

This is a draft chapter for a book tentatively titled "Structural Holes in Virtual Worlds."

Main aim of paper: how certain network structures around an individual generates some advantages.

These advantages derivate from network are dual and they came from brokerage and from closure. First, the idea is that achievement is fostered by access to structural holes; i.e. the brokerage principle. Second, the idea is that trust and reputation are fostered within closed networks making less likely the probability of bad behavior inside the network, i.e. the closure principle. The two principles are closely linked as achievements associated with brokerage require the trust and reputation associated with closure. Thus the duality of network advantage: new ideas and growth come from people who bridge across groups, while system governance via trust and reputation comes from closed networks within groups.

Network models of advantage build on two facts (1) People cluster into groups as a result of interaction opportunities (2) Communication is more frequent and influential within than between groups

Information in the group becomes "sticky" (von Hippel, 1994) because within a cluster, people share certain explicit and implicit understandings making the knowledge sticky to their cluster.

Explicit knowledge converted into local, tacit knowledge makes information sticky such that holes tear open in the flow of information. These holes in the social structure of communication, or more simply "structural holes" (Burt, 1992), are missing relations that inhibit information flow between people (Page 4).

Empty space between clusters indicates a structural hole. Structural holes are the empty spaces in social structure. Structural holes define non-redundant sources of information, sources that are more additive than overlapping. People can play either of two roles in a cluster (Figure 2.1): specialize within a cluster (closure), or build bridges between clusters (brokerage).

Brokerage is about the benefits of exposure to variation in opinion and behavior provided by connecting across structural holes to engage diverse information.

People whose relations connect across structural holes (call the people network brokers, connectors, hubs, or entrepreneurs) are exposed to the diversity of surrounding opinion and behavior so they are more likely to detect productive new combinations of previously segregated information, and more likely to see alternative sets of people whose interest would be served if the new combination were brought to fruition.

Thus, a structural hole is a potentially valuable context for action, brokerage is the action of coordinating across the hole with bridge connections between people in opposite sides of the hole, and... brokers are the people who build the bridges. Pag 7

Distinguishing network brokers

See figure 2.2

Network metrics often used to distinguish the brokers in a network. These measures depend on Network features: network size (degree); network connectivity and density (average strength of connections between ego's contacts); network hierarchy

1.-Network closure: a network is closed to the extent it is small and how much the contacts in it are interconnected. Constraint index is a summary index of closure around ego. Constraint is the percentage of individual's energy and time consumed by one group and decreases with extent to which ego has many contacts (size). Constraint increase with the extent to which ego's network is closed by strong connections among ego's contacts (density). Increases with the extent to which Ego's network is closed by a partner strongly connected with all ego's contacts (hierarchy). A maximum constraint score of 100 indicates no access to structural holes (ego has no friends, or all ego's friends were friends with one another (page 10).

2.-"Nonredundant contacts", is a count of the clusters to which ego is attached

3.-Freeman's betweenness index is a count of the structural holes to which ego has monopoly access.

Evidence of broker advantage

The main idea is that network brokers are compensated for their work with some kind of advantage. What these benefits could be? The people who connect across the structural holes and between clusters have information breadth, timing and arbitrage advantages.

In Burt (2004) there are Quantitative association between a person's access to structural holes and the acknowledge value of their ideas. Numerous studies report performance metrics higher for network brokers: see references in pag. 13.

Among the positives outcomes of brokerage is recognition as a leaders. Network brokers tend to be the recognized leaders in a population (See the section Network Leaders).

But, information diversity is the key factor predicting performance, not the network. Holes in the ego's network are merely an indicator of ego's access to diverse information. More, bridge relations are not equally valuable, nor always valuable (Page 13). Network brokerage is not a guarantee. It is a probability. The advantage of ego's access to diverse information seems to come from processing information more than from getting information. In other words, advantage is not a direct result of access to structural holes. Advantage is a by-product and is much a result from personal abilities exercised and developed while engaged in diverse information (Burt, 2010).

However, benefitting from those opportunities involves an audience, a set of people who have to accept the broker as a source of information. So, the audience can ask some questions: is the broker known for competence in the proposed idea? How will it look to my colleagues if I accept a proposal from the would-be broker? Is the would-be broker an appropriate source of

actionable information? These are questions about trust, reputation, and social property (page24).

The importance of trust and reputation to network advantage shifts attention to the internal dynamics of dense social clusters. Closure generates the trust and reputation on which returns to brokerage are dependent (Page 35)

Closure is about strengthening connections within a cluster. The core of the closure argument is that embedding facilitates trust by creating reputation cost of bad behavior. The argument is that dense communication channels in a closed network make it more likely that behavior and opinion inconsistent with the standards in the network will be detected and discuss.

Brokerage contingent on closure seems a contradiction. Brokerage by definition involves links across closed networks, so how do brokers find the trust and reputation necessary for successful brokerage?

Two points resolve the ostensible contradiction: The first is a matter of timing. The safety offered by a closed network is less necessary as two people get to know one another. At some point, collaboration can be maintained by relational embedding without structural embedding. Second, reputation is maintained and owned by the broker's audience not the broker. A network broker is by definition not embedded in a closed network with the people between whom she brokers connections but she does have connections into closed networks within which her reputation is built and maintained. Reputation does not require closure between broker and contacts. It requires only that some proportions of a broker's contacts are in closed networks (Page 49).