

Abstract

Network-focused research in public administration has expanded rapidly over the past two decades. This rapid growth has created some confusion about terminology and approaches to research in the field. We organize the network literature in public administration using compact citation networks to identify coherent subdomains focused on (1) policy formation, (2) governance and (3) policy implementation. We trace how these domains differ in their approach to defining the role of networks, relationships and actors and to what extent the articles apply formal network analysis techniques. Based on a subsequent content analysis of the sample articles, we identify promising research avenues focused on the wider adoption of methods derived from social network analysis and the conditions under which networks actually deliver improved results.

Key words

Network research in public administration, policy networks, citation analysis, snowball sampling, governance

NETWORKS IN PUBLIC ADMINISTRATION

Current scholarship in review

Jesse D. Lecy, Ines A. Mergel and
Hans Peter Schmitz

Jesse D. Lecy
Andrew Young School
Georgia State University
Atlanta, GA
USA
E-mail: jdlecy@gsu.edu

Ines A. Mergel
Maxwell School of Citizenship and Public Affairs
Syracuse University
Syracuse, NY
USA
E-mail: iamergel@maxwell.syr.edu

Hans Peter Schmitz
Maxwell School of Citizenship and Public Affairs
Syracuse University
Syracuse, NY
USA
E-mail: hpschmit@syr.edu

INTRODUCTION

Public administration researchers have for some time observed the replacement of hierarchical or bureaucratic authority by more complex governance arrangements involving multiple public and private sector entities such as mixed markets and public private partnerships (Frederickson, 1999; Rhodes, 1996). In response to this shift, scholarship has increasingly adopted new theoretical frameworks, including the concept of 'networks' as a form of organizing important governance functions across independent actors (Salamon and Elliott, 2002).

In this article, we present a structured literature review on the evolution of public administration research on networks over the past two decades. We confirm previous reviews by noting that the most cited articles in public administration often use similar terms (such as 'policy network') to describe very different types of networks. A more detailed content analysis of the articles shows that very few authors clearly define the network under study, its boundaries or other important properties. These issues pose a challenge to the development of a coherent agenda moving forward.

Building on existing reviews of the network literature, we argue that addressing the conceptual confusion around network concepts starts with identifying discernible clusters of research defined by co citation patterns and differences in conceptual approaches to networks. Our structured literature review finds merit in organizing research along three separate research programmes focused on policy formation, governance and implementation. This taxonomy and the review overall contribute to a deeper understanding of collective efforts in network research by allowing scholars to develop a more complete view of existing network research and relate their own research more directly to those studies focused on similar questions.

Following the presentation of the patterns emerging from the citation networks, we provide a more in depth content analysis of the articles contained in the sample. This analysis highlights directions for future research, including the growing adoption of methods derived from social network analysis, the gains derived from adopting greater definitional and conceptual clarity, and the need to focus more attention on the conditions under which networks as an alternative form of social organization actually deliver improved results.

THE EVOLUTION OF THE NETWORK CONCEPT IN PUBLIC ADMINISTRATION

Growing interest in networks has been driven by advances in social network analysis and its promise of measuring previously unacknowledged factors such as structural position power and network cohesion (Freeman, 1979; Krackhardt, 1988; Wasserman and Faust, 1994). Network analysis found its way into public administration primarily through two channels: organizational studies as exemplified by the works of White *et al.* (1976), Granovetter (1983) and Burt (1992), and political science research focused on

networks and their impact on policymaking and governance (Berry *et al.*, 2004; Laumann and Knoke, 1987; Rhodes, 1997).

Early network research in public administration culminated in the mid 1990s with a set of seminal articles and books. In 1995, Provan and Milward published *A Preliminary Theory of Interorganizational Network Effectiveness*, a study on the delivery of mental health services through inter organizational collections of service providers. This study became representative of many subsequent research programmes focused on correlating the formal network structure of a collection of organizations (usually contractual or referral networks) with a particular performance measure. Two years later, Kickert *et al.* (1997) published *Managing Complex Networks*, an edited volume on collaborative governance, and O'Toole (1997b) urged public administration to begin *Treating Networks Seriously*. O'Toole offered five recommendations for advancing network research that included more systematic assessment of the scope and prevalence of networks in public administration, shifting the unit of analysis of policy research from programmes to networks, identifying characteristics of network structure that matter for public administration, focusing on a few unambiguous cases for the purpose of theory development and incorporating normative questions into the interpretation of network outcomes. O'Toole also predicted that 'complex networks are not only relatively common, they are likely to increase in number and importance' because of the presence of 'wicked problems' (those that are non decomposable and thus require coordination between many actors and many sectors), the outsourcing of government services to private and not for profit entities, and the comparative advantage of network approaches to management (O'Toole, 1997b: 46-7).

It has now been a decade and a half since these agenda setting pieces appeared. Since then, the volume of network research in public administration and neighbouring fields has expanded rapidly. Borgatti and Foster (2003), for example, have noted an *exponential* increase in sociological publications containing the words 'social network' in the title or abstract. The visibility of network analysis has also grown significantly in political science (Ward *et al.*, 2011) and international relations (Hafner Burton *et al.*, 2009), among other academic fields. These trends have led Agranoff and McGuire to declare 'the age of the network' in public administration research (2001: 677).

NETWORK RESEARCH LACKS COHERENCE

Despite the enthusiasm for network research in public administration, various scholars have expressed their dissatisfaction with a lack of definitional clarity and coherence of the research programme. Börzel asserted that 'authors only have a vague and ambiguous idea of what a policy network is' (1998: 254). A decade later, Wachhaus arrived at similar conclusions when writing that 'after more than 20 years of scholarship, a coherent body of scholarship on networks has not been developed' (2009: 60).

In order to address this lack of coherence, scholars have regularly made efforts to organize this literature either by offering analytical frameworks (Agranoff and McGuire, 1998; Klijn, 1996; Klijn *et al.*, 1995; Rhodes, 1997) or by extensive literature reviews (Berry *et al.*, 2004; Isett *et al.*, 2011; Provan *et al.*, 2007; Robinson, 2006). We go beyond the previous research by examining a representative set of articles in public administration to refine a research taxonomy that sorts publications into coherent clusters based upon the outcomes explained in the studies. Using bibliometric tools and a content survey of major articles, we first examine the progress and limitations of network research across public administration, and, second, identify a number of specific lessons designed to advance research in the field.

METHODOLOGY

In this article, citation analysis is performed using a snowball sampling technique that generates a representative sample of a research stream within a discipline.¹ Snowball sampling is used to identify iteratively articles citing seed articles and, subsequently, additional articles citing the secondary sources, and so on. Since research clusters can be identified by a common set of core citations that can be used as seed articles, this method allows for the parsimonious mapping of a research field (Harper and Peattie, 2011; Harris *et al.*, 2011; Lecy *et al.*, 2012).

This methodology reflects a less biased sampling technique than procedures employed by traditional literature reviews or searches of academic databases using keywords (Lecy and Beatty, 2012). Firstly, the study uses the *Google Scholar* academic database, rather than the *Web of Science* because of a more extensive index of publications (Noruzi, 2005), a factor particularly important for niche disciplines such as public administration. Secondly, traditional reviews can be limited by familiarity with specific publications and methodologies, and keyword searches are constrained by the hazards of applying appropriate search terminology (for example, policy networks might be called epistemic communities, inter local agreements or public private partnerships in some articles). In contrast, snowball samples avoid these possible biases, in particular when terminology is diverse. The citation practices of the scholarly community drive the collection of the sample, thus avoiding biases generated by peculiarities of search keywords or a scholar's specific views with regard to a domain of study.

The seed articles are an important determinant of the sample and their choice requires explanation. Seeds for the study were identified based on consultations with domain experts as well as recent reviews, including Berry *et al.* (2004) and Isett *et al.* (2011). Because snowball samples move forward in time, the seeds chosen are between 10 and 15 years old (see Table 1). The snowball sample then traces salient research patterns emerging over the past decade (Lecy and Beatty, 2012). We used a sampling rate of 10 per cent and limited the search to three levels from each seed to

Table 1: Seed articles used to frame study of public administration network

<i>Authors</i>	<i>Title</i>	<i>Publication</i>
Agranoff and McGuire (2001)	Big questions in public network management research	<i>Journal of Public Administration Research and Theory</i>
Jones <i>et al.</i> (1997)	A general theory of network governance: exchange conditions and social mechanisms.	<i>The Academy of Management Review</i>
Klijn <i>et al.</i> (1995)	Managing networks in the public sector: a theoretical study of management strategies in policy networks	<i>Public Administration</i>
Klijn and Koppenjan (2000)	Public management and policy networks	<i>Public Management Review</i>
Laumann and Knoke (1987)	<i>The organizational state: social choice in national policy domains</i>	Book
Milward and Provan (2000)	How networks are governed	Book chapter
O'Toole (1997a)	Implementing public innovations in network settings	<i>Administration & Society</i>
O'Toole (1997b)	Treating networks seriously: Practical and research-based agendas in public administration	<i>Public Administration Review</i>
O'Toole (1997c)	The implications for democracy in a networked bureaucratic world	<i>Journal of Public Administration Research and Theory</i>
Provan and Milward (1995)	A preliminary theory of inter-organizational effectiveness: a comparative study of four community mental health systems	<i>Administrative Science Quarterly</i>

generate a citation network comprised of 13,084 publications and 18,807 citation relationships.

A NEW FRAMEWORK FOR NETWORK RESEARCH IN PUBLIC ADMINISTRATION

Berry *et al.* (2004) argued for greater intellectual exchange between network traditions in sociology, political science and public administration. They emphasized opportunities of greatly expanding network analysis in public administration by systematically integrating methodological and theoretical insights generated in neighbouring fields. Isett *et al.* distinguish three research clusters of policy, collaborative and governance networks

(2011: 161).² They elaborate that policy networks seek to shape public decision making, collaborative networks work together in the delivery of services and governance networks combine aspects of policymaking and service delivery. Mandell and Keast (2009) find the language of 'policy' or 'governance' too broad and instead opt to define networks by their level of horizontal integration. Here, 'cooperative networks' are least integrated and focus solely on the exchange of information among organizations. One step above is 'coordination networks' where participant organizations more substantively align their policies to attain outcomes they could not realize without working with others. For Mandell/Keast, most of the public administration network literature falls into this category, including the Provan/Milward school. Finally, the label 'collaborative' network is reserved for the highest level of integration signifying a true interdependence among organizations. Collaborative networks require the development of significant levels of trust needed to effectively address new and particularly complex problems that are beyond the capacity of any single actor.

Our own research finds merit in both approaches, but also led us to slightly modify terminologies to better capture and categorize the existing research clusters. For example, we find that authors use the term policy networks across a wide range of stages of the policymaking and implementing process. This insight led us to mainly strive for reducing existing terminological ambiguities by narrowing the broad label of 'policy networks' and by relabelling 'collaborative networks' as 'implementation' focused networks. We also concluded that the level of horizontal integration and internal alignment proposed by Mandell/Keast are best understood as open ended research questions, not necessarily definitional determinants. For example, an absence of trust within a network may serve as an important explanation for its ineffectiveness.

We embrace the umbrella term of 'policy networks' and suggest to identify primarily three different stages of the policy process – formation, governance and policy implementation. These three schools are discernible in the citation networks presented in the 'Results from the structured literature review' section. Each school encompasses a discreet aspect of the network research landscape with overlaps in citations where the literatures naturally merge (Figure 1).

Identifying separate research programmes and clearly distinguishing perceived schools of thought will aid in organizing the growing literature on networks in the public sector. The three schools are discussed in depth below after the presentation of empirical results.

RESULTS FROM THE STRUCTURED LITERATURE REVIEW

Our sample of over 13,000 publications is sufficient to contain the core literature of network research within public administration, but it also contains many articles that do not relate directly to the topic. Judicious filtering was accomplished by first identifying the set of public administration journals within the sample. This is not to say that

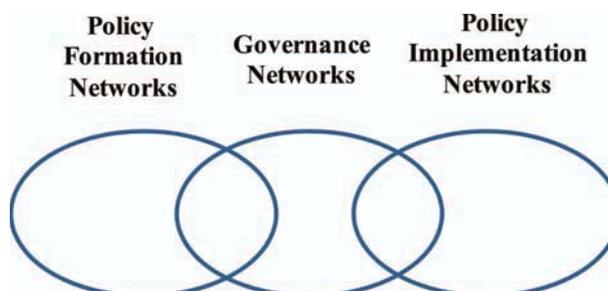


Figure 1: Domains of network research in public administration

network research in other fields is irrelevant, but rather that this is a review looking specifically at scholarship in public administration. All of the journals that appeared at least ten times in the network were coded as either public administration journals or non public administration journals. This resulted in a list of twenty six public administration journals that have published network research related articles (see Appendix 1 for the resulting list).

A subgraph of 782 articles was created by extracting the network of publications occurring in public administration journals exclusively. Of these, 322 were either isolates or occurred in subgraphs of less than five publications. As these disconnected publications do not represent areas of high research intensity, the main component was extracted and retained, resulting in a network of 460 articles. In this network, each article was cited an average of forty times. The final sample was generated by filtering all publications in the network that were cited at a below average number of times. The remaining core network, visualized in Figure 2, consists of 82 articles and 253 ties. This highly refined network contains only the most cited publications in the public administration literature, and as such represents the focal point of the public administration (PA) network literature during the past 10 years. The nodes in Figure 2 are sized by the total number of citations that they receive. The full list of articles labelled in the graph can be found in Appendix 2.

This technique of identifying a citation network of the most highly cited scholarship in public administration does not, however, capture the cutting edge research in the field because it is likely recently published and not yet highly cited. Hence, the review does not capture current areas of active scholarship, but rather presents an organic view of the evolution of research in a given field.

Several interesting findings emerge from the analysis. Firstly, we see that the policy formation cluster is smaller than the other clusters, confirming the finding of Berry *et al.* (2004) that public administration focuses its main attention on governance and service delivery networks. Secondly, we can also see that articles from the policy formation cluster are highly cited, but not highly integrated into the public administration literature. This is a result of two patterns that are made visible by the data. Policy

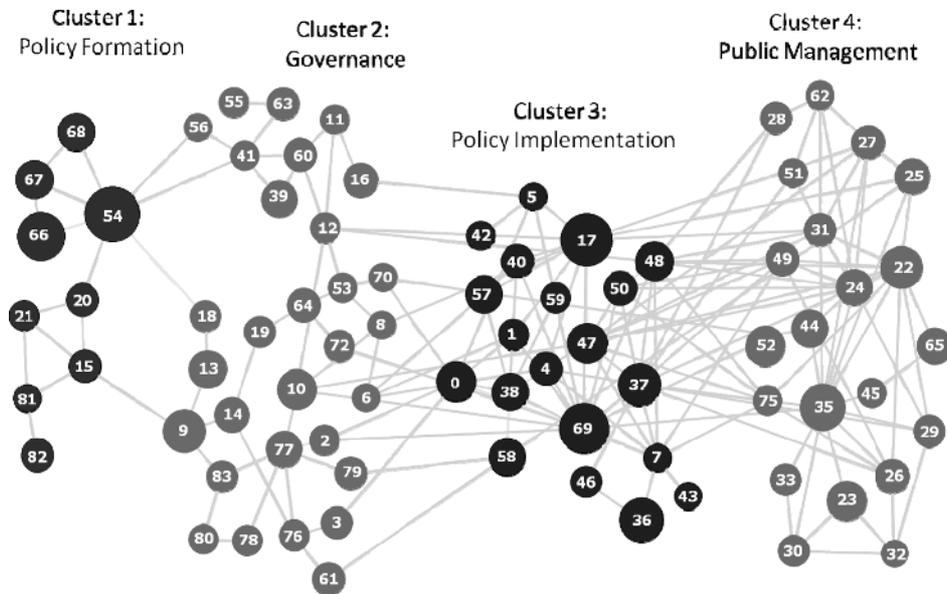


Figure 2: Visualization of the PA network literature core. *Note:* Node size represents the log of total citations for each article

formation focuses on inputs to the policymaking process, which is often driven by epistemic communities of experts or interest groups that are trying to influence a policy process. For example, articles #1 to #4 focus on epistemic communities in the European Union, and articles #5 to #9 are about interest groups, access and lobbying success. These topics are traditionally the realm of political science, so the publications that we see here are in hybrid journals such as *Governance* and the *European Journal of Public Policy*. Similarly, the focus is heavily European, likely because the disciplines of public policy and political science are less separated in Europe than in the United States.

Thirdly, the clusters emerging follow the research schematic represented in Figure 1; that is, the governance cluster shares citations with the policy formation and policy implementation clusters, but policy formation and policy implementation literatures do not cite each other. Some publications may straddle two clusters, which have led us to include overlapping regions in Figure 1.

Fourthly, it is also evident from Figure 2 that the public management and policy implementation literatures are not distinct, even though the public management articles in the sample are not dealing specifically with network topics. They appeared in the snowball sample because they were published in public administration journals and were highly cited. The two clusters have been sorted here by article content to visually separate the differences, but based upon the density of ties they would structurally be considered part of the same cluster. This indicates that PA scholars do not differentiate

network topics from public management research, or stated differently scholarship on network implementation appears to be mainstream in public management.

REFINING CURRENT RESEARCH CLUSTERS

Of the eighty two articles included in the sample, only forty nine focus specifically on network research. In examining these forty nine articles, many of the definitional problems identified by the critics of network research are apparent. Very few studies define networks clearly, and even fewer define the boundaries around the networks in the study or their units of analysis. Many of the studies will talk broadly about policy networks, but the meaning can range from social networks of individuals to policy domains or inter organizational networks (contracts between public agencies, for example). In some cases, ties refer to frequency of communication, in other cases they reflect shared beliefs or values, and in a few cases they refer to formal agreements or partnerships. These inconsistencies in definitions and labelling undermine cumulative research based on comparable findings across similar studies. We describe here three schools that help overcome some of these challenges.

Policy formation networks

The cluster of research around policy formation studies inputs into the policymaking process which includes expertise and influence exerted on policymakers.³ It is an important topic as policy creation is increasingly shaped by many different actors and interest groups in the networked polity. This research focuses on how diverse sets of actors coalesce into coalitions or interest groups and how these collective actors work together to shape the policy process. Networks of this type respond to perceived failures of state authorities to address problems and typically use horizontal cooperation to frame social problems as new agendas. The research grew out of political science work on agenda setting, policy change, diffusion of policy innovations or networked communication (Berry *et al.*, 2004). Examples include the concept of epistemic communities developed by Haas (1992) or the idea of advocacy networks introduced by Keck and Sikkink (1998). This stream of research highlights ways actors that are typically not part of the traditional policymaking process use networking to become influential players in shaping public opinion and policy, primarily based on shared principled beliefs or a common understanding of evidence based policies. These networks emerge as new and cheaper communication technologies increase opportunities for non hierarchical cooperation (even across borders). Some examples of publications in this cluster include Verdun (1999), discussing the role of non state experts in the creation of the Eurozone, and Pappi and Henning (1999) who show that national officials are more heavily networked with lobby groups, while members of the

European Commission develop denser networks within their own bureaucracy rather than with lobby groups seeking to influence policies.

Policy governance networks

Policy governance networks typically emerge as a response to complex policy problems that cannot be effectively addressed by a single actor. Research in this area focuses on processes of 'shaping the rights, rules, preferences and resources that structure political outcomes' (March and Olsen, 1995) and explores in what ways networked governance creates new or different challenges compared to more traditional ways of governing. Governance in networks entails

'stable patterns of social relations between mutually dependent actors which form themselves around policy problems or clusters of resources and which are formed, maintained and changed by a series of games [...]. The policy network is more or less the context within which separate games about policy decisions take place'. (Klijn *et al.*, 1995: 439)

The notion of games is an important component of governance, as the process of competing for resources differ from traditional bureaucratic structures where hierarchical roles and control of resources were well defined. In networks, informal rules can be as important as the formal channels of participation and stakeholder analyses are crucial to understanding how networks operate (Bryson, 2004). For example, network position is important because it can determine access to and control over resources (see Thurmaier and Wood, 2002 for a discussion on network exchange theory).

But while research on network management is more narrowly focused on the creation and maintenance of networks (Klijn *et al.*, 1995), our review suggests that it is useful to distinguish research on governance networks (or, what some label collaborative networks) from the network management literature. Examples of what we call governance networks move beyond a more narrow focus on what defines 'good' network management and highlight that an increasing number of complex problems can only be addressed by actors collaborating in networked relationships (van Bueren *et al.*, 2003; Weber and Khademian, 2008). In both cases, considerations of representation, accountability and equity are at the centre of the inquiry (Agranoff and McGuire, 2001; Bogason and Musso, 2006), setting it apart from the other research clusters.

Agranoff and McGuire (2001) identified 'big questions' of network management research, including questions of accountability, trust, power and the outcomes produced by networks. Romzek and Johnston found that effective accountability measures in social service networks look 'very different in a system that is highly dependent on collaboration and cooperation than it does in a market like system with multiple providers' (2005: 446). While both articles cover questions broadly addressed

in the governance and implementation clusters, they exemplify a primary concern for the structure of interactions within more or less integrated network relations.

Policy implementation networks

Policy implementation networks serve as coordination mechanisms for public service delivery that are distinct from hierarchical organizations, such as a single government agency, or the marketplace. These networks typically involve the delivery of services and researchers focus primary attention on the efficiency and efficacy of policies that are implemented through networks, and in what ways networks affect outcomes. Examples of policy implementation networks include mental health networks that consist of private businesses, non profit organizations and government agencies (Provan and Milward, 1995), or economic development through public private partnerships that distribute investment costs and risk (Savas and Savas, 2000). Participants in the service delivery process remain independent from each other and may still be subject to centralized authority stemming from negotiating power or contracts. While governance issues are relevant in so far as actors shape resource allocations and access to the services, the primary research interest lies with the delivery of the service itself, not the governance process (Provan and Milward, 2001).

The Provan and Milward school emphasizes the use of collaborative management practices necessary for the overall network performance as measured by efficiency (Huang and Provan, 2007; Isett and Provan, 2005; Provan *et al.*, 2002, 2007). It also highlights the need for hybrid forms of organizing and collaborating that emerged between hierarchy and market relationships: the collaborative network (Powell, 1990). The Agranoff and McGuire school tends to emphasize the managerial challenges of operating in a networked environment and favours the phrase *collaborative public management* where networks are only one part of the equation (Agranoff and McGuire, 1998, 1999, 2003).

Although specific studies may capture multiple parts of the policy process and thus make the schools seem confusing, we find that the research can be effectively categorized by the outcome emphasized in each study. For example, studies on the contribution of expert knowledge to policymaking (Verdun, 1999) or the diffusion of policies across borders focus on new policies coming into existence. Concerns about access to the policymaking process (O'Toole and Meier, 2004a), fairness in networked governance (Bovaird, 2005) or control of scarce environmental resources (Lubell *et al.*, 2002) have as their primary focus outcomes concerned with governance. These are in contrast with management studies that examine the effectiveness and efficiency of outcomes in networked settings (Provan and Milward, 1995). Formulating effective policy and implementing policy both entail aspects of governance, as reflected in the overlap of these domains in Figure 1. We expect the governance process to be dialectic with processes of policy formation and re formulation, as well as management and governance. Feldman

and Khademian (2002) asserts that 'to manage is to govern', for example. But the outcome of each study tends to fall primarily in one of the three clusters.

Units of analysis also tend to vary within each domain. Policy networks focus on individual actors – experts or lobbyists – and the ties tend to be communication channels. Governance and policy implementation networks, on the other hand, tend to focus on organizational networks. But there is great diversity in what kinds of networks are studied. In the minority of cases, nodes represent organizations and ties represent some formal relationships such as contracts or referral networks. More often, nodes are individuals that operate within policy networks, such as presidents of school boards or local government managers. Ties are most often defined as 'frequent interactions' or 'actors in games', but rarely operationalized or empirically measured. Policy implementation networks are unique in that they use network level measures to study variation in outcomes across different types of networks.

LIMITATIONS OF THIS STUDY

The methodology of a structured literature presented here is transparent and has the advantage that articles are selected based upon their importance to the field, i.e. they are highly cited and well embedded. There are several limitations to the analysis, however. The most notable is the choice to examine only articles appearing in public administration journals. While this choice reflects the research question focused on how public administration scholars have integrated networks in their research, it creates concerns about whether the results are driven by the limited sample framework and the initial choices of seed articles. We conducted a sensitivity analysis to ensure that the clusters did not change once articles outside of the PA core were considered. This was done by examining the neighbourhood of all publications within a distance of one citation link from any article published in a PA journal. In other words, a new sample was created that includes all of the titles that cite anything in PA journals, and all of the titles that are cited by PA articles, versus the sample presented above which only contains articles published in PA journals. Examination of this augmented network does not change any patterns or conclusions in a substantive way. The larger network is, however, too unwieldy for visualization.

OPPORTUNITIES AND CHALLENGES FOR NETWORK RESEARCH IN PUBLIC ADMINISTRATION

Our findings show that very few articles in the sample – five out of the forty nine in the sample that focus on networks – use formal quantitative social network analysis techniques (Milward and Provan, 1998; O'Toole and Meyer, 2004b; Provan *et al.*, 2004; Raab, 2002; Weible and Sabatier, 2005). These articles use basic measures such as centrality and visualization. Some articles also describe specific positions in the

network in the form of roles, such as central or peripheral actors. Only two articles use somewhat sophisticated analysis techniques, such as cluster analysis and cohesion measures. Overall, with the exception of Milward and Provan (1995), none of the studies included in this review completed large scale data collection that would be necessary for a quantitative analysis of network ties and other measures.

Outside of the public administration, much more sophisticated methods for network research were developed and used in related fields. Advances on several fronts have created a sophisticated set of theories and analytical tools that have recently culminated in a 'new science' of networks that spans sociology, physics and organizational sciences (Barabási, 2002; Borgatti *et al.*, 2009; Newman, 2003; Parkhe *et al.*, 2006; Watts, 2004). Statisticians have laid the groundwork for models that allow for inferential hypothesis testing of social theories within a network context as well as longitudinal data analysis to observe and analyse evolution of networks over time (Goodreau, 2007; Handcock, 2003; Krackhardt, 1988; Robins *et al.*, 2007; Snijders, 2002; Snijders *et al.*, 2007).

Confirming Berry *et al.* (2004), we find slowly increasing cross pollination based on interesting theoretical and conceptual work happening around the fringes of public administration. For example, Jackson (2008) offers a clear and concise text on network analysis. Whereas PA scholarship has relied mainly on qualitative descriptions of network creation, Jackson has emphasized a variety of stochastic and formal economic models of the emergence of network structure from social processes. These include several game theoretic models that account for incentives of networks' participants (Jackson and Wolinsky, 1996). Jackson also provides some conceptually rich notions of social welfare based upon network structure (2005), and in this way offers an analytical frame that fits well with the existing self organization of the public administration literature. Similarly, Easley and Kleinberg (2010) apply formal network techniques to the analysis of economic markets in a way that lends itself to policy analysis. Although more formal pieces are starting to appear in the PA literature (Provan *et al.*, 2012; Shrestha, 2012), there is still much room for PA scholars to import insights from other disciplines.

Beyond the call for a wider adoption of network analytical methods, there remain significant empirical challenges for the field. Network research has become such a mainstream topic that the efficacy of networks seems to go unquestioned. The idea that networks provide better public management than alternatives is still largely taken for granted, rather than investigated. It is important to note, however, that the review did not identify a single piece that established the legitimacy of this claim in the same way that Powell (1990) examined the efficacy of networks for economic exchange or (Jones *et al.*, 1997) looked at management processes in organizations. As an example, Provan and Milward (1995) compare performance across different kinds of networks, but they do not compare networks to hierarchical bureaucracies.

The field is struggling to come to terms with what it means to manage and operate within networks partly because the transition from traditional bureaucracy or hierarchical systems was not intentional or fully apparent while in progress. Now many managers are forced to deal with the reality of networks, even though they did

not explicitly choose them as the best means to govern. That said, none of the articles explicitly test the assertion that networks are a better way to govern, i.e. that networks produce better outcomes than hierarchies or other alternative forms of organization. This point was asserted by Koontz and Thomas (2006) after looking at the lack of empirical evidence on collaborative management practices for environmental projects. Similarly, Lubell (2004) used a quasi experimental design to show that adopting a collaborative structure does not improve cooperation in estuary management zones. Boyne (2003) conducted a large meta analysis of factors associated with public service improvement and found that networked management is not a significant factor. O'Toole and Meier's *Desperately Seeking Selznick* (2004) find empirical support for important concerns raised by Berry *et al.* (2004), including how networks may foster 'groupthink' or bias against 'members of society who have no access or whose voices are silent' (550). If anything, the set of articles collectively pose a challenge to the notion of network efficacy in public administration. These results have led Olsen (2006) to call for research that questions the assumptions of network efficacy.

CONCLUSION

Research focused on the role of networks has increased significantly in the field of public administration during the past two decades. This new research agenda has allowed scholars to explore the potential of alternative forms of collaboration, while it has also created a number of conceptual and empirical challenges associated with adapting the network concept to the specific needs of the public administration research community.

Building on existing reviews of the PA network literature and based on a citation network analysis, we identified three distinct clusters of research focused on policy formation, governance and policy implementation. We found overlaps between the first and second as well as the second and third clusters and confirmed previous claims that the PA literature is most heavily focused on questions of policy implementation. This primary focus on implementation shows that the role of networks in earlier stages of the policy process has received less attention, despite the importance of agenda formation and governance arrangements as factors shaping the confines of the policy implementation process. Our research also shows that we have yet to see the widespread adoption of advanced network methodologies developed in neighbouring academic fields. Our review identified greater conceptual clarity and broader usage of methods capable of capturing network activities as the two main future directions for network research in public administration.

Important questions about the policy formation and the governance of networks receive more detailed attention in neighbouring academic fields. Expanding public administration research in those areas will offer the opportunity to establish with greater confidence claims about the role of networks throughout the entire policy process. Questions currently receiving insufficient attention in the PA literature include: How do

policy issues rise to the agenda through network mechanisms? Who introduces policy innovations to the network of influential policymakers and creates awareness for the need of change? And, once the need for innovation is accepted, what are the networking mechanisms that shape the subsequent process towards policy implementation?

We argue that adopting a common language regarding the specific stage of the policy process (formation, governance, implementation) based upon the dependent variables in the studies will facilitate collective efforts of researchers to advance network research. For example, identifying the stage of the policy process will help scholars locate related research in other fields for insights on research design or data sources. As the usage of the network concept in research will rapidly expand, it becomes increasingly valuable for individual researchers to clearly define not only the network studied, but also the stage of the policy process they are most concerned with. Such clarity will also allow researchers to more easily study what happens to networks after they have reached their goals. How do network ties dissolve? Which ties are sustainable over time and can be reactivated for future networking? What are other possible outcomes of networking activities that may not have been identified as an original purpose?

Network research in public administration has come a long way, but future progress in sustaining this vibrant research agenda depends on increased conceptual and definitional clarity. We assert that research on networks has not yet shown that networks are indeed a better form of governance than alternative bureaucratic forms. Our finding of research organized around three phases of the policy process led to the conclusion that a more studies focused on policy formation and governance processes will be necessary to make more confident pronouncements about the role of networks as effective problem solving mechanisms.

NOTES

- 1 Data was collected for the study using a custom program written by the first author and is used in the R statistical environment. For a full description of the methodology and accompanying software, see Lecy and Beatty (2012).
- 2 Berry *et al.* did not separate public management networks into collaborative management and governance networks as Isett *et al.* did, but they also suggested methodology as a potential third cluster of research, although there is no evidence of a methodology school emerging in PA.
- 3 Isett *et al.* define policy networks as ‘collections of public agencies, legislative offices, and private sector organizations (including interest groups, nonprofits, etc.) that have an interest in public decisions within a particular area of policy’ (2011: i158).

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Appendix 1.

List of PA journals used to construct the sample

Administration and Policy in Mental Health and Mental Health Services Research
Administration and Society
Australian Journal of Public Administration
European Journal of Political Research
Governance
International Journal of Public Administration
International Journal of Public Sector Management
International Public Management Journal
International Review of Administrative Sciences
Journal of European Public Policy
Journal of Policy Analysis and Management
Journal of Public Administration Research and Theory
Journal of Public Policy
Nonprofit and Voluntary Sector Quarterly

(continued)

Appendix 1. (continued)

Nonprofit Management and Leadership
Policy Studies Journal
Political Studies Review
Public Administration
Public Administration Review
Public Management Review
Public Organization Review
Public Performance and Management Review
Review of Policy Research
The American Review of Public Administration

Appendix 2.**Articles that comprise the 'core' of PA network research**

<i>ID</i>	<i>First author</i>	<i>Year</i>	<i>Title</i>	<i>Journal</i>
1	Radaelli, C. M.	1999	The public policy of the European Union: whither politics of expertise?	<i>JEPP</i>
2	Verdun, A.	1999	The role of the Delors committee in the creation of EMU: an epistemic community?	<i>JEPP</i>
3	Sabatier, P. A.	1998	The advocacy coalition framework: revisions and relevance for Europe	<i>JEPP</i>
4	Radaelli, C. M.	2000	Policy transfer in the European Union: institutional isomorphism as a source of legitimacy	<i>GOV</i>
5	Coen, D.	2007	Empirical and theoretical studies in EU lobbying	<i>JEPP</i>
6	Woll, C.	2006	Lobbying in the European Union: from sui generis to a comparative perspective	<i>JEPP</i>
7	Eising, R.	2004	Multilevel governance and business interests in the European Union	<i>GOV</i>
8	Beyers, J.	2002	Gaining and seeking access: the European adaptation of domestic interest associations	<i>EJPR</i>
9	Pappi, F. U.	1999	The organization of influence on the ECS common agricultural policy: a network approach	<i>EJPR</i>
10	Weible, C.	2004	A comparison of a collaborative and top-down approach to the use of science in policy: establishing marine protected areas in California	<i>PSJ</i>
11	Lubell, M.	2004	Collaborative environmental institutions: all talk and no action?	<i>JPAM</i>
12	Koontz, T. M.	2006	What do we know and need to know about the environmental outcomes of collaborative management?	<i>PAR</i>

(continued)

Appendix 2. (continued)

<i>ID</i>	<i>First author</i>	<i>Year</i>	<i>Title</i>	<i>Journal</i>
13	Weible, C. M.	2005	Comparing policy networks: marine protected areas in California	<i>PSJ</i>
14	Milward, H. B.	1998	Measuring network structure	<i>PA</i>
15	Hudson, B.	2004	Analyzing network partnerships	<i>PMR</i>
16	Osborne, S. P.	2006	The new public governance?	<i>PMR</i>
17	Carlsson, L.	2000	Policy networks as collective action	<i>PSJ</i>
18	Weber, E. P.	2008	Wicked problems knowledge challenges and collaborative capacity builders in network settings	<i>PAR</i>
19	O'Toole, L. J.	1997	The implications for democracy in a networked bureaucratic world	<i>JPART</i>
20	Feldman, M.,S.	2002	To manage is to govern	<i>PAR</i>
21	Dubnick, M.	2005	Accountability and the promise of performance: in search of the mechanisms	<i>PPMR</i>
22	Bryson, J. M.	2004	What to do when stakeholders matter	<i>PMR</i>
23	Considine, M.	1999	Governance at ground level: the frontline bureaucrat in the age of markets and networks	<i>PAR</i>
24	Bovaird, T.	2005	Public governance: balancing stakeholder power in a network society	<i>IRAS</i>
25	Coen, D.	2008	Network governance and multi-level delegation: European networks of regulatory agencies	<i>JPP</i>
26	Eberlein, B.	2005	Beyond delegation: transnational regulatory regimes and the EU regulatory state	<i>JEPP</i>
27	Raab, J.	2003	Dark networks as problems	<i>JPART</i>
28	Huxham, C.	2003	Theorizing collaboration practice	<i>PMR</i>
29	Ansell, C.	2000	The networked polity: regional development in western Europe	<i>GOV</i>
30	Skelcher, C.	2005	Jurisdictional integrity polycentrism and the design of democratic governance	<i>GOV</i>
31	Klijin, E. H.	1995	Managing networks in the public sector: a theoretical study of management strategies in policy networks	<i>PA</i>
32	Van Bueren, E. M.	2003	Dealing with wicked problems in networks: analyzing an environmental debate from a network perspective	<i>JPART</i>
33	Rhodes, R.	1997	From marketisation to diplomacy: it's the mix that matters	<i>AJPA</i>
34	Hanf, K.	1992	Revisiting old friends: networks implementation structures and the management of inter-organizational relations	<i>EJPR</i>
35	Schneider, V.	1992	A comparison of the chemicals control and telecommunications policy domains in Germany	<i>EJPR</i>
36	Pratchett, L.	1999	New technologies and the modernization of local government: an analysis of biases and constraints	<i>PA</i>
37	Teisman, G. R.	2002	Partnership arrangements: governmental rhetoric or governance scheme?	<i>PAR</i>

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Appendix 2. (continued)

<i>ID</i>	<i>First author</i>	<i>Year</i>	<i>Title</i>	<i>Journal</i>
38	Pollitt, C.	2003	Joined-up government: a survey	<i>PSR</i>
39	Entwistle, T.	2005	From competition to collaboration in public service delivery: a new agenda for research	<i>PA</i>
40	Milward, H. B.	2003	Managing the hollow state	<i>PMR</i>
41	Provan, K. G.	2004	Cooperation and compromise: a network response to conflicting institutional pressures in community mental health	<i>NVSQ</i>
42	Jennings, E. T.	1998	Interorganizational coordination administrative consolidation and policy performance.	<i>PAR</i>
43	Provan, K. G.	2001	Do networks really work? A framework for evaluating public-sector organizational networks	<i>PAR</i>
44	Thurmaier, K.	2002	Interlocal agreements as overlapping social networks: picket-fence regionalism in metropolitan Kansas City	<i>PAR</i>
45	Agranoff, R.	2001	American federalism and the search for models of management	<i>PAR</i>
46	O'Toole, L. J.	2004	Public management in intergovernmental networks: matching structural networks and managerial networking	<i>JPART</i>
47	Meier, K.,J.	2003	Public management and educational performance: the impact of managerial networking	<i>PAR</i>
48	Meier, K.,J.	2001	Managerial strategies and behavior in networks: a model with evidence from us public education	<i>JPART</i>
49	McGuire, M.	2002	Managing networks: propositions on what managers do and why they do it	<i>PAR</i>
50	Agranoff, R.	2001	Big questions in public network management research	<i>JPART</i>
51	Agranoff, R.	1999	Managing in network settings	<i>RPR</i>
52	O'Toole, L. J.	1999	Modeling the impact of public management: implications of structural context	<i>JPART</i>
53	O'Toole, L. J.	1997	Treating networks seriously: practical and research-based agendas in public administration	<i>PAR</i>
54	Wettenhall, R.	2003	The rhetoric and reality of public-private partnerships	<i>POR</i>
55	O'Toole, L. J.	2004	Desperately seeking Selznick: cooptation and the dark side of public management in networks	<i>PAR</i>
56	Romzek, B. S.	2005	State social services contracting: exploring the determinants of effective contract accountability	<i>PAR</i>
57	Raab, J.	2002	Where do policy networks come from?	<i>JPART</i>
58	Kettl, D. F.	2000	The transformation of governance: globalization devolution and the role of government	<i>PAR</i>
59	Andrews, R.	2005	Representative bureaucracy organizational strategy and public service performance: an empirical analysis of English local government	<i>JPART</i>

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Appendix 2. (continued)

<i>ID</i>	<i>First author</i>	<i>Year</i>	<i>Title</i>	<i>Journal</i>
60	Pitts, D. W.	2005	Diversity representation and performance: evidence about race and ethnicity in public organizations	<i>JPART</i>
61	Boyne, G. A.	2004	Strategy content and public service organizations	<i>JPART</i>
62	Boyne, G. A.	2003	What is public service improvement?	<i>PA</i>
63	Walker, R. M.	2004	Using multiple informants in public administration: revisiting the managerial values and actions debate	<i>JPART</i>
64	Andrews, R.	2006	Strategy content and organizational performance: an empirical analysis	<i>PAR</i>
65	Boyne, G. A.	2003	Sources of public service improvement: a critical review and research agenda	<i>JPART</i>
66	Meier, K. J.	2002	Public management and organizational performance: the effect of managerial quality	<i>JPAM</i>
67	O'Toole, L. J.	2003	Plus ca change: public management personnel stability and organizational performance	<i>JPART</i>
68	Lynn, L. E.	2001	The myth of the bureaucratic paradigm: what traditional public administration really stood for	<i>PAR</i>
69	Olsen, J. P.	2006	Maybe it is time to rediscover bureaucracy	<i>JPART</i>
70	Fernandez, S.	2006	Managing successful organizational change in the public sector	<i>PAR</i>
71	Grizzle, G. A.	2002	Implementing performance-based program budgeting: a system-dynamics perspective	<i>PAR</i>
72	Rainey, H. G.	1999	Galloping elephants: developing elements of a theory of effective government organizations	<i>JPART</i>
73	Brewer, G. A.	2005	In the eye of the storm: frontline supervisors and federal agency performance	<i>JPART</i>
74	Moynihan, D. P.	2005	Testing how management matters in an era of government by performance management	<i>JPART</i>
75	Wright, B. E.	2007	Public service and motivation: does mission matter?	<i>PAR</i>
76	Chun, Y. H.	2005	Goal ambiguity and organizational performance in US federal agencies	<i>JPART</i>
77	Wright, B. E.	2004	The role of work context in work motivation: a public sector application of goal and social cognitive theories	<i>JPART</i>
78	Pandey, S. K.	2006	Connecting the dots in public management: political environment organizational goal ambiguity and the public manager's role ambiguity	<i>JPART</i>
79	Van Slyke, D. M.	2003	The mythology of privatization in contracting for social services	<i>PAR</i>
80	Alexander, J.	1999	Implications of welfare reform: do nonprofit survival strategies threaten civil society?	<i>NVSQ</i>
81	Alexander, J.	1999	The impact of devolution on nonprofits	<i>NML</i>
82	Eikenberry, A. M.	2004	The marketization of the nonprofit sector: civil society at risk?	<i>PAR</i>