Social Network Analysis and the Evaluation of Leadership Networks¹

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Abstract
Leadership development practitioners have become increasingly interested in the formation of leadership networks as a way to sustain and strengthen relationships among leaders within and across organizations, communities, and systems. This paper offers a framework for conceptualizing different types of leadership networks and identifies the outcomes that are typically associated with each type of network. One of the challenges for the field of leadership development has been how to evaluate leadership networks. Social Network Analysis (SNA) is a promising evaluation approach that uses mathematics and visualization to represent the structure of relationships between people, organizations, sectors, silos, communities and other entities within a larger system. Core social network concepts are introduced and explained to illuminate the value of SNA as an evaluation and program tool.

Introduction
Leaders need effective and efficient ways to connect with one another to share information, get support, mobilize resources, learn, and align their visions in a strategic direction. Often leadership networks form (or are created) to make it easier for leaders to connect. Leadership networks form in different ways. Sometimes networks form as the result of an intentional selection process. Many leadership programs bring together diverse participants who normally would not interact: for example, professionals who work in different fields or sectors; or business and civic leaders in a community. In these programs, they have an opportunity to get to know each other, share their experiences and perspectives, and form bonds that may endure over time. While individuals who participate in programs always have the chance to keep up individually with each other, organized network activities such as listservs, retreats, and learning communities can nurture those relationships both face-to-face and online.

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Other leadership networks form through a process of collective emergence (Johnson, 2001). These networks are typically more complex and capable of reaching a larger scale. They have self-organizing processes that leaders participate in out of self-interest, shared values and/or a sense of collective purpose. These leaders communicate and engage in actions that are self-directed and facilitated by ties in the network. An example of an emergent network is Amazon.com where people purchase and review books. These activities create a large amount of information that is highly valuable to someone new who is considering purchasing a book. An emergent leadership network occurs when individuals and organizations come together around a shared purpose or cause. By acting together they have a collective power that is not possible if they remain fragmented and isolated.

One of the challenges for the field of leadership development is how to evaluate leadership networks. How does one visualize, analyze, and understand the relationships among leaders? What are the boundaries of a leadership network? What are the currencies (e.g., information, resources, etc.) that flow within networks? How can a network be strengthened? Can networks be mobilized for social and systems change?

In this paper we provide a framework for understanding different types of leadership networks, and consider how social network analysis can be used as a tool for evaluating leadership networks.

We distinguish four types of leadership networks:
- Peer leadership networks
- Organizational leadership networks
- Field/policy leadership networks (sometimes called “production networks”)
- Collective leadership networks

Each of these networks can be characterized by who participates in the network, what circulates through the network (e.g., information, expertise, resources), what binds people together, and what they do for and with each other. We discuss each network type and provide examples for each. We also identify outcomes that are commonly associated with each type of network and how participants in different types of networks are using social network analysis. Interspersed throughout the paper are discussions of three methods of network assessment: connectivity, centrality and structural equivalence. We end the paper with a discussion of network visualization, the ethics of collecting and interpreting network data, and some of the most promising uses of network data for leadership development purposes.

**Related Work**
Our conceptual framework for understanding leadership networks is rooted in our understanding of the field of leadership development and the types of
network outcomes that are often articulated. Our understanding about what
distinguishes different types of networks has been influenced by the work of
Borgatti and Foster (2003), Plastrik and Taylor (2006), and Provan and
Milward (2006). We have chosen to use different terms to be more consistent
with the language within the leadership development field.

We stress that any classification scheme is useful in so far as it helps to
understand existing networks. Some networks may fit neatly into one of
these categories, but others may be harder to categorize. Our intent is to
develop a framework that can help leaders and leadership development
practitioners assess leadership networks better.

Social network analysis is one tool for evaluating leadership networks. It is
particularly useful for those who are seeking to influence policy, disseminate
new frameworks and ideas, and mobilize resources towards a common goal.
It is also a valuable tool for understanding where there are gaps in a network
that represent opportunities for recruiting new members. It can highlight
silos or communication barriers within an organization or community. What
makes social network analysis unique is the capacity to visualize a system of
relationships that otherwise would be hidden from view. What is missing
from social network analysis is the story behind the relationships (e.g., what
people did together as a group or community and what difference it made).
Social network maps can themselves be used to stimulate people to tell
stories about the relationships that are visible on the map. There are a
number of other methodologies that are also useful with groups,
organizations, and communities to help them uncover the “collective story”,
such as Photovoice (Wang, 2006), Q-methodology (Militello et al., 2008)
Most Significant Change (Davies and Dart, 2005), and Critical Moments
Reflection (McDowell et al, 2005). While we will not discuss these methods in
this paper, we urge readers to study different methods, since using more
than one method for collecting data gives a richer understanding of the
phenomena being evaluated.

**Introduction to Social Network Analysis**

Social Network Analysis (SNA) is a set of theories, tools, and processes for
better understanding the relationships and structure of a network. In social
networks, the members or nodes of the network are people and the links are
the relationships between these people. Sometimes nodes are also used to
represent events, ideas, objects, or other things. Using surveys and
computer-aided analysis, SNA practitioners conduct mathematical analyses
and often produce maps or pictures that display the patterns of connections
between the nodes of the network. These maps reveal characteristics of the
network that help guide participants as they evaluate their network and plan
ways to improve their collective ability to identify and achieve shared goals.
Two core concepts in networking are bonding and bridging. Bonding denotes connections to a tight-knit group with many mutual relationships. Bridging denotes connections to diverse others. These terms are commonly used in the social capital literature (Putnam, 2001). We emphasize the distinction between bridging and bonding because of their different outcomes. Bonding typically yields a sense of trusted community where interactions are familiar and efficient. Bridging typically yields access to new resources, innovation, and profit. Our enthusiasm for using SNA to assess leadership networks stems in part from its ability to illuminate where bridging and bonding are happening, respectively, so that their likely outcomes can be compared to the specific goals of the leadership network at hand.

Peer Leadership Networks
Peer leadership networks are the most common type of network to emerge from leadership programs. They are often composed of leaders who were selected to participate in a leadership program. They have a shared experience in a program that creates personal and professional bonds that last over time. Bonds are enhanced when a program provides opportunities for leaders to collaborate on action learning projects, or when they engage in deep dialogue and listening. The sustainability of these ties beyond the end of the program depends on the quality of relationships that were forged during the program, and also depends on the supports that are provided to cultivate the network after the program (e.g., newsletters, listservs, social web resources, retreats, etc.).

An example of a peer leadership network is the Sierra Health Leadership Program Alumni Network. For the last seven years, the Sierra Health Foundation and USC have partnered to provide a leadership program for over 130 nonprofit executive leaders from 21 northern and central California counties. The program includes a four-day retreat, and 3 multi-day sessions over nine months, team action learning projects, and the use of web-based technology to support peer-to-peer exchange. After the nine month program, participants join the Alumni Network. The network holds retreats three times a year to reestablish friendships, reinforce earlier learnings and address new topics to enhance their leadership skills. They also receive a newsletter and participate in a listserv. These activities reinforce connections among leaders who have had a shared program experience both within and across cohorts.

A successful peer leadership network has the following outcomes for participants.
• **Peer support.** Alumni listen to one another and provide support often reducing feelings of isolation

• **Peer Coaching.** Alumni act as sounding boards for one another, share stories and advice about challenges like how to manage boards, how to achieve financial sustainability, how to build alliances for broader impact, etc.

• **Resources.** Alumni share resources with each other, e.g., speaking at each other’s event, trading or providing services, getting quick reliable information to a question, etc.

• **Job assistance.** Alumni provide each other with leads to new job opportunities and provide references for one another.

• **Introductions.** Alumni introduce and help make connections between alumni and other people in their networks.

• **Collaboration.** Alumni initiate collaborations on joint projects around issues and problems they care about.

**Assessing Peer Leadership Networks: Connectivity**

The success of a peer leadership network depends in large part on how well it recruits leaders from diverse backgrounds and then provides them with an environment that fosters creation of new trusting relationships. This is bonding.

A simple and effective way to assess this process is by measuring the connectivity of network members both before they start and after they finish participating in the initial peer leadership development program. Low connectivity at the start is one indicator of effective recruiting across diverse backgrounds. Higher connectivity at the end of the initial program is an indicator that participants have created a new trusted community.

Relationship questions such as “how well do you know this person” and “how often do you communicate one-on-one with this person” are useful survey questions for this type of assessment. Allowing respondents a range of options (e.g., “I don’t know this person,” “I know this person somewhat,” and “I know this person well”) is especially helpful for assessment. Successful peer leadership networks will transform many “don’t know” relationships into “know somewhat” relationships. In contrast, “know well” relationships are unlikely to change much even in the most successful peer leadership network unless there is some reason for peers to collaborate on a project.

**Measuring Bonding and Connectivity**

The most popular measure of connectivity is density, which is simply the fraction of actual connections that exist divided by the maximum possible number of connections that could exist between members of the network. Density is a sensible metric when network size is held constant; however, networks usually grow and shrink, and so we recommend against tracking density without significant additional context. For example, each of the networks below has a density of 0.2 (or 20%), but it is hard to imagine a
context where this equality corresponds to a truly meaningful property shared by the networks:

For a more robust numerical assessment of connectivity, we recommend using both the average number of links per node and density as two equally important metrics. Simply eyeballing network maps is also quite helpful to compare their properties of connectivity.

**Using SNA to Evaluate Peer Leadership Networks**

Using SNA as an evaluation tool for peer leadership networks is likely to be more interesting to network sponsors and facilitators than to network members. Tener et al (2008) describe the benefits to a facilitator firsthand. The network at right shows who communicates “once every month or so” in a network facilitated by Tener. The map filters out both less frequent and more frequent levels of communication. Seeing the middle range of activity provides powerful feedback to the facilitator, who already knows about stronger links from her familiarity with existing collaborative projects, and who already knows about weaker links from observing attendance at formal network events. The middle range reveals the heartbeat of the peer leadership network that pumps behind the scenes with a life of its own.

In contrast to facilitators and sponsors, members of peer leadership networks gain no particular value from seeing the larger network of relationships unless these networks begin to move towards becoming field/policy leadership networks. At that point seeing the larger system of relationships becomes an asset when seeking to influence policy or build a field.

Before discussing field/policy networks, however, we next discuss organizational leadership networks. With organizational leadership networks (more so than in peer leadership networks) we see significant energy devoted to mobilizing members to improve their performance toward a common goal. In the study of organizational leadership networks, there is much discussion of network centrality and how it relates to performance. The work of mobilizing and the theory of centrality are important prerequisites to
our last two categories of networks, field/policy leadership networks and collective leadership networks.

**Organizational Leadership Networks**

Most of the time, leaders work in the context of an organization that has clear boundaries of membership and formally defined goals that its members contract to pursue together. One of the most common organizational goals is profit, and so much of the work around organizational leadership networks has a strong business slant. This for-profit business slant is much less prevalent in the other more mission-oriented categories of our framework; however, we distinguish organizational leadership networks not by their goals (profit vs. mission) but by the contractual relationships that define both for-profit and not-for-profit organizations.

Organizational leadership networks typically focus on either the intra- or inter-organizational level. In this section, we discuss intra-organizational leadership networks, drop the “intra” prefix, and refer to them simply as “organizational”; we classify inter-organizational leadership networks as field/policy (or production) networks, which are discussed in the next section.

Organizational leadership networks are often formed to achieve very much the same goals as peer leadership networks. But, unlike peer leadership networks, where success hinges on promoting bonding, the success of an organizational leadership network hinges on the bridging activity of its members, whose shared organizational context has already given them more than enough opportunity to bond. Burt (2004) and Burt and Ronchi (2007) exemplify the research that supports the critical importance of bridging in this context.

Some of the outcomes that organizations achieve through attention to leadership networks are the following.

- **Innovation.** Encouraging leaders to bridge across diverse groups helps spawn innovations, born of old ideas transplanted to new settings.
- **Productivity.** Recognizing and supporting communities of practice helps individuals with similar roles share best practices, even when they are separated by organizational silos or geographic distance.
- **Knowledge management.** Organizational leaders know where expertise and knowledge exist within an organization and how to access that information in a timely way.
- **Managing change.** Formal changes in an organization (such as a merger or change in leadership) work best when they leverage the informal organizational structure.

It is important that organizations distinguish between “attention to” and “convening of” leadership networks. Attention to leadership networks is critically important (as described above). Convening leadership networks within an organizational context can be counterproductive beyond a certain
Commonwealth Software (renamed) is an example of an organization that pays attention to its leadership network. A year ago, with 50 employees and plans for rapid growth, Commonwealth wanted to identify emerging leaders within the company, in order to test management assumptions about who these people were, and also to help the company intentionally support leadership development. The company examined the social networks of its employees. The process of mapping its organizational network helped Commonwealth not only by achieving its primary stated goal (recognizing emerging leaders) but also by catalyzing several unexpected and equally important insights. First, the process illuminated one overtaxed senior leader and enabled him to rebalance his role. Second, by inviting employees to name not just co-workers but also non-employees as important network connections, the process revealed that one of the most important leaders for the company was a client, whose significance as a company leader came as a revelation to its employees. Finally, and most importantly, the process revealed to the CEO of the company that his entire philosophy of leadership had been based on capabilities of individuals. As a result of the process, without intending to, he changed his focus to collective leadership—how all the pieces of Commonwealth fit together.

The above case study is exceptional for its ultimate focus on collective leadership. Organizational leadership is more often measured on an individual basis. This is true not only of CEOs who evaluate their employees but also of academics who study social networks and professional performance (e.g., Brass and Krackhardt, 1999). For an individual, performance metrics such as promotions and pay raises have been found again and again to correlate strongly to the centrality of that person within the organizational network. How these individual results affect organizational success remains unclear (Kilduff and Tsai, 2003). With that caution in mind, we overview centrality and its applications to leadership networks below.

Assessing and Coordinating Organizational Networks: Centrality

There are several fundamentally different ways to define and calculate centrality. We consider the two basic centrality calculations that are most important for assessing organizational leadership: betweenness and indegree. Then we consider the question: What kinds of relationship networks best illuminate organizational leadership?

Measuring performance with betweenness centrality: One of the most distinguishing traits of high performers in an organization is their tendency to bridge, or connect with diverse others. Measuring bridging is therefore critical to assessing organizational leadership. One way to measure bridging is by finding all the shortest paths in a network (between all possible pairs of people), and counting how often each person is on one of these paths. This is betweenness centrality, the most popular calculation for measuring bridging.
Even though Borgatti (2005) has pointed out theoretical problems behind this application of betweenness centrality, it is still quite effective in practice. Burt (2004) uses network constraint to measure bridging and provides substantial evidence correlating this measure to job performance. A person with high network constraint has links to similar others already connected to each other. Low network constraint is similar to high betweenness centrality—both indicating a person that connects to diverse others who are not directly connected to each other. Such a person is very likely to be a high performer in an organization.

**Measuring influence with indegree centrality:** Assessing and developing leadership in any organization relies on knowing who are the influencers—those people whose opinions are sought after and followed more than others. Influencers often go unrecognized by formal organizational charts, and they usually exist even in the most collaborative “leaderless” settings.

The process of assessing influence within an organization is only nominally an evaluation, and must be seen primarily as an intervention. An individual’s ability to assess the influence network is itself critical to influence, above and beyond one’s actual position in the network (Krackhardt, 1990). How others perceive an individual’s role in the influence network is more important than that individual’s actual role (Kilduff and Krackhardt, 1994). These results reinforce the care that should be taken when collecting, interpreting, and presenting influence networks.

Measuring influence in a network begins with the straightforward calculation of indegree, which counts how many advice-seeking relationships point towards an individual. Derived from this simple notion are more advanced metrics that consider not just how many others seek the advice of a particular person, but also how influential those other advice-seekers are. A person whose advice is sought by someone who is highly influential may have a higher influence score than one whose advice is sought by many non-influencers. Bonacich and Lloyd (2001) overview several of these more advanced influence metrics and explain how most of them compute nearly the same thing. When choosing among these metrics for an organizational leadership assessment, we recommend deciding based more on how the results of these calculations are likely to be received, with less concern for the logical soundness of the chosen calculation. In most cases, measuring indegree makes sense because it demonstrates the point without unnecessary complications.

When measuring influence, it is especially important to inform directional metrics such as indegree with relationship questions that differentiate “seeking” from “being sought.” Relationship questions such as “how often do you seek work-related advice from this person” are useful survey questions for assessing organizational leadership. Rizova (2006) distinguishes the technical-advice and organizational-advice networks as equally important. Technical advice refers to direct help solving a problem (e.g., how to write a
grant application). Organizational advice refers to indirect help, where the advisor does not solve the problem but knows someone who can. In contrast to these two kinds of advice networks, friendship networks and “works-with” relationships are less useful for assessing organizational influence and leadership.

More illuminating than even advice-seeking relationships are energy-building and energy-sapping relationships (e.g., Cross et al, 2003; Labianca and Brass, 2006). These type of relationship questions may be more sensitive for a consultant-practitioner to ask of an organization, and useful only within a research setting. See Borgatti and Molina (2005) for a discussion of these and many other ethical considerations.

**Using SNA to Evaluate Organizational Leadership Networks**

Using SNA as an evaluation tool to assess organizational leadership is particularly useful to managers of complex organizations because it helps them see how the pieces fit together. Identifying problem areas before they negatively impact the company can save the company money. Likewise, making visible leadership beyond what is reflected in the organizational chart gives managers valuable insights about leadership assets that may have been previously hidden.

**Field/Policy Leadership Networks**

Some leadership programs and initiatives are designed to have an impact on policy (e.g., access to quality early education experiences) or a field of practice (public health). These programs recruit, select and train leaders to more effectively advocate for policy change, identify promising practices, and create and disseminate new knowledge. Field and policy leadership networks share a lot in common with peer leadership networks. They foster continued leadership development and improve connections among program alumni. In addition, leaders in these networks have a commitment to advance a field and/or promote a policy agenda.

What we are calling field/policy leadership networks are termed by Plastrik and Taylor “production networks.” A production network fosters joint action by people or organizations. In its most developed form, “network members plan together and have clear agreements about who will do what.” We have chosen to use the term field/policy leadership networks because it more aptly describes where these leadership networks seek to have influence.

The Schott Fellowship for Early Care and Education has a goal to build a cadre of public policy leaders from within the diverse early care and education populations in Massachusetts. Through a one-year fellowship, early care and education leaders develop their capacity to identify policy problems, research and propose policy solutions, write policy papers, and advocate for policy change. At the core of the Schott Leadership Network are 42 leaders who have graduated from the program, along with 6 staff and advisors. While the network is still in its early phases of becoming a field/policy
leadership network, there is growing awareness among leaders about the power of weaving their professional networks together and beginning to identify who beyond the fellowship are key stakeholders who influence policy outcomes (e.g., state and local officials, advocates, service providers, funders, those in the media and business), and intentionally building relationships with them. This network has been using network mapping to increase awareness about its connections and relationships to each other and the larger system of influencers.

Another example is the National Public Health Leadership Network which brings together 7,000 graduates from statewide, regional, national, and international leadership programs that seek to strengthen the public health infrastructure around the world. These efforts were initially begun by the Center for Disease Control in 1990 in response to an Institute of Medicine report calling for increased leadership skills among the nation’s (and the world’s) public health leaders. The initial leadership program enrolled senior leaders from local, state and federal levels of public health, as well as public health academia, health care organizations and national health organizations. A number of the 800 leaders that this program trained went on to establish state and regional leadership programs around the country providing a multiplier effect.

The Network was formed first at the state and regional levels and later attracted the participation of the national program. A recent evaluation report describes how the network began to weave these independent strands together “into a common ‘rope’ or movement that could pull the field forward together.” (Umble et al., 2007). The Network offered developers of newly forming state and regional programs “plenty of advice and support from those who had already walked that road.” This description demonstrates many of the peer leadership network outcomes we described above.

As alumni of these programs continued to come together they undertook a number of initiatives to benefit the field of public health. They developed documents on ethical practice in public health that were officially adopted by the American Public Health Association in 2002. They issued white papers on the public health workforce, workforce development, and leadership. The Network has also developed a “Public Health Leadership Competency Framework” that includes transformational, political, trans-organizational, and team building competencies. All of these activities have strengthened the field of public health leadership development.

The following outcomes are typical of field/policy leadership networks:

- **Knowledge Dissemination.** Networks disseminate knowledge, standards of practice, protocols to key stakeholders in a field through policy papers, white papers, evaluation reports, testimony at public hearings, presentations at conferences and at community forums.
- **Resource sharing.** Leaders share ideas, curricula, training materials, and tools with each other through learning communities, professional
associations, working groups in order to strengthen the leadership infrastructure for their fields.

- **Alliance building.** Leaders cross boundaries and silos to partner and collaborate in order to advance an agenda. Alliance-building may be cross-organizational, cross-community or cross-network.
- **Mobilization.** Leaders mobilize support around an issue that increases the numbers of people who are involved in an activity or event.
- **Standardization.** Leaders develop a shared language and shared understanding of their different perspectives and how those relate to a whole field.

**Coordinating and Mobilizing Field/Policy Networks: Structural Equivalence**

Field/policy networks measure their success by their ability to mobilize members and achieve greater impact on the world around them. This kind of success depends on standardizing and scalability, in addition to the usual outcomes of peer and organizational networks.

For those seeking to promote standards and scalability, structural equivalence is a critical network metric. Structural equivalence sounds complicated, but it is as simple as Amazon.com reporting that “People who bought books A and B also bought books C and D.” Here we consider both people and books as members of a single network. Links in this network join people to the books they have purchased. People who own many of the same books have a high value of structural equivalence; people with different books have low structural equivalence.

Structural equivalence in field/policy networks is most often based not on shared reading lists but rather on shared organizational goals or professional interests. For example, the network above displays members of the Schott network and the sectors with which each network member has some close working history. The members of the network are unlabeled nodes; the sectors are labeled nodes. The larger nodes are more central sectors that have many connections to the Schott network.

In order to promote standards and scalability, it is important not just to consider which sectors are more connected to Schott, but also to consider structural equivalence. Which Schott network members link to the same
sectors? Which sectors share common connections to Schott? The node
locations in the map above answer these questions (Borgatti, 2002; Gower,
1971; Hanneman and Riddle, 2005). Clusters of close-by nodes reveal
distinct roles within the field/policy network. For example, nodes in the left-
most cluster all have very similar connections, but none of them link to city
government. The central cluster of nodes stands apart from the left-most
center because all these nodes link to city government.

Another way to interpret clusters in a structural equivalence map is people
who have similar network assets and similar network weaknesses. For
instance, the left most cluster in the map above has strong connections to
early education and care services, advocacy organizations, and state-
appointed officials. They are likely key players in mobilizing early care and
education resources to influence the policy agenda and how policies get
implemented through state agencies. This group does not, however, have
contacts with city government and public schools and so may be unaware of
policy ramifications at the local level, whereas the cluster of people in the
middle of the map would be useful allies in understanding local impact and
mobilizing local resources.

It is our opinion that structural equivalence does not receive the attention it
deserves from the leadership development and evaluation communities,
compared to network metrics such as density and centrality. Mathematical
literature on the topic is extensive (e.g., the bibliography of Luczkovich et al,
2005) but not very accessible to many readers. We suggest Hanneman and
Riddle’s (2005) text and its section on visualizing two-mode networks as a
helpful next step for those reading this article.

Finally, it is suggestive to note that ecologists use structural equivalence to
measure ecosystem maturity, which is characterized by fewer redundant
links and more hierarchy in the food chain (Johnson et al., 2003). These
notions mesh well with field/policy networks’ goals of standardizing for
scalability and impact; however, they contrast with the highly-linked non-
hierarchical nature of successful peer leadership networks. This is no
paradox; it is simply a reminder that evaluators must choose their metrics
carefully based on a clear understanding of the network at hand.

**Using Social Network Analysis to Evaluate Field/Policy Leadership
Networks**

In a field/policy network, social network analysis can be a useful tool both for
sponsors and facilitators and also for members. Network maps make it easy
for members to identify who has close working relationships with key
stakeholders in a policy network or field. This knowledge can create
opportunities for access. In addition, network members may see where there
are gaps in their network. For instance in the Schott Fellowship, little
attention has been given so far to developing relationships with people in the
media who can help spread the network’s policy messages. Identifying key
media people and adding their names to future network surveys may be an
important catalyst for network members to focus on developing those relationships.

**Collective Leadership Networks**

Collective leadership is defined as “the capacity of a group of leaders to deliver a contribution in service of the common good through assuming joint and flexible leadership, according to what is perceived and required” (Kunkel 2005). In essence, collective leadership is leading together as partners. Collective leadership embraces diversity of people and perspectives, unleashes self-organizing and the collective intelligence that exists when people come together to act (Gauthier 2006).

Collective leadership networks can be intentional, emergent or some combination of the two. In an intentional collective leadership network, the nodes of the network are not individuals but groups, organizations or communities. Groups, organizations, or communities are characterized by having a shared sense of collective identity (e.g., shared values, beliefs, mission or purpose).

Two examples of leadership initiatives that are seeking to strengthen and support collective leadership are Kellogg Leadership for Community Change (KLCC) and the Berkana Exchange. In KLCC, a host organization in a community is selected to identify and bring together members of the community that represent the diversity of who is present in the community and who share a commitment to a common purpose (e.g., improving K-12 education, fostering adult-youth partnerships). Community teams are supported by outside and inside resources (e.g., trainers, facilitators, coaches, evaluators) in order to develop greater capacity for leadership and self-organizing. In addition, KLCC supports up to six community teams to come together and share their successes, their challenges and to learn from one another how to strengthen their collective leadership capacity.

The Berkana Exchange has a similar yet different approach to supporting the emergence of collective leadership (Wheatley and Frieze, 2006). In any system people self-organize in creative and innovative ways to meet their economic, social and spiritual needs. These communities often exist below the radar screen even though their approaches, if scaled up, could significantly improve the quality of life for many communities. The Berkana Exchange seeks to identify, name and illuminate these emergent communities, and provide opportunities for exchange, learning, and solidarity. Through these connections, communities develop a shared consciousness about what they are engaged in and how what they are collectively doing is shifting the system of influence, e.g., that which is normative and taken for granted as the way things are. As a new system of influence becomes more visible, more and more people find themselves influenced to act in new ways.
Sometimes self-organizing creates large scale impact without directive intervention. Take for example the self-organizing that has taken place among supporters of the Barack Obama for President campaign. A sophisticated social web platform was created by a Facebook co-founder for the Obama for President campaign. Supporters use the platform to build relationships, share information, and act together on a scale that would be unimaginable if it were orchestrated from the campaign headquarters. Many thousands of people have used the Internet to raise money, recycle campaign supplies, organize events, mobilize boycotts and letter-writing campaigns and much more. Social web technologies have transformed the capacity of citizens to organize in ways that is altering the election process in profound ways.

Collective leadership network outcomes include:

- **Shared purpose and values.** A commitment and passion for change among a diverse group who are committed to a common cause or purpose
- **Relational connectivity.** Webs of relationships that span across boundaries, often highly interconnected over space and time
- **Scale.** The accumulation of small actions linked together in a system of influence that changes what is taken for granted and how resources and relationships are organized.
- **Innovation.** New ideas and creative solutions that respond to emerging needs.
- **Influence.** New ways of organizing relationships and resources that take hold at the level of culture and systems (e.g., paradigm shift)

**Using Social Network Analysis as an Evaluation Tool for Collective Leadership Networks**

Neither KLCC nor Berkana have found social network analysis a particularly useful tool in their efforts to understand the emergence and influence of collective leadership. There is, however, growing interest among social movement scholars to use social network analysis to understand the leadership dynamics of social movements that are characterized by a number of different groups and organizations taking action in coordinated and uncoordinated ways. As social movements gain momentum, some people emerge as spokespeople for the movement, others play brokering roles between different segments of the movement. SNA helps reveal these dynamics (Diani and McAdam, 2003).

Other collective leadership practitioners have found great success through deliberate application of SNA. Amazon is a pioneer of structural equivalence, and Google of centrality. These and other similar collective leadership networks demonstrate the power of self-organizing networks to create social (and financial) value, and leave no doubt that social network analysis is useful for collective leadership. The challenge remains to duplicate their successes in other environments with other goals—perhaps less dependent
on the Web and more clearly devoted to a larger common good. We are intrigued by the literature on self-organizing online communities (e.g., Cheshire, 2007) as a possible valuable addition to the dialogue on the network paradigm and collective leadership for social change.

The Ethics of Collecting and Analyzing Network Data
One of the unique characteristics of social network data is that respondents are clearly visible in the network maps. Those who collect and use social network data must be responsible stewards of the results (Borgatti and Molina, 2005). Consent about having one’s name appear in a network map is critical since people may feel at risk or vulnerable when their names appear in relation to others in the network.

It is important to educate people about the value of network data, the opportunities it provides, and clear statements about how the network data will be used so that everyone understands and agrees. When there is clarity and transparency there is a much higher likelihood that people will accept the data and the decisions that are made based on the data.

When we conduct a social network survey, we usually address the above ethical concerns with an introduction similar to the following:

One of the goals of our Peer Leadership Program is to strengthen the connections among those who are working to help children of low-income families in our state. Your participation in this survey will enable us to gain a deeper understanding of the current leadership network. The survey will take about 15 minutes to complete.

In order for this survey to be effective, we need participation from as many people as possible. The primary result of this survey will be a network map of who communicates with whom. The results of the survey will be shared with current network participants at our next meeting, when we will interpret and discuss them collectively. Results will also be shared with Foundation staff.

Do you grant permission to have your name appear in the network map?

☐ Yes
☐ No

Network visualization and subjective interpretation
We caution people who use network maps to look for multiple interpretations of the data. We refer to McGrath and Blythe (2004) to illustrate this point. Subjects were shown the following two networks of working relationships and asked, “All other things being equal, which organization is more adept at change?” Responses were mixed: some thought the less hierarchical left group (A) would be better at change, because of the wealth of informal connections. Others thought the more hierarchical right group (B) would be better at change, because of the influence of the central authority figure. Very few came up with the correct answer: that networks (A) and (B) are identical.

![Network Visualization](image)
One helpful rule of thumb is to rely on network maps more for raising questions than for answering them. Someone who is in the center of the network may be a gateway or a bottleneck. Someone at the periphery of the network may be disengaged or may be a vital source of innovation. Network data has the potential to be misused if it is not presented and discussed by skilled analysts.

**Using Social Network Data to Strengthen Leadership Development Efforts**

Leadership programs and initiatives can use social network data to assist with a variety of tasks. Here are some ways in which we have seen network data used.

- **Catalyze network reflection.** Use the network maps to stimulate conversation about the network and its strengths and weaknesses.
- **Peer support.** Track connections among alumni of their programs to learn how widely they are staying connected after the program finishes. This information can be useful when planning and evaluating both alumni activities and the self-organizing that leaders may be doing amongst themselves.
- **Diffusion or Mobilization.** Identify leaders who are “connectors” in the network and who thus have a high likelihood of sharing important information with their colleagues. This information can be useful to the participants as well as to program staff to help them ensure the broadest distribution of knowledge and information within an organization or a community, or enable them to mobilize resources quickly.
- **Structural holes.** Identify where there are gaps in the network. This information can be used to target recruitment to bridge those gaps in the network.
- **Innovation.** Identify the people on the periphery of the network. This information is valuable because often people on the edge of a network are connected to other networks. They bring ideas and perspectives that are different from those who operate in the core of the network. Creative innovations are more likely to occur when diverse people, ideas, and perspectives interact.
- **Learning.** Identify clusters of connections. A cluster of connections offers an ethnographic research opportunity to find out how and why these people are connected, often they are working on a project together or are in the same field or geographic area. Some of these clusters will make interesting stories about program impact.
- **Strategy.** Policy change and organizational change are complex and require working across silos, sectors, and political and personal identities. Information about who is working closely with whom, or who communicates frequently with whom can indicate where connections are strong and where they are weak. Based on this
information efforts might be developed to strengthen connections where they are weakest thus improving the chances of strategic successes, such as passing new policies, or reinventing an organization.

Conclusion

Social network analysis offers an array of metrics that make relationships in a system visible. Fundamental types of SNA metrics include connectivity, centrality, and structural equivalence. In this paper we have associated each one of these types with a specific category of leadership network; however, this neat one-to-one association is merely a narrative device. For a practitioner, all the metrics we have described should be considered potentially valuable for evaluating any leadership network, be it peer, organizational, field/policy, and/or collective in nature.

When using SNA as an evaluative tool, we balance our enthusiasm with acknowledgement of Wheatley and Frieze (2006), who say, “Social network analysis... is often used by leaders to find ways to manipulate the network, to use it in a traditional and controlling way.” In this paper, we have taken care to highlight how easy it is to reinforce pre-conceived stereotypes not only with network maps but also with seemingly objective mathematical calculations such as density and indegree. There are no hard and fast rules to guarantee success, no science to neutralize the politics. Ultimately it depends on what you want to learn. We have found SNA a valuable tool for assessing leadership networks, especially when combined with other methods that reveal the stories behind the connections among the nodes.
Bibliography


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