IBM Center for
The Business of Government

Collaborating Across
Boundaries Series

Inter-Organizational Networks

A Review of the Literature to Inform Practice

Janice K. Popp, MSW, RSW
University of Calgary

H. Brinton Milward, PhD
University of Arizona

Gail MacKean, MPA, PhD
University of Calgary

Ann Casebeer, MPA, PhD
University of Calgary and The
Kensington Group

Ronald Lindstrom PhD, FCCHL
Royal Roads University

Collaborating Across Boundaries Series 2014

Inter-Organizational Networks: A Review of the Literature to Inform Practice

Janice K. Popp, MSW, RSW
University of Calgary

H. Brinton Milward, PhD
University of Arizona

Gail MacKean, MPA, PhD
University of Calgary

Ann Casebeer, MPA, PhD
University of Calgary and The Kensington Group

Ronald Lindstrom PhD, FCCHL
Royal Roads University

Table of Contents

Table of Contents (continued)

Foreword

On behalf of the IBM Center for The Business of Government, we are pleased to present this special report, *Interorganizational Networks: A Review of the Literature to Inform Practice,* by Janice K. Popp, H. Brinton Milward, Gail MacKean, Ann Casebeer, and Ronald Lindstrom.

Daniel J. Chenok

Over the past decade, the IBM Center has sponsored a series of reports on collaborative and interorganizational networks. We see this as not only a growing field for research, but also the direction that government leaders are taking to address public challenges in an increasingly complex world.

This report examines the literature on interorganizational networks that has evolved over the past decade, written from a wide range of academic disciplines including sociology, business management, public administration, and political science. The authors note that different disciplines often use a variety of terms to describe the same phenomena, which has made the literature less accessible to practitioners in government.

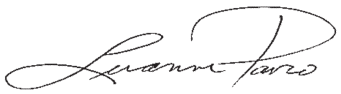
Luanne Pavco

The authors distill key concepts and trends from the literature in order to help government leaders make sense of content relevant to their jobs, and where they might most fruitfully spend time when they need to a "deeper dive." This includes an exploration of the types and structures of networks, their governance and leadership, their evolution over time, and how they are evaluated for effectiveness.

Publishing a literature review is a first for the IBM Center, but given the importance of the topic, and the excellent insights of the authors in drawing from the literature to present key findings that can help government, we felt that this was important work to be shared with a wide audience of government stakeholders. In the years ahead, the literature on interorganizational networks will evolve as a result of the impact of new technologies, social media, and changes in the nature of work and the workplace. This review provides an key baseline from which to assess that evolution.

We hope executives working in and around all levels of government around the globe find this report on interorganizational networks helpful as they tackle large problems requiring solutions that cross organizational boundaries.

Daniel J. Chenok
Executive Director
IBM Center for The Business of Government
chenokd@us.ibm.com



Luanne Pavco
Managing Partner
IBM Global Business Services
luanne.pavco@us.ibm.com

Authors' Foreword

This review is presented as part of a toolkit for network leaders and managers. It builds on an earlier review of the literature on networks (Hill, 2002) conducted under the auspices of the Southern Alberta Child and Youth Health Network. The idea of a toolkit germinated through discussions among network researchers, leaders and managers at a series of Networks Leadership Summit meetings that began in 2003. These meetings have been held across Canada with participants from both Canada and the United States and, on occasion, from other countries as well. The Networks Leadership Summit series was created to provide a forum for people to share their experiences researching and working in networks, with the goal of increasing understanding of the nature, value and effective use of networks. This interest and support for extending and exchanging practical knowledge concerning network leadership and network effectiveness has inspired several strands of collective action, including the pursuit of this review of the literature to inform practice about inter-organizational networks.

At the fourth Networks Leadership Summit held in Banff, Canada in January 2009, based on the cumulative learning through all the summits, a consensus statement on the value of stimulating and supporting networks as vehicles for achieving societal goals was developed. We feel it is worth including a section from this consensus statement here, as the points made very much resonate with some of the key messages that emerged through this review of the literature.

Consensus Statement

Networks have been established in the public and nonprofit sectors to create collective solutions to complex problems through cross-boundary action, whether those boundaries are jurisdictional, organizational, programmatic, geographic, professional, or sectoral. Those looking to maximize results on complex social issues will find investment in networks to be particularly useful in a comprehensive strategy, as networks have been demonstrated to facilitate progress by:

- Leveraging scarce resources and achieving economies;
- Strengthening integration, collaboration and coordination across and within programs, funders, organizations and sectors, while maintaining the benefits of diversity;
- Leveraging change by increasing shared learning, creativity, and innovation among individuals and organizations;
- Addressing needs in a more comprehensive way and improving responsiveness by enhancing the flow of information; and
- Empowering communities to respond to change and problems with greater capacity and resilience.

(Networks Leadership Summit IV, 2009, p. 22)

Given the value of stimulating and supporting networks as vehicles for achieving societal goals, it is important that we continue to generate knowledge about when and if inter-organizational networks are needed; the circumstances under which they are best formed; what type of network might be most suitable depending on the purpose and the context; and how best to support the evolution of a network throughout its life cycle. The nature of collaborative networks lends itself to a co-production model—a joint effort between network researchers, who bring the latest theories and research on networks; and network practitioners, who bring the latest experience of networks. Together, they can address the critical questions about networks.

Executive Summary

The use of inter-organizational networks as a strategy for public sector management, and the study of these networks by a diversity of scholars, has grown rapidly in the past fifteen to twenty years. Network practice has often had to move ahead without the benefit of a well understood or easily available evidence base, and, while doing so, advancing practical knowledge in the field. This review of the literature, undertaken in a partnership between academics and practitioners, on the conceptualization, implementation and evaluation of inter-organizational networks is primarily meant to be a resource document for network practitioners—leaders, managers, participants and facilitators. The goal of the review was to bring forward and discuss evidence that would be of practical value to people managing or working in inter-organizational networks. Both academic research and literature from the practice field were included in the review.

The key findings from this literature review fall under five thematic headings:

- key concepts and characteristics;
- network types and functions;
- network governance, leadership and management, and structure;
- network evolution; and
- evaluating networks.

In each of these areas, key findings from recent research and literature that are likely to be most relevant to practice are highlighted and discussed. Experiential knowledge gained from leading and working in networks is used to illustrate and expand on particular points. An evolving model of action to guide network evaluation is presented based on what is known from research and practice about the factors contributing to network effectiveness. The review concludes with suggestions for future research and practice, and some final reflections from the authors.

Key Findings

The literature review process

- There is an extensive body of literature on inter-organizational networks, published across many academic disciplines, which use a variety of terms to describe the same phenomenon. This means that, as with inter-organizational networks themselves, the literature base and practice experience are wide ranging, diverse and sometimes difficult to find.
- This is a review of the literature conducted to bring forward evidence of practical value to people working in inter-organizational networks. As such, it contains some collective and reflective commentary on the state of the evidence base. The comments are meant to provoke readers to think beyond the published literature and current knowledge, and to

encourage wisdom from both practice experience and research to find its way into the future evidence base concerning the development, management and evaluation of inter-organizational networks.

Key concepts and characteristics

- There are many definitions of inter-organizational networks in the literature; at the foundation of virtually all lies the concept of networks consisting of the structure of relationships between actors (individuals and organizations), the nature of the links between actors, and the meaning of those relationships. Trust is described as the lubricant that makes cooperation possible between these actors, and higher levels of trust are believed to lead to increasing network effectiveness.
- Some argue that inter-organizational networks exist because of a moral imperative. That is, the important issues facing society (e.g., poverty, crime, health promotion, economic development, the environment, natural disasters, education, healthcare reform) *must be addressed*, yet clearly cannot be tackled by single organizations working on their own.

Benefits and limitations of networks

- Many of the benefits described in the literature (e.g., shared risk, advocacy, positive deviance, innovation, flexibility and responsiveness) suggest that the creation of inter-organizational networks can be a strategy for developing a structure that is more nimble and able to create change, and/or be more responsive to change, than bureaucratic organizations.
- There are known challenges to working in inter-organizational networks (e.g., achieving consensus on the network purpose and goals, culture clashes, loss of autonomy, coordination fatigue, the time and effort it takes to develop trusting relationships, power imbalances) that practitioners need to seriously consider and work diligently to mitigate. Networks should only be used if the task is unsuitable for a hierarchical organization.
- Two important questions for consideration by practitioners and researchers alike are:
  - Do the added benefits of networks outweigh their challenges or limitations, and in what circumstances?
  - When is an inter-organizational network the right organizational form for a particular task?

Emergent vs. formal networks

- There are pros and cons to emergent and formal (mandated) networks. An obvious pro of a mandated network is that it can provide a powerful incentive for organizations to work together. An emergent network, on the other hand, may start with higher levels of trust due to its voluntary nature. Allowing sufficient time for trust and genuine commitment to be built is critical to the longer-term effectiveness of all networks.

Network types and functions

- Under the umbrella of collaborative inter-organizational networks, there are a variety of network types and functions described in the literature.
- The types and functions of networks described commonly in the literature are briefly outlined, with three functions described in more depth given their centrality to many networks:
  - information diffusion and knowledge exchange;

  - network learning; and
  - innovation.

- Although a network may be viewed as a particular type of network based on its primary function, it will generally have multiple functions. For example, a service delivery network, with the main function being the delivery of coordinated services to a particular client group, will likely have a number of other important functions such as information diffusion, knowledge exchange, learning and capacity building.

Network governance, leadership and management, and structure

- Three key interlocking themes, related to effective network development and growth, are:
  - network governance,
  - management and leadership of and in networks, and
  - network structures.

  The exploration of these themes begins to answer the question, "Is there a way of working unique to networks?"

- A typology of *network governance* proposed by Provan and Kenis (2008) is widely referred to in the public administration literature on networks, and identifies three distinct types of governance structures within networks:
  - shared governance;
  - lead organization; and
  - network administration organization.

  An important task for network managers is to determine which governance structure is the best fit for an individual network, at a particular time and why, so as to ensure that the network structure evolves to meet the changing needs of the network as it grows and develops.

- The management and leadership of and in networks are widely described as being challenging, and yet are essential to maintaining the flexibility and resiliency needed to accomplish network level tasks, and ultimately to address the network's vision. The degree to which network leadership and management overlap with each other, or with leadership and management in organizational hierarchies, are points of discussion.

- *Leadership* in a network is not viewed as the purview of a single leader in a formal leadership position, but rather seen as something more organic in nature that is supported and grown across the network. This way of conceptualizing leadership aligns with both a relational view of leadership that focusses on process, context and relationship building; and with the literature on complexity leadership, where leadership processes can be shared, distributed, collective, relational, dynamic, emergent and adaptive. The role of a network manager as leader is to nurture this kind of leadership. Some terms used to describe network leadership include host, servant leader, helper, network weaver and network orchestrator. However, some types of networks, such as mandated networks, may need to approximate more traditional forms of leadership.

- Network managers must have a good understanding of the purpose and functions of a network in order to manage it effectively. Some essential *network management*, and potentially leadership, tasks and behaviours identified in the literature are described, and include management of design, commitment, conflict, accountability and legitimacy. There are a number of tensions and paradoxes inherent in networks that need to be managed, one of which is the balancing of the needs of the organization with the needs of the network.

- An understanding of network structure can help in the design of effective networks. *Network structure* consists of the nodes that comprise the network; the ties that connect the nodes; and the patterns, structures and nature of the relationships that result from these connections. Each node represents an actor in a network, and in an inter-organizational network these actors are organizations. Social network analysis is often used to study the structure of inter-organizational networks, or the connections between these nodes. The structure and nature of the ties are important and both strong ties and weak ties are of value in a network, serving different purposes.
- Understanding the relationships and processes occurring through the network structure is as important as understanding the structure itself. If a network is to thrive and achieve its goals, the type of work and the way in which it is conducted must support the ongoing development of relationships and collaborative processes.

Network evolution

- Despite the recognition of the cyclical nature of networks by many people working in this field, there is very little published research on how networks evolve over time. Four stages of evolution are identified and briefly discussed.
  - Stage One: Formation. There are multiple early decisions, activities and processes required when establishing a network. Consideration must be given to precursors and context, balancing development of network structures and processes, and setting the tone for ongoing collaboration and consensus building, sustainability and resilience.
  - Stage Two: Development and growth. The development and growth of a network requires conscious facilitation, paying attention to what is going on with respect to network structure, carrying out essential management tasks, and encouraging distributed leadership. Four themes of relevance if the network is to continue to develop and grow are discussed in more detail: trust; power; positive deviance; and outcome attribution and accountability.
  - Stage Three: Maturity, sustainability and resilience. As a network matures, engaging in and supporting the following activities would seem to be important for network leaders:
    - scanning of the context within which the network exists;
    - revisiting of the network's vision in order to respond to changes in the context;
    - ongoing development of internal and external legitimacy; and
    - monitoring and evaluation of the network's processes and outcomes.
  - Stage Four: Death and transformation. Given the dearth of research on the natural life cycle of inter-organizational networks, we have very little understanding of their death and/or transformation. Future evaluation and research is needed to contribute to our knowledge about how to distinguish between a natural and an untimely death of a network, including how to prepare for the former and prevent the latter.

Evaluating networks

- An understanding of what the research to date says about factors contributing to network effectiveness is critical to the evaluation of networks. In general terms, network effectiveness can be defined as the achievement of positive network level outcomes that cannot be attained by individual organizational participants acting alone. Examining both a network's processes and outcomes is important, as is multi-level analysis.
- Building on what has been learned through practice and research about network effectiveness, we propose an evolving model of action that might be helpful to guide the evaluation

of network processes and outcomes, with a goal of maximizing our learning about what works, what does not, in what contexts, and why.

- Social network analysis as a method of evaluating networks remains highly useful, particularly as a way to understand the structure and quality of relationships of various types. It can function as a map that managers can use to more effectively manage the network by pointing out gaps and areas in need of strengthening or adjustment. However, there is still much to learn about how to adequately capture the value of inter-organizational networks beyond their structure, particularly in ways that support the value of the network without diminishing the roles and contributions of the member organizations.

Gaps in knowledge and future research and evaluation

- Given the value of stimulating and supporting networks as vehicles for achieving societal goals, it is important that we continue to generate knowledge about when and if inter-organizational networks are needed, the circumstances under which they are best formed; what type of network might be most suitable depending on the purpose and the context; and how best to support the evolution of a network throughout its life cycle. Longitudinal, comparative and practice based research and evaluation are needed.
- While the bodies of research relevant to inter-organizational networks are growing and developing in maturity, more is needed. Given the nebulous nature of networks, much can also be learned from the experience of those who lead, manage and participate within these networks.

Introduction

Purpose of Report

The purpose of this literature review is to consciously bring forward evidence of practical value, identifying and synthesizing what is known about inter-organizational networks.

> *"Networks are valuable tools that can be used to contribute to the accomplishment of a wide range of objectives, and there are specific contexts where network activity is particularly well suited."*
>
> (Birdsell, Matthias, & colleagues, 2003, p. ii)

This review includes collective and reflective commentary on the state of the knowledge base contained within current literature. The additional perspectives woven into the text and found within the Authors' Final Reflections section at the end are purposeful, and we hope useful. The comments are meant to provoke readers to think beyond the published literature and current knowledge, and to encourage additional wisdom from both practice experience and research to find its way into the future evidence base concerning the development, management and evaluation of networks.

Intended primarily as a resource for network practitioners—leaders, managers, participants and facilitators—this review can be characterized as part of a developing 'network toolkit'; that is, one of a number of activities or products that could be helpful to practitioners engaged in developing or managing inter-organizational networks. Managing in the absence of a typical chain of command is a craft skill that relies on trust to make reciprocity do the work of hierarchy. It requires a commitment to the mastery of knowledge, tools, techniques, and methods that are appropriate for leading and managing networks. In other words, network management entails learning through reflective practice. There are many definitions of reflective practice, with most including the linking of theory and practice; critical examination of experience, emotions and actions in order to gain insight; and conscious application of that learning (see, for example: Donald Schon's Reflective Practitioner [1983] http://en.wikipedia.org/wiki/reflective_practice; and Linda Finlay's Reflecting on 'Reflective Practice [2008] http://www.open.ac.uk/opencetl/files/opencetl/file/ecms/web-content/Finlay-(2008)-Reflecting-on-reflective-practice-PBPL-paper-52.pdf). The hope is that the review will both enhance reflective network practice and encourage network practitioners to actively conduct and participate in applied research, and publish in this area.

The more specific focus with respect to the expected audience for this review is on people and organizations, either already involved in health and other human service networks or considering formation of a network to address complex social issues. Having said that, the literature reviewed here spans a broad array of disciplines and settings so the findings may inform practitioners working in a variety of collaborative non-profit and/or public sector networks and they may also provide some useful comparative ideas and evidence for private sector network initiatives. The findings may also stimulate academics and students interested in inter-organiza-

tional networks to expand the knowledge base through empirical studies in this field, particularly in the areas that are not yet well understood as identified in a number of places throughout this report. While not specifically designed as a policy document for governments, nevertheless the review may provide some food for thought for governments as they attempt to address highly complex or "wicked" societal problems through the use of collaborative networks.

Background to Report

The use of inter-organizational networks as a strategy for public sector management and the study of these networks by a diversity of scholars have grown rapidly in the past fifteen to twenty years. Berry, Brower, Choi, Goa, Jang, Kwon, and Word (2004) identify the explosion in the use of networks as a framework in both the popular and academic literature and suggest, in particular, that the "cross-fertilization" of research across multiple disciplines (i.e., sociological, political and public management traditions) can contribute to clarifying the thinking and knowledge about networks, particularly those in the public management arena. They provide an excellent synthesis of network research in the three traditions, including the underlying assumptions, common research methods and the principal questions of interest to each (Berry et al., 2004).

"Networks have assumed a place of prominence in the literature on public and private governing structures, gradually nudging hierarchies and markets as the foremost means to organize to address complex problems, share scarce resources, and achieve collective goals" (Weber & Khademian, 2008, p. 334). Networks can be viewed as an alternative when both markets and bureaucracies fail or as entities that augment them (Gilchrist, 2006; Isett, Mergel, LeRoux, Mischen, & Rethemeyer, 2011; Kenis & Provan, 2009; Milward & Provan, 2006).

A number of authors describe the revolution in public management that has contributed to the increase in inter-organizational networks in the public sector, with a variety of terms used for this phenomenon, including: the hollow state; third-party government; and the market state (Isett et al., 2011; Milward & Provan, 2006). Contributing factors to this public management revolution have been "the search for greater productivity; more public reliance on private markets; a stronger orientation toward service; more decentralization from national to subnational governments; increased capacity to devise and track public policy; and tactics to enhance accountability for results" (Kettl, 2005 as cited in Milward & Provan, 2006, p. 8). Conteh (2013) suggests trends such as these reflect that the success of public policy implementation requires adaptation to the external environment. He reinforces the importance of "synchronizing the activities of public agencies" (p. 518) not only across levels of government, but with non-state actors and with community groups, representing a "shift in emphasis from narrow intra-organizational and managerial issues to inter-organizational relationships and multi-actor governance processes" (p. 502).

The de-institutionalization movement across many human services (e.g., mental health, care of the elderly, care of children) is a strong contributing factor to an increase in the development of human and health services networks. The shift away from institutionally based care was accompanied by an increased need for a more coordinated and collaborative approach to the provision of community-based services to ensure that those requiring services received them and did not fall through the cracks between organizations delivering services (Isett et al., 2011).

Due to this immediate practical need to increase the coordination of community-based health and human services, and the use of inter-organizational networks as one vehicle for doing so,

network practice has often had to move ahead without the benefit of a well understood or easily available evidence base. In doing so, practical knowledge in the field has been growing, contributing to a dynamic interplay between what is known (or not known) through network research and network practice and, at times, advancing the knowledge beyond the published research. While there has been recent rapid growth in the networks' literature in the Public Administration field as academic research tries to catch up, networks as an area of study is still in its early stages. As Isett et al. (2011) note, "scholars remain faced with fundamental questions and challenges that make network studies a variegated undertaking where a variety of phenomena are described in multiple ways" (p. i159).

Mindful of the challenges and elucidating ongoing, perhaps unanswerable, questions, this review captures and collates much of what is known about inter-organizational networks. The intent is to extend practical knowledge of what we collectively understand about the value and the challenges of designing, developing, managing, sustaining and evaluating inter-organizational networks. This review also critically examines the limits of the evidence base and suggests areas and issues where new research and practice efforts are required.

Literature Search and Review Strategy

There is an extensive body of literature on inter-organizational networks, published across a variety of academic disciplines, which use a variety of terms to describe the same phenomenon. This means that, as with inter-organizational networks themselves, the literature base and practice experience are wide ranging, diverse and sometimes difficult to find.

Maintaining a focus on inter-organizational networks, a series of key questions grouped under four areas were developed to guide the search strategy and literature review (see Appendix 1 for detailed questions); the groupings are as follows:

- key concepts and characteristics of inter-organizational networks in the public or non-profit sector;
- implementation, sustainability and resilience of inter-organizational networks;
- evaluation of inter-organizational networks; and finally
- is there anything new emerging from the most recent literature that is important to include?

Isett et al. (2011), in their review of research on public administration networks, identified three major streams of research that are related to three broad types of inter-organizational networks:

1. **Policy networks** (i.e., with a common "interest in public decisions within a particular area of policy because they are interdependent and have a shared fate" and often focussed on "decision making about public resource allocation", p. i158)
2. **Collaborative networks** (i.e., that "work together to provide a public good, service or 'value' when a single public agency is unable to create the good or service on its own", p. i158)
3. **Governance networks** (i.e., that "fuse collaborative public goods and services provision with collective policy-making...and focus on the coordination of agencies toward a common goal rather than the policies or products that the networks actually produce", p. i158).

While these types are useful analytically, in the real world of networks parts of all three may be present in any one network. We are most interested in **collaborative networks** because, as practitioners in the public service arena, understanding how to collaborate and implement in

relation to improving services is what we view as most important to the clients we serve. Thus, the majority of the literature included in this review falls under the second type, collaborative networks, as they are the most common in the public and non-profit sector and in particular the human services sector, including healthcare.

Given this focus, a number of topics had to be excluded although they are closely related and often overlap with inter-organizational networks. These topics are:

- social networks and social network analysis (except in the context of evaluating inter-organizational networks);
- social capital;
- intra-organizational networks (e.g., networks that reside within a single organization);
- communities of practice; and
- complex adaptive systems.

While published research on these topics does contain knowledge that is potentially useful to people working in collaborative inter-organizational networks, the respective bodies of literature are too large and disparate to include substantively in a single literature review. Accordingly, we acknowledge their importance and reference them occasionally. We also provide a brief overview of these topics in Appendix II, and include some suggestions for further reading.

Key Concepts and Characteristics

What do we mean by a 'network'?

"A good network leaves nobody unchanged and frequently breaks down barriers that institutions preserve."

Networks Leadership Summit Participant (Canadian Health Services Research Foundation [CHSRF], 2005-06, p. 4)

There are many definitions of networks in the literature. Throughout this report, when the term network is used, we are referring to collaborative inter-organizational networks where three or more organizations are working together toward a common purpose. Since common purpose is integral to this definition, these networks consist mostly of public and non-profit organizations rather than competitive, for-profit organizations. This working definition is derived from the research of many authors who contribute to a growing number of ways to describe inter-organizational networks of various kinds in varying contexts. While essential to settle on a definition of networks for our purposes, it is neither possible nor necessarily desirable to capture a complex human phenomenon with one definition. The discussion that follows, then, is intended to illustrate the range and complexity of the language and definitions used within the literature.

"In very broad terms, networks are defined by the enduring exchange relations established between organizations, individuals, and groups" (Weber & Khademian, 2008, p. 334). In inter-organizational networks, the focus is on inter-organizational relations. Provan, Fish, and Sydow (2007) note that:

> …although inter-organizational networks are by now a commonly understood phenomenon of organizational life, it is not always clear exactly what organizational scholars [or people in practice] are talking about when they use the term. Even the term *network* is not always used. Many who study business, community, and other organizational networks prefer to talk about partnerships, strategic alliances, inter-organizational relationships, coalitions, cooperative arrangements, or collaborative agreements. (p. 480)

In addition to the list outlined in the quote above, the terms collaboration and collaborative alliance are also sometimes used to refer to inter-organizational networks. Gray and Wood (1991) define collaboration as occurring "when a group of autonomous stakeholders of a problem domain engage in an interactive process, using shared rules, norms, and structures, to act or decide on issues related to that domain" (p. 146). Bryson, Crosby and Stone (2006) define "cross-sectoral collaboration as the linking or sharing of information, resources, activities and capabilities by organizations in two or more sectors to achieve an outcome that could not be achieved by organizations in one sector separately" (p. 44). Huerta, Casebeer, and VanderPlaat (2006), with their interest in using networks to enhance service delivery, define networks as "a group of three or more autonomous organizations working together across

structural, temporal and geographic boundaries to implement a shared population health or health services strategy" (p. 13).

Recently the term "whole network" has been introduced as a covering term to refer to "a group of three or more organizations connected in ways that facilitate achievement of a common goal. That is, the networks…are often formally established and governed and goal directed rather than occurring serendipitously" (Provan et al., 2007, p. 482). Whole networks (i.e., consciously formed, organized, goal-directed networks):

> are especially relevant in health, where the collective action of multiple organizations is often required to provide effective care. They differ from serendipitous networks (Kilduff & Tsai, 2003), which form and evolve spontaneously, focus on dyadic connections between social actors, and generally have no common theme or goal shared by network members. (Provan, Beagles, & Leishow, 2011, p. 316)

Still, it could well be that emergent networks may not have a common goal to start with, but develop one as they work together, and it is subsequently that common goal that keeps the network together over the longer term. Thus, serendipitous networks can sometimes evolve into whole networks.

The examples above are only a small sample of the definitional variation in the literature. That said, we also know from the literature that: "Despite differences, nearly all definitions have a few common elements including social interaction (of individuals acting on behalf of their organizations), relationships, connectedness, collaboration, collective action, trust, and cooperation" (Provan et al., 2007, p. 480). At their base, networks consist of the structure of relationships between actors (individuals and organizations) and the meaning of the linkages that constitute those relationships. Trust is the lubricant that makes cooperation between these actors possible, and, in general, higher levels of trust are believed to lead to more effective collaboration (Axelrod, 1984).

Network practitioners need not be distracted by the lack of a singular definition, but simply select a term or definition, as the authors of the review did, that resonates with the organizations and individuals involved in the particular network, understanding that trusting relationships and shared purpose will generally be foundational underpinnings of any definition, and of network effectiveness.

Why do inter-organizational networks exist?

"Networks are not the solution to every problem; however, when used strategically they can be very valuable to deal with complex issues."

Networks Leadership Summit Participant
(CHSRF, 2005-06, p. 4)

The potential benefits of networks are often inferred in the underlying rationale for networks. Inter-organizational networks can be viewed as a way to address complex social and population health problems by taking advantage of a broader set of resources and increased capacity (Bryson et al., 2006; Gilchrist, 2006; Hoberecht, Joseph, Spencer, & Southern, 2011; Keast, Mandell, Brown, & Woolcock, 2004; Riley & Best, in press; Weber & Khademian, 2008). Often these inter-organizational networks will also be intersectoral, in that many of society's most difficult public challenges require collaboration amongst government, business, non-profits, communities and/or the public as a whole (Bryson et al., 2006; Gilchrist, 2006; Conteh, 2013).

> Organizations join or form networks for a variety of reasons, including the need to gain legitimacy, serve clients more effectively, attract more resources, and address complex problems. But regardless of the specific reason, in a general sense, all network organizations are seeking to achieve some end that they could not have achieved independently. (Provan & Kenis, 2008, p. 240)

Human services organizations working in these complex service and policy fields often have multiple goals. While they may have client specific outcomes that are within their reach, they may also have broader social change agendas that could not possibly be met alone. For example, while an organization may have a specific mandate to assist individuals living in poverty, it may also have the broader goal of poverty reduction at a population level. Similarly, some would argue that collaborative inter-organizational networks exist because of a moral imperative. That is, the important issues facing society (e.g., poverty, crime, health promotion, economic development, the environment, natural disasters, education, healthcare reform) *must be addressed*, yet clearly cannot be tackled by single organizations working on their own (Bryson et al., 2006; Hoberecht et al., 2011; Huxham & Vangen, 2005; Keast et al., 2004).

Others argue that it is not so much the moral imperative that is the rationale for networks, but the failure of traditional, bureaucratic hierarchical organizations to address complex problems that cut across jurisdictions and defy precise definition (in reality it is likely both). Keast et al. (2004) state that a variety of collaborative arrangements, including networks, have emerged as a result of the failure of traditional, bureaucratic hierarchical organizations to address these broader issues. These complex or 'wicked' problems or issues (e.g., poverty, homelessness, chronic health problems - including mental health and addictions) present a unique challenge to governments at all levels (federal, provincial, local), mostly because they defy precise definition and cut across disciplines, sectors, geographical and authority jurisdictions, policy and service delivery areas. To date, neither the single agency or silo approach nor the simplicity of the market model have been effective in addressing these kinds of problems (Keast et al., 2004).

Huxham and Vangen (2005) use the term "collaborative advantage" to refer to collaborative alliances and inter-organizational partnerships that are effective in tackling complex social issues that would otherwise fall through the gaps between hierarchies and markets. They make the case for networks by arguing that: "Almost anything is, in principle, possible through collaboration because you are not limited by your own resources and expertise" (p. 3). While that is very inspiring, a more measured set of potential benefits of networks come from a number of studies of inter-organizational networks. These are summarized in Table 1 along with a sample list of authors, from the articles reviewed, writing about these benefits.

> *"Networks are critical in times of change. Organizations that are part of the network will be seeking new answers and networks can facilitate that exchange of information so organizations can learn to adapt."*
>
> (Networks Leadership Summit IV, 2009, p. 10)

While the potential benefits of networks are many, it is important for practitioners to understand that the benefits most likely to be realized in any individual network are those aligned with its particular purpose. For example, a network developed to create opportunities for universities to collaborate with health service delivery organizations could have learning and capacity building benefits. It can be challenging for university-based researchers to engage in the kind of 'just in time' research that matters to health professionals trying to solve real time problems. Creating formalized network structures can enable researchers and health practitioners to come together to think and act beyond the norms of both cultures, a benefit that can help to accomplish mutual goals. In other words, opportuni-

Table 1: Potential benefits of inter-organizational networks

Potential benefit	Description
Access to and leveraging of resources	• Stretch, build on or strengthen limited resources • Access to resources not held within a particular organization (Bryson et al., 2006; Gulati, Lavie, & Madhavan, 2011; Huxham & Vangen, 2005; Milward & Provan, 2006; Provan & Lemaire, 2012; Scott & Hofmeyer, 2007; Weber & Khademian, 2008)
Shared risk	• The ability to distribute or share risks fosters creativity and innovation by reducing risk to any one organization (Casebeer, Popp, & Scott, 2009; Hoberecht et al., 2011; Huxham & Vangen, 2005; Kapucu & Demiroz, 2011; Weber & Khademian, 2008)
Efficiency	• More efficient use of resources • Ability to achieve economies of scale (e.g., purchasing, being more competitive in grant competitions) (Huxham & Vangen, 2005; Provan & Kenis, 2008; Provan & Lemaire, 2012)
Service quality, coordination, seamlessness	• Ability to provide coordinated, higher quality services and a full continuum of care (Hoberecht et al., 2011; Huxham & Vangen, 2005; Kenis & Provan, 2009; Popp, Douglas-England, Casebeer, & Tough, 2005a; Provan & Lemaire, 2012_
Advocacy	• Able to exert more pressure due to greater political clout and community reach resulting from greater numbers and diversity of network members (Provan & Lemaire, 2012)
Learning, capacity building	• Knowledge exchange can enable learning and capacity building at a network level and in the broader community (Brass, Galaskiewicz, Greve, & Tsai, 2004; Bryson et al., 2006; Huxham & Vangen, 2005; Isett et al., 2011; Keast et al., 2004; Kenis & Provan, 2009; Klijn, Edelenbos, & Steijn, 2010; Knight, 2002; Knight & Pye, 2005; Provan & Lemaire, 2012; Weber & Khademian, 2008)
Positive deviance	• Networks can be a forum to think and act beyond the organizational norm, structure or mandate; to work deliberately in deviation from the standard organizational processes, overtly or covertly, to influence change in systems (Casebeer et al., 2009; Bradley, Curry, Ramanadhan, Rowe, Nembhard, & Krumholz, 2009; Singhal, 2010; Goldsmith, 2014)
Innovation	• Networks are enabling structures that create opportunities for innovation, which is closely connected to learning (Brass et al., 2004; Hoberecht et al., 2011; Klijn et al., 2010; Provan & Lemaire, 2012; Turrini, Christofoli, Frosini & Nasi, 2010)
Shared accountability	• Opportunity to work collaboratively to address, and share responsibility for, a quadruple bottom line (e.g., financial, social, environmental and cultural) • Developing a sense of accountability to one's network colleagues (Hoberecht et al., 2011; Romzek, LeRoux, & Blackmar, 2012; Romzek, LeRoux, Johnston & Kempf, 2014)
Flexibility and responsiveness	• Capacity to be more flexible and responsive in order to deal with unforeseen problems (e.g., disasters) (Isett et al., 2011; Provan & Lemaire, 2012)

ties are created to work together in positive deviant ways. Researchers learn about issues that matter to health practitioners and the kinds of research that has the potential to be useful, and health practitioners learn how to generate knowledge through research.

Several of the benefits outlined in Table 1 (e.g., shared risk, advocacy, positive deviance, innovation, flexibility and responsiveness) suggest that the development of an inter-organizational network can result in a structure that is more nimble and able to create change, and/or be more responsive to change, than organizational hierarchies.

What are the limitations of inter-organizational networks?

Both researchers and practitioners indicate that networks should not be seen as a panacea, and describe the difficulty inherent in network management and leadership in a context often characterized as complex and ever changing (Bryson et al., 2006; Huerta et al., 2006; Huxham & Vangen, 2005; Canadian Health Research Foundation [CHSRF] 2005-06; McGuire, 2006; McGuire & Agranoff, 2011; Provan & Lemaire, 2012). Huxham and Vangen (2005) are frank about the challenges of making collaboration work in practice, especially when actions rely on complete agreement on a shared purpose. Bryson et al. (2006) note that cross-sector collaborations are frequently unable to solve all the problems they tackle and can, in reality, create more problems. They indicate that negative unanticipated consequences can occur because of how highly interconnected things are, meaning that any change can result in unexpected ripples, which may difficult to contain, across the system or sectors. Huerta et al. (2006) speculate that there may be a class of problems for which networks are inappropriate and call for research identifying the types of problems that networks should or should not address. McGuire and Agranoff (2011) describe the importance of seeing networks as only one of the emergent management entities, noting that they are "neither the be all and end all of governing nor some replacement for government" (p. 280).

> *"Organizations and networks are both arrows in your quiver."*
>
> (B. Milward, Networks Leadership Symposium, 2013, p. 7)

At a Networks Leadership Symposium in 2013, McGuire talked about the limitations of networks suggesting that "moderating our enthusiasm for networks may help to temper expectations by practitioners of what networks can achieve and provide more critical examinations of networks by scholars;" and that "both practitioners and scholars should work at isolating the key ingredient that stimulates beneficial network activity, suggesting that this key ingredient may differ across networks" (Networks Leadership Symposium, 2013, p. 7). At the same event, Milward proposed that networks were on a continuum of organizing and that "leaders need to be strategic and think broadly about what kind of organizing makes sense for the problem or issue at hand" (Networks Leadership Symposium, 2013, p. 7). Cross-sector collaborations, although a promising mechanism for addressing issues that are complex and interconnecting, are no panacea, and can create as well as solve problems.

At the same time, many of these same points could be made about markets and organizational hierarchies. Thus, the challenges of working in inter-organizational networks must be set against the limits and constraints that other organizational forms encapsulate. The question for practitioners and researchers alike, then, is whether the added benefits of networks outweigh their challenges or limitations, and in what circumstances. The degree to which the challenges can be anticipated, managed or offset is an important consideration when establishing an inter-organizational network. Thinking through the potential challenges may, in fact, help drive the composition, governance and leadership of a network, or indeed the decision to

use a different organizational form for a particular problem. In addition, given the highly interconnected nature of networks, building in strong ongoing monitoring and evaluation mechanisms from the earliest stages of a network's development is an important strategy for identifying and addressing any unintended negative consequences.

A number of particular challenges, which bear forethought, to working in an inter-organizational network are described in the literature (Bryson et al., 2006; Hoberecht et al., 2011; Huerta et al., 2006; Huxham & Vangen, 2005; McGuire, 2006; Provan & Lemaire, 2012). While one may argue that these challenges are not necessarily unique to networks, they are frequently described in the literature reviewed here. Some of these identified challenges are listed in Table 2 below and we have further attempted to articulate why they are challenges and provide some suggestions as to how they might be mitigated. Again, the authors' list is not exhaustive, but reflective of the literature reviewed.

When is a network the right organizational form?

The need to work together differently is recognized "because traditional methods, including cooperation and coordination, have not been sufficient. In fact, network structures are established when all other options have failed."

(Keast et al., 2004, p. 365)

Although inter-organizational networks can be a powerful mechanism for addressing complex problems, they should be entered into only when there is a potential for real collaborative advantage. The literature suggests that this is when there is an issue to be tackled that has not been effectively addressed through more traditional organizational structures and ways of working (Hoberecht et al., 2011; Huxham & Vangen, 2005; Isett et al., 2011; Keast et al., 2004). This is an interesting perspective because it presupposes that the genesis of a network is always embedded in failure, to some degree forced. It disregards the possibility that organizations might come together, not as a result of their own failed attempts at problem solving, but in advance recognition of the complexity of the issue at hand and with a realistic view of the benefits to be gained through an inter-organizational network approach. Holley (2012) suggests using networks when changes to existing systems or a high degree of experimentation or innovation are desirable, and Lee, Feiock, and Lee (2011) identified perceptions of both competition and cooperation as potential drivers for networks. In practice we see a variety of pathways for establishing inter-organizational networks, both reactive and proactive, and suggest that further analysis of the precursors to the decision to form a network might provide insights into later successes or challenges encountered.

In the public management literature there is discussion about a variety of collaborative management structures that work for different purposes (McGuire, 2006; Provan & Lemaire, 2012). Provan and Lemaire (2012) describe choosing networks based not necessarily on "the complexity of the problem being addressed, but rather, how routine and predictable the problem is and whether the problem can be addressed sufficiently by a single organization" (p. 11). For example, they describe bureaucracy (i.e., the classic hierarchy) as being appropriate when a task is stable and routine, but inappropriate for most non-routine tasks (Provan & Lemaire, 2012). Inter-organizational networks are also chosen when problems, such as organized crime or terrorism, fall outside the boundaries or mandate of any one organization (Raab & Milward, 2003). Keast et al. (2004) note that the literature suggests that a common trigger for the development of inter-organizational networks is a crisis, which is an indicator that the stakes are high and can increase the likelihood that resources will be provided to support network development. Thus, there are multiple reasons for establishing an inter-organizational network,

Table 2: Some challenges to working in an inter-organizational network

Challenge	Why it is a challenge	How it might be mitigated
Achieving consensus on and varied commitment to network purpose and goals (Bryson et al., 2006; Provan & Lemaire, 2012; Vangen & Huxham, 2012; Kelman & Hong, forthcoming)	Member organizations come to the table with diverging perspectives and priorities, varying levels of trust in the process, and differing tolerance for subjugating individual needs in favour of the common goal.	• Use a participatory, collaborative process for establishing initial goals, making sure to involve key stakeholders and implementers. • Develop specific terms of reference for the goals of the collaboration. • Choose early activities that could change behaviour first contributing to new norms and, ultimately, consensus.
Culture clash, or competing "institutional logics" (Bryson et al., 2006; Hoberecht et al., 2011; Huerta et al., 2006; McPherson, Popp, & Lindstrom, 2006; Provan & Lemaire, 2012)	Member organizations have different ways of doing things (cultures) and/or institutional logics (e.g., approach to decision making, ways of providing services, transparency with partners), which can make it challenging to agree on essential structures, processes and outcomes.	• Identify and openly discuss the underlying cultures and logics of member organizations. • Develop structures and processes for the network that reflect a diversity of those found within member organizations.
Loss of autonomy (Provan & Lemaire, 2012)	Legally autonomous organizations may resist coordinated decision-making, particularly when the decisions are not perceived as being in the best interests of their organization.	• Ensure that planning and decision-making is participatory and open. • Pay attention to how a potential decision could affect organizational members differently; highlight the potential gains.
Coordination fatigue and costs, including being pulled in multiple directions (Huerta et al., 2006; Provan & Lemaire, 2012)	Working collaboratively and coordinating decisions and activities take time and effort away from the day-to-day work of an organization. As well, it is not uncommon for a single organization to belong to multiple networks, which exacerbates the time and effort required.	• Adoption of an appropriate governance form and sufficient resourcing of the network can help ensure that the time individual member organizations commit to network activities is optimized. • Creating a network culture that allows members to engage at varying intensities on particular activities can also provide relief.
Developing trusting relationships (Axelrod, 1984; Bryson et al., 2006; McGuire, 2006; Keast et al., 2004; Huxham & Vangen, 2005; Gulati et al., 2011)	Trusting relationships take time to build, and must continue to be attended to if trust is to be maintained over time because reciprocity emerges from repeated interactions.	• Build trust initially by sharing non-threatening information or knowledge and engaging in low-risk activities, thus demonstrating competency, good intentions and follow-through. • Regular check-ins on the 'health' of network relationships may help identify and mitigate trouble. • Use the strategy of tit for tat; if someone cooperates with you in the first round, you cooperate with them in the next. • Cooperate with a non-cooperator occasionally as they may surprise you and cooperate.

Table 2: Some challenges to working in an inter-organizational network (continued)

Challenge	Why it is a challenge	How it might be mitigated
Obstacles to performance and accountability (Provan & Milward, 2001; Bryson et al., 2006; Provan & Lemaire, 2012; Romzek et al., 2012; Romzek et al., 2014)	Accountability can be a particularly complex issue, as it is often not clear to whom the network is accountable and for what. This diffusion of accountability can lead to "free-riders", where some organizations participate minimally and let others pick up the slack.	• Establish an early expectation that all network members will contribute in some fashion over time, setting the stage for network members to hold each other accountable. • Tracking inputs and creating transparency within the network can also make individual member contributions and corresponding outcomes more visible and provide evidence for tough conversations with "free-riders."
Management complexity (Agranoff & McGuire, 2001; Milward & Provan, 2006; McPherson et al., 2006; Provan & Lemaire, 2012; Kelman, Hong, & Turbitt, 2013)	Management within a network context requires managing across organizations as well as within the traditional hierarchical structures of member organizations. Tensions that arise between the two are typically difficult to resolve but still require confronting.	• Acquire and share knowledge within the network about how networks operate. • Identify how each organization fits into the network and predict the tensions that may arise. • Ensure good conflict resolution mechanisms are in place to address issues in an open and transparent way. • Foreshadow the fact that some tensions may be irresolvable and that this is acceptable within the network culture.
Power imbalance and resulting conflict (Bryson et al., 2006; Provan & Lemaire, 2012; Purdy, 2012)	As in life, organizational members come into the network with differing levels of status and resources, making power imbalances a reality.	• Use language that reinforces equality among members. • Provide early and ongoing assurance that the interests of all members are being considered. • Use resources to mitigate power imbalances and manage conflict effectively.
Lack of organizational capacity to work collaboratively (Bryson et al., 2006; McPherson et al., 2006; Kelman & Hong, forthcoming)	Organizational members may lack experience working collaboratively because of traditional organizational ways of working.	• Work to develop the network culture or a compelling narrative such as the 'network way of working.' • Provide education on collaboration to network members. • Choose an early activity to work together on that has good potential for a quick win. • Model a collaborative leadership style.
Sustainability (Provan & Milward, 1995; Provan et al., 2010; O'Toole & Meier, 2004; Provan & Huang, 2012; Bakker, Raab & Milward, 2012)	Sustaining a network can be challenging for a number of reasons, many of which have been discussed throughout this table. An additional challenge to network sustainability is change in the environment within which a network operates, or the network moving to a new evolutionary stage of development.	• Be aware of the common challenges experienced by networks, mitigating them where possible. • Ensure the network remains nimble by trying to anticipate and respond/adapt to changes in context. • Promote network level learning. • Institutionalize network structures and processes to encourage stability.

and these reasons influence how a particular inter-organizational network is formed and how it functions (Hoberecht et al., 2011).

It is important to acknowledge that "seeking collaborative advantage is a seriously resource-consuming activity, so is only to be considered when the stakes are really worth pursuing" (Huxhum & Vangen, 2005, p. 13). The researchers who are raising these cautionary flags are doing so not because they do not believe that networks are worthwhile; indeed, many of these authors have invested considerable intellectual capital in studying networks and strongly believe they are essential for solving or mitigating some of society's most vexing problems. They are trying to ensure, however, that people considering establishing a network are doing so for the right reasons and are proceeding in a way and in a context that will increase the probability of developing an effective network.

When, then, is a network the right organizational form? Some questions that may be helpful in determining whether the establishment of an inter-organizational network is a good option are summarized in the box below.

When might a network be the right organizational form?

1. Is the identified problem beyond the capacity of any one organization?
2. Is this a problem or issue where the stakes are high?
3. Is the issue complex?
4. Have other traditional methods already been tried?
5. Is it likely that a common aim could be identified and agreed to?
6. Do the organizations involved have similar cultures and values?
7. Is there enough diversity among potential participants to provide multiple perspectives on the problem?
8. Is there a history of trusting relationships among the organizations that would comprise the network? If not, is there enough time to develop them before tangible outcomes are expected?
9. Will you have the necessary resources to develop and implement a network?
10. Is the issue one that will require long-term collaboration?

Adapted from: Bryson et al., 2006; Holley, 2012; Huxham & Vangen, 2005; Keast et al., 2004; McGuire, 2006; Provan & Lemaire, 2012; Raab & Milward, 2003

A negative response to any of these questions does not necessarily mean that forming an inter-organizational network is a bad idea. Rather, they are outlined here to support careful consideration about when a network might be the most appropriate organizational form.

Is there a difference between emergent vs. mandated networks, and formal vs. informal networks?

The degree to which networks and collaboration can be mandated is debated in the literature and in practice, representing an extension of the definitional challenges in the world of networks. Some suggest that the term 'network' itself implies emergent (Chisholm, 1998) and

that collaboration by its very nature is unable to be mandated (Hill, 2002), with others arguing to the contrary as evidenced in practice (McPherson et al., 2006).

Some authors use the terms formal and mandated, and informal and emergent interchangeably. Isett et al. (2011) define informal and formal networks as follows: "Formal networks are consciously created with some sort of binding agreement for participation, whereas informal networks are more organically derived—an outgrowth of organizational contingencies that multiple actors come together to address" (p. i162). Equating formal and mandated, and informal and emergent networks in this fashion can be somewhat problematic from a practice perspective. For example, McPherson et al. (2006) indicate that, in Canada, a number of inter-organizational child health networks have been consciously created and have had recognized, although perhaps not legally binding, agreements for participation. Some have been mandated by government; in other cases governments have simply encouraged networks, either directly or indirectly, but not required participation. The latter would align best with the descriptor 'formal' but not with the term mandated. Likewise, emergent networks may not always be informal. Once again the language surrounding the defining and/or differing characteristics of networks is neither consistent nor necessarily helpful. It may be useful to look beyond the labels and usual assumptions made about whether mandated versus emergent or formal versus informal is good or bad, to whether it matters, or matters in what ways?

It may be useful to look beyond the labels and usual assumptions made about whether mandated versus emergent or formal versus informal is good or bad, to whether it matters, or matters in what ways?

There appear to be pros and cons to emergent and mandated (i.e., usually by government) networks. Being mandated can provide a powerful incentive for organizations to work together. In practice these networks are often provided with additional resources and timelines to encourage the collaboration in the short term, resulting in earlier success than emergent networks (Networks Leadership Symposium, 2013). On the other hand, Carboni and Milward (2012) suggest that governments may not necessarily be attuned to the systemic risk they are creating by mandating networked forms of service delivery; if the network fails, the impact for clients can be catastrophic. Of even greater concern, researchers and practitioners alike have questioned whether "governments may now be using networks more as a mechanism to 'off-load' issues. That is, governments may now be mandating networks in order to be seen to be doing something to address a complex policy or service issue, but without any real commitment to resourcing or supporting the work of the network" (Networks Leadership Summit VII, 2013, p. 7). If mandated networks, then, are to be more than "a suboptimal solution to the failures of government policy" (Networks Leadership Summit VII, 2013, p. 7), the risks must be acknowledged and mitigated as much as possible through provision of essential resources and support. Part of this support entails allowing mandated networks enough time to build the trust and genuine commitment that is critical to longer-term network effectiveness (Provan & Lemaire, 2012).

"Are networks simply a way for governments to look like they are doing something, with no expectations that a network will have any success?"

(Networks Leadership Summit VII, 2013, p. 7)

Heffren, McDonald, Casebeer, & Wallsten (2003), in their evaluation of a mandated intersectoral collaboration involving education, social services and health, found that the effect of being mandated depended to a large degree on the pre-existing relationships among the organizational participants. When these were good and trusting, being mandated helped, because

it provided additional resources and permission. Where relationships were less optimal, one of two things happened: either the resources accompanying being mandated created new impetus to try to work better together, or being mandated further highlighted the lack of any genuine interest to collaborate.

Mechanisms based on a shared understanding among the actors, while necessary, will not be sufficient to move organizations from the appearance of, to true collaboration.

Rodriguez, Langley, Béland, and Denis (2007), in their comparative study of collaborative initiatives mandated by government as part of healthcare service delivery reform in Quebec, identify the challenge of moving organizations beyond the appearance of cooperation to genuine collaboration. They begin by indicating that, when not mandated, collaborative processes among organizations generally have two main features: 1) exchanges are voluntary; and 2) "the mode of regulation of exchanges between actors is the clan [i.e., network], which is a hybrid governance mode between the hierarchy and the market, which calls for the development of shared meaning between actors" (Rodriguez et al., 2007, p. 152). They questioned whether, when organizations may feel forced into relationships, regulation based only on mechanisms that rely on shared understanding would suffice in promoting genuine collaboration. Similar to Milward and Provan (1998), who suggest that organizations in a mandated network may actively work to undermine the network, Rodriguez et al. indicate that, when collaboration is mandated, organizations may behave as if they are collaborating but, in fact, be working to maintain their privileged positions behind the scenes. Mechanisms based on a shared understanding among the actors, while necessary, will not be sufficient to move organizations from the appearance of, to true collaboration. This means that a mandated network can spend enormous amounts of time on wasted efforts. To address this issue they suggest the use of multiple mechanisms, including both those relying on shared understanding and some more traditionally used in markets and hierarchies, such as incentives from markets and authoritative strategies (i.e., formalized rules and performance monitoring) from hierarchies, to foster interdependency and change the interest of participants (Rodriguez et al., 2007) toward true collaboration. The need to use tools from hierarchies in networks is discussed further in the section on network management in a recent article by Kelman, Hong and Turbitt (2013).

In our experience, while networks as structures can be mandated, successful relationships cannot simply be mandated. Instead a network culture must be established that facilitates and supports their development, which we term "the network way of working." We contend that, in any given network, there must be conscious thought given to the development of what the unique way of working is within that network; a way of working together that differentiates it from a traditional organization and begins to acculturate the members to the reciprocal relationship expectations, and the use of trust within those relationships as a lever for change.

A number of factors contributing to the development of strong network ties among individual organizations in non-mandated or emergent networks have been identified, and summarized recently by Provan and Lemaire (2012, p. 641):

- homophily (i.e., similarity based on size, reputation, service orientation, etc.);
- proximity (i.e., those physically close to each other form a tie);
- heterophily (i.e., being dissimilar in ways that might benefit from working together);
- the need to reduce dependence on others;
- having prior relationship experience; and
- the need to gain both legitimacy and access to key information and/or resources.

The knowledge of these factors, gained from emergent network research, has rarely been incorporated into the research on public networks, many of which are mandated. Provan and Lemaire (2012) go on to suggest that if a network is not performing as intended it may be due to a lack of understanding of how emergent relationships form and are strengthened and sustained over time.

Successful relationships cannot simply be mandated, but a network culture must be established that facilitates and supports their development.

In their examination of network scholarship in public administration, Isett et al. (2011) found that much of the literature focusses on formal or mandated networks, leaving emergent and informal networks underexplored and creating a gap between research and practice, a gap they believe is wider for informal than formal networks. While informal networks often emerge for the purpose of information sharing, the literature suggests they can also be useful mechanisms for other things such as problem solving, capacity building and service delivery (Isett et al., 2011). Understandably, by their very nature emergent and informal networks are more difficult to identify and thus to study. However, given the variety of their uses and their potential to increase our knowledge and understanding of formal inter-organizational networks, it is even more important to look across bodies of literature and begin to close the research practice gap about the value and effectiveness of informal networks.

In addition, Isett et al (2011) identified an increasing support in the literature for formalization of networks because this has the potential to increase the capacity of the network, move it beyond personal relationships and increase accountability. It also seems to be a common evolutionary trend in networks to see them emerge informally and then over time become more formal. It may be that in cases where a network begins informally and then becomes more formal or even mandated, there is little difference between the two.

In any case, a critical issue for practitioners to understand in regard to the longer-term effectiveness of a network, whether emergent or mandated, formal or informal, appears to be allowing time for trust and commitment to be built.

Network Types and Functions

Under the umbrella of collaborative networks, there are a variety of network types identified in the literature and described in more detail in Table 3 below. Milward and Provan (2006), in the IBM Center publication *A Manager's Guide to Choosing and Using Collaborative Networks*, outline four main network types:

- service implementation;
- information diffusion;
- problem solving; and
- community capacity building.

These are closely aligned with the four main types of networks described by McGuire (2006):

- informational;
- developmental;
- outreach; and
- action.

In both cases, these types of networks are delineated by the scope of activities undertaken within the network.

Huerta et al. (2006) indicate that networks can be classified in terms of both their activities and goals. They suggest that "network activities lie on a continuum between pure exploration and pure exploitation" (p. 12), with networks emphasizing knowledge development being on the exploration end of the continuum, and those focussed on leveraging resources being on the exploitation end. In relation to goals, Huerta et al. suggest that networks can be classified according to the type of goal, "with some focusing on conception and others on implementation" (p. 13). The exploration—exploitation classification continuum is also suggested by Feiock, Lee and Park (2012) in a discussion of coordination versus cooperation networks, both of which are viewed as types of collaborative networks, but with differing functions. Coordination networks are depicted as aligned with exploration and having the limited function of transmission of low risk information; cooperation networks are thought to involve mutual exploitation through the exchange of critical information. Of note is that the latter requires stronger ties and more trust and entails higher stakes (Feiock, et al., 2012).

The attempt to delineate network type by function highlights an issue in the literature on networks; that is, the significant overlap between the descriptions of network type and function. In the literature reviewed here, the term type and function were at times used interchangeably, causing confusion in the classification of networks. This overlap between network type and function resonates with what we know generally about the relationship between form and function. What is important is function, with the network type or form following function.

We acknowledge that many networks have multiple functions, although some might be primary functions and others secondary, and thus do not fall neatly into one type. Functions may also evolve over time to meet the changing needs of the network. Additionally, that which is viewed as a type of network in one context may be seen as a network function in another context. While this may seem overly academic, the purpose of classification is to begin to clarify what functions a given type of network performs.

A good example of the above classification/typology issue is depicted in an additional network type called collaborative governance (Ansell & Gash, 2008), which is described as "a governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets" (p. 544). This may include oversight of government contracts that provide funding to a network of organizations to deliver public programs (Provan & Lemaire, 2012). Vangen, Hayes and Cornforth (2014) delineate conceptually between 'collaborative governance' and 'governing collaborations', with the former being described as concerned with "governance *through* the formation of inter-organizational collaborations," the latter being concerned with the "governance *of* inter-organizational collaboration entities" (p. 7). Governing collaborations, then is the practice of the "governance, leadership and management of inter-organizational relationships" with the view to "achievement of collaborative advantage/joint collaboration level goal" (p. 3). While both are described as types of collaboration, the focus varies. Collaborative governance, a network type due to a singular focus in some contexts, may in other contexts be one of a number of functions or activities of another type of network (i.e., to govern collaboratively).

There are a variety of additional network types and functions, also summarized in Table 3, described by other authors including: knowledge exchange and generation; policy development; individual, organization and network learning; and innovation. Ultimately, classifying networks into different types is only useful in that it helps us distinguish among networks based on their primary function(s) and begins to provide a means for network practitioners to think about the purpose of their network. Precise delineation is neither necessary nor possible.

A more recent broad classification of network type is to distinguish between bright (overt) networks and dark (covert) networks. Dark networks are a type of collaborative network but for purposes that are illegal (Milward & Raab, 2006; Raab & Milward, 2003). As with bright or legal networks, which we tend to view as positive (Raab & Milward, 2003), dark networks may also vary in type or function; for example, criminal networks operating for greed or profit and insurgent networks out of grievance or ideology (Bakker et al., 2012; Hejnova, 2010). Additionally, while we often think of a dark network being a terrorist network such as Al Qaeda, it could also be a network such as the African National Congress fighting to rid South Africa of Apartheid. Hejnova (2010) underscores the issue of perspective and the value judgments inherent in classifying networks as light or dark, proposing yet another typology based on a network's goals (political or apolitical) and the environment in which the network resides (tolerant or hostile). Several authors suggest that the study of dark networks may lead to a better overall understanding of networks, and lessons can be learned about network success and failure that may be applicable to bright networks (Raab & Milward, 2003; Berry et al., 2004; Hejnova; 2010; Milward, forthcoming).

Finally, contributing to the confusion and problematic overlap in terminology, the functions of a network are also often intimately connected and, at times, described as desired outcomes of networks. For example, information sharing, knowledge creation and knowledge exchange all contribute to better problem solving, more effective service delivery and innovation. Yet, information sharing, knowledge creation, service delivery, innovation, etc. are also viewed as outcomes of networks. When, then, is 'information sharing' a type of network, a function of a

Table 3: Examples of network types and functions

Network type	Function
Information sharing, informational, information diffusion	Primary focus is on sharing information across organizational boundaries. A number of authors make a distinction between information sharing and knowledge exchange. (Isett et al., 2011; Mays & Scutchfield, 2010; McGuire, 2006; Milward & Provan, 2006; Huang, forthcoming)
Knowledge generation and exchange, knowledge management	Primary focus is the generation of new knowledge, as well as the spread of new ideas and practices between organizations. (Bell &. Zaheer, 2007; Carlsson, 2003; Hartley & Benington, 2006; Huerta et al., 2006; McGuire, 2006; Weber & Khademian, 2008; Phelps, Heidl, & Wadhwa, 2012)
Capacity building, social capital, outreach	Primary focus is on building social capital in community settings, and on improving the administrative capacity of the network members. (Isett et al., 2011; McGuire, 2006; Milward & Provan, 2006)
Individual, organizational, network and community learning	Primary focus here is learning, which overlaps both with knowledge exchange and capacity building. Knight and Pye (2005) describe network level learning. (Borgatti & Foster, 2003; Klijn et al, 2010; Knight, 2002; Knight & Pye, 2005; Schulz & Geithner, 2010)
Problem solving, complex issue management	Primary focus is on improving response to complex issues, and/or solving complex problems (where a solution is possible). Often emerges from an information diffusion or knowledge exchange network. (Isett et al., 2011; McGuire, 2006; Milward & Provan, 2006)
Effective service delivery, service implementation, service coordination, action	Primary focus is service delivery, where services are jointly produced by more than two organizations. Collaboration is often between programs in larger organizations. (Graddy & Chen, 2006; Isett et al., 2011; Mays & Scutchfield, 2010; McGuire, 2006; Milward & Provan, 2006)
Innovation	Primary focus is on creating an environment where diversity, collaboration and openness are promoted with the goal of enabling and diffusing innovation. (Borgatti & Foster, 2003; Hartley & Benington, 2006; Hoberecht et al., 2011; Keast et al., 2004; Thorgren, Wincent, & Örtqvist, 2009; Klijn et al., 2010; Turrini et al., 2010; Munoz & Lu, 2011)
Policy	Primary focus here is an interest in public decisions within a particular area of policy. The original conceptualization of policy networks concerned decision making about public resource allocation. (Isett et al., 2011; Mays & Scutchfield, 2010; Rethemeyer & Hatmaker, 2008)
Collaborative governance	Primary focus on direction, control and coordination of collective action between government agencies and non-public groups, including government funded initiatives or contracts. (Ansell & Gash, 2008; Provan & Lemaire, 2012; Vangen et al, 2014)

network, or an outcome of a network? For network practitioners, answering this question in context is important as it will impact the dimensions on which a given network might be evaluated.

While any of the functions above may have more or less prominence in a particular network, three of the functions - information diffusion and knowledge exchange, network learning, and innovation—are frequently described in the literature as being critical functions of networks and, as such, explored briefly here. These functions are intricately connected and the degree to which they are incorporated into a network may well be an indication of the network's effectiveness.

Function One: Information diffusion and knowledge exchange

The focus on information diffusion and knowledge exchange reflects the increasingly prevalent view that a major resource in the new economy is knowledge (Carlsson, 2003). As pressure to improve productivity and performance in public services increases, so does the "premium on the discovery, development and use of innovative services…and an emphasis on new knowledge and new technologies as the route to innovation and improvement" (Hartley & Benington, 2006, p. 101).

In this context, inter-organizational networks are increasingly seen as mechanisms for improving the spread of new ideas and practices (Hartley & Benington, 2006) and their ability to do so successfully is an indicator of network performance. An ultimate challenge for networks and network managers, then, has to do with both collectively generating new knowledge tailored to address the common problem, and ensuring that this new knowledge is actually used.

Hale's (2011) book *How Information Matters: Networks and Public Policy Innovation,* reviewed by LeRoux (2012) and Smith (2013), begins to address the issue of how to ensure information and knowledge is utilized. Hale studies the value of information networks among public and non-profit organizations to disseminate and institutionalize innovation and proposes a typology of "information positions", that may be present in a network, based on the level of member support for and engagement with a policy innovation (LeRoux, 2012; Smith 2013). Assuming these positions (i.e., "champion, supporter, bystander, or challenger" [LeRoux, 2012, p. 1110]) are present and/or changeable depending on the issue, it would seem that strategic use of network members and their connections could be made to promote information sharing, institutionalization of best practices or implementation of an innovation. Hale's book supports the position that linkages between public and non-profit organizations, "expand the capacity of government to solve challenging public problems" (Smith, 2013, p. 216) and, therefore, the clients they serve (LeRoux, 2012).

Research on knowledge sharing (Hartley & Benington, 2006) suggests knowledge is not simply "transferred" from one context to another, but rather continuously reviewed as it is taken into different settings, or rediscovered in relation to new purposes or alongside existing 'old' knowledge. This fits with the idea that "knowing is doing" (Pfeffer & Sutton, 2000) and that knowledge exchange is not only practical, but occurs collectively in real time and involves continual iterations of knowing and acting in a variety of practice settings (Lindstrom, 2006). It implies that adaptation versus simple adoption is central to knowledge exchange, with innovation occurring in response to the evolving knowledge context, and that knowledge is socially mediated information (Weber & Khademian, 2008). Information in networks, then, is socially mediated by the members of the network as they receive information and help determine how it is framed, understood and collectively mobilized toward a mutual network goal—in other words, turned into useful knowledge.

Additionally, inter-organizational networks, because of their focus on developing trusting relationships and joint problem solving, are often seen as having greater capacity to share and mobilize tacit knowledge; that is, informal knowledge that is commonly viewed as "harder to share because is consists both of mental models and metaphors, intuitions and 'know-how'" (Hartley & Benington, 2006, p. 103). Tacit, emergent knowledge is beyond the grasp of others who do not have the same intimate familiarity in that context (Flyvbjerg, 2001; Schram, 2012). Each participant in a network will bring their own practice based knowledge of the problem or issue; "such hard-won knowledge is difficult to share or send and difficult to receive" (Weber & Khademian, 2008, p. 339).

Exchanging this kind of knowledge requires the relational context that networks can provide and, in turn, tacit knowledge can become a more tangible commodity helping the diffusion and acceleration of innovation within the network. For example, sharing knowledge gained through practice experience can be both broadened and accelerated when a network supports cross organizational or inter-professional service delivery teams that afford an opportunity for service providers to work more closely together than possible in their usual practice. However, sharing tacit knowledge takes time and effort, thus requiring higher motivation to do so—the necessary motivation is more evident when there are strong ties among network members (Huang, forthcoming). Network managers interested in promoting practice innovation through knowledge sharing need to understand that "strong ties enhance the likelihood of information sharing" (Huang, forthcoming, p. 8), and consequently they need to create opportunities for those ties to develop.

Barriers and enablers to knowledge generation and exchange in inter-organizational networks described in the literature include: the features of organizations that enable them to recognize, communicate, or use new knowledge; features of the knowledge exchange process; and the nature of the policy context (Hartley & Benington, 2006). We would add that features related to power and politics within a network can also impact knowledge exchange. How power is wielded via roles, interests and professions can affect the ways in which knowledge is shared (or not) across inter-organizational networks. For example, Huang (forthcoming) describes the problematic roll out of the website related to the launch of the Affordable Care Act as an illustration of how "knowledge hoarding" in order to avoid blame in a service implementation network made a bad situation even worse.

Network managers, then, must create the conditions necessary to fertilize new thinking and practice by actively nurturing a network culture that addresses competing interests, politics and power differentials; and that promotes trusting relationships, curiosity, conscious interest in gaining different perspectives, and respect for diversity of views among organizations (Hartley & Benington, 2006).

Function Two: Network learning

Closely linked to knowledge creation and exchange, learning is inherent in networks by the very fact that networks are established to learn how to solve problems that single organizations cannot, through information sharing and collaboration. What, then, is network learning? To begin with, learning can be considered to be one of a number of 'dynamic capabilities' (Eisenhardt & Martin, 2000) of a network; in other words, one of the resources internal to a network that it can use to advance its goals. The more internal capacity a network has to learn, the more likely it is to create new information and knowledge that will allow it to innovate (Casebeer, Reay, Dewald, & Pablo, 2010). As well, the network's 'absorptive capacity' (Lane, Koka, & Pathak, 2006), or ability to draw knowledge and learn from outside the organizational or network boundaries, will also influence its potential to "acquire, assimilate, transform and exploit knowledge" (Zahra & George, 2002, p. 186).

The concepts of individual, group and organizational learning are well established and much of what we know about them is relevant to networks (Knight & Pye, 2005). Organizational learning, for example, has been described as more than the sum of learning done by individuals; but as being about people within an organization learning together to achieve a common goal (Stoyko, 2001), and as a process that links the gaining of knowledge with improved performance (Montgomery, 1996; Nelson, Raskind-Hood, Galvin, Essien, & Levine, 1999). However, a fourth level of learning has also been identified—inter-organizational network learning (Engeström & Kerosuo, 2007; Knight, 2002; Knight & Pye, 2005). Knight (2002) defines network learning as "learning by a group of organizations as a group" (p. 427). Network learning, then, is described as a kind of system level learning, which is distinct from learning by individuals or organizations in a network context. That is not to suggest that learning unique to the individual or organization is unimportant to a network, but instead to suggest that network learning may also be required to advance collective knowledge and network goals. Indeed, Schulz and Geithner (2010) suggest network level learning is a prerequisite to organizational learning and change. Network learning outcomes are envisioned as impacting three types of network level properties—network practices; network interpretations; and network structures (Knight & Pye, 2005). These network learning impacts seem to be in keeping with what was described earlier as the way in which information is socially mediated.

While both types of learning (i.e., network member learning in the network context and network level learning) are acknowledged as important, much of the research to date has focussed on the network as a context for learning, rather than on the whole network as learner. Leach, Weible, Vince, Siddiki, and Calanni (2014), in studying marine aquaculture partnerships, found that individual learning is a frequent outcome of collaboration and that, while this learning is influenced by both individual and partnership traits, the most significant influence on learning came from the partnership level traits of trust and fairness. Leach et al. conclude that "partnership conveners who want to promote learning should devote adequate time and resources to cultivating interpersonal trust and procedural fairness," and that future research might explore "the underlying mechanisms by which trust and fairness aid learning" (p. 611). It is also important to note that, in reality, learning is often multi-directional and difficult to attribute to a particular set of actors or a singular level within an inter-organizational network.

Function Three: Innovation

Innovation is a somewhat elusive concept "…which remains a contentious and highly debated term."

(Casebeer et al., 2010, p. 251)

Innovation is an important function of networks because it is critical to addressing complex problems (Keast et al., 2004; Provan & Huang, 2012), and the "capacity of the network to innovate and change given conditions" has been linked to network effectiveness (Turrini, Christofoli, Frosini & Nasi, 2010, p. 533). There are a variety of definitions of innovation, but most include the notions of innovation as both products and/or processes and of being either radical and/or incremental in nature. Innovation can be derived from existing knowledge (adoption) or generated through new creative action (origination) (Kuhn, 1985; Conference Board of Canada, 2013). As noted earlier the functions of knowledge exchange, learning and innovation are intricately connected, in that learning and knowledge exchange contribute to innovation, with tacit knowledge exchange being particularly valuable. In stable conditions, learning tends to be a narrowing and converging process of testing, whereas in chaotic conditions it is a process of expansion, divergence and discovery, thus setting the stage for innovation (Carlisle & McMillan, 2006).

Given that inter-organizational networks are formed in the context of complex problems and challenging environments rather than stable conditions, networks are well suited to encourage, capture and share innovations.

Other factors thought to stimulate innovation in networks include: a larger number of network members as this brings additional opportunities, resources, and products (Thorgren et al., 2009); a diversity of network members that bring in differing perspectives and encourage creative conflict, at least up to a point (Provan & Kenis 2008); a network environment that provides opportunities to work through disagreements (Reay, Goodrick, Casebeer, & Hinings, 2012); a bottom-up formation process as it tends to strengthen member commitment and motivation for change (Thorgren et al., 2009); and a large administrative function that can analyze network strengths and weaknesses, coordinate network activities, and foster communication, transparency and engagement (Human & Provan, 2000).

> *"How do you help networks cope with some of the side effects of innovation?"*
>
> (Networks Leadership Symposium, 2013, p. 17)

Two cautionary notes sounded about innovation are that when innovation occurs it may replace something else also thought to be of value, and that there can be unintended consequences or "side effects of innovation" for a network (Networks Leadership Symposium, 2013, Networks Leadership Summit VII, 2013). The suggestion was that networks should be careful not to lose their essence through unbridled embracing of innovation. However, "the lesson is not to avoid the policy window, but to enter it carefully while realistically assessing the possible ramifications on the network, both positive and negative" (Networks Leadership Summit VII, 2013, p. 7). Since "value is socially created" a network manager must ensure that network members see that the "creation is…greater than [the] destruction" and that the risk to internal legitimacy is worth the added value that adopting the innovation will bring to external legitimacy (Networks Leadership Symposium, 2013, p. 17). Fundamentally, networks should act on innovation windows that are not only opportunistic, but most likely to contribute to desired network goals.

More research and practice experience with networks are required to capture innovation pathways leading to improved network performance and value. The same is true for enhancing our understanding of the roles that knowledge creation, exchange and mobilization play within network contexts, and just how and what kinds of approaches are best suited to supporting network learning.

This discussion of just three network functions begins to elucidate a number of things for network practitioners to consider, including the importance of network composition, and the care and active role that network managers must take in establishing the network culture that will support desired network functions.

Network Governance, Leadership and Management, and Structure

Although not without challenges, working in networks can also be very rewarding and, as noted previously, is often necessary to address the critical issues facing society. Given this, what factors need to be considered to maximize the rewards and mitigate the challenges? Is there a way of working unique to networks and, if so, what does it entail? Three key interlocking themes related to effective network implementation discussed in the literature that begin to answer these questions are network governance, management and leadership of and in networks, and network structures.

Network Governance

As discussed earlier, networks are often described as a response to the failure of other kinds of governance structures (e.g., markets, hierarchies). We may have some understanding of why networks can be a better mode of governance, but little of how networks themselves are governed (Provan et al., 2007). Provan and Kenis (2008) describe network governance as "the use of institutions and structures of authority and collaboration to allocate resources and to coordinate and control joint action across the network as a whole" (p. 230).

As very often networks are not legal entities, the legal imperative for governance is not always present in the way it is for organizations. In addition, "some people have the view that you cannot govern networks, that in trying to do so you will destroy everything that is good about them" (Networks Leadership Symposium, 2013, p. 10). However, adequate network governance is seen as necessary to network effectiveness in that it ensures "that participants engage in collective and mutually supportive action, that conflict is addressed, and that network resources are acquired and utilized efficiently and effectively" (Provan & Kenis, 2008, p. 230). The chosen network governance structure contributes to and overlaps with network management and leadership.

A typology of network governance proposed by Provan and Kenis (2008), and widely referred to in the public administration literature on networks, is described as an important contributing factor to network effectiveness (Milward & Provan, 2006; Milward, Provan, Fish, Isett, & Huang, 2010; Provan & Kenis, 2008; Provan & Lemaire, 2012). The typology identifies three distinct types of governance structures within networks (Milward & Provan, 2006; Milward et al., 2010; Provan & Kenis, 2008):

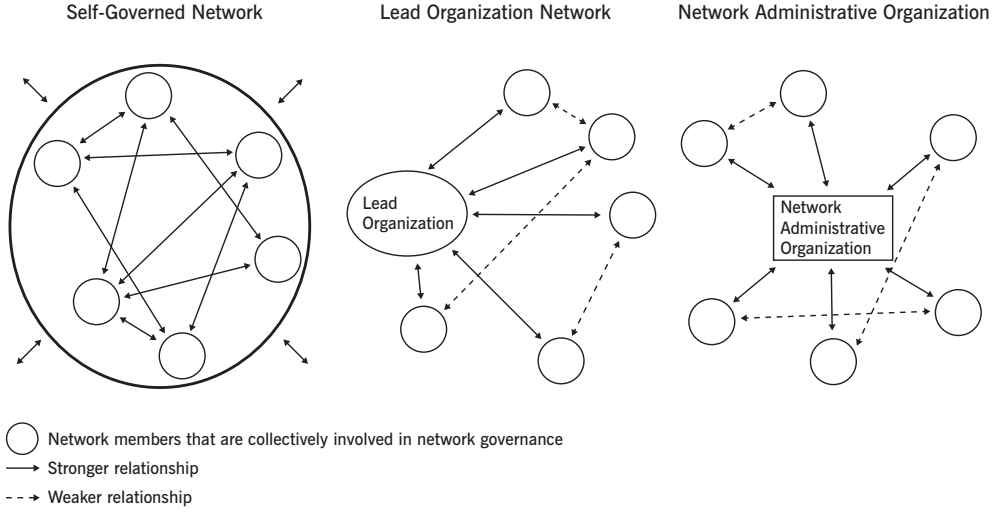
- shared governance;
- lead organization; and
- network administration organization.

Recently there has been recognition that sometimes the governance model used in practice is a hybrid of more than one of these three "pure" types (Lemaire, Provan, & Milward, 2010; Provan & Lemaire, 2012), which are described below in Table 4 and depicted in Figure 1.

Table 4: Network governance

Governance type	Description	Author(s)
Shared governance, consensual	All participants contribute to the management of and leadership in the network. There is no formal administrative entity.	Milward & Provan, 2006; Provan & Kenis, 2008
Lead agency	The network manager and administrative entity is one of the key network members.	Milward & Provan, 2006; Provan & Kenis, 2008
Network administrative organization	A separate administrative entity is established to manage the network, and a manager hired.	Milward & Provan, 2006; Provan & Kenis, 2008

Figure 1: Modes of network governance



Source: Provan & Kenis, 2008

Empirical research on inter-organizational networks is in its infancy in that there are about 120 years of research on organizations and only about 30 on networks; however, research done to date suggests the following:

- Networks in the private sector are more likely to have a shared governance model than networks in the health and human services domain, which are more likely to have either a lead organization or, more often, a network administrative organization model (Provan et al., 2007).
- A fundamental challenge with governance of any network is that the needs and activities of multiple organizations often require accommodation and coordination (Provan & Kenis, 2008).
- Factors such as network size and the degrees of trust among members influence which form is going to be most appropriate, and ensuring that managers make a conscious choice is critical for matching the best governance form to the context (Bryson et al., 2006; Milward & Provan, 2006; Provan & Kenis, 2008).
- The governance model selected needs to be able to balance power and authority and, given the importance of informal power, also be able to support new modes of leadership that rely on the role of the facilitator or broker (Hoberecht et al., 2011; Keast et al., 2004).

- Shared governance is generally acknowledged to be challenging, if not impossible, when there are a larger number of organizations involved in a network (i.e., generally more than five or six) (Provan & Lemaire, 2012).
- Formal governance mechanisms (e.g., contracts) can be complementary to inter-organizational trust, which appears to be critical in public networks (Provan & Lemaire, 2012).
- A benefit of designing more formal networks is that a diversity of representation can be built into the design. In more informal networks, high degrees of homophily (birds of a feather) tend to be exhibited (i.e., formalizing networks may provide an opportunity to give voice to more perspectives) (Isett et al., 2011).
- The role of management is critical for effective network governance, especially regarding the handling of tensions inherent in each governance form. For a network administrative organization to be effective, network level staff must develop the skills needed for network level action; this is often a challenge due to significant resource constraints (Provan & Kenis, 2008).
- The form of network governance adopted, and the management of tensions related to that form are critical for explaining network effectiveness (Provan & Kenis, 2008).

Clearly it is important to have a good fit between a particular network and the governance type chosen in order to optimize network effectiveness. Features of the network to take into consideration when planning the governance structure include the:

- distribution of trust;
- number of participants;
- existence of goal consensus; and
- need for network level competencies (see Table 5 below).

In general, Provan and Kenis (2008) argue that:

> as trust becomes less densely distributed throughout the network, as the number of participants gets larger, as network goal consensus declines, and as the need for network-level competencies increases, brokered forms of network governance, like lead organization and network administrative organization, are likely to become more effective than shared-governance networks. (p. 237)

Table 5: Key predictors of a good fit between a network and a governance structure

Governance structure	Distribution of trust	Number of participants	Goal consensus	Need for network level competencies*	Decision making
Shared governance	Widely distributed	Few (i.e., < 6-8)	High	Low	Decentralized
Lead organization	Narrowly distributed, occurring differentially within individual dyads or cliques	Moderate Number	Moderately low	Moderate	Centralized
Network administrative organization	Moderately distributed, NAO monitored by members	Moderate to many	Moderately high	High	Mixed

Adapted from: Milward & Provan, 2006; Provan & Kenis, 2008

* Examples of network level competencies could include: quality monitoring; building legitimacy; bridging; negotiation; advocating

The availability of resources will also influence the governance structure. For example, developing a stand-alone network administrative organization will take more resources than a shared governance model. Thus there may need to be a compromise between the preferred model and what can realistically be afforded.

The governance structure of a network often evolves over time, and particularly so in emergent networks where it is common to begin with a shared governance structure and then, as the network grows, move to a more formalized governance structure. An important initial task for network leaders and managers is to determine which governance structure is a good fit for a particular network at this time, with the aim of optimizing network success (Milward & Provan, 2006). In the longer term, network leaders and managers need to be sensitive to the changing context and needs of the network, and ready and willing to adapt the governance structure as necessary at any point along the way. No matter which governance model is chosen, it is important that it be adequately resourced if its effectiveness is to be maximized because networks have a finite carrying capacity. For example, a network that performs brilliantly with 3,000 clients may fail if given 6,000.

Leadership and Management of and in Networks

The management and leadership of and in networks is widely described as being challenging (Huxham & Vangen, 2005; Keast et al., 2004; Klijn et al., 2010; McGuire, 2006; Milward & Provan, 2006; Provan & Lemaire, 2012; Saz-Carranza & Ospina, 2011; Weber & Khademian, 2008). The nature of collaborative networks means that there cannot be heavy, centrally directed control. This does not mean there should be no direction or control, but that there needs to be a balance between providing direction and letting things emerge.

Network structures and processes interact in collaborations (Bryson et al., 2006), with the aim being the creation of an environment that allows for the innovations needed to deal with complex problems (Keast et al., 2004; Uhl-Bien & Marion, 2009; Wheatley & Frieze, 2011). The literature suggests that there is a key role for network managers and leaders to establish a foundation upon which network participants can operate, maintaining the flexibility and resiliency needed to accomplish network level tasks (Keast et al., 2004; Provan & Huang, 2012).

Management and leadership often overlap, and the literature reviewed here is often unclear in its use of both terms. The degree to which leadership is a function of effective network management or a process or activity separate from management was also debated among the authors of this review. While acknowledging this, we attempt to help elucidate both, discussing leadership first and then management.

Leadership in networks

> *"The research question that is the 800 lb. gorilla in the room remains largely unaddressed: What is leadership in multi-actor settings?"*
>
> (Silvia & McGuire, 2010, p. 264)

Keast et al. (2004) depict network structures as different from most traditional organizational structures in that there is no chain of command. Although some members of a network, as in other organizational forms, may have more formal power due to position, professional education and training, resources or political clout, this power cannot be wielded unilaterally the way we generally believe it can be in a traditional hierarchy. "In addition, informal power based on interpersonal relations can be more important than formal power. This means that new modes of leadership that rely on the role of the facilitator or broker are needed" (Keast et al., 2004, p. 365).

In their research focussed on public sector leaders, Silvia and McGuire (2010) attempt to tackle the assumption that network leadership, or leadership in multi-actor settings, is different than leadership in single agency contexts. They argue that, while conceptually it makes sense that multi-actor, or what they term as "integrative leadership" (Silvia & McGuire, 2010, p. 265) would be different, the supporting evidence is scarce. Consequently, Silvia and McGuire attempted to identify and define the behaviours that public managers displayed in their roles as network leaders, and then subsequently compare these behaviours to those displayed by the same public managers in their home organizations to see if there were differences. They found the following behaviours, in order of frequency displayed, to be hallmarks of effective network leadership: "treating all network members as equal", "freely sharing information amongst network members" as opposed to withholding or stifling information flow, "creating trust amongst network members", and "encouraging support from and keeping the network in good standing" with external stakeholders (Silvia & McGuire, 2010, pp. 270–271). Furthermore, significant differences in leadership behaviours were found by the same managers when leading in their home agency. Overall, when leading in the network context, managers displayed a higher proportion of people oriented behaviours while, when leading in a single agency context, they displayed more task oriented behaviours (Silvia & McGuire, 2010). These results direct our attention to what makes effective network management different than leadership in effective organizations.

Wheatley and Frieze (2011) assert that to be effective leaders in a collaborative network, managers need to view their role as "leader as host" rather than "leader as hero", and go on to describe the following characteristics of leaders as hosts:

- They realize problems are complex and that, in order to understand the full complexity of any issue, all parts of the network need to be invited to participate and contribute;
- They trust in other people's creativity and commitment to get the work done;
- They know that people support those things they have played a part in creating;
- They extend sincere invitations, ask good questions, and have the courage to support risk-taking; and
- They invest in meaningful conversations among people from across the network, realizing this is the most productive way to engender new insights and possibilities for action.

Whether or not they are correct in this assertion, the concept of leader as host resonates with the concepts of servant leadership and stewardship, which are discussed in the context of both complex adaptive systems and community development. The Greenleaf Centre for Servant Leadership (n.d.) describes the servant leader as follows:

> The servant-leader *is* servant first… It begins with the natural feeling that one wants to serve, to serve *first*. Then conscious choice brings one to aspire to lead. That person is sharply different from one who is *leader* first, perhaps because of the need to assuage an unusual power drive or to acquire material possessions…The leader-first and the servant-first are two extreme types. Between them there are shadings and blends that are part of the infinite variety of human nature.

The basic premise inherent in servant leadership is that leaders put the needs of their followers ahead of their own needs, trying to make sure that other people's highest priority needs are being served. Servant leadership and the concept of stewardship are closely related. Stewardship is defined as "the choice to preside over the orderly distribution of power" (Block, 1993, p. xx). This means giving all people in an organization choice over how to contribute to the well-being of the larger organization; it is about accountability without control or compliance. It means moving from a boss-subordinate relationship to a peer-to-peer relationship. The

concepts of leader as host, servant, or steward should be viewed as aspirational by network practitioners and, given the paucity of research on network leadership, this is an area where network leaders can try out these concepts of leadership to see if they are effective in their networks.

The study of leadership in either a network or organizational context reinforces the point that it is people who collaborate, not organizations or networks. O'Leary, Choi and Gerard (2012) explored the perspective of federal executives on the skill set required for an effective collaborator. The researchers identified seven dimensions or competencies from the literature on collaboration and then surveyed executives as to which were most important. The most frequently mentioned were "individual attributes and interpersonal skills…followed by group process skills, strategic leadership skills, and substantive/technical expertise" (p. 570); in general what they describe as "enablement skills" (p. 581). O'Leary et al. were initially surprised at how high individual attributes and interpersonal skills ranked. While acknowledging they may have attracted primarily the "believers" in collaboration, O'Leary et al. suggest the many comments provided by respondents, such as the one below, provided an explanation for this finding:

> A successful collaborator has to be concerned not only with his or her own interests, but the interests of others. They must recognize the benefits of synergy and the great ideas it produces. That means recognizing no one individual has all the best ideas… When you respect someone enough to involve them and seek out their opinions, you help create mutual respect….(p. 579)

Mays and Scutchfield (2010) describe the importance of leadership in their overview of partnerships in population health:

> Beyond incentives, successful partnerships are likely to require changes in organizational culture, values, and strategy that can be achieved only through strong organizational leadership. Partnerships require leaders who can elucidate the participation incentives and constraints faced by individual organizations and identify shared objectives and compatible interests. Collaborative leadership can reveal the potential gains from partnerships and help organizations commit to difficult but beneficial public health actions that cannot be accomplished through independent endeavors. (p. 6)

Metzger, Alexander, and Weiner (2005) indicate that:

> the ability to lead through vision is a key competency of coalition leadership. Effective leaders are able both to successfully guide creation of a vision and to use the resulting vision strategically...Collaborative, open, and explicit decision making processes serve to allow broad input into vision creation and adoption...Results suggest that vision consensus critically influences how people view the value of what they are putting into and getting out of the coalition. (p. 469)

They argue that an empowering, participatory leadership style, along with collaborative decision making processes, fosters a sense of shared purpose and network member participation.

Holley (2012) describes network leadership as drawing on "…the natural leadership capacity that exists in all of us", and goes on to say that, "Network leadership is something we do and learn together" (p. 28). She depicts leadership in networks as network weaving and encourages all those involved in a network to view themselves as network weavers and thus as network leaders. Four leadership roles are identified for network weavers including (Holley, 2012):

- **connector catalyst**: connecting people and helping to get the network started;
- **project coordinator**: helping network members with their self-organized projects of interest;
- **network facilitator**: helping with ongoing development of network structures, activities and relationships; and
- **network guardian**: putting in place systems such as communications, training and resources to help the network as a whole function effectively.

Leading networks through any of the models or metaphors described is not an easy task, and there is no strong research evidence base supporting any of these paradigms. What we can say with some assurance is that influence, use of process and consensus building rather than authority become the main agents of change, and this means that leadership in networks can be considerably more nuanced and subtle than in traditional hierarchies. While such leadership may sound like less work, it may in fact be more work, or frequently different work, than in traditional leadership roles. Using the leader-as-host metaphor, there is a lot of work that needs to be done in advance if you want to host a successful party. To this point, Wheatley and Frieze (2011) clarify that leaders-as-hosts do not just benevolently let go and trust that people will do good work entirely on their own, in part because people are often used to being told what to do. Consequently, they indicate there is a great deal of work for hosting leaders to do in shaping the conditions for a successful outcome, including:

- Providing good conditions and group processes for people to work collaboratively;
- Creating opportunities for people and the network to learn from experience;
- Keeping the bureaucracy(s) at bay by creating enclaves where people are less encumbered by bureaucratic requirements;
- Playing defense with network participants who may be used to playing a more traditional leadership role, and who want to take control;
- Reflecting back to network participants on a regular basis what they are accomplishing and how far they have come;
- Working with people to develop relevant measures of progress in order to make achievements visible; and
- Valuing true esprit de corps, the spirit that arises in any group that accomplishes challenging work together.

While we are not necessarily able to equate the above descriptions and discussions with effective network leadership, they are grounded in practice experience (i.e., the network way of working) and align with complexity and relational leadership approaches often viewed by practitioners as relevant to networks. Complexity leadership suggests leadership processes can be shared, distributed, collective, relational, dynamic, emergent and adaptive (Uhl-Bien & Marion, 2009) and leadership is viewed as "multi-level, processual, contextual, and interactive" (p. 631). A relational view of leadership "elevates attention to processes and context" and orients leadership to "enhancing relationships among individuals or organizations" (Quick, 2014, p. 542). In *Advancing Relational Leadership Research*, editors Uhl-Bien and Ospina attempt to lay out the difference between relational leadership and traditional leadership, the latter typically focussed on the characteristics of the leader, and suggest relational leadership is particularly suited to collaboration and management across organizational boundaries (Quick, 2014).

Finally, another issue in network leadership, based on our practice experience, is related to the individuals involved in inter-organizational networks on behalf of their respective organizations and to their position as leaders in their home organizations.

- Firstly, if they are not recognized leaders in their home organization, it may be a signal about the importance of the network in that particular organization or the scale of the work of the network in relation to the larger organizational mandate. For example, if child health is only a small fraction of the work of a large health care organization, it may not be viewed as essential to have a senior leader representing the organization in a network aimed at improving child health.
- Secondly, if network members are recognized leaders in their home organization, they may well be used to being in charge and may require acculturation to the network context.

Aside from recognizing the advanced skills and day-to-day senior roles of network members and providing opportunities for them to play a lead role in various network initiatives, this entails helping organizational leaders understand the differences between leading in hierarchies versus networks and, if need be, develop the corresponding new competencies. The challenge then is to ensure that leaders from within specific organizations begin to assume leadership for the network, but in a way that is in keeping with the collaborative network context. As such, it is important to model a more collaborative leadership style with the aim of diffusing some of the command and control behaviours endemic in many organizations. Ultimately, in networks where organizational representation may come from varied levels and where client groups may be included, being a good network leader means making all participants feel welcomed and valued regardless of their relative organizational position or stature.

Management of networks

There are varied definitions of network management in the literature and, again, there is often crossover with leadership and governance terminology. Hibbert, Huxham and Ring (2008) describe network management as:

> a series of processes undertaken by a team of individuals, with various skills and capabilities, that are focused on defining both the direction to be taken by an inter-organizational entity and the allocation and implementation of resources towards those ends. (p. 391)

Network management is also defined as "the use of social ''tools'' to steer social processes toward some set of goals or away from stagnation and ''blockage'' through joint problem solving" (Rethemeyer & Hatmaker, 2008, p. 630), and "the deliberate attempt to govern processes in networks" (Klijn et al., 2010, p. 1065).

"The role of the network manager is to understand what people need to get from the network and ensure they get what they need. You have to find out what the gives and gets are or the people will drop off."

(Networks Leadership Summit IV, 2009, p. 13)

In choosing the term network orchestration, Paquin and Howard-Grenville (2013) attempt to capture both the activities and processes involved in assembling and managing a network through its varying developmental phases. The activities required of the network orchestrator shift in response to the need to create and demonstrate the added value of the network to various stakeholders over time; for example, from enabling serendipity early on to more deliberately directing ties.

All of these definitions include a focus on the intentional use of processes toward particular ends and depict network management as a highly conscious activity. This is to be expected in that networks are still, as has been noted, a relatively new organizational form without the depth of management history held by traditional organizations where, irrespective of their effectiveness, many management functions may seem to be second nature to managers.

In an important article entitled "Big Questions in Public Network Management Research," Agranoff and McGuire (2001) argue that network management is in need of a knowledge base that is equivalent to that which exists for the paradigm of hierarchical, bureaucratic management. More specifically, based on their review of the network management literature, they propose four essential network management tasks:

- activating,
- framing,
- mobilizing and
- synthesizing.

Not all authors agree with the need for a separate network management knowledge base. Kelman et al. (2013) argue that there is little difference between effective management practices in collaborations and those that would be effective in single organizational settings. They suggest that "being a good collaboration manager involves *good management period*" (p. 609) and that collaborations may underestimate the existing management tools available to them. Their study explored network performance in relation to the use of ten management practices, half typically used in hierarchies, such as monitoring follow through on commitments, dealing with "blockages" and use of performance measures, which they framed as "hierarchy-light"; and half generally seen as aligned with collaborative management, such as building trust, visionary leadership and encouraging collaborative behaviours. One could debate the placement of the particular practices into one or other of the two categories and Kelman et al. do acknowledge they are not necessarily mutually exclusive. Placement was determined through interviews with managers of network administrative organizations about their work, and by the location of the practice within the literature on collaboration or hierarchies; for example, they describe visionary leadership as "still icing on the hierarchical cake" and note that performance measurement, while receiving attention in the literature on collaboration, "appears as a control technique in classical hierarchy literature" (p. 615). Kelman et al. found that improved network performance was related to the use of hierarchy-light/general management practices, but only when conditions were favourable. When conditions were unfavourable, such as political instability, multiple layers of government involved, confounding population demographics, or lower levels of social trust in the community as depicted by high population diversity, neither set of management practices improved performance. Kelman et al. conclude that "in situations where it makes sense to have collaboration, managers should prioritize hierarchy-light practices" (p. 624). This finding may be due to the fact that the study only included networks that were government mandated and supported and managed by a network administrative organization, and thus on a continuum of networks to organizations, would be very close to the organization side.

In keeping with Kelman et al., Fountain (2013) indicates that there are many similarities between managing within an agency and in cross agency collaborations, and that the horizontal management tools or skills typically associated with collaboration, such as negotiation and persuasion, are "necessary but not sufficient" (p. 18) in managing cross agency collaborations. Effective collaborative management, or indeed effective management, she contends, in addition to critical interpersonal skills requires "rigorous, systematic management systems and processes" (p. 18), including performance management and the use of authority, presumably more aligned with managing in a hierarchy. An effective collaborative manager, then, must have expertise in both relationship building and process management (Fountain, 2013).

The above discussion, to some degree, positions managing networks and hierarchies as being on a managerial practice continuum, this in itself a matter of debate in both practice and research. As well, while it gives network managers permission or freedom to use management

techniques typically associated with hierarchies, it raises the question of whether there is a tipping point for the use of hierarchical management techniques within a network; that is, a point at which the collaborative culture would be significantly compromised by prioritizing hierarchical strategies. The view that part of good network management entails deliberately using and highlighting practices that differ from hierarchies has been a point of discussion among practitioners and researchers in a series of meetings on network leadership (Networks Leadership Summit IV, 2009: Networks Leadership Summit VII; 2013; Networks Leadership Symposium, 2013), with the practice tendency being to reject all things hierarchical in an effort to establish a network culture that is seen as significantly different, thereby setting the stage for new 'network' behaviours.

"Is the network really 'managed' by anybody, let alone a specific, identifiable network manager"?

(Berry et al., 2004, p. 548)

One might argue that any attempt to establish a prescribed set of tasks for management of networks may be antithetical to the very nature of networks, less structured entities than organizations, particularly those networks that are more informal or emergent. Berry et al. (2004), for example, raise the question of whether networks can be managed at all. However, Milward and Provan (2006), similar to Agranoff and McGuire (2001), also identified key tasks for network managers. They first describe the overarching role of a network manager as being to increase the stock of trust and reciprocity in the network. Within that context they identify a number of key management [of network] tasks and behaviours (i.e., management of accountability, legitimacy, conflict, design and commitment) and argue that it is important for managers to have a good understanding of the purpose and functions of a network before they can manage it effectively (Milward & Provan, 2006). Additionally, Turrini et al. (2010) identify a number of concepts, which they found to be common in the literature on network effectiveness, as core competencies required for managers to be successful in network environments. They state, "'buffering instability/nurturing stability' or 'steering the network' are some umbrella concepts that capture what actions (and competencies) public managers should develop in order to be successful in networked situations" (pp. 545-46). Buffering and nurturing are viewed as aligned with the softer roles of facilitator or mediator, while steering is described as being more oriented to stronger direction setting and leadership. McGuire (2006) also describes the importance of matching management behaviours with the network environment, noting that effective managers are those most able to be responsive to the changing context. The tasks that are of most importance will flow from the network purpose and functions.

Some essential network management, and potentially leadership, tasks and behaviours identified through the literature are summarized below in Table 6, building on the work of Agranoff and McGuire (2001) and Milward and Provan (2006). A number of these tasks have already been noted in previous sections of this report, most notably in the section on leadership, and others are discussed following the table. While there is some overlap in the descriptions, it is still useful from a practice perspective to begin to delineate the tasks.

Table 6: Management tasks and behaviours in collaborative non-profit, public networks*

Network management task or behaviour	Description
Framing	Facilitating agreement on the operating rules of the network, including its prevailing values and norms; developing a shared vision; helping establish an identity and culture for the network; helping establish a working structure for the network. (Agranoff & McGuire, 2001; Bryson et al., 2006; Hoberecht et al., 2011; Klijn et al., 2010; McGuire, 2002; McGuire, 2006; Saz-Carranza & Ospina, 2011)
Activation; construction of the right community	The identification and incorporation of the right mix of people or organizations to achieve program goals, as well as ongoing building of member capacity. (Agranoff & McGuire, 2001; McGuire, 2002; McGuire, 2006; Saz-Carranza & Ospina, 2011)
Management of design/governance structure	Selecting a governance structure that is likely to work most effectively for the network, and then ensuring that the structure evolves appropriately with the network. (McPherson et al., 2006; Milward & Provan, 2006; Provan & Kenis, 2008; Provan & Lemaire, 2012)
Creating and supporting participatory leadership	Building leadership for collaborative advantage; providing opportunities for distributed or shared leadership; developing consensus on vision; using influence; creating a welcoming culture; etc. (Bryson et al., 2006; Huxham & Vangen, 2005; Keast et al., 2004; Uhl-Bien & Marion, 2009; Wheatley & Frieze, 2011)
Synthesizing, facilitating, involving, arranging, connecting	Creating the environment for productive interaction among network participants. Organizing interactions; facilitating relationships in order to build trust. (Agranoff & McGuire, 2001; Bryson et al., 2006; Hoberecht et al., 2011; Huxham & Vangen, 2005; Klijn et al., 2010; McGuire, 2002; McGuire, 2006; Paquin & Howard-Grenville, 2013; Saz-Carranza & Ospina, 2011)
Development and flow of resources	Includes the development of both material (e.g., funding, human resources) and tacit resources (e.g., knowledge, new practices), and decentralizing the flow of these resources. (Provan & Huang, 2012; Reay et al., 2013)
Management of commitment; mobilizing	Building commitment for the joint undertaking, sometimes also referred to as mobilizing. Dealing promptly with the perception or reality of unequal distribution of resources in the network or unequal commitment to the network, as well as training and joint problem solving exercises, can help in building commitment. (McGuire, 2002; McGuire, 2006; Milward & Provan, 2006)
Facilitating knowledge exchange; collaborative dialogue	Aim is to establish a knowledge base that can be used by the network to address complex problems, so a key role for managers is to build this capacity across the network. Involves actively exploring the different views of participants and connecting these ideas. (Huxham & Vangen, 2005; Klijn et al., 2010; Gray, 2004; Weber & Khademian, 2008)
Management of conflict	Listening to the various voices of members and providing mechanisms for conflict resolution; bridging differences through mediation; providing opportunities for open dialogue and structured disagreement. (Bryson et al., 2006; McGuire, 2006; Milward & Provan, 2006; Reay et al., 2013; Saz-Carranza & Ospina, 2011)
Management of accountability	Key issues include who is responsible for what; how to respond to free riders; how to measure joint success and attribution of value. (Agranoff & McGuire, 2001; Hoberecht et al., 2011; Milward & Provan, 2006; Provan & Huang, 2012; Weber & Khademian, 2008)

* In the context of networks many of these management tasks are also leadership responsibilities.

Table 6: Management tasks and behaviours in collaborative non-profit, public networks (continued)

Network management task or behaviour	Description
Management of legitimacy	Working to convince stakeholders, both internal and external to the network, that working with other organizations in broader network is worthwhile. This involves building support both internally and externally. This is closely related to management of commitment and mobilizing. (Agranoff & McGuire, 2001; Bryson et al., 2006; McGuire, 2002; McGuire, 2006; Milward & Provan, 2006; Paquin & Howard-Grenville, 2013; Provan & Lemaire, 2012)
Management of tensions; paradoxes	The management of tensions, including tensions that arise related to the governance structure selected, is critical for explaining network effectiveness. (Huerta et al., 2006; Provan & Kenis, 2008; Provan & Lemaire, 2012; Saz-Carranza & Ospina, 2011; Vangen & Huxham, 2012; Carboni & Milward, 2012; Paquin & Howard-Grenville, 2013; Romzek et al., 2014)
Promoting network level learning	Shared learning by individuals from the group of organizations in the network. The collective learning advances the network culture, collective knowledge and understanding of the network. For example, bringing network members together to learn about networks, simultaneously and from the same information and experience, helps advance the common culture of the network. This is distinct from the network as a context for individual learning on varied topics of interest to the network or its organizational members. (Knight, 2002; Knight & Pye, 2005; Schulz & Geithner, 2010; Leach et al., 2014)

Management of tensions and paradoxes

Tensions and paradoxes are understood as natural phenomena which cannot necessarily be resolved.

(Plsek & Greenhalgh, 2001)

The tensions and paradoxes inherent in networks and network management emerged as a strong theme in the inter-organizational network literature (Provan & Milward, 1995; Gray, 2004; Huerta et al., 2006; Milward & Provan, 2006; Milward, Kenis & Raab, 2006; Milward & Raab, 2006; Provan & Kenis, 2008; Milward et al., 2010; Saz-Carranza & Ospina, 2011; Provan & Huang, 2012; Provan & Lemaire, 2012; Carboni & Milward, 2012; Paquin & Howard-Grenville, 2013; Romzek et al., 2014; Riley & Best, in press; Vangen & Huxham, 2012; Vangen et al., 2014). It is clear from the discussion below that the ability to identify, understand, and work with key tensions and paradoxes, is critical to effective network management.

Thus every manager in a network has two jobs, managing within his/her organization and managing within the network.

(Milward & Provan, 2006)

Milward and Provan (2006), as mentioned earlier, argue that the five management tasks they identify (i.e., management of accountability, legitimacy, conflict, design and commitment) are essential for both the management *of* networks and managing *in* networks. They define managers in networks as "those individuals who represent their organization within the network" (Milward & Provan, 2006, p. 18). The primary loyalty of these managers is to their home organization, but they also have a responsibility to work within the network context and toward both organization and network level goals (Milward & Provan, 2006). A fundamental tension, then, is balancing the needs of the organization with the needs of the network; this is particularly challenging when organizations are participating in more than one network as is often the case. The only exception is for the very small cadre of people who are "network managers," those with responsibility for managing the network as

a whole, such as those in a network administrative organization or a network facilitator. These positions could be likened to leadership roles with management functions also attached, complicating the delineation of leadership versus management roles and functions in networks.

Provan and Huang (2012) describe the importance of encouraging network members to develop both tacit and material resources and they speak to how those resources should be managed. They suggest that:

> by discouraging lead organizations from efforts to centralize the flow of all resources, the network is likely to be flexible and resilient, enhancing the capacity of members to deliver needed services to clients while strengthening the performance of the network as a whole. (Provan & Huang, 2012, p. 373)

Carboni and Milward, 2012 also talk about the role of decentralization in contributing to network resilience, in this case a network's ability to manage potential systemic risks, risks that are significant enough to cause an entire system or network to fail. They cite research that indicates decentralized networks are more likely to survive shocks and propose that "the more centralized a network is, the less resilient the network will be to systemic shocks" (p. 540). And yet other research (Provan & Milward, 1995; Turrini et al., 2010; Raab, Mannak & Cambré, 2013) has found that centralization was consistent with effectiveness in inter-organizational service implementation networks, especially where network stability is relatively high. There is a dilemma here from a network management point of view. If a centralized network is less resilient but more effective when stable, then it is at risk for instability, and potentially ineffectiveness, if perturbed. Yet networks must be ready for, and able to resist, shocks if they are to survive—survivability ultimately being a prerequisite for effectiveness. Thus network managers must, even in times of relative stability, balance a tension between promoting resilience through decentralization, and effectiveness through centralization.

The management of accountability is another particularly challenging issue in networks. Provan and Huang (2012) state:

> Though the emphasis on results is welcomed by practicing managers and scholars, important cautions have been issued to attend to accountability—how we arrive at results can be as crucial as the results that are achieved, particularly when the desired goal or result is not clear or under contentious dispute. This is, of course, particularly the case when working to address wicked problems. (p. 370)

Similarly, Romzek et al. (2014) speak to the interactions and potential tensions between informal accountability mechanisms for network processes, or how things are done, and formal accountability for service or organizational outcomes. As well, because networks are viewed as having more capacity to respond to complex issues than traditional organizations, the expectations for results can be unrealistically high (Riley & Best, in press). Managing these potentially conflicting expectations in regard to accountability is an important task for network practitioners.

The concept of network control is another tension to be managed. Milward et al. (2006) argue that control is an essential aspect of networks, even though the defining characteristic of networks is that they do not have a hierarchy of authority. This could be described as another tension that needs to be managed. Control is defined as: "…a process of monitoring something, comparing it with some standard, and then providing selective rewards and adjustments" (Milward et al., 2006, p. 204). Thus, control is about paying attention to whether network development is proceeding as intended and producing desired outcomes, and, if not, then making some informed correction. Control does not need to be done only through a hierarchy of authority, but is something that can be done collaboratively.

Fundamental questions for management of a network include issues of design and governance: "Basically, public managers and policy officials need to know how the network can be set up and run to be effective in accomplishing network goals, while minimizing the emergence of tensions" (Provan & Lemaire, 2012, p. 17). Provan and Kenis (2008) outlined three key tensions, and how the selection of governance structure can affect these tensions (see Table 7).

Table 7: Three common tensions faced by network managers and how these are affected by governance structures

Tension	Description	How tensions can be affected by choice of governance structure(s)
Efficiency vs. inclusiveness	Networks face a tension between the need for administrative efficiency and inclusive decision-making. Collaboration is described in the literature as essential in building trusting relationships, but involvement in network planning and decision making processes can be incredibly time-consuming, leading to member burn-out.	"In shared-governance networks, the tension will favor inclusion; in lead organization–governed networks, the tension will favor efficiency; and in NAO-governed networks, the tension will be more balanced but favor efficiency" (Provan & Kenis, 2008, p. 245).
Internal vs. external legitimacy	Networks face a tension between the need for internal (i.e., network members) and external legitimacy (i.e., external stakeholders, including funders). Both are of value to networks, and the role of network governance is critical for building and sustaining both.	"In shared-governance networks, the tension will favor internal legitimacy; in lead organization–governed networks, the tension will favor external legitimacy; and in NAO-governed networks, both sides of the tension will be addressed but in a sequential fashion" (Provan & Kenis, 2008, p. 245).
Flexibility vs. stability	Networks face a tension between the need for flexibility and the need for stability. Networks are usually seen as flexible organizational forms, but research conducted to date indicates that they need to be relatively stable at their core while maintaining flexibility, particularly at their periphery.	"In shared-governance networks, the tension will favor flexibility; in NAO and lead organization–governed networks, the tension will favor stability" (Provan & Kenis, 2008, p. 245).

Adapted from: Provan & Kenis, 2008.

Legitimacy clearly has an impact on network effectiveness, and the challenges that managers experience in building legitimacy are often related to whether the network is mandated or emergent, with networks often displaying characteristics of both. Public sector networks are frequently mandated by government, with a government agency charged with building, funding, overseeing and maintaining the network. A risk here is that external legitimacy for the network will be established by the fact that government is paying for the service the network provides, but that internal legitimacy could be ignored or under-valued, meaning that network participants from nonprofit agencies or private firms could be weakly committed to working closely with others in the network (Provan & Lemaire, 2012).

Mandated networks can still be effective, but building internal legitimacy may be a priority for the network, particularly if pre-existing relationships are not robust (Milward et al, 2010). This requires the building of trust-based relationships, as would typically occur in an emergent network. In an emergent network more focus is generally required on establishing external legitimacy in comparison with internal legitimacy, although both are clearly important with

monitoring required to ensure that there is a balance between both over time (Provan & Lemaire, 2012).

Paquin and Howard-Grenville (2013) identify two main dilemmas or tensions for deliberately constructed or orchestrated networks:

- Firstly, also addressing the issue of legitimacy, they describe the tension for network managers between spending time developing "broad" or moral legitimacy with external audiences versus "pragmatic" legitimacy based on the practical usefulness of an activity to a particular set of network constituents.
- Secondly, they address the tension between allowing, or enabling, relationships to develop serendipitously ("blind dates") versus deliberately orchestrating them by directing ties ("arranged marriages").

Each brings a differing value to the network with serendipitous relationships potentially bringing with them unanticipated outcomes, and deliberately orchestrated relationships more expected outcomes; in both cases either good or bad.

Saz-Carranza and Ospina (2011), based on their research on immigrant advocacy networks in the United States, identified a tension related to unity versus diversity. They found that network administrative organization staff spend considerable time managing the tension generated by the simultaneous demands to nurture unity (i.e., bringing the organizations together to function in accord) and diversity (i.e., drawing out unique contributions, based on their differences, from each organization) (Saz-Carranza & Ospina). Furthermore, they suggest that the need for both unity and diversity in a network is underscored by a central debate in the literature about how closed networks generate trust, and how structural holes (i.e. gaps in connectedness that open up opportunities for new linkages) (Burt, 2005) offer diversity in knowledge but weaken network identity. Linking the unity-diversity tension to network effectiveness, Saz-Carranza and Ospina (2011) state:

> Understanding the unity-diversity tension experienced in networks implies three premises: diversity of the network is necessary for effectiveness, unity of the network is necessary for effectiveness, and diversity and unity may easily undermine each other if diversity turns into disunity or if unity turns into similarity. (p. 356)

Thus, again, one of the most important tasks of the network manager is to find a way to effectively balance these conflicting tensions.

This unity versus diversity tension resonates with Gray's work (2004) on framing and reframing, Milward's and Raab's (2006) work on integration versus differentiation, and on what others describe as a tension related to efficiency and inclusiveness (Provan & Kenis, 2008, Vangen et al., 2014). Gray suggests that, when there is too much diversity among network members on how they view or "frame" issues, processes of interaction and each other, collaborating to find a mutually agreeable way forward becomes exceedingly difficult. Although bringing together network members with diverse perspectives can facilitate arriving at innovative solutions to complex problems, the more diverse the perspectives the more challenging it will be to achieve agreement or unity. Milward and Raab (2006), in their study of dark networks, contend that the ability of a network to manage the tension between mechanisms that support integration (i.e., capacity to act) and differentiation (i.e., ability to persist/survive), rebalancing them as the context changes, will contribute to its resilience and thus effectiveness. They go on to identify a number of mechanisms, such as "direct mutual coordination," "shared beliefs" and "an orientation to common goals," that can be used to support varying levels of integration (Milward & Raab, 2006). Vangen et al. (2014), in addressing the efficiency-

inclusiveness tension, identify the need for a structure that is "tight enough to allow for consensus decision-making yet open enough to ensure continuing inclusion of enough stakeholders to help sustain the collaboration" (p. 22).

Managing the unity-diversity tension, and we would argue potentially others as well, according to Saz-Carranza and Ospina, requires working strategically to establish a higher level value in the network on the concept of diversity as a unifying concept, specifically "creating unity in diversity" (p. 350). This is later described in a review of Saz-Carranza's 2012 book (Raab, 2014) as a largely cognitive strategy designed to encourage unity around a "meta-goal". Employing a network administrative organization is a potential governance solution to help with developing the meta-perspective as it sits above the fray and can work with all network members to see the larger goal. The role of network managers, in any case, similar to the tasks proposed by Agranoff and McGuire (2001), is to "bridge differences, frame basic agreements and procedures, and contribute to enhance the networks' or the members' capacity" (Saz-Carranza & Ospina, 2011, p. 350). Thoughtful recruitment of new members is implied in the latter. One criticism applied to this research by Page (2013), also in a review of the more detailed description of the study in Saz-Carranza's 2012 book, is that inadequate attention is paid to the impact and management of power imbalances, particularly salient in the immigration context.

In a similar vein, a number of authors identify an apparent "goals paradox" arising from a need for organizations in networks to have goals that are aligned enough to promote cooperation and avoid conflicting desired outcomes and, at the same time, diverse or heterogeneous enough promote a true advantage from collaborating (Agranoff & McGuire, 2001; Provan & Kenis, 2008; Ansell & Gash, 2008; Vangen & Huxham; 2012). And within this, Vangen and Huxham (2012) identify that there may be goal incongruence, not only among organizations and between organizational and network goals, but also between individual and organizational goals and between individual and network goals, raising the question of how to manage which (or whose) goals are paramount and when. Goals may also be self-generated or imposed, for example by funders, or change over time potentially creating additional tensions. Table 8 below illustrates some of the complexities and tensions inherent in goals in collaboration.

Table 8: Dimensions of Goals in Collaboration

Dimension	Types	Key issue
Level	The collaboration, the organization, the individual	Members may seek to incorporate individual and/or organizational goals that are only tangentially related to the collaborative goals
Origin	Members, external stakeholders	Certain external parties (e.g., funders, government) or individual members may strongly influence goals
Authenticity	Genuine, pseudo	Stated goals may nominally meet expectations but lack any true intent
Relevance	Collaboration dependent, collaboration independent	Goals may be developed that are related, but not germane to the collaboration
Content	Collaborative process, substantive purpose	Tensions may arise related to the importance of process goals versus those directed to the desired outcome; process goals may help or hinder the collaboration
Overtness	Explicit, unstated, hidden	Goals may be explicit, deliberately hidden or simply unstated due to factors such as perceived acceptability, time available for discussion, or organizational intent

Adapted from: Vangen & Huxham, 2012, p. 744, p. 753

Vangen and Huxham go on to describe a "tangled web" of goals where, on any of the dimensions above, "multiple sets of variously categorized…goals will be interacting" and there will be a "mixture of sub- and superordinate relationships between…goals" with perceptions of the hierarchy differing among partners (p. 753). If the ability of a network to reach its stated goals is an indicator of network effectiveness (Turrini et al., 2010), network managers need to be clear about which goals are in play at any given time.

Vangen and Huxham (2003), in exploring a tension for network managers between ideology and pragmatism, coined the term "collaborative thuggery," signifying the type of activity that might be necessary to accomplish network goals. From an ideological perspective, network managers want and need to work within the spirit of collaboration by embracing, empowering, involving, etc. Pragmatically, however, Vangen and Huxham contend that, to advance the work of a network, they may also need to manipulate agendas or play the politics. Playing the politics as a management strategy is generally underexplored in the inter-organizational research, perhaps because it seems to go against the grain of what inter-organizational collaboration is supposed to be about.

Two additional interesting tensions, described by Huerta et al. (2006), are related to network evolution and evaluation:

- Firstly, they suggest that, as networks mature, their member organizations may become increasingly competent or able to deal with issues themselves, meaning that at some point the network may no longer be needed. If commitment to the network is high, this could create ambivalence about performance.
- Secondly, networks require information derived through evaluation to develop and be sustained, and yet they often lack metrics for assessing their impact (Huerta et al.) making it difficult for network managers to know how to adjust network structures and processes for maximum effect.

The ability of a network manager to be neutral to these tensions—that is, to view them as non-value laden and to use them differentially depending on the phase of a network's development, its work and its resources—would seem to be an important factor in effective network management.

As one can see from the discussion above, there is considerable discourse in the literature about the management of networks and the tensions and paradoxes therein. The ability of a network manager to be neutral to these tensions and to manage one's natural valence or inclination toward one dimension of the tension or another—that is, to view them as non-value laden and to use them differentially depending on the phase of a network's development, its work and its resources—would seem to be an important factor in effective network management, and ultimately network effectiveness. How, then, can this be accomplished? In their action research with middle managers on organizational change and sensemaking, Lüscher and Lewis (2008) provide some clues. They present a collaborative process for working through and reframing tensions and paradoxes by using an 'interventive' questioning approach more commonly found in the family therapy domain. They suggest that, by moving progressively from linear to circular to reflexive to strategic questioning, a manager can make more sense of what starts out as a mess or a problem and begin to view it as a dilemma and then a paradox and finally a workable certainty. Linear and circular questions can help to uncover current understandings of an issue, while "reflexive questions delve into the effects of those beliefs and related actions" (Lüscher & Lewis, p. 229) thereby helping managers relieve themselves of a limiting "either/or mind-set" and begin to "search for both/and options" (Lüscher & Lewis). Much like what Saz-

Carranza and Ospina (2011) suggested above in "creating unity in diversity" (p. 350), this way of viewing tensions requires "moving to a higher level of abstraction" and "seeking a link between contradictory elements" (Lüscher & Lewis, 2008, p. 229). Adopting a paradoxical lens, then, is seen as something to strive for; as a tool to expand thinking and options for sensemaking or, as Lüscher and Lewis indicate, as a process rather than a label. While their research was in the context of traditional organizational management, given the number and variety of tensions and paradoxes identified that need to be addressed within network management, Lüscher and Lewis's model may well be of use to network managers.

Until recently, there has been little empirical research exploring how network activities are managed and coordinated (Provan et al., 2007; Rethemeyer & Hatmaker, 2008; Saz-Carranza & Ospina, 2011). Saz-Carranza and Ospina (2011) note that the research to date has focussed more on the structural dimensions of network governance, rather than on the management behaviours necessary for network success. Rethemeyer and Hatmaker (2008) argue that "the foundations of network management as an area of inquiry are somewhat shaky because the phenomenon being managed is still poorly understood" (p. 630). They contend that more attention needs to be paid to understanding network management in the context of a system of networks (Rethemeyer & Hatmaker). Similar to Milward and Provan (2006), they identify that network managers must be able to function across policy, collaborative and fiscal networks within their home system as well as in adjacent systems if they are to be effective (Rethemeyer & Hatmaker, 2008).

Network effectiveness is linked to effective management by a number of authors (Klijn et al., 2010; Bryson, Crosby, Stone & Saunoi-Sandgren, 2009; Mandell & Keast, 2007; Milward & Provan, 2006; O'Toole & Meier, 2006). Klijn et al. (2010), through their research on environmental networks, even suggest that how a network is managed matters more than how it is organized. Yet network management remains elusive, in part because the allocation and utilization of management resources expended is necessarily fluid across time within a given network (McGuire, 2006). Network management is also ambiguous because, as noted above, with the exception of those managers who reside exclusively in a network administrative organization, it is difficult to know when a network member is acting on behalf of their organization or on behalf of the network and, thus, which management tasks belong where. More research is required on identifying those particular management processes that contribute to network effectiveness in what way and under what circumstances.

> *"Sure, we can separate leading and managing conceptually. But can we separate them in practice? Or, more to the point, should we even try?"*
>
> (Mintzberg, 2009, p. 8)

From our exploration of the literature, it is evident that the language used to describe the leadership and managerial roles, behaviours and tasks involved in networks is overlapping and confusing. However, to at least one renowned author in the management field, Mintzberg (2009), this does not seem to matter. While addressing leadership and management each in turn, this literature review does not try to conceptually distinguish these terms. We have used them largely interchangeably, as found in much of the literature reviewed. One thing that seems evident is that, no matter how leadership and management are conceptualized, there needs to be some consideration for the degree to which either of them is shared within a network.

Network Structure

The study of inter-organizational networks borrows heavily from what has been learned about the structure of social networks (i.e., where the actors are individuals). Ahuja, Soda, and Zaheer (2012) define network structure or architecture as:

> the nodes that comprise the network, the ties that connect the nodes and the patterns or structures that result from these connections. Network architectures can therefore be associated with the number, identity, and characteristics of nodes; the location, content, or strength of ties; and the pattern of interconnections or ties among nodes. (p. 435)

Each node represents an actor in a network, and in an inter-organizational network these actors are organizations. Studying the connections between the nodes of inter-organizational networks can provide information about network structure and its relationship to network effectiveness. For example, general network structure, and the positioning of each organization within the network, influences information sharing through a network (Provan et al., 2007). Given that knowledge and information exchange is a key function for many inter-organizational networks, paying attention to network structure as an enabler is critically important. These authors go on to say that cliques, sub-networks, or clusters within networks are prevalent and can play important roles in the creation of positive outcomes (Provan et al., 2007).

Provan and Lemaire (2012) also draw on the rich body of knowledge on network structure to inform their discussion on the design of more effective networks. They arrive at two key conclusions as follows:

1. It is not possible to determine the correct *amount* of integration in a particular network, as this depends on a number of factors including the purpose, functions and size of the network. Rather, they describe the importance of selective integration. "Selective integration means that network links must be targeted and appropriate, so that those organizations that need to work closely together do so, while others do not" (Provan & Lemaire, 2012, p. 644).
2. Both strong ties and weak ties are of value in a network, and serve different purposes. Strong ties build unity and weak ties bring in information and perspectives that may differ from those among strongly connected members (Granovetter, 1973). Provan and Lemaire (2012) indicate that there are distinct advantages to both maintaining network closure (i.e., where people are connected to one another) and structural holes (i.e., gaps in connectedness in a network that may otherwise include clusters of strongly connected individuals). Closure is good for maintaining and building trust and for sharing information that is already reasonably well known, whereas structural holes are useful for generating new ideas and approaches (Burt, 2005).

Uzzi (1997) proposed that there are market based dyadic relationships (arm's length ties) governed by legally binding contracts or regulations, and trust based relationships (embedded ties) governed by social contracts and norms of reciprocity. "The optimal network structure to link to is a mix of arm's length and embedded ties, because each type of tie performs different functions: Embedded ties enrich the network, while arm's length ties prevent the complete insulation of the network from market demands and new possibilities" (Uzzi, 1997, p. 59).

Since the strength of ties between network members and the extent of integration are thought to be factors influencing effectiveness, public networks, in order to maximize their effectiveness, should be designed with an emphasis on selective integration and a mix of tie strength (Provan & Lemaire, 2012). In practice, a combination of strong and weak ties helps to sustain a network in that it allows for members to maximize their participation in, and benefit from, the network by choosing areas of high relevance for strong connectivity and/or integration, thus potentially enhancing commitment and avoiding the member exhaustion that may arise if strong ties are required on all dimensions or activities. It also legitimizes peripherally involved members who may at a later time be able to engage more significantly, bringing with them new ideas and resources. This makes tie strength an important measure when evaluating network effectiveness.

With respect to future research on the use of social network analysis as a tool for increasing our understanding of network structure, and how this structure in turn influences network effectiveness, a number of researchers have described the need for more work in this area as it applies to inter-organizational networks (Galaskiewicz, 2007; Gulati et al., 2011; Isett et al., 2011; Munoz & Lu, 2011; Provan et al., 2007; Provan & Lemaire, 2012). Some researchers note that one way forward may be to study the structure of well performing emergent networks in order to provide insights about how to purposefully design more formal networks (Isett et al., 2011). Others have noted that "...a more in-depth analysis of the outcomes [and we would argue value] of ties, rather than a focus purely on the durability of ties, may be more useful for understanding the evolution of a network" (Provan et al., 2007, p. 503). The practical use of social network analysis as an analytical tool in the evaluation of networks is discussed in later in the section on Evaluating Networks.

In summary, the issues surrounding network governance, leadership and management, and network structure begin to paint a picture of the complexities of inter-organizational networks in regard to:

- both structure and process;
- the similarities and differences between networks and other organizational forms; and
- the need for further conceptual and empirical definition regarding a 'network way of working.'

Network Evolution

Whether emergent or consciously formed, very little is known about the natural life cycle of inter-organizational networks. Recognition of the cyclical nature of networks has led many people working in this field to continue to call for more research on how networks evolve over time (Birdsell, et al., 2003; Berry et al., 2004; Huerta et al., 2006; Isett et al., 2011; Provan et al., 2007; Provan et al., 2011). Comparative case study research where a number of networks are followed over a longer period of time, using a mix of qualitative and quantitative methods, would help increase understanding of network evolution. This kind of research tends to be costly and time consuming, however, which is likely why there have not been many such studies conducted to date.

Provan et al. (2011) indicate that the evolutionary path that a particular network takes depends both on key external events that occur as the network evolves and on the influence, incentives and pressures of the organizations that are involved in the network. Context, then, is a key factor in understanding evolution.

Summarized in this section are key points from the literature with respect to the main issues or activities to focus on at different stages of network evolution, as well as how the same activity (e.g., leadership) might vary according to stage. Four stages of evolution are identified and briefly discussed here:

- formation;
- development and growth;
- maturity, sustainability and resilience; and
- death and transformation.

Whether emergent or consciously formed, very little is known about the natural life cycle of inter-organizational networks.

For the most part, we are focussing on inter-organizational networks that are being deliberately formed, although a number of the main issues or activities may also apply to emergent networks as they evolve.

Stage One: Formation

A primary initial question to consider is whether an inter-organizational network is likely to be the best structure to achieve the desired outcome(s). As noted previously, a typical reason for forming a network is to address a complex issue or problem that no one organization can address well on its

"Unless the idea or the purpose of the network meets a critical mass of stakeholder needs, it cannot flourish, even if you agree it is the right thing to do. Shared vision has longevity."

(Networks Leadership Summit IV, 2009, p. 8)

own. For example, a commonly desired outcome for human services networks is to improve the coordination and integration of services for clients. Questions to consider when making this decision were outlined earlier.

Much of the literature focusses on either the dimensions of the problem or the failure of traditional organizational forms as precursors to network development. We have heard that collaborations are more likely to form in turbulent environments, and that formation and sustainability are affected by both driving and constraining forces in the competitive and institutional environments. Formation appears to be particularly influenced by the extent to which single efforts to solve the problem have failed (i.e., "sector failure") (Bryson et al., 2006).

Contextual factors are important to consider when determining whether the timing is right for forming a network. Rose (2004), in research on the early evolution of a child health network, suggests that having supportive pre-conditions or "fertile ground" at conception is a factor in whether a network will evolve successfully. While sector failure to resolve complex problems, as mentioned above, could be viewed as providing fertile ground, other more supportive pre-conditions might include (Rose, 2004; Popp et al., 2005a):

- technological capacity to support more organizational interdependence;
- public support for and consensus on the issue to be tackled;
- alternative funding plans for physicians (in the case of health networks);
- cross-ministry policy frameworks; and
- government encouragement for collaboration.

The degree to which there are forces that drive or constrain network development—based on problem size and complexity, organizational failure, crises, opportunity, or supportive pre-conditions—must be taken into account in the decision to form an inter-organizational network.

Once the decision has been made to form a network, or where a network has begun to emerge, an early focus needs to be on the design of the network and on determining what activities or tasks must be done in order for the network to develop effectively. A balance needs to be struck from the beginning between developing the structure of a network and providing time for network processes to evolve. In the very early phase of network formation, "there is usually someone or some group that assumes the role of 'entrepreneurial orchestrating'—getting the people together, mobilizing them and framing the issue" (Networks Leadership Summit IV, 2009, p. 8). In studying the development of a mandated network over two years, Bryson, Crosby, Stone and Saunoi-Sandgren (2009) found that inclusive processes and flat structures were necessary initially to reach "enough consensus and compromise" to be able to move forward. While they emphasize the requirement to build genuine stakeholder involvement in a new endeavor, they suggest complete agreement on how the problem is framed is not necessary in order to proceed (Bryson et al., 2009). This is in keeping with the earlier discussion on the value of using hierarchy light practices in addition to, or instead of, what one generally thinks of as collaborative management practices (Kelman et al., 2013).

As mentioned previously, and similar to the term 'entrepreneurial orchestrating' used above, Paquin and Howard-Grenville (2013) use the term network orchestration, which they describe as the process of assembling and developing an inter-organizational network. Much like the conductor of an orchestra, a network orchestrator actively brings along every member to his or her peak performance at any given time, and draws out particular kinds of relationships among members in the service of creating a comprehensive, harmonious whole. In the early assembly of a network, the orchestrator focusses on enabling a network culture where relationships can develop serendipitously, essentially to see what of value might arise. The orchestrator also

spends time on "engagement" and in "sense-making" exposing potential new audiences to the developing network and helping them to understand the value of a new set of activities or network processes (Paquin & Howard-Grenville, 2013).

'Sensemaking', or developing the common understanding or meaning of information and/or language, is often unique to a particular network and can help build the network culture or narrative. In their 2013 book, *The Power of Narrative in Environmental Networks,* as reviewed by Bixler (2014), Lejano, Ingram and Ingram contend that the "narrative enables the network to form and function…is the underlying logic..and the network understands itself through narrative, and it represents itself through narration" (Bixler, 2014, p. 277). The point is further reinforced that "to understand a network, one must understand the narrative of the network" (Bixler, 2014, p. 278) with the implication that this must be an essential component of network evaluation.

Contrary to many authors, Kelman and Hong (forthcoming) suggest that early activities focus on behavioural rather than attitudinal change. They argue that getting organizational members to act in collaborative ways is more important than improving their attitude toward collaboration, because early events can influence later development by creating structures that lead to "path dependence". Once the course is set, the structure creates incentives for certain actions rather than others, and actions become mutually reinforcing. The concept is that organizational or network norms get established through the actions, and attitudinal change will follow; thus, the importance of ensuring the right choices that will lead to success are made early on rather than relying on serendipity (Kelman & Hong). Kelman and Hong used a retrospective approach to study to what extent early managerial choices influenced the outcomes of crime reduction networks ten years later. They found that "change behavior first practices were associated with crime reduction and change attitude first practices were not" (pp. 19-20). This is not unlike the health promotion approach to tobacco reduction in North America, which has successfully focussed on getting people to quit smoking first rather than worrying about what they think about it.

This perspective resonates with what has been described as a "more nuanced view of networks" (Networks Leadership Summit VII, 2013) which suggests that, rather than being tied to what has been seen as a typical path of development (i.e., common vision must come first) networks must exhibit more flexibility and variation in the means to their end (e.g., change behaviour first).

This discussion presupposes that a great deal is in the control of a network manager.... In reality, there may also an element of luck.

Additional network management tasks and behaviours were described earlier in Table 6. Which of these is going to be most important early on will vary depending on the context within which the network is developed and the overall purpose or function of the network. This discussion presupposes that a great deal is in the control of a network manager. Experience has also shown that, particularly in the early stages, "resource availability also strongly influences the ability to gain legitimacy and facilitate network development" (Provan et al., 2007, p. 503). In reality, there may also an element of luck.

Provan et al. (2011), in their study of the North American Quitline Consortium (NAQC), describe the balance of structure and process required in establishing a network. They saw a progression from focussing initially on creating a shared identity, to establishing governance arrangements, and then to building legitimacy:

> …the keys to being able to build sufficient legitimacy…to ensure its early success as a network were to draw on the diversity of roles in the network, build support for the

> network through a bottom-up strategy, and develop and implement a mission that was supportive of, and not in competition with, NAQC members. (Provan et al., 2011, pp. 324-25)

Hoberecht et al. (2011) also provide some practical examples of activities that can be used initially to get a network started. They describe leveraging conferences or other pre-planned events to kick-start an inter-organizational network, as this quote illustrates:

> The members of the group acknowledged that participants varied widely in their levels of background knowledge regarding systems thinking principles, and they responded by organizing an impromptu "systems thinking 101" workshop as a way of generating common understandings regarding the principles and concepts guiding their work. (Hoberecht et al., 2011, p. 26)

Keast et al. (2004), in their case study of an Australia-based Service Integration Project (SIP), developed a mechanism to facilitate knowledge exchange and relationship building that appears to have been quite successful, although resource intensive. They offered a graduate certificate in social sciences, which provided an opportunity for the network participants to spend 16 full days over two semesters developing inter-professional leadership competencies (Keast et al.). They intertwined the learning of new theories, the unlearning of old behaviours and developing shared language and skills with progressing the design and delivery of the SIP (Keast et al.). This is similar to two North American attempts to help promote the development of networks by bridging theory and practice and creating common ground:

"The relationships developed through this program were frequently cited as facilitating and underpinning the operation of the project."

(Keast et al., 2004, p. 366)

- the Networks Leadership Symposium and Summit series spearheaded out of Canada, and
- the Network Leadership Training Academy supported through the University of Colorado in Denver.

These examples highlight the importance of spending time in the early development of a network on building the foundational relationships and common understanding of the network and its way of working. Establishing the network narrative can help consolidate the network by binding network members together, facilitating relationships across boundaries and providing principles for organizing (Bixler, 2014).

Rose (2004) suggests that, given the significant time it takes to develop relationships, "the extent to which participating in the network can be credited to individuals' local and regional daily workloads, the more accountable they may be to it" (p. 20). Paquin and Howard-Grenville (2013) describe the importance of face-to-face interactions in the development and deepening of connections with network members. They also warn network orchestrators to be alert to a possibility of over-engineering, which they describe as overly directing a network towards delivering on a particular collective goal, which may result in overly narrow membership and/or particularly strong ties with a relatively small group of members (Paquin & Howard-Grenville, 2013). This can lead to a network losing the benefit of a broad and diverse membership (Paquin & Howard-Grenville, 2013).

Mays and Scutchfield (2010), in their review of public health partnerships, suggest the success of large-scale implementation partnerships (i.e., partnerships where the purpose is to collaborate in the actual delivery of public health interventions) may depend on whether the partnership has first succeeded at "prerequisite forms of collaboration" such as information-exchange and

planning. Choosing low risk activities in the early stages of a network allows network members to build trusting relationships that can then be capitalized on, and that can withstand the testing that will be necessary when the network attempts later to take on other activities that might require more commitment, resources or operational changes.

McPherson et al. (2006) talk about their experience with child health networks and the tendency for them to gravitate to structure and formalization of processes in the early phases because this is what network members are familiar with in their home organizations. As such, network managers need to resist the temptation to overly formalize things at the beginning in order to avoid network created structural impediments later on. An early task, then, is to look for ways to help network members become comfortable with the ambiguity and horizontal nature of the network. This phenomenon was described as the "nebulosity" of a network in an evaluation of a child and youth health network just after its third birthday (Popp, L'Heureux, Dolinski, Adair, Tough, Casebeer, Douglas-England, Morrison, 2005b):

> …'nebulosity'…is represented by the conflict or incongruence between the network's desire to support more fluid processes and individual expectations and experience of participation. From a network vision perspective, the drive to eliminate...rigidity, in order to create an environment where ideas and information can circulate freely, may be easily adopted by members. However, when this requires personal or organizational change or flexibility (that is, challenges to traditional ways of working), members may experience considerable discomfort, and the tendency can be to revert to creating structure to manage the anxiety. (p. 140)

In summary, there are multiple early decisions, activities and processes required when establishing a network. Consideration must be given to precursors and context, balancing development of network structures and processes, and setting the tone for ongoing collaboration and consensus building. The care in orchestrating, planning, designing and selecting the initial activities of a network will ultimately influence its ongoing development.

Stage Two: Development and Growth

The development and growth of a network once again requires conscious facilitation by network managers, attending to network structure, carrying out essential management tasks and encouraging distributed leadership. For managers of organizations that are participants in the network, balancing the fundamental tension between the needs of the organization and the needs of the network is important. Bryson et al. (2009) suggest the need for "organizational and collaborative ambidexterity" (p. 32) in order to manage the tensions that vary across time and space as the network grows and changes. What may be a tension at one time in a network may be irrelevant, or even an asset, at another. With respect to the development of governance structures, a trend described in the literature is the tendency for informal networks that begin with a shared governance structure to become more formalized over time (Isett et al., 2011). For example, Bryson et al. (2009) found that network structures changed from being very fluid and participatory early on, to more exclusive and hierarchical as the network moved into implementation. Four other themes of relevance to the development and growth of networks that emerged from the literature are:

- trust,
- power,
- positive deviance and
- outcome attribution.

Theme One: Trust

Trust has long been described as critical to successful collaboration (Berardo, 2009; Chen, 2008; Gulati et al., 2011; Huxham & Vangen, 2005; Isett et al., 2011; Keast et al., 2004; McGuire & Silvia, 2009; Milward et al., 2010; Munoz & Lu, 2011; Provan et al., 2007; Provan & Kenis, 2008; Romzek et al., 2012), and leaders and managers play an important role in building trust within a network (McGuire & Silvia, 2009; Milward & Provan, 2006). Trust decreases the transaction costs of collective action in collaboration, thus enhancing the likelihood of positive collaborative outcomes (Chen, 2008). Trust may be based on prior experience, but it also may be entirely based on subjective perceptions of trustworthiness, at least until proven otherwise. Trust in a network is also based on an expectation of reciprocity. The quality of relationships has been generally accepted as an indicator of trust, in that if an agency states that the quality of its relationship with an organization is moderate to high, then it would follow that they would trust that agency (Milward et al., 2010).

Much of the research on development of trust in collaborative relationships has focussed on the development of trust between individuals. Provan et al. (2007) note that there has been considerable work done on trust in networks, but it too has focussed on dyadic relationships (i.e., relationships between two actors). How then does network level trust emerge and evolve?

How, then, does network level trust emerge and evolve, and is it the same thing as trust between individuals?

In their study of the evolution of chronic disease prevention networks, Provan, Nakama, Veazie, Teufel-Shone and Huddleston (2003) found that despite the increase in density of ties as the network evolved, measures of trust across the network showed a slight decline. They noted that this decline in trust could be an unintended consequence of network members working together more closely and getting to know each other better (Provan et al., 2003), which may include beginning to see more differences and experiencing conflicts. This finding has implications for network stability, as efforts to build collaborative relationships may lead to some short term testing of relationships. As such, "trust is not something that inevitably and immediately follows the establishment of relationships" (Provan et al., 2003, p. 655). Rather, relationships between individuals may change frequently as network members try to find network members in other organizations with whom they can work effectively. It is the working through of differences to a satisfactory resolution at the dyad level that is likely to broaden trust levels in a network over time. As the organizational theory literature would suggest, organizations may need to work together for a number of years to develop truly trusting relationships. Although organizations may be willing to connect to new partners, these new relationships will initially be untested and lack depth; trust takes longer to develop (Provan et al., 2007). In practice, no matter how well individuals get to know and like one another, there may still be a modicum of mistrust if their organizational interests clash.

Isett et al. (2011) state that "trust among public and nonprofit organizations is a function of personal (propensity to trust), dyadic (perceived trustworthiness of another), and third-party influences (trust transferability)" (p. i166). Gulati et al. (2011) talk about trust in relation to receptivity, indicating that "inter-organizational trust defines the extent to which an organization and its partners can rely on each other to fulfill obligations, behave predictably, and negotiate and act in good faith. Interpersonal trust complements inter-organizational trust but is distinct from it" (p. 216). The presence of trust, for example, will influence how receptive a network member is to exchanging resources or knowledge. Extent of trustworthiness has been found to be a factor that individuals within a collaborative partnership consider when making decisions about with whom to coordinate (Calanni, Siddiki, Weible, & Leach, 2014). As well,

Romzek et al. (2012) found that reciprocal relationships based on trust are a necessary component of informal accountability in networks.

If trust between organizations is needed in collaborative inter-organizational networks, network structures must rely on exchanges that are based on interpersonal relations. Keast et al. (2004) argue, although the reality is that trust may not be easy to build, two factors can temper these constraints:

> First, the development of an inter-organizational network means there is recognition that their purposes cannot be achieved independently, that all action is mutually interdependent. Second, many of the participants may already know each other and may have formed pockets of trust before the network structure was formed. These pockets of trust can be capitalized on through the use of effective management strategies. (Keast et al., 2004, p. 365)

Bryson et al. (2009) also recognize the importance of prior relationships, but still caution that those sponsoring the network must not underestimate the need to create authentic stakeholder participation. It may be that prior relationships, while often a facilitator of network development, could also be inhibitors, especially if past experiences included failed attempts to address similar issues.

Because building relations forms the basis for the development of trust, the ability to facilitate and nurture relationships is a critical leadership and management capability through the start-up and growth of a network. Through adequate facilitation and support, a network manager can help members find the added value in their newfound or shifting relationships: "…perceptions of each other begin to change. Members begin to recognize and appreciate each other as resources. In effect, the pool of expertise is expanded based on these new ways of relating to each other" (Keast et al., 2004, p. 369).

Huxham and Vangen (2005) suggest that "there is a gap between the common wisdom that trust is necessary for collaboration to be successful and common practice, which suggests that trust is frequently weak (if not lacking all together) and suspicion is rife" (p. 153). If this gap is to be addressed, it is necessary to look at how trust can be built and maintained in any collaboration. They argue that trust is built through a cyclical loop, meaning that trust takes time to develop and grows as the collaboration has some success (Huxham & Vangen, 2005). The trust building process is critically important but also resource intensive, as "it requires paying continuous attention to the interaction between changes in structure and membership, changes in aims and agendas and changes in power with respect to who can enact or sabotage those agendas" (Huxham & Vangen, 2005, p. 172). They outline a series of pragmatic trust building and management considerations related to what they see as five key challenges involved in initiating and sustaining this trust building loop (Huxham & Vangen):

- forming expectations;
- managing risk;
- managing dynamics;
- managing power imbalances; and
- nurturing the collaborative relationship.

Of these, issues related to power can be particularly challenging as discussed in the next section.

Network managers, then, must be prepared for periods of instability as a natural part of the development and growth of the network. They must be ready to support the difficult conversations that may be required as relationships between individual members are tested, as membership changes, and as organizations evolve beyond a surface willingness to connect to new partners to a deeper level of trust. They must also learn to live with the fact that member organizations may have conflicting interests in some areas. In summary, the ability to foster relationships is a critical leadership and management capability through the start-up and growth of a network.

Theme Two: Power

People are sometimes reluctant to talk about power, particularly in the context of collaborative networks; yet it is critically important in the development of collaborative relationships and trust. As well, networks often have the explicit goal of shared decision-making, implying shared power. Huxham and Beech (2008) define power as "the ability to influence, control, or resist the activities of others" (p. 555). They go on to say that because power is a relational concept (i.e., it must involve at least two parties), it is no surprise that it is seen as a central issue in inter-organizational settings (Huxham & Beech, 2008). Berry et al. (2004) identify power as a dependent variable in networks and indicate that "examining whose interests are represented and who has power over decisions is critical" (p. 547) to understanding the ultimate impact of power on public service delivery.

> *"shifting organizations and people out of …power base driven thinking/operating is a challenge that takes much perseverance and time."*
>
> (Dolinski, 2005, p. 16)

Purdy (2012) cites research on two issues related to power in cross sector collaborations:

- an organization must have sufficient power to convene stakeholders and
- power imbalances among stakeholders must be continuously managed.

Where the convening organization also plans to be a participant, particular attention needs to be given to ensuring they are not the dominating force; and where actors lack power, efforts must be made to ensure their inclusion and avoid co-option by more powerful members (Purdy, 2012). In practice, as power, responsibility and accountability often go together in a network, it can be the case that smaller stakeholders prefer to leave all three situated with larger organizations to offset risks, particularly early in the life of a network, potentially delaying the progression of the collaborative culture.

In Huxham and Vangen's (2005) book, *Managing to Collaborate*, the terms power differences, power games, power plays and power struggles all appear in their chapter on trust building. Network practitioners and researchers both link trust to issues of power, and dealing with power differences in a network is often described as a key challenge for network managers (Addicott, McGivern, & Ferlie, 2007; Bryson et al., 2006; Hartley & Benington, 2006; Hoberecht et al., 2011; Huxham & Vangen, 2005; Huxham & Beech, 2008; Keast et al., 2004; McGuire, 2006; Provan & Lemaire, 2012). Through experience managing networks, one comes to realize that power can be viewed as personal (i.e., the individual's experience of their own influence) or positional (i.e., the attribution of power to another based on their organizational role). The degree to which individuals choose to exercise or relinquish their personal or positional power to either facilitate or inhibit trust can significantly impact network development.

A power imbalance, because it can be a source of distrust, is one of Bryson et al.'s (2006) three key factors that can negatively influence a cross-sectoral collaboration's process, structure and governance. Their proposition is that "cross-sector collaborations are more likely to succeed when they build in resources and tactics for dealing with power imbalances" (Bryson et al., 2006, p. 50).

Chen (2008) believes that although a completely equal distribution of power in inter-organizational settings is unrealistic, a more shared, equitable power allocation among partners may be one of the desirable outcomes of collaboration. This builds on the work of Gray (2004), who says that the power dynamics generally shift in true collaborative relationships from the kind of unequal distribution of power often associated with elitist decision making to more participative, equally shared access to decision making processes.

What can managers of and in networks do when faced with an imbalance of power and influence among participants? While this is one aspect of inter-organizational networks that requires further research (McGuire, 2006; Huxham & Beech, 2008), Huxham and Beech see the identification of both the sources of power and uses of power as a precursor to understanding how to manage it and argue that there is a need to be particularly mindful of where power might be unwillingly or unintentionally exerted. They suggest exploring how power can be shared, even temporarily, or used collectively to facilitate the work of the network (Huxham & Beech, 2008).

Purdy (2012) also identifies the importance of understanding sources and uses of power. She proposes and tests a framework for assessing power in the context of collaborative governance, pointing the way for network managers to address power imbalances by recognizing and emphasizing both different sources of, and arenas for, power among network participants. Three sources of power are identified (Purdy, 2012):

- formal authority,
- resources (e.g., tangible, such as financial or human resources, and intangible, such as knowledge or culture), and
- discursive legitimacy.

The latter is described as "the ability of an organization to represent or speak on behalf of an issue" and/or "the ability to manage meaning by influencing how information is presented" (Purdy, 2012, p. 411). These sources of power are seen to intersect with three arenas for exercising power (see Table 9 below):

- participant,
- process design and
- content.

The implication is that, in assessing network members on these dimensions, a network manager can reinforce or de-emphasize power according to the needs, including stage of evolution, of the network thereby "leveling the playing field" as required (Purdy, 2012). We suggest the framework might also be used to help network managers understand how to better wield power themselves.

Table 9: Framework for assessing power in collaborative processes

Arenas to exercise power	Source of Power		
	Formal Authority	**Resources**	**Discursive Legitimacy**
Participant	• Selection of participants • Limits on participants	• Number of representatives • Expertise of representatives	• Status of representatives • Use of coalitions
Process Design	• Ownership of the process • Interaction expectations for the process • Number, length, location of meetings	• How the process is paid for	• Frequency of voice • Methods of voice • Communication about the process
Content	• Setting the agenda • Outcome expectations for the process • Use of indirect authority, such as legal rights	• Distribution of information • Understanding and analyzing the issues • Production of meeting records	• Prioritization of issues • Framing of the issues to be addressed

Adapted from: Purdy, 2012, p. 412

Power may also be intentionally and overtly exerted to resist or circumvent network goals. In some circumstances this may be more readily addressed because it is an obvious phenomenon and can therefore be openly discussed. On the other hand, the relative size of the organizational players involved may determine whether the intentional use of power can be openly or effectively addressed. In general, it is likely that the subtle, unintended or covert uses of power will be more problematic because they are less apparent and thus more easily denied.

Theme Three: Positive deviance

"To even begin to address some of the complex issues for which networks are created, some shaking up of the status quo is usually required."

(Networks Leadership Summit VII, 2013, p. 10)

Casebeer et al. (2009) argue that for many networks, "a key component of success relates to pulling and pushing at the edges of multiple connections and boundaries in 'positively deviant' ways" (p. 611). They deliberately use this apparent oxymoron arguing that, when attempting to innovate or enable and sustain change in complex organizational and system environments, different and deviant capacities can actually produce positive outcomes (Casebeer et al., 2009).

Practitioners and researchers agree that there is a role for perturbation in networks, acknowledging that differing from the norm can become a source of power that can advance network goals, but also be risky, and suggesting further research into both (Networks Leadership Summit VII, 2013).

Casebeer et al. (2009) suggest that there is need for networks to regularly work in "positively deviant" ways, deliberately acting and maneuvering in ways that are aberrant (from normal or even exceptional practice) within more traditional bureaucratic and hierarchical structures. Positive deviance, then, is a way of describing how networks work around "the standard organizational processes to influence change in systems that are often fixed in their ways and bound up in traditional organizational hierarchy" (Casebeer et al., 2009, p. 612).

Positive deviance can be viewed as both an approach to the work of a network, as well as a potential benefit of organizing in networks. Discussing the value of positive deviance in improving health system performance, Bradley, Curry, Ramanadhan, Rowe, Nembhard, and Krumholz (2009) indicate that, "the central premise of a positive deviance approach is that solutions to problems that face a community often exist within that community," and need only to be uncovered and "generalized to improve the performance of other members" (http://www.implementationscience.com/content/4/1/25#). The approach involves actively seeking out, and learning from, individuals or organizations that positively influence outcomes by behaving in ways that deviate from the organizational norm. The role of the change agent, or network manager, in this situation, is to facilitate a process of self-discovery within the network membership (Singhal, 2010).

Positive deviance is a benefit of networks to the degree that the network culture itself encourages new and different (i.e., positively deviant) behaviours in the service of shared outcomes, consequently improving the odds of discovering innovations and/or utilizing new knowledge. In a review of a new book by Robert Behn on performance management in the public sector, Goldsmith (2014) identifies that performance is enhanced when room is provided for discretionary responses because it allows for the identification of "positive deviants" who may "hold the key to discovering what works" (http://www.governing.com/blogs/bfc/col-robert-behn-book-review-performancestat-potential.html#). All three authors (Singhal, 2010; Bradley et al., 2009; Goldsmith, 2014) suggest that, because the new behaviour is discovered from within the community rather than coming from an external source, it has a certain amount of validation or "social proof" that is likely to enhance its uptake.

From the cases highlighted by Casebeer et al. (2009), four groups of characteristics of positively deviant networks are identified: 1) collaborative and democratic; 2) deliberative and risk-taking; 3) generative and inquiring; and 4) divergent from the prevailing culture. One "positively deviant" case described involved the development of a collaborative learning network in the health sector that started in the mid 1990's. This network engaged health professionals and their organizations in a two-year cohort-based learning program. The content was on evidence use and applied research in the health system, but what was emphasized was learning over time as part of an ongoing learning community. This was a departure, at the time, from both university degree programs and the time-limited professional development conferences and workshops that were the norm in healthcare. In this case, all characteristics of positive deviance were present; with the brief description provided here emphasizing the fourth characteristic, divergence from the prevailing culture.

One can see from the discussion above that there are conceptual linkages between positive deviance and the critical functions, examined earlier, of knowledge exchange, network learning and innovation. The implication for network growth and development is that nurturing the characteristics of positively deviant networks, as defined above, may increase the comfort of network members to deviate from the norm, thereby promoting innovation and new ways of doing things and ultimately contributing to the network's ability to accomplish the work for which it was established.

Theme Four: Outcome attribution and accountability

Attribution of outcomes is a challenge, often throughout the life of a network, and needs to be managed according to the stage of network development.

First and foremost there is the "joint production problem" articulated by Provan and Milward (2001), where multiple agencies are responsible for one or more components of a single service creating blurred or indistinct organizational boundaries. This unified delivery of services may

satisfy clients, but presents difficulties for networks as they try to delineate the legitimate outcomes of the network versus those of organizational members.

Secondly, while some outcomes of a network might be quite obvious, such as improvements or changes in service delivery as a result of increased collaboration or collective action, others may be more subtle or even invisible. Linking improvements in client experiences or health outcomes directly to the work of the network, for example, may or may not be possible. Additionally, participating in a network may alter how an organization views its mandate and work, enhance the knowledge of organizational staff, or change internal organizational practices. However, the organization may not, itself, view these outcomes as related to the network.

Thirdly, our experience tells us that when a network is still in its infancy, challenges with outcome attribution are compounded because of the importance of providing opportunities for individual member organizations to lay claim to the successes of the network in order to cement their involvement and commitment. Similarly, network managers must be careful not to claim, on behalf of the network, outcomes achieved by member organizations within their normal operational scope as this may risk alienation. And yet, there are often expectations for networks to display early results to demonstrate their value, so there is a need to somehow tie outcomes to the network as a whole. This is a tension that network managers must pay attention to as the network evolves, always gauging the balance between, and member tolerance for, tying outcomes to individual member organizations or to the network as a whole. In a practice example from the Southern Alberta Child and Youth Health Network, newsletters communicating the work of the network consistently profiled the activities of individual member organizations, but tied the activities together under an editorial theme related to the overarching goals of the network. This allowed both organizational members and the network as a whole to achieve recognition for outcomes.

Attribution of outcomes is a challenge, often throughout the life of a network, and needs to be managed according to the stage of network development.

Attributing outcomes to the network is also important because this is a way of demonstrating accountability, as well as highlighting the added value of the network both to participating organizations and funders. Bryson et al. (2006), in their framework for understanding cross-sectoral collaborations, include a category titled outcomes and accountabilities noting that "accountability is a particularly complex issue for collaborations because it is often not clear whom the collaboration is accountable to and for what" (p. 51).

The accountability challenge for organizational actors in networks is to balance their organizational missions and goals with the collective network mission and goals; hence the importance of meaningfully engaging all network members in establishing those network goals in the first place. Recognizing the importance of accountability in sustaining inter-organizational networks, as well as the inherent challenges in demonstrating accountability, Romzek et al. (2012) developed a preliminary theory of informal accountability among organizational network actors that emphasizes both the inter-organizational and interpersonal behaviours that reflect informal accountability. In addition to shared norms and facilitative behaviours, rewards and sanctions were thought to be important components of informal accountability by reinforcing a cycle of "social learning", and thus the desired behaviour toward collective goals within the network. Romzek et al. (2012) also identified challenges to informal accountability, such as turf battles and financial pressures. Evolving the model further, Romzek et al. (2014) defined "relationship building and champion behavior as being critical to informal accountability dynamics" (p. 13) and articulated the tensions that can arise between formal and informal accountability mechanisms. They suggest that formal accountability mechanisms within organizations, such as fiscal

policies, may have embedded, although not necessarily purposeful, disincentives to collaboration; and that, at times, informal accountability processes (e.g., shared norms of trust and reciprocity) may be able to offset the limitations imposed by formal mechanisms thereby helping to achieve desired network outcomes. This discussion reinforces for network managers that attention to the relational aspects within the network is a legitimate part of network accountability, and that in practice it would be wise to include both formal and informal mechanisms, and the interactions between them, in any network accountability framework.

The accountability challenge for organizational actors in networks is to balance their organizational missions and goals with the collective network mission and goals; hence the importance of meaningfully engaging all network members in establishing those network goals in the first place.

Another challenge for network managers and leaders is how to maintain the unique 'networky' nature, or culture, of a network while also being accountable to an organizational structure or board (Networks Leadership Summit IV, 2009, p. 11). Network leaders often see the vision of the network as more important than the network form. They argue that, while you may want network members to attribute outcomes back to the network in its current form, it is ultimately more important that the network members identify with the network's vision so that the collective work toward that vision can continue on if the form or structure of the network shifts, or even disappears, with changing circumstances over time. In this way network members may continue to keep the network culture alive, working together toward a vision, even in the absence of any formal network structure (Networks Leadership Summit IV, 2009).

Finally, the increasing emphasis in government and non-profit organizations on using outcome measurement to demonstrate accountability for public funds means the challenge in attributing outcomes to a network can threaten its growth, development and very existence. How to capture the value of networks and their often-invisible contributions is discussed further in the section on evaluation.

Stage Three: Maturity, Sustainability and Resilience

A key factor affecting the sustainability of a network is the development and maintenance of both internal and external legitimacy throughout the evolution of the network. Internal legitimacy, or how the members of a network view the network's value, has been shown to be more important early in the network's development as a way of sustaining the network through times of crisis. Too much focus on the development of external legitimacy, or how other stakeholders view the value of the network, at the expense of internal legitimacy early on has been linked to network failure (Provan & Lemaire, 2012). Ongoing relationship development within the network then, an important aspect of creating internal legitimacy, is of critical significance to sustaining a network. It is particularly important for those networks that are mandated and not emerging out of prior relationships, which research has shown are more likely to fail (Provan et al., 2007). It also speaks to the need to 'institutionalize' the participation of member organizations within a network so that, as individuals come and go within an organization, the organization itself remains involved in the network thereby contributing to its sustainability.

Even as networks mature there may still be difficulties with attributing direct outcomes to the work of the network. However, if internal legitimacy has been well established, and therefore the added value of the network more apparent to organizational members, as demonstrated in the evaluation of the Southern Alberta Child and Youth Health Network (Lemaire et al., 2010), it may be easier for network members to allow the network as a whole to lay claim to outcomes, reinforcing a collaborative, trusting and sustainable network culture.

Network maturity, sustainability and resilience are strongly linked to network learning, which is in turn linked to network effectiveness (Provan et al., 2007). Trusting relationships are a precursor for network learning, again reinforcing the need for network managers to ensure that optimal conditions are in place to not only develop, but nurture, the relationships within the network as it evolves if network learning is to occur.

Typically, at a mature stage of network development, there is some institutionalization of structure and processes. Network routines may be established and, by now, any 'pruning' of uncommitted members is likely to have occurred. Research has shown that some stability is a necessary condition if network performance is to improve (Milward et al., 2010; O'Toole & Meier, 2004; Provan & Milward, 1995). O'Toole and Meier (2004), for example, found that school districts in the United States operating in more fiscally interdependent and complex settings benefited from some managerial and personnel stability, which translated to more effective performance. They wondered whether stability could perhaps be a platform for risk-taking, entrepreneurial action in networks. On the other hand, the limited research that has been conducted on whole network stability indicates a stability-flexibility paradox; that is, "networks need to be relatively stable at their core, while maintaining flexibility, especially at the periphery" (Provan & Lemaire, 2012, p. 27).

In practice, network managers need to think about how to develop the necessary stability, but keep the network refreshed with new inputs that can help to revitalize members and maintain the desired flexibility.

In practice, then, network managers need to think about how to develop the necessary stability, but keep the network refreshed with new inputs that can help to revitalize members and maintain the desired flexibility. One strategy is to encourage a decentralized flow of resources (e.g., information, knowledge) among network members (Provan & Huang, 2012). Trust should be high enough in a mature network that, even if there is a lead organization or network administrative organization, resources can be shared more broadly. Spreading knowledge and resources among network members enables the network to remain flexible and resilient, which is connected to positive network performance over time (Bakker et al., 2012; Bryson et al., 2006; Provan & Lemaire, 2012; Provan & Huang, 2012).

McGuire (Networks Leadership Symposium, 2013) talks about "fixations" that can become problematic as networks mature. Fixations are when network actors take their perceptions so much for granted, they no longer reflect on them.

> He [McGuire] identifies two main types of fixations, cognitive and social. In cognitive fixation: *"Actors in the network have…dealt with the same problem definition for a long time and none of them want to change it."* In social fixation: *"Mutual relations and interaction rules are no longer subjects of reflections, and introducing new ways of handling problems is no longer considered."* (Networks Leadership Symposium, 2013, p. 28)

Facilitating reflective conversations becomes an important network management task at this point in order to avoid complacency or stagnation.

Powell, Koput, White, and Owen-Smith (2005) argue that networks, because of their very nature, should be resilient. They state that "a cohesive network, with plural pathways, means participants are connected through different linkages" (Powell et al., 2005, p. 1139). Many nodes would need to be removed to weaken such a structure, meaning that networks tend to be highly resilient. Network structure may be less stable, however, when there are significant

external shocks to the network (Lemaire et al., 2010; Provan & Huang, 2012) such as funding cuts, significant restructuring within member organizations, a change in the lead or network administration organization governing the network that is imposed externally, or changes within the political context. An optimal blend of stability and flexibility can increase resistance to shocks and enable the network to be responsive to important changes in context. Ability to withstand shocks is frequently described as an important contributing factor to network resilience (Bakker et al., 2012).

In other words, the very skills and activities that will grow a network successfully at the beginning can ultimately restrict the network if not properly tempered later on.

What does this all mean for network managers and/or leaders with respect to engaging in activities that help to sustain a network over time? Activities undertaken during the initial formation of the network, as well as during the network's growth and development, will affect how the network matures, and how it will evolve and be sustained over time. As has been described earlier, a key early role for network managers is to provide a foundation for network members to develop trusting relationships, to operate and to maintain the required flexibility for network members to interact, learn and work together on accomplishing network level tasks. Notwithstanding what has been described as the natural tendency to resilience of the network structure, a key issue for a network administrative or lead organization is to resist imposing too much central control and to instead strengthen network resilience by encouraging the spread of information and resources. As well, in yet another paradox for network managers, Paquin and Howard-Grenville (2013) caution that network managers, as they get better at orchestrating activities, processes and relationships, need to take care not to orchestrate things to such a degree that there is no longer any opportunity for new members or new input, thereby resulting in network inertia. In other words, the very skills and activities that will grow a network successfully at the beginning can ultimately restrict the network if not properly tempered later on.

In general, as a network matures, engaging in and supporting the following activities would seem to be important for network managers and leaders: scanning of the context within which the network exists; revisiting of the network's vision in order to respond to changes in the context; ongoing development of internal and external legitimacy; and monitoring and evaluation of the network's processes and outcomes.

Stage Four: Death and Transformation

There is a dearth of research on the natural life cycle of inter-organizational networks and very little found on their death and/or transformation. Given that networks generally emerge in response to contextually embedded, complex issues that require a collaborative response, it may be that there is a natural lifespan for a network. That is, there may be a natural evolution or progression to death or transformation that can be expected as the context changes. A network may also differentiate into other networks as the problems confronting it changes. Perhaps a network is not meant to have the same lifespan or longevity as a traditional organization? The following questions, then, may be useful to consider as the network evolves and matures:

- Has the network reached a point where what it can offer has been maximized?
- Is the reason for which the network was formed still at issue?
- Does the network need to reinvent or reframe itself?
- Is the network still able to demonstrate its added value?

- Is the network highly susceptible to external shocks?
- Is the network's vision still valid?
- Do we still need the network to advance this vision? (Networks Leadership Summit IV, 2009)

Some network leaders would argue that if the network administrative organization that coordinates and facilitates the network development is successful, as the network matures that network administrative organization may no longer be necessary to the viability of the network (Networks Leadership Summit IV, 2009). In this context, Royce (2011), describing the Canadian National Centres of Excellence research networks, identified some factors common to successful transition, including:

- Proactive, visionary, resilient leadership and vision;
- High commitment to network participants, partners and the development of strong relationships;
- Strategic planning processes developed to underpin next steps (e.g., legacy initiatives);
- Extensive stakeholder engagement in the transition process;
- Effective and broad communication of transition plans;
- Successful leveraging of partnerships and expertise;
- Ability to develop new partnerships and engage new stakeholders; and
- Some continuation of administrative support from the network 'host' organization through the transition.

In the research literature reviewed here, there was virtually nothing to be found about what happens if a network experiences sudden and unexpected death before its natural lifespan has been reached. This is not surprising, since the question of whether there even is a natural lifespan for networks remains outstanding. However, practice experience suggests it is common for network participants, and particularly those who are most intimately involved in leading a network, to experience grief if a network is disbanded unexpectedly, and this grief can delay or even prevent any further transitional process from occurring (Royce, 2011). If network managers and leaders believe that networks do have a natural lifespan, it seems worthwhile for them to incorporate some element of ongoing planning for transition, with a goal of maximizing the legacy of the network and ensuring that network participants can continue to strive toward realizing the vision of the network. The most likely enduring legacy for networks, the relationships developed among network participants, may then be leveraged to embark upon new collaborations and initiatives (Royce, 2011).

The legacy of interpersonal and inter-organizational relationships would tend to be supported in the experience of a child and youth health network in Alberta. This network, in which the authors were involved, was eight years old when it was abruptly disbanded in 2009, in spite of achieving positive outcomes (Lemaire et al., 2010), in a major overhaul of the health system. Four years later, the relationships nurtured during the tenure of the network by and large remain and the references to the network, its accomplishments and its way of working continue. Perhaps, when a formal network structure is dissolved, an informal network remains and awaits reactivation as the context changes yet again.

Others argue that it might be helpful to begin to move away from thinking about networks as having a typical life cycle that involves a birth, and then a period of growth until it reaches a stage of maturity, at which it is sustained. The argument is that networks and other collaborative efforts are much more of an organic life form and have eco-cycles, rather than life cycles,

where there is a solid renewal loop (Hurst & Zimmerman, 1994) or reinvigoration process (Paquin & Howard-Grenville, 2013). In an eco-cycle model the focus is on continually adapting and reinventing the network rather than sustaining it. There is a leadership paradox here, as network leaders and managers must be deeply committed to success but also ready to let go of the current network form, particularly if it is unable to make further progress toward its vision (Cabaj, 2011). Indeed, Hurst and Zimmerman (1994) argue that renewal may require the destruction of an existing organizational form. Similarly, Zimmerman, Lindberg, & Plsek (1998) observe that, while the life cycle model helps in our understanding of the growth and maturity phases of organizations, it does not incorporate two critically important phases—"destruction and renewal….The eco-cycle extends the life cycle concept to incorporate these dimensions….The paradox is that renewal and long-term viability require destruction" (p. 172). Hurst and Zimmerman (1994) contend that once the organizational form no longer formally exists, the knowledge created through the endeavor and the connections developed live on. They remain:

> as patterns of interaction in an immense, weakly connected network…but through this network, the patterns have the potential to be reincarnated in new, formally connected organizations at any time. In the long run perhaps this is the only sense in which any human organization survives. (p. 353)

Future research embedded in network practice should help improve our understanding about whether there is a natural lifespan for inter-organizational networks, and what happens when a formal network governance structure ceases to exist. For example, is there a sustained impact on how these organizations work together? Are some new and different ways of working developed as a result of participation in the network? Does knowledge accrued through the network remain with participants after a network's demise? Are there some ways of preparing for transition that will maximize the use of knowledge generated by the network and its participants after its death?

Questions remain about how to distinguish between a natural death and an untimely death, including how to prepare for the former and prevent the latter. Or perhaps using the eco-cycle model is a good fit for networks, meaning that the focus is on a renewal loop where there is ongoing cycling through development, exploration, maturity and creative destruction, rather than a birth, growth, maturity and death/transformation model.

Evaluating Networks

Evaluating any organizational form is no small feat. However, the nebulous nature of networks, differences in perceptions of connectedness, potential role confusion, divergence in defining criteria for success, and the difficulty in identifying and attributing measurable outcomes have been identified as factors making network evaluation even more challenging (Dolinski, 2005; Popp et al., 2005b; Provan et al., 2005; Rose, 2004). As well, some would argue that there are no specific outcomes that are unique to networks, and thus the only outcomes of interest to be measured or described are the substantive ones associated with the desired purpose of the network.

Because context matters, many answers to questions about best practice in network development and evaluation may be that of "it depends" (Networks Leadership Summit VII, 2013), again requiring a more sophisticated and nuanced view of networks. As well, in all likelihood, the network will be only one of many factors contributing to any particular outcome. "Frustrating as it may be, there will be no simple cause and effect relationship. An important evaluation question then might be *"what would it be like if the network did not exist; how would things be different?"* (Networks Leadership Summit VII, 2013, p. 13). Add to this, networks as growing, evolving and changing entities, combined with difficulties identifying and understanding network effectiveness; and one can begin to appreciate the complexity of network evaluation.

Consequently, the definitions, approaches, methods and case examples described here can be viewed as a 'work in progress' representing what is known about evaluating networks at this time. While some promising approaches and evaluation processes emerge, the conclusion is that much more work needs to be done at a conceptual, methodological level and certainly at an empirical, evaluative one.

One significant opportunity for progress may reside in designing and connecting evaluation efforts and methods to align with the stages of network evolution, using all the evaluation tools currently available, and likely adapting and designing new ones. With this in mind, there are some useful guidelines and experience to bring to bear on network evaluation.

We know from the conventional evaluation literature that ideally evaluation planning should begin at the same time as the initial planning and design of the network, and evaluation should commence as soon as the network is up and running. This is critical given the importance of using early process evaluation results to inform ongoing network development. In addition, since the substantive outcomes of interest are as wide ranging as the purposes of the various networks (Birdsell et al., 2003), it may well be important early on to identify and agree on how effectiveness is defined for a particular network, as well as on what shorter term outcomes can be identified to help track progress. In other words, what are you trying to achieve through the development of the network, and how will you be able to tell if you are progressing toward achieving this?

Understanding Network Effectiveness

Network effectiveness can be defined "as the attainment of positive network level outcomes that could not normally be achieved by individual organizational participants acting independently" (Provan & Kenis 2008, p. 230). Although it is common to evaluate the impact of an inter-organizational network on at least two levels (i.e., the impact on the member organizations and the impact on the whole network), Provan and Kenis (2008) contend that more emphasis needs to be put on whole network effectiveness. That is, has the network as a whole been able to move forward in addressing the issue on which they came together to work? In order to justify investing in networks, there is a need to measure the overall impact of the network and demonstrate the added value of the network in terms of achieving new outcomes or improving efficiency or effectiveness.

Networks in health and human services are often formed to improve service delivery systems or broad population health, but held accountable for improved direct client outcomes, which may not necessarily follow, at least in the short term. Showing causal relationships between work done at the network level and individual client outcomes is not easily accomplished. In part, this is because there are often multiple contributing factors to client level outcomes, making it difficult to attribute changes to network activities alone. As was described in previous sections, it is the member organizations of the network that are providing the direct client service, making it difficult for networks to determine the legitimate outcomes of the network versus those of their organizational members. As well, depending on the phase of network development, there may be reasons to emphasize tying outcomes to organizational members over the network as a whole. Evaluating effectiveness primarily at the network level then, although important, may not satisfy decision-makers and funders (whose support is required for network sustainability) if it cannot be directly tied to organizational and client outcomes. Network evaluations need to demonstrate links between whole network effectiveness and these more specific outcomes.

Both Turrini et al. (2010) and Raab et al. (2013) build on what they describe in turn as the "benchmark" and "seminal" work of Provan and Milward (1995) on network effectiveness which "explains network effectiveness with structural characteristics (centralized integration, external control) and contextual factors (system stability and resource munificence)" (Raab et al., 2013, p. 4). Turrini et al. undertook a meta-analysis of literature on determinants of network effectiveness in an effort to create an integrated framework of network effectiveness. They draw out concepts and associated variables and map their positive or negative impacts to network performance at client, community, and network levels just as Provan and Milward (2001) did. Not surprisingly, some concepts and their associated variables have impacts at more than one level in a network. For example, the concepts of "resource munificence" and "system stability" and the variables within them are seen to have impacts at the client, community and network level. Aligned with our earlier discussion on the importance of network management, Turrini et al. highlight the emphasis among studies on "the role of network functioning (and in particular of the behaviours of managers working in the network) in determining the degree of network effectiveness" (p. 545). Ultimately they propose a model where the characteristics of network functioning, structure and context all lead to network effectiveness at varying levels.

Raab et al. (2013) further explore how network structure, governance and context relate to network effectiveness, also adding in network age as a consideration. They propose that the "complex interplay between necessary and sufficient conditions can explain…high or low levels of effectiveness" (p. 5). In a study of 39 networks, Raab et al. test six hypotheses: five identify singular variables (i.e., age, system stability, resource munificence, centralized integration and being governed by a network administrative organization) as being necessary but

insufficient for network effectiveness, with the sixth hypothesis suggesting a network with a combination of all five variables will be effective. They found that:

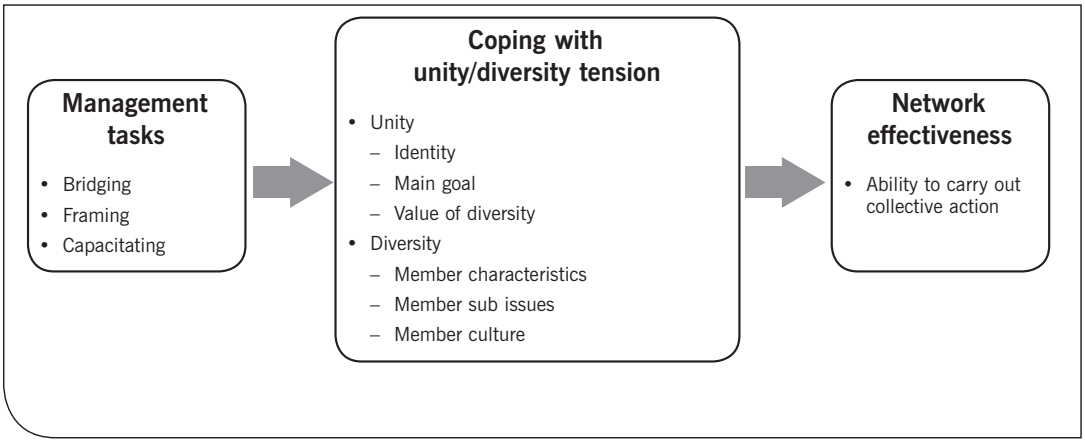
> Effective networks are centrally integrated networks that have been in existence for at least 3 years (age) and which show a high degree of stability. In addition, they either have considerable resources at their disposal or they have been set up with a network administrative organization. The results confirm core insights from Provan and Milward's earlier study. (Raab et al., 2013, p. 1)

The finding in regard to network age suggests caution is necessary in relation to when a network evaluation is completed. Notwithstanding the general thinking that evaluation should commence right at formation in order to help shape a network's development, it would be important that network stakeholders understand effectiveness is not likely to be demonstrated in the early years. While any new organizational system is likely to have more than a few bugs that need to be worked out, for networks, the added time needed to establish trusting relationships and meaningful activity is a factor that must not be underestimated. If this is not clearly understood, there could be risks to early evaluation.

Raab et al. (2013) advise that the finding that effective networks either have substantial resources or a network administrative organization as a governance structure does not mean that a network can do only with a network administrative organization and no other financial resources; rather it means that the resources inherent in a network administrative organization can offset a smaller resource base. As mentioned earlier, a network administrative organization governance structure costs more but, as found by Raab et al., may also provide more support to a network.

Saz-Carranza and Ospina (2011), as described earlier, link network effectiveness directly to the resolution of the unity-diversity tension and they propose the following model (Figure 2) in this regard:

Figure 2: Governing Whole Networks: Addressing the Unity-Diversity Tension



Adapted from: Saz-Carranza & Ospina, 2011, p. 356

As Raab (2014) indicates, and seems to question, this line of reasoning means that "networks will only be effective if diversity can be positively used in generating resources and ideas for the achievement of network goals and solution of joint problems" (p. 532). While clearly the unity-diversity tension is important to address, one can question whether or not it is the ultimate

dilemma for networks. Additionally, Saz-Carranza and Ospina's study was based exclusively on networks that included a network administrative organization so it is not clear if their conclusions can be generalized to all inter-organizational networks.

Ultimately, the outcomes used to define effectiveness will be somewhat unique to each network, and to each sector in which a network exists, depending on the purpose of a particular network (Provan et al., 2007). For example, if the main purpose of a health or human service delivery network is to improve coordination of services, including reducing both gaps in and duplication of services, then the ultimate outcome of interest will be more coordinated service delivery. If the main purpose of a university-practice research network is to increase the use of research in practice, then this will be the ultimate outcome of interest.

Regardless of the purpose of a network, however, there are a number of known factors, based on the literature reviewed and the discussion thus far, that suggest when a network is effective. Activities undertaken during the initial formation of the network, as well as during the network's growth and development will all affect how the network matures, and how it will evolve and be sustained over time. Thus, using what we know about effective network functions; governance; leadership/management and structure; as well as how networks develop and grow through their life cycle; will enhance the robustness and practicality of a network evaluation. A network's effectiveness is also influenced by the level of its resourcing, the load it is asked to carry within those resources and the quality of the services it is delivering (Milward & Provan, 1998). If required to do more than its resources can bear, a network is unlikely to be effective. As well, a network that is well resourced and coordinated may still not be effective if the quality of services produced by its member organizations is mediocre.

It is important to design evaluations that purposely build in ways to assess the factors that are linked to overall network effectiveness. Some possible evaluation questions to consider, drawing from the literature with respect to known factors that contribute to the overall effectiveness of a network, are presented in the box below.

Possible Network Evaluation Questions

- Does the network have a clear vision and goals that are understood and supported by all members?
- Is the governance structure a good fit for this network?
- Is the network appropriately resourced to do its work?
- Does the leadership style fit with what we know about effective network leadership?
- Are important management tasks being attended to, and is the management focus evolving appropriately over time?
- Is attention being paid to both the management of the network, and management in the network?
- Does the network have both the internal and the external legitimacy it requires?
- Is the network structure evolving as expected and contributing positively to the work of the network?
- Is there a reasonable mix of strong and weak ties among network members?
- Are the linkages targeted and appropriate?
- Is there trust among network members?
- Are power differentials being recognized and addressed as appropriate?
- Are there multiple levels of involvement?
- Is there a balance of stability and flexibility?
- Where is the network in its development? How many years has it been in existence?
- How does the work of the network in this policy/problem area differ from what has occurred in the past?

Processes and Outcomes are Both Important

Recent literature on the evaluation of inter-organizational networks stresses that, to date, there has been more emphasis on the evaluation of network structure than processes. Both are necessary, but it is important to design evaluations that are able to capture what we know about the kinds of processes that lead to desired outcomes. Evaluating 'how' results are achieved may be just as important (if not more important in the longer term) as looking at 'what' results are achieved. Exploring how results are achieved provides the network with important information on the health of the network itself, including an assessment of the relationships and whether the desired culture of the network is being implemented and maintained. Gilchrist (2006) indicates that a focus on processes as well as the impact of networks has the potential to make them more fit for purpose. Networks rely on trust and empathy, and thrive through the "quality and reach of their relationships" (Gilchrist, 2006, p. 29). Ensuring that evaluation of networks can generate knowledge about the status of these relationships, so they can be nurtured, repaired and shaped, is critical to continuing network effectiveness (Gilchrist, 2006).

In other words, the evaluation of both the structures and processes used to facilitate the achievement of outcomes is vital in that it can provide the network with much needed information about the state of the network as a whole. In turn, the network can address membership, governance or structural issues and correct its course if need be to sustain the network and its work.

In addition, given what we know about the evolution of networks, and especially the challenges of attributing outcomes to networks in the early phases, "evaluating networks appropriately requires some knowledge of the path of evolution and the particular life stage of the network being evaluated" (Birdsell et al., 2003, p. 30). Indicators and milestones need to be established against which to assess whether the network is developing as planned or anticipated, as well as leaving the flexibility for capturing unintended consequences and new directions resulting from the evolution of the network (Birdsell et al., 2003) and changes in the context in which the network is operating. Network managers and leaders have identified potential indicators, many of which are linked to the level of trust in a network, that relate to whether a network is evolving in maturity, such as:

- Members being able to discuss money seriously (or disclose hitherto unknown budgets);
- Achieving agreement about key issues (e.g., governing structure, criteria for success);
- Resolving a conflict successfully;
- Members voluntarily subjugating their own interests to those of the collective in the short term;
- Acknowledging that sustainability is about more than funding;
- Referral [of clients] among members;
- Showing respect for various perspectives; and
- Using the network as a problem solving mechanism (Birdsell et al., 2003).

Traditional organizational performance measures (i.e., measuring tasks and activities or clinical health outcomes) may fall short of being able to judge the effectiveness of an inter-organizational network (Kapucu & Demiroz, 2011; Mandell & Keast, 2007; McGuire & Agranoff, 2011; Popp et al., 2005b). When traditional performance measures are emphasized, other aspects of performance are often ignored, such as: relationship development; changing values and attitudes; trust-building; and longer term and system level impact (Mandell & Keast, 2007).

Multi-level Analysis is Required

A key topic of discussion in much of the evaluation literature is the importance of analyzing network effectiveness at multiple levels. As alluded to previously, networks are complex entities that, because of their very nature, will have an impact at a number of levels of social engagement. Also, given the many different stakeholders, with potentially differing ideas about a 'good' outcome, who are involved in networks (e.g., network members, service recipients, funders and decision-makers), it is important to be able to show the impact of networks in areas that matter to varying groups. Levels of analysis to consider in the evaluation of inter-organizational network effectiveness were described in some depth in the original Southern Alberta Child and Youth Health Network literature review (Hill, 2002), building on the work of Provan and Milward (2001) who identified three levels of analysis in their framework for evaluating public sector networks: community; network; and organization/participant. Hill (2002) broke this third level down into two levels, the organization and the individual. A brief description of four levels of analysis, along with outcomes measures seen in the evaluation literature related to each of these levels is included in Table 10.

Table 10: Levels of analysis in Inter-organizational network evaluation

Level of analysis	Description	Sample outcomes
Individual	Assessment of the impact that the network has on the individuals who interact in the network on behalf of their respective organizations and on individual clients.	• Increased job satisfaction • Increased capacity • Increased client satisfaction with services • Improved client outcomes
Organization	Assessment of the impact that the network has on member organizations, as the success of network members is critical to overall network effectiveness.	• Agency/organization survival • Enhanced legitimacy • Resource acquisition • Improvement in referrals
Network	Assessment of the network itself can have a variety of foci, many of which depend on the relative maturity of the network. The strength of relationships across the whole network is always an important focus.	• Network membership growth • Relationship strength • Member commitment to network goals
Community	Assessment of the contributions that the network makes to the community it was established to serve.	• Better integration of services • Less duplication of and fewer gaps in services • Services provided at lower cost to the community • Positive policy change • Improved population-level outcomes

Adapted from: Provan & Milward, 1995; Provan & Milward, 2001; Hill, 2002

Toward a Model of Action to Guide Network Evaluation

Evaluations are often conceptualized as somewhat linear and fixed processes, where inputs lead to particular outputs, and these outputs in turn lead to the development of short, interim and long-term outcomes. This may well be a point of departure for network evaluation given the fluidity of network work and evolution. For example, this way of thinking is well illustrated by the growing popularity of the use of logic models in program evaluation. Although logic models may be helpful to guide some network evaluations, they may not be suitable for all

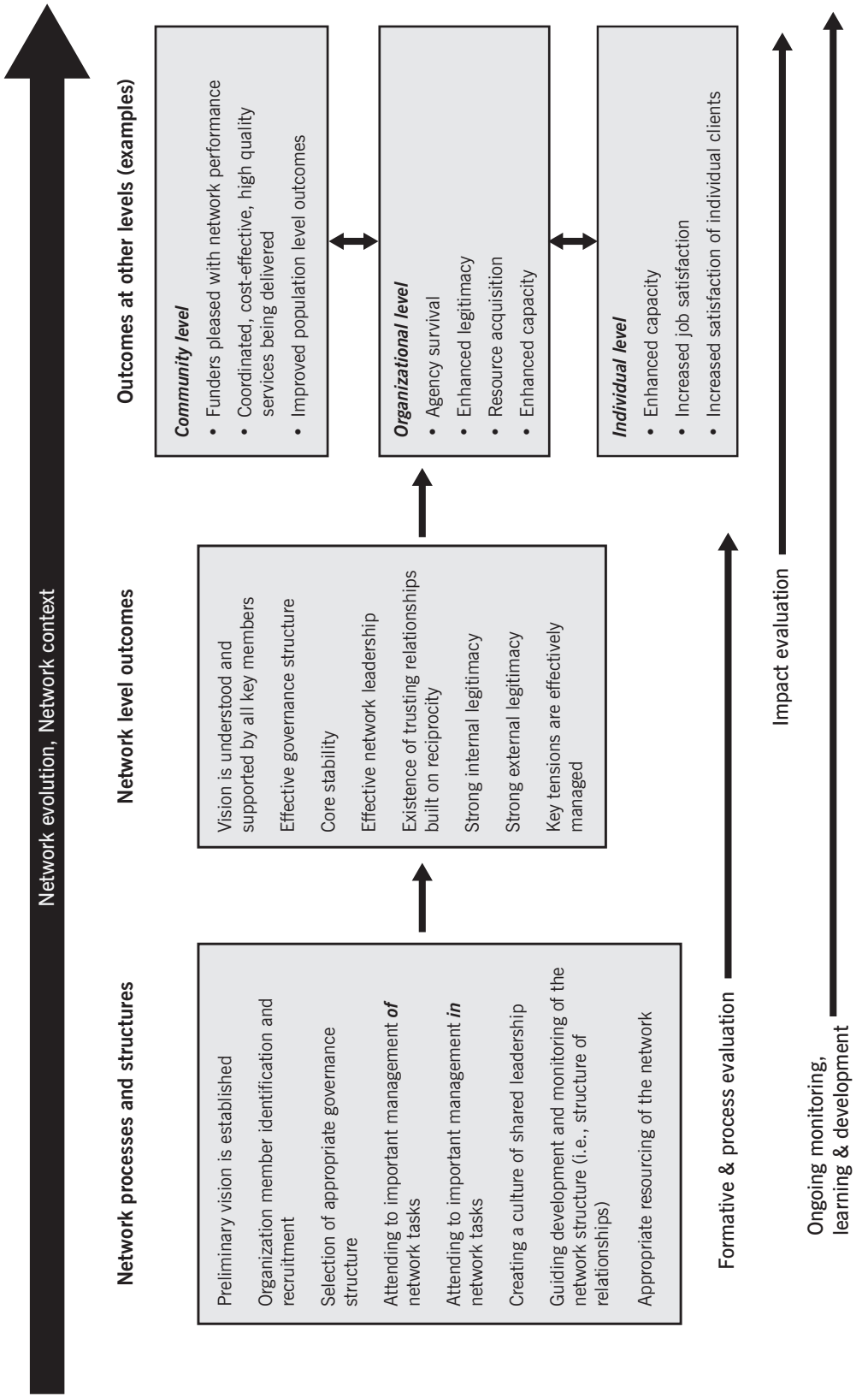
depending on the purpose of the network. Networks that have as their purpose some type of social innovation, where desired changes are likely to occur at multiple levels and across multiple contexts, may not be able to develop a linear logic model. In these cases, considering different approaches to evaluation and ways of depicting the desired achievements of the network is worthwhile. As network leaders have noted, caution is advised regarding assessing or measuring only what networks are doing now or are expected to do. Rather, there is a need for flexibility in order to be able to capture the unintended consequences of networks. This requires the development of evaluation strategies that actively incorporate looking for unintended consequences, including social consequences of organizing in a less formally structured way (CHSRF, 2005–06).

Still, the development of a high level logic model or model of action is a common strategy used by evaluators to articulate how a program or initiative being evaluated is expected to work based on what is known (i.e., from research, evaluation and other knowledge generating activities). While developing such a model for network evaluation is challenging due to the multiple levels of effectiveness that need to be considered, it may nonetheless be a useful starting point. Based on the literature reviewed here, and considering the discussion above, a model of action that network leaders could use to guide evaluation is proposed in Figure 3.

The key proposition underlying this model is that effectiveness at the network level is a necessary prerequisite for positive outcomes at other levels

The key proposition underlying this model is that effectiveness at the network level is a necessary prerequisite for positive outcomes at other levels (i.e., individual; organization; community). An advantage for conceptualizing the evaluation of network effectiveness in this way is that the desired longer term outcomes of a network that are aligned with its purpose (e.g., improved coordination of services, increased knowledge exchange and utilization, more cost-effective use of resources) are clearly seen as being facilitated through effectiveness at the network level. We understand that many of the relationships among the various levels, activities and evaluation processes are in fact iterative rather than linear in nature, but attempt to show a progression leading to overall network effectiveness. Developing this type of a model also addresses one of the key points made in the Hill (2002) network literature review with respect to advancing the field of network evaluation, which was that continuing to incorporate multiple levels of analysis in network evaluations is critical, but that also incorporating a systems level approach that examines the relationships between these levels would be an important next step.

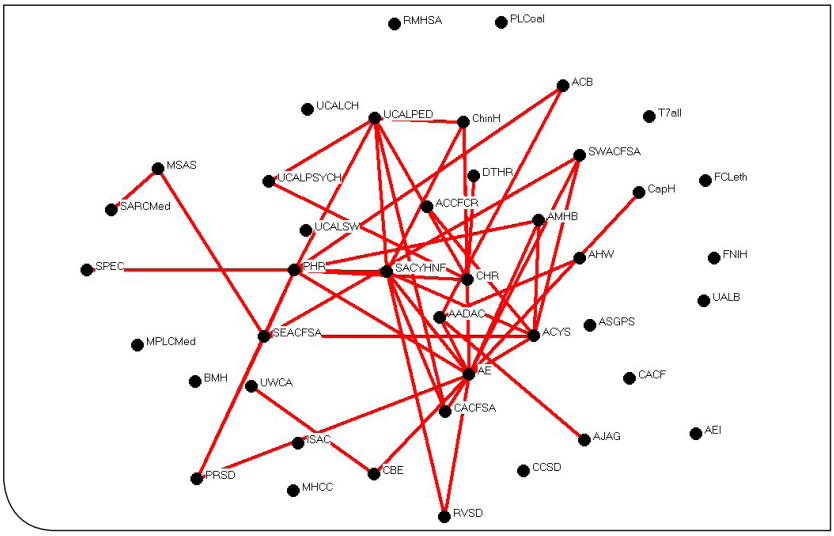
Figure 3: Toward a model of action to guide the evaluation of inter-organizational networks



The Critical Role of Social Network Analysis and Mapping

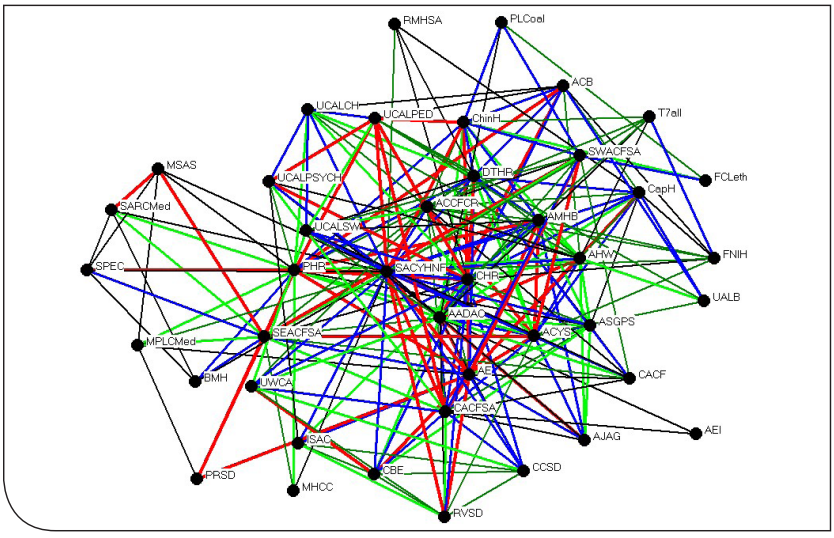
Perhaps the single most valuable conceptual tool available to network evaluators is social network analysis (SNA). Despite its complexity and the costs in time and other resources, SNA exposes the intricacies of network structure that cannot be captured through other methods. As Provan and Lemaire (2012) note, it is important to consider the dyadic relationships that collectively make up the whole network in order to understand how public networks operate. While a typical SNA demonstrates the state of the network structure at a given point in time, it can also depict the connections within the network on multiple dimensions or activities (e.g., strategic planning, service delivery, educational activities, information sharing, contracts, or client referrals) or parse out a single one. For purely illustrative purposes, two sample network maps or plots are provided below, the first showing connections within a network on one activity (see Figure 4), and the second on several with each colour representing a separate dimension (see Figure 5).

Figure 4: Network map - Connections on one activity



Adapted from: Lemaire, Provan, & Milward, 2010

Figure 5: Network map - Connections on several activities



Adapted from: Lemaire, Provan, & Milward, 2010

Summarized in the box below are some key considerations regarding data collection and measurement in inter-organizational network evaluation planning, as well as some key attributes that can be captured through SNA. When combined with other evaluative information, particularly concerning the quality of underlying relationships and processes supported by the network structure, SNA becomes an invaluable component of network evaluation practice.

Although social network analysis methods are widely used to evaluate the structure of inter-organizational networks, like any kind of data the findings need to be interpreted in context and with caution. This is particularly salient because the majority of the rich volume of research on SNA has been conducted on relationships between individuals (Gulati et al., 2011); that is, the

Key Considerations and Attributes of Social Network Analysis in Inter-Organizational Network Evaluations

Key considerations regarding data collection and measurement

Network bounding: Which organizations should be included in the network when collecting data?

Link content*:* What types of links or relationships should be assessed (such as shared resources, clients, shared information, funding and contracts, or joint programs)?

Frequency of links: Do the links measured occur with regularity or only occasionally?

Level of interaction: Administrative (top management, board) versus operational (service delivery level).

Trust: What is the quality of the relationship among partners (that is, based solely on formal agreements, rules and procedures, or on trust and informal norms of reciprocity)?

Data collection: Primary data from structured questionnaires and interviews and secondary data from agency records, where available (such as contracts).

Respondents*:* Executive director, program heads, or operational personnel. Confirmation: Are the relationships reported by an organization confirmed by its link partner?

Cross sectional vs. longitudinal*:* Are network data collected once or at several points in time, thereby allowing examination of network evolution?

Key social network data analysis attributes

Density: What is the overall level of connectedness among organizations in the network (can be calculated using data for specific types of links or for all links of any type)?

Centrality: Which organizations are most central or most involved in the network (the number of direct and indirect links maintained by each agency)?

Multiplexity*:* What is the strength of the relationship between individual network partners, based on the number of types of different links (joint programs, referrals, etc.) they maintain?

Strong versus weak ties*:* Are relationships confirmed or multiplex (strong) or are they unconfirmed or based only on one type of link (weak)?

Fragmentation*:* Are all or most network members connected, either directly or indirectly (that is, through another organization), or is the network broken up into fragments of unconnected organizations?

Dyads: Links or relationships between two organizations. Dyads are the building blocks of networks.

Cliques: The existence of subgroups of three or more fully interconnected organizations within the structure of the network.

Network plots: A visual representation of all organizations in the network and the links/relationships among them (e.g., Figures 4 and 5).

Adapted from: Provan et al., 2005, *The use of network analysis to strengthen community partnerships*, p. 605.

node or actor has been an individual rather than an organization. Gulati et al. suggest that the mechanisms that drive performance effects in inter-organizational networks; such as reach, richness and receptivity, and we would add responsiveness; may be different than those in relationships between individuals. Thus, while SNA is a very promising tool for evaluating inter-organizational networks, prudence in interpreting results is warranted.

Also, similar to many other methods, a cross sectional SNA does not capture temporal factors, meaning that evaluations are based on data that reflect the network at one point in time. Employing SNA at multiple intervals does have the ability to track changes and show the evolution of the network's relationships over time. Networks, as we know, are dynamic and ever-changing (Institute for Healthcare Improvement [IHI], 2011), meaning that repeated measures over time would be ideal. SNA is resource-intensive, however, making it challenging for many networks to undertake repeated measures. While full of promise, the limitations of a single, point in time, social network analysis reinforces the need for using multiple methods, and in particular qualitative research methods, to develop a more complete picture of the processes and impact of a network.

On a positive note, a new tool called PARTNER (Program to Analyze, Record, and Track Networks to Enhance Relationships), developed by Danielle Varda at the University of Colorado in Denver, is being made available to network practitioners and may offset some of the high intensity SNA resource requirements:

> PARTNER is a social network analysis tool designed to measure and monitor collaboration among people/organizations. The tool is sponsored by the Robert Wood Johnson Foundation and designed for use by collaboratives/coalitions to demonstrate how members are connected, how resources are leveraged and exchanged, the levels of trust, and to link outcomes to the process of collaboration. (PARTNER, n.d.; www.partnertool.net)

Examples of Network Evaluations

There are a number of network evaluations published in the academic literature and available in the practice literature, as well as a number of articles discussing important issues related to how to assess the performance or effectiveness of networks. Included in Table 11 are some examples of network evaluations that include a variety of different kinds of networks, as well as a range of levels and kinds of items measured.

Reviewing the variety of processes and outcomes measured across this sample of network evaluations illustrates how closely tied outcomes are to the purpose of the network. This is particularly apparent at the community level of outcomes. There are some trends to note, however, and they include:

- Conducting analysis at a variety of levels;
- Assessing or measuring both processes and outcomes;
- Considering the development of collaborative processes and strong relationships at the network level as important outcomes in their own right;
- Using a mix of data collection and analysis methods within a single evaluation (e.g., surveys, interviews, focus groups, document review, qualitative data analysis, social network analysis); and
- When measuring network level relationships, examining relationships at the whole network level in addition to looking at dyadic relationships.

Table 11: Examples of network evaluations

Evaluation project	Level(s) of analysis	Processes and outcomes measured
Inter-organizational partnerships between child and adult mental health services in Clark County, Washington (Davis, Koroloff, & Johnsen, 2012)	Network	Density and centrality of relationships for 4 activities: • participation in client-related meetings • participating in meetings on issues of mutual interest • sending referrals • receiving referrals
Service delivery network for LA family and children's services (USA) • **lead agency governance model** • **mandated network** (Chen, 2008)	Network • dyadic relationships between a lead agency and each of its network partners	Collaborative processes • joint decision making • joint operation • reduced autonomy • resource sharing • building trust Collaborative outcomes • goal achievement • quality of working relationships • broadened views • increased interactions • equitable influence
Federal Response Plan network, Hurricane Katrina response network (Kapucu & Demiroz, 2011)	Network (Used UCINET, a social network analysis software package, to analyze data collected through content analysis of news reports, government documents and after-action reports)	• Governance structure • Information diffusion • Risk sharing • Goal commitment • Service integration • Multiplexity
Human service delivery network in Goodna (Australia) (Keast et al., 2004, Mandell & Keast, 2007)	Network Community Organization, Individual	• Improved relationships among members • Increased trust • Shared power and decision making • Commitment to the whole • Sustained relations • Seamless service delivery • Involvement of community • Aggregate service outcome measures • Cost-benefit • Improved infra-structure and facilities • Improved capacity
Voluntary Collegial Clinical Networks in New South Wales, Australia • **consumer involvement** (McInnes, Middleton, Gardner, Haines, Haertsch, Paul, & Castaldi, 2012)	Network Community	Conditions for effective clinical networks • Relationship building • Effective leadership • Strategic evidence-based work plans • Adequate resources • Ability to implement and evaluate network initiatives Desirable outcomes of successful clinical networks • Interdisciplinary and consumer collaboration • Better relations between clinicians and government agencies • Improved services, care and patient outcomes • Increased evidence-based practice

Table 11: Examples of network evaluations (continued)

Evaluation project	Level(s) of analysis	Processes and outcomes measured
Alberta Healthy Living Network • **mission is to provide leadership for integrated, collaborative action to promote heath and prevent chronic disease** (Moore, Smith, Simpson, & Minke, 2006)	Network Organization	• Organization centrality, using a Freeman degree measure • Network ties (i.e., percentage tie homophily) • Financial support for organization's programs and activities
Southern Alberta Child & Youth Health Network • **hybrid lead agency/network administrative organization governance model** • **mission is to advance high quality, coordinated programs and services for children, youth and families** (Lemaire et al., 2010)	Network Organization Community	• Strong relationships (i.e., cross-sectoral, inter-regional, trusting, multiplex) • Leadership at steering committee, secretariat and regional levels • Parent involvement • Role of network facilitators • Improved services • Increased capacity and professional development • Improved integration of care • Improved service delivery at a system level
Network of teacher training colleges in the Netherlands (Schalk, Torenvlied, & Allen, 2010)	Network (Focus on relations between all network members, rather than dyadic relationships) Organization	• Network embeddedness (i.e., organizational membership in a cohesive subgroup) • Individual student satisfaction
Inter-university research project teams from eleven leading hospitality management programs in the US (Susskind, Odom-Reed, & Viccari, 2011)	Network Individual	• Communication relationships • Team performance (i.e., team project rankings) • Individual team member performance • Team leader performance
Brazos Valley Health Partnership • **mission is to improve coordination of service delivery** (Wendel, Prochaska, Clark, Sackett, & Perkins, 2010)	Network Community	• Extent to which organizations in the network collaborated • Type of collaborative activities underway (e.g., share information, plan joint efforts, share tangible resources) • Emergence of new leaders • Development of new knowledge and skills • Long term sustainability of new health-related activities

Finally, in order to increase our understanding of the role and importance of networks, and why some networks are more effective than others over time, a broad range of evaluation approaches need to be integrated (Casebeer, Huerta, & VanderPlaat, 2006). There is a need then for comparative, longitudinal evaluations that rely on multiple methods. The evaluation of the Southern Alberta Child and Youth Health Network by Lemaire et al. (2010) is one example of an evaluation that relied on multiple methods to increase understanding of the processes that were important in developing the network, as well as the outcomes or impacts of the network. Although the evaluation of this network was not initially designed as longitudinal, this was the third evaluation activity undertaken by the network in eight years. The data collection methods used were:

- A document review, in order to enhance understanding of the context;

- A questionnaire, using social network analysis, designed to assess overall network structure, the strength and quality of cross-sectoral and inter-region relationships, and the impact of the network at multiple levels;
- Parent focus groups, to obtain parent perspectives on their participation in the network, as well as the impact of the network on the child and youth system;
- Interviews with key stakeholders to obtain more in-depth perspectives on many of the issues addressed in the questionnaire, as well as other issues that the interview participants raised as being critical to the success and sustainability of the network; and
- Digital stories that captured perspectives of participants at varying levels in the network. Digital storytelling is one type of narrative approach that has been used to relay how involvement in a network has changed an individual, their thinking and the way they now work in the system (see Center for Digital Storytelling, www.storycenter.org).

As is true for attempting to research and evaluate any complex phenomena, it is increasingly clear that a multiple, mixed method approach to the evaluation of networks is likely to yield much more useful and robust information than could any single method on its own. Additionally, given the evolutionary nature of networks, a longitudinal and comparative approach is better suited to understanding networks across time and through stages of development than a single cross sectional design. Keast et al. (2004) make a strong case for moving away from traditional approaches of evaluation and, in addition to longer timeframes for evaluation, recommend the following: "a new emphasis on integration rather than simply delivery of services, changed perceptions about each other's contribution to the whole, and recognition of the value of relationship building are a promising start" (p. 370).

Gaps in Knowledge and Future Research and Evaluation

Through this review of the literature there emerged a number of areas on which to focus future research and evaluation in an effort to take the next big step in advancing knowledge about networks to inform practice.

There is a growing body of research on inter-organizational networks that has extended the study of interpersonal networks to an organizational level, viewing organizations as "actors embedded in webs of social relations" (Gulati et al., 2011, p. 208) and primarily using a structural lens in investigating the antecedents and consequences of inter-organizational networks. Gulati et al. (2011) argue that using only the structural lens may result in the "misapplication of theory across levels of analysis" (p. 208), meaning that the mechanisms that drive inter-organizational relationships are not the same as those in interpersonal relationships. Findings about social relations at the individual level, then, may not necessarily translate to inter-organizational relationships. To avoid this pitfall and to develop evidence unique to inter-organizational relationships, future network research needs to include a focus much broader than only a structural lens.

The emphasis in the recent inter-organizational network literature on whole networks and a network level of analysis is a response to this gap. To date, there has been considerably more emphasis on social network analysis, which looks at the bilateral dyadic ties between individual organizations, than on exploring the multi-lateral relations that define a whole network (Gulati et al., 2011; Provan et al., 2007; Provan & Kenis, 2008; Provan & Lemaire, 2012). Looking at the whole network has the potential to increase our understanding of how networks evolve, how they are managed and governed, and ultimately how community level outcomes might be generated (Berry et al., 2004; Provan et al., 2007).

Bryson et al. (2006) identify the intellectual challenge of studying cross-sectoral collaborations because of the need to "blend multiple theoretical and research perspectives" (p. 52). They also discuss the limitations of viewing cross-sectoral collaborations as "networks" and using network theory to ground research questions, suggesting that this approach results in a focus on structural variables, and tends to disregard what they describe as three critical components of cross-sectoral collaboration:

- An appreciation of the differences between sectors, including their strengths and weaknesses;
- Ongoing process dimensions, including a broad definition of leadership; and,
- The dynamic nature of collaborative development. (Bryson et al., 2006, p. 52)

Future research and evaluation must bridge these perspectives if it is to capture the complexity inherent in cross-sectoral collaborations. Combining a network lens with narrative analysis, exploring how networks understand themselves, is one way proposed to help differentiate between networks and the variation in their performance (Bixler, 2014).

Along with research focussed at the network level and on whole networks, rounding out the understanding of networks by exploring the characteristics and functioning of both bright and dark networks, and the assumptions embedded in them (Berry et al., 2004; Hejnova, 2010; Raab & Milward, 2003), would be a significant contribution to the knowledge base.

In the literature reviewed here, there was a dearth of research on network leadership and its similarities or differences from leading in other organizational forms. However, there is a large body of literature on leadership that is not well integrated into the research conducted to date on inter-organizational networks. Given this, it may be useful for future research to explore in more depth the concepts of network leadership and network management, their relationship to each other, and the differences between leading and managing in networks versus in traditional hierarchical organizations. Furthermore, exploring the role of network managers, how network managers go about developing good relationships, and how decisions are made within a network would be useful (Berry et al., 2004). Further research would be welcomed on the context of network management, including on the handling of the multitude of tensions over the course of the life of a network, the necessary and sufficient conditions for network effectiveness (Raab et al., 2013), and the circumstances under which certain management practices and tools are likely to be more successful (Kelman et al., 2013).

A number of authors identify the importance of addressing power issues in networks and raise questions for further research (Huxham & Vangen, 2005; McGuire, 2006; Huxham & Beech 2008, Purdy, 2012) such as research to: identify what managers can do to effectively address power imbalance, understand the impact of power, and explore how power can be successfully shared and used collectively. We further add the suggestion for research to explore how network managers can effectively wield, not just manage, power to advance the goals and evolution of the network.

A number of functions of networks were identified in this review of the literature, and once again there is considerable research done on these functions outside of a network context that may be helpful to build into future network research. We identified three functions where more network research is required, with a focus on building on the knowledge generated in other disciplines: information diffusion and knowledge exchange; network learning; and innovation.

With respect to network learning, research in organizational studies has suggested that organizations have different and varying levels of 'dynamic capabilities' and 'absorptive capacity' (Eisenhardt & Martin, 2000; Lane et al., 2006). We further suggested that these conceptual approaches might be particularly relevant to understanding different ways that networks and their constituent organizational members learn and develop. As well as creating new value through absorbing external resources, organizations (and the networks they belong to) can develop dynamic capabilities through their own internal learning processes. How the development of internal resources in the context of an inter-organizational network might dovetail with absorptive capacity warrants additional practice focus and research efforts. Research designed to measure changes in both dynamic capability and absorptive capacity of organizations as a result of network participation, along with assessing the impact on the quality and quantity of available resources across the network, may contribute to better understanding of network value and effectiveness.

Information diffusion and knowledge exchange is an important function of most non-profit or public sector inter-organizational networks, as is the bringing together of different kinds of knowledge and/or generating new knowledge, because these potentially enable a network to tackle the important issue that brought the network together. Hartley and Benington (2006) state that future research needs to develop theories that take into account the political and more explicitly contested nature of knowledge in the public service sector. They argue that

there is a need for research that captures the processes involved in the co-creation of knowledge, and to explain why knowledge takes root in some contexts and not in others. Innovation is intricately linked to knowledge generation and exchange, and is an important function of networks because it is critical to addressing complex problems. More research and practice experience with networks are required to capture innovation pathways leading to improved network performance and value.

The anthropological, ethnographic kind of research called for by Hartley and Benington (2006) is similar to the research being proposed by others in relation to going beyond network structure to understand behaviours. Overall, there is a call for research that is more longitudinal and comparative in nature, research that uses a combination of qualitative and quantitative methods, and is more cross disciplinary (Berry et al., 2004; Isett et al., 2011; Keast et al., 2004; Plastrik & Taylor, 2006). Isett et al. (2011) describe the importance of conducting more meta-analysis types of research, using data sets developed through in-depth individual network case studies to help augment network theory. They note the current challenge in determining which of the factors that contribute to a particular network's effectiveness are transferable to other inter-organizational networks. Comparisons and reviews of multiple case studies have the potential to tease out common success factors that cut across networks, as well as increase our understanding of the evolution of networks. Others suggest studying the structure of well performing emergent networks in order to provide insights about how to purposefully design more formal networks (Isett et al., 2011).

The lack of research on the evolution of networks has been described by a number of inter-organizational networks researchers (Berry et al., 2004; Huerta, et al., 2006; Isett et al., 2011; Provan et al., 2007; Provan et al., 2011) as being a critical gap in our knowledge base. Again, comparative case study research, following a number of networks over a longer period of time and using a mix of qualitative and quantitative methods, would help increase understanding, if there is such a thing, of the natural life cycle or eco-cycle of inter-organizational networks. Research such as this would contribute to knowledge about how to distinguish between a natural death and an untimely network death, including how to prepare for the former and prevent the latter.

Research efforts across disciplines could address some of the gaps in knowledge described here. Examples of areas of study that can be drawn upon to inform future network research include: collaboration; social capital; complex adaptive systems; multi-organizational learning and change; leadership; and community development. Both content and research methods from these areas may be beneficial to the study of networks, and to increasing our understanding of the complexities of inter-organizational networks and what works when, where, and why.

Recent advances in the discipline of evaluation, specifically developmental evaluation (Patton, 2011), show promise in increasing our ability to understand the development, and ultimately the impact, of complex entities such as inter-organizational networks. Patton (2006, 2011) describes developmental evaluations as learning evaluations, where the aim is to encourage people involved in social innovation initiatives to be constantly assessing what is working as intended, what is not, and using what they learn to make necessary adjustments to the initiative.

The use of narrative, such as digital stories (www.storycenter.org), as a promising approach to extend and present evaluation findings has also been identified (Networks Leadership Summit IV, 2009). Stories can be a powerful mechanism for demonstrating value, particularly of initiatives that are deeply embedded in context. A government minister might not read or understand a statistical report, but a compelling story about the impact of a network on people's lives may get their attention. In other words, stories can be effective in engaging both the hearts and the

minds of key stakeholders. They can relay how involvement in a network has changed an individual, their thinking and the way they now work in the system, and can be a powerful transformational tool at a policy level.

In summary, there is a call for leveraging the knowledge and various research and evaluation methodologies used across academic disciplines to explore networks more fully, including the assumptions behind networks; their development and evolution; leadership, management and ways of working; and their ultimate value and impact.

Authors' Final Reflections

In 2006, Huerta and colleagues stated that, "*Network* has become such a ubiquitous term that it is of little practical use in the context of a search on most literature data bases" (p. 12). Eight years on, our search for literature relevant to *inter-organizational networks* remained problematic and messy. Just like inter-organizational networks themselves, the literature base and practice experience are wide ranging, diverse and sometimes difficult to find.

Definitional issues and inconsistent terminology were difficult enough, but bounding the literature search was even more trying, especially as the authors had varying levels of tolerance for crossing academic disciplines or bodies of knowledge. At every point along the way, any one of us was bemoaning a decision that limited our reach or excluded our favourite concepts or bodies of literature.

Tensions arose regarding the inclusion of unpublished literature, much of which gave voice to the practitioner perspective. Some of us would argue strongly that virtually all practice based network experience and knowledge is legitimate evidence, and others that "there are just as many nitwit network practitioners out there as bad network scholars." Discussions and decisions regarding the quality of unpublished literature were sometimes heated, although to be fair some of the same heated discussions occurred in relation to the quality of the published academic literature.

The inclusion of literature from domains other than strictly the field of network studies, such as organizational learning, complex adaptive systems, knowledge exchange, leadership and evaluation was contentious. Some would argue that these bodies of literature, on face value, are relevant and transferrable to networks and that, indeed, the studies of networks have not yet generated evidence in many important areas, so we are required to draw from other fields. Others would say this is "reasoning by analogy" and extreme caution should be used in making these leaps due to lack of empirical evidence, even if they seem useful to practitioners. Sometimes we found ourselves jumping from one side of the fence to the other depending on the topic. When we did agree to refer to some of these other bodies of knowledge, it was evident that we simply could not go into the depth we would like to without essentially undertaking another complete literature review. Instead we tried to provide a sample in the body of the review, making the link as we saw it to inter-organizational networks; ergo our encouragement for readers to use this as a springboard for more learning and inquiry of their own.

A principle of 'equalized unhappiness' prevailed. Ironically, the process of bounding the literature search parallels that which researchers ask network practitioners to go through routinely, namely creating a potentially artificial boundary around a network in order to make research or evaluation feasible.

That said, we have been able to identify a significant body of work we hope will be of considerable value to those working inside inter-organizational networks. We also suggest that the

messiness of the boundaries of literature potentially of use may be seen as an opportunity as well as a challenge, as it allows us to learn from multiple disciplines and diverse perspectives.

We had great and irresolvable debates about network types and functions (when is it which?); network leadership versus management (are they different from each other and are they different in networks than in other organizational forms?); and the question of a network life cycle or eco-cycle (do networks have either one?); mirroring what we found or did not find in the literature on networks and reinforcing the need for more practice based research. We felt stymied on conceptual and theoretical fronts more than once, and frustrated by the lack of clarity in the literature on elements of fundamental importance to networks and their functioning.

Thankfully, we had some "violent agreements" as well. There was never any question about our agreement that inter-organizational networks can be pivotal mechanisms to address big societal issues, despite the difficulties of capturing their value and tying outcomes directly back to their work. Similarly, we collectively embrace the concept of 'the network way of working'. We believe there are some important distinctions to be made about ways of working in networks, some of which this critical review of the literature has begun to elucidate. Finally, there was also never a question about our ongoing commitment to studying networks in order to demonstrate their value and contribute to the practical and conceptual knowledge base on networks.

Appendix I: Literature Review Questions

1. What are the key concepts and characteristics of inter-organizational (IO) networks in the public or not-for-profit sector?[1] Building on the conceptualization section of the 2002 literature review:
   - What is an IO network; and what is not an IO network?
   - Why do IO networks exist (i.e., rationale)?
   - What do IO networks do (i.e., functions - e.g., knowledge exchange; coordination of services; addressing meta-problems; etc.)?
   - How do IO networks evolve (i.e., eco and life cycle models)?

2. With respect to the successful implementation (i.e., planning and design, development, growth), sustainability and resilience of inter-organizational networks, considering the 4 network levels identified in the 2002 review (i.e., vision, structure, processes, action [called service delivery in the 2002 review]):
   - What are the enablers of successful implementation, sustainability and resilience? (e.g., management strategies; kinds of leadership; "network way of working"; positive deviance)
   - What are the barriers or challenges to successful implementation, sustainability and resilience?
   - What do we know about the evolution or life cycle of networks?
   - What do we know about promising practices, with an emphasis on what works and what doesn't in which contexts and why?
   - What are the limitations of networks? When should and when shouldn't you use networks?
   - How do emergent networks differ from mandated networks (i.e., relative to all these questions)?
   - Are there some exemplars out there?

3. With respect to the evaluation of inter-organizational networks:
   - What levels of analysis are identified in network evaluations (i.e., individual, organization, network, community, other)
   - How is success defined? What are desired outcomes and impacts? How is value attributed to a network?

1. Realizing that conceptualization is not the primary focus of this literature review, it might still be good to pick up any recent key articles that can contribute to our initial description of inter-organizational networks (building on what was described in the 2002 review).

- What approaches to evaluation show the most promise in helping us to understand how to better implement inter-organizational networks, and using what is learned to make needed changes to our network structures and/or processes[2]?
- What approaches to conducting evaluations and sharing evaluation findings show promise with respect to showing the impact of inter-organizational networks?
- Do evaluations contribute to sustainability of networks? If yes, how?
- Are there some exemplar evaluations out there?

4. Is there anything new emerging from the most recent literature that is important to include in this review (i.e., it will be important to keep our eyes open for surprises, aha's, frontiers)?

2. Note that there is overlap here with quality improvement.

Appendix II: Expanded Discussion on Scope of This Review

Social networks and social network analysis

Inter-organizational networks, rather than interpersonal or social networks, are the focus of this review. However, much of what has been learned about the structure of social networks through social network analysis research has informed the analysis of the structure of, and relationships within, inter-organizational networks. This is not surprising since the development and maintenance of interpersonal relationships is a key component of inter-organizational networks, and given that it is people who are doing the interacting. Thus, social network analysis methods, as discussed in the section on evaluation, are widely used to evaluate the structures in inter-organizational networks.

Because of the relevance of both interpersonal relationships and social network analysis to inter-organizational networks, we include a brief description here of some key concepts and provide a short list of further readings for readers who are interested in learning more (Borgatti & Foster, 2003; Borgatti, Mehra, Brass, & Labianca, 2009; Galaskiewicz, 2007; Gulati et al., 2011; Kilduff & Brass, 2010; Monge & Contractor, 2003).

> There are many kinds of networks in the world. Each individual is part of a social network that links one to others in a variety of ways—friends, relatives, work colleagues, and so on. Each person is called a "node" in network terminology. Relationships, or linkages, among a group of individuals are commonly referred to as a social network, and the network as a whole is the pattern of linkages among the individuals. (Milward & Provan, 2006, p. 9)

While widely adopted, Gulati et al. (2011) advise scholars to be careful how they apply the rich body of research on social networks to the level of the organization, stating: "we recognize that scholars may continue to draw inspiration from the voluminous research on interpersonal networks, but we encourage consideration of alternative conceptual schemes more fully grounded in the study of inter-organizational networks" (p. 221).

Suggestions for further reading:

- Borgatti and Foster (2003). "The network paradigm in organizational research: A review and typology". This article reviews and analyses the emerging network paradigm in organizational research.
- Borgatti and Halpin (2011). "On network theory". This article analyzes two well-known network theories: Granovetter's strength of weak ties theory and Burt's structural holes theory, both of which are frequently discussed in research on the structure of inter-organizational networks.
- Borgatti, Mehra, Brass, & Labianca (2009). "Network analysis in the social sciences". This article includes a useful typology of the kinds of ties studied in the social sciences.

- Galaskiewicz (2007). "Has a network theory of organizational behaviour lived up to its promises?" This article provides a brief summary of the state of the science on the theory of social network analysis as it applies to understanding organizational behaviour.
- Institute for Healthcare Improvement (2011). Summary Report: 90-day R & D Project. "Network Theory". This report provides an overview of the main orienting concepts in social network theory (i.e., centrality, density, embeddedness, strength of connections, cliques, social capital, structural holes, structural equivalence, and structural cohesion), and a brief description of social network analysis.
- Kilduff and Brass (2010). "Organizational social network research: Core ideas and key debates". This article provides an overview of the state of the science on social network research.

Social capital

A fundamental concept underlying research on inter-organizational networks is social capital (Borgatti & Foster, 2003; Casebeer et al., 2009; Gulati et al., 2011; Provan & Lemaire, 2012; Scott & Hofmeyer, 2007). Borgatti and Foster (2003) state that "in the most general terms, the concept is about the value of connections" (p. 993). Provan and Lemaire (2012) note that social capital is based on attributes of the relationship between individuals, unlike economic capital (resources) or human capital (knowledge and training) which are based on attributes of the actor/individual. "A person who has high social capital is someone who has a rich set of social connections that provide access to information, resources, support and so on" (Provan & Lemaire, 2012, p. 639).

Scott and Hofmeyer (2007) also describe social capital as the nature and extent of the impact of social relationships. They state that "social capital refers to resources such as information, support and social control that flows through networks, rather than the network structure itself" (Scott & Hofmeyer, 2007, p. 3). They make a distinction between bonding (i.e., close, often friendship or family ties), bridging (i.e., ties that connect people who are somewhat distant) and linking social capital networks (i.e., vertical ties with people unlike ourselves) (Scott & Hofmeyer). They go on to talk about three key network concepts in the context of social capital:

- **Concept One: The strength of weak ties:** The flow of information is likely to come through weak ties. Strong ties can be a form of social control, with ostracism limiting access to support, information or other essential resources.
- **Concept Two: Cross-cutting ties:** "Weaker connections between groups represent holes in the social structure" (Scott & Hofmeyer, 2007, p. 3). These structural holes insulate social networks from each other, enabling people to remain focussed on their specialized tasks. There is a need to maximize the value of structural holes by both developing cohesiveness within the group (i.e., to generate trust and support), but also providing opportunities for individuals to build formal, unique ties beyond the group (e.g., to gather new ideas). It is not just the existence of these bridging ties that is important, but the quality of these ties.
- **Concept Three: Structural equivalence/status**—This reflects the degree to which two people have similar relations with others in a network (e.g., physicians are more likely to adopt an innovation if it has been adopted by other physicians) (Scott & Hofmeyer, 2007).

Suggestions for further reading:

- Adler and Kwon (2002). "Social capital: Prospects for a new concept". This article synthesizes the research on social capital that has been undertaken by a variety of disciplines, and develops a conceptual framework that outlines the sources, benefits, risks and contingencies of social capital.

- Kawachi, Subramanian, & Kim (Eds.) (2007). "Social capital and health". This book describes the theoretical origins of social capital, the strengths and limitations of current methods of measuring it, and examples of how social capital concepts can inform public health policy and practice.
- Scott and Hofmeyer (2007). "Networks and social capital: A relational approach to primary healthcare reform". This article provides an overview of key concepts related to social capital in the context of networks, arguing that network theory and social capital can provide the foundation for a multi-focal approach to primary healthcare reform.

Intra-organizational networks

We recognize that there may be lessons learned about the success of intra-organizational networks, networks that consist of nodes all within a single organization, which could be transferable to inter-organizational networks and vice versa. Once again, however, there is another body of literature on this topic that could not be fully included in this review.

In healthcare in particular, there is increasing attention being paid to the development of clinical networks with a goal of strengthening care pathways and improving the coordination and quality of care provided to patients. Many of these clinical networks are contained within a single organization.

On the other hand, some clinical networks do cross organizational boundaries, such as primary care networks where a number of clinics or agencies form a network with the goal of improving the quality of care, including access, for patients. Another example is specialty clinical networks, such as stroke or cardiology networks, where health professionals working in different organizations form a network often with multiple purposes, including knowledge exchange and service coordination. The literature on inter-organizational networks is relevant to these clinical networks.

Much of what is learned from the literature on inter-organizational networks will still be of value in informing the development and maintenance of intra-organizational networks, including clinical networks in healthcare. Many organizations in healthcare are large, and include a number of hospitals and other healthcare facilities, meaning that there are also often many sub-cultures. In addition, there is considerable professional autonomy in healthcare, meaning that command and control management strategies are often not a good fit. The ways of leading and managing of and in inter-organizational networks described in this review, then, may be helpful reading for practitioners engaged in intra-organizational networks.

Suggestions for further reading:

- Addicott (2008). "Models of governance and the changing role of the board in the 'modernized' UK health sector". This article describes findings from five comparative case studies of managed clinical networks for cancer in London.
- Addicott, McGivern, & Ferlie (2007). "The Distortion of a managerial technique? The case of clinical networks in UK health care". This article explores how stakeholders involved in the delivery of cancer services in the UK have adopted or adapted managed clinical networks as a novel managerial technique for sharing best practice and knowledge.
- McInnes, Middleton, Gardner, Haines, Haertsch, Paul, & Castaldi (2012). "A qualitative study of stakeholder views of the conditions and outcomes of successful clinical networks". This article provides new knowledge on the conditions needed to establish successful clinical networks and on the outcomes of network initiatives considered valuable by those working in or associated with clinical networks.

Communities of practice

Communities of practice are formed by people who engage in a process of collective learning around a concern or a passion for something they do, and they learn how to do it better as they interact regularly. This definition allows for, but does not assume, intentionality; learning can be the reason the community comes together or an incidental outcome of members' interactions. Etienne Wenger (n.d.) contends that it is the combination of three elements that constitutes a community of practice. By developing these three elements in parallel one cultivates a community:

1. A domain—a shared field of interest to which members are committed and around which they develop a shared competence.
2. A community—people build relationships that enable them to learn from each other (i.e., members engage in join activities and discussions, help each other, and share knowledge).
3. The practice—members develop a shared practice (i.e., a repertoire of experiences, stories, tools and ways of addressing recurring problems) (Wenger, n.d.).

Communities of practice are often described as complementing other organizational structures, as they can galvanize knowledge sharing, learning and change. Some inter-organizational networks may also be considered to be communities of practice if they have a singular focus, or a large network encompassing many different kinds of practices or issues may develop or support a number of communities of practice in the service of the overarching network goal. As Wenger & Snyder (2000) note, a community of practice can thrive with members from different organizations. Like many networks, communities of practice are described as fundamentally informal and self-organizing, yet benefiting from cultivation (Wenger & Snyder, 2000).

Suggestions for further reading:

- Agranoff (2008). "Enhancing performance through public sector networks: Mobilizing human capital in communities of practice". This article describes key performance outcomes of public management networks based on a study of 14 intergovernmental networks, and discusses the importance of networks as communities of practice for achieving collaborative outcomes.
- Wenger (n.d.). Retrieved August 19, 2012 from: http://wenger-trayner.com/category/resources/theory/. This is a basic description of communities of practice, and its underlying theory, as articulated by Etienne Wenger in 2006 and posted on this website. There is also a link on this website to Wenger and his partner's new website on social learning and communities of practice: http://wenger-trayner.com.
- Wenger and Snyder (2000). "Communities of practice: The organizational frontier". This article describes the hallmarks of communities of practice as a "new organizational form" and gives a number of examples of how they have helped companies by galvanizing knowledge sharing, learning and change.

Complex adaptive systems

Networks are often correlated with or viewed as similar to complex adaptive systems. A complex adaptive system is described by Plsek and Greenhalgh (2001) as a "collection of individual agents with freedom to act in ways that are not totally predictable, and whose actions are interconnected so that one agent's actions change the context for other agents" (p. 625), requiring them to be fluid enough to adapt to the new circumstances. They go on to explain that complex adaptive systems can be characterized as having fuzzy boundaries where membership can change, and where agents can simultaneously be members of several systems

(Plsek & Greenhalgh), much like inter-organizational networks. As a result, the literature on complex adaptive systems may be useful to network practitioners, even if not always directly transferrable to networks.

Suggestions for further reading:

- Carlisle and McMillan (2006). "Innovation in organization from a complex adaptive system perspective". This article describes the importance of innovation in organizations, and discusses how the notion of organizations as complex adaptive systems can offer new insights into our understanding of learning and innovation.
- Plsek and Greenhalgh (2001). "The challenge of complexity in health care". This is an introductory article in a series of articles on complexity published in the British Medical Journal (BMJ). It outlines some basic principles for understanding complex adaptive systems, and discusses how conceptualizing 21st century healthcare as such a system can point to new approaches for clinical practice, organizational leadership and education.
- The Plexus Institute (n.d.). This is a US-based non-profit organization that works to apply complex system approaches to the healthcare context. There are a number of useful resources on this website. Retrieved January 16, 2013 from: http://www.plexusinstitute.org.
- Uhl-Bien and Marion (2009). "Complexity leadership in bureaucratic forms of organizing". This article briefly describes the concept of complexity leadership, and how the interactive process between adaptive leadership and complexity dynamics generates outcomes such as innovation, learning and adaptability in the organization.

Appendix III: Literature Search and Review Strategy

Search strategy overview

The initial version of this literature review was completed in February 2013. A limited systematic approach was taken to this targeted and critical review of relevant published and unpublished literature on inter-organizational networks in the public and non-profit sectors. Intended to build on the review completed in 2002, the literature reviewed originally was primarily from 2002 to 2012. Some foundational articles and books published prior to 2002 were included if they continue to guide research and practice. Given the amount of literature published on inter-organizational networks across a range of academic disciplines, this could not be an exhaustive review of every article. Rather, the goal was to identify the key articles and documents that addressed the questions guiding this review. Readers are encouraged to use this review as a means to extend the depth and breadth of their own reading and learning.

A combination of search strategies was used to identify articles to include in the review. A research librarian developed an initial literature search strategy guided by the literature review questions and additional input from members of the advisory committee. This initial search of research databases yielded 533 citations. A second search conducted, that included additional keywords and expanded the fields searched, yielded an additional 1928 citations. Review of these citations resulted in 117 articles identified from the initial search, and 97 from the second search for possible inclusion in the review.

Authors and advisory committee members also identified key articles from both the academic peer-reviewed literature and unpublished reports for potential inclusion in this review. A search by author was also conducted, with key authors identified both from the first stage of this literature review and the 2002 literature review. Nineteen more articles were identified for possible inclusion in the review using this search strategy. Finally, a number of additional articles were identified through references cited in key articles. 265 full text articles were reviewed with 142 included.

To ensure that the review was as up to date as possible for its publication by IBM's Business of Government Center, we conducted an additional review of leading public administration journals in July, 2014 to include the latest papers that had been published between 2012 and 2014. A total of 45 additional papers, unpublished reports and references were identified with 35 included.

Review and synthesis

The authors of this report were collectively involved in the review process to determine which articles would be read for possible inclusion in the review. The literature was sorted into major groupings corresponding with questions guiding the review, such as network functions, implementation, evolution and evaluation. In this review we cite a number of major review articles

(Borgatti & Foster, 2003; Berry et al., 2004; Bryson, Crosby, & Stone, 2006; Isett et al., 2011; McGuire, 2006; Provan, Fish, & Sydow, 2007; Provan & Lemaire, 2012; Turrini et al., 2010; Phelps et al. 2012; Raab et al., forthcoming; Vangen et al., 2014), a book (Huxham & Vangen, 2005) and a report (Milward & Provan, 2006) that provide a good synthesis of large bodies of literature. These are also viewed as being good resources should readers wish to delve further into particular areas of the literature. The inclusion and exclusion criteria used to guide the review process are presented in the box on the following page. An important criterion was that it be of value to a practitioner audience. This means that articles that are heavily theoretical in nature, where the primary goal is to contribute to the research knowledge base and theory development rather than draw out implications for practice, are excluded from this review.

The goal of the literature synthesis process was to identify key themes in relation to the questions that guided the review, and briefly summarize the findings from the literature organized around these key themes.

Strengths and limitations

Strengths of this review include the systematic approaches used. A systematic and replicable approach was taken to searching a large and often messy body of literature crossing multiple fields. The team approaches used to screen for relevance and quality were also systematic and confirmable. The primary benefit achieved through this combination of search and review activities is the critical assessment and synthesis of a large number of articles with the goal of describing the current state of the science on collaborative inter-organizational networks in a way that would be useful for people leading and working in networks.

Limitations of this review are primarily related to the complexity of the literature in conjunction with the finite resources available to conduct the review. Research on inter-organizational networks is conducted by many disciplines (e.g., management, public administration, political science, sociology, anthropology, health and human services, psychology) using a wide variety of terms. This creates a complicated and dynamic landscape of literature to identify, review and synthesize. Our efforts, while systematic, informed and targeted, were not exhaustive and surely leave some relevant work undiscovered.

Inclusion and exclusion criteria for literature review

Screening for relevance (or importance and applicability) to the literature review questions

Inclusion criteria

- Focus is on inter-organizational networks
- Focus is on cooperative or collective action networks, rather than competitive networks (i.e., these are usually non-profit, or public sector networks)
- Informs our questions on the:
  - Conceptualization of networks
    - » note that we're looking for new knowledge here (e.g., life cycle/eco-cycle models; attribution of value)
  - Implementation of networks (i.e., planning & design, development & growth)
  - Evolution of networks
  - Sustainability & resilience of networks
  - Evaluation of networks
- Anything new or emerging from the recent literature
- Western context

Exclusion criteria

- Primary focus is social networks (i.e., rather than inter-organizational networks; this is about relationships between organizations rather than individuals)
- Focus is on competitive (usually for-profit) networks
- Does not address our questions (see above)
- Not likely to be of value to practitioners
- Government networks [unless key review articles]
- Collaborative governance networks
- PhD theses [unless exceptional in some way]

Acknowledgements

The authors would first like to recognize the earlier work of both the Southern Alberta Child and Youth Health Network and the Collaborative Networks of North America (formerly the Child and Youth Health Networks of Canada). Their efforts date back to the early 2000's when they began connecting researchers and practitioners with shared interests in advancing the evidence base concerning networks. Their interest and support for extending and exchanging practical knowledge concerning network leadership and network effectiveness has inspired several strands of collective action including the pursuit of this critical review of the literature to inform practice about inter-organizational networks.

We would like to thank the following organizations, all of which made an earlier version of this review possible through funding and in-kind support:

- Alberta Centre for Child, Family and Community Research
- Alberta Innovates—Health Solutions
- Royal Roads University, Centre for Health Leadership and Research
- University of Arizona, School of Government and Public Policy
- University of Calgary, Department of Community Health Sciences

We would also like to acknowledge the Institute for Advanced Study at the University of Konstanz, Germany and research grant FA9550-10-1-0569 from the U.S. Air Force Office of Scientific Research for the support they provided enabling the participation of our co-author, Brint Milward, when the review was being revised to incorporate the most recent contributions from the literature.

Special thanks to Donna Angus, Alberta Innovates—Health Solutions; Allan Best, InSource Research Group; and Robin Lemaire, Center for Public Administration & Policy, Virginia Tech for their assistance with defining the questions and scope for the review and identifying key literature; as well as to Liza Chan, Research Librarian, Alberta Innovates—Health Solutions for the significant contributions she made in helping with the search and retrieval of literature in a large and complex area.

We would further like to acknowledge all those publishing information concerning when, how and why inter-organizational networks can make a contribution to important social and public sector goals. Recognition and encouragement is extended to network practitioners, managers and leaders out there making a difference at the coalface. Breaking new ground is rarely easy and, going forward, we hope to see more of your experience and knowledge reflected in the literature.

Finally, and with the utmost respect and affection, the authors would like to recognize the contributions of our friend and colleague, Dr. Keith Provan, who passed away in February, 2014.

Keith's influence on this review can be readily seen. His influence on us and our thinking about networks and on that of many, many others around the world is lasting. Keith's opinion was often the yardstick against which we would measure our work. As a group, we often asked, "What would Keith think about this?" We miss his intellect and wry wit, and we are grateful to have known and loved him.

References

Addicott, R., McGivern, G., & Ferlie, E. (2007). The distortion of a managerial technique? The case of clinical networks in UK health care. *British Journal of Management, 18*(1), 93–105.

Addicott, R. (2008). Models of governance and the changing role of the board in the modernized UK health sector. *Journal of Health Organization and Management, 22*(2), 147–163.

Adler, P. S., & Seok-Woo Kwon. (2002). Social capital: Prospects for a new concept. *Academy of Management Review*, *27*(1), 17–40.

Agranoff, R. (2008). Enhancing performance through public sector networks: Mobilizing human capital in communities of practice. *Public Performance & Management Review, 31*(3), 320.

Agranoff, R. & McGuire, M. (2001). Big questions in public management research. *Journal of Public Administration Research and Theory, 11*(3), 295–326.

Ahuja, G., Soda, G., & Zaheer, A. (2012). The genesis and dynamics of organizational networks. *Organization Science, 23*(2), 434–448.

Ansell, C., & Gash, A. (2008). Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory, 18*(4), 543–571.

Axelrod, R. (1984). *The evolution of cooperation*. New York: Basic Books.

Bakker, R. M., Raab, J., & Milward, H. B. (2012). A preliminary theory of dark network resilience. *Journal of Policy Analysis and Management, 31*(1), 33–62.

Behn, R. (2014). *The PerformanceStat Potential: a Leadership Strategy for Producing Results.* Brookings Institution Press.

Bell, G. G., & Zaheer, A. (2007). Geography, networks, and knowledge flow. *Organization Science, 18*, 955–972.

Berardo, R. (2009). Generalized trust in multi-organizational policy arenas: Studying its emergence from a network perspective. *Political Research Quarterly, 62*(1), 178–189.

Berry, F. S., Brower, R. S., Choi, S. O., Xinfang Goa, W., Jang, H., Kwon, M., & Word, J. (2004). Three traditions of network research: What the public management research agenda can learn from other research communities. *Public Administration Review, 64*(5), 539–552.

Birdsell, J., Matthias, S., & colleagues (2003). *Networks and their role in enhancing research impact in Alberta.* Alberta, Canada: Alberta Heritage Foundation for Medical Research (unpublished document).

Bixler, P.R. (2014). It's not just who you know, but can you tell a story? The role of narratives in network governance. *Public Administration Review, 74*(2): 277–280. A review of Lejano, R., Ingram, M., & Ingram, H. (2013). *The power of narrative in environmental networks.* Cambridge, MA: MIT Press.

Block, P. (1993). *Stewardship: Choosing service over self interest*. San Francisco: Berrett-Koehler.

Borgatti, S. P., & Foster, P. C. (2003). The network paradigm in organizational research: A review and typology. *Journal of Management, 29*(6), 991–1013.

Borgatti, S. P., & Halpin, S. (2011). On network theory. *Organization Science, 22*(5), 1168–1181.

Borgatti, S. P., Mehra, A., Brass, D. J., & Labianca, G. (2009). Network analysis in the social sciences. *Science, 325*(5916), 892–895.

Bradley, E., Curry, L., Ramanadhan, S., Rowe, L., Nembhard, I., Krumholz, H. (2009). Research in action: using positive deviance to improve quality of health care. *Implementation Science, 4*(25) (retrieved from http://www.implementationscience.com/content/4/1/25#).

Brass, D. J., Galaskiewicz, J., Greve, H. R., & Tsai, W. (2004). Taking stock of networks and organizations: A multilevel perspective. *Academy of Management Journal, 47*(6), 795–817.

Bryson, J. M., Crosby, B. C., & Stone, M. M. (2006). The design and implementation of cross-sector collaborations: Propositions from the literature. *Public Administration Review, 66*(SUPPL. 1), 44–55.

Bryson, J. M., Crosby, B. C., & Stone, M. M., & Saunoi-Sandgren, E. O. (2009). *Designing and managing cross-sector collaboration: A case study in reducing traffic congestion.* Washington, D.C.: IBM Center for The Business of Government.

Burt, R. S. (2005). *Brokerage and Closure: An Introduction to Social Capital*. New York: Oxford University Press.

Cabaj, M. (2011). *Network death and renewal in the adaptive cycle.* Networks Leadership Summit VI. Victoria, B.C., Canada.

Calanni, J. C., Siddiki, S. N., & Weible, C. M. (forthcoming). Explaining coordination in collaborative partnerships and clarifying the scope of the belief homophily hypothesis. *Journal of Public Administration Research and Theory*, First published online May 20, 2014.

Canadian Health Services Research Foundation (CHSRF) (2005–06). *Bridging Boundaries, Creating Knowledge: The Power of Good Conversation.* Final Report, Networks Leadership Summits I & II, Invitational Sessions. October 25, 2005, Halifax N.S., June 12–13, 2006, Toronto ON.

Carboni, J. L., & Milward, H. B. (2012). Governance, privatization, and systemic risk in the disarticulated state. *Public Administration Review*, *72*(S1), S36–S44.

Carlisle, Y., & McMillan, E. (2006). Innovation in organization from a complex adaptive system perspective. *E:CO*, *8*(1), 2–9.

Carlsson, S. A. (2003). Knowledge managing and knowledge management systems in inter-organizational networks. *Knowledge and Process Management, 10*(3), 194.

Casebeer, A., Huerta, T., & VanderPlaat, M. (2006). Re-navigating the research and practice terrain of health services networks. *Healthcare Papers, 7*(2), 68–72.

Casebeer, A., Popp, J., & Scott, C. (2009). Positively deviant networks: What are they and why do we need them? *Journal of Health Organization and Management, 23*(6), 610–626.

Casebeer, A. L., Reay, T., Dewald, J., & Pablo, A. (2010). Knowing through doing: Unleashing latent dynamic capabilities in a public sector context. In Walshe, K., Harvey, G., & Jas, P. (Eds.). *Connecting knowledge and performance in public services* (251–275). Cambridge: Cambridge University Press.

Center for Digital Storytelling (www.storycenter.org).

Chen, B. (2008). Assessing inter-organizational networks for public service delivery: A process-perceived effectiveness framework. *Public Performance & Management Review, 31*(3), 348.

Chisholm, R. F. (1998). *Developing network organizations: Learning from practice and theory*. USA: Addison Wesley Longman Inc.

Conference Board of Canada. (n.d.) (Retrieved January 22, 2013 from: http://www.conferenceboard.ca/topics/inn/default.aspx).

Conteh, C. (2013). Strategic Inter-Organizational Cooperation in Complex Environments. *Public Management Review, 15*(4), 2013.

Davis, M., Koroloff, N., & Johnsen, M. (2012). Social network analysis of child and adult interorganizational connections. *Psychiatric Rehabilitation Journal, 35*(3), 265–272.

Dolinski, C. (2005). *Southern Alberta Child and Youth Health Network—Evaluation Report*. Report prepared for the Southern Alberta Child and Youth Health Network (SACYHN). Calgary, AB: SACYHN.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal, (21)*10–11, 1105–1121.

Engeström, Y., & Kerosuo, H. (2007). From workplace learning to inter-organizational learning and back: The contribution of activity theory. *Journal of Workplace Learning, 19*(6), 336–342.

Feiock, R. C., Lee, I. W., & Park, H. J. (2012). Administrators' and elected officials' collaboration networks: Selecting partners to reduce risk in economic development. *Public Administration Review*, *72*(S1), S58–S68.

Finlay, L. (2008). Reflecting on 'Reflective Practice'. (Retrieved from http://www.open.ac.uk/opencetl/files/opencetl/file/ecms/web-content/Finlay-(2008)-Reflecting-on-reflective-practice-PBPL-paper-52.pdf).

Flyvbjerg, B. (2001). *Making social science matter: Why social inquiry fails and how it can succeed again.* Cambridge, UK: Cambridge University Press.

Fountain, J. (2013). *Implementing Cross-Agency Collaboration: A Guide for Federal Managers*. Washington, D.C.: IBM Center for The Business of Government.

Galaskiewicz, J. (2007). Has a network theory of organizational behaviour lived up to its promises? *Management and Organization Review, 3*(1), 1–18.

Gilchrist, A. (2006). Maintaining relationships is critical in network's success. *Healthcare Papers, 7*(2): 28–31.

Goldsmith, S. (2014). An Essential Guide to the 'Stat' Revolution in Government. (Retrieved from http://www.governing.com/blogs/bfc/col-robert-behn-book-review-performancestat-potential.html#). A review of Robert Behn, R. (2014). *The PerformanceStat Potential: a Leadership Strategy for Producing Results.* Brookings Institution Press.

Graddy, E. A., & Chen, B. (2006). Influences on the size and scope of networks for social service delivery. *Journal of Public Administration Research and Theory, 16*(4), 533–552.

Granovetter, M. (1973). The Strength of Weak Ties. *American Journal of Sociology, 78*(6): 1360–80.

Gray, B. (2004). Strong opposition: Frame-based resistance to collaboration. *Journal of Community & Applied Social Psychology, 14*(3), 166–176.

Gray, B. & Wood, D. J. (1991). Collaborative alliances: Moving from practice to theory. *Journal of Applied Behavioral Science, 27*, 3–22.

Greenleaf Center for Servant Leadership. (n.d.) (Retrieved January 5, 2013 from: http://www.greenleaf.org/whatissl/).

Gulati, R., Lavie, D., & Madhavan, R. (2011). How do networks matter? The performance effects of interorganizational networks. *Research in Organizational Behavior, 31*, 207.

Hale, K. (2011). *How information matters: Networks and public policy innovation.* Washington, D.C.: Georgetown University Press.

Hartley, J., & Benington, J. (2006). Copy and paste, or graft and transplant? Knowledge sharing through inter-organizational networks. *Public Money & Management, 26*(2), 101.

Heffren, W., McDonald, A., Casebeer, A., & Wallsten, D. (2003). Mandated intersectoral, interdisciplinary collaboration: Opportunity or oxymoron? In P. Hibbert, (Ed.), *Co-creating Emergent Insight,* 221–227. Glasgow: Graduate School of Business, University of Strathclyde.

Hejnova, J. (2010). Beyond dark and bright: Towards a more holistic understanding of intergroup networks. *Public Administration*, *88*(3), 741–763.

Hibbert, P., Huxham, C., & Ring, P. S. (2008). Managing inter-organizational relations. In S. Cropper, M. Ebers, M. C. Huxham and P. S. Ring, (Eds.), *The Handbook of Inter-organizational Relations,* 391–416. Oxford: Oxford University Press.

Hill, C. (2002). *Network literature review: Conceptualizing and evaluating networks.* Calgary, AB: Southern Alberta Child and Youth Health Network (SACYHN) (unpublished document).

Hoberecht, S., Joseph, B., Spencer, J., & Southern, N. (2011). Inter-organizational networks: An emerging paradigm of whole systems change. *OD Practitioner, 43*(4), 23–27.

Holley, J. (2012). *Network weaver handbook: A guide to transformational networks.* Athens, Ontario: Network Weaver Publishing.

Huang, K. (forthcoming). Knowledge sharing in a third-party-governed health and human services network. *Public Administration Review,* First published online July 10, 2014.

Huerta, T., Casebeer, A., & VanderPlaat, M. (2006). Using networks to enhance health services delivery: Perspectives, paradoxes, propositions. *Healthcare Papers, 7*(2): 10–26.

Human, S. E., & Provan, K. G. (2000). Legitimacy building in the evolution of small-firm multilateral networks: a comparative study of success and demise. *Administrative Science Quarterly, 45*(2), 327–365.

Hurst, D., & Zimmerman, B. (1994). From lifecycle to ecocycle: A new perspective on the growth, maturity, destruction and renewal of complex systems. *Journal of Management Inquiry, 3*(4), 339–354.

Huxham, C., & Vangen, S. (2005). *Managing to collaborate: The theory and practice of collaborative advantage.* New York: Routledge.

Huxham, C., & Beech, N. (2008). Inter-organizational power. In S. Cropper, M. Ebers, M. C. Huxham and P. S. Ring, (Eds.), *The handbook of inter-organizational relations* (555–579). Oxford: Oxford University Press.

Institute for Healthcare Improvement (IHI). (2011). *90-day R&D project final summary report: Network theory.* (Retrieved January 7, 2013 from: www.ihi.org).

Isett, K. R., Mergel, I. A., LeRoux, K., Mischen, P. A., & Rethemeyer, R. K. (2011). Networks in public administration scholarship: Understanding where we are and where we need to go. *Journal of Public Administration Research and Theory, 21*(SUPPL. 1), i157–i173.

Kapucu, N., & Demiroz, F. (2011). Measuring performance for collaborative public management using network analysis methods and tools. *Public Performance & Management Review, 34*(4), 549.

Kawachi, I., Subramanian, S. V., & Kim, D. (Eds.). (2007). *Social capital and health*. New York: Springer.

Keast, R., Mandell, M. P., Brown, K., & Woolcock, G. (2004). Network structures: Working differently and changing expectations. *Public Administration Review, 64*(3), 363–371.

Kelman, S., & Hong, S. (forthcoming). This could be the start of something big: Linking early managerial choices with subsequent organizational performance. *Journal of Public Administration Research and Theory,* First published online June 20, 2014.

Kelman, S., Hong, S., & Turbitt, I. (2013). Are there managerial practices associated with the outcomes of an interagency service delivery collaboration? Evidence from British crime and disorder reduction partnerships. *Journal of Public Administration Research and Theory*, *23*(3), 591–622.

Kenis, P., & Provan, K. G. (2009). Towards an exogenous theory of public network performance. *Public Administration, 87*(3), 440.

Kilduff, M., & Brass, D. J. (2010). Organizational social network research: Core ideas and key debates. *The Academy of Management Annals, 4*(1), 317–357.

Kilduff, M., & Tsai, W. (2003). *Social networks and organizations.* Sage Publications, London, UK.

Klijn, E., Edelenbos, J., & Steijn, B. (2010). Trust in governance networks: Its impacts on outcomes. *Administration & Society, 42*(2), 193.

Knight, L. (2002). Network learning: Exploring learning by interorganizational networks. *Human Relations, 55*(4), 427.

Knight, L., & Pye, A. (2005). Network learning: An empirically-derived model of learning by groups of organizations. *Human Relations*, *58*(3), 369–392.

Kuhn, R. L. (1985). *Frontiers in creative and innovative management*. Cambridge, MA: Ballinger.

Lane, P. J., Koka, B. R., & Pathak, S. (2006). The reification of absorptive capacity: A critical review and rejuvenation of the construct. *Academy of Management Review, 31*(4), 833–863.

Leach, W. D., Weible, C. M., Vince, S. R., Siddiki, S.N. & Calanni (2014). Fostering learning through collaboration: Knowledge acquisition and belief change in marine aquaculture partnerships. *Journal of Public Administration Research and Theory*, *24*(3), 591–622.

Lee, I. W., Feiock, R. C., & Lee, Y. (2011). Competitors and cooperators: A micro-level analysis of regional economic development collaboration networks. *Pubic Administration Review, 72*(2), 253–262.

Lejano, R., Ingram, M., & Ingram, H. (2013). *The power of narrative in environmental networks.* Cambridge, MA: MIT Press.

Lemaire, R. H., Provan, K. G., & Milward, H. B. (2010). SACYHN network analysis and evaluation report. Calgary, AB: Southern Alberta Child and Youth Health Network (SACYHN) (unpublished document).

LeRoux, K. (2012). How information matters: Networks and public policy innovation. *Public Administration*, *90*(4), 1107–1120. A review of Hale, K. (2011). *How information matters: Networks and public policy innovation.* Washington, D.C.: Georgetown University Press.

Lindstrom, R. R. (2006). *A community-based participatory approach to planning child and youth health services in north west British Columbia: Finding common ground.* (Doctoral dissertation). University Theses Canada Portal. (Amicus No. 33507246)

Lüscher, L. S., & Lewis, M. W. (2008). Organizational change and managerial sensemaking: working through paradox. *Academy of Management Journal, 51*(2), 221–240.

Mandell, M., & Keast, R. (2007). Evaluating network arrangements: Toward revised performance measures. *Public Performance & Management Review, 30*(4), 574–597.

Mays, G. P., & Scutchfield, F. D. (2010). Improving public health system performance through multiorganizational partnerships. *Preventing Chronic Disease, 7*(6), A116.

McGuire, M. (2002). Managing networks: Propositions on what managers do and why they do it. *Public Administration Review, 62*(5), 599–609.

McGuire, M. (2006). Collaborative public management: Assessing what we know and how we know it. *Public Administration Review, 66*(s1), 33–43.

McGuire, M., & Agranoff, R. (2011). The limitations of public management networks. *Public Administration, 89*(2), 265–284.

McGuire, M., & Sylvia, C. (2009). Does leadership in networks matter? Examining the effect of leadership behaviors on managers' perceptions. *Public Performance & Management Review, 33*(1), 34–62.

McInnes, E., Middleton, S., Gardner, G., Haines, M., Haertsch, M., Paul, C. L., & Castaldi, P. (2012). A qualitative study of stakeholder views of the conditions for and outcomes of successful clinical networks. *BMC Health Services Research*, *12*(1), 49.

McPherson, C., Popp, J., & Lindstrom, R. (2006). Reexamining the paradox of structure: A child health network perspective. *Healthcare Papers, 7*(2), 46–52.

Metzger, M. E., Alexander, J. A., & Weiner, B. J. (2005). The effects of leadership and governance processes on member participation in community health coalitions. *Health Education Behavior, 32*(4), 455–473.

Milward, H. B. (forthcoming). "What can healthcare leaders learn from dark networks?" *Healthcare Management Forum.*

Milward, H. B., Kenis, P., & Raab, J. (2006). Introduction: Towards the Study of Network Control. *International Public Management Journal. 9*(3), 203–208.

Milward, H. B., & Provan, K. G. (1998) Principles for controlling agents: The political economy of network structure. *Journal of Public Administration Research and Theory*, *8*(2), 203–222.

Milward, H. B., & Provan, K. G. (2006). *A manager's guide to choosing and using collaborative networks.* Washington, D.C.: IBM Center for The Business of Government.

Milward, H. B., Provan, K. G., Fish, A., Isett, K. R., & Huang, K. (2010). Governance and collaboration: An evolutionary study of two mental health networks. *Journal of Public Administration Research and Theory, 20*(SUPPL. 1), i125–i141.

Milward, H. B., & Raab, J. (2006). Dark networks as organizational problems: Elements of a theory. *International Public Management Journal, 9*(3), 333–360.

Mintzberg, H. (2009). *Managing.* San Francisco, CA: Berrett-Koehler Publishers.

Monge, P. R., & Contractor, N. (2003). *Theories of Communication Networks.* New York: Oxford University Press.

Montgomery, J. R. (1996). *Goal-based learning: Accelerating performance change.* St. Charles, Ill: Andersen Worldwide.

Moore, S., Smith, C., Simpson, T., & Minke, S. W. (2006). The influence of partnership centrality on organizational perceptions of support: A case study of the AHLN structure. *BMC Health Services Research, 6*, 141.

Munoz, P., & Lu, L. (2011). Interorganizational networks and open innovation environments: Addressing emerging paradoxes. *International Journal of Entrepreneurship and Innovation, 12*(4), 227.

Nelson, J. C., Raskind-Hood, C., Galvin, V. G., Essien, J. D., & Levine, L. M. (1999). Positioning for partnerships. Assessing public health agency readiness. *American Journal of Preventive Medicine, 16*, 103–117.

Networks Leadership Summit IV. (2009). *The power of networks in times of change*. Banff, Alberta (unpublished report).

Networks Leadership Summit VII. (2013). If Networks are the answer what is the question: Rethinking networks. Victoria, BC. (unpublished report).

Networks Leadership Symposium (2013). *If networks are the answer, what is the question: Rethinking networks*. Symposium Proceedings, Victoria, BC. (unpublished report).

O'Leary, R., Choi, Y., & Gerard, C.M. (2012). The skill set of the successful collaborator. *Public Administration Review, 72*(S1), S70–S83.

O'Toole, L. J., Jr., & Meier, K. J. (2004). Desperately seeking selznick: Cooptation and the dark side of public management in networks. *Public Administration Review, 64*(6), 681.

O'Toole, L. J., Jr., & Meier, K. J. (2006). Networking in the penumbra: Public management, cooptative links, and distributional consequences. *International Public Management Journal, 9*(3), 271.

Page, S. (2013). Achieving shared aims through organizational networks. *Public Administration Review, 73(*6), 891–893. A review of Saz-Carranza, A. (2012). *Uniting diverse organizations: Managing goal-oriented advocacy networks.* New York/London: Routledge.

Paquin, R. L., & Howard-Grenville, J. (2013). Blind dates and arranged marriages: Longitudinal processes of network orchestration. *Organization Studies, 34*(11), 1623–1653.

PARTNER: Program to analyze, record, and track networks to enhance relationships. (n.d.) (Retrieved August 17, 2014 from: www.partnertool.net*).*

Patton, M. Q. (2006). Evaluation for the way we work. *Non-Profit Quarterly*, 28–33.

Patton, M. Q. (2011). *Developmental evaluation: Applying complexity concepts to enhance innovation and use.* New York: The Guilford Press.

Pfeffer, J., & Sutton, R. I. (2000*). The knowing-doing gap: How smart companies turn knowledge into action.* Boston, MA: Harvard Business School Press.

Phelps, C., Heidl, R., & Wadhwa, A. (2012). Knowledge, networks, and knowledge networks: A review and research agenda. *Journal of Management, 38*(4), 1115–1166.

Plastrik, P., & Taylor, M. (2006). *Net gains: A handbook for network builders seeking social change* (Version 1.0). (Retrieved March 2012 from: http://networkimpact.org/downloads/NetGainsHandbookVersion1.pdf).

Plsek, P. E., & Greenhalgh, T. (2001). The challenge of complexity in healthcare. *British Medical Journal, 323,* 625–628.

Popp, J., Douglas-England, K., Casebeer, A., & Tough, S. (2005a). Creating frameworks for providing services closer to home in the context of a network. *Healthcare Management FORUM, 18*(2), 27–33.

Popp, J. K., L'Heureux, L. N., Dolinski, C. M., Adair, C. E., Tough, S. C., Casebeer, A. L., Douglas-England, K. L., & Morrison, C. C. (2005b). How do you evaluate a network? A Canadian child and youth health network experience. *Canadian Journal of Program Evaluation, 20*(3), 123–150.

Powell, W. W., Koput, K. W., White, D. R., & Owen-Smith, J. (2005). Network dynamics and field evolution: The growth of interorganizational collaboration in the life sciences. *American Journal of Sociology, 110*(4), 1132–1205.

Provan, K. G., Beagles, J. E., & Leischow, S. J. (2011). Network formation, governance, and evolution in public health: The North American quitline consortium case. *Health Care Management Review, 36*(4), 315–326.

Provan, K., Fish, A., & Sydow, J. (2007). Interorganizational networks at the network level: A review of the empirical literature on whole networks. *Journal of Management, 33*(3), 479.

Provan, K., & Huang, K. (2012). Resource tangibility and the evolution of a publicly funded health and human services network. *Public Administration Review, 72*(3), 366–375.

Provan, K., & Kenis, P. (2008). Modes of network governance: Structure, management, and effectiveness. *Journal of Public Administration Research and Theory, 18*(2), 229.

Provan, K. G., & Lemaire, R. H. (2012). Core concepts and key ideas for understanding public sector organizational networks: Using research to inform scholarship and practice. *Public Administration Review, 72*(5), 638–648.

Provan, K. G., & Milward, H. B. (1995). A preliminary theory of interorganizational network effectiveness: A comparative study of four community mental health systems. *Administrative Science Quarterly*, *40*, 1–33.

Provan, K. G., & Milward, H. B. (2001). Do networks really work? A framework for evaluating public-sector organizational networks. *Public Administration Review, 61*(4), 414–423.

Provan, K. G., Nakama, L., Veazie, M. A., Teufel-Shone, N. I., & Huddleston, C. (2003). Building Community Capacity Around Chronic Disease Services through a Collaborative Interorganizational Network. *Health Education Behavior,* 3*,* 646–662.

Provan, K. G., Veazie, M. A., Staten, L. K., & Teufel-Shone, N. I. (2005). The use of network analysis to strengthen community partnerships. *Public Administration Review, 65*(5), 603–612.

Purdy, J. M. (2012). A Framework for assessing power in collaborative governance processes. *Public Administration Review, 72*(3), 409–417.

Quick, K. S. (2014). Taking a relational turn in leadership studies. *Public Administration Review*, *74*(4), 542–544. A review of Uhl-Bien, M. & Ospina, S.M., (Eds.) (2012). *Advancing relational leadership research: A dialogue among perspectives.* Charlotte, NC: Information Age.

Raab, J. (2014). Extending our knowledge on network governance. *Journal of Public Administration Research and Theory, 24*(2) 531–535. A review of Saz-Carranza, A. (2012). *Uniting diverse organizations: Managing goal-oriented advocacy networks.* New York/London: Routledge.

Raab, J., Mannak, R. S., & Cambré, B. (forthcoming). Combining structure, governance, and context: A configurational approach to network effectiveness. *Journal of Public Administration Research and Theory*, First published on-line August 23, 2013.

Raab, J., & Milward, H. B. (2003). Dark networks as problems. *Journal of Public Administration Research and Theory*, *13*(4), 413–439.

Reay, T., Goodrick, E., Casebeer, A., & Hinings, C. R. (2013). Legitimizing new practices in primary health care. *Health Care Management Review*, *38*(1).

Rethemeyer, R. K., & Hatmaker, D. M. (2008). Network management reconsidered: An inquiry into management of network structures in public sector service provision. *Journal of Public Administration Research and Theory, 18*(4), 617–646.

Riley, B., & Best, A. (In Press). Extending the ecological model: Stakeholders, organizational partnerships, and coalitions. In S. Kahan, A. Gielen, P. Fagan and L. W. Green (Eds.), *Health behavior change in populations: The state of the evidence and roles for key stakeholders.* John Hopkins Press.

Rodríguez, C., Langley, A., Béland, F., & Denis, J. (2007). Governance, power, and mandated collaboration in an interorganizational network. *Administration & Society, 39*(2), 150.

Romzek, B. S., LeRoux, K., & Blackmar, J. M. (2012). A preliminary theory of informal accountability among network organizational actors. *Public Administration Review, 72*(3), 442–453.

Romzek, B., LeRoux, K., Johnston, J., & Kempf, R. J. (2014). Informal accountability in multi-sector service delivery collaborations. *Journal of Public Administration Research and Theory*, 24, 813–842.

Rose, T. R. (2004). *Research project report: Evolution, development, and maintenance of the Southern Alberta Child and Youth Health Network*. Centre for Health and Policy Studies at the University of Calgary (unpublished manuscript).

Royce, D. (2011). *Network death and transformation: Voices of national centres of excellence experience*. Networks Leadership Summit VI, Victoria B.C., Canada.

Saz-Carranza, A. (2012). *Uniting diverse organizations: Managing goal-oriented advocacy networks.* New York/London: Routledge.

Saz-Carranza, A., & Ospina, S. M. (2011). The behavioral dimension of governing interorganizational goal-directed networks — managing the unity-diversity tension. *Journal of Public Administration Research and Theory, 21*(2), 327–365.

Schalk, J., Torenvlied, R., & Allen, J. (2010). Network embeddedness and public agency performance: The strength of strong ties in Dutch higher education. *Journal of Public Administration Research and Theory, 20*(3), 629–653.

Schram, S. (2012). Phronetic social science: An idea whose time has come. In B. Flyvbjerg, T. Landman and S. Schram (Eds.), *Real social science: Applied phronesis* (pp. 1–12). Cambridge, UK: Cambridge University Press.

Schulz, K., & Geithner, S. (2010). Between exchange and development: Organizational learning in schools through inter-organizational networks. *Learning Organization, 17*(1), 69–85.

Scott, C. M, & Hofmeyer, A. (2007). Networks and social capital: A relational approach to primary healthcare reform. *Health Research Policy and Systems, 5*(9), 1–8.

Schon, D. (1983). Reflective Practitioner. (Retrieved from http://en.wikipedia.org/wiki/reflective_practice).

Silvia, C., & McGuire, M. (2010). Leading public sector networks: An empirical examination of integrative leadership behaviors. *The Leadership Quarterly, 21*(2), 264–277.

Singhal, A. (2010). Communicating What Works! Applying the Positive Deviance Approach in Health Communication. *Health Communication,* 25, 605–606.

Smith, A. E. (2013) Collaboration is the name of the game: information, innovation, and mitigation. *Journal of Public Administration Research and Theory, 23*(1), 215–222. A review of Hale, K. (2011). *How information matters: Networks and policy innovation.* Washington, D.C.: Georgetown University Press; Steelman, T. A. (2010). *Implementing innovation: Fostering enduring change in environmental and natural resource governance.* Washington, D.C.: Georgetown University Press; Feiock, R. C. and Scholz, J. T. (Eds.) (2010). *Self-Organizing federalism: Collaborative mechanisms to mitigate institutional collective action dilemmas.* New York: Cambridge University Press.

Stoyko, P. (2001). *The learning journey, a guide to achieving excellence.* Ottawa, ONT: Canadian Centre for Management Development Roundtable on the Learning Organization.

Susskind, A., Odom-Reed, P., & Viccari, A. (2011). Team leaders and team members in inter-organizational networks: An examination of structural holes and performance. *Communication Research, 38*(5), 613.

The Plexus Institute. (n.d.) (Retrieved January 16, 2013 from: http://www.plexusinstitute.org).

Thorgren, S., Wincent, J., & Örtqvist, D. (2009). Designing interorganizational networks for innovation: An empirical examination of network configuration, formation and governance. *Journal of Engineering and Technology Management, 26*(3), 148–166.

Turrini, A., Cristofoli, D., Frosini, F., & Nasi, G. (2010). Networking literature about determinants of network effectiveness. *Public Administration*, *88*(2), 528–550.

Uhl-Bien, M., & Marion, R. (2009). Complexity leadership in bureaucratic forms of organizing: A meso model. *The Leadership Quarterly, 20*(4), 631–650.

Uhl-Bien, M., & Ospina, S.M. (Eds.) (2012). *Advancing relational leadership research: A dialogue among perspectives.* Charlotte, NC: Information Age.

Uzzi, B. (1997). Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly, 42*(1), 35–67.

Vangen, S., & Huxham, C. (2003). Enacting leadership for collaborative advantage: dilemmas of ideology and pragmatism in the activities of partnership managers. *British Journal of Management, 14*, 61–76.

Vangen, S., Hayes, J. P., & Cornforth, C. (2014). Governing Cross-Sector, Inter-Organizational Collaborations. *Public Management Review*, 3–21.

Vangen, S. & Huxham, C. (2012). The tangled web: unraveling the principle of common goals in collaborations. *Journal of Public Administration Research and Theory*, *22*(4), 731–760.

Weber, E. P., & Khademian, A. M. (2008). Wicked problems, knowledge challenges, and collaborative capacity builders in network settings. *Public Administration Review, 68*(2), 334–349.

Wendel, M. L., Prochaska, J. D., Clark, H. R., Sackett, S., & Perkins, K. (2010). Interorganizational network changes among health organizations in the Brazos Valley, Texas. *The Journal of Primary Prevention, 31*(1–2), 59–68.

Wenger, E. (n.d.). (Retrieved August 19, 2012 from: http://wenger-trayner.com/category/resources/theory/).

Wenger, E. C., & Snyder, W. M. (2000). Communities of Practice: The Organizational Frontier. *Harvard Business Review*, *Jan-Feb*, 139–145.

Wheatley, M., & Frieze, D. (2011). Leadership in the age of complexity: From hero to host. *Resurgence Magazine,* Winter 2011. (Retrieved August 17, 2012 from: http://www.margaretwheatley.com/articles/Leadership-in-Age-of-Complexity.pdf).

Wikipedia. (n.d.). (Retrieved January 5, 2013 from: http://en.wikipedia.org/wiki/Peter_Block).

Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualisation and extension. *Academy of Management Review, 27*(2):185–203.

Zimmerman, B., Lindberg, C., & Plsek, P. (1998). *Edgeware: Insights from complexity science for health care leaders.* Irving, TX: VHA Inc.

About the Authors

Janice Popp, MSW, RSW is an Adjunct Assistant Professor, Faculty of Social Work at the University of Calgary. She has a keen interest in the use of inter-organizational networks to create mechanisms, seed innovation and mobilize knowledge to improve service systems. For the past twelve years she has been involved in leading or contributing to a number of national and provincial networks in the areas of child health and mental health.

From 2001 to 2009, she was Director of the Southern Alberta Child & Youth Health Network, a highly successful inter-regional, cross-sector network established to optimize the health and well-being of children, youth and families. She is the past Chair of Child and Youth Health Networks of Canada, a 'network of networks' that came together to promote the awareness, understanding and evaluation of child and youth health networks, and that evolved into a network with an expanded focus on all networks in the public interest. She is currently managing the ongoing development of an inter-organizational network designed to provide supports and services to children and youth, primarily within the school setting. Popp has been a lead organizer of a series of Network Leadership Summits held in Canada over the past seven years bringing together international network researchers and practitioners. She also has extensive clinical, management, and policy experience in the area of children's mental health.

Popp holds a Masters of Social Work Degree from the University of Calgary and is an approved clinical supervisor under the Alberta College of Social Workers.

H. Brinton Milward, PhD, is the Director of the School of Government and Public Policy at the University of Arizona. He holds the Providence Service Corporation Chair in Public Management. He was Director of the National Institute for Civil Discourse, which is co-chaired by President George Herbert Walker Bush and President Bill Clinton. He has been president of two national associations: the Public Management Research Association and the National Association of Schools of Public Administration and Affairs.

He is a Fellow of the National Academy of Public Administration and in 2010 won the Distinguished Research Award given by the National Association of Schools of Public Affairs and Administration and the American Society for Public Administration. Dr. Milward's research interests revolve around networks and collaboration. The focus of his work has been on

understanding how to efficiently and effectively manage networks of organizations that jointly produce public services like health and human services.

Milward has conducted studies of what happens when governments privatize public services, which he terms "governing the hollow state." In addition, since 9/11 he has studied illegal and covert networks that pursue grievances or greed. His articles on "Dark Networks," have been widely cited for their application of network analysis and management theory to terrorist networks, human trafficking, drug smuggling, and other illegal activities. His particular foci have been the governance of dark networks, their trajectories, and accounting for their relative degrees of effectiveness and resilience. Milward received his B.A. from University of Kentucky and his MA and PhD from Ohio State University.

Gail MacKean, MPA, PhD, is an experienced health researcher and consultant. She has worked on a number of collaborative research and evaluation teams with health organization decision-makers over the past 20 years. Particular areas of interest include: patient, family and citizen engagement in health services planning and decision-making; patient and family centered care; healthcare quality and safety; and organizational and systems change. Mackean's experience as a parent of a child born and living with complex medical problems is a key contributing factor to these areas of interest. Her interest in inter-organizational networks lies in their promise as a potentially powerful mechanism for addressing complex health and human service issues.

MacKean has a Bachelor of Science in Physiotherapy from the University of Manitoba, a Masters in Public Administration from Carleton University, and a PhD in Community Health Sciences (Health Research). Her doctoral research focus was patient and family centered care. She is an Adjunct Assistant Professor with the Department of Community Health Sciences at the University of Calgary and a member of the Calgary Institute for Public Health.

Ann Casebeer, MPA, PhD is an Adjunct Professor in the Department of Community Health Sciences, based at the Institute for Public Health, located at the University of Calgary. For the past 20 years, her academic work has targeted: advancing experiential learning platforms in both practice and educational settings; broadening the stakeholder base for health system decision making to better include patient and citizen perspectives; and, evaluating team and networked based innovation.

She combines an applied practice background with an academic grounding in organizational learning and systems change. Her understanding of innovation and broad social policy mechanisms for change within complex environments is anchored by 10 years in the UK National Health Service, and 15 years with SEARCH (a public service organization targeting knowledge development for health gain). Research expertise includes the use of qualitative and mixed methods in action-oriented contexts and for knowledge generation, exchange and use.

Since leaving her full-time academic position, Casebeer is a Principal Consultant with The Kensington Group — undertaking strategic assessment, learning facilitation and evaluative research focussing on public and not-for-profit quality assurance and innovation. She also retains an Adjunct Professor position at The School of Public Policy and Administration at Carleton University.

Ron Lindstrom, PhD, FCCHL is a Professor in the School of Leadership Studies; Director, Centre for Health Leadership and Research, and, Henri M. Toupin Research Fellow in Health Systems Leadership at Royal Roads University, Victoria, British Columbia, Canada. His role includes: development and implementation of an applied research agenda in health systems leadership to inform scholarly practice and policy; development of partnerships and networks to support and advance health systems leadership, applied research activities and knowledge mobilization strategies; conduct of applied health leadership research and coordination of activities with stakeholders to address emergent needs in academic and practice settings; and, convening conferences, symposia, summits and think-tanks in emerging areas of scholarship and practice.

Lindstrom has extensive knowledge of and experience in the health system at the regional, provincial, and national levels. He has held a number of senior executive roles in community hospital and academic health centre environments in British Columbia before moving into academia. He also worked as a consultant with health service and related organizations for several years.

His current focus is on integrating research and practice in the health system with research interests including health leadership, health services planning and policy, knowledge linkage and exchange, participatory action research, complex adaptive systems, and inter-organizational networks.

Lindstrom holds an MSc in health services planning and administration. His more recent academic preparation at the PhD level focussed on participatory research in health services. Lindstrom is a Fellow of the Canadian College of Health Leaders.

Key Contact Information

To contact the authors:

Janice K. Popp
Assistant Professor (Adjunct)
Faculty of Social Work
University of Calgary
2500 University Dr. NW
Calgary, Alberta, Canada
T2N 1N4
mobile: (403) 874-3109

e-mail: jkpopp@shaw.ca

H. Brinton Milward
Director and Providence Service Corporation Chair in Public Management
School of Government and Public Policy
University of Arizona
Tucson, AZ 85721-0027
phone: (520) 621-7476
fax: (520) 621-5051

e-mail: milward@email.arizona.edu

Gail MacKean
Health planning, evaluation & research consultant
Assistant Professor (Adjunct)
Department of Community Health Sciences
University of Calgary
c/o: #14, 110 10th Avenue NE
Calgary, Alberta, Canada
T2E 0W7
mobile: (403) 830-2580

e-mail: glmackea@ucalgary.ca

Ann Casebeer
The University of Calgary
3rd Floor, TRW Building
3280 Hospital Drive
Calgary, Alberta, Canada
T2N 4Z6

e-mail: a.casebeer@ucalgary.ca

Ronald R. Lindstrom
School of Leadership Studies
Faculty of Social and Applied Sciences
Royal Roads University
2005 Sooke Rd.
Victoria, B.C., Canada
V9B 5Y2
phone: (250) 391-2600, Ext. 4130

e-mail: ronald.lindstrom@royalroads.ca

Reports from IBM Center for The Business of Government

For a full listing of IBM Center publications, visit the Center's website at **www.businessofgovernment.org.**

List of IBM Center for the Business of Government Reports on The Use of Networks and Collaboration, 2000–2014

Adapting the Incident Command Model for Knowledge-Based Crises: The Case of the Centers for Disease Control and Prevention by Christopher Ansell and Ann Keller (2014)

Coordinating for Results: A Case Study of Interagency Coordination in Afghanistan by Andrea Strimling Yodsampa (2013)

Implementing Cross-Agency Collaboration: A Guide for Federal Managers by Jane Fountain (2013)

Designing Open Projects: Lessons From Internet Pioneers by David Witzel (2012)

Collaboration Across Boundaries: Insights and Tips from Senior Federal Executives by Rosemary O'Leary and Catherine Gerard (2012)

Designing Collaborative Networks by Jane Fedorowicz and Steve Sawyer (2012)

Environmental Collaboration: Lessons Learned About Cross-Boundary Collaborations by Kathryn Bryk Friedman, Kathryn Foster (2011)

The Promise of Collaborative Voluntary Partnerships: Lessons from the Federal Aviation Administration by Russell W. Mill (2010)

Food Safety—Emerging Public-Private Approaches: A Perspective for Local, State, and Federal Government Leaders by Noel P. Greis, Monica L. Nogueira (2010)

Planning for the Inevitable: The Role of the Federal Supply Chain in Preparing for National Emergencies by Robert Handfield (2010)

Strategies for Supporting Frontline Collaboration: Lessons from Stewardship Contracting by Cassandra Moseley (2010)

Designing and Managing Cross-Sector Collaboration: A Case Study in Reducing Traffic Congestion by Melissa M Stone, Emily O Saunoi-Sandgren, John M Bryson, and Barbara C Crosby (2009)

Inter-Agency Collaboration Among Social Services Agencies in Los Angeles County by Nancy Thoennes, Jessica Pearson (2008)

Preparing for Disasters by Ross Clayton, Richard F. Callahan, Dan M. Haverty, Ross O'Brien (2008)

Four Strategies to Transform State Governance by Keon S. Chi (2008)

Integrating Service Delivery Across Levels of Government: Case Studies of Canada and Other Countries by John Langford and Jeffrey Roy (2008)

Success Factors for Implementing Shared Services in Government by Timothy J Burns, and Kathryn G Yeaton (2008)

Transforming Government Through Collaborative Innovation by Satish Namisan (2008)

Engaging Citizens in Measuring and Reporting Community Conditions: A Manager's Guide by Alfred T. Ho (2007)

From Forest Fires to Hurricane Katrina: Case Studies of Incident Command Systems by Donald Moynihan (2007)

Reports from IBM Center for **The Business of Government**

For a full listing of IBM Center publications, visit the Center's website at **www.businessofgovernment.org.**

List of IBM Center for the Business of Government Reports on The Use of Networks and Collaboration, 2000–2014

A Manager's Guide to Resolving Conflicts in Collaborative Networks by Lisa B. Bingham, Rosemary O'Leary (2006).

The E-Government Collaboration Challenge: Lessons from Five Case Studies by Janis Gogan, Christine B. Williams, Jane Fedorowicz (2006)

A Manager's Guide to Choosing and Using Collaborative Networks by H. Brinton Milward, Ph.D., Keith G. Provan, Ph.D. (2006)

The Next Government of the United States: Challenges for Performance in the 21st Century by Donald F. Kettl (2006)

Leveraging Collaborative Networks in Infrequent Emergency Situations by Donald Moynihan (2005)

The Quest to Become One by Russ Linden (2005)

Communities of Practice: A New Tool for Government Managers by Xavier de Souza Briggs, William M. Snyder (2003)

Leveraging Networks: A Guide for Public Managers Working Across Organizations by Robert Agranoff (2001)

Leveraging Networks to Meet National Goals: FEMA and the Safe Construction Networks by William Waugh (2001)

Applying 21st-Century Government to the Challenge of Homeland Security by Elaine C. Kamarck (2001)

Transborder Service Systems: Pathways for Innovation or Threats to Accountability? by Alasdair Roberts (2001)

The Challenge of Coordinating "Big Science" by W. Henry Lambright (2001)

Collaboration and Performance Management in Network Settings: Lessons from Three Watershed Governance Efforts by Mark Imperial (2001).

Assessing Partnerships: New Forms of Collaboration by Gregory F. Treverton, Robert Klitgaard (2001)

IBM Center for
The Business of Government

About the IBM Center for The Business of Government

Through research stipends and events, the IBM Center for The Business of Government stimulates research and facilitates discussion of new approaches to improving the effectiveness of government at the federal, state, local, and international levels.

About IBM Global Business Services

With consultants and professional staff in more than 160 countries globally, IBM Global Business Services is the world's largest consulting services organization. IBM Global Business Services provides clients with business process and industry expertise, a deep understanding of technology solutions that address specific industry issues, and the ability to design, build, and run those solutions in a way that delivers bottom-line value. To learn more visit: ibm.com

For more information:
Daniel J. Chenok
Executive Director
IBM Center for The Business of Government
600 14th Street NW
Second Floor
Washington, DC 20005
202-551-9342
website: www.businessofgovernment.org
e-mail: businessofgovernment@us.ibm.com

Stay connected with the IBM Center on:

or, send us your name and
e-mail to receive our newsletters.