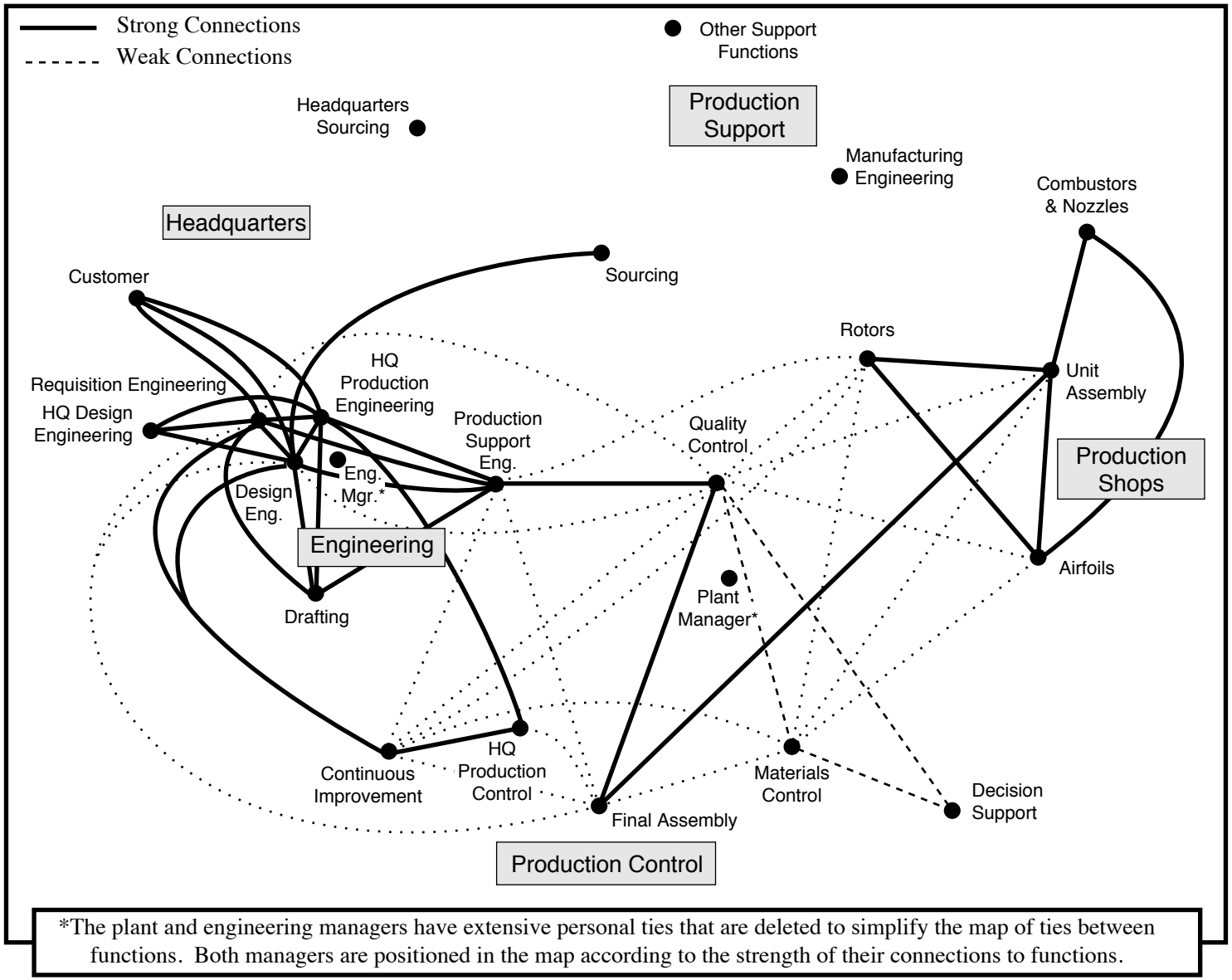
I'll have John draw up a quick sketch of the production process to guide you. I've had John call Jerry LeFleur, the plant manager, to let him know that you will be coming down. Get back to me quickly on this one. / Mike

Joe: The Oklahoma plant is organized like our others (below). HQ works with the customer to figure out what turbine they want (requisition engr), we design it (design engr), then oversee its production (production engr & quality control). Working from our designs, production plan, and quality specs, people in the Oklahoma plant manufacture the airfoils, rotors, combustors and injectors, assemble the rotor unit, and assemble the casing around the rotor unit. Those five tasks define the five work groups in the plant. The flow of product through the five groups is managed by the plant manager and the materials control people, who manage the flow of supplies from outside vendors and between work groups in the plant.



I had my assistant talk with people here and with Greg Anderson, Director of Final Assembly at the Oklahoma plant, to run a Network Diagnostic so you can get a quick sense of the plant's social organization. The Diagnostic is run from Greg Anderson's perspective, summary output follows this page, and my assistant sent a disk containing the raw data to your secretary. Let me know if I can be of any further help (use the mobile number; I'm away this weekend). Good luck. / John

The Actual Organization Is Not so Simple



*The plant and engineering managers have extensive personal ties that are deleted to simplify the map of ties between functions. Both managers are positioned in the map according to the strength of their connections to functions.

The situation and network are described in Burt and Ronchi, "Measuring a large network quickly" (*Social Networks*, 1994)

Senior Management Network

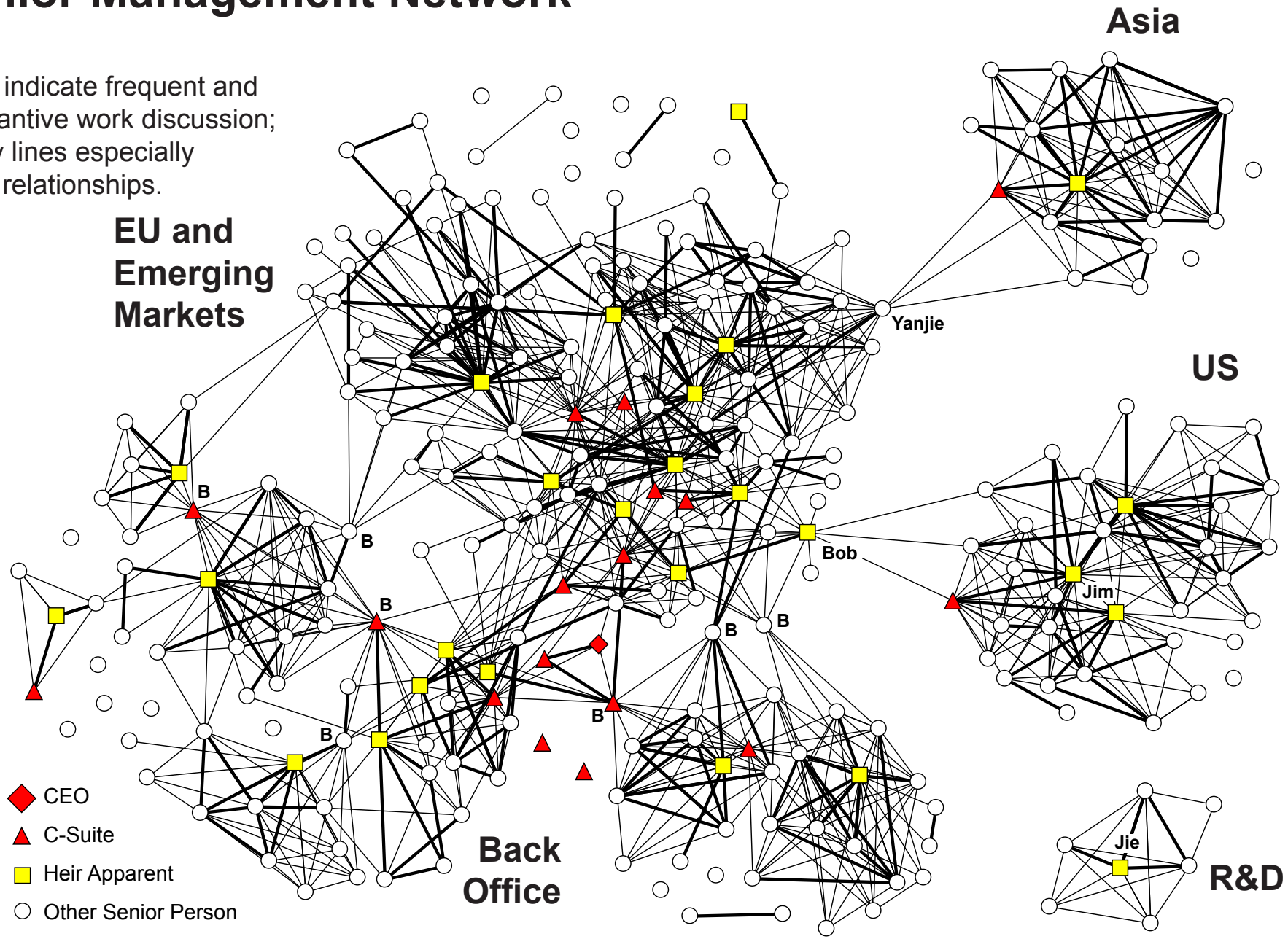
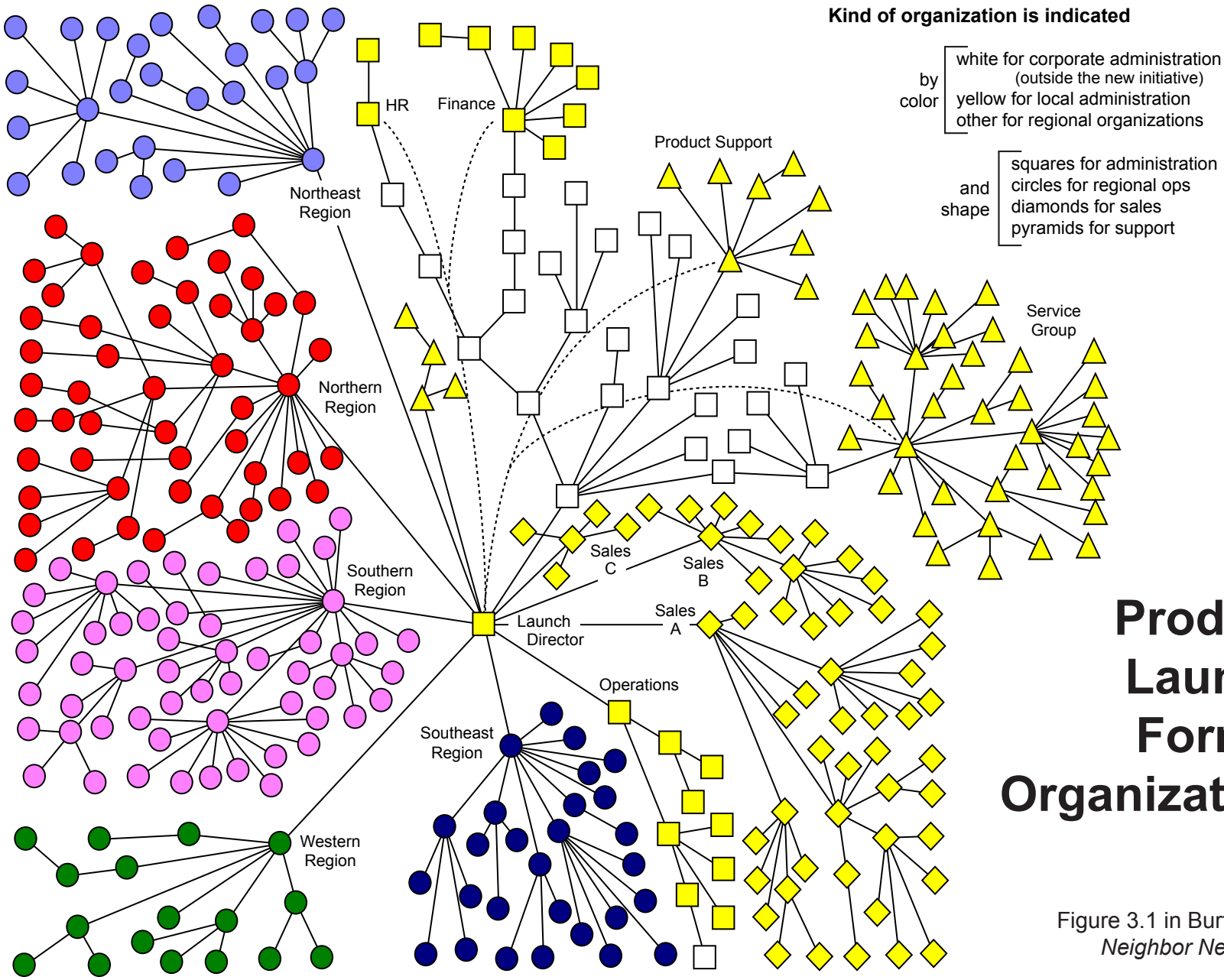


Figure 1 in Burt and Soda, "The social origins of great strategies" (*Strategy Science*, 2017)



Product Launch Formal Organization

Figure 3.1 in Burt (2010, *Neighbor Networks*)

Social Network Behind the Product Launch

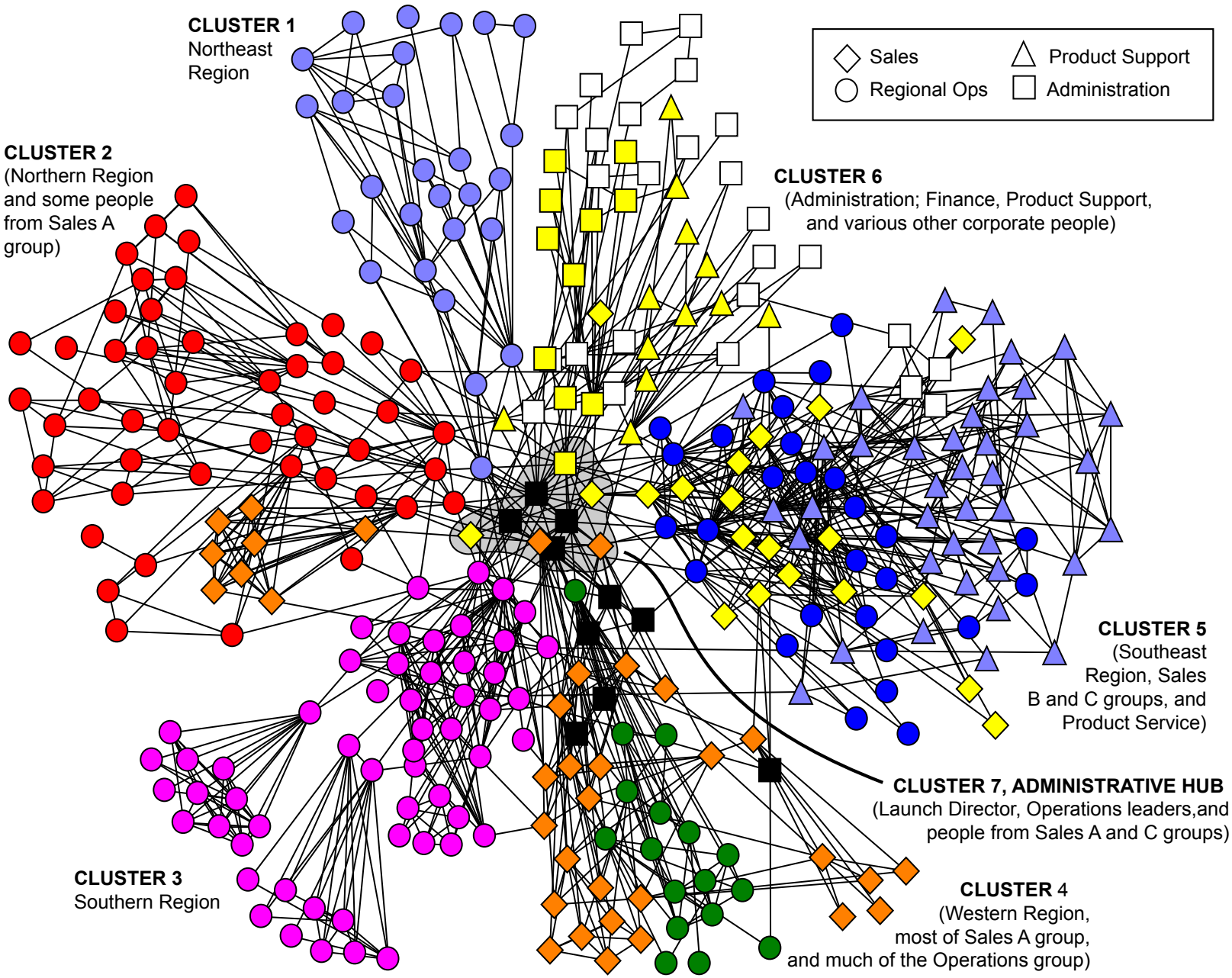
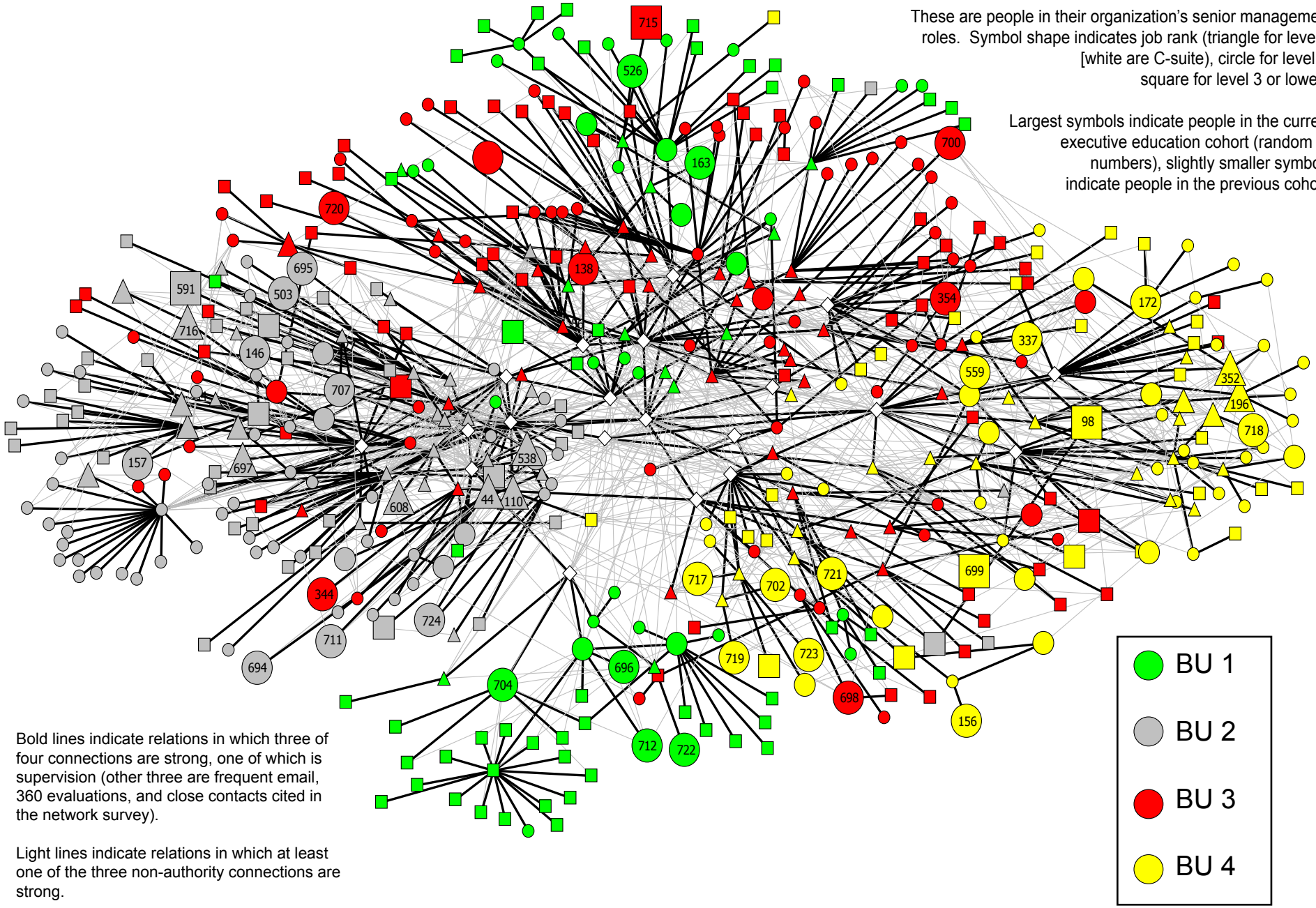


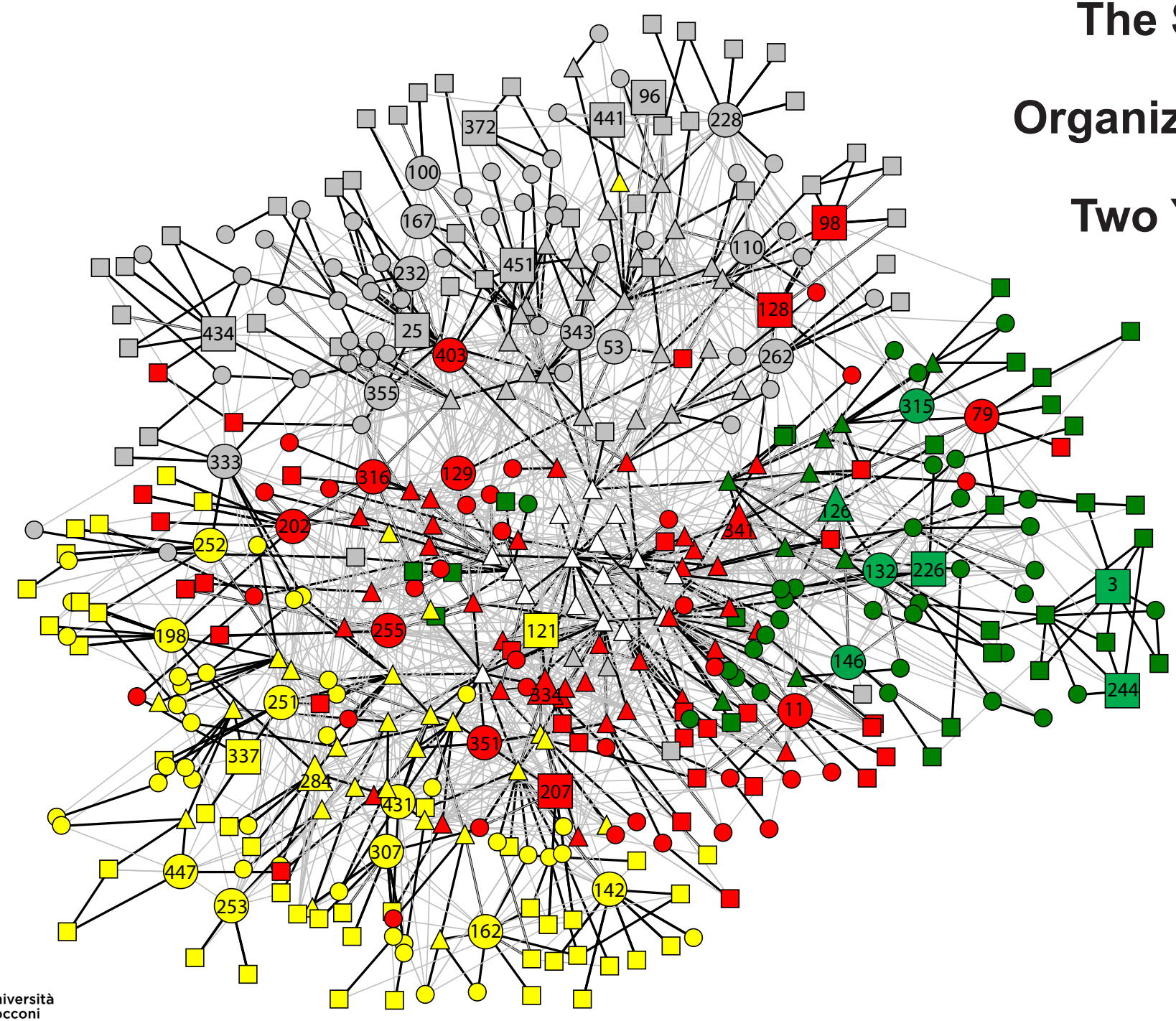
Figure 3.2 in Burt (2010, *Neighbor Networks*)

Network Map of Senior Management in a Large Financial Organization



Università Bocconi
MILANO

The Same Organization Two Years Later



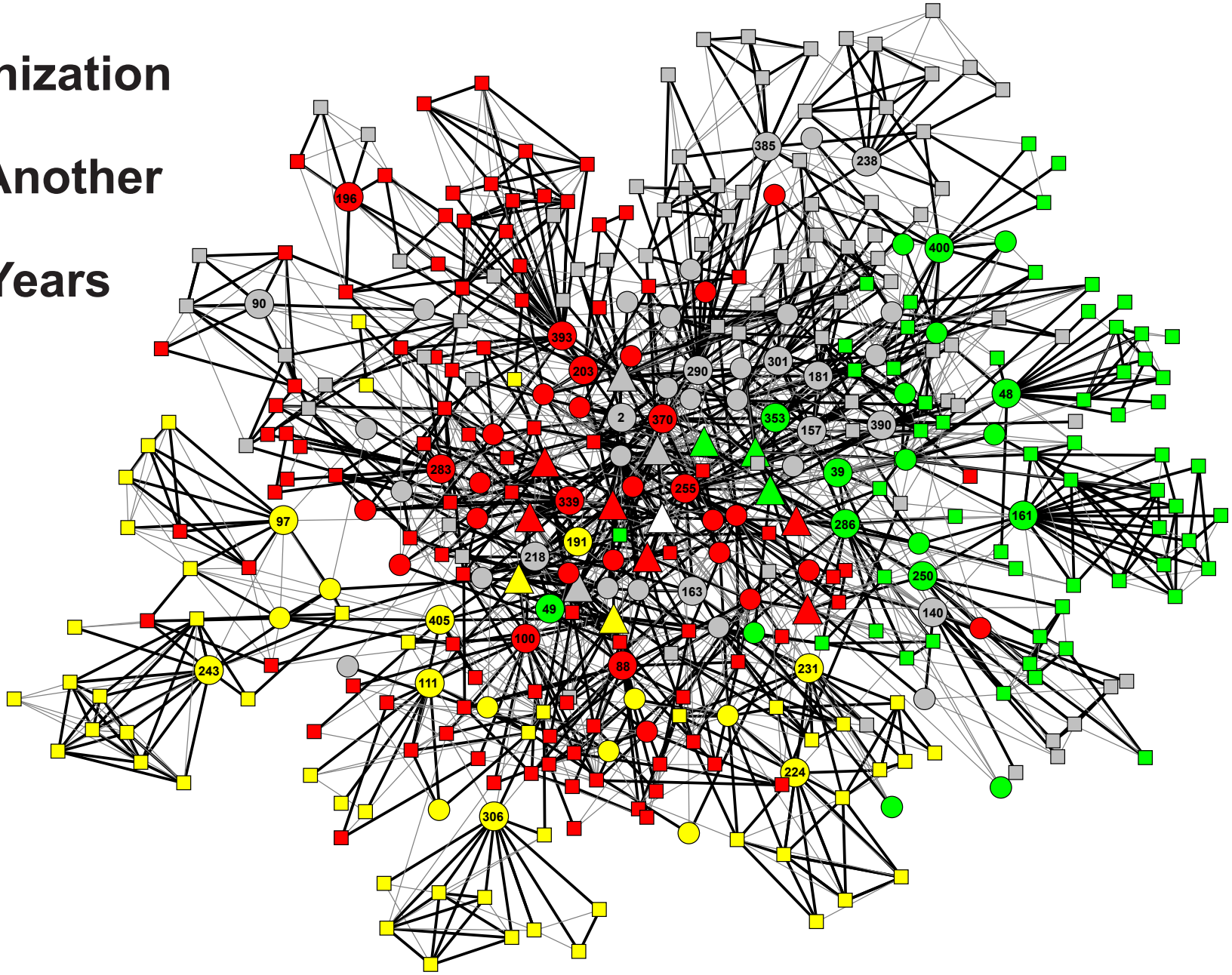
The Same

Organization

Still Another

Two Years

Later

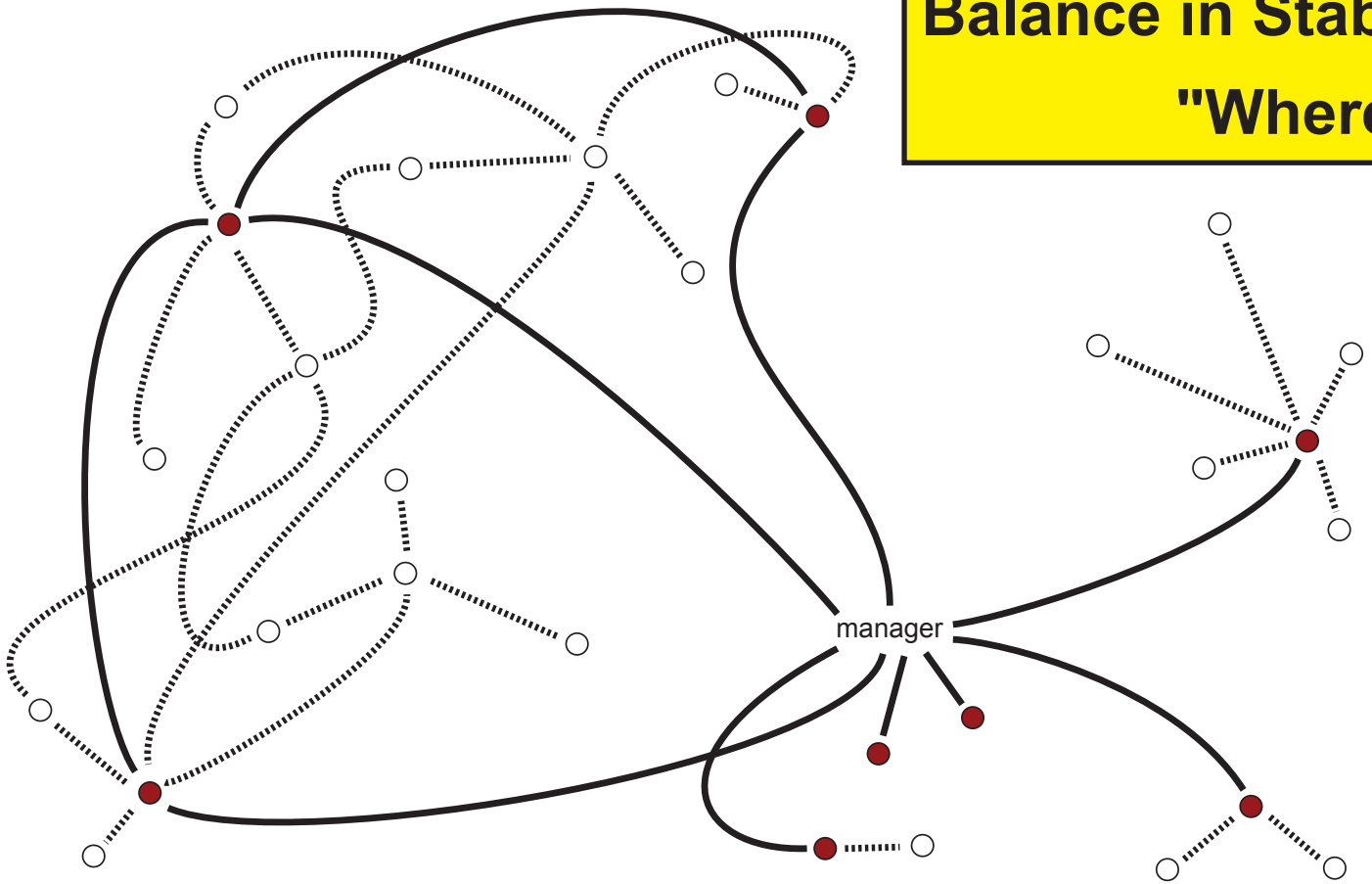


Balance in Principle for the General Case

Brokerage for top-line growth (vision, dissipation)

Closure for bottom-line growth (alignment, myopia)

Balance in Stable Networks, "Where, in general"



"Where, more precisely"

Balance in Dynamic Networks, "When"

For variations on the theme of balancing brokerage versus closure, see Klapp (1978) on opening vs. closing, Zaleznik (1977) and Kotter (1990) on leaders vs. managers, March (1991) on exploration vs. exploitation.

B-C Balance in Stable Networks, "Where"

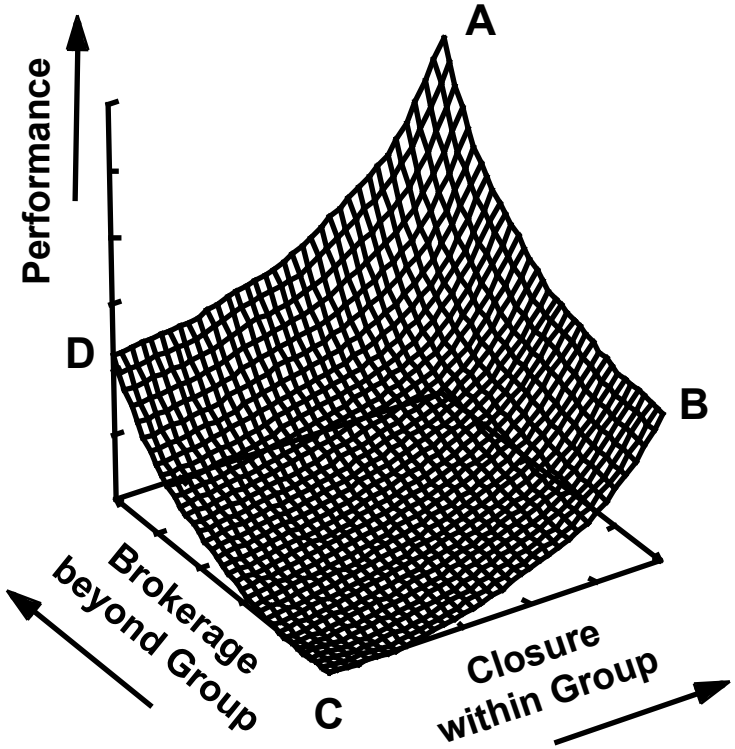
Performance Is Highest

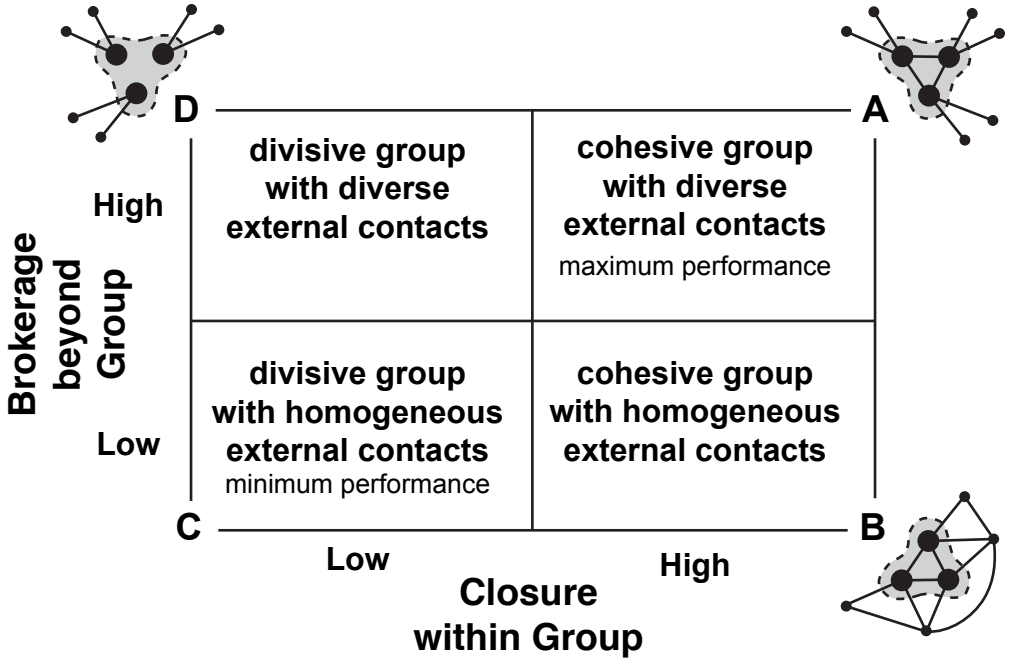
for

Closure Within a Group

combined with

Brokerage Beyond the Group





From Figure 3.5 in *Brokerage & Closure*

Structural Autonomy =

E(Performance) =

α Closure_in$^{\beta}$ Brokerage_out$^{\gamma}$

Steve Jobs, 1995

Which Can Make a "Business Network" Valuable

A business network brings together otherwise disconnected people to share valuable and otherwise difficult-to-obtain information (i.e., the network creates bridge relations embedded in a reputation-inducing, trust-facilitating, closed network; e.g., Les Cunningham's Business Network of home contractors*, Chicago's Commercial Club, Ian McDaniels' China-US Business Council, Mark Twain Bancshares*, Dennis and Donna Joannides' National Business Associates)

Pro: early access to experience and leads, broad access to benchmarking experience

Con: early disclosure of future plans, broad disclosure of past mistakes (rep critical)

Consider Michael McCarthy's experience, quoted in *Inc Magazine* (November, 1995): Many entrepreneurs worry that they'll outgrow their early relationships with banks. But not Michael McCarthy, CEO of McCarthy Co., a St. Louis construction company. Although McCarthy has grown his business to $1 billion in sales, he remains close to the local community bank that backed him more than 20 years ago, Mark Twain Bancshares.

"The bigger the bank, the more you're at the whim of a very capricious management situation. You never know when the senior executives of a big bank will suddenly decide that your kind of company doesn't fit in with its new business plan and you'll be out of luck."

"I've continued to do business with Mark Twain Bancshares even when I also needed to borrow larger sums from bigger banks," he says. "And that saved us during one year, seven or eight years ago, when we had unexpectedly large, multiple losses. Our big banks suddenly came up with all kinds of new criteria and required us to pay off our loans, because of our financial problems. Mark Twain stood by us and continued to support us, even creating a new $7-million line of credit for us."

His conclusion: "Big banks often respond to an entrepreneur and his or her special needs with edicts. If you've built a good relationship with a smaller bank, maintain it. You never know when you'll need that extra level of support."

*See Sgourev and Zuckerman, "Improving capabilities through industry peer networks" (2006, *Sloan Management Review*) and the HBS case, "Mark Twain Bancshares," for details on using the bank-branch board of directors as a business network to identify attractive loans with mid-size companies and high-wealth individuals.

THE WALL STREET JOURNAL. | CAREERS

CAREERS | NOVEMBER 26, 2009

What Facebook Can't Give You

Over 52 Years, These Men Have Evolved Into Movers and Shakers—Together

By KATHERINE ROSMAN (photos by Bryan Derballa for The Wall Street Journal)

Before there was Facebook, there was the Wednesday 10.

In 1957, as men in their late 20s, they began meeting—initially over breakfast, then over dinners held at the Sherry-Netherland Hotel or at the Harvard Club in midtown Manhattan. Few were born to means. Many were sons of immigrants. Most went on to become luminaries in their fields—presidents of television networks, partners at banks, editors of magazines.

On occasion, they shared their influence with one another. When member Mort Janklow made a career switch from corporate attorney to literary agent, a fellow member, columnist William Safire, offered himself as a famous first client. When Robert Menschel, a senior director at Goldman Sachs Group Inc., was considering deals involving large consumer companies such as Procter & Gamble, he would pick the brain of fellow club member Ed Meyer, the former chief executive of Grey Advertising.

In a day when "social network" is a buzz term from colleges to board rooms, the members of Wednesday 10 show the benefits of old-fashioned networking. "We were all young kids starting out, and it is easy when you are so involved in building your career to lose touch with other people who are outside your field," says Mr. Menschel, who has been at Goldman Sachs for 55 years. "It helped me to understand why other people do what they do—which is important in life and in business. You don't learn anything from talking to sameness."

The Wednesday 10 comprised, at various points, more than 20 men; the goal was a number small enough to maintain intimacy yet large enough to ensure that at least 10 members would show up for each of the monthly Wednesday-night meetings. No

The Wednesday 10, shown at a 1960s banquet with their dates, began meeting 52 years ago.

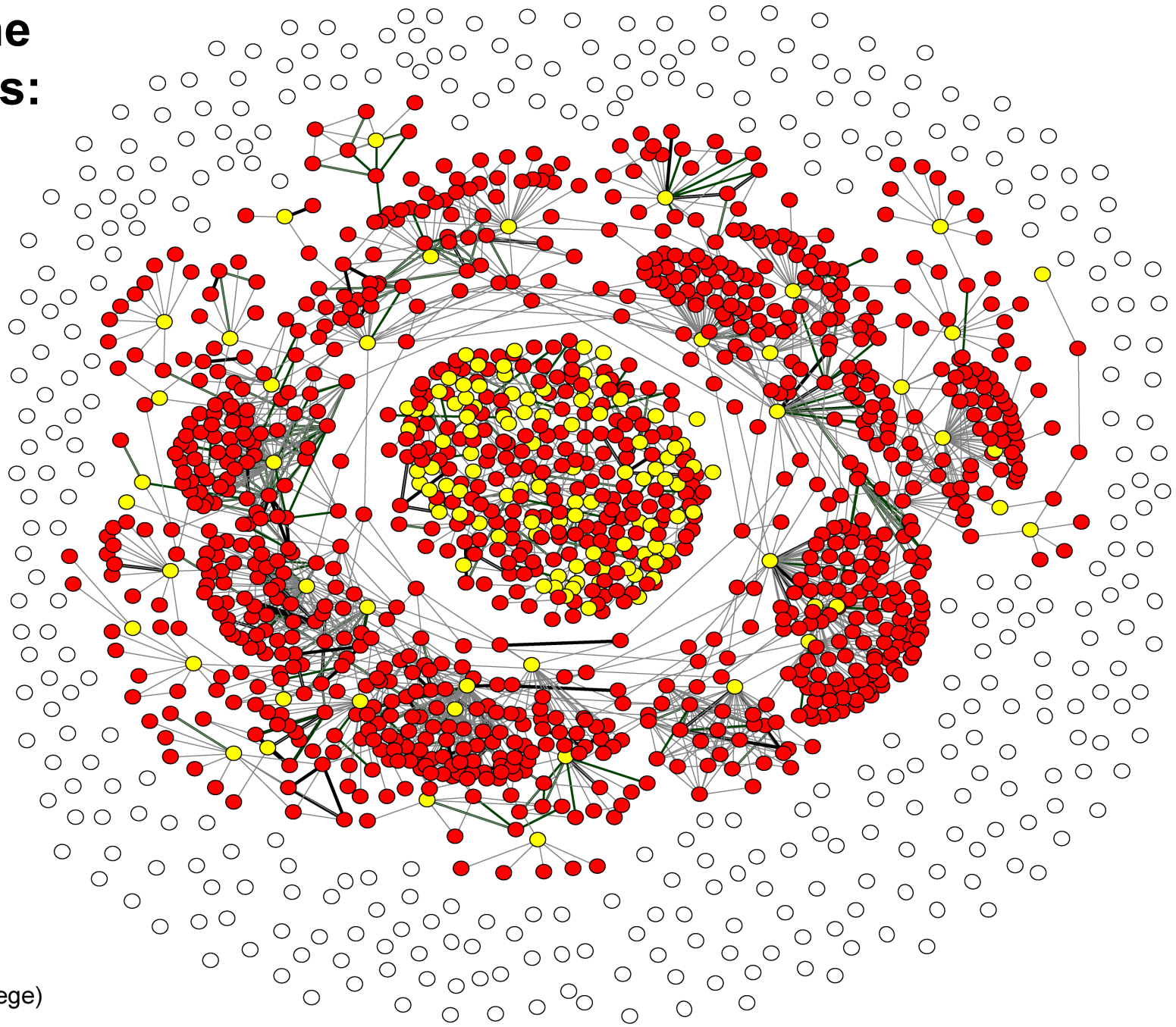
Balance Can Vary Over the Three Worlds:

Periphery, Outer Circle, Inner Circle

A random sample of 500 people was drawn in the virtual world Second Life,

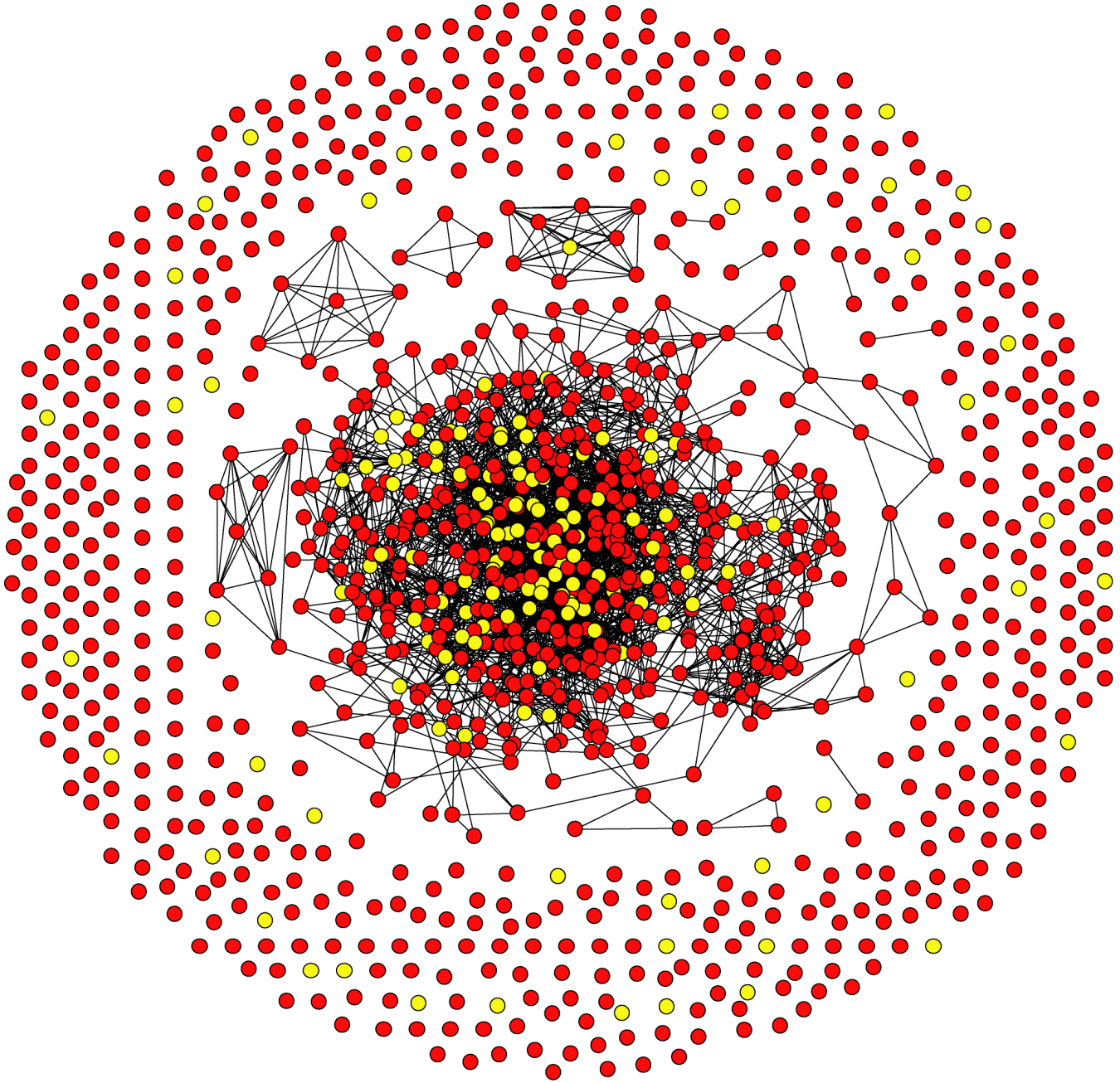
then snowballed out to include friends of the sampled people,

resulting in a network of 1,533 people.



- Sample Isolate
- Sample Person Who Has Friends
- Friend to a Sample Person

- Strong Tie (modify objects)
- Tie (locate)
- Weak Tie (online, no-privilege)



Sociogram of Directors in Chicago Index Companies

1,380 Chicago directors.

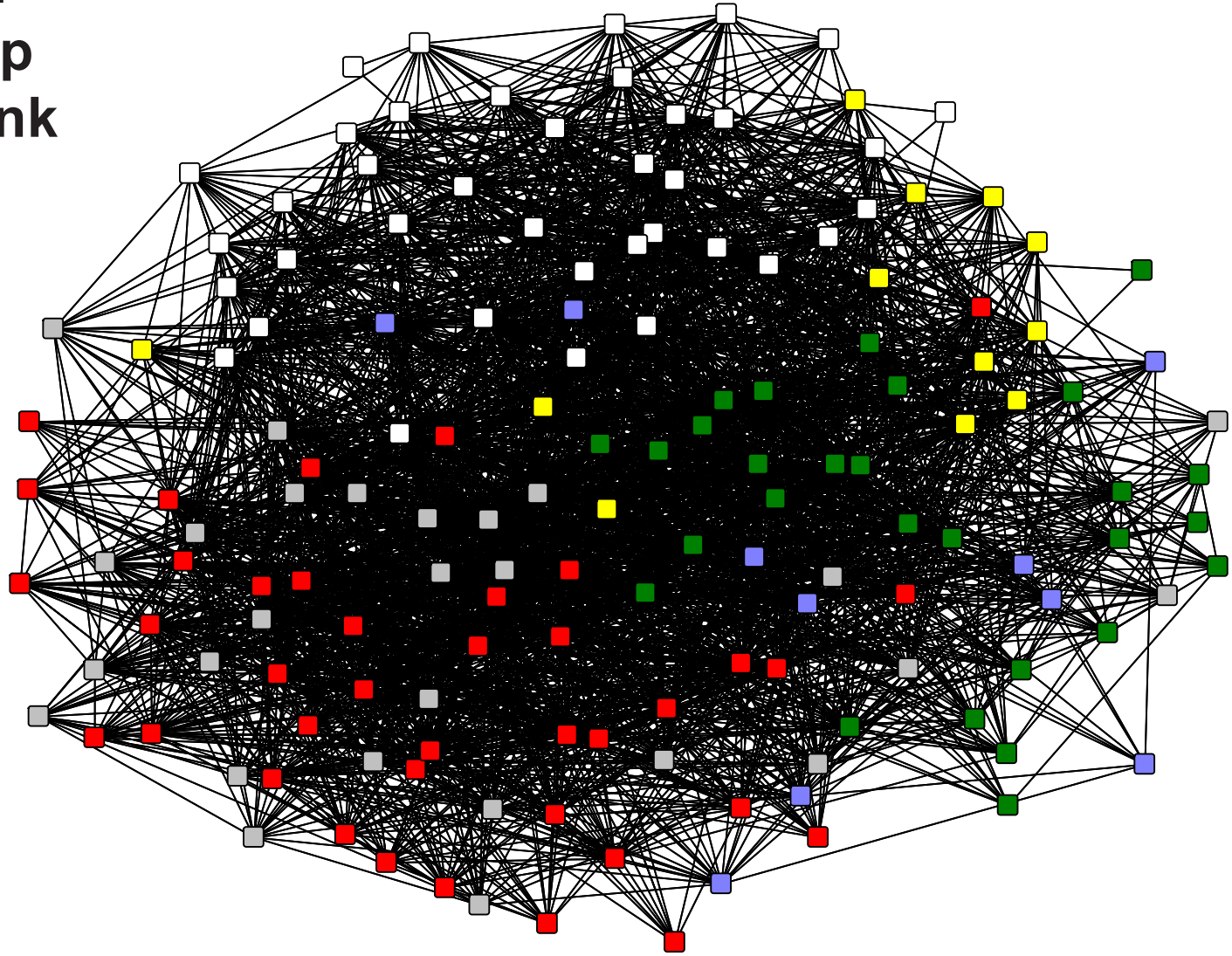
Gold indicates Commercial Club member, concentrated in center (13.2 t-test).

818 isolates sit on one Chicago board or one Chicago board plus outside boards containing no other Chicago elites.

What would you expect in large Italian cities? Germany? France?

These are senior leaders at the top of a large EU bank after the Global Financial Crisis.

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).



- Executive Function
- Corporate Operations
- Insurance
- Retail
- Other Divisions
- Wholesale

What are the implications of such a dense network for bank operations? Customer service? Employee engagement? Bank adaptation to the changing business environment?

(Q137) **How does an informal alumni group like the "Wednesday 10" provide competitive advantage?**

A. Advantage comes from dense trust relations among the alumni, who know one another from time together in school.

B. Advantage comes from the diverse occupations of the alumni, providing bridge relations into diverse markets.

C. Advantage comes from the similar backgrounds of people invited into the group which improves communication.

D. The alumni graduated together from an elite college. Any group they form will be associated with success.

E. Advantage comes from dense trust relations within the group and diverse bridge relations beyond the group.

The Wednesday 10, shown at a 1960s banquet with their dates, began meeting 52 years ago.

(Q145) A general rule for managing your team's network is to build closure within the team, and brokerage beyond the team. True or false?

A. True

B. False

(Q22) For senior leadership to operate as "one company," each leader should be strongly connected with every other senior leader in the senior management network. **True or false?**

A. True

B. False

(Q80) Structural holes are a problem for coordination. An able manager should work to eliminate the structural holes in his or her organization. **True or False?**

A. True, because structural holes are disconnections in the flow of information between employees.

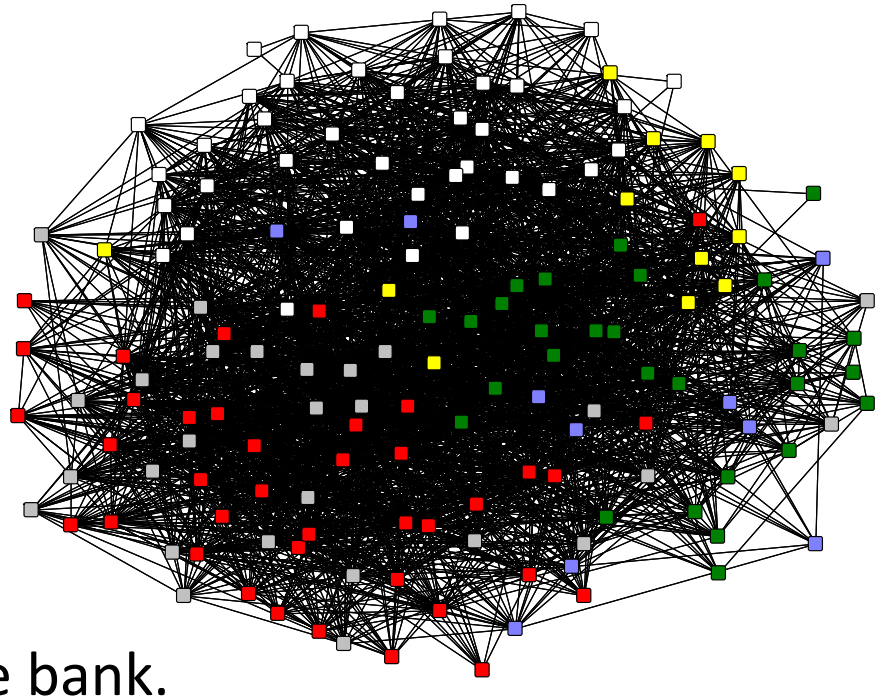
B. False, because structural holes often result from an efficient division of labor.

C. True, because structural holes are places where the manager can broker ideas to create value for the organization.

D. False, because structural holes can contribute to job security.

E. True, because employees are less engaged when they are segregated in groups separated by structural holes.

(Q10) The sociogram below describes the social network among the 150 most senior people in a large commercial bank. **Reasoning from our discussion of balancing brokerage against closure, you could expect all <u>except</u> which of the following characteristics from the bank?**



A. Stable banker reputations.

B. Efficient bank operations.

C. Innovative bank operations.

D. Suspicion of people outside the bank.

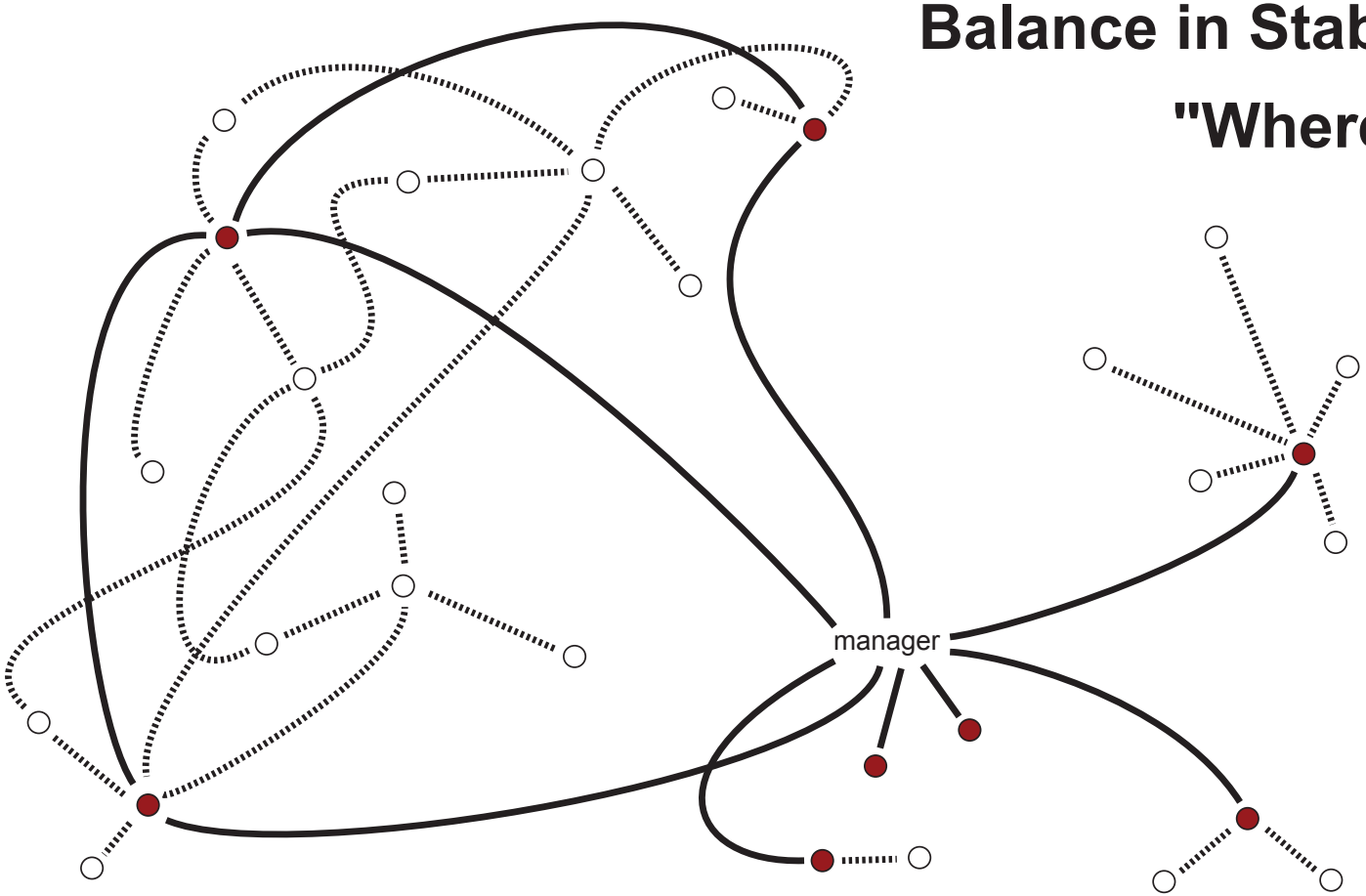
E. Frequent expressions from senior people of loyalty to the bank.

Balance in Principle for the General Case

Brokerage for top-line growth (vision, dissipation)

Closure for bottom-line growth (alignment, myopia)

Balance in Stable Networks, "Where, in general"



"Where, more precisely"

Balance in Dynamic Networks, "When"

(Q54) The competitive advantage of network brokerage is fragile. **True or false?**

A. True. By the closure-trust association, trust is higher in people with whom we share mutual friends.

B. False. People who emerge as network brokers tend to continue to be network brokers.

C. True. There are a limited number of good ideas available. Network brokers are more likely to come up with one, but the odds are low of lightning striking the same person again.

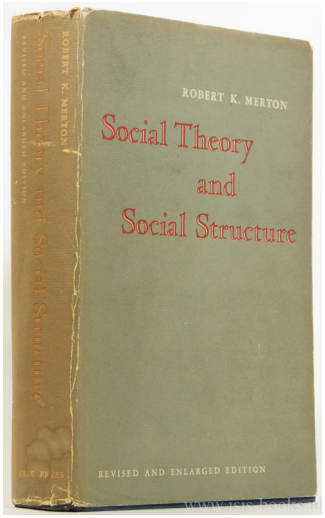
D. False. Bridge connections on average are more fragile than connections embedded in mutual friends, but there are many bridge connections that are just as strong as connections embedded in mutual friends.

E. True. Relative to connections embedded in mutual friends, bridge connections are more likely to decay.

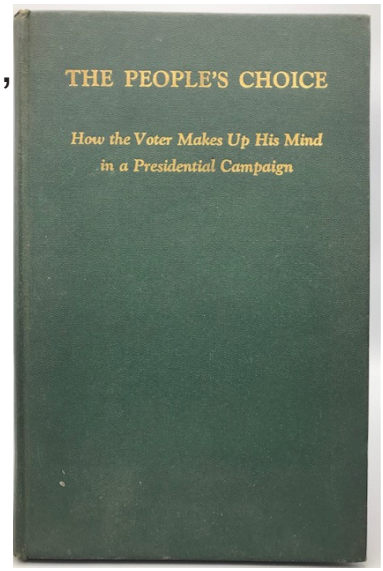
Four Generations of Development in Concepts of Network Brokerage

Generation	First Generation (Columbia, 1940s-50s)	Second Generation (Harvard, 1960s-70s)	Third Generation (diffuse, 1980s-90s)	Fourth Generation (diffuse, last decade)
Theme	Wisdom and Influence via Bridge Relations	Successful Search via Bridge Relations	Success via Bridge Relations	Success via Bridge Relations
Key idea	Bridge and Cluster Structure to Information	Weakness of Relationship Can Be Used To Infer Bridge	Lack of Surrounding Relations Defines Bridge	But Only Trusted Bridge Relations (history moves to center stage)
Key Data	Survey Contacts*	Relationship	Relations Surrounding Relationship	History of Bridge Relationship
Key concept	Cosmopolitans and Opinion Leaders	Strength of Weak Ties	Structural Holes	Strong Bridges

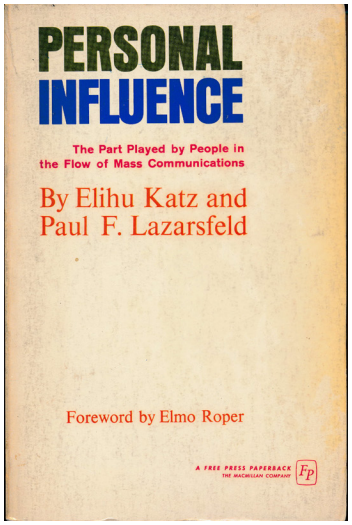
*See Jean Converse (1987, *Survey Research in the United States: Roots and Emergence*)



Robert Merton on local and cosmopolitant influentials (1957 *Social Theory and Social Structure*, p. 447 in 1968 ed.) "The localite largely confines his interests to this community. Revere is essentially his world. . . . Contrarywise with the cosmopolitan type. He has some interest in Revere, and must of course maintain a minimum of relations within the community since he, too, exerts influence there. But he is also oriented significantly to the world outside Revere, and regards himself as an integal part of that world. He resides in Revere but he lives in the Great Society."



Paul Lazarsfeld on opinion leaders in the two-step flow (with Bernard Berelson, Hazel Gaudet in 1948 *The People's Choice*, and with Elihu Katz in 1955 *Personal Influence,* p. 138). What we shall call opinion leadership, if we may call it leadership at all, is leadership at its simplest: it is casually exercised, sometimes unwitting and unbeknown, within the smallest groupings of friends, family members, and neighbors. . . . We began by interviewing a cross-sectional sample of some 800 women in Decatur, Illinois, a middle-sized city in the Middle West. We inquired into four areas of everyday decisions: marketing, fashions, public affairs, and movie-going. And for each area, we asked our respondents not only about themselves and their own behavior but about other people as well — people who influence them, and people for whom they are influential."

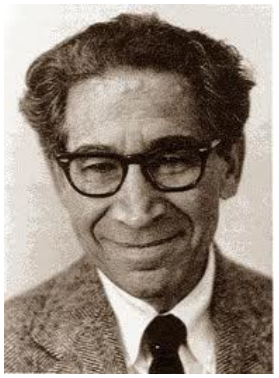


Long History, Many People Set Today's Stage
Network Structure Maps the Distribution of Information

Paul Lazarsfeld 1901-1976

Bob Merton 1910-2003

Solomon Asch 1907-1996



Leon Festinger 1919-1989

Stanley Schachter 1922-1997

Elihu Katz 1926 - 2021

Network models of advantage are grounded in two facts about the social distribution of information from the 1950s "golden age" of social psychology (e.g., Festinger, Schachter & Back, 1950; Asch, 1951; Katz & Lazarsfeld, 1955; Schachter 1959): (1) people cluster into groups as a result of contact opportunities defined by the places where people meet, and (2) communication is more frequent and influential within than between groups so that people in the same group develop similar views.

People tire of repeating arguments and stories explaining why they believe and behave the way they do. Within a group, people create systems of phrasing, opinions, symbols and behaviors defining what it means to be a member. Beneath the familiar arguments and experiences are new, emerging arguments and experiences awaiting a label, the emerging items more understood than said within the group. What was once explicit knowledge interpretable by anyone becomes tacit knowledge meaningful primarily to insiders. With continued time together, information in the group becomes "sticky" – nuanced, interconnected meanings difficult to understand in other groups (Von Hippel, 1994). Much of what we know is not easily understood beyond the colleagues around us. Holes tear open in the flow of information between groups. These holes in the social structure of communication, or more simply structural holes (Burt, 1992), are missing relations indicating where information is likely to differ on each side of the hole and not flow easily across the hole. In short, the bridge and cluster structure in social networks indicates where information is relatively homogeneous (within cluster) and where information is likely to be heterogeneous (between clusters).

From Burt, "Network disadvantaged entrepreneurs" (*Entrepreneurial Theory and Practice*, 2019, page 22)

Foundational Context: Bridge and Cluster Structure

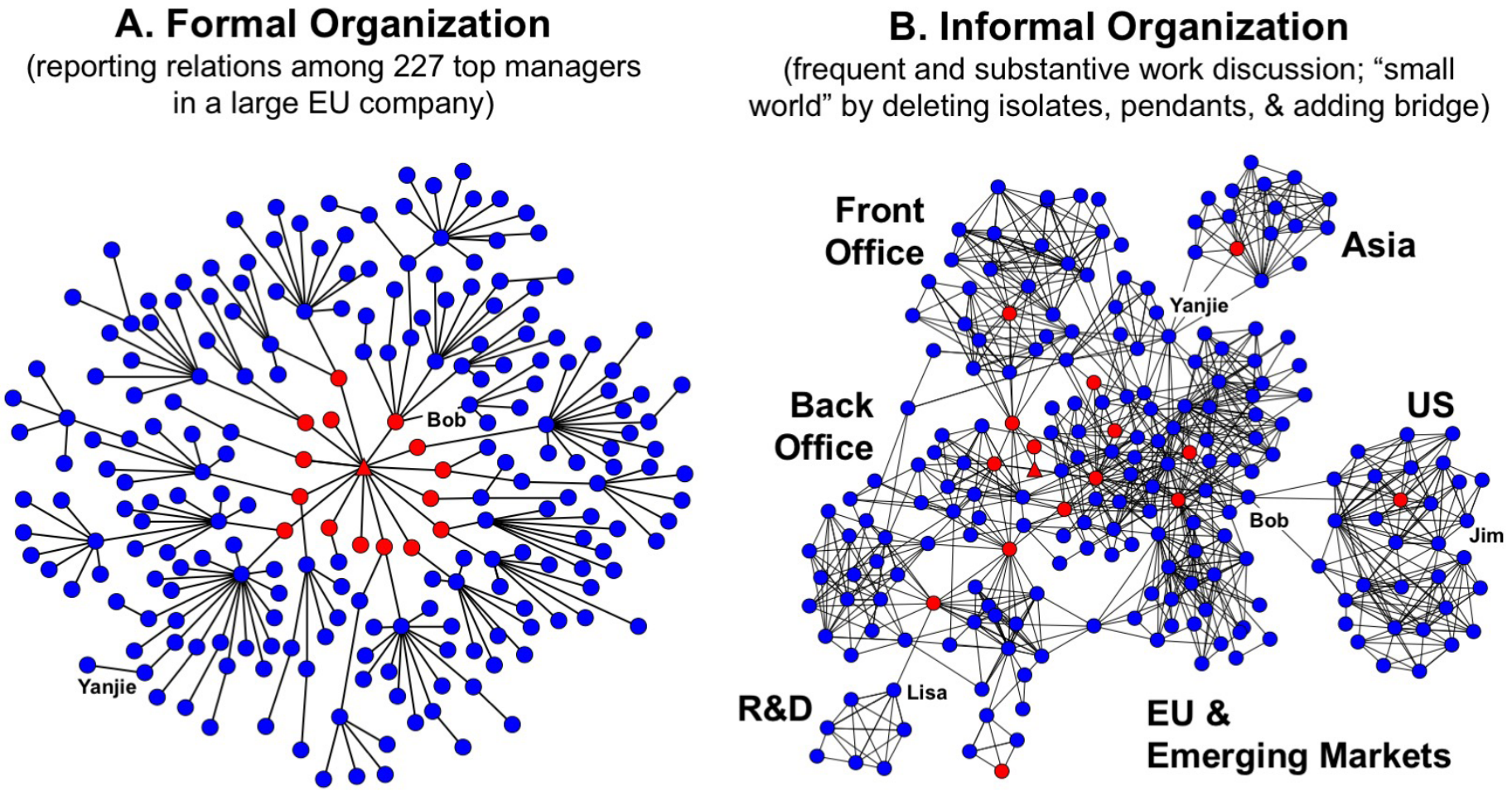
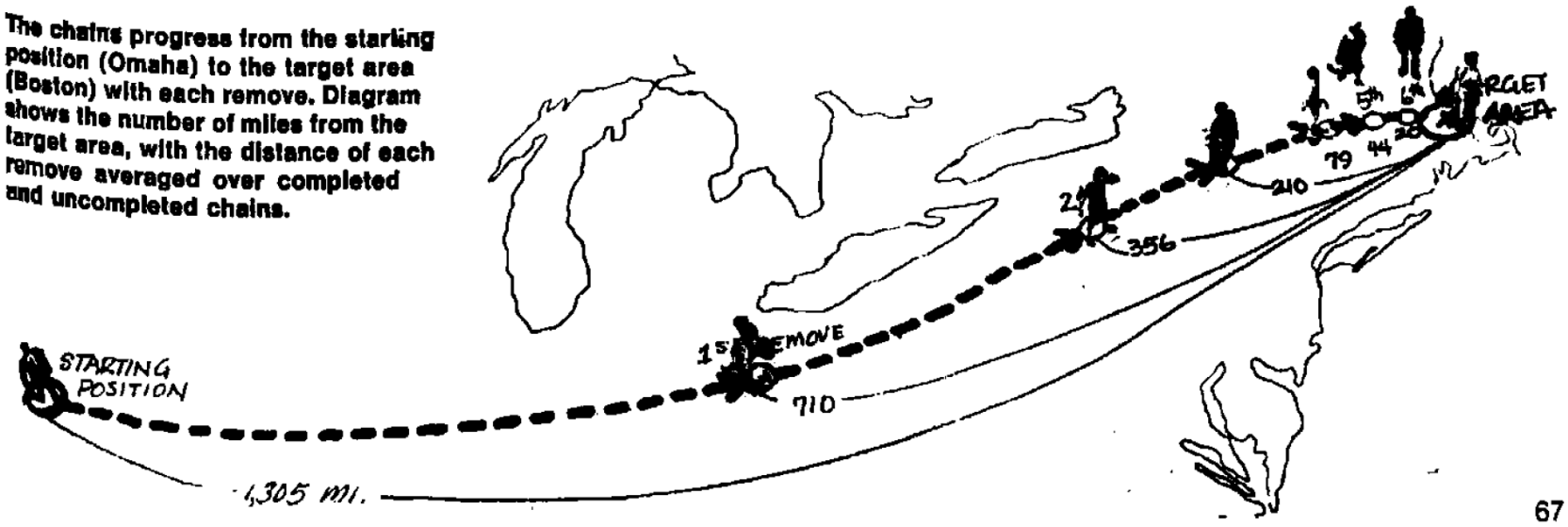


Figure 1 in Burt (2026, "Fragile brokerage?")

Four Generations of Development in Concepts of Network Brokerage

Generation	First Generation (Columbia, 1940s-50s)	Second Generation (Harvard, 1960s-70s)	Third Generation (diffuse, 1980s-90s)	Fourth Generation (diffuse, last decade)
Theme	Wisdom and Influence via Bridge Relations	Successful Search via Bridge Relations	Success via Bridge Relations	Success via Bridge Relations
Key idea	Bridge and Cluster Structure to Information	Weakness of Relationship Can Be Used To Infer Bridge	Lack of Surrounding Relations Defines Bridge	But Only Trusted Bridge Relations (history moves to center stage)
Key Data	Survey Contacts*	Relationship	Relations Surrounding Relationship	History of Bridge Relationship
Key concept	Cosmopolitans and Opinion Leaders	Strength of Weak Ties	Structural Holes	Strong Bridges

*See Jean Converse (1987, *Survey Research in the United States: Roots and Emergence*)



Stanley Milgram small-world study (Gordon Allport & Soloman Asch; 1960 Harvard PhD & initial funds, 1967 *Psychology Today*). The message passes through a sequence of acquaintances (median 5), each known personally to the next, forming a chain of contacts bridging widely separated social worlds.

Nancy Howell Lee abortionist study (Harrison White; 1954 Harvard PhD & initial funds, 1969 *The Search for an Abortionist*). "Think back now to all the people you asked for information on how to arrange an abortion, or for the address of an abortionist. Without mentioning any names, please describe briefly each person you asked for help..." (p. 177, median 2 on p. 69). The most fruitful lines of inquiry were those that reached beyond one's immediate circle.

Mark Granovetter job-seeking study (Harrison White; 1970 Harvard PhD & initial funds, 1974 *Getting a Job*). "How did you find out about your present job? (for example, through an advertisement, or through a friend, relative, or acquaintance?) "If through a person, who was that?" "Was this person a close friend, a relative, or more of a casual acquaintance?" "Of those finding a job through contacts, 16.7% reported that they saw their contact often at the time, 55.6% said occasionally, and 27.8% rarely (N 54). The skew is clearly to the weak end of the continuum." (AJS p. 1371; also see book p. 54) Median chain was 2 steps (former friend knows of opportunity, AJS p. 1372).

The "forbidden triad," an immensely productive didactic device (not a fact).

from Granovetter (1973, "Strength of weak ties," *American Journal of Sociology, pp. 1361 and 1363*. First submitted in 1969, while Mark was still a graduate student at Harvard [graduated in 1970].)

Most intuitive notions of the "strength" of an interpersonal tie should be satisfied by the following definition: the strength of a tie is a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie.[2] Each of these is somewhat independent of the other, though the set is obviously highly intracorrelated. Discussion of operational measures of and weights attaching to each of the four elements is postponed to future empirical studies.[3] It is sufficient for the present purpose if most of us can agree, on a rough intuitive basis, whether a given tie is strong, weak, or absent.[4]

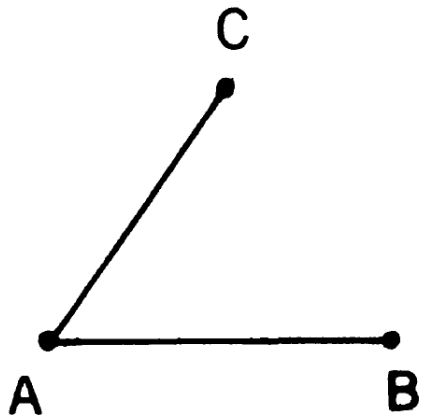


FIG. 1.—Forbidden triad

I will exaggerate it in what follows by supposing that the triad shown *never* occurs—that is, that the *B*-*C* tie is always present (whether weak or strong), given the other two strong ties. Whatever results are inferred from this supposition should tend to occur in the degree that the triad in question tends to be absent.

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*See Jean Converse (1987, *Survey Research in the United States: Roots and Emergence*)

The Natural Distribution of Relationships

(bridges are likely to be weak, but weak ties are not likely to be bridges)

Strength	Location in Social Structure: Redundant Tie within Cluster	Location in Social Structure: Nonredundant Tie beyond Cluster	Total
Weak Tie	many	some	More
Strong Tie	some	rare	Less
Total	More	Less	

Table 1.1 in Burt (1992 *Structural Holes*)

Create Value by Bridging Structural Holes

STICKY INFORMATION
Information expensive to move because: (a) tacit, (b) complex, (c) requires other knowledge to absorb, or (d) interaction with sender, recipient, or channel.

STRUCTURAL HOLE
disconnection between two groups or clusters of people

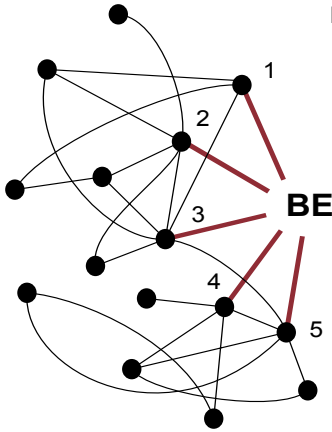
BRIDGE
relation across structural hole

NETWORK ENTREPRENEUR
or "broker," or "connector:" a person who coordinates across a structural hole

BROKERAGE
act of coordinating across a structural hole

Here is the core network for a job BEFORE and AFTER the employee expanded the network advantage of the job by reallocating network time and energy to more diverse contacts.

It is the weak connections (structural holes) between contacts in the AFTER network that provides expanded network advantage.



BEFORE

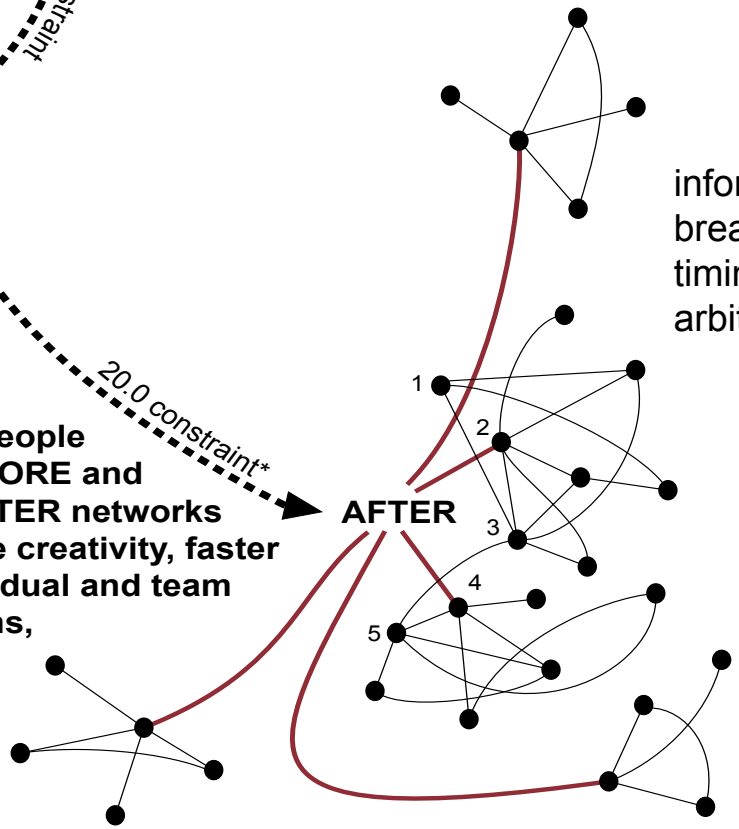
5.3. 6 constraint

The employee AFTER is more positioned at the crossroads of communication between social clusters within the firm and its market, and so is better positioned to craft projects and policy that add value across clusters.

Research shows that employees in networks like the AFTER network, spanning structural holes, are the key to integrating operations across functional and business boundaries. In research comparing senior people with networks like these BEFORE and AFTER networks, it is the AFTER networks that are associated with more creativity, faster learning, more positive individual and team evaluations, faster promotions, and higher earnings.

20.0 constraint*

AFTER



information breadth, timing, and arbitrage

*Network scores refer to direct contacts.

From Figure 1.4 in Burt (1992 *Structural Holes)*, and Figure 1.2 in *Brokerage and Closure*.
See Appendix I on survey network data, Appendix IV on measuring network constraint.

MEASUREMENT:

Important to capture strength of relations surrounding a relationship.

Network surveys need to include matrix questions such as the 1984 proposal here to put network questions on the General Social Survey.

from Burt (1984, "Network items and the General Social Survey," *Social Neteworks*)

Q1. **From time to time, most people discuss important personal matters with other people. Looking back over the last six months -- that would be back to last August -- who are the people with whom you discussed an important personal matter?**

Please just tell me their first names or initials. (RECORD NAMES IN THE ORDER LISTED BY RESPONDENT AND RECORD TOTAL NUMBER OF PEOPLE NAMED. IF FEWER THAN FIVE NAMES ARE GIVEN, PROBE: **Anyone else?**)

RESPONDENT

EC var 1					FIRST NAME
EC var 2	S EC var 3				SECOND NAME
EC var 4	S EC var 5	S EC var 6			THIRD NAME
EC var 7	S EC var 8	S EC var 9	S EC var 10		FOURTH NAME
EC var 11	S EC var 12	S EC var 13	S EC var 14	S EC var 15	FIFTH NAME

NUMBER OF PEOPLE NAMED ☐

IF NO ONE IS NAMED, SKIP TO QUESTION 16

IF ONLY ONE NAME CAN BE OBTAINED, CIRCLE THE VAR 1 **EC** AND SKIP TO QUESTION 5

Q2. **Do you feel equally close to all of these people?** ____Yes ____No

IF YES, THEN CIRCLE THE **EC** CODE IN THE RESPONDENT COLUMN FOR EACH ROW NAMED

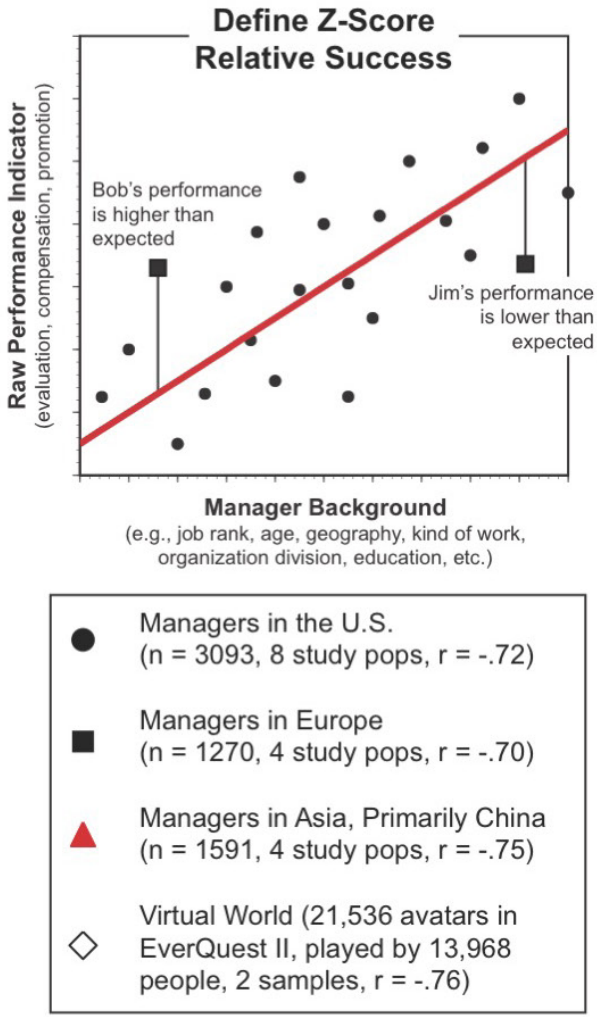
IF NO, THEN ASK: **Who is especially close to you?** (CIRCLE THE **EC** CODE IN THE APPROPRIATE ROW OF THE RESPONDENT COLUMN IN THE MATRIX)

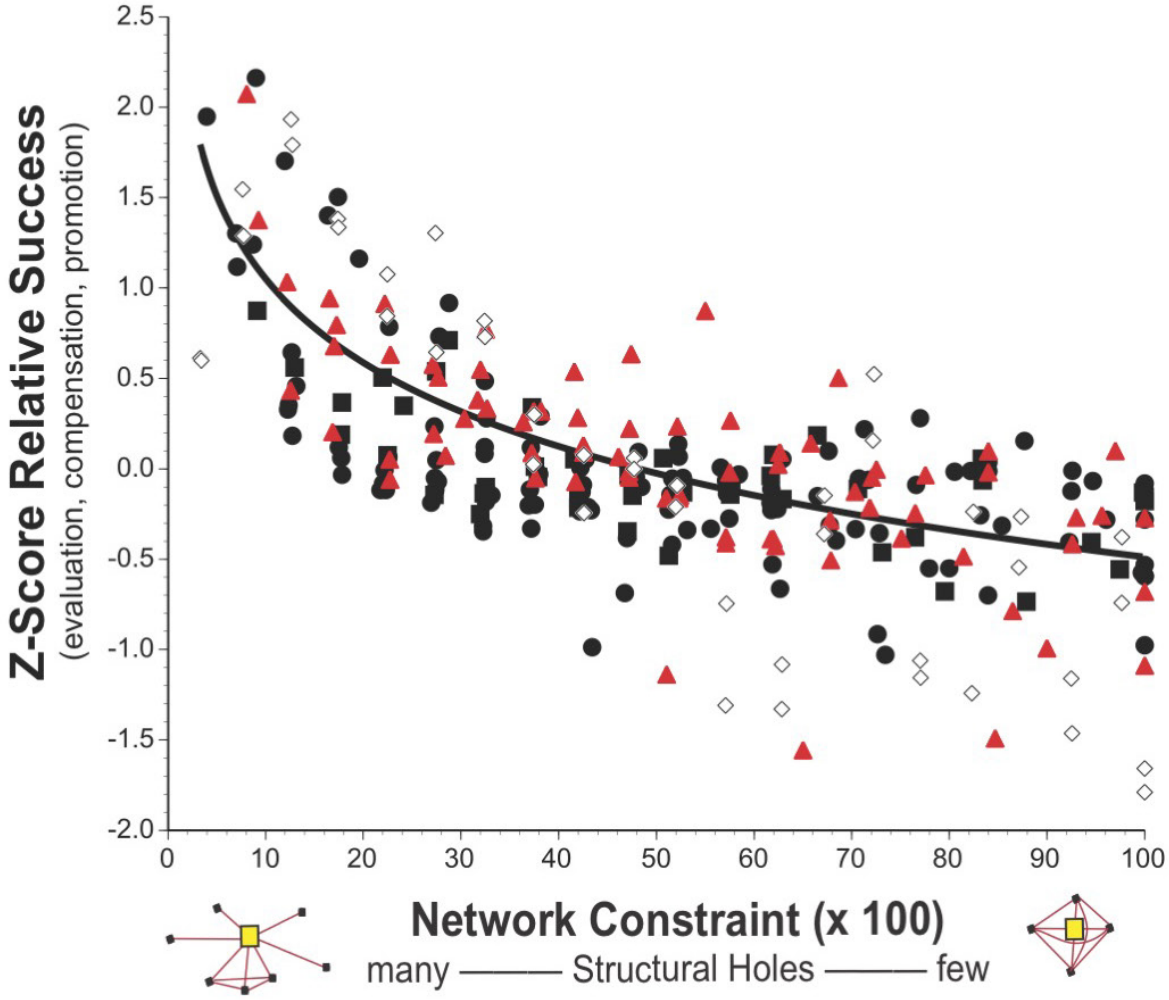
Q3. **Please think about the relations between the people you just mentioned. Are [NAME 1] or [NAME 2] or [NAME 3] or [NAME 4] or [NAME 5] total strangers, in the sense that they wouldn't recognize one another if they bumped into one another on the street?** ____Yes ____No IF NO, SKIP TO QUESTION 4

IF YES, THEN ASK: **Who among them are strangers?** (CIRCLE THE **S** CODES IN THE APPROPRIATE BOXES OF THE MATRIX -- SKIP TO QUESTION 5 IF MATRIX IS FULL)

☐ ALL ARE STRANGERS - CIRCLE **S** IN NAMED ROWS, THEN SKIP TO QUESTION 5

Replicable Retuns to Brokerage



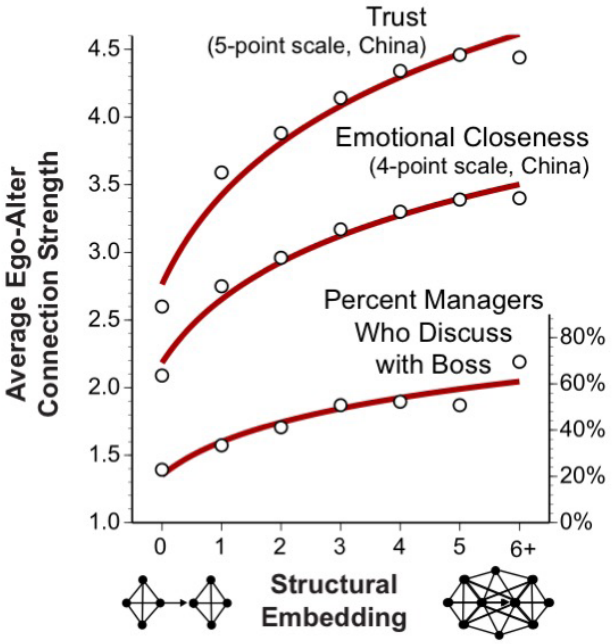


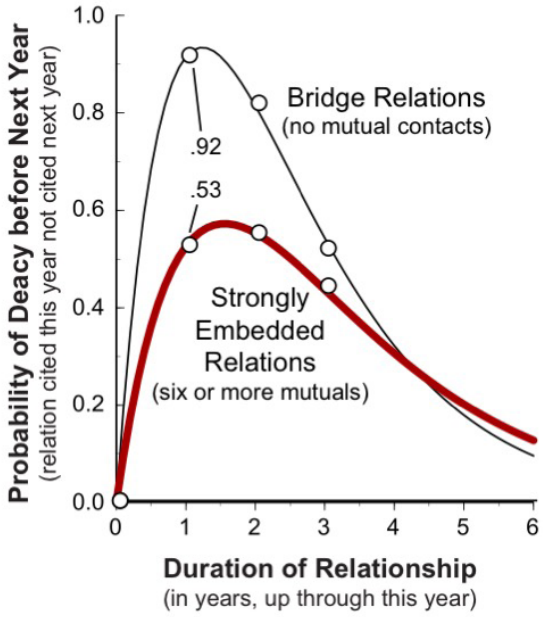
NOTE — Plotted data are average scores within five-point intervals of network constraint in each study population. Correlations are computed from the plotted data using log network constraint. Inset graph to the upper left contains hypothetical data illustrating computation of z-score relative performance. Adapted from Burt (2019b:38)

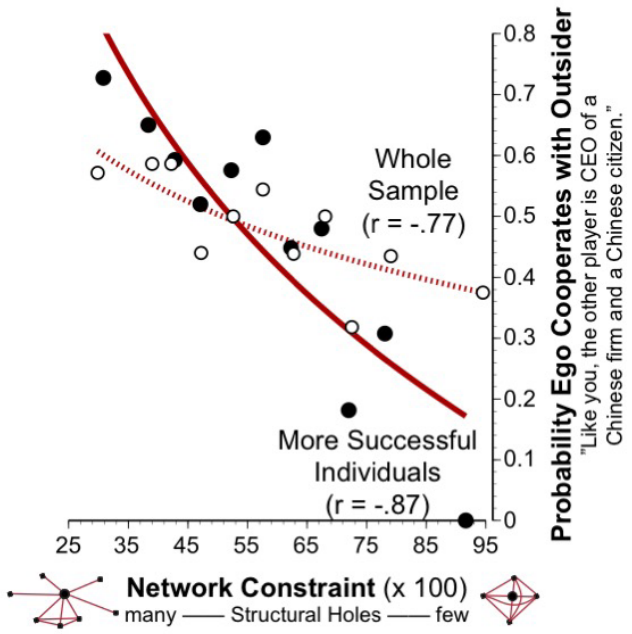
Figure 1 in Burt (2026, "Fragile brokerage?")

Fragile Brokerage: Local cohesion facilitates trust inside, distrust outside — creating weak bridges & suspicion of brokers

Can I trust this information received from someone in that group? Their interests can be less virtuous, irrelevant to my own, even contradictory. Is it even worth the costly due diligence to test the truth of the information?







A. Closure-Trust Association

Rich history: **Economics** (Coase 1937 through Greif 1989), **Psychology** (Heider 1958, Festinger et al 1950), **Sociology** (Blau 1974; Granovetter 1973 1985, Coleman 1988), **Law** (Ellickson 1991, Bernstein 1992), **Political Science** (Putnam 1993). Two top lines are based on 7,166 evaluations by Chinese entrepreneurs of business contacts. Bottom line is based on 674 evaluations by American managers of discussion with corporate boss. Adapted from Burt and Opper (2026a:Fig. 2).

B. Which Protects Against Decay

For a population of investment bankers and analysts in a large US firm, this graph plots the probability of a relationship cited this year not being cited next year (based on 48,231 relations, from Burt 2010:181).

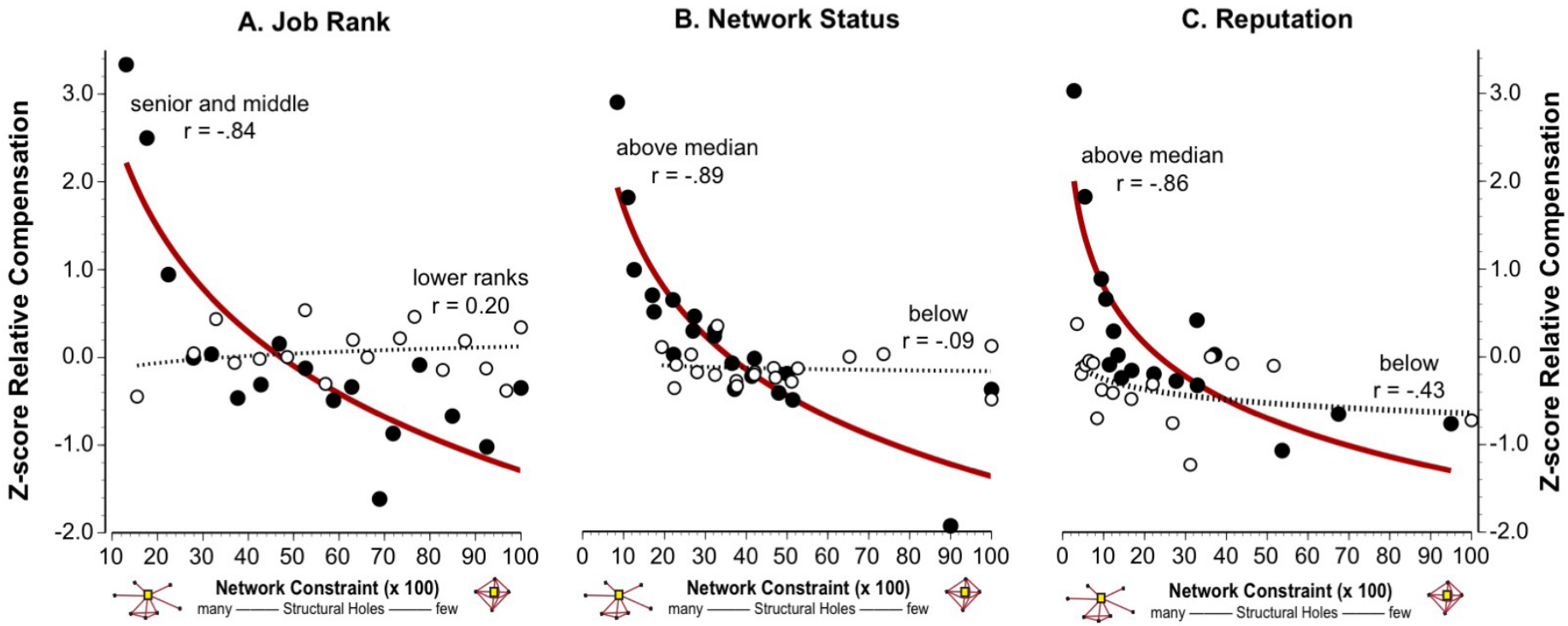
C. And Intensifies Distrust of Outsiders

For a probability sample of Chinese entrepreneurs, this graph plots averages for 5-point intervals on X with thin tails of X truncated for infrequency. "More Successful" are entrepreneurs whose businesses had above-median profit last year. Adapted from Burt et al. (2022:503). Regression lines in all three graphs are through the plotted data.

Figure 3 in Burt (2026, "Fragile brokerage?")

Fragile Brokerage: As a result, returns to brokerage are contingent on broker social standing.

Being reputable is not essential for acquiring information, but it is to rewards for shared information.



Note: Plotted data are average scores within five-point intervals of network constraint within four populations (electronics company for job rank, software company and HR in commercial bank for network status, investment bankers for reputation). Solid dots refer to people with high social standing (senior/middle job rank, above-median network status, above-median reputation). Correlations are computed from plotted data for log network constraint.

Figure 4 in Burt (2026, “Fragile brokerage?”)

Given the closure-trust association, one way to ensure strong (load-carrying) bridges is to reinforce the bridges with third parties:

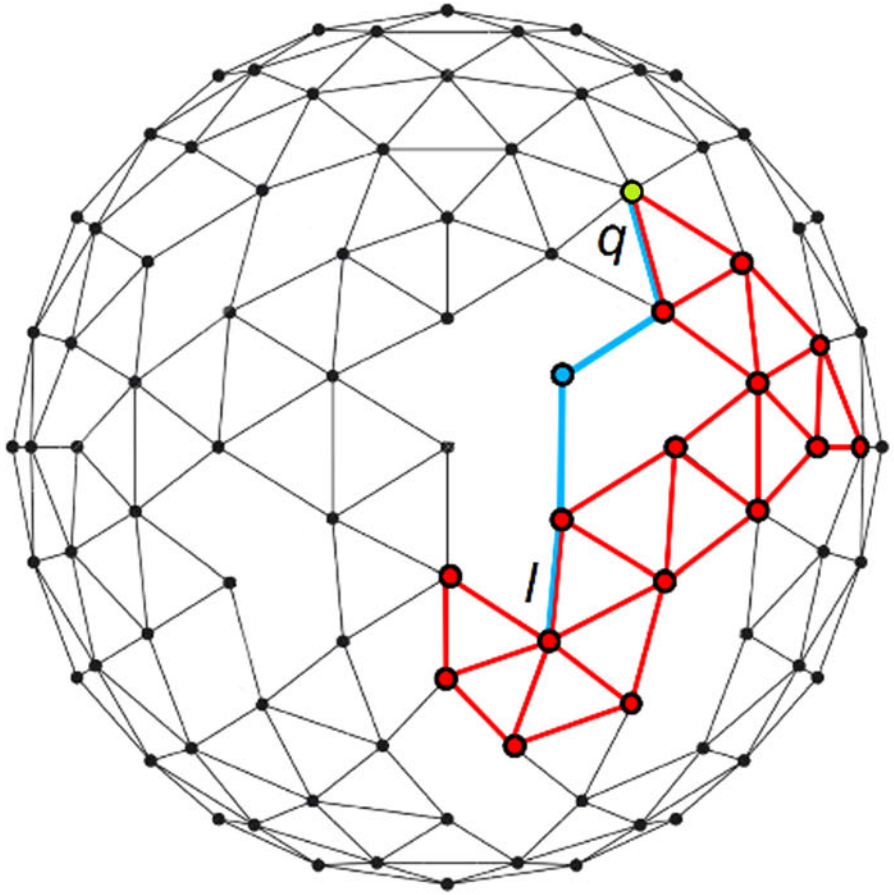
Simmel Ties - "Two people are Simmelian tied to one another if they are reciprocally and strongly tied to each other and if they are each reciprocally and strongly tied to at least one third party in common." (Krackhardt, 1999:186; Krackhardt, 1992; Tortoriello and Krackhardt, 2010)

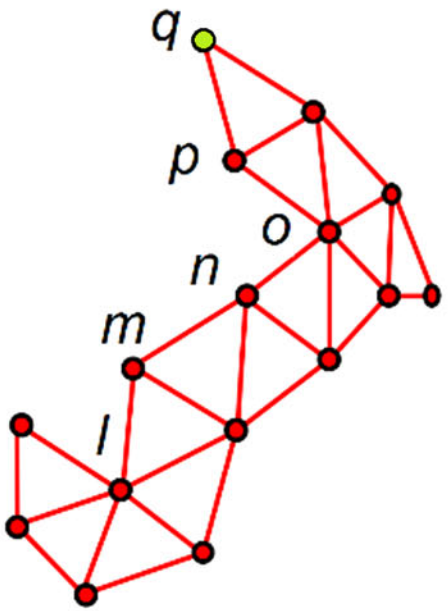
Wide Bridges – "A bridge is generally assumed to consist of a single tie, which is sufficient for simple contact between neighborhoods. However, if a connection requires multiple contacts, then a bridge must consist of multiple ties. Hence, we can measure a bridge not only by its length (the range that is spanned by the bridge) but also its width (the number of ties it contains). … The importance of bridge width has been overlooked in previous research because it is not relevant for simple contagions. However, propagation of many collective behaviors depends on bridges that are wide as well as long. The structural weakness of long ties is that they form bridges that are too narrow for complex contagions to pass." (Centola and Macy, 2007:710; Centola, 2010; 2018; Guilbeault and Centola, 2021) See example on next page.

Institutional Embedding - Stovel et al. (2011) discuss examples (cf. Kollock 1998, on "structural solutions," Bernstein 1992 on diamond exchange): Brokerage can be made less fragile by confining it to a group that cannot abuse broker information advantage (e.g., marriage matchmakers in China), absorbing brokers into one side or the other (e.g., Protestant missionaries supporting practical community interests rather than colonial elite interests), or absorbing brokerage into the activity of an established organization (e.g., social welfare organizations that foster brokerage among members).

Workable, Poor Solution - This strategy turns brokerage into closure (e.g., network constraint), which is negatively associated with innovation and growth. Adding third parties converts a bridge between groups into an embedded relationship within a group. Third-party reinforcement has several attractive features discussed in the second handout (especially for loosely-connected networks across the internet, next page). But for the general case, which includes unambiguously balkanized networks within and across organizations, third-party reinforcement is a theoretically unsatisfactory solution to brokerage fragility.

From Figure 1 in Guilbeault & Centola (2021 *Nature*)





Complex paths between node *l* and *q*

Shortest simple path between node *l* and *q*

Shortest Complex Path

V(*Geodesic*) = {*l*,*m*,*n*,*o*,*p*,*q*}

E(Geodesic) = {(*l*,*m*),(*m*,*n*),(*n*,*o*),
(*o*,*p*),(*p*,*q*)}

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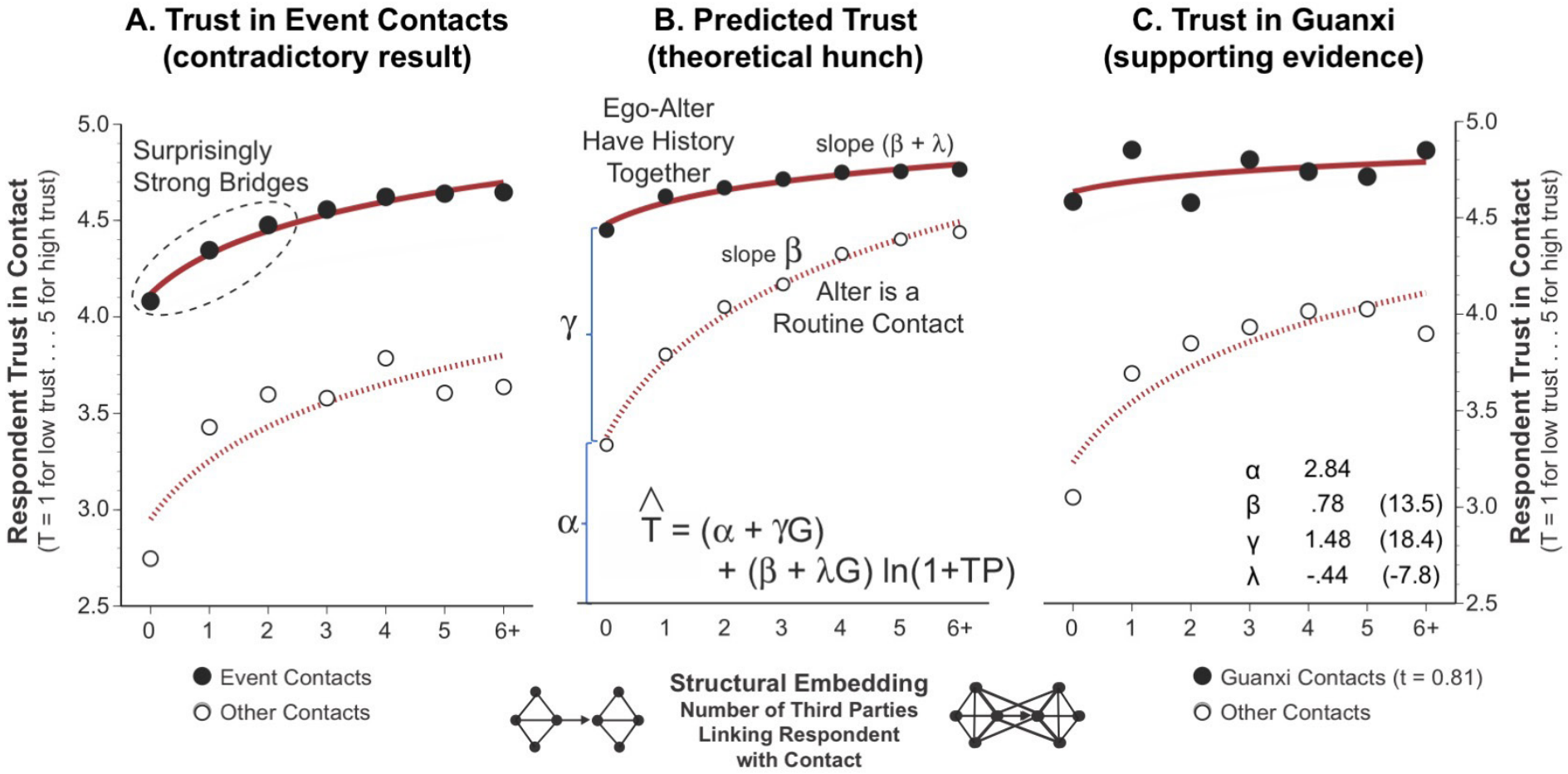
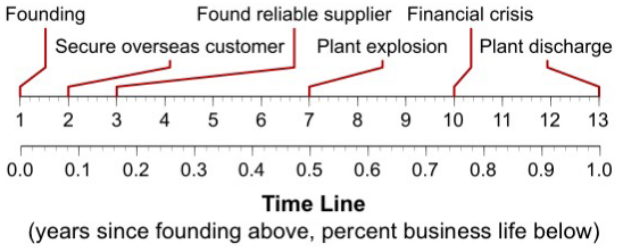
*See Jean Converse (1987, *Survey Research in the United States: Roots and Emergence*)

Contradictory Data Reveal a General Solution: From Event Contacts to Strong Bridges

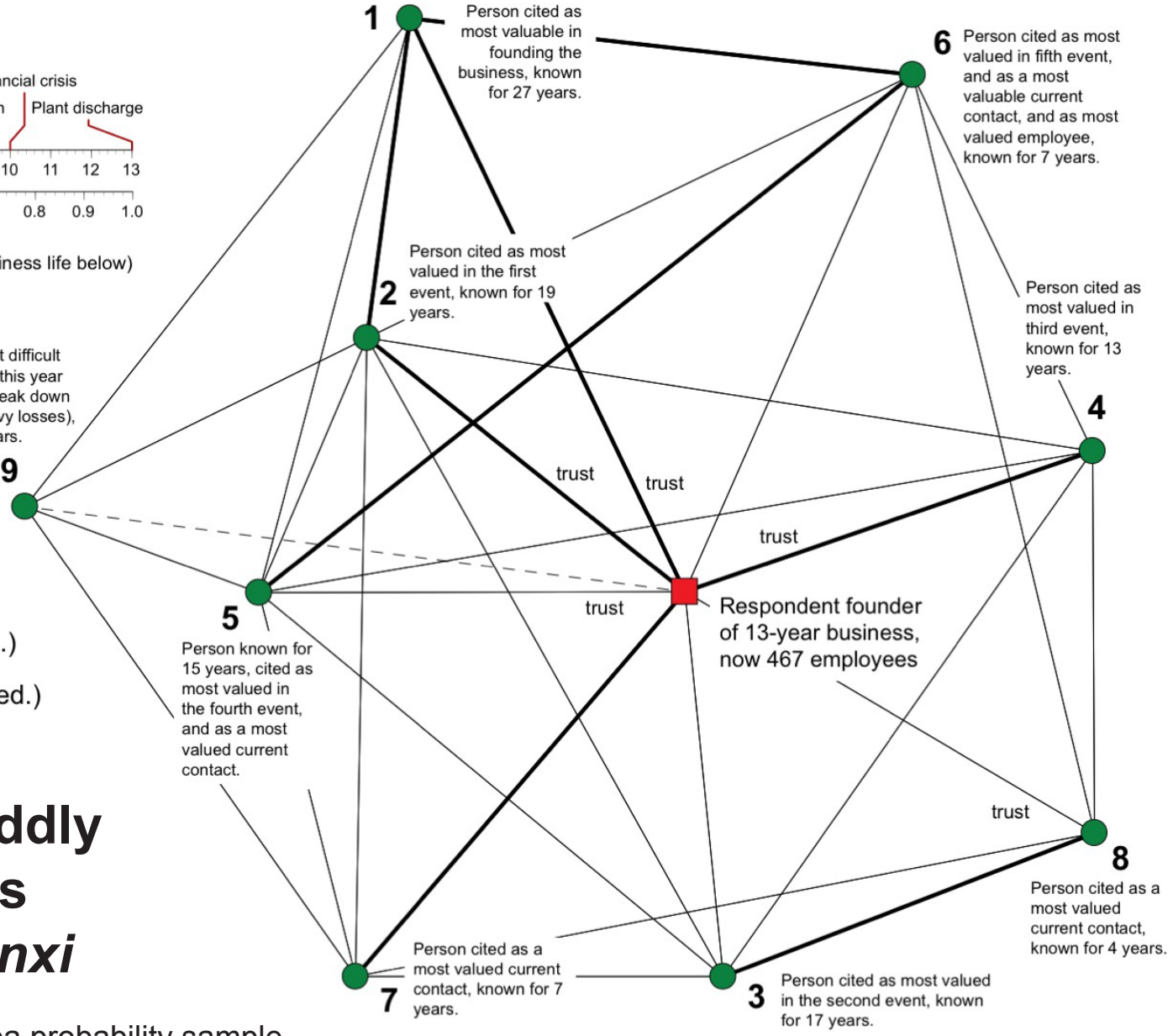


NOTE: Dots are average Y scores at each level of X. Graphs describe relationships (a) with 4,464 contacts cited in 2012 by 700 respondents, (c) with 2,702 contacts cited in 2018 by 384 respondents. Vertical axis is respondent trust in contact, measured on a five-point scale. Horizontal axis is the number of other people in a respondent's network connected with the contact. Dummy variable G equals 1 for contacts cited as guanxi. Estimates in (c) are with individual fixed effects and jackknife test statistics.

Figure 5 in Burt (2026, "Fragile brokerage?")



2012	2018	
700	384	Respondents
80%	83%	Founders
11	10	Firm Age (med.)
67	66	Employees (med.)

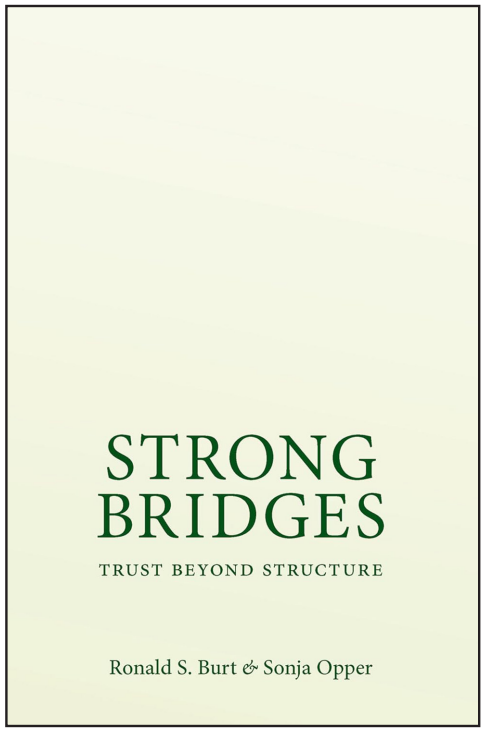


Hunch: The Oddly Strong Bridges Could Be *Guanxi*

Two surveys, stratified area probability sample of Chinese heads of SME private enterprises (CEOs/entrepreneurs). Thick line indicates “especially close,” dashed line indicates “less than close,” no line indicates “distant,” and “trust” indicates relations deemed highest trust.

Figure 3.2, Burt and Opper (2026 *Strong Bridges*)

Our hunch was that the event contacts correspond to the valuable, particularistic relationships known in China as "guanxi." We launch the inquiry as follows:



A meritocracy is widely understood to be a governance system that distributes resources in proportion to merit. Such systems are worthy of aspiration, but typically noted for their absence. Familiar barriers to a practical meritocracy include accidents of birth, friends, ignorance, love of one's own kind, obligations, quotas, sloth — it is a long list.

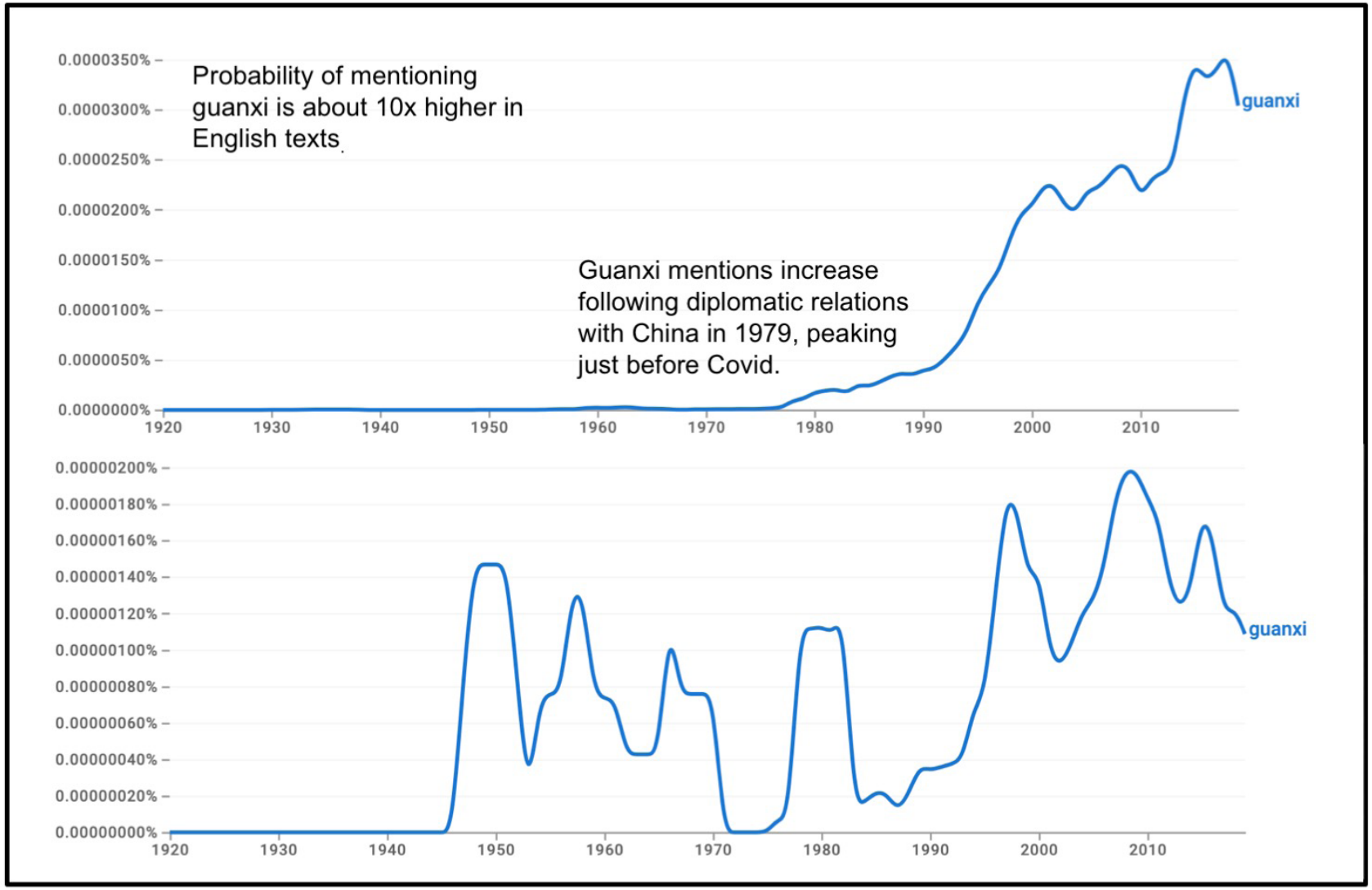
The yawning gap between aspiration and reality generates frustration and anger. It is not surprising that people in diverse cultures have a word for relations that provide a way around meritocracy; a manifestation of insider wisdom when you are advantaged, an indicator of corruption when someone else is advantaged: There is blat in Russia, enchufe in Spain, piston in France, guan hệ in Vietnam, raccomandazione in Italy, sifarish in India, Vitamin B in Germany — and guanxi in China.

This category of colloquial words is a playground for social network theory. Theory defines social mechanisms responsible for the referenced advantage. In a narrow sense, this book can be read as a story of building theory around one such word, the Chinese term guanxi.

We treat guanxi as an example of what Merton and Barber (2004: 256) term a niche-word, a word that expresses "a familiar kind of human experience that transcends national and other cultural and linguistic boundaries." Our premise in this book is that the relationships known in China as guanxi refer to a broad category of human relationships.

From Chapter 1 to Burt and Opper (2026, *Strong Bridges*).

Guanxi Mentions in China and the West



NOTE: Google ngram output with 2-year smoothing (created on September 30, 2024). Here are some events related to peaks in Chinese attention: (early 1950s) attack on clientelist ties and feudal networks (so-called 3-Anti-campaign launched in 1951 and 5-Anti-campaign in 1952), (1957) year before Mao launches Great Leap Forward (mass mobilization and collectivization), (1966) cultural revolution begins (to purge counter revolutionaries), (1978-79) economic reforms (Deng Xiaoping begins to replace old veterans), (1997) financial crisis (in parallel 1993-1997, anti-corruption campaign by Jiang Zemin), (2008) financial crisis (in parallel 2003-2012 Hu Jintao's fairly moderate anti-corruption campaigns), (2015) height of Xi Jinping's anti-corruption campaign, started with taking office in 2012).

Figure 4.1 in Burt and Opper (2026, *Strong Bridges*). For more on language, see Chapter 6 on the language used in China to explain guanxi.

Ask Business Leaders Directly Who in Their Network Is *Guanxi*

After eliciting the names of key business contacts, we put the name interpreter item at the right to the stratified probability sample of 384 Chinese CEOs in 2018 running SMEs to explicitly distinguish contacts they deem *guanxi* versus those deemed not-*guanxi*.

2018 sample is stratified by city, industry, and size (Shanghai, Ningbo, Hangzhou; Auto Parts vs IT; Small vs Large). No firm is included from the 2012 survey.

H1: Guanxi reproduces strong bridges of event contacts. See Figure C on next page.

H2: Guanxi strong bridges are essential for competitive advantage of brokerage. See pages 53-54.

14. Are you familiar with the word "guanxi?"

(Interviewer circle answer) yes no

14b. If no, skip to question 14c. If yes, ask: **When there is guanxi between two people, that tells you certain things about their relationship. In your own words, how would you describe to a foreigner the relationship between two people who have guanxi with each other?** (Interviewer, hand across GUANXI SHEET. Staple sheet to this page with answer.)

_____

_____

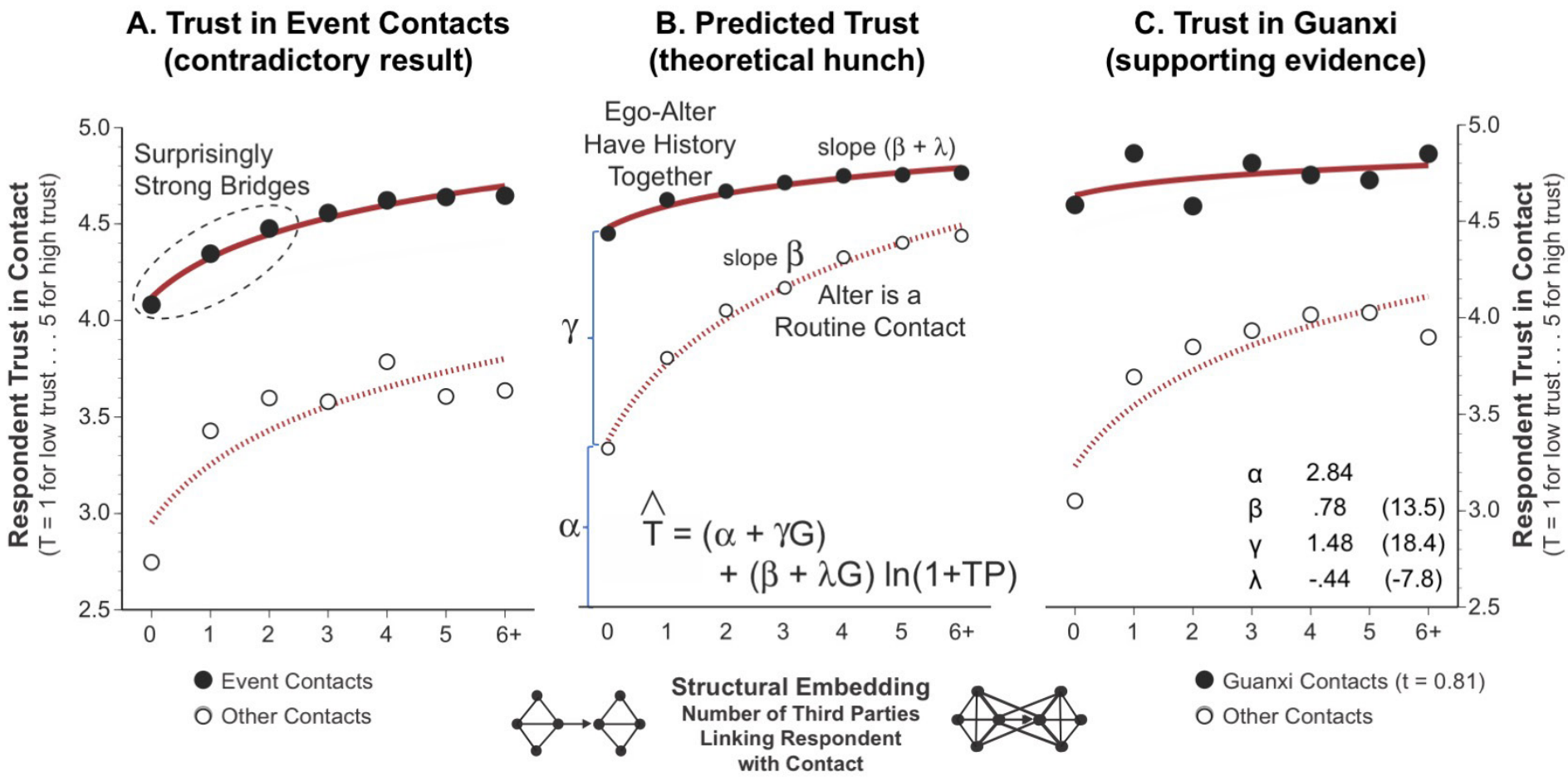
_____

14c. In general, people say that guanxi exists when two people feel morally obligated to help one another without the expectation of a direct compensation. **Look over the list of your business contacts. Thinking of guanxi as feeling a moral obligation to help each other, with whom do you feel you have the strongest guanxi? Just read the number next to the name of the person.** (Interviewer, write "1" in response line for named person.)

14d. **Are there any other people on the list with whom you have guanxi almost as strong as with the person you just named, contact "number named in question 14c"?** (Interviewer, write "2" in response lines for named people.)

14e. **In terms of the general understanding of guanxi as feeling a moral obligation to help each other, with which people on the list do you definitely NOT have guanxi?** (Interviewer, write "3" in response lines for each named person.)

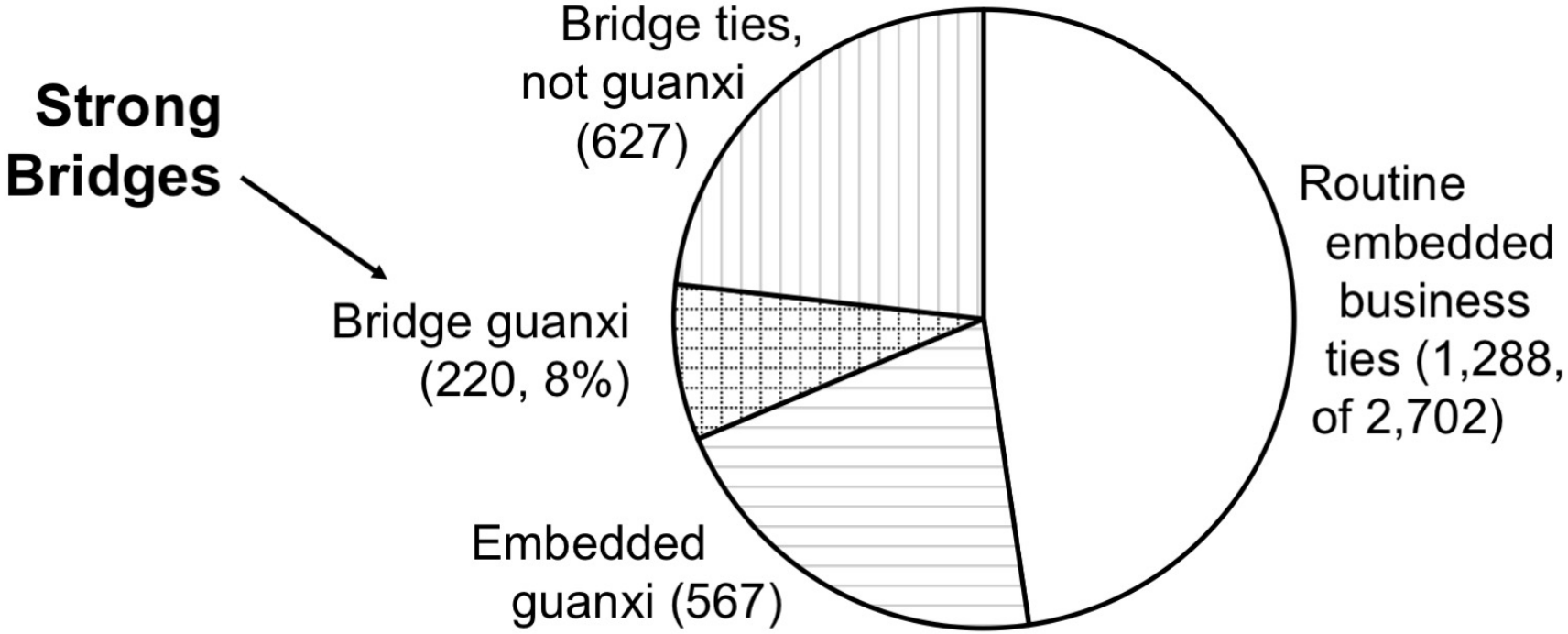
Unexpected Strong Bridges Are Even More Obvious in Guanxi



NOTE: Dots are average Y scores at each level of X. Graphs describe relationships (a) with 4,464 contacts cited in 2012 by 700 respondents, (c) with 2,702 contacts cited in 2018 by 384 respondents. Vertical axis is respondent trust in contact, measured on a five-point scale. Horizontal axis is the number of other people in a respondent's network connected with the contact. Dummy variable G equals 1 for contacts cited as guanxi. Estimates in (c) are with individual fixed effects and jackknife test statistics.

Figure 5 in Burt (2026, "Fragile brokerage?")

Summary Partition of Cited Business Relationships



(Q367) The relations known in network analysis as strong bridges are known in China as guanxi. **True or False?**

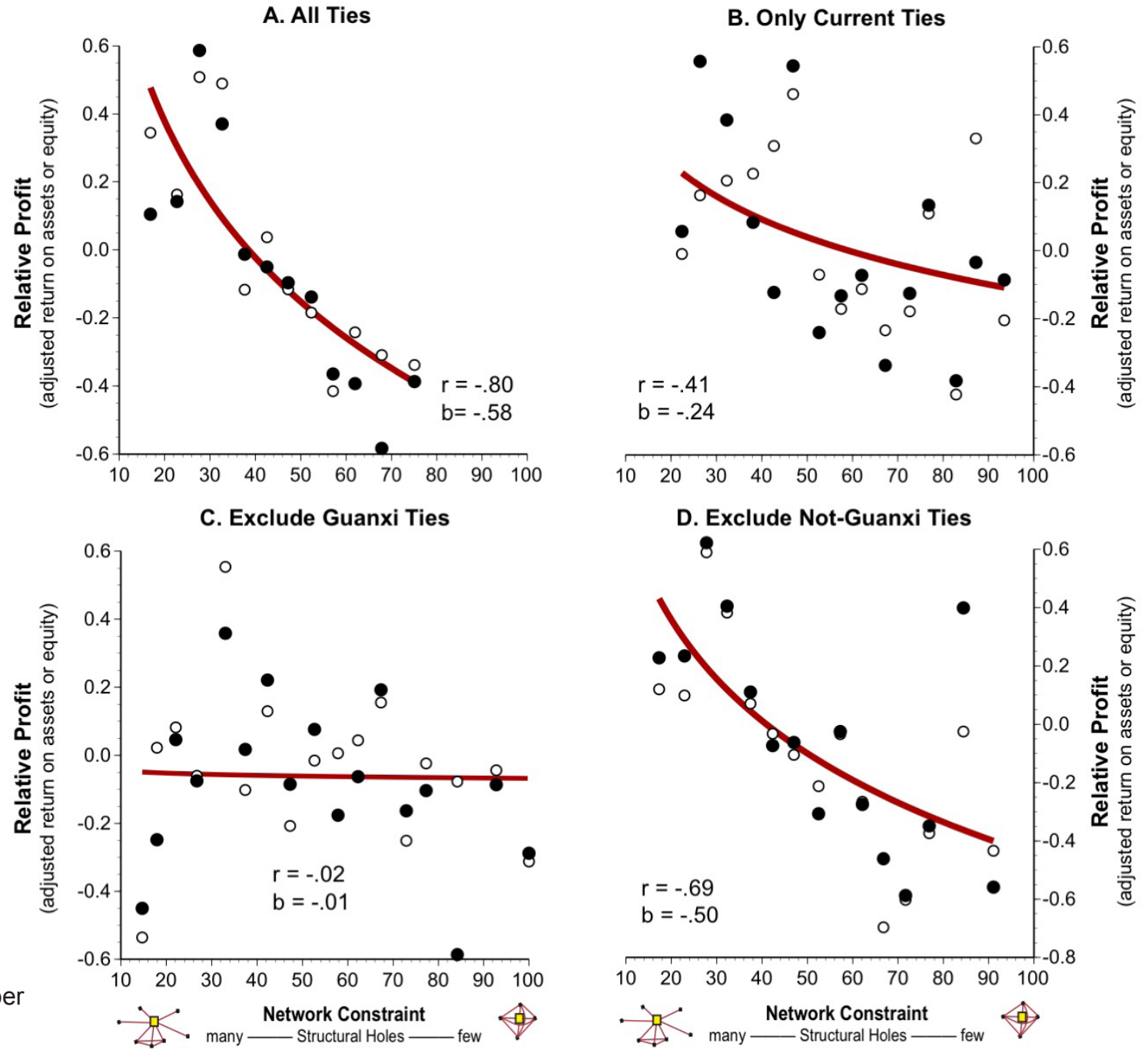
(Q368) The relations known in China as guanxi are known as strong bridges in network analysis. **True or False?**

Figure 4.8 in Burt and Opper (2026, *Strong Bridges*).

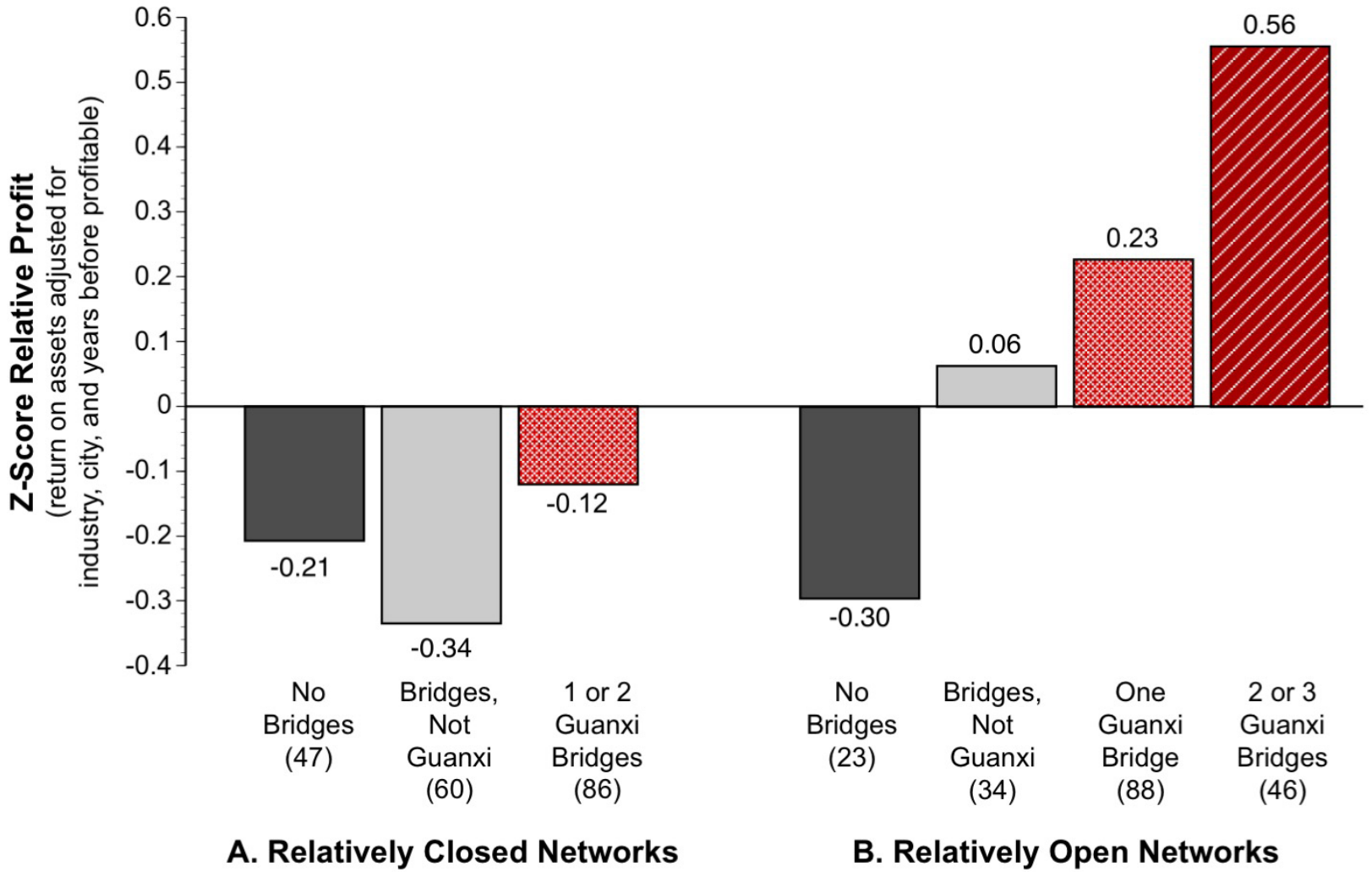
Guanxi Ties Are Critical to the Advantage Hypothesis

NOTE: Plotted scores are 384 individual scores on vertical and horizontal axes averaged within five-point intervals of network constraint. Dark dots show average return on assets (adjusted for value of business assets, years from founding until business was profitable, and industry). Hollow dots show average return on equity (adjusted for value of business equity, years from founding until business was profitable, and industry). Correlations are computed from plotted data with log(network constraint).

Figure 4.6 in Burt and Opper (2026, *Strong Bridges*)



Strong Bridges in the Network-Performance Link



NOTE: Adapted from Burt and Opper (2026:Figure 4.7; cf Burt & Opper 2024:31). Bars show z-score relative profit. Networks are sorted on the horizontal (parentheses contains number of entrepreneurs in each condition). Closed versus open networks are distinguished by median network constraint computed from all ties except the strongest guanxi. No bridges refers to networks in which no relationship is embedded in less than a strong indirect connection. Seven entrepreneurs with two guanxi bridges are combined in the high category of relatively closed networks, and six entrepreneurs with three guanxi bridges are combined in the high category of relatively open networks.

Figure 6 in Burt (2026, “Fragile brokerage?”)

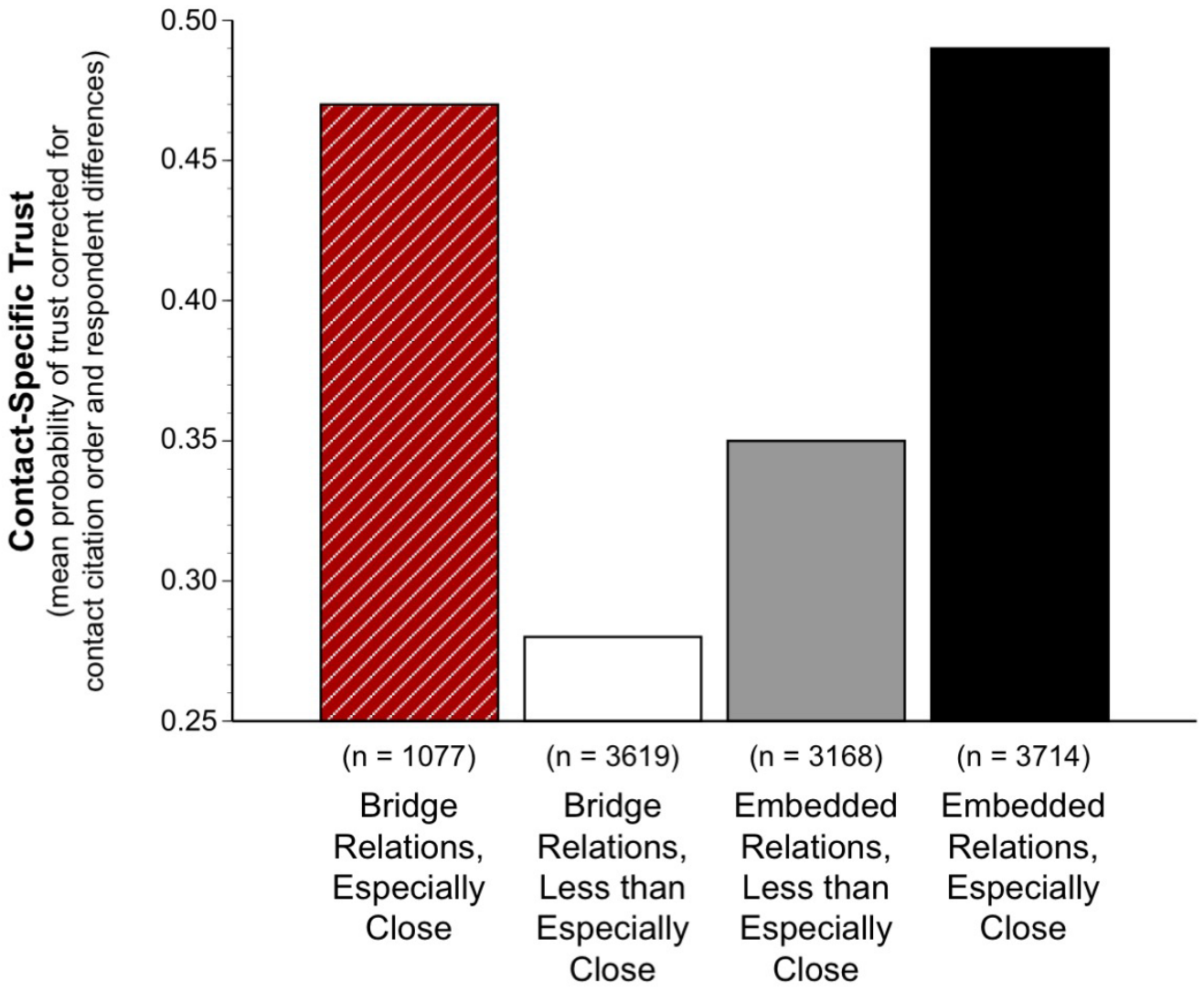
Reassuring Answers to Key Questions

Are strong bridges limited to relations associated with certain kinds of help or certain kinds of events? **NO!** Strong bridges develop from all kinds of help in all kinds of events. They key is not the kind of help or event so much as significance to the person experiencing the help while going through the event. The event can be soldiers looking out for one another during combat, fraternity brothers pledging in the same cohort, people surviving together a disaster than for some others proved fatal, students struggling with a critical course. In general, guanxi ties are positive sentiment forged to bond through felt support during a significant event. (Chapter 3 in *Strong Bridges*.)

Do the advantages of the strong bridges provided by guanxi depend on family or other roles? **NO!** The trust and competitive advantage of strong bridges provided by guanxi occur whether the guanxi is family, or work roles, or classmates, or childhood friends, or any other kind of positive relationship. (Chapter 5 in *Strong Bridges*.)

Are the strong bridges provided by guanxi particularly resilient to disruptive events? **YES!** Relations with quanxi contacts are the only relations likely to survive over time through the COVID pandemic in 2019. Weak bridges in particular are prone to decay. Strong bridges are an asset that lasts. (Chapter 7 in *Strong Bridges*.)

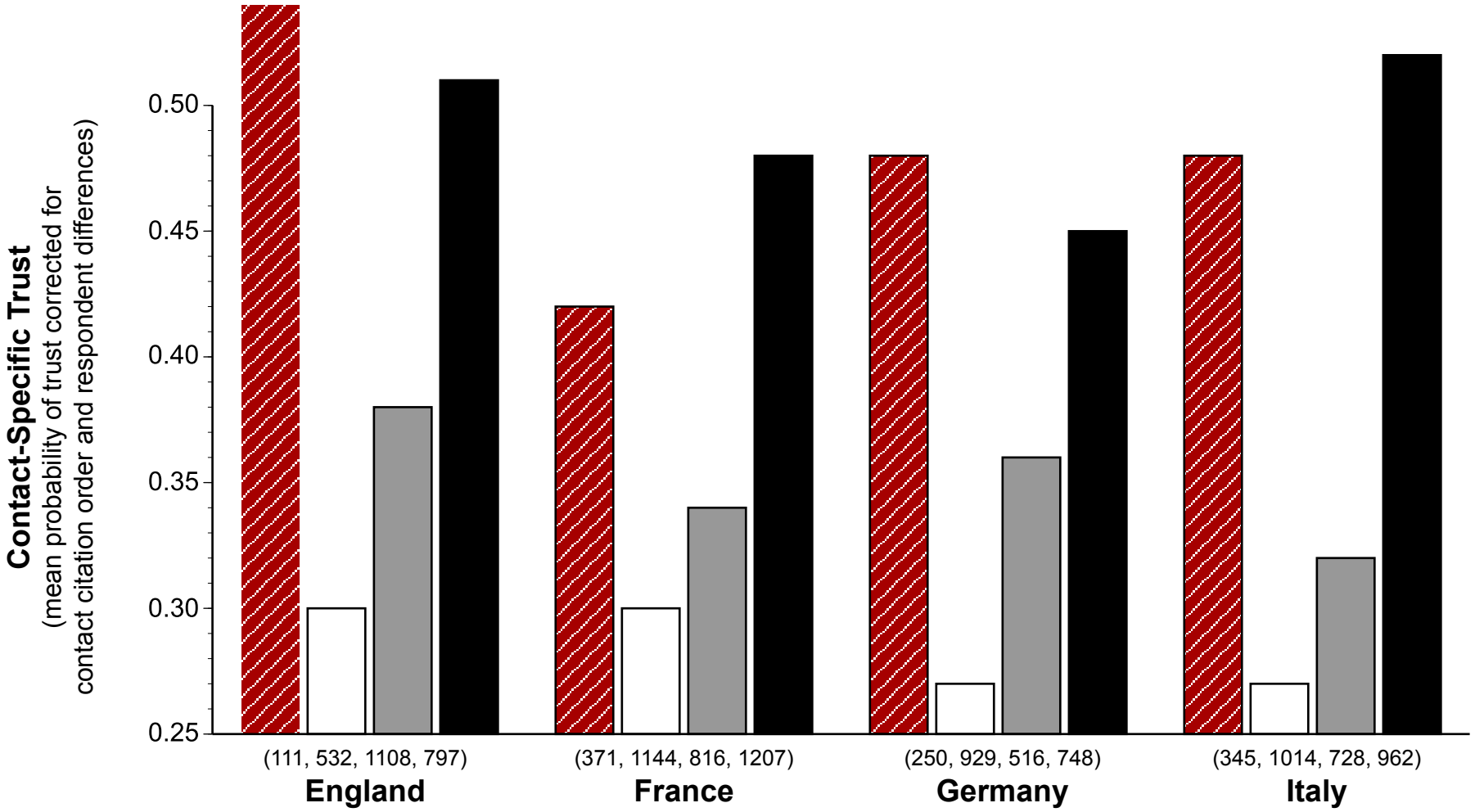
Are the strong bridges provided by guanxi conditions unique to China? **NO!** The conditions that generate guanxi ties in China are the same that generate strong ties in social exchange theory generally. What seems to be exceptional about guanxi in China is its ubiquity. As a leading Chinese network scholar summarizes (Lin 2001b:159): “What is so unique about guanxi in the Chinese context is that it has been so pervasive and dominant in the entire society throughout much of its historical, political, and economic contexts.” In short, China is a uniquely informative laboratory for learning about the substance and implications of the bridge relations provided by guanxi — in preparation for work on strong bridges outside China. (In fact, you can see them in Europe. Next two pages.)



Strong Bridges in England, France, Germany, and Italy

NOTE: Vertical axis is average of observed trust minus baseline trust predicted by contact citation order and the respondent's average observed trust. Respondents who show no variation in trust across their contacts are excluded (trust all contacts or none).

Figure 8.4 in Burt and Opper (2026, S*trong Bridges*)



Strong Bridges within Each European Country

NOTE: See previous page for category labels and note.

Figure 8.5 in Burt and Opper (2026, S*trong Bridges*)

Core Implication:

Don't worry about the diversity of your acquaintances.

Worry about the diversity of the close friends you trust.

Trusted contacts in groups outside your own are your strong bridges. Those strong bridges endure and index your competitive advantage.

(Q54) The competitive advantage of network brokerage is fragile. **True or false?**

A. True. By the closure-trust association, trust is higher in people with whom we share mutual friends.

B. False. People who emerge as network brokers tend to continue to be network brokers.

C. True. There are a limited number of good ideas available. Network brokers are more likely to come up with one, but the odds are low of lightning striking the same person again.

D. False. Bridge connections on average are more fragile than connections embedded in mutual friends, but there are many bridge connections that are just as strong as connections embedded in mutual friends.

E. True. Relative to connections embedded in mutual friends, bridge connections are more likely to decay.

(Q59, gen 2) You are looking for a new job. **You are more likely to be successful by:**

A. Searching for leads from people you can trust among your interconnected close colleagues.

B. Searching for leads from former colleagues with whom you have lost touch.

(Q64, gen 3) You are working on the script for a short video. **You are more likely to come up with an admired script by:**

A. Discussing ideas with people you can trust among your interconnected colleagues.

B. Discussing ideas with people with whom you have little or no prior work.

(Q69, gen 4) You are developing a product production process. **You are more likely to develop an admired process by:**

A. Discussing ideas with people you can trust among your interconnected colleagues.

B. Discussing ideas with people with whom you have history in other organizations.

(Q346) We discussed evidence showing that strong bridges are the core of network broker advantage. Given their importance for economic performance, it is important to be able to identify such relations. **What is the quality in a bridge relationship that most identifies it as a strong bridge?**

A. High trust with a member of your family

B. High trust with a colleague at work

C. High trust regardless of mutual friends

D. High trust with a close friend

E. High trust within a dense network

(Q351) The structural hole definition of a bridge became popular as data became more available on connections between a person's contacts. **True or False?**

A. True B. False

(Q362) A strong bridge to a family member carries more trust than a strong bridge beyond the family. **True or False?**

A. True B. False

(Q16) The "forbidden triad" used to support the “strength of weak ties” argument is based on the known fact that a person’s closest friends are never strangers to one another. **True or False?**

A. True B. False

(Q300) When was the bridge and cluster structure to information established in network analysis?

A. 1950s

B. 1970s

C. 1990s

D. 2010s

Balance in Principle for the General Case

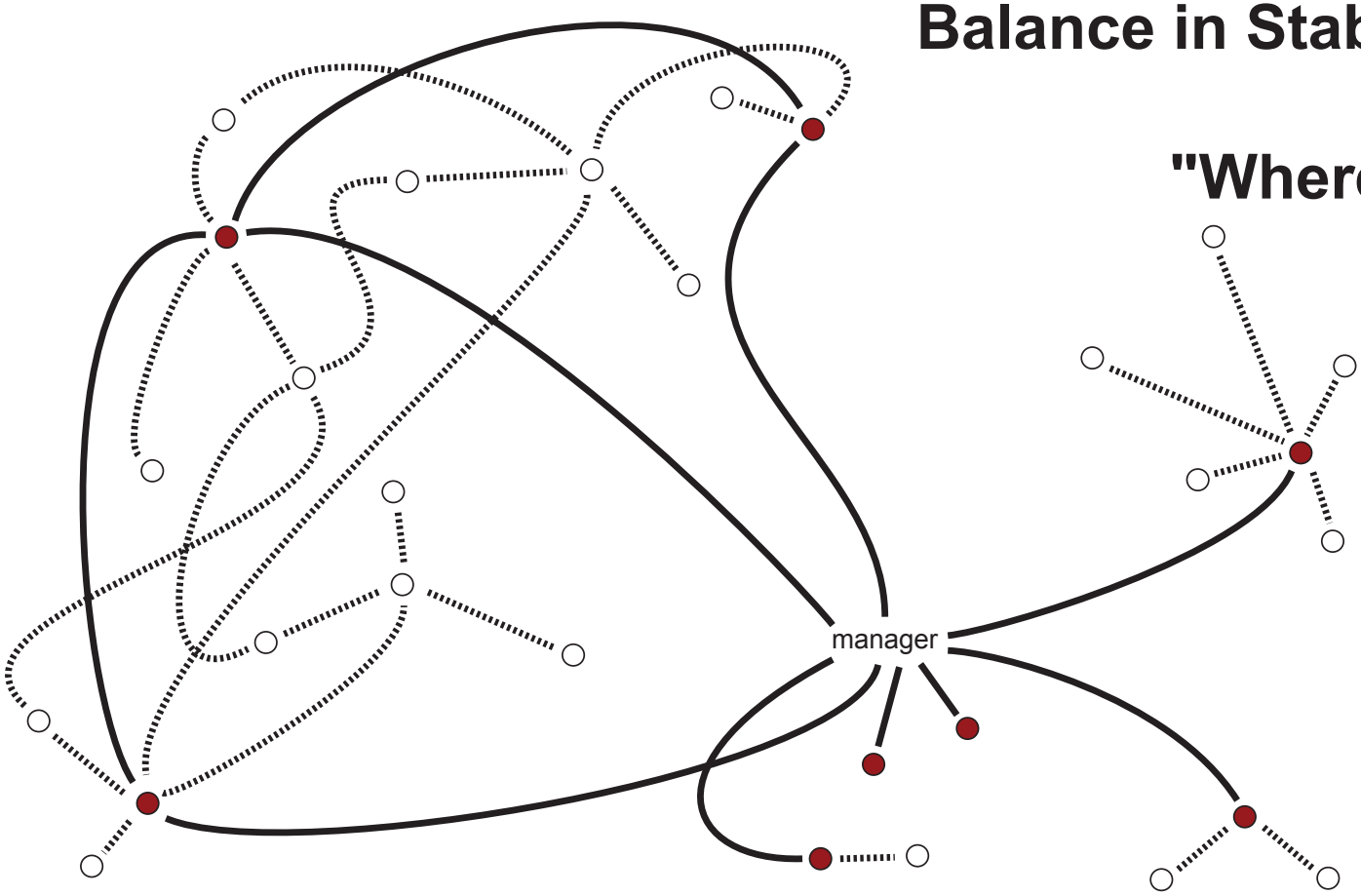
Brokerage for top-line growth (vision, dissipation)

Closure for bottom-line growth (alignment, myopia)

Balance in Stable Networks,

"Where, in general"

"Where, more precisely"



Balance in Dynamic Networks, "When"

Network Memory: The Influence of Past and Current Networks on Performance

From Soda et al. in *Academy of Management Journal* (2004)

Investigating the efficacy of two alternative network structures, *closure* and *structural holes*, from the contingent perspective of time, we connect past and current social structures to outcomes. We show that, in the Italian television production industry, current structural holes rather than past ones, but past closure rather than current closure, help current network performance. Thus, structural holes and closure are both valuable, but at different points in time.

Performance is production team's current audience size

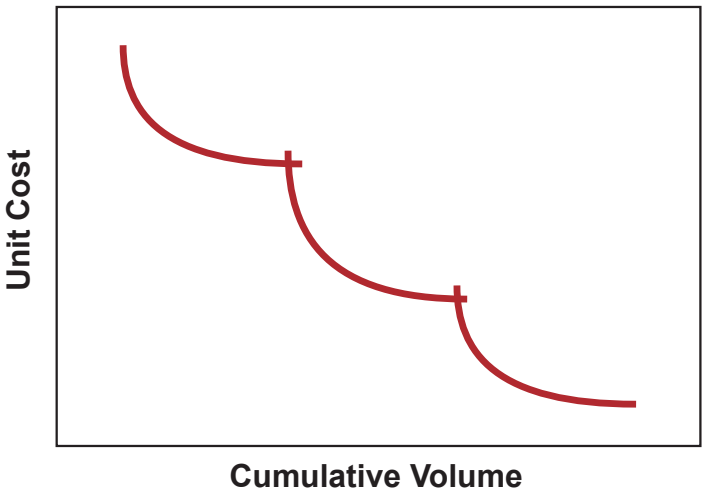
Brokerage is team member collaborations with people in diverse other teams

Closure is team's past collaborations with teammates

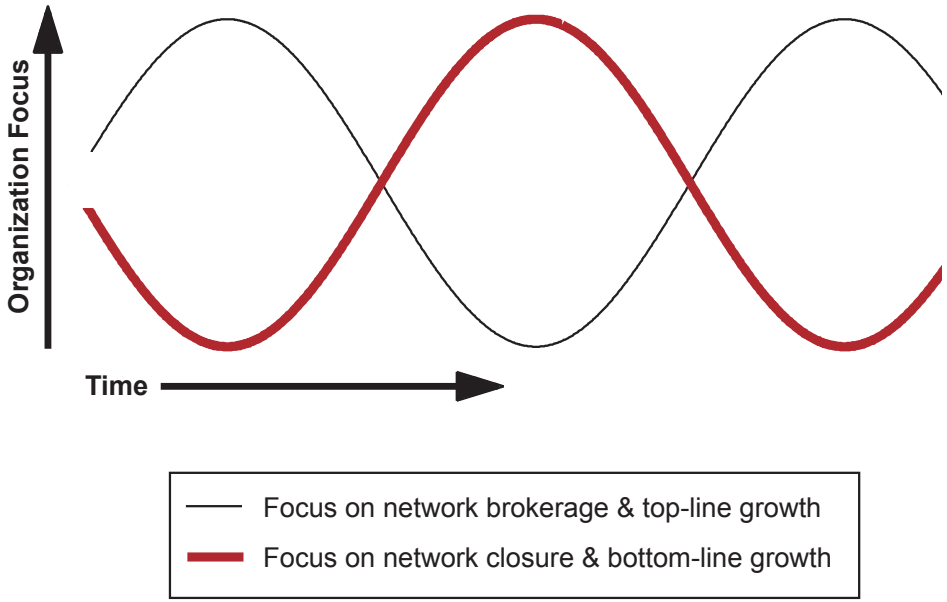
$$E(\text{Performance}) = \alpha + \beta(\text{closure within}) + \gamma(\text{brokerage beyond})$$

Contingent Optimum Raises a Question of "When" to Push Brokerage or Closure

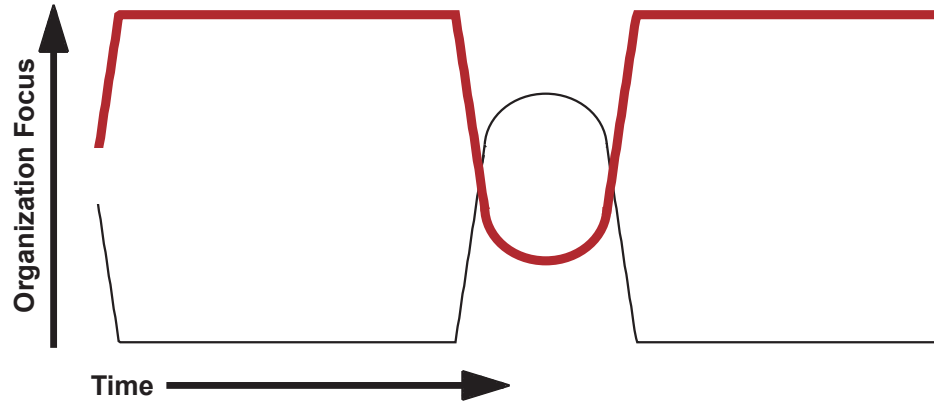
For example, Oscillation, and Learning-Curve Cascades



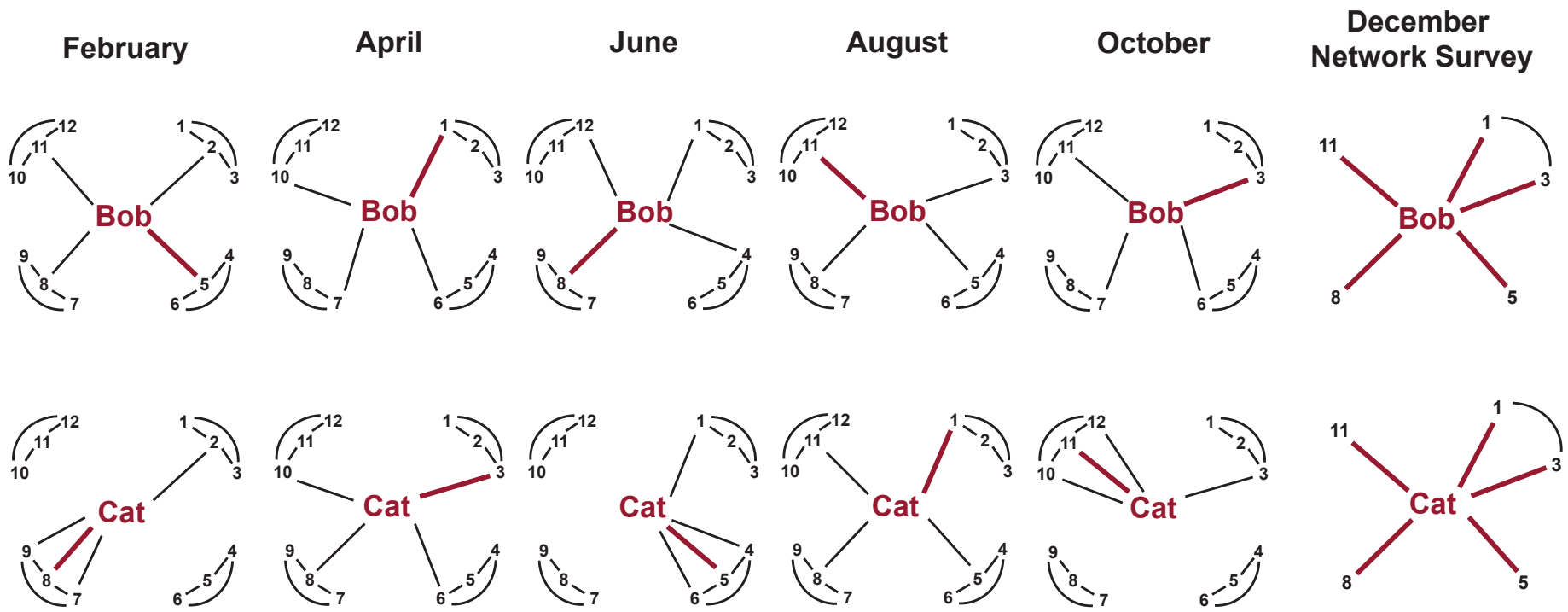
A. Business Cycles



B. Learning-Curve Cascade



Building Your Network: A Broker Network Can Result from Always Being a Broker or from Network Oscillation



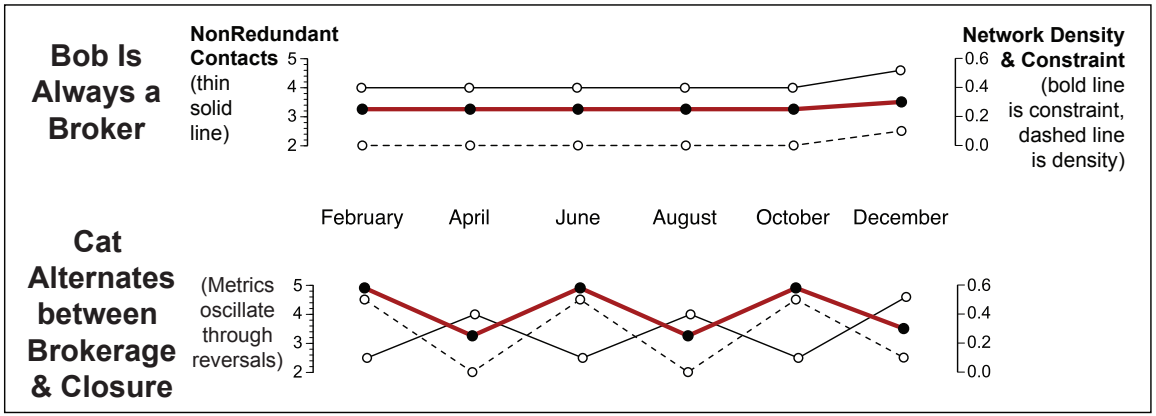
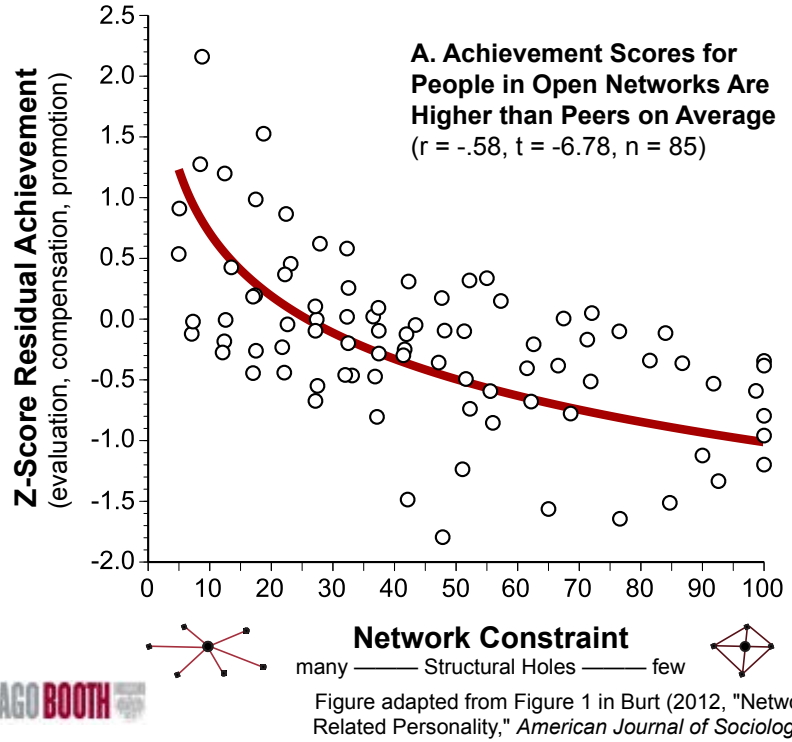


Figure 1 in Burt & Merluzzi, "Network Oscillation" (2016, *Academy of Management Discoveries*)

Substantial Differences in Individual Returns to Brokerage

Graph A below is from *Brokerage & Closure* and the previous handout showing achievement increasing with more access to structural holes. Circles are z-score residual achievement for 1,986 observations averaged within five-point intervals of network constraint in each of six management populations (analysts, bankers, and managers in Asia, Europe, and North America, see discussion of Figure 2.3 in Chapter 2; heteroscedasticity is negligible, $X^2 = 2.97$, 1 d.f., P ~ .08). Bold line is the vertical axis predicted by network constraint.

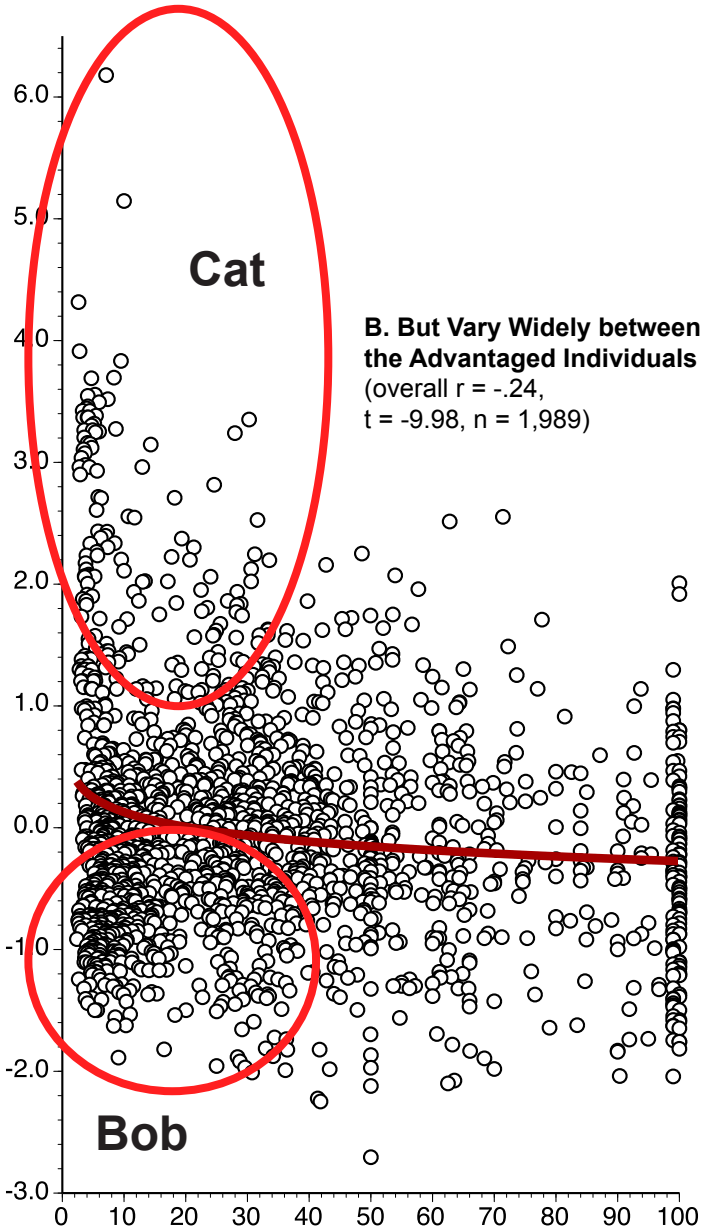
Graph B to the right shows the raw data that were averaged to create Graph A. Vertical axis is wider to accommodate more variable achievement. Heteroscedasticity is high due to achievement differences between advantaged individuals ($X^2 = 269.5$, 1 d.f., P < .001), but the association between achievement and network advantage remains statistically significant when adjusted for heteroscedasticity (Huber-White, t = -8.49).



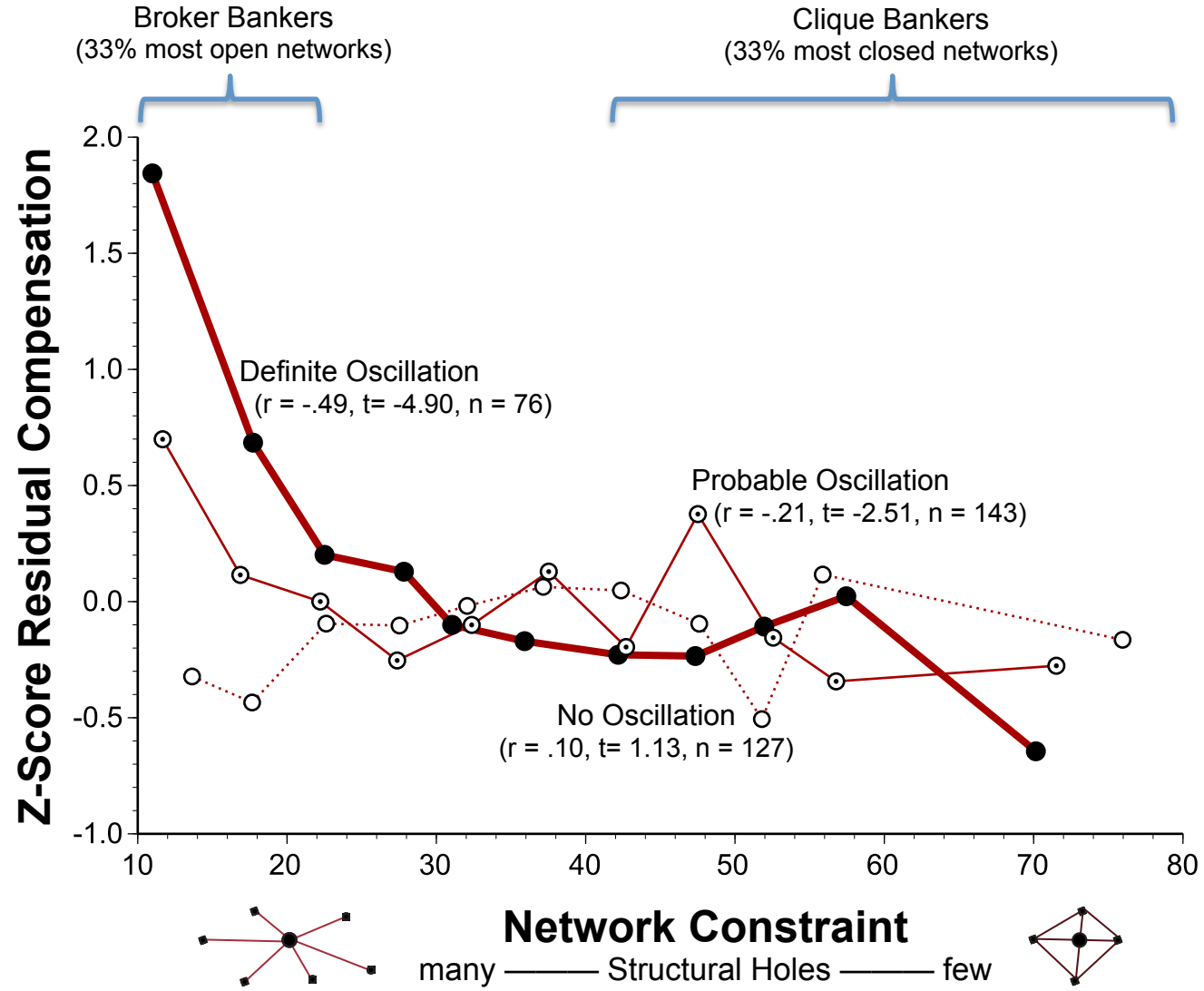
Strategic Leadership
Brokerage Contingencies (page 2)

CHICAGO BOOTH

Figure adapted from Figure 1 in Burt (2012, "Network Related Personality," *American Journal of Sociology*).



from the first handout, "Brokerage"



How Much Does Oscillation Matter for Each Category of Bankers?

	N	t-test	P
Broker Bankers	111	4.38	<.001
Middling Bankers	116	0.08	.94
Clique Bankers	119	-0.84	.84

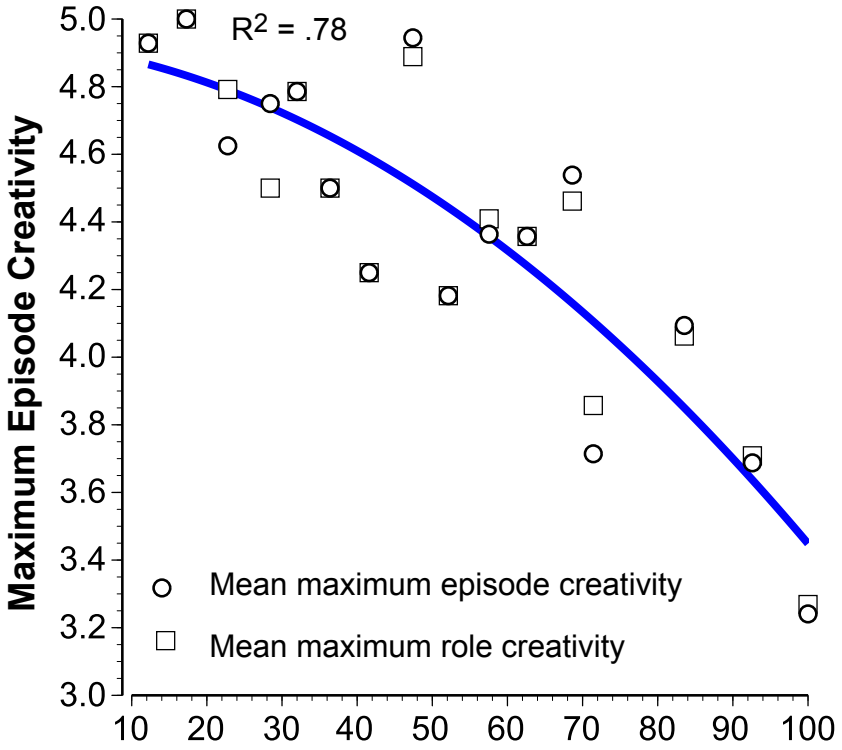
NOTE - Test for oscillation association with relative compensation for each row of bankers using a contrast of 1 for definite oscillation, 0 for probable oscillation, and -1 for no oscillation. Average z-score compensation across four years is predicted from average network constraint, holding constant job rank, seniority, peer evaluations, gender, race, and geography (Model IV, Table 1, Burt and Merluzzi, 2015).

Returns to Brokerage Are Contingent on Oscillation

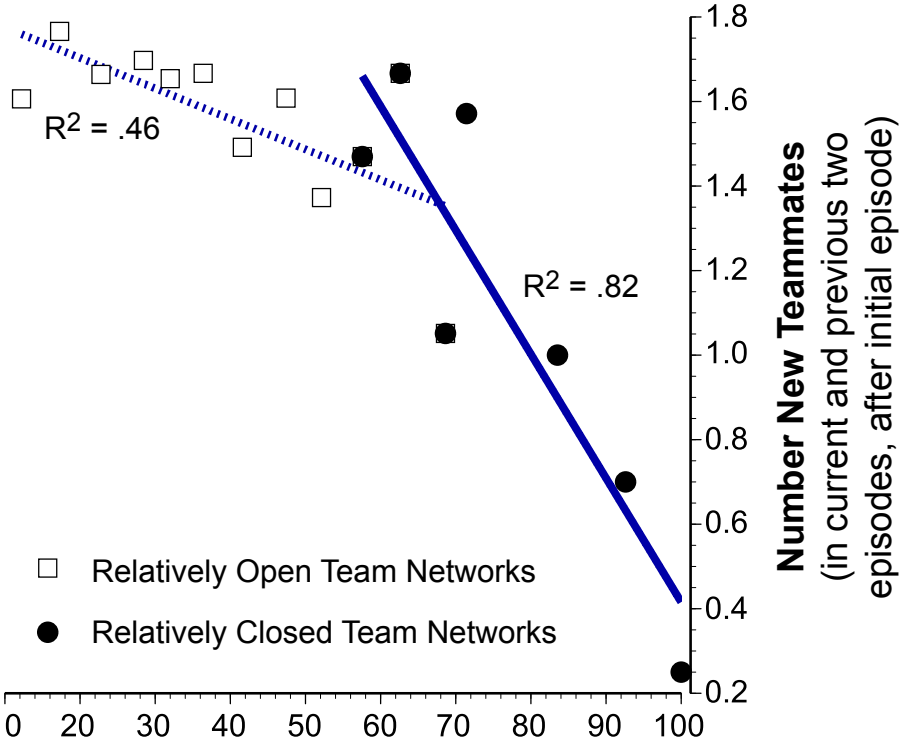
Vertical axis is a banker's z-score annual compensation — adjusted for the banker's job rank, evaluation by colleagues, years with the bank, gender, race, and geographic location — averaged across the four-year observation period. Horizontal axis is annual network constraint averaged across the four years. Symbols indicate averages of individual scores on the horizontal and vertical axes, within five-point intervals of network constraint. The three lines distinguish bankers by the extent to which oscillation across the four years is visible in their annual networks: Definite oscillation refers to bankers who experienced reversals in network status and constraint. Probable oscillation refers to bankers who experienced a reversal in status or constraint, but not both. No oscillation refers to bankers who experienced no reversals. As a summary test for oscillation, compensation was regressed for all 346 bankers across the control variables plus a dummy variable for probable oscillation and a dummy variable for definite oscillation, plus two interactions between the oscillation dummies and log network constraint. Negligible association between constraint and compensation for "no oscillation" bankers (-.86 t-test, P ~ .39), increases to significantly higher associations for probable and definite oscillation (15.28 $F_{2,333}$, P < .001), yielding significantly higher levels of compensation for broker bankers (17.20 $F_{2,333}$, P < .001).

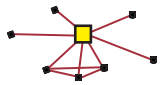
Figure 5 in Burt and Merluzzi, "Network Oscillation" (2016 *AMD*)

A. Broker teams are more creative.



B. Broker teams are more likely to refresh with new teammates.





Network Closure
(100 x team network constraint)

Teams are composed of a producer, 1 or 2 directors, and 1 to 3 writers:

64 teams of three
176 teams of four
33 teams of 5+

Broker team networks, and refreshing with new teammates, both predict team creativity.

Graphs plot averages for 200 people in any of all episodes. A third of the people only worked on an initial episode. R^2 is .75 in graph B for continuous function in graph A.

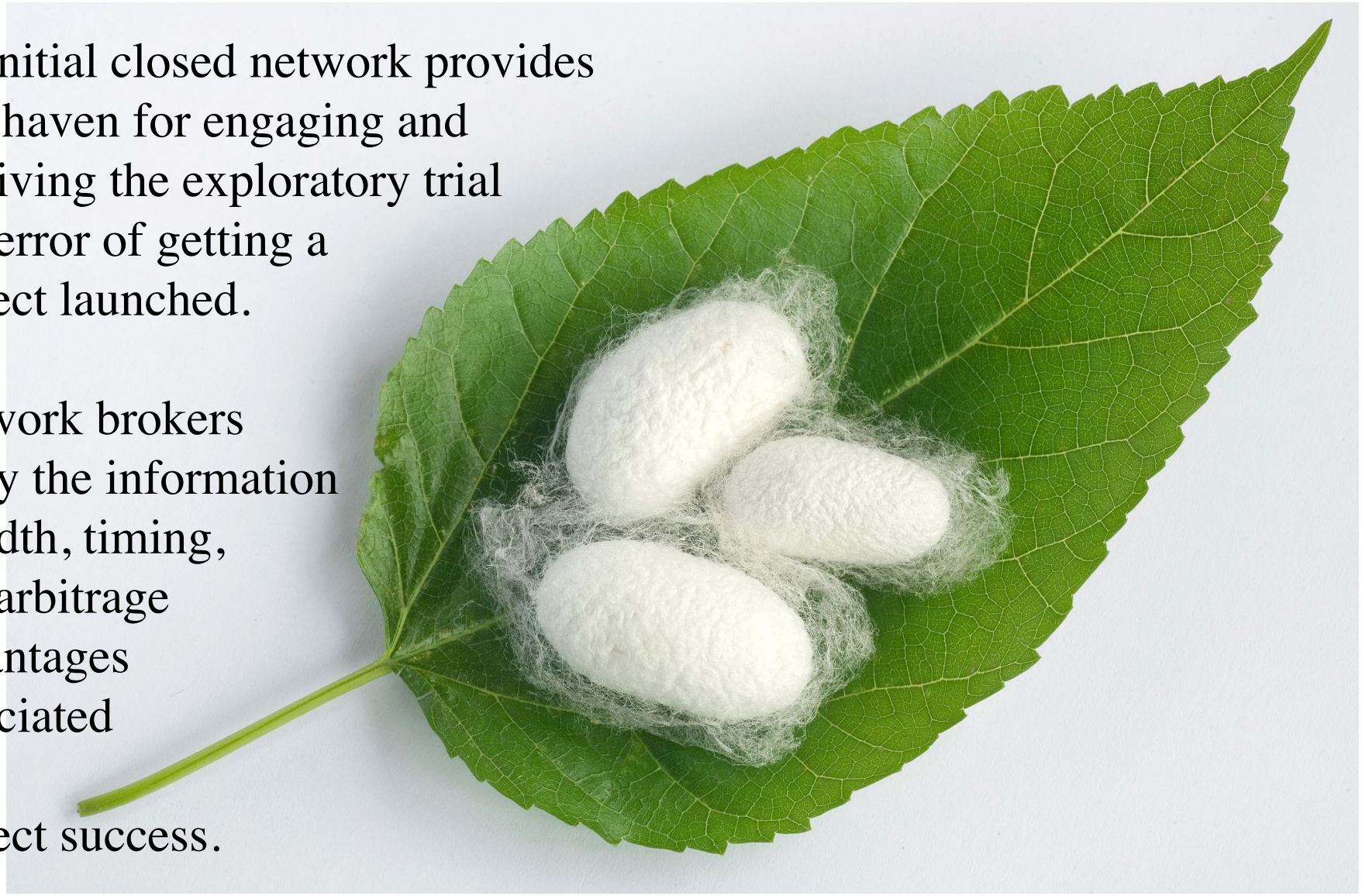
Università Bocconi MILANO

Soda, Mannucci, and Burt, "Networks, creativity, and time: staying creative through brokerage and network rejuvenation," *Academy of Management Journal*, forthcoming.

Cocoon Hypothesis — Success is more likely, and greater, for network brokers who begin their project within a closed network, which dissolves in subsequent brokerage.

An initial closed network provides safe haven for engaging and surviving the exploratory trial and error of getting a project launched.

Network brokers enjoy the information breadth, timing, and arbitrage advantages associated with project success.

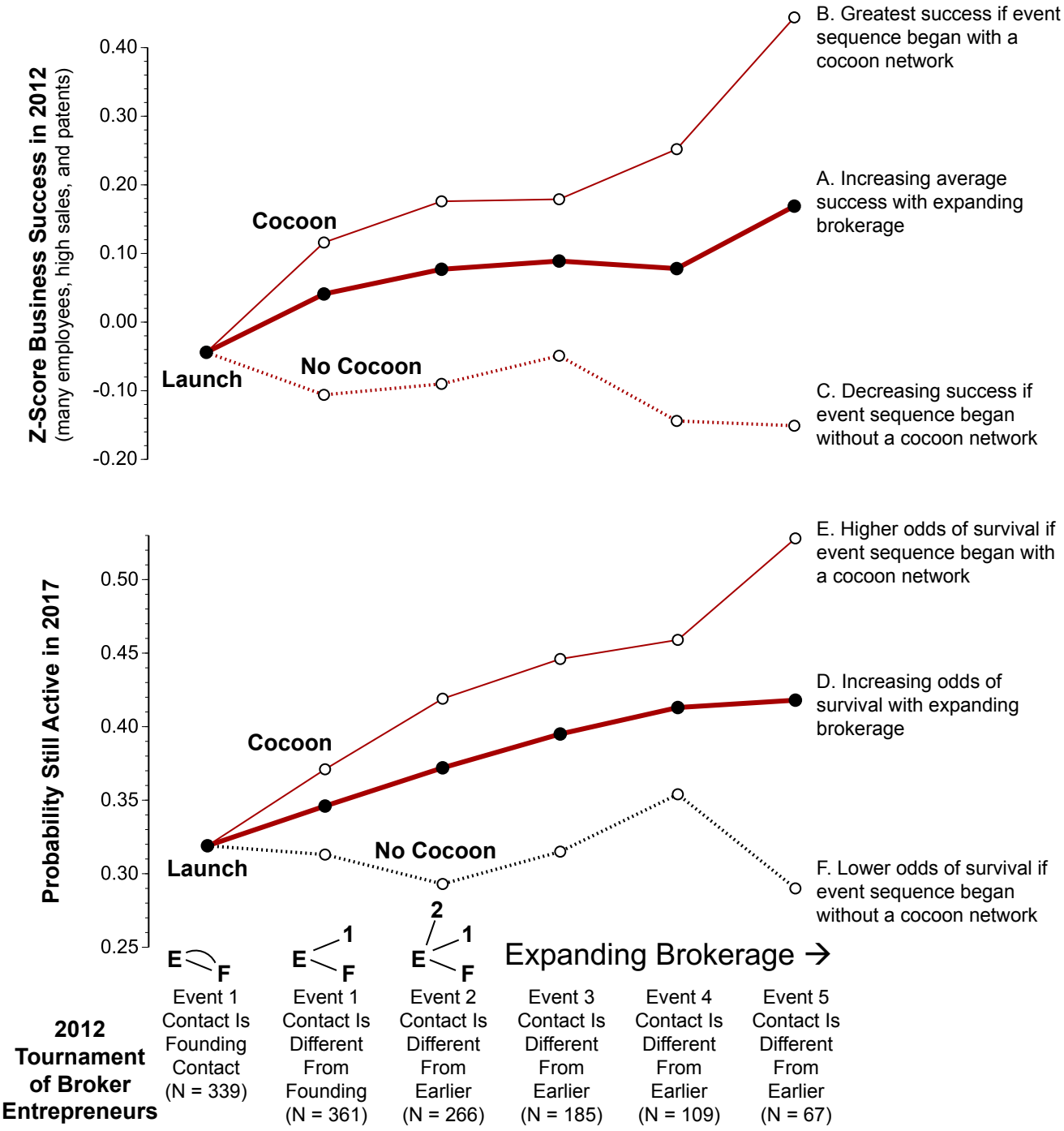


Initial Cocoon Network Improves Later Success,

The graph shows benefit to entrepreneurs of having an early multi-person, closed network subsequently expanded into a large, open network characteristic of a broker.

A tournament is defined across the horizontal axis. Entrepreneurs are removed when they use a contact for help on more than one significant event in building the business.

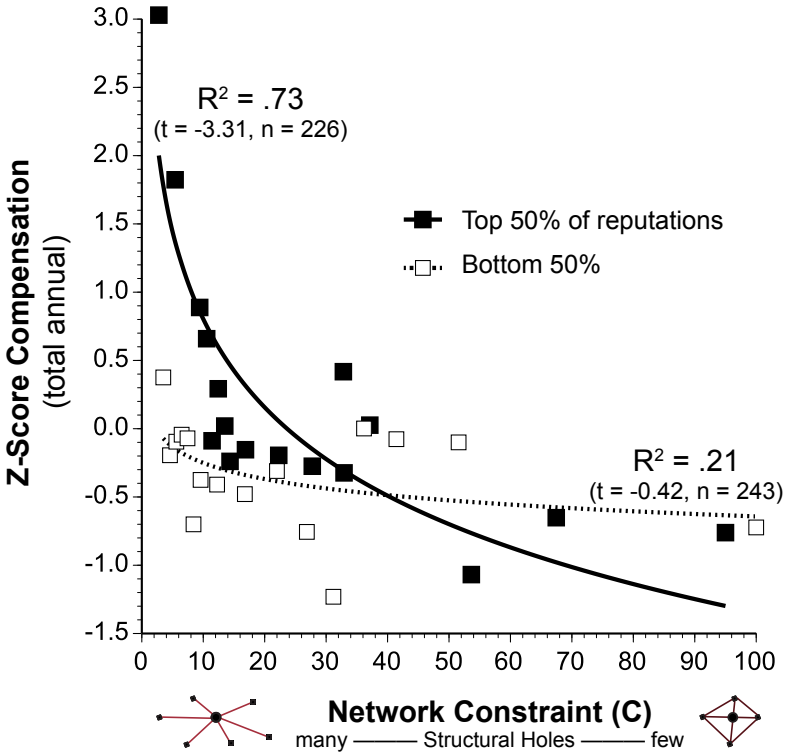
This is from Figure 11 in Burt and Opper (2017, *MOR*), Figure 3 in Zhao and Burt (2018, *MOR*), Figure 4 in Burt (2019, *ETP*).



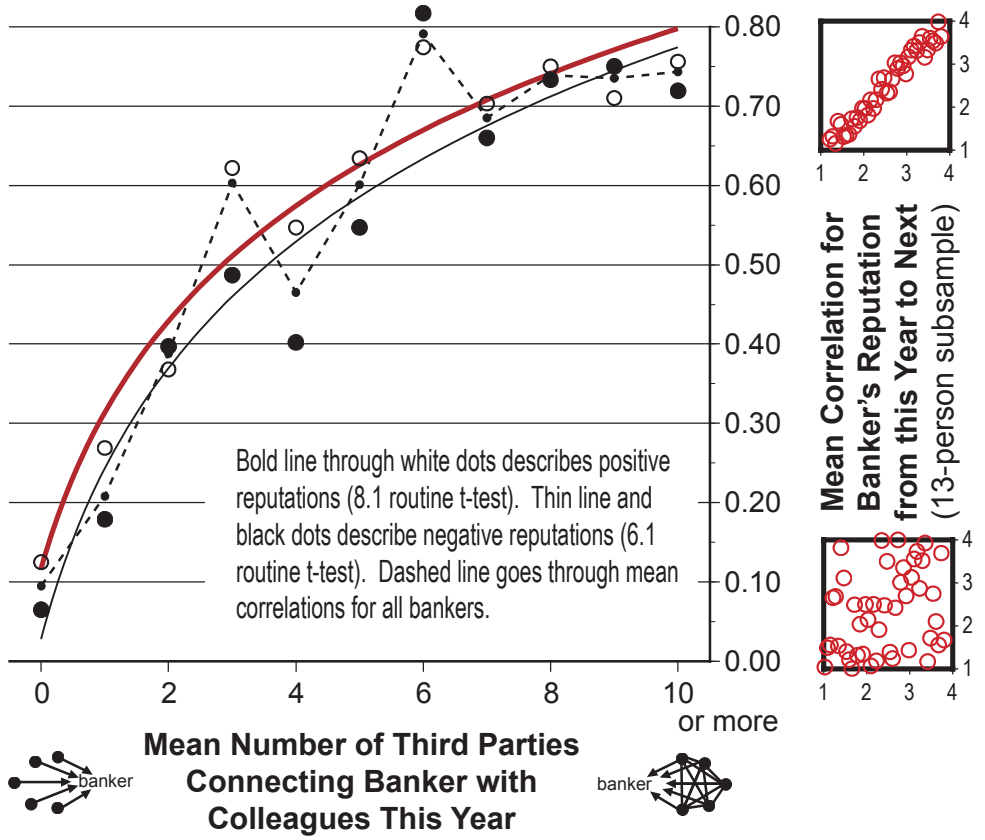
(1) Reputation Is Essential to Broker Achievement, and Reputation Is Maintained in Closed Networks

(Graphs are from "Closure" handout.)

A. Broker Achievement Depends on Reputation



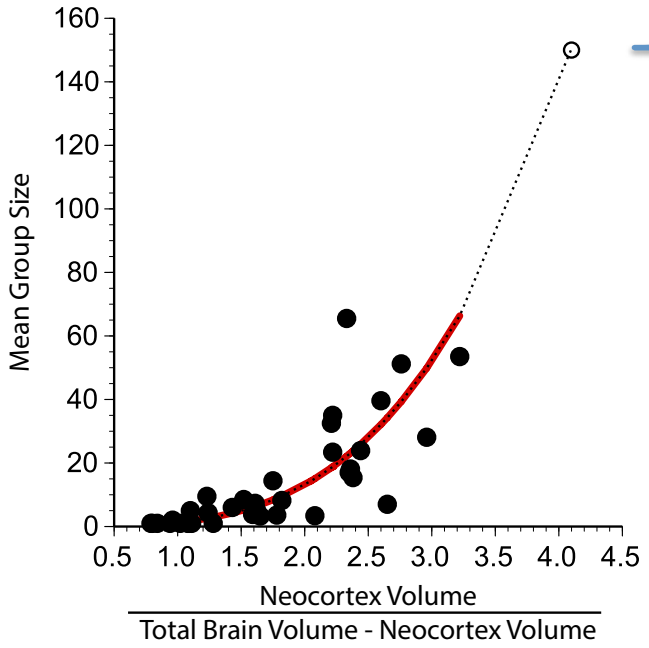
B. And Reputation Depends on Closed Networks



(2) A Second Oscillation Advantage: Large Networks.

"Dunbar's number" — an extrapolation from correlation between primate brain size and average group size — says 150 relations is the average upper limit to a human group.

Below graph is based on numbers in Table 1 of Dunbar's initial report (1992, *J Human Evolution*), "Neocortex size as a constraint on group size in primates." Black dots are primates. White dot is humans. Graph to the right is from Dunbar (1998, *Evolutionary Anthropology*), "The social brain hypothesis."



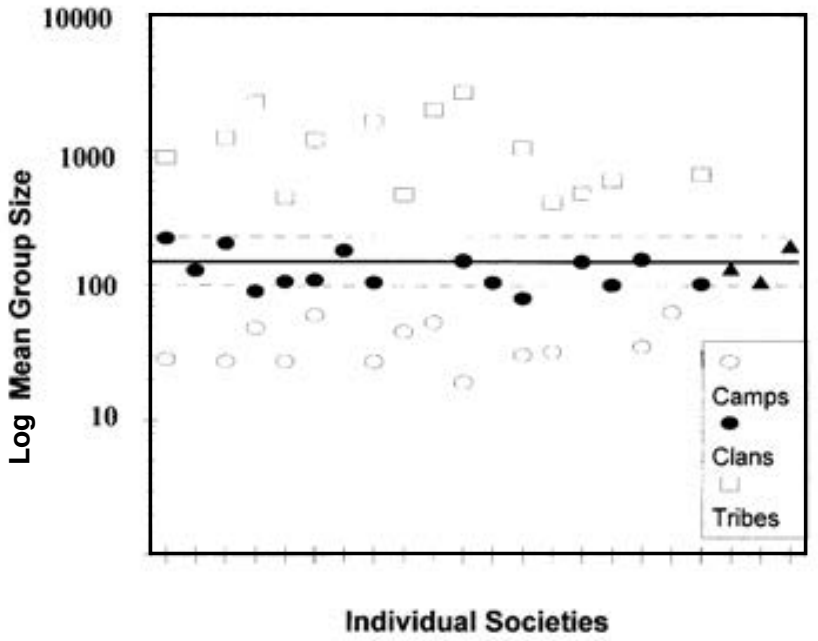
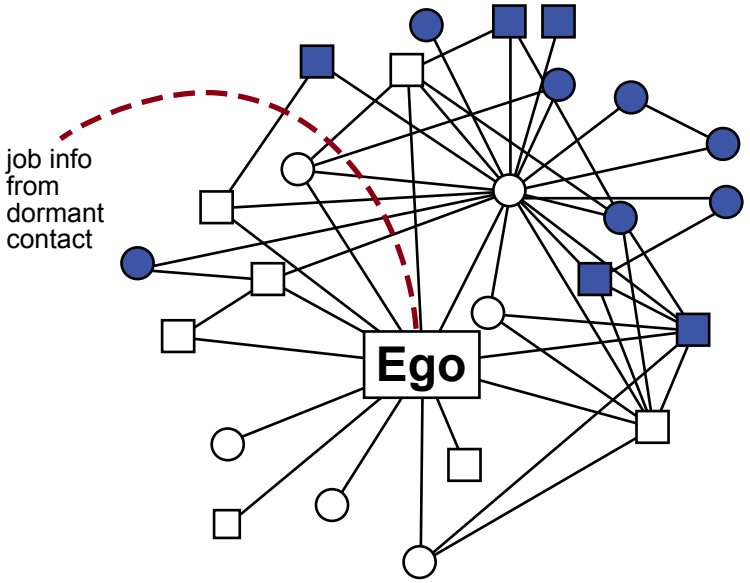


Figure 7. Mean sizes for different types of groups in traditional human societies. Individual societies are ordered along the bottom, with data for three main types of social groups (overnight camps, clans or villages, and tribes). Societies include hunter-gatherer and settled horticulturalists from Australia, Africa, Asia, and North and South America. The triangles give mean group sizes for three contemporary United States samples: mean network size from small-worlds experiments (N = 2),[67] mean Hutterite community size,[68] and the size of an East Tennessee mountain community.[69] The value of 150 predicted by the primate neocortex size relationship (from Fig. 1d) is indicated by the horizontal line, with 95% confidence intervals shown as dashed lines.

Note Wide Variation in Mean Group Size

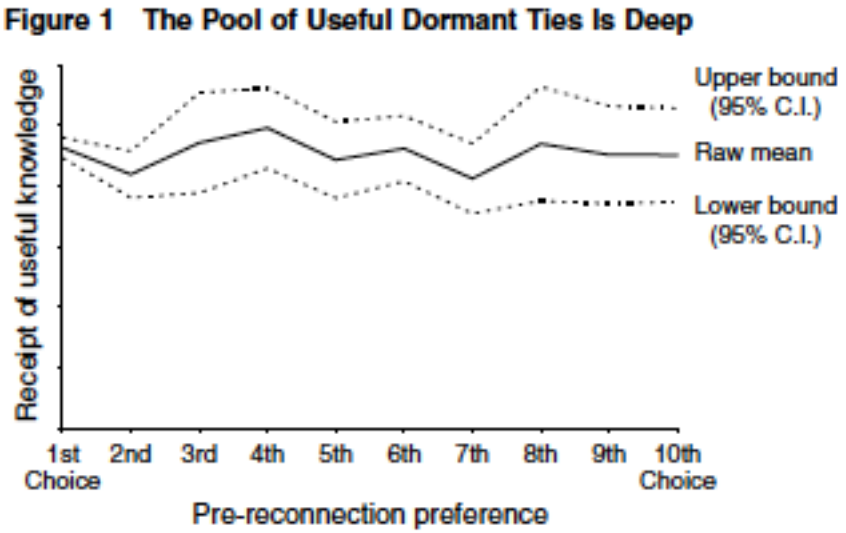
(2 cont.) Second Oscillation Advantage: Large Networks.

Dunbar calculations ignore dormant relations. In addition to sharpening skills in shifting between projects, and building reputation, oscillation creates an inventory of dormant contacts to be re-animated as needed.



Granovetter (1973, AJS) "The strength of weak ties." Information that leads to a new job tends not to come from close friends or colleagues. It is more likely to come from a dormant contact — a person with whom you were close in school, or where you used to live, or where you used to work, et cetera. The point in this classic article: Dormant ties, when re-animated, are often valuable bridges.

Relatedly, Small (2017, *Someone To Talk To*) describes people using casual ties for significant support. This veers into agility, the third and next explanation for oscillation and success.



Levin, Walter, Murnighan (2011, *Org Science*) "Dormant ties: the value of reconnecting." Some EMBA students were asked to think of an important current project, then name 10 contacts dormant for at least three years who would be likely to have information useful on the project, then sort the 10 contacts from most to least likely to have useful information. People were asked to re-connect with the first-ranked dormant contact and one other randomly selected from the other nine contacts. The above graph shows a high perceived value to information received, on average, from the first through the tenth contact. If there is a decline in value, it happens beyond the first 10 dormant contacts.

(2 cont.) The volume of structural holes to which you have access is likely much higher than you might believe . . .

This worksheet is completed in four steps:

(1) In the oval, write your name.

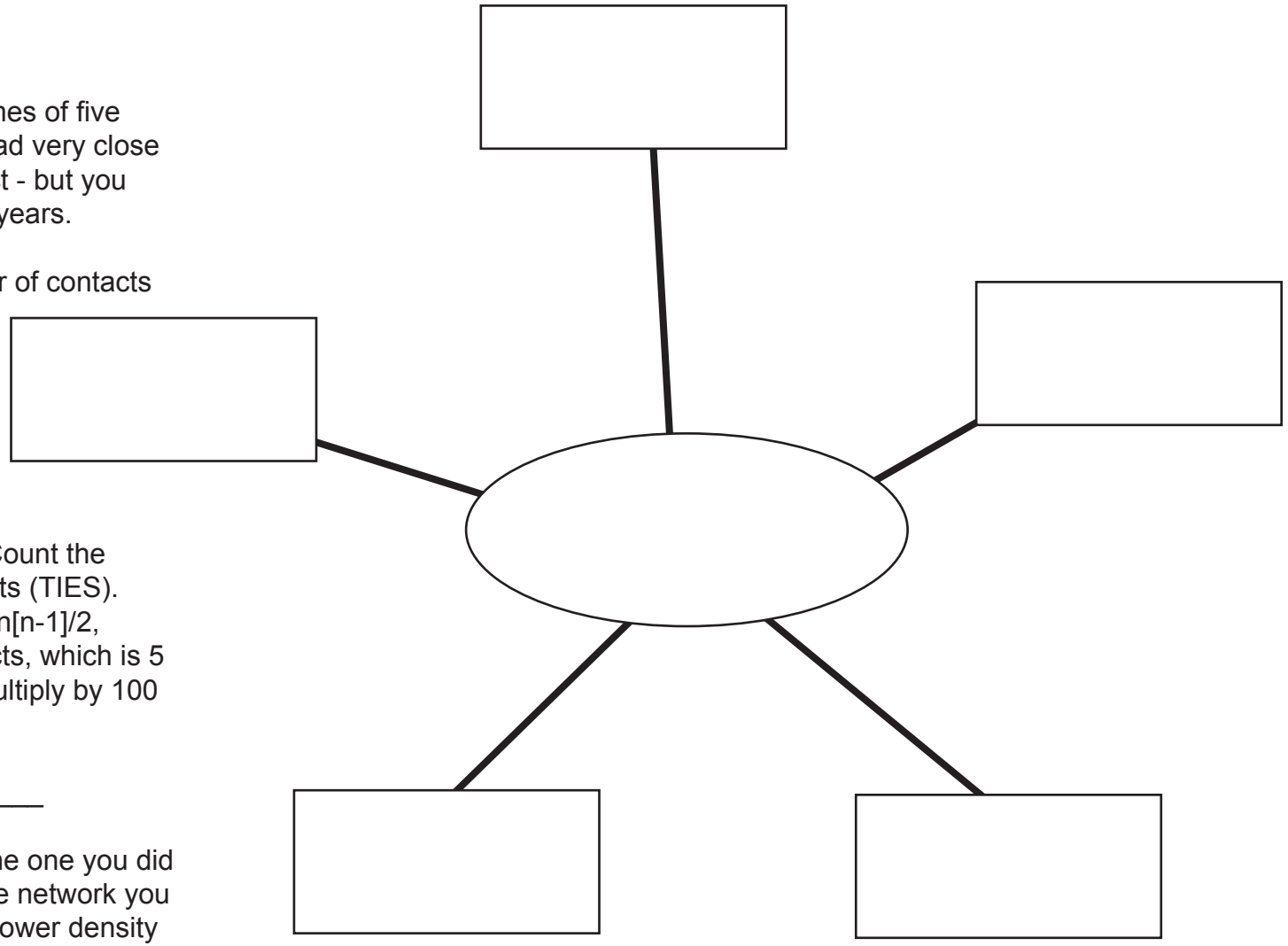
(2) In the squares, write the names of five contacts with whom you once had very close and substantial business contact - but you haven't seen for more than two years.

(3) Draw a line between any pair of contacts that are connected, to the best of your knowledge, in the sense that the two people speak often enough that they have some familiarity with current issues in one another's work.

(4) Compute network density. Count the number of lines between contacts (TIES). Divide by the number possible (n[n-1]/2, where n is the number of contacts, which is 5 if you entered five contacts). Multiply by 100 and round to nearest percent.

DENSITY = _____

This exercise is a variation on the one you did in the "Brokerage" handout. The network you describe here is typically much lower density than a current network.



(3) Agility is another oscillation advantage

The Wisdom of the Naskapi Indians (Weick, The Social Psychology of Organizing, 1979:262-263)*

The Naskapi Indians of Labrador survive primarily by hunting. Each morning the adult males gather to ask: “Where should we hunt today?”

An unusual procedure is used to answer the question: The men take the shoulder bone of a caribou, hold it over a fire until the bone cracks, then hunt in which ever direction the crack points.

The procedure works. The Naskapi almost always find game, which is rare among hunting bands.

Why is their procedure successful?

*Also Appendix VII in the "Closure" handout, William Starbuck, “Unlearning ineffective or obsolete technologies” Journal of Technology Management 1996 (http://www.stern.nyu.edu/~wstarbuc/unlearn.html); page 10 in Levy, "The Nut Island Effect" (2001, HBR) on how to stop the Nut Island effect before it starts; and Adam Grant's (2021) *Think Again*.

(3 cont.) Agility as Third Oscillation Advantage

During a discussion at a conference on learning, one of the attendees, a U.S. Army Colonel who runs a course for field commanders at the Army's Command and General Staff College (a graduate school for American and foreign military leaders founded in 1881), told a story about a misguided search for knowledge. For many years this course has been based on nine war games played by intact battalion teams. In the long history of the course, only one commander has ever won all nine war games. That was in 1985.

The success of this commander is the stuff of folklore at the college. It has led many subsequent commanders on a hunt for how the celebrated commander was able to achieve perfection. Typically, operations commanders who are scheduled to attend the course try to get a copy of the 1985 "battle book" written by the victorious commander. It doesn't seem to matter that battle scenarios and technology have changed considerably since 1985. Nor does it seem to matter that it is well-known that the underlying reason for the unique 1985 success is not in the codified knowledge in the battle book, but in the commander's style of preparation for the course. Every week for six months prior to the course, the commander assembled his staff for an informal lunch. The commander began by sketching a hypothetical battle scenario, then inviting his team to discuss how they would engage the enemy. In the ensuing debate, the team explored alternatives with the commander — serving less as final authority, and more as a Socratic instructor helping his team reason through the risks and advantages of alternative tactics. By the time this team entered the course, they had explored hundreds of hypothetical scenarios and learned a great deal not only about how each of his colleagues reasons, but how to reason together.

Dwight Eisenhower 1957 on national defense: "Plans mean nothing, but planning is everything."

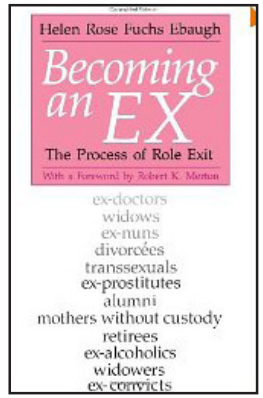
This example illustrates the somewhat depressing fact that often times it's not a lack of knowledge that causes performance failures but an inability to take in, metabolize, and learn from knowledge that is readily available. If we try to solve every puzzle only through the paradigm of the learning curve, we shall discover that all learning curves reach an asymptote. Eventually we exhaust the stock of knowledge available to us in our immediate community.

Time and again I see in my own company examples of people who become quite content — indeed even take great pride — with the fact that they have formed highly cohesive, close-knit teams. Surely cohesiveness is valuable … to a point. But at some point, cohesiveness starts to take on the characteristics of a cult. Cults abhor questioning, criticism, and, debate. They are petrie dishes for group think. Great leaders intuitively understand this. They are like conductors who ensure that while their teams may be playing from the same overall score, there is always the sound of alternative voices. Positions are framed and argued on the basis of available knowledge and data but always in juxtaposition to one or more alternatives.

Text is from Dr. Mike Prevou (Lt. Col., US Army Retired), relayed by Dr. Don Ronchi (Exec. VP, Raytheon). On tactics in adaptive organization, see Bechky & Okhuysen (2011, *Org Science*), "Expecting the unexpected? How swat officers and film crews handle surprises."

Can Be Difficult for Individuals

Hermina Ibarra's (2003) book, Working Identity, is a helpful and accessible discussion for network brokers transitioning to new identities (also see her HBR note "How leaders create and use networks"). 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 the similarity to other 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.

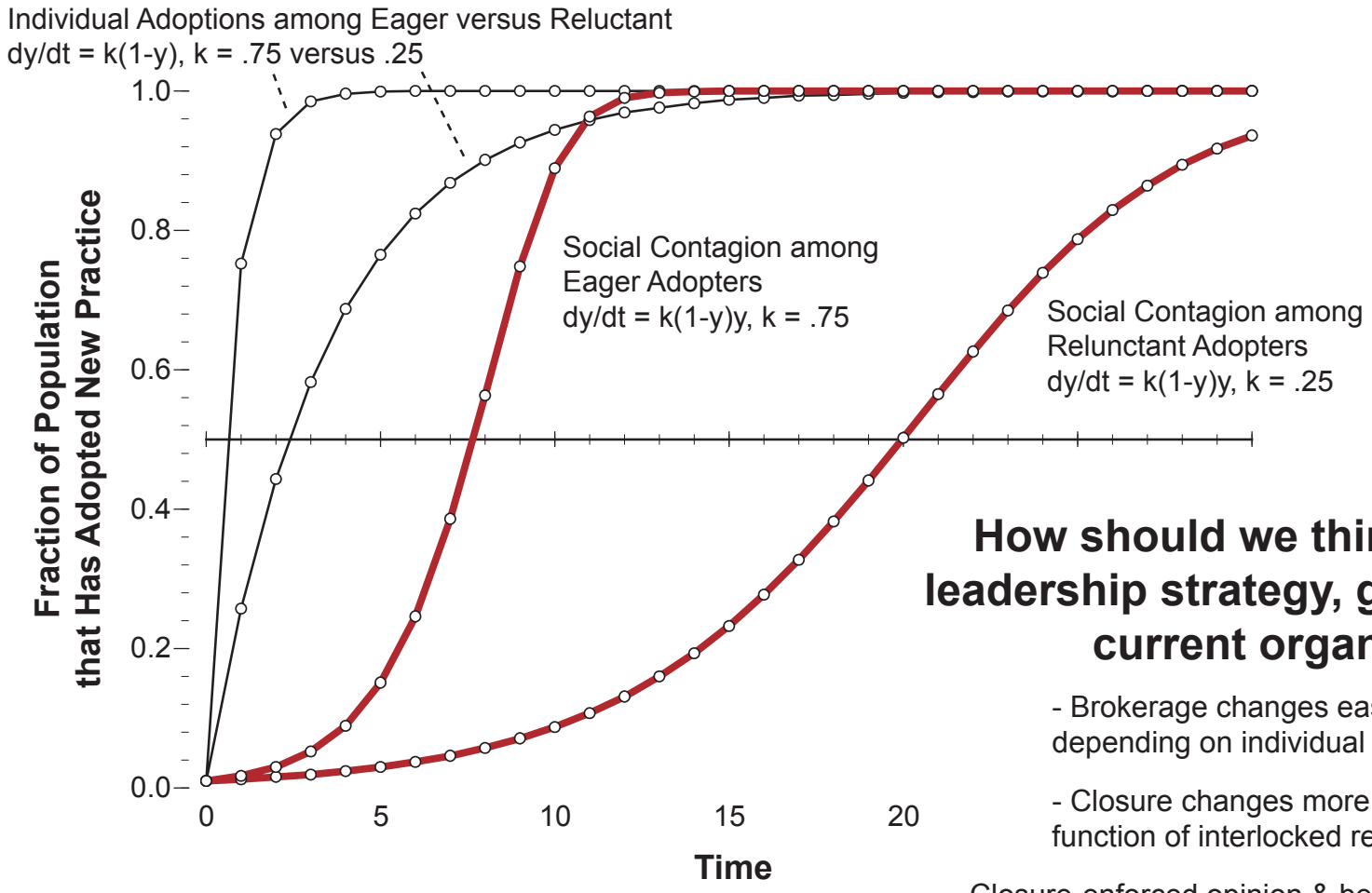
month	Y this month	.8*(1-Y)	Y next month, individual
1	0.1	0.7200	0.8200
2	0.8200	0.1440	0.9640
3	0.9640	0.0288	0.9928
4	0.9928	0.0058	0.9986
5	0.9986	0.0012	0.9997
6	0.9997	0.0002	0.9999
7	0.9428	0.0458	0.9886
8	0.9886	0.0092	0.9977
9	0.9977	0.0018	0.9995
10	0.9995	0.0004	0.9999

month	Y this month	.8*(1-Y)*Y	Y next month, social
1	0.1	0.0720	0.1720
2	0.172	0.1139	0.2859
3	0.2859	0.1633	0.4492
4	0.4492	0.1979	0.6472
5	0.6472	0.1827	0.8298
6	0.8298	0.1130	0.9428
7	0.9428	0.0431	0.9859
8	0.9859	0.0111	0.9970
9	0.9970	0.0024	0.9994
10	0.9994	0.0005	0.9999

More So for an Organization: Adopting a New Practice

y = proportion of target population that has adopted

k = probability of adoption by average individual



How should we think about leadership strategy, given the current organization?

- Brokerage changes easily, depending on individual preferences.

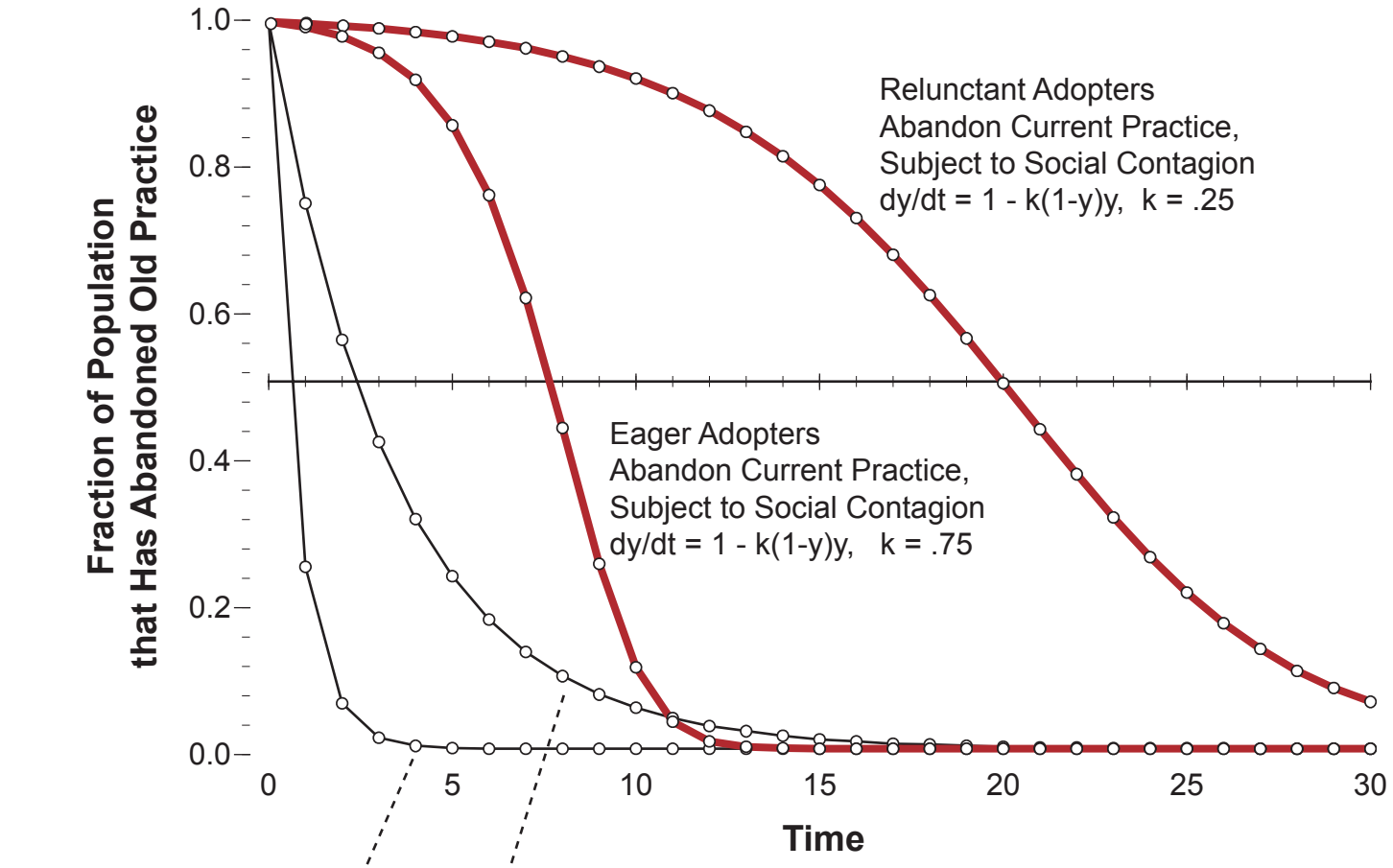
- Closure changes more slowly as a function of interlocked relationships.

- Closure-enforced opinion & behavior norms can arise from minor initial social behavior (Salganik, Dodds & Watts, 2006 *Science*).

Abandoning a Current Practice

y = proportion of target population that has abandoned the practice

k = probability that average individual will abandon the practice



Even when people want to change and have complete control over change, they tend not to change. Ingram and Morris (2007, ASQ, "Do people mix at mixers?") show that EMBA students intending to meet new people at a program mixer provided in response to student requests for a networking mixer tend to spend their time with people they already know.

In the early days of WWII, when armaments of all kinds were in short supply, the British made use of a venerable field piece that came down to them from previous generations. These guns, hitched to trucks, served as useful mobile units in the coast defense. But it was felt that the rapidity of fire could be increased. A time-motion expert was called in to suggest ways to simplify the firing procedures. He watched one of the gun crews of five men at practice in the field for some time. Puzzled by certain aspects of the procedures, he took some slow-motion pictures of the soldiers performing the loading, aiming, and firing routines. When he ran these pictures over once or twice, he noticed something odd. A moment before the firing, two members of the gun crew ceased all activity and came to attention for a three-second interval extending throughout the discharge of the gun. He summoned an old colonel of artillery, showed him the pictures, and pointed out this strange behavior. What, he asked the colonel, did it mean. The colonel, too, was puzzled. He asked to see the pictures again. "Ah," he said when the performance was over, "I have it. They are holding the horses." (from Elting Morison, pp. 17-18, 1966, *Men, Machines, and Modern Times*)

Timing Transition to a New Practice

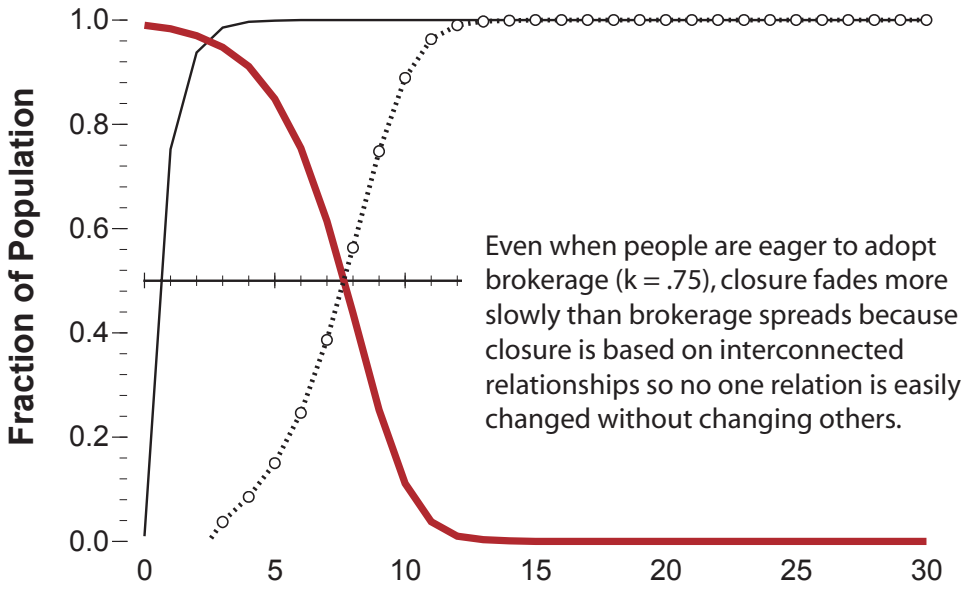
The Shadow of History as a New Focus on Brokerage Spreads through the Organization

Brokerage spreads as a process of individuals adopting.

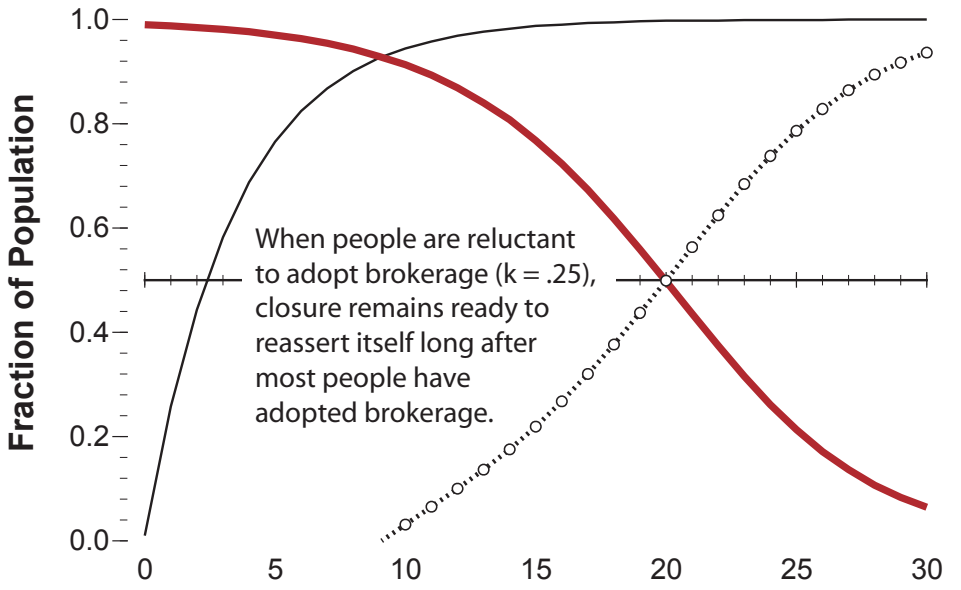
Closure is abandoned as a social contagion process triggered by friends abandoning it.

So brokerage is understood more quickly than it is used because closure preserves the legacy organization (fraction adopting brokerage minus fraction stuck in closure).

A. Shift to Brokerage among Eager Adopters



B. Shift to Brokerage among Reluctant Adopters



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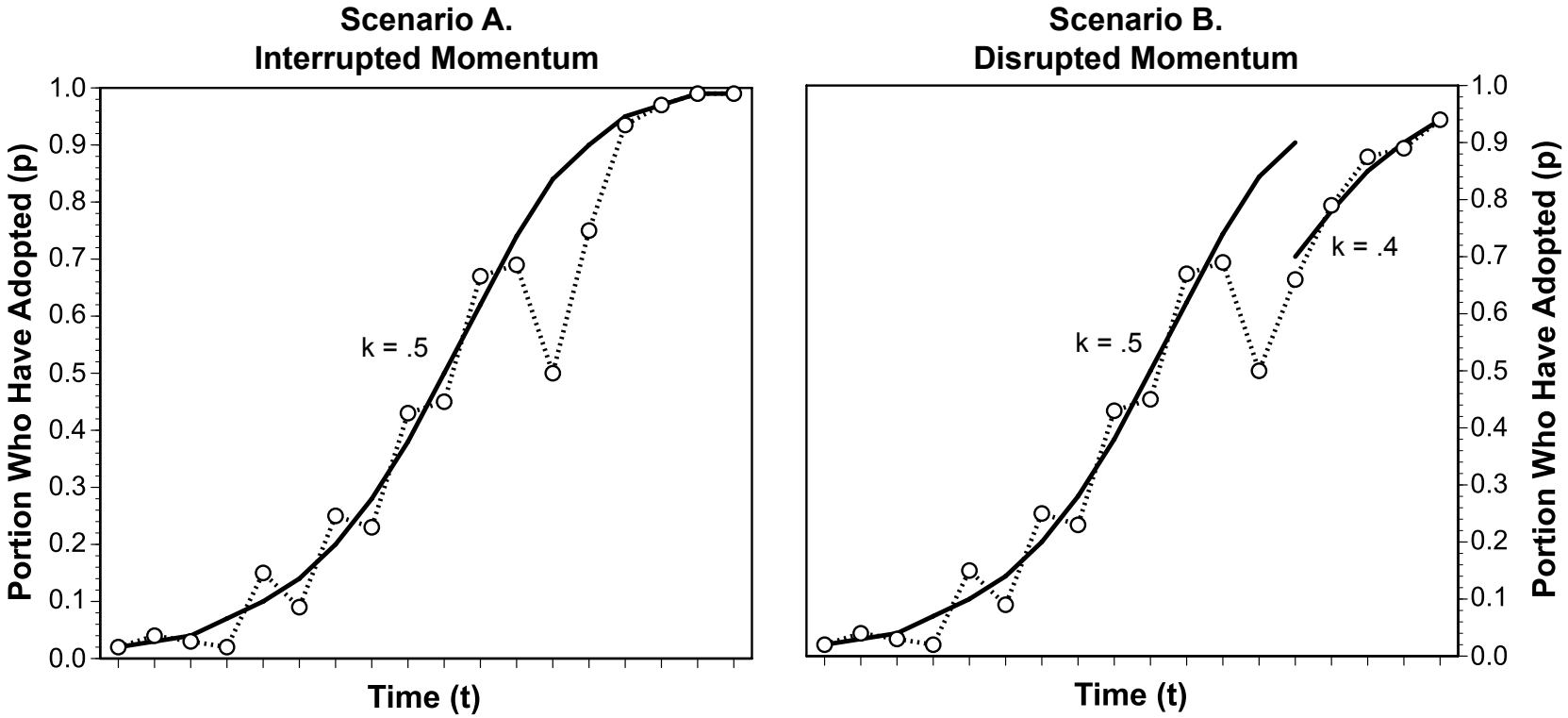
Remember the discussion in the Harvesting Value hand-out of changes that get reversed. There is an established underlying process at work that will reverse your change.

from Harvesting handout:



The graph in Figure B describes a hypothetical event that interrupts and disrupts established behavior. Activity is the same in the two graphs up to the event. Subsequent to the event, Figure A shows a return to the prior pattern, while Figure B shows a new pattern consistent with theory, but at a lower level resulting in slower diffusion. Figure A is an “interrupted momentum” effect. Figure B is an “disrupted momentum” effect.

Random Shocks Can Help **(if they are central, so they are difficult to ignore)**

(Shirado & Christakis, "Locally noisy autonomous agents improve global human coordination in network experiments" Nature 2017, 454:370-374): "We show that bots acting with small levels of random noise and placed in central locations meaningfully improve the collective performance of human groups, accelerating the median solution time by 55.6%. This is especially the case when the coordination problem is hard."

The task is color coordination within a 20 person network (details on page 103 of this handout). You have 3 contacts and a choice of 3 colors. Conflict is when you and one of your contacts is the same color. Solution is when there are no conflicts. In some trials, three bots replace people, and chose their colors at one of three levels of random. Quicker solution is indicated in the graphs by faster and further drop in "survival proportion" (which is % of sessions that remain unsolved at the x-axis time).

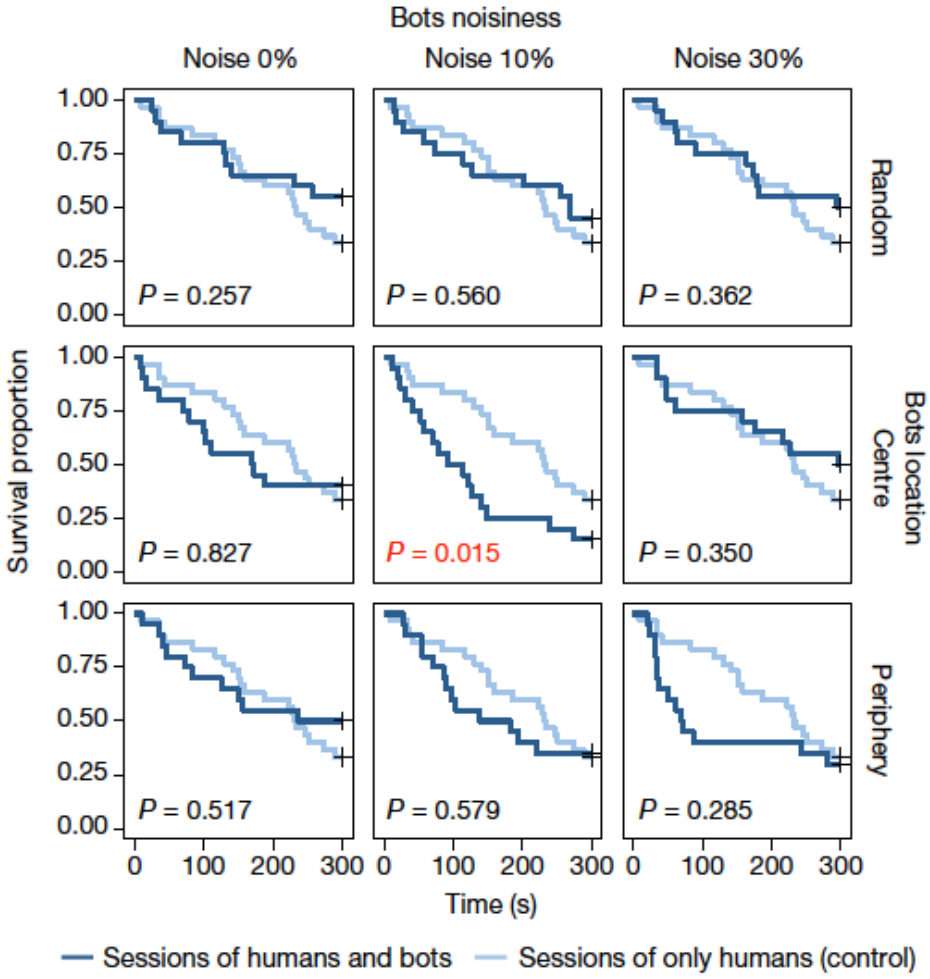


Figure 2 | Survival curves of sessions, by noisiness and location of bots. The curves show the percentage of sessions unsolved at a given time.

Dark blue lines show results for the sessions including bots (n = 20), by their noise level (horizontal dimension) and geodesic location (vertical dimension). Light blue curves show results for the control sessions involving solely human players (n = 30). Total n = 210. Sessions are censored at 300 s; P values given by the log-rank test.

Bots having 10% behavioural noise and located at the centre of the network cause a significant improvement in the solvability of the game (P = 0.015), and induce 55.6% acceleration in the median time to solution, from 232.4 s to 103.1 s.

Company Processes Can Help People Pay Attention To, Rather than Ignore, Exogenous Shocks to the Status Quo

WINNERS FOR 2003...

Here are many of the winners of the Industrial Design Excellence Awards:

DESIGN FIRMS	AWARDS GOLD	SILVER	BRONZE	TOTAL
IDEO	3	3	2	8
ZIBA DESIGN	3	2	1	6
RKS DESIGN	1	1	3	5
@RADICAL.MEDIA	2		1	3
DESIGN CONTINUUM		1	2	3
FUSEPROJECT	2		1	3
HERBST LAZAR BELL	2	1		3
LUNAR DESIGN		2	1	3
DESIGN EDGE	1	1		2
DESIGNWORKS/USA	1	1		2
NEWDEALDESIGN	1	1		2
PENTAGRAM		1	1	2
RALPH APPELBAUM			2	2

CORPORATIONS	AWARDS GOLD	SILVER	BRONZE	TOTAL
LOGITECH	2	2	2	6
BMW	2		2	4
HEWLETT-PACKARD		1	2	3
IBM	1		2	3
SAMSUNG ELECTRONICS	1	2		3
WHIRLPOOL	1		2	3
APPLE COMPUTER	1	1		2
BOMBARDIER RECREATIONAL	1		1	2
MOTOROLA	1		1	2
NIKE		1	1	2
TARGET		2		2
WARN INDUSTRIES	2			2

...AND OVER FIVE YEARS

Year after year, some design firms and corporations win:

DESIGN FIRMS	AWARDS 1999-2002	2003	TOTAL
IDEO	42	8	50
ZIBA DESIGN	17	6	23
LUNAR DESIGN	12	3	15
SMART DESIGN	14	1	15
DESIGN CONTINUUM	11	3	14
PENTAGRAM	11	2	13
HERBST LAZAR BELL	9	3	12
FROG DESIGN	10		10
HAUSER	8		8
RALPH APPELBAUM	6	2	8

CORPORATIONS	AWARDS 1999-2002	2003	TOTAL
APPLE COMPUTER	17	2	19
SAMSUNG ELECTRONICS	15	3	18
IBM	12	3	15
HEWLETT-PACKARD	9	3	12
MICROSOFT	10	1	11
NIKE	8	2	10
OXO INTERNATIONAL	9	1	10
STEELCASE	10		10
FISHER-PRICE	9		9
BMW	4	4	8
LOGITECH	2	6	8
MOTOROLA	6	2	8
PHILIPS DESIGN	7	1	8
TARGET	6	2	8

Data: Industrial Designers Society of America

IDEO: Leading Design Firm*

Using what you have learned so far, how would you explain how they do it?

Tom Kelley & Jonathan Littman (2005), The Ten Faces of Innovation; for elaboration of the IDEO saying, "fail often to succeed sooner," see Firestein (2016) Failure: Why Science is So Successful.

*Photos are from the 1999 Nightline video on IDEO's "shopping cart" project.

From ChatGPT 2025-11: IDEO is among the largest and most established design consultancies globally. It's not a boutique studio — it operates at scale, with global reach and a broad offering. (1999 video became a legend in design education.)

Reported estimated annual revenue: around US$894.7 million per year.

Employee count: varies by source; data indicates approx. 2,630 employees in one dataset.

Geographical presence: offices globally (US, Europe, Asia) and multi-disciplinary teams.

Public profile: Still visible in major projects (e.g., in article "The changing face of design" marking IDEO Shanghai 20-year anniversary).

Team Project (four or five classmates)

1. Identify 3 best examples of closure in IDEO's process.

2. Identify 3 best examples of brokerage in IDEO's process.

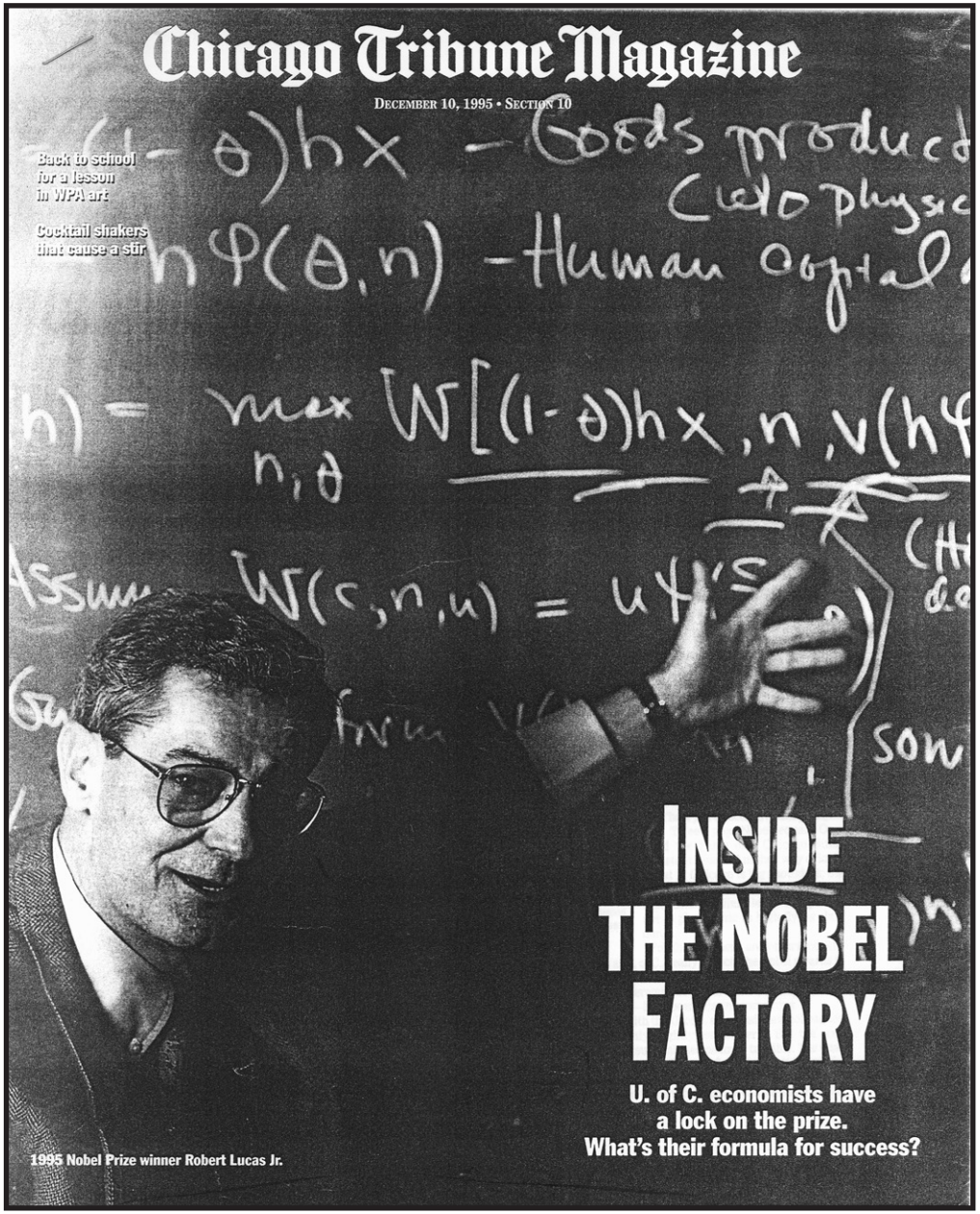
3. Order your 6 behaviors in time. Which occurs first. Which occurs next. Which next, and so on.

Write on a sheet of paper your team's responses to the above, and the names of teammates.

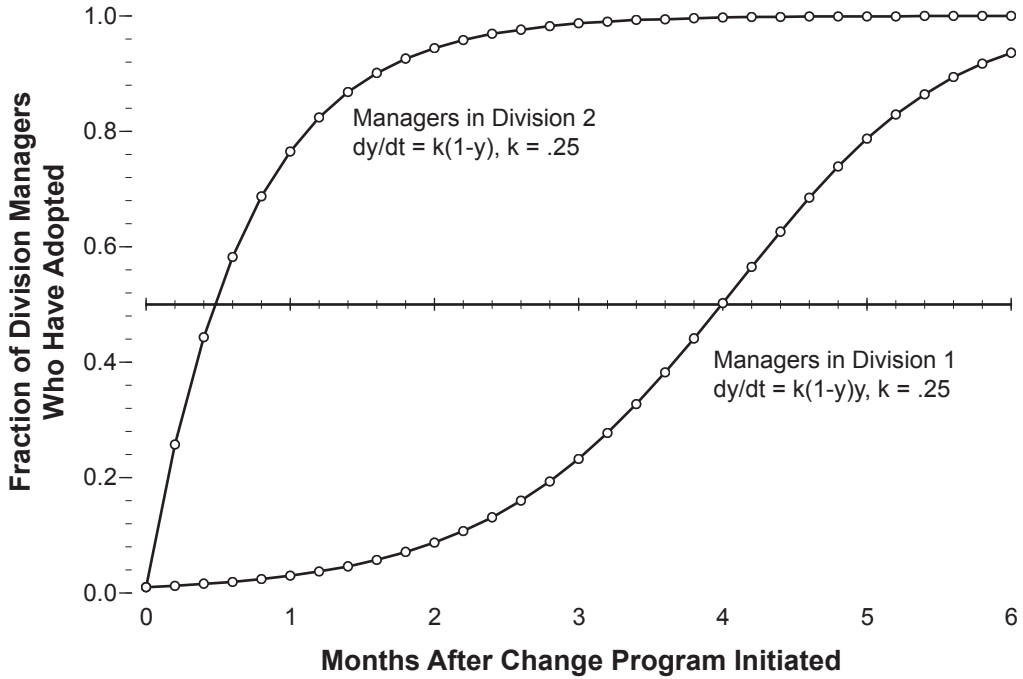
The IDEO process looks like the oral, workshop culture of certain educational institutions.

"Inside the Nobel Factory: U. of C. economists have a lock on the prize. What's their formula for success?"

(*Chicago Tribune Magazine*, December, 1995)



(Q114) You accepted the job of turning around a troubled organization. After a quick study of the organization and its markets, you have a sense that the organization needs to adopt Six Sigma practices to be a serious competitor. After six months in office, you have email traffic monitored to get a sense of which employees are adopting Six Sigma practices. You are given the results in the graph to the right describing the spread of Six Sigma in your organization's two divisions.



What network mechanisms are driving Six Sigma adoption in the two divisions?

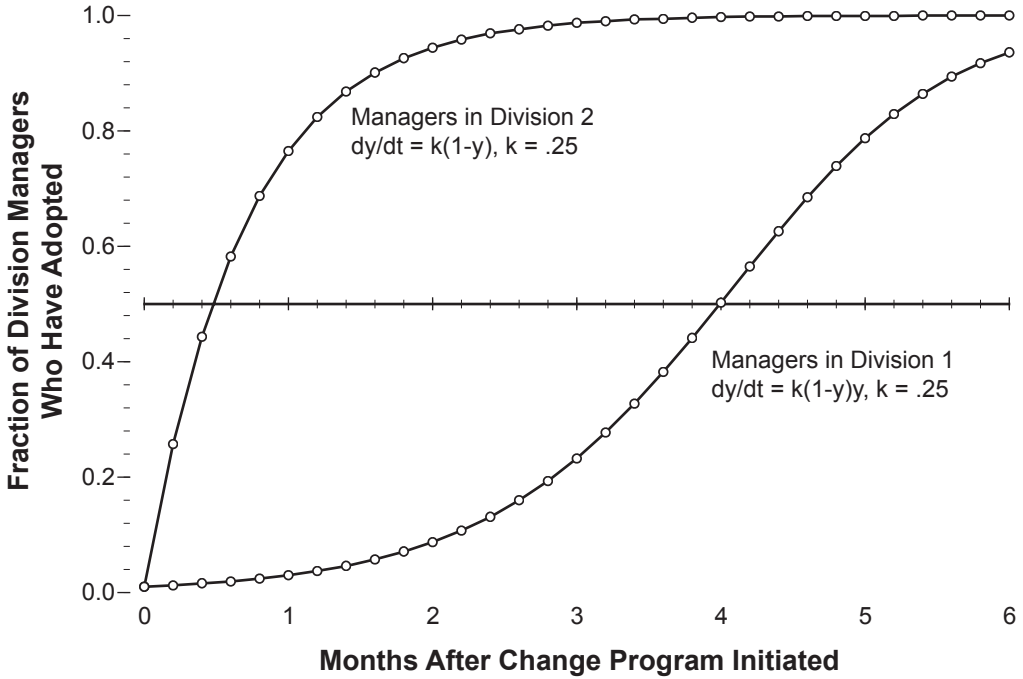
A. Social contagion in Division 1 and independent adoption in Division 2

B. Social contagion in Division 2 and independent adoption in Division 1

C. Social contagion in both divisions

D. Independent adoption in both divisions

(Q115) You accepted the job of turning around a troubled organization. After a quick study of the organization and its markets, you have a sense that the organization needs to adopt Six Sigma practices to be a serious competitor. After six months in office, you have email traffic monitored to get a sense of which employees are adopting Six Sigma practices. You are given the results in the graph to the right describing the spread of Six Sigma in your organization's two divisions.

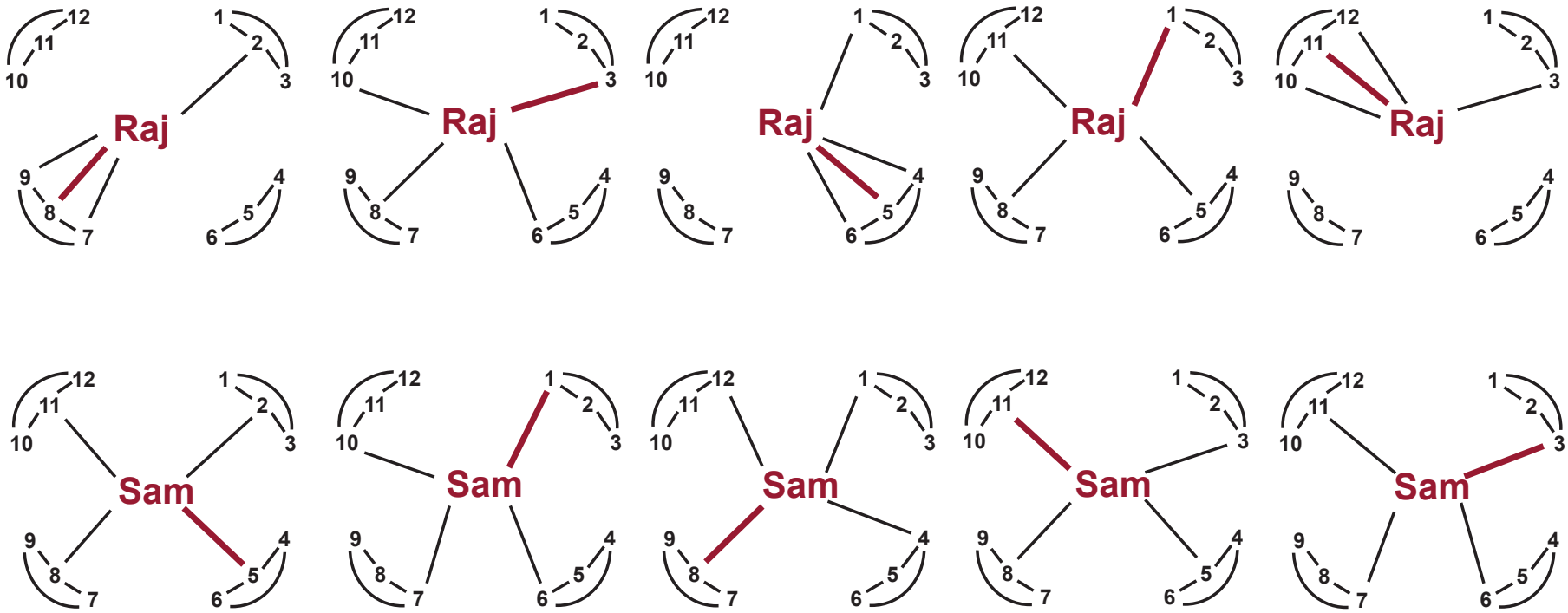


Which division, 1 or 2, is more likely to show benefits from Six Sigma practices?

A. Division 1

B. Division 2

C. Neither division is likely to show benefits in this case.



(Q199) The above network sequences both cumulate to the same broker network, but differ substantially in their development.
What performance level would you expect from Raj and Sam?

A. Raj & Sam similar B. Raj higher C. Sam higher

(Q265) We discussed research demonstrating that random shocks can be beneficial in moving a work group away from a local solution to a more beneficial global solution. **Which of the below sentences best describes our conclusion that this research, while accurate, requires cautious application in practice?** (Hint: Recall the Naskapi Indians.)

A. Random shocks prevent the group from over-hunting the same territory again and again.

B. Random shocks can be confusing.

C. Random shocks can be ignored.

D. Random shocks require an AI algorithm.

Four Summary Points

Balance is most often discussed on case-by-case basis of correcting for too much closure, or too much brokerage.

Examples: Gas turbine plant, pharma firm, computer tech firm, financial advisory firm.

As a general principle about <u>where</u> to focus on closure versus brokerage, look for "closure within, brokerage beyond."

Combines the breadth, timing, and arbitrage advantages of brokerage with the cooperation and social comparison advantages of closure. This encourages guanxi-like ties among cohesive elites at the center of the network. Examples: Wednesday 10, Second Life, City of Chicago, commercial bank.

<u>More precisely where</u>, focus on your diversity of trusted contacts beyond your group (your strong bridges; i.e., the diversity of your guanxi).

4th generation brokerage: Is she someone over there I can trust and respect?

As a general principle about <u>when</u> to focus on closure versus brokerage, look for oscillation.

Combines the breadth, timing, and arbitrage advantages of brokerage with the information access and reputation-building of closure. Different forms: continuous (bankers), episodic (entrepreneurs). Three explanations for effect: Reputation stability, network breadth, agility.

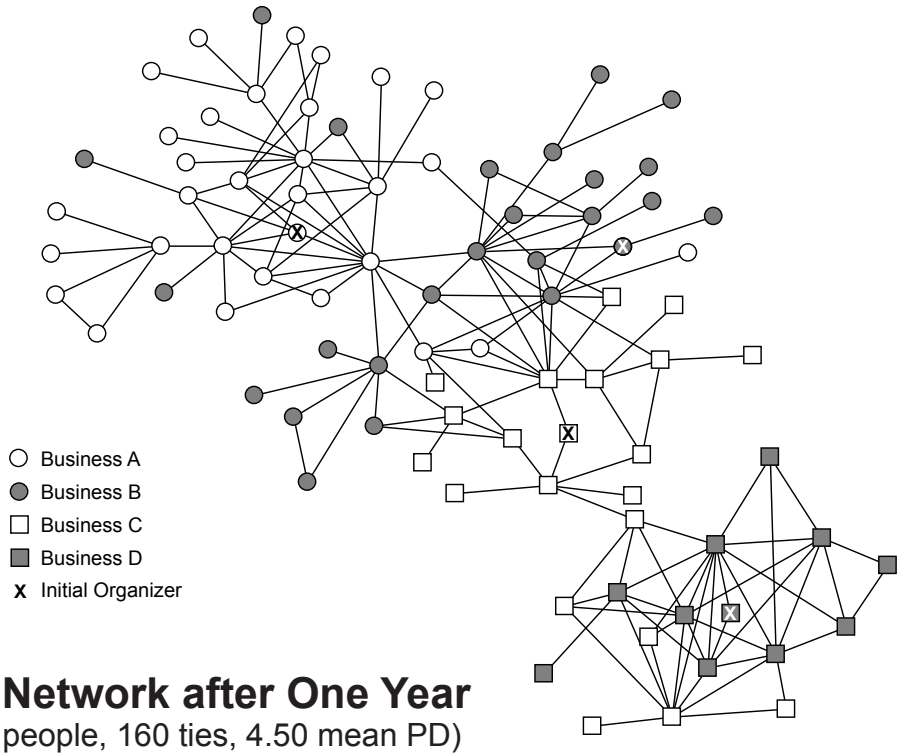
Can be difficult for individuals (Ibarra vs. Ebaugh), but dramatically more difficult for organizations. Organizations resist change, often reverting to old form (Atlanta, virtual organization for Homeland Security). Forecasting transition with diffusion curves. Random shocks break through suboptimal solutions. Institutional rituals facilitate organizational oscillation (IDEO).

Appendix Materials

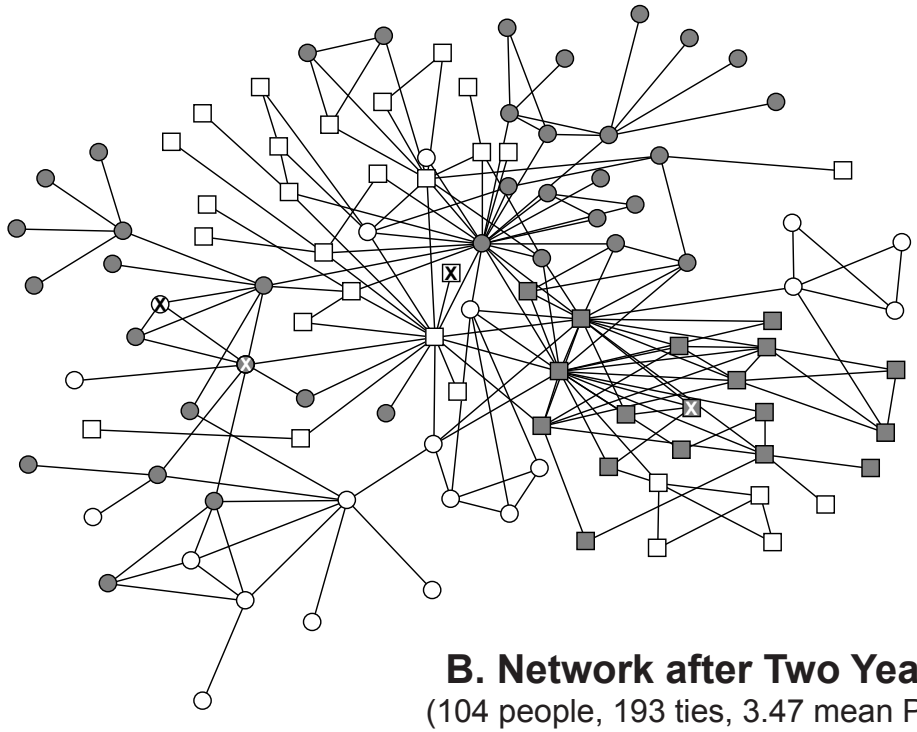
At the Organization Level, B-C Shifting Is Especially Difficult

This is a Virtual Organization across a Four-Division Manufacturing Company

Discussion Network
Before and After an Intervention



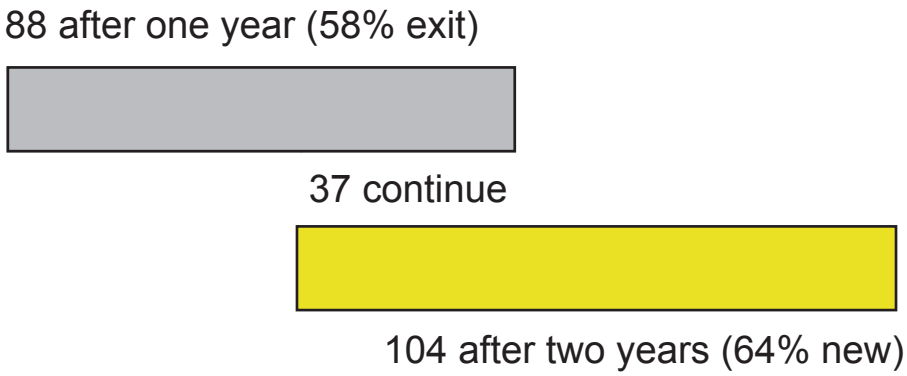
A. Network after One Year
(88 people, 160 ties, 4.50 mean PD)



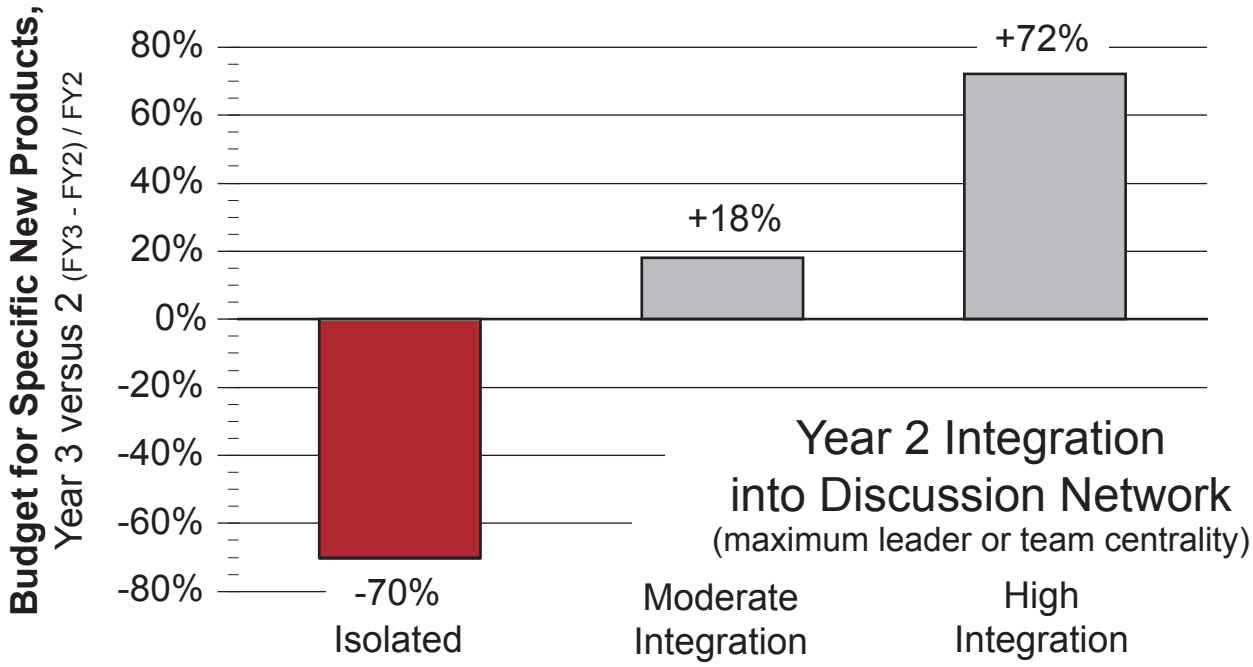
B. Network after Two Years
(104 people, 193 ties, 3.47 mean PD)

Figure 4 in Burt and Soda (2021, "Network capabilities: brokerage as a bridge between network theory and the resource-based view of of the firm," *Journal of Management*) and Figure 5 in Burt "Network duality of social capital," in *Social Capital*, edited by Viva Bartkus and James H. Davis (2009). Also remember two examples discussed in class: corruption in Atlanta and Coca-Cola distributers.

Turnover

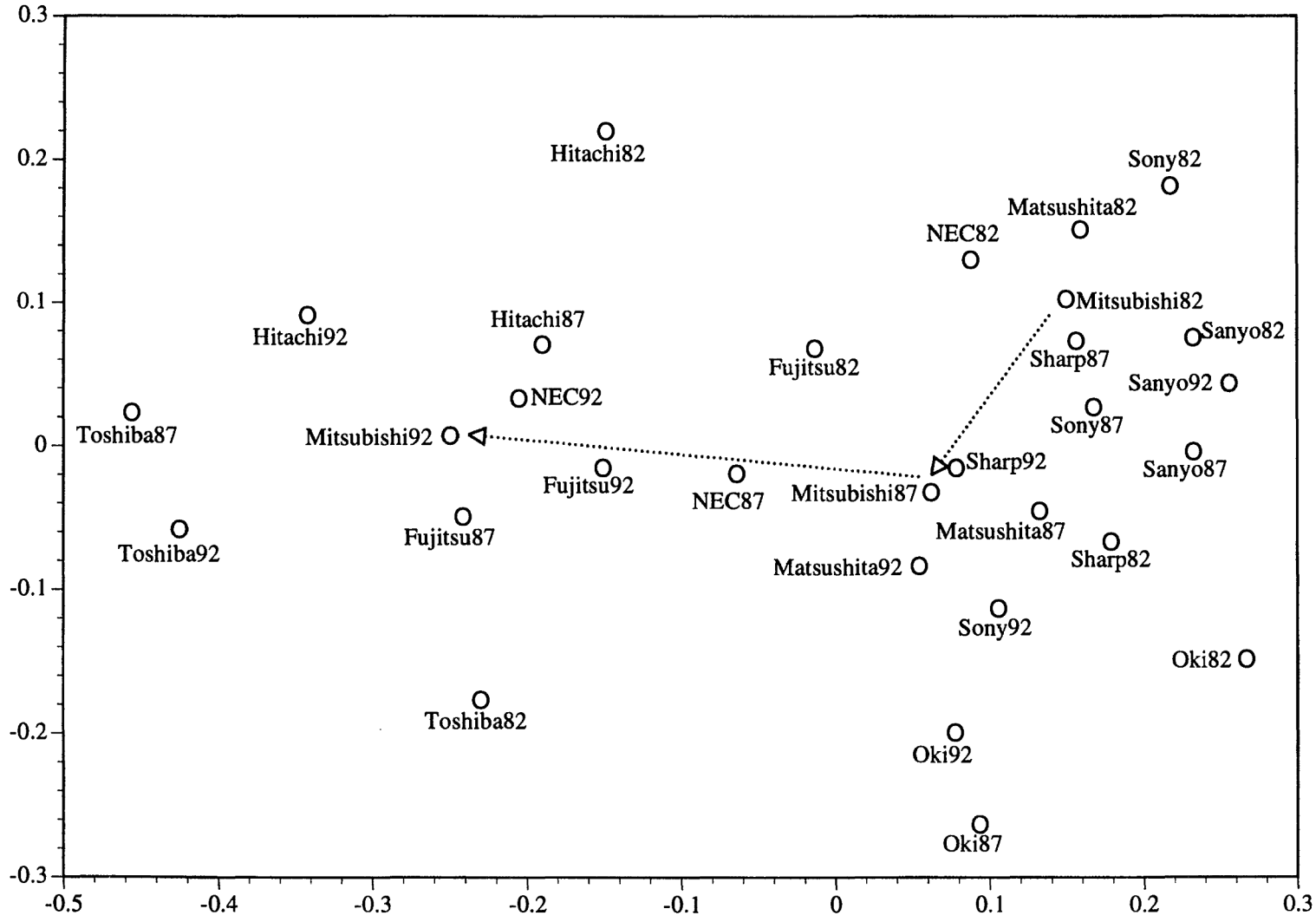


Myopia



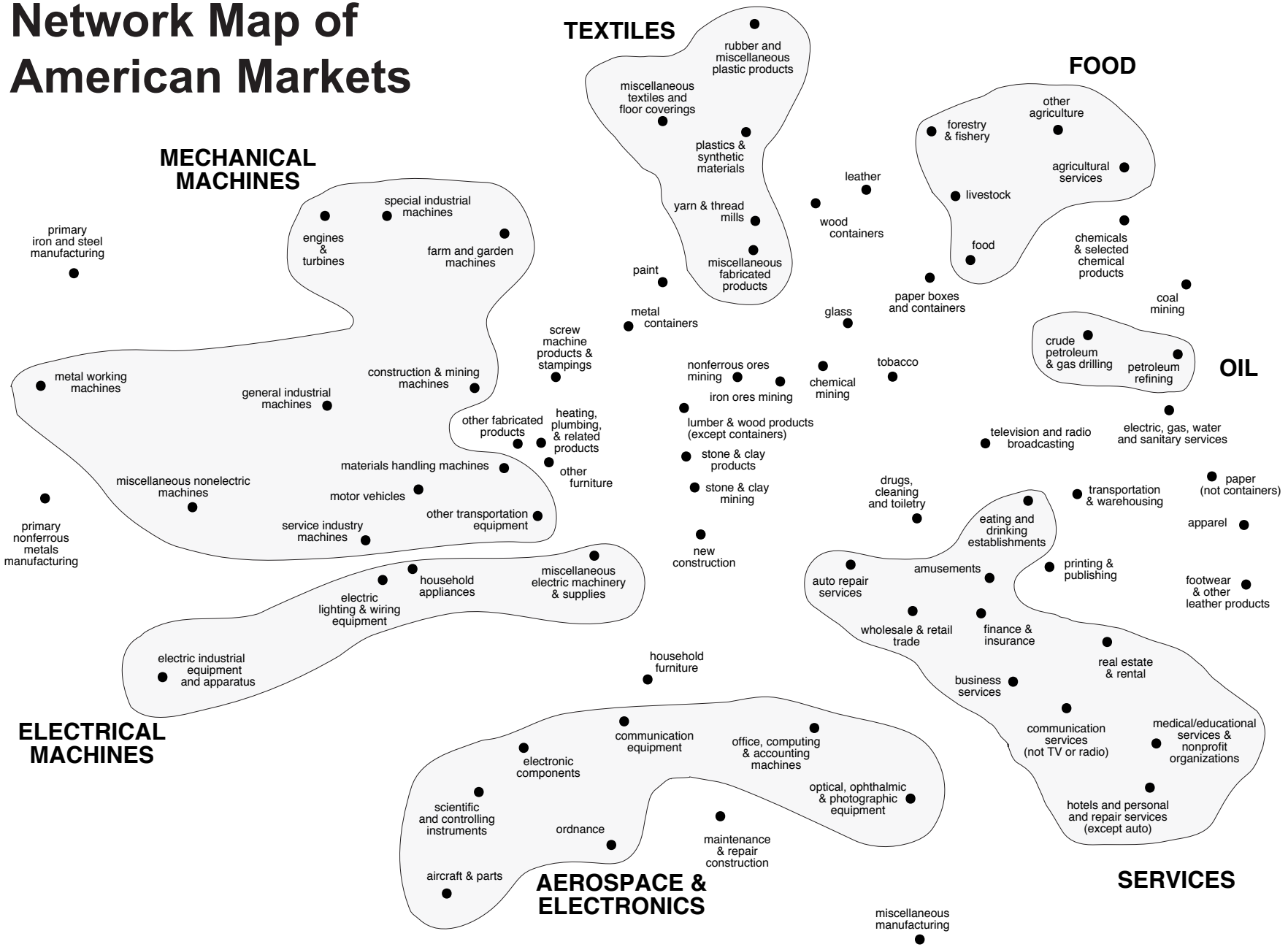
Network Map of Japanese Micro-Chip Production

Map lists firms at three points in time: 1982, 1987,and 1992. Firms are close together (e.g., Sharp and Sony in 1987) to the extent that they filed US patents citing the same antecedent patents (i.e., are structurally equivalent with respect to past technology). Firms that continue in the same location over time (e.g., Sanyo in 1982, 1987 and 1992) worked the same technology niche over time. The arrow shows Mitsubishi's evolution from a specialty producer in the upper right (producing for their own consumer electronics businesses) to an industry-leader at the far left (producing complex devices such as logic circuits and MOS memory for computer and industrial applications, e.g., as a second source for Intel microprocessors).



from Figure 3 in Stuart and Podolny (1996), "Local search and the evolution of technological capabilities," *Strategic Management Journal.*

Network Map of American Markets



from Figure 3.2 in Burt (1992) *Structural Holes*; also see Figure 1 in Burt & Carlton (1989) "Another Look at the Network Boundaries of American Markets" *American Journal of Sociology*

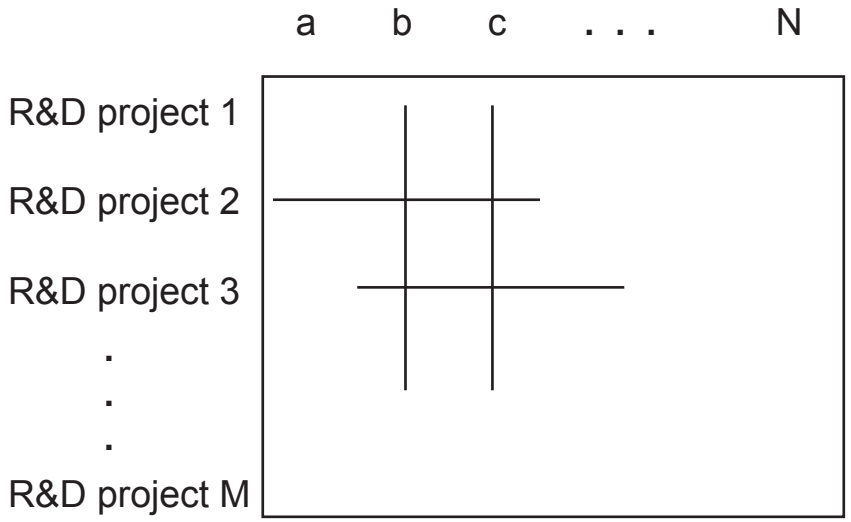
Building a Strategy Map

Strategy maps can be constructed as spatial representations of structural equivalence distances between projects or the components and processes involved in projects. The raw data are illustrated below. Rows correspond to projects. Columns correspond to components or processes. Cell (3,b) measures the extent to which project 3 involves component/process b. Cell entries could be a binary measure of involved versus not, or a continuous measure of relative investment.

The (M,M) matrix of distances among the M projects in the rows defines a strategy map in terms of projects. Projects close together in the map use similar components or processes.

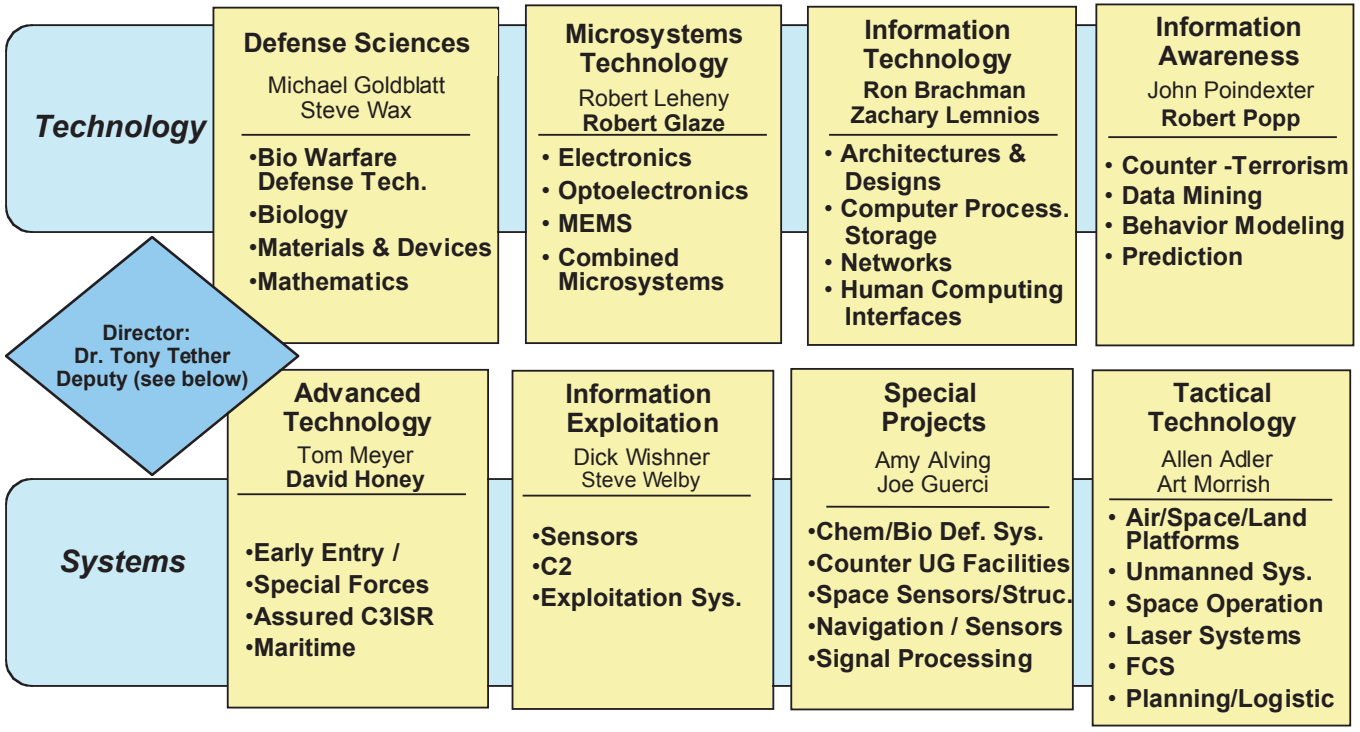
The (N,N) matrix of distances among the N columns defines a strategy map in terms of components and processes. Components/processes close together in the map are being used in the same projects.

Coordination across the structural holes between proximate projects, components, or processes is most likely successful and rewarding in terms of new products/services/revenue and resources liberated from investments in redundant work.



Targeting Structural Holes in the Client

Here is a company's September 2002 reach into the Defense Advanced Research Projects Agency (DARPA, founded in response to Sputnik launch in 1958 and father of the internet).

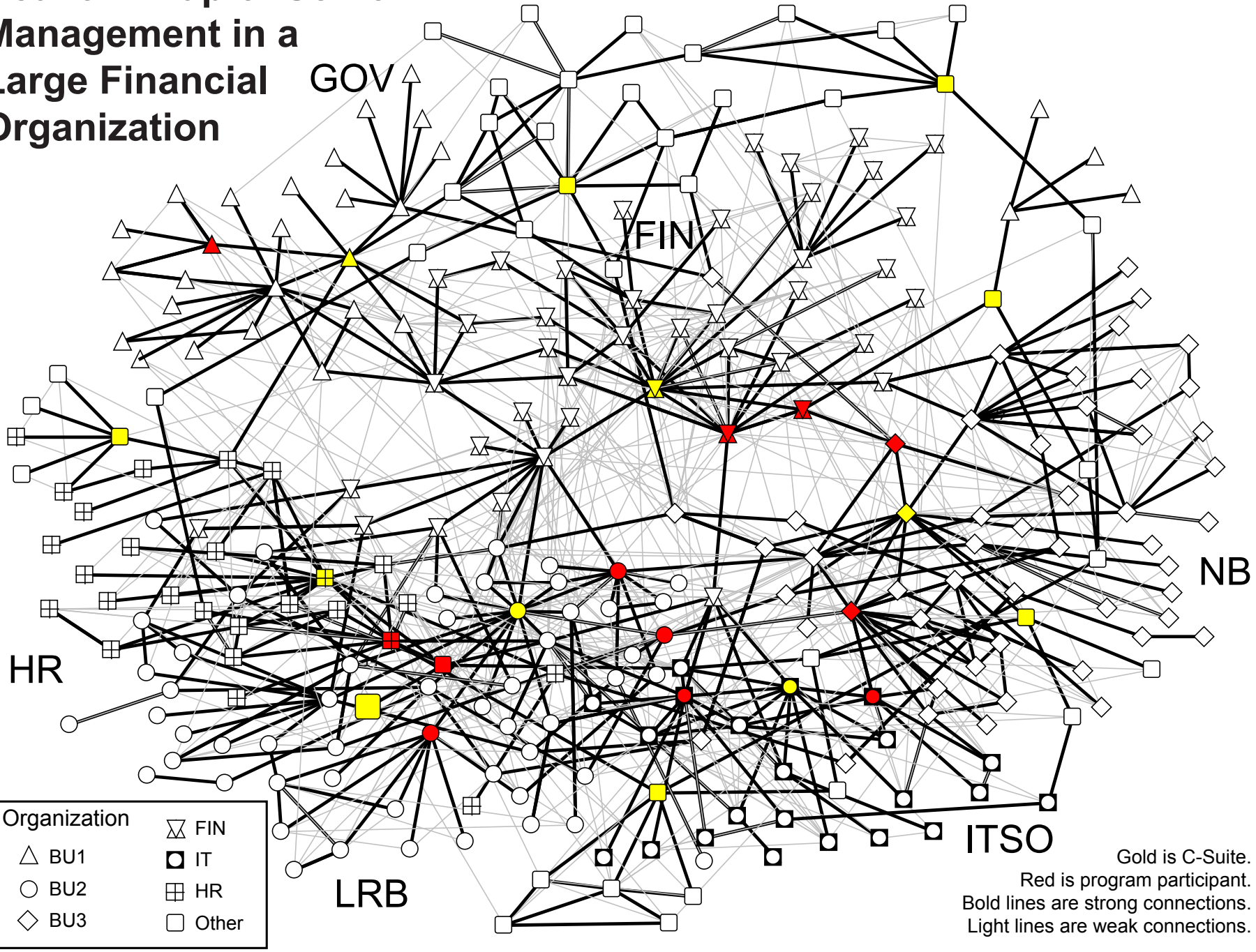


Density of Perceived Discussion Ties within & across DARPA offices

Defense Sciences	10	1							
Microsystems Tech	80	-	32						
Information Technology	8	-	-	5					
Information Awareness	7	-	-	-	5				
Advanced Technology	49	-	10	-	-	19			
Information Exploitation	62	-	-	1	2	3	30		
Special Projects	29	-	4	-	-	2	7	10	
Tactical Technology	24	-	4	-	-	2	14	1	5
TOTAL	952	15	141	17	21	95	125	60	58

(641 within our organization)

Network Map of Senior Management in a Large Financial Organization

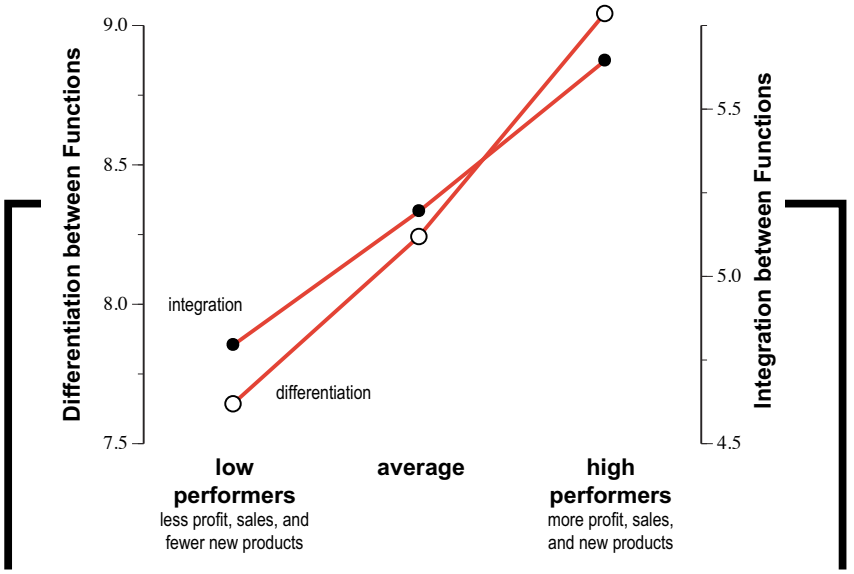


Contingent Optimum

Optimum balance between integrating operations (closure) and preserving differentiation (brokerage) is contingent on the work being performed. In a classic study showing contingency, Lawrence and Lorsch distinguish kinds of work by the industry in which a firm operates.

Firm profitability in the plastics industry increases with both integration across the three functions (sales, production, and research), and differentiation (structural holes) between the three functions. This is an illustration of Jack Welch's "integrated diversity."

Firms in the Plastics Industry



managers behave and are organized differently in different functions

functions compared on four dimensions:
- goals (e.g., quantity vs. quality)
- time frame (short-term vs. long-term)
- interpersonal (getting job done vs. building relations)
- hierarchy (many levels, reviews, supervisors/employee)

difference between two functions on each attribute divided into five categories:
- 1 two functions least different on attribute
  (e.g., sales and research functions have similar hierarchy in low-A firm, relative to the other 9 firms)
- ...
- 5 two functions most different on attribute

then summed across the four attributes to describe differentiation between functions:

e.g., here is differentiation in the low-A firm

	S	P	R
Sales	—		
Production	5	—	
Research	13	9	—

and the firm's differentiation score is average differentiation between key functions
(e.g., the 9 on p. 103 for low-A firm is [5+9+13]/3)

managers are tightly coordinated across functions

respondents think about cross-function ties:
- senior managers who span functions
- cross-function teams
- scheduling procedures
- individual managers working outside official channels

then are asked to characterize relations between each pair of functions:
- 1 couldn't be worse; bad relations; serious problems
- 2-3 somewhat breakdown in relations
- 4 average — sound enough to get by
- 5-6 better than average, almost full unity
- 7 sound, full unity of effort is obtained

then their average response is used to describe integration between functions:

	S	P	R
Sales	—		
Production	5.87	—	
Research	4.55	4.88	—

e.g., here is integration in the low-A firm

and the firm's integration score is average integration between key functions
(e.g., the 5.1 on p. 103 for low-A firm is [5.87+4.55+4.88]/3)

Data are from pp. 40 (performance), 36, 50 (differentiation),and 47, 50 (integration) of Lawrence and Lorsch (1967, 1986), *Organization and Environment*, (see pp. 258-260 of the book for methodological details).

Optimum is contingent on work being performed,

here distinguished by the industry in which a firm operates.

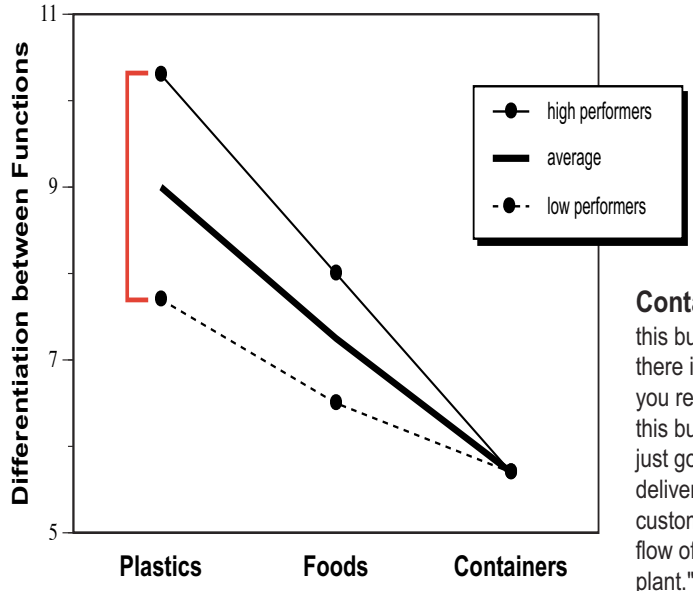
Where firms compete primarily on price, differentiation (structural holes) has no value. It is best to tightly integrate operations across functions. To the right, container firms compete primarily on price (e.g., tin can producers). Low- and high-performing container firms have low differentiation. High-performers are distinguished by their integration across functions.

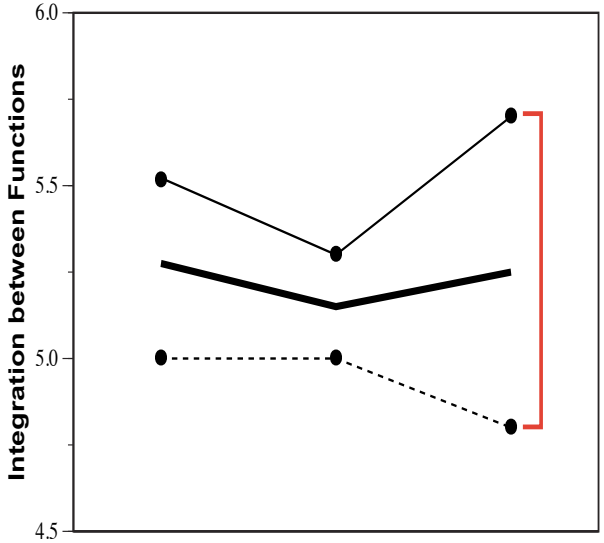
The economic value of having a strong corporate culture shows a similar contingency (next page).

Plastics: "The development of plastics materials is more of an art than a science. ... However, we have developed the art to a high enough degree so we can hit a target area, even if we can't hit the target in every case."

"Because our customers typically use the products we sell in a chemical reaction, we have a relatively high level of control over the suitability of our product to the customer. ... Consequently, we have a hundred markets, each different in requirements because of the customers' processing needs."

Foods: "This is a profitable business, which is an intensely competitive market, but not a very price-sensitive one. Top competition takes the form of a very intense merchandising effort around new product innovations."





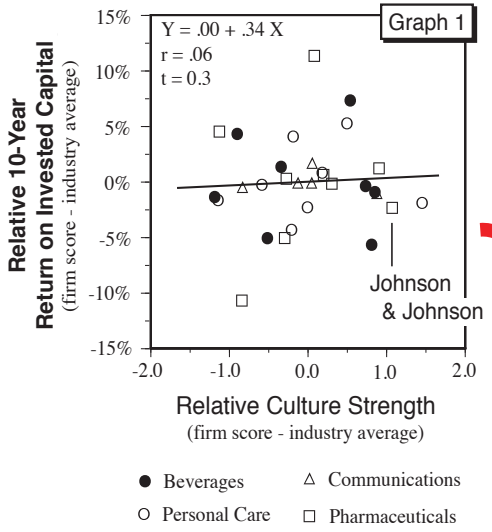
Containers: "As far as this business is concerned, there is no innovation. If you really want to grow in this business, you ... have just got to have good delivery service to the customer, optimizing the flow of you material into his plant."

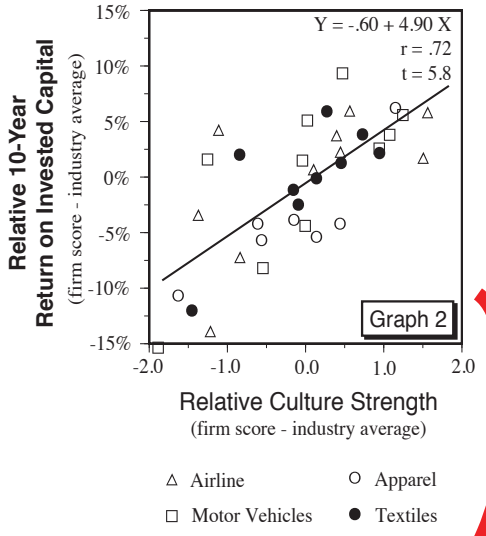
"Prices are important in this industry only in the sense that you must meet them. Also, product specifications are standardized, ... so we are producing a very undifferentiated product. Obviously, you have to sell something else. ... The customers, because of the speed at which they run their lines, are very concerned about imperfect containers. They keep detailed records of their losses and whose containers caused them."

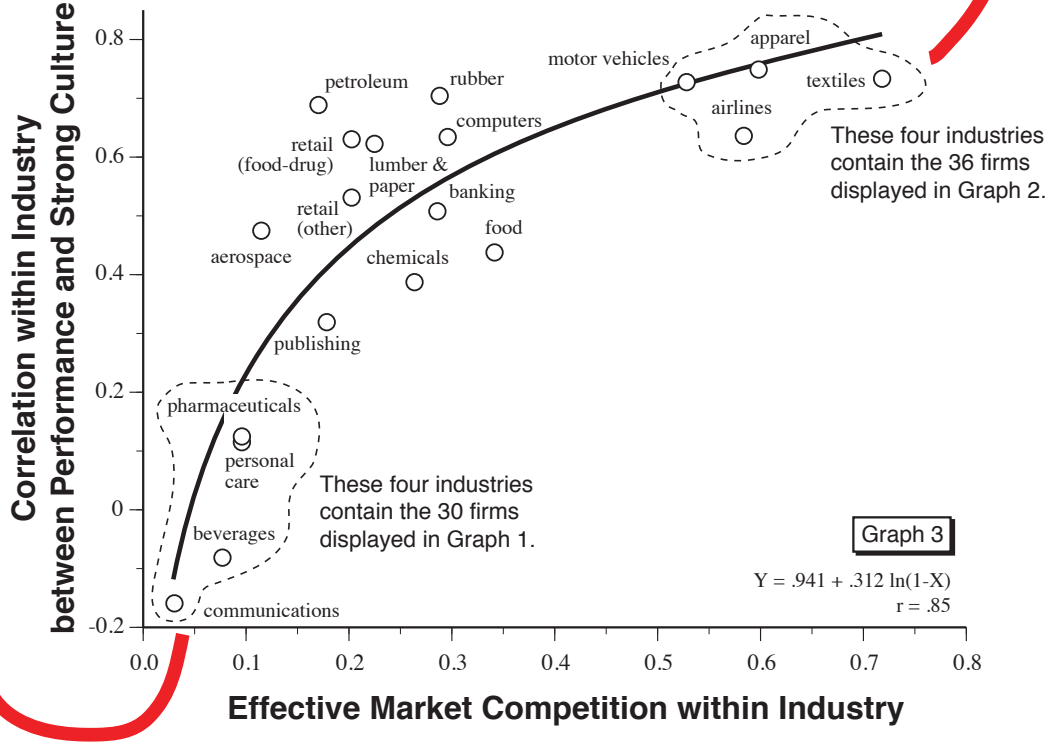
Quotes are from pp. 25-26, 89-90, in Lawrence and Lorsch (1967, 1986), *Organization and Environment*. Graph is from page 103 of the book (plastics high-performer scores are averages of the two high-performing firms and low-performer scores are averages of the two low-performing firms).

Contingent Optimum (cont.)

When competition is on price, the bottom-line growth associated with network closure (here in the form of strong corporate culture in the early 1980s) is a competitive advantage.







From Burt, "When is corporate culture a competitive asset?" (1999, *Financial Times*, text given in Appendix IV in the "Closure" handout)

Detail on color coordination task on page 85 of this handout (from Shirado & Christakis, "Locally noisy autonomous agents improve global human coordination in network experiments" *Nature* 2017, 454:370-374). Text below is from the article [brackets added], and here is a video of the coordination task in process: https://media-nature-com.proxy.uchicago.edu/original/nature-assets/nature/journal/v545/n7654/extref/nature22332-sv1.mp4 (you will need to authenticate yourself via U of Chicago).

We recruited 4,000 unique subjects online and randomly assigned them to 1 of 11 conditions in a series of 230 sessions (see Supplementary Information). Subjects were assigned a location in a network of 20 nodes, generated by a preferential attachment model; the network structure was created de novo for each session by attaching new nodes (each with two links) to existing nodes; and subjects were placed into the resulting networks at random. [Each subject has three contacts.] The collective goal is for every node to have a colour different than all of its neighbour nodes. This colour coordination game successfully captures the problem of systematic failure by sub-optimization in coordination; that is, while each individual attempts to reach a solution that is optimal for that individual, this may not be optimal for the whole group.

In the sessions, each subject was allowed to choose a colour from three choices (green, orange and purple) at any time. The number of colours made available was the minimum necessary to colour the entire network without conflicts [conflict means your color matches one of your neighbors], which is known as the chromatic number; and all networks in our experiments are, by construction, globally solvable. However, while all the networks allowed the subjects to reach the collective goal, the networks could (by chance) vary in their number of solutions (that is, the networks ranged from 6 to 13,824 possible colourings that would work, known as the chromatic polynomial; see Supplementary Information).

Subjects could see only the colours of neighbours to whom they were directly connected, in addition to their own colour. Thus, although a subject might have solved the problem from his or her own point of view, the game might continue because the network still had conflicts in other regions of the graph. In terms of the optimization problem, the cost function of the game is expressed as the sum of the number of conflicts. As in past work, the subjects got paid according to how long it took for all conflicts in the network to be resolved, and they had to complete the task within 5 min (see Supplementary Information for details).

1. Business Time Line

This first question asks you to look back through time to identify significant events in the history of your business.

A. Begin by defining the time-line. The line on the bottom of your worksheet represents time. Today, 2012, is at the extreme right. **At the extreme left, under "business founded," please write the year in which you founded your firm.** No need for months, just round to whole years. If you operate multiple firms, please complete the time line for the largest of your firms. As a guide, an illustrative time-line is provided at the top of the worksheet for a hypothetical business. The business was founded in 1997.

B. **In the middle of the line, write the year half-way between the founding date and today.** For the example firm in the box at the top of the worksheet, half-way is 2002 (2012 minus 1992 is 20, half of which is 10, so half-way is 1992 plus 10, or 2002). Again, just round to whole years.

C. **Write in the year at the two quarters.** For the example firm, a quarter is half of 10, which is 5, so the two quarters are marked 1997 and 2007. Again, just round to whole years.

D. **Use the four dates as a frame of reference to write in each year during which you experienced a significant event for your business. Please limit yourself to five or fewer significant events.** We rely on your judgment to determine what events are significant, but examples could include events like the ones that happened to the example firm at the top of your worksheet. After the firm was founded in 1992, the owner secured a relationship with a key technology partner in 1993. The business prospered. To expand faster, a bank loan was obtained in 1999. In 2000, the firm had to deal with the problem that a critical supplier was purchased so it was no longer available. A new supplier was arranged and the business grew into its first export contract in 2004. Four years later, in 2008, a contract was secured with the current primary export customer.

Different firms have different histories. In the space at the bottom of your worksheet, please indicate up to five significant events in the history of your firm.

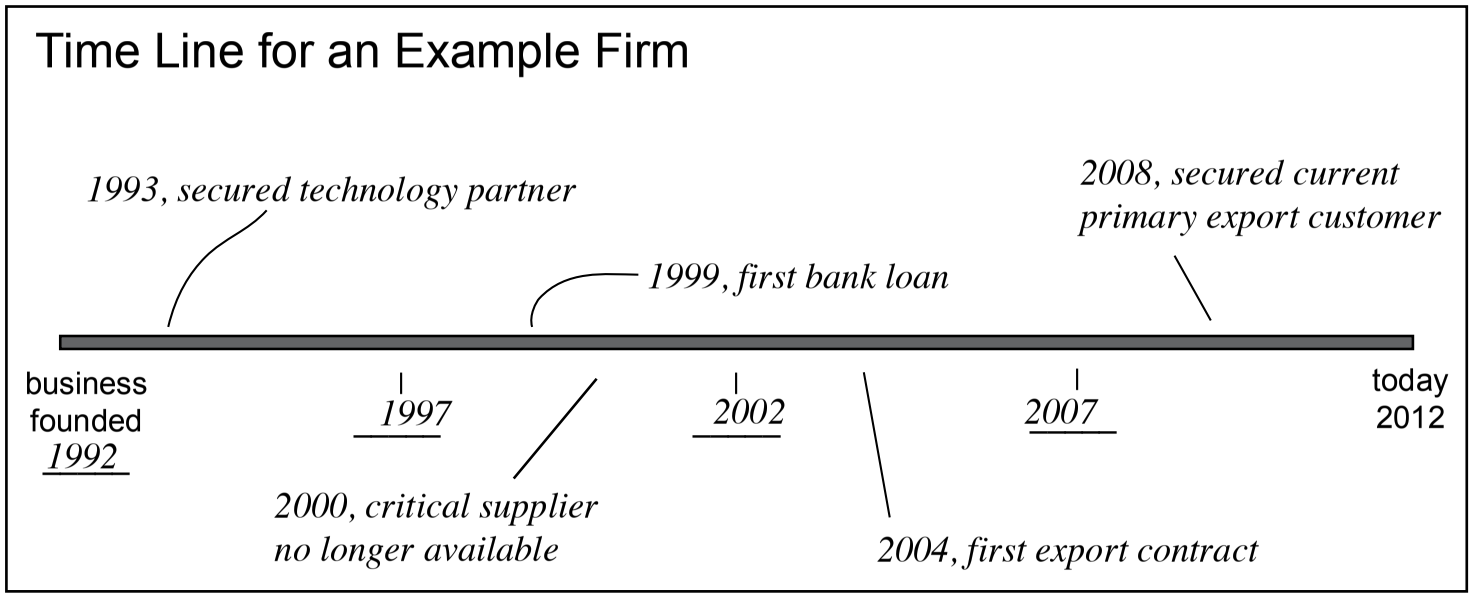
Please be sure to include the year in which each event took place.

You have a lot of space, so don't worry about scratching things out.

Event Contact Name Generator

Business Time Line Worksheet

Time Line for an Example Firm



Time Line for Your Firm