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# Structural and Institutional Determinants of Influence Reputation: A Comparison of Collaborative and Adversarial Policy Networks in Decision Making and Implementation

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## Abstract

The central assumption in the literature on collaborative networks and policy networks is that political outcomes are affected by a variety of state and nonstate actors. Some of these actors are more powerful than others and can therefore have a considerable effect on decision making. In this article, we seek to provide a structural and institutional explanation for these power differentials in policy networks and support the explanation with empirical evidence. We use a dyadic measure of influence reputation as a proxy for power, and posit that influence reputation over the political outcome is related to vertical integration into the political system by means of formal decision-making authority, and to horizontal integration by means of being well embedded into the policy network. Hence, we argue that actors are perceived as influential because of two complementary factors: (a) their institutional roles and (b) their structural positions in the policy network. Based on temporal and cross-sectional exponential random graph models, we compare five cases about climate, telecommunications, flood prevention, and toxic chemicals politics in Switzerland and Germany. The five networks cover national and local networks at different stages of the policy cycle. The results confirm that institutional and structural drivers seem to have a crucial impact on how an actor is perceived in decision making and implementation and, therefore, their ability to significantly shape outputs and service delivery.

## Introduction

Policy analysis and public administrawtion both have a strong interest in how effective and efficient policy outputs and outcomes are produced (Howlett and Ramesh 1995; Knill and Tosun 2012). Yet they focus on different stages of the policy cycle (Jann and Wegrich 2007; Rethemeyer and Hatmaker 2007): a management perspective focuses its attention on the role, performance, and effectiveness of public and private organizations with regard to implementation and the quality of service delivery (Huang and Provan 2013; Klijn 2005). Research about policy making tends to concentrate on negotiations and structures during the decision-making process. It aims at explaining how policy solutions are designed to tackle problems that have passed the crucial agenda-setting stage (Baumgartner and Jones 1993; Sabatier and Jenkins-Smith 1993).

This article was written within the framework of three projects running at the Swiss Federal Institute of Technology (ETH Zurich) and the University of Bern: "Sustainable Land-Use Practices in Mountain Regions: Integrative Analysis of Ecosystem Dynamics under Global Change, Socio-economic Impacts and Policy Implications" (MOUNTLAND), supported by the Competence Center Environment and Sustainability; "NCCR-Climate," supported by the Swiss National Science Foundation; and "Multi-level regulation of the utilities sector in Belgium, the Netherlands, Ireland, and Switzerland: energy and telecommunications" (REGUNET), led by KU Leuven and UC Louvain, Belgium. Address correspondence to the author at karin.ingold@ipw.unibe.ch.

In what follows, we adopt a more encompassing perspective, including both, political decision making and implementation at the national and local level, and highlight that both branches of the literature are interested in how effective and efficient outputs come about and that they attribute a strong role to "powerful" political actors (Ferris et al. 2007; Watkins and Rosengrant 1996).

The definition of the power of those actors depends on whether we conceptualize policy making as a process shaped by elected officials and senior public managers or rather by a variety of interdependent private and public actors (Montjoy and Watson 1995; Svara 1998). Although the first can be understood as institutional power defined by formal rules, the second can be characterized as informal structural power or access to political influence (Stokman and Zeggelink 1996). Historically, the view on power in management and decision making developed hand-in-hand with the emergence of what is often called interorganizational collaboration or network governance (Provan and Kenis 2008; Raab and Kenis 2009; Raab, Mannak, and Cambré 2013; Rethemeyer and Hatmaker 2007). Processes are shaped by both horizontal and vertical integration of actors into the governance system (Bolleyer and Börzel 2010). If we acknowledge this complex and interdependent nature of today's decision making and service delivery, a viable research strategy is to adopt a network approach in order to analyze power differentials. Policy networks are composed of actors (nodes) and the relations among them (ties or edges). Actors' attributes (such as their resources) and network configurations (i.e., specific realizations of a network) are jointly responsible for policy dynamics and outcomes (Henning 2009; Klijn 1996; Laumann and Knoke 1987; Lin 2001; Pappi and Henning 1998, 1999).

In empirical policy networks, the two modes of power—formal power derived from institutional roles and structural power derived from network configurations—cannot be easily disentangled. Recent studies emphasize the potentially complementary impact of the two modes of power (see also Feiock et al. 2003): Choi and Robertson (2013) distinguish between formal, "processual," and "structural" modes of power that might be able to mitigate power imbalances among actors, and thus impact upon decision outcomes in a group of stakeholders. Park and Rethemeyer (2012) analyze the explanatory value of actors' resource dependence for the structure of policy networks. They too distinguish between "material-institutional" and "social-structural" resources (Park and Rethemeyer 2012, 4). Both studies aim at disentangling formal decision-making rules and institutionally derived resources from, on the one hand, deliberative processes and, on the other, resources derived from persistent patterns of interaction between actors in a network (see also Kenis and Schneider 1991). They further highlight that integrating both institutional and structural resources into one statistical network model would help to understand the complexity of resource dependence and power (im)balance.

In line with these studies, we aim to provide a structural and institutional explanation for power differentials in policy networks and further ask what impact structural versus formal power has on the formation of policy outputs and outcomes. However, we acknowledge that it is difficult to empirically evaluate the policy success of an actor or the effectiveness of achieving policy outputs (McConnell 2010). We therefore seek to investigate an antecedent condition for factual political influence and success: the reputation of an actor as being influential. From the social psychology literature, we borrow the argument that how an actor is perceived in the policy process matters for the actor's policy effectiveness. Put differently: perception influences action. Carpenter (2010) and Carpenter and Krause (2012) convincingly demonstrate how reputation shapes the factual influence and behavior of government agencies and how organizational reputation is relevant for understanding their role in democratic systems. In line with Kilduff and Krackhardt (1994), we define reputation as the perceived importance of actors when evaluated by their peers or other stakeholders involved in the policy process. The underlying assumption is that actors who have a reputation for being influential can considerably influence collective decision making.

This research therefore asks: what factors determine the influence reputation of political actors?

We posit that influence reputation on the political outcome is related to two complementary factors: vertical integration into the political system by means of formal decision-making authority, and horizontal integration by means of advantageous structural positions in the policy network. Hence, we argue that actors are perceived as influential because of both their institutional power and their structural power derived from their positions in the policy network.

Moreover, the analysis presented in this article tests whether these propositions are empirically valid across different types of networks, or whether they are confined to local- or national-level networks, collaborative or adversarial networks, or decision making or implementation networks. Theoretical arguments from the different branches of the literature suggest that a

unified explanation of power differentials might be valid across contexts.

Our argument is structured as follows. The first section discusses perceived influence reputation (our dependent variable in the statistical model presented below) as an intervening variable in the explanation of political outcomes. The second section reviews existing research on reputation in policy networks and develops several hypotheses along the lines of institutional and structural features of actors in policy networks (our independent variables). The third section provides details about the datasets and methods employed in our empirical analysis. Section four presents temporal and cross-sectional exponential random graph models (ERGMs; temporal exponential random graph model [TERGM] and ERGM) and discusses the results in light of existing findings on policy networks. Park and Rethemeyer (2012) observe that "surprisingly little is known about the effects of [various] social factors on the structure of policy networks due, in part, to the statistical challenges in modeling them precisely." With our use of temporal ERGMs, we are able to explore the causal relationships between the variables of interest and thus overcome some of those limitations. Finally, the last section concludes and discusses implications for public policy and management, and avenues for future research.

## Influence Reputation as an Intervening Variable Between Network Structure and Political Outcomes

How actors are perceived matters. Zhang and Feiock (2010) show under what conditions administrative managers share power with elected bodies. They point out that managers' experience and professionalism seem to impact upon their "perceived policy leadership." "Authority [of managers] is often more a function of their personalities and personal charisma than it is of their official positions" (Fairholm 2001, iv). This is not to say that managers do not require formal authority, but rather that the combination of authority and referent power—defined as respect, loyalty, and admiration—can create considerable influence (Locke 2003). Hence, there are some broader views on important positions and political influence, rather than just a focus on formal authority and decision making (for the latter, see Lukes 1974; Schumpeter 1943). Carpenter (2010), and later Carpenter and Krause (2012), point to factors that affect perception in organizational settings. They prominently emphasize the link between reputation and outcomes by analyzing how an actor's reputation and exposure to multiple audiences (such as clients, media, and congressional committees) conditions his or her administrative choices and strategic behavior. The way in which organizational reputations are formed and subsequently cultivated is fundamental to understanding the role of public administration in a democracy (Carpenter and Krause 2012, 26). Building on this important insight, we are interested in explaining how the *influence reputation* of private and public agencies involved in the policy process comes about in the first place.

The issue of reputation is also prominently studied in sociology and organizational studies in which authors analyze the factors that determine perceived reputation (Kilduff and Krackhardt 1994; Lee and Whitford 2012; Maor, Gilad, and Bloom 2012). Burt (2008) shows the relevance of two main approaches: the human capital approach, which focuses on accumulated experience and knowledge that may enhance positive reputation and make it persist over time; in contrast, the social capital approach focuses on the quality and/or quantity of an actor's ties to explain his or her reputation. From this perspective, reputation can be defined as the extent to which a person, group, or organization is known to be trustworthy, performing well or important (Burt 2005, 2008; Lamothe and Lamothe 2012; Weigelt and Camerer 1988). It should be noted that reputation is related to a cognitive approach: it is not about who an actor is or what he or she does, but about how an actor is perceived in terms who he or she is or what he or she does.

In early political sociology and policy elite research, the reputational approach received considerable attention and was compared with positional and decisional approaches in order to study the influence of organizational actors (for a comparison, see French 1969). The "reputational method" was first employed by Hunter, Steven, and Hancock (1953) and conceptualizes power in terms of actors mutually recognizing one another as influential. An actor is influential if he or she is rated as being influential by other relevant actors. The "positional method" was first employed by Mills (1956) and relies on archival data to describe capital flows and the other relations and properties of organizations. An actor is influential if he or she accumulates more resources than others and thereby gains a position of authority. The "decisional approach" was first used by Hunter (1953, 214) and conceptualizes influence as a result of an organization's realized interest positions. An actor is influential if he or she participates in important decisions. The relative merit of each approach was subject to debate in the 1960s. French (1969) found that reputational power enriched with positional indicators provides the most accurate picture of influence. This view is supported by Freeman

et al. (1963, 797), who find that the reputation method identifies those actors that are actually influential and the "institutional leaders" behind the scenes, whilst the decisional approach only gets at the active "workers" who rely on the institutional leaders (cf. French 1969).

In other words, it is well established in various branches of the literature that actors with considerable reputational power are particularly able to shape decision making. To date, however, very little research exists in political science and public administration as to why some actors are perceived as more important than others and can therefore exert stronger factual influence. Nevertheless, it is recognized that some specific actors involved in policy processes particularly care about their reputation and how they are perceived by others: politicians are subject to a (re-)electoral logic and are therefore especially keen on having a good reputation and being regarded as influential (Barro 1973; Besley and Case 1995; Landry and Varone 2005).

If influence reputation is an intervening variable that affects political outcomes, the important question then becomes: what factors determine whether an actor is regarded as influential by other political actors in the first place? How can we deconstruct and understand influence reputation in policy and implementation processes? In line with Kilduff and Krackhardt (1994), we focus on actors' reputations and assume that actors who have a higher reputation can greatly influence decision making. Influence reputation thus follows a cognitive approach, where peers evaluate how important they perceive an actor involved in the respective policy or implementation process to be (Hunter 1953).

## Structures and Institutions as Sources of Influence Reputation

The institutionalist view on power and influence presupposes that important actors can be identified by looking at formal decision-making rules and institutionalized power (Dahl 1994; Tsebelis 2002). From a social-structural perspective, however, perceived influence depends on direct and, possibly, indirect connections with others (Smith et al. 2014), and on the location in the overall network rather than rules and institutions (Ibarra 1993; Wellman and Berkowitz 1988). An important insight from policy process theory (Howlett and Ramesh 1995; Laumann and Knoke 1987) and neo-institutionalism (Mayntz and Scharpf 1995) is that the two perspectives are not necessarily mutually exclusive: institutions (formal, informal, and operational rules; see Kiser and Ostrom 1982) and structures can influence one another (see also Choi and Robertson 2013; Novell and Steelman 2014; Park and Rethemeyer 2012).

We therefore take both structural and institutional elements into account and investigate how they affect the perceived influence of an actor in a given political decision-making or implementation process.

### Structural Power

A central issue in understanding any type of network requires the identification of which actor in the network has power (Smith et al. 2014). Organizations or actors participate in policy networks because they depend on the public sector for key resources (Park and Rethemeyer 2012). To assess structural determinants of resources and power, some scholars point to two different branches of research that have followed "relatively separate tracks" (Rethemeyer and Hatmaker 2007; see also Schalk, René, and Allen 2009): policy networks versus collaborative networks research.

*Policy networks* can be defined as a set of relatively stable relationships which are of a nonhierarchical and interdependent nature and link a variety of public and private actors who share common interests (not preferences) with regard to a specific policy (Börzel 1997; Peterson and Bomberg 2009, 8). Actors exchange resources and information in order to increase the impact of their lobbying on policy decisions (Baumgartner and Leech 2001; Leech et al. 2009). This relational exchange is organized in policy networks (Laumann and Knoke 1987). Although it is widely acknowledged that final decision control is the most important resource in policy-making, authors largely agree that this control can be exchanged for influence resources such as information, public support, or technical expertise (Coleman 1986; Choi and Robertson 2013; Henning 2009; Knoke et al. 1996; Leifeld and Schneider 2012; Pappi and Henning 1999, 1998). The possession of these influence resources considerably facilitates direct access to decision making and policy design and increases actors' reputational power (Beyers and Braun 2013; Heaney 2014; Raub and Weesie 1990).

Some recent policy network studies analyze reputation as dyadic influence attribution, rather than as an attribute. They focus on common venue participation, joint issue or policy preferences, and existing channels of cooperation between any two actors as complementary determinants of influence attribution, and thus the formation of reputation (Fischer and Sciarini 2013; Heaney 2014).

Although research on policy networks stresses the competitive and adversarial logic of decision making (through lobbying, resource exchange, gatekeeping, and brokerage), research on *collaborative networks* conceptualizes decision making and implementation as a cooperative game for the common cause of policy coordination—a game during which cooperation

often breaks down due to collective action problems. Research on collaborative networks identifies factors that inhibit these collective action problems, such as bonding and bridging, social capital, and the integration of local actors (Andrews et al. 2005; Berardo and Scholz 2010; O'Toole 1997; Provan and Milward 1995; Schneider et al. 2003; Shrestha 2012; Terman and Feiock 2014).

Although policy networks are mostly concerned with decision making, collaborative networks are established for implementing and providing public goods (Schalk, René, and Allen 2009: 630; see also Huang and Provan 2007; Lubell and Fulton 2007; Novell and Steelman 2014; Rethemeyer and Hatmaker 2007, 620). In some applications—mainly concerning natural resource management—the boundaries between the two are blurred by analyzing decision making in local policy networks as a common good (Bodin and Crona 2009; Calanni et al. 2014; Henry, Lubell, and McCoy 2011; Ingold, Balsiger, and Hirschi 2010; Lubell and Scholz 2001; Scholz and Wang 2006). The empirical analysis presented below takes into account this diversity of settings and logics and includes networks operating at different scales (national, regional, and local), at different stages of the policy cycle (decision making versus implementation) and with different rationales of actors (collaboration versus adversarial lobbying).

Both concepts, policy networks and collaborative governance networks, assume that actors get involved because they expect a payoff from participation (Burt 1992; Granovetter 1973), and collaboration, cooperation, or information exchange relations are typically analyzed (for an exception, see Smith et al. 2014). The selective formation of these network relations seems to enhance an actor's ability to gain structural or strategic advantage from participation in the network (Leifeld and Schneider 2012).[1]

We follow the argument that ties, once established, become resources (Rethemeyer and Hatmaker 2007) and that the only feasible strategy to attract greater attention and thus a better reputation is to allocate the scarce resources (i.e., the limited number of cooperation ties) in a more efficient way. Thus, actors strategically select collaboration partners so that many other actors can observe the strategic role the actor is playing in the policy network. In this article, we thus posit that reputation also has a systemic component, and we develop a notion of systemic power rather than localized ("dyadic") structural power (see figure 1): political actors strive to occupy network positions from where they can control resource or information flows through the network, and this is rewarded by gaining a greater reputational power.

Burt's concept of "structural holes" (Burt 1992) is one prominent approach used to investigate how actors strategically select their collaboration partners. The ability of an actor to control the flows reaching other actors is one of the underlying mechanisms cited for the power of a broker's position in a structural hole (Smith et al. 2014, 162). A broker is therefore defined as an intermediary actor between several otherwise disconnected actors; he or she holds a powerful position by controlling the flows between them (Ingold and Varone 2011; see again Smith et al. 2014). Obtaining resources indirectly is especially attractive as there are little or no added costs to actors in sustaining these indirect ties (Burt 1992; Granovetter 1973; Shrestha 2012, 308). Actors thus try to achieve brokerage positions (measurable by indices like betweenness centrality) to become more powerful. Based on an analysis of the communication network in the US health policy domain, Fernandez and Gould (1994, 1481) conclude that the occupancy of brokerage positions is a crucial determinant of influence. From a game-theoretical perspective, we can therefore expect actors to engage in what Bei et al. (2011) call a betweenness centrality game. Conversely, if actors strive for a higher reputation by occupying positions with a high betweenness, we can expect other actors to rate them as being particularly influential if they occupy such positions.

Betweenness centrality (Freeman 1979; for applications, see Galaskiewicz 1979; Ingold 2011; Laumann and Knoke 1987; Laumann and Pappi 1976) is defined as the number of shortest paths between any two actors in a network on which an actor is situated. The greater the number of exclusive shortest paths an actor occupies, the easier it is for this actor to cut off indirect connections between other actors, or manipulate information or other resources that travel through the network (Muñoz-Erickson et al. 2010, Scott 2000). We argue that this constitutes a structural ability to exert power in a policy network. It is a systemic rather than a local or dyadic component of power and reputation because it involves both adjacent and remote actors in the network.

Hypothesis 1: The higher the betweenness centrality of alter in a collaboration or contact network, the more likely ego is to report alter as being particularly influential.

The pertinent literature contends that local or dyadic-relational patterns, such as relational visibility of alter or homophily, add to our understanding of reputation (Fischer and Sciarini 2013; Heaney 2014). Relational visibility can be defined as the presence of direct contacts to others in the network (Heaney 2006, 910).

1 Policy networks may consist of different types of relations (Pappi and Henning 1998), that is, empirical networks are often multiplex. We focus on collaborative relations among actors because we are interested in how strategic collaboration with other actors can increase one's reputation.

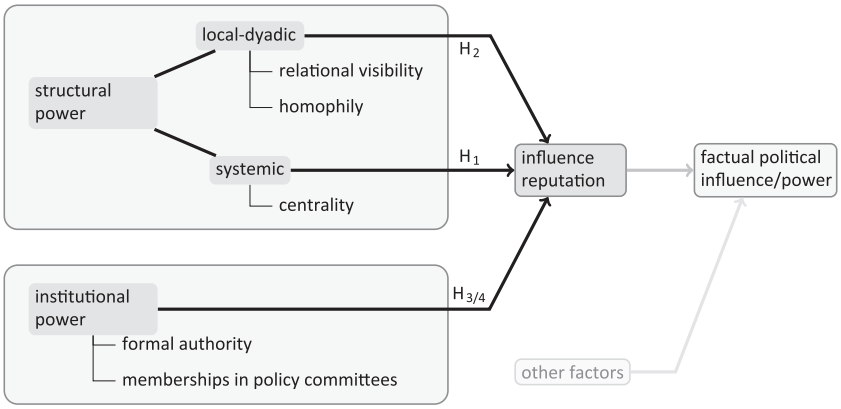


**Figure 1.** Conception of Influence Reputation

If an actor ("ego") maintains collaborative ties with another actor ("alter"), ego may be inclined to rate alter as particularly powerful (Fischer and Sciarini 2013). Burt (2008), for example, deduces reputation from such direct links between actors. If two individuals are directly linked, this affects their positive evaluation of each other (Burt 2005).

Hypothesis 2: Collaboration between ego and alter leads ego to report alter as being particularly influential.

Hypothesis 1 thus captures a systemic-structural aspect of power, whereas hypothesis 2 captures a dyadic-relational aspect of power (figure 1).

### Institutional Power

The structural aspects of power, as hypothesized previously, address the horizontal integration of political actors in the policy network. "Horizontal" integration refers to informal, nonhierarchical network structures, rather than formal responsibilities and institutionally derived arrangements. Our argument is that power is comprised of both this horizontal component and the vertical integration of actors into the political system (a similar argument was developed by Kilduff and Krackhardt 1994 in an intra-organizational context). Horizontal and vertical integration supposedly have additive effects, which means that one of the factors can contribute to the influence reputation of an actor independently of the other factor.[2]

The degree of vertical integration into the political system is the distinction between actors who have institutionally granted power (= high vertical integration) and actors whose power is limited to lobbying activities (= low vertical integration). Stokman and van den Bos (1992), for example, distinguish between an influence stage and a voting stage in the policy process. In the influence stage, all sorts of actors may engage in lobbying activities, whereas the voting stage is restricted to decision-makers and elected politicians.

Fischer and Sciarini (2013) confirm that institutionalized decision-making power affects how influential an actor is perceived in a policy network. They include this formal authority of political actors as an explanatory variable for dyadic reputation. Actors have formal authority if they are administrative agencies, executive bodies of the central state, political parties, or peak associations. We adopt a slightly narrower definition of formal power by including only the subset of actors with formal voting or otherwise legally binding power. This includes political parties because their parliamentary groups can vote in the parliament, and federal ministries, which can give ministerial orders. Moreover, independent regulatory agencies and infrastructural project managers (in local-level implementation networks) can issue legally binding orders.

Hypothesis 3: Actors with institutional decision-making power tend to be perceived as particularly influential by other actors, irrespective of their structural position in the policy network.

Finally, formal power is also expressed through institutionalized rules of access granted to key policy venues. These venues or policy committees are arenas where policy-making takes place behind closed doors (Baumgartner and Jones 1991; Pralle 2006, 2003). In sum, institutional voting power can be assessed through the identification of actors with formal decision-making competences or with institutionalized access to authoritative decision arenas. It is presumably complementary to the structural aspects of power.

Hypothesis 4: Actors with multiple memberships in policy committees and institutionalized policy venues are perceived as being more influential.

2 We ruled out potential interaction effects in additional model specifications, which are not reported here.

**Table 1.** Case Study Characteristics

| Case/Network | Country | Level | Policy Cycle Stage | Availability | Year of Data Collection |
|---|---|---|---|---|---|
| Swiss climate policy 1995–2000 and 2002–05 | Switzerland | National | Decision making | Longitudinal (two waves) | 2004–05 |
| Swiss telecommunications implementation | Switzerland | National | Implementation | Static | 2010 |
| Regional flood prevention (PM Visp) | Switzerland | Local | Implementation | Static | 2009 |
| German toxic chemicals policy network | Germany | National | Decision making | Static | 1984–85 |

Figure 1 summarizes the four hypotheses and our conception of influence reputation.

## Datasets and Methodology

Four different case studies are used to test our hypotheses. Table 1 gives an overview of their characteristics. The datasets cover local and national settings, as well as decision-making policy networks and collaborative implementation networks. Three out of the four case studies were conducted in Switzerland, which is characterized by direct-democratic instruments and consensual policy-making. The fourth case study was conducted in Germany, which is also known as a consensual democracy. The four case studies were therefore selected to provide variation across several potentially important macro variables and to increase confidence in the results. If the statistical effects are consistent across those cases, we can be confident that we have properly caught the data-generating process and are not merely over-fitting the data. Furthermore, if the results are consistent despite the case studies being conducted in two different countries and the networks operating at different scales (national versus local networks) and different stages of the policy cycle (decision making versus implementation), and with different underlying rationales of the actors (collaborative governance versus adversarial lobbying), then we can expect the results to be applicable to other cases as well.

The first case study is about Swiss climate policy making during two different time steps, the second addresses the Swiss telecommunications implementation network, the third a regional flood prevention project, and the fourth concerns toxic chemicals regulation at the national level in Germany in the 1980s.

The two waves of the climate policy network case study focus on two different legislative processes: the launch of the Swiss CO2 Act (SR 641.71), which was aimed at mitigating greenhouse gas emissions and reducing them by 10% by 2012; and a major amendment of this act by extending existing voluntary measures and introducing an incentive tax to mitigate climate change. All data were gathered in the winter of 2004–05 by conducting 50 semi-structured and survey-based interviews with representatives of 33 organizations (more details about the dataset are provided by Ingold 2008). This network includes 4 governmental actors (all public agencies), 5 political parties (4 governmental parties among them), 11 organized interest groups (private sector and business associations), 6 scientific/research organizations, and 7 ecological non-governmental organizations. The response rate was 100%.

The telecommunications dataset focuses on implementation rather than decision-making. It captures the implementation of regulatory decisions arising from the Swiss Telecommunications Act (Telecom–SR 784.10) introduced in 1997. The act consists of the full liberalization of the Swiss telecommunications market and was amended by a minor reform in 2006. Data were gathered in 2010 through a paper-and-pencil postal survey, with a focus on the special role of newly introduced actors, such as independent sector- and nonsector-specific regulatory agencies. The survey was sent out to 38 actors and the response rate reached 82%. This network consists of 14 governmental actors (mainly federal ministries, but also including 4 independent regulatory agencies), 6 political parties, 13 private sector representatives (organized interest groups and telecommunications providers), and 5 trade unions.

The regional flood prevention project is about Priority Measures in the city of Visp (PM Visp) in the Swiss canton of Valais. The policy process was about the implementation of infrastructural measures and spatial planning to prevent the region from a 100-year-flood event. Constructions of PM Visp began in 2008 and are expected to be completed in 2016. Sixty-two percent of the 38 actors answered the paper-and-pencil postal survey. This case includes 20 governmental actors (municipalities and cantonal public agencies),

12 representatives of local industry and business, and 6 organized interest groups (environment and consumers associations).

Finally, the toxic chemicals regulation policy network is a national-level case study from Germany based on publicly available[3] network data collected by Schneider (1988). Details on the case study are described by Schneider (1988, 1992) and more recently by Leifeld and Schneider (2012). Network and attribute data were collected on 47 political actors just after the decision-making phase of a new chemicals law (ChemG) in 1984/85. The law was about how new and existing toxic chemical substances should be regulated. The dataset contains the "influence core" of those 30 actors in the policy network who at least one other actor rated as being influential during the decision-making process. This network is composed of 11 governmental actors (among them six federal ministries), three political parties, seven organized interest groups (health, environment, occupational safety, and industry), six scientific/research organizations, and three international organizations. The response rate was 100%. This policy network can be characterized as an adversarial network where competing interests try to exert influence on the political process (Schneider 1988).

In all four cases, boundary specification and actor selection followed the procedures outlined by Laumann, Marsden, and Prensky (1983). Actors were first identified through the analysis of primary and secondary sources, as well as expert interviews. For the first list of actors, we relied on the positional approach (Laumann, Marsden, and Prensky 1983) to investigate whose interests were affected by the respective decision-making and implementation process.[4] We then divided each process into decisional phases and assessed who participated in more than one such phase; those actors who did were added to our list in the second step. Finally, and using a reputational approach (Laumann, Marsden, and Prensky 1983), this list was then presented to 2–4 experts per case who could add further actors that he or she deemed to be important in the respective process. This combined approach left us with 33 actors for the climate cases, 38 for telecommunications, 37 for PM Visp, and 30 for the toxic chemicals policy network. Only organizational actors, rather than individuals, are included in the analysis because they are the relevant actors who shape policy making and implement political decisions (for a justification, see Knoke et al. 1996; Kriesi 1980).

3 http://hdl.handle.net/1902.1/17004 (accessed January 1, 2014).

4 Note that data gathering for three out of the four cases, and for four out of the five networks, was done by one of the co-authors, whereas for the German toxic chemicals case, we relied on publicly available data provided by Schneider (1988) and accessible at http://hdl.handle.net/1902.1/17004 (accessed January 1, 2014).

The dependent variable is an influence reputation relation. Each interview partner was asked which actors in the respective process his or her organization *perceived as very important and influential*. The responses were transformed into a sociomatrix with the evaluating organizations (the senders) as row labels and the organizations being evaluated (the receivers) as column labels. This constitutes a directed and binary network matrix.

Whether reputation is a network relation and thus subject to dependence between dyadic observations or whether a dyadic independence model, such as logistic regression, is sufficient is an unanswered question. On the one hand, actors cannot usually observe other actors' cognitive judgments about third parties, which would mean that—at least at the level of purposive action—one dyadic judgment does not affect another dyadic reputation judgment. On the other hand, influence reputation is presumably a hierarchical phenomenon that is, by its very definition and under the assumption of internal validity of the data, characterized by acyclic and transitive relations. If actor A judges actor B to be important, and B rates C as important, C is unlikely to rate A as important because this would violate transitivity. This may be a network dependency at the systemic level rather than strategic action by actors. We thus model reputation using an ERGM with dyadic dependence (Robins et al. 2007a, 2007b) and include a model term for cyclical ties and a model term for transitive ties in order to control for the potentially hierarchical nature of the network. These model terms capture the propensity of edges to be involved in cyclical triads (i.e., $A \rightarrow B \rightarrow C \rightarrow A$) and transitive triads ($A \rightarrow B \rightarrow C$ and $A \rightarrow C$), respectively. As cyclical ties should not be present in a hierarchical phenomenon such as influence reputation, we expect there to be negative coefficients. Conversely, we should see positive coefficients for transitivity if the network shows these kinds of dependencies.

We also control for the potential tendency of ties to be reciprocated in order to make sure that there are no omitted dependencies when we estimate our effects of interest. Moreover, the number of edges in a network serves as a baseline for all other effects, similar to a constant in linear models. Finally, in any dyad, the actor who makes the judgment (= ego) may have an individual baseline propensity towards making positive judgments. One actor may be inclined to call many other actors influential, whereas another actor may be more cautious and may identify fewer organizations as influential irrespective of the characteristics of all alters. We control for the number of judgments that ego makes in the whole network, which is effectively the outdegree centrality (Freeman 1979) of ego in the influence reputation network.

As an operationalization of the structural independent variables, each interview partner was asked to indicate with which actors in the process his or her organization was *strongly collaborating*. This information was then also transformed into a directed and binary network matrix, where entries of 1 correspond to an active collaboration tie and entries of 0 indicate the absence of collaboration. In the telecommunications and PM Visp case studies, 9% and 58% of the values in the collaboration network matrix, respectively, were missing due to unit nonresponse. The results of the two structural effects in these two cases are, therefore, not as certain as in the other three cross-sectional models. In these missing cases, the dyad A → B was imputed by the dyad B → A if possible, and the dyad B → A was imputed by the dyad A → B. If both directions were missing, the modal value (=0) was imputed. This procedure is justifiable on the grounds that collaboration as a social fact is, per se, undirected, and unconfirmed ties can be regarded as a nuisance rather than real directional information. In the climate policy and toxic chemicals case studies, we decided to retain the directed relations in order not to lose any information.

Finally, we constructed two variables which capture institutional aspects of power: the first is a binary attribute variable for each actor, where 1 indicates that the actor has formal decision-making power and 0 indicates that the actor does not have any formal decision-making power. The second is a count variable, which represents the number of policy committee or institutional venue memberships of an actor. Supplementary Tables A1–A6 show summary statistics of our variables and relations for all four cases; Supplementary Tables A9–A12 provide actors' lists including the type of organization, and various attributes and network measures for each actor.

All estimations were conducted in the statistical computing environment R (R Development Core Team 2009) and using the *ergm* package (Handcock et al. 2008), the *tergm* package (P. N. Krivitsky, S. M. Goodreau, and Statnet Development Team 2012), and the *xergm* package (Leifeld et al. 2014).

ERGMs are increasingly employed in political science and public administration to model (a) network dependencies (i.e., endogenous structural properties like cycles or popularity), (b) exogenous node-level covariates (like properties of actors involved in a dyad), and (c) dyad-level covariates (e.g., other network relations affecting whether ego and alter establish an edge) in order to explain tie formation in networks. These models are estimated using the Markov Chain Monte Carlo Maximum Likelihood Estimation (MCMC MLE). For seminal political science applications, see Cranmer and Desmarais (2011), Henry, Lubell, and McCoy (2011), Leifeld and Schneider (2012), and Park and Rethemeyer (2012).

In order to tap the full potential of the longitudinal character of the first case study, we also employ two forms of temporal ERGMs: an autoregressive temporal ERGM with lagged dependent and independent variables (TERGM), and a separable temporal exponential random graph model (STERGM)—both are recent developments in social network analysis (Desmarais and Cranmer 2012; Hanneke, Fu, and Xing 2010; Krivitsky and Handcock 2014)—to model the transition between the climate policy network at time step 1 and the network at time step 2. MCMC MLE is used to fit the two longitudinal models. The use of TERGMs allows us to make claims about the direction of causality, which would not otherwise be warranted. For example, although from a cross-sectional ERGM it is not clear whether collaboration causes influence attribution or vice-versa, the temporal models allow us to test whether the change in collaboration between $t = 1$ and $t = 2$ increases or decreases the likelihood of influence attribution at $t = 2$ controlling for collaboration at $t = 1$ and influence attribution at $t = 1$. This enables us to infer the direction of causality because, arguably, influence attribution at $t = 2$ cannot affect collaboration at $t = 1$. Compared with static ERGMs and TERGMs, STERGMs allow for edge formation and edge dissolution to be modeled as two separate processes. Hence, there are separate coefficients indicating whether a factor contributes to the persistence of ties over time and whether a factor triggers the formation of new ties. The downside of this approach is that the network at t = 1 cannot be used as a lagged dyadic covariate for the network at t = 2. For this reason, we report both types of temporal models: the TERGM and the STERGM.

## Analysis and Discussion

The main analysis is composed of five different static ERGMs, two for each of the two respective waves of the climate policy panel dataset and one for each remaining case study (see table 2 for the coefficients and standard errors). A second analysis presents the results of the (S)TERGMs, which are based on the longitudinal climate policy case study.

### Analysis of Static Network Snapshots

The coefficients in table 2 can be interpreted as log-odds ratios conditional on the rest of the network (Hunter, Steven, and Hancock 2008). ERGMs follow a generative paradigm, which means that the interplay of the model terms is simulated and then compared with the empirically observed network in order to fit the model iteratively.

The edges term is similar to a constant in linear regression models and indicates the baseline likelihood of any dyad in the network to form a tie. Four of the

**Table 2.** Cross-Sectional ERGMs

| | Climate 1995–2000 | Climate 2002–2005 | Telecom | PM Visp | Chemicals |
|---|---|---|---|---|---|
| Edges | −4.47*** (1.00) | −3.81 (5.24) | −6.74*** (1.68) | −2.60 (1.63) | −5.48*** (1.26) |
| Cyclical ties | −0.45*** (0.08) | −0.52*** (0.09) | −0.22** (0.11) | 0.00 (0.29) | −0.16 (0.10) |
| Transitive tries | 0.91 (0.57) | 1.33 (4.77) | 1.18** (0.60) | −1.37* (0.79) | 0.11 (0.49) |
| Reciprocity | 0.40 (0.29) | −0.02 (0.23) | 0.21 (0.53) | 0.64** (0.25) | 0.43 (0.30) |
| Outdegree of ego | 0.19*** (0.03) | 0.15*** (0.03) | 0.19*** (0.05) | 0.15*** (0.02) | 0.25*** (0.05) |
| Alter = decision-maker | 0.90*** (0.26) | 0.76*** (0.22) | 2.06*** (0.53) | 0.80*** (0.25) | 1.50*** (0.28) |
| Committee memberships of alter | 0.57*** (0.18) | −0.44** (0.17) | 0.21*** (0.08) | 0.32** (0.14) | 0.12*** (0.04) |
| Betweenness of alter | 0.08*** (0.02) | 0.13*** (0.02) | 0.10** (0.04) | 0.09*** (0.03) | 0.11*** (0.03) |
| Collaboration | 1.64*** (0.28) | 1.80*** (0.23) | 1.85*** (0.43) | 1.95*** (0.27) | 0.46** (0.22) |
| AIC | 913.16 | 1081.98 | 642.10 | 859.55 | 740.65 |
| BIC | 958.36 | 1127.19 | 688.59 | 902.27 | 783.57 |
| Log likelihood | −447.58 | −531.99 | −312.05 | −420.77 | −361.32 |

*Note:* AIC, Akaike information criterion; BIC, Bayesian information criterion.
*$p < 0.1$; **$p < .05$; ***$p < .01$.

five models show a negative coefficient for cyclical ties, although this term is not significant in the PM Visp case. The negative coefficients indicate the absence of cyclical ties, which is in line with the prediction that influence reputation is a hierarchical, acyclic social phenomenon—if A rates B as influential and B rates C as influential, then C is unlikely to rate A as influential, just like in formal hierarchies that are organized like "trees." Four of the five models also show a positive coefficient (in one case significant) for transitivity, which is a complementary effect that captures the hierarchical structure. The reciprocity control is significant in one case, and the outdegree of ego control variable is significant in all cases. The more outgoing ties an actor has, the more likely the actor is to call any alter influential. Controlling for these structural and nodal terms allows for the substantive interpretation of the remaining coefficients.

Most importantly, in all five models we find a significantly positive effect of the betweenness centrality of alter in the collaboration network. In other words, the more alter tends to occupy a strategic position (from an information and resource control perspective) in the policy network, the more likely it is that ego finds alter powerful. The betweenness scores were rescaled so that all scores in a network add up to 100%. This allows them to be comparable and interpretable. Exponentiating the coefficients yields fairly similar results between the networks: if the betweenness centrality of alter is increased by 1%, the odds of establishing an influence reputation tie between ego and alter increase by roughly 8% in the first climate network, 14% in the second climate network, 11% in the telecommunications network, 9% in the PM Visp network, and 12% in the toxic chemicals policy network. Considering that the standard deviations (SD) of the betweenness scores range between 4.74 and 5.93 for the different networks, even moderate changes in the structural composition of the network could lead to large increases in the odds of establishing a tie. For example, if an alter in the second climate policy network were able to increase his or her strategic position by improving his or her betweenness score by 1 SD (=5.93%), the odds of ego calling alter influential would go up by roughly 116%. This analysis reveals that the structural position an actor is able to acquire in the network is an important aspect of influence reputation.[5]

The next relational model term is the presence of existing collaboration. Again, the effects are similar in magnitude across the five models (except for a lower value in the chemicals regulation model). An existing collaboration tie between ego and alter roughly quintuples (or doubles, in the last model) the odds of ego reporting alter as being particularly influential, compared with dyads where a collaboration tie does not exist. Two explanations come to mind: either this is a perceptual bias of ego, as actors may tend to perceive those whom they collaborate with as important because this increases their own importance. Or this may be a structural component of power because incoming collaboration ties are exponentially

5 As alternative model specifications, we tested the effects of indegree centrality and eigenvector centrality in the collaboration network (results reported in the Supplementary material; see Tables A7 and A8). As the centrality measures are somewhat correlated, their effects work as substitutes rather than complementary mechanisms: including one centrality measure makes the other measure insignificant. Conclusions from these results show that organizations are deemed to be influential if they either have many incoming collaboration ties (and are thus visible, as measured by indegree centrality); if they have incoming collaboration ties from other influential actors (as measured by eigenvector centrality); or if they occupy strategic gatekeeping positions in the collaboration network that would allow them to secure control over information or resource flows (as measured by betweenness centrality).

distributed (i.e., collaboration edges tend to cluster together around the same targets), and if ego has such a tie to alter, it is likely that many others also collaborate with alter, which makes alter important. On the other hand, as mentioned previously, controlling for the indegree of alter in the collaboration network only makes betweenness centrality insignificant, and not the collaboration effect, which would support the first interpretation of a perceptual bias. In any case, whether theoretically understood or not, this effect supports the earlier findings of Heaney (2014) and Fischer and Sciarini (2013), and its inclusion does not mitigate the theoretical mechanism we are mainly interested in: the betweenness centrality of alter as a structural component of power.

In addition to structural components, we are interested in the institutional aspects of influence reputation. If alter is a decision-maker, the odds of alter being identified as particularly influential are more than doubled in all models (compared with cases where alter is not a decision-maker, irrespective of whether ego is a decision-maker), and in the telecommunications and toxic chemicals models even more so. This suggests that institutional positions in these two regulatory policy domains are more important for the influence reputation of an actor than in the other policy domains. Taking a closer look at the mixing matrices of the decision-making dummy variable demonstrates that density is usually highest where both ego and alter are decision-makers and is second-highest where only alter is a decision-maker but not ego. Apparently, decision-makers find one another particularly important (a homophily effect) but, independent of this observation, decision-makers are also judged to be more influential than nondecision-makers by nondecision-makers. The bottom line is that the ability to vote or give binding orders is an important component of reputation (in adversarial policy networks and collaborative settings), and this aspect of power is complementary to the structural aspects of power outlined previously. It is, therefore, not premature to speak of a composite effect of structural and institutional power, or horizontal and vertical integration, into policy-making.

Finally, institutional integration of an actor via membership in policy committees significantly increases the likelihood of it being rated as influential. Except for the outlier in the second climate politics branch (where potential membership in only one committee was recorded), an additional policy committee increases the odds of being tied by between 13% in the toxic chemicals policy domain (where the average number of committee memberships per actor is 6.00) and 77% in the first climate politics branch (where the average number of committee memberships per actor is only 0.56).

To sum up the empirical evidence so far, both structural and institutional components of influence reputation can be pinpointed. There is relatively little variation in the empirical findings across cases, which means that the substantive results hold for collaborative and adversarial settings, and national as well as local-level case studies. However, a potential objection might be that causality may run in the opposite direction for at least some of the hypothesized relationships if the estimation of tie formation is based on a single snapshot of each observed network. In the following analysis, we therefore exploit the fact that two waves of the climate policy network were recorded and estimate a TERGM and a STERGM.

### Longitudinal Analysis of Consecutive Network Snapshots

The first column of table 3 shows a TERGM, which essentially reduces to an ERGM of the second time step with the first time step being used as a lagged covariate. All other interesting hypotheses are introduced into the model as lagged covariates and, additionally, in terms of their absolute changes between the first and the second time step ($\Delta$). This allows us to assess the direction of causality because causality can only go from the change of the covariate between $t = 1$ and $t = 2$ to dyadic influence reputation attribution at $t = 2$, but not vice versa. To achieve this, we control for the absolute level of the covariate at $t = 1$ and the reference likelihood of tie formation in the reputation network at $t = 1$. Due to the inclusion of the lagged network, this procedure entails that we now conceptualize policy-making as a process that spans multiple years. This assumption is backed by the policy networks literature, which argues that policy networks are relatively stable, or "sticky," informal arrangements (Leifeld and Schneider 2012).

The two remaining columns of table 3 present the results of a STERGM, which estimates tie formation and tie dissolution between $t = 1$ and $t = 2$ in a single model. Coefficients are interpreted in a similar way as before, with two main differences: (a) a positive coefficient in the formation column means that the model term increases the odds that a new tie is established between the two time periods where a tie previously did not exist, whereas a negative coefficient means that the model term decreases the odds of establishing a new tie between the two time periods where a tie did previously not exist; and, (b) a positive coefficient in the dissolution column means that the model term increases the odds that an existing tie is kept, whereas a negative coefficient means that a model term decreases the odds of carrying an existing tie from time point 1 over to time point 2. Simply put, the formation column is about new influence reputation ties, whereas the dissolution

**Table 3.** TERGM and STERGM Results for Swiss Climate Policy-Making Including Two Waves (1995–2000; 2002–05)

| | TERGM | Tie Formation | Tie Dissolution |
|---|---|---|---|
| Edges | −4.08 (3.93) | −2.82 (2.76) | −1.95* (1.18) |
| Cyclical ties | −0.53*** (0.09) | −0.50*** (0.09) | −0.56*** (0.15) |
| Transitive ties | 1.37 (3.46) | 0.11 (2.41) | 0.55 (0.35) |
| Reciprocity | 0.13 (0.26) | 0.06 (0.24) | 0.15 (0.65) |
| Outdegree of ego at $t = 1$ | 0.11*** (0.03) | 0.10*** (0.03) | 0.13** (0.06) |
| Outdegree of ego (Δ) | 0.16*** (0.02) | 0.16*** (0.02) | 0.20*** (0.04) |
| Alter = decision-maker | 0.64*** (0.25) | 0.66** (0.26) | 0.37 (0.42) |
| Committee memberships of alter at $t = 1$ | 0.00 (0.12) | −0.10 (0.16) | 0.07 (0.30) |
| Betweenness of alter at $t = 1$ | 0.08*** (0.02) | 0.10*** (0.02) | 0.06** (0.03) |
| Betweenness of alter (Δ) | 0.03** (0.02) | 0.09*** (0.03) | −0.02 (0.03) |
| Collaboration at $t = 1$ | 1.58*** (0.35) | 1.20** (0.47) | 2.09*** (0.58) |
| Collaboration (Δ) | 1.58*** (0.25) | 1.61*** (0.29) | 1.77*** (0.51) |
| Lag: influence reputation at $t = 1$ | 1.79*** (0.20) | | |

*Note:* *$p < 0.1$; **$p < .05$; ***$p < .01$.

column is about existing influence reputation ties. As the STERGM estimates tie formation and dissolution as a process, the lagged covariate from the TERGM cannot be incorporated.

Figure 2 shows the goodness of fit of the TERGM. The boxplots are the results of 100 simulations of the model, and the black lines represent the empirical climate policy network at $t = 2$. Although the fit is moderate for the indegree distribution because the empirical network does not show any clear trends, the model is able to reasonably well reproduce the distribution of edge-wise shared partners, dyad-wise shared partners, and the shortest paths in the empirical network. Overall, the goodness of fit of the TERGM is relatively high.

The network at time point 1 has an effect on the network at time point 2, as indicated by the positively significant effect of the lagged reputation network in the TERGM in the first column. Influence ratings appear to be stable over time, which is an indicator that the data-generating process did not change between the two waves of data collection, unlike in other studies reported in the literature (e.g., Park and Rethemeyer 2012).

Both the TERGM and the STERGM show that influence ratings are acyclic. The TERGM has a strongly negative coefficient for cyclical ties, which means that the configuration A → B → C → A occurs significantly less than in a random graph. The STERGM provides more nuanced context for this finding: if a dyad is involved in a cyclical triad at $t = 1$, between the time periods new ties are very unlikely to be established and, if a tie already exists in the context of a cyclical triad, it is likely to be discontinued at $t = 2$, further supporting the observation that influence as a social phenomenon is hierarchically structured. The other indicator of hierarchy, the transitive ties count, is not significant. It is, however, positive as expected. As in the cross-sectional case, there is no particular tendency for reciprocity, and the outdegree of ego has a positive and significant effect.

As for the structural components of reputation, the higher the betweenness centrality of alter in the collaboration network at $t = 1$, the more likely ego is to judge alter to be influential (TERGM)—even more so if ego has not done so before (STERGM, tie formation column). A 1% increase in the relative betweenness score of alter in the previous time step (compared with other dyads) increases by 11% the odds that ego changes his or her mind between $t = 1$ and $t = 2$ and calls alter particularly influential. The persistence of positive reputation judgments is also slightly more likely than mere chance. This finding is in line with Rethemeyer's (2007) study on the effect of the internet on policy processes, where actors who were already entrenched in positions of structural power within the network possessed very high reputational ratings.

Most interestingly, we can estimate a separate effect of the change of betweenness centrality between $t = 1$ and $t = 2$, which can be interpreted on top of the absolute betweenness effect of $t = 1$: actors are very sensitive to structural changes in their surrounding policy network. Having controlled for betweenness and reputation ties at $t = 1$, absolute changes in betweenness between $t = 1$ and $t = 2$ significantly increase the likelihood of a reputation tie (in the TERGM). This longitudinal perspective demonstrates that influence not only places actors in more central positions, but occupying strategically more advantageous positions (assessed through betweenness centrality) makes actors to be perceived as more influential over time.

Moreover, if ego did not deem alter to be particularly influential at $t = 1$, but alter's betweenness centrality increased from $t = 1$ to $t = 2$, then ego is likely to

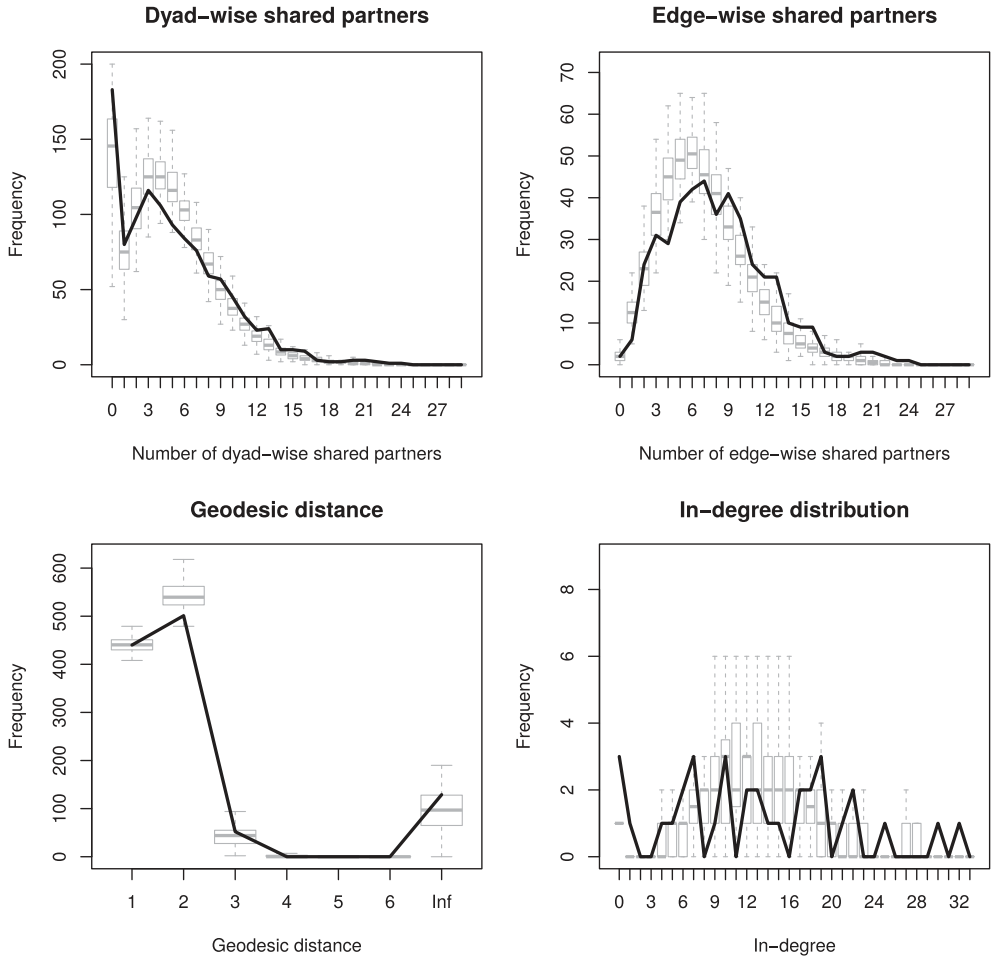


**Figure 2.** Goodness of Fit of TERGM

judge alter as particularly influential at $t = 2$ (formation column). For each additional betweenness centrality percentage point gained between $t = 1$ and $t = 2$, ego's odds of calling alter influential go up by roughly 9%. This reactivity of actors to changes in the betweenness of their peers is independent of the absolute level of the structural ability of these peers in terms of betweenness centrality.

There are similar findings for dyadic collaboration. Collaboration between ego and alter at $t = 1$ forms a reputation tie at $t = 2$ (TERGM column), as well as making the formation of a tie between $t = 1$ and $t = 2$ (formation column) more likely and tie dissolution less likely (or tie persistence more likely, see the dissolution column). On top of this cross-temporal baseline effect, the absolute change in collaboration from $t = 1$ to $t = 2$ (–1 = stopped to collaborate, 0 = no change, +1 = started to collaborate) can also explain tie presence at $t = 2$, as well as tie formation and tie persistence. All of these effects are highly significant. If a collaboration tie emerges between ego and alter from $t = 1$ to $t = 2$, this boosts tie formation of influence attribution (in case there was no tie at $t = 1$) or causes ego to carry over his or her positive reputation evaluation of alter to $t = 2$ (in case there was a tie at $t = 1$).

As for the institutional components of power, irrespective of ego's type, decision-makers are prominently associated with influence. The STERGM further reveals that alters who are decision-makers are likely to be judged as influential at $t = 2$ if they were not judged to be influential at $t = 1$. Existing influence attributions towards decision-makers at $t = 1$, by contrast, are neither significantly retained nor significantly removed. This is in line with the findings of the cross-sectional models. Committee memberships are also consistent with the cross-sectional climate case studies—there was contradictory evidence for the two waves, and there is therefore no significant tendency in the longitudinal model.

Summarizing these findings, there is substantial longitudinal (and hence causal[6]) evidence that influence reputation is composed of structural and institutional

6 True causal analysis is only possible by conducting experiments. The longitudinal design employed here, however, comes as close to causal inference as possible with survey data.

elements. In particular, the structural components of influence reputation, such as betweenness centrality and dyadic collaboration, can be consistently interpreted: when the structural conditions are present or pronounced, reputation ties are likely, and when they emerge or disappear, reputation ties emerge or disappear as well. Actors appear to be very sensitive to other actors who achieve better network positions over time. Put differently, ego is particularly likely to regard alter as influential if alter has recently managed to occupy a network position where he or she can control more information or other resources than previously (as identified in the models through higher betweenness centrality scores). This adds to our knowledge about structural aspects of power because being perceived as influential is not only about being central in absolute terms but also about becoming more central rather than more peripheral in relative terms. Collaboration between ego and alter behaves in a similar way and is a complementary predictor of reputation (formation). More (less) collaboration over time leads to a greater (lower) likelihood of ego rating alter as particularly influential. On the other hand, the evidence for the institutional components—operationalized by formal decision-making power and participation in political committees—is mixed: although formal authority is a clear predictor across all case studies, institutional committee memberships seem to play a role in all but one case study (which may be due to the fact that only one committee was available at the time).

## Conclusion

What have we learned from studying the determinants of influence reputation in detail? First and foremost, we have been able to deconstruct power into two separate but complementary components: an institutional element and a structural element, which are not substitutable. These two drivers of influence reputation correspond to political actors' vertical integration into the political system by means of formal authority and horizontal integration into policy-making or implementation through informal collaborations.

Our finding adds to the existing literature on influence reputation by demonstrating how power is shaped by systemic-structural features, in addition to the local dyadic patterns (like collaboration or actor homophily) or nodal attributes (like formal authority) identified by previous research (in particular Heaney 2014 and Fischer and Sciarini 2013). By only focusing on institutionalized decision-making power or local network effects (such as joint participation in venues, stages, or phases)—without incorporating the second, structural-systemic dimension of political power—our understanding of why some actors are more successful than others at influencing policy-making and implementation would be incomplete. The broader significance of our findings is that we have explained how an important intervening variable in the explanation of political outcomes comes about.

These results are valid across several types of networks at different levels. On the one hand, political actors in adversarial policy networks can gain influence reputation by occupying structural holes (horizontal integration). Actors with formal authority or with access to formal decision-making venues are (perceived as) more influential (vertical integration). On the other hand, this research has similar managerial implications for collaborative and implementation networks: public managers and officials with binding decision-making rights are (perceived as) more influential in the negotiation or implementation process (vertical integration), and these actors can gain additional influence reputation by occupying structural holes in the network (horizontal integration).

The institutional *and* structural composition of political influence is also relevant to other subfields of public administration and political science. First, in addition to knowledge, professionalism and expertise, the structural position in collaborative networks might also matter for the development of leadership abilities (see also Zhang and Feiock 2010). Future research may shed light on the link between structural and institutional variables and the leadership skills of public managers. Second, this article also contributes to the literature on collective action problems and confirms that actors can expect a payoff from participation in networks: results show that actors who want to be perceived as influential might want to occupy structural holes and establish ties with disconnected others (Burt 1992). Third, there are implications for macro-comparative political research. Comparative politics has long been content with analyzing institutional variation between political systems as determinants of cross-national policy variation, largely neglecting structural variation. The results reported here suggest that institutional macro variables like corporatism versus pluralism (Streeck and Schmitter 1985), the number of veto players (Tsebelis 2002), or consensual versus majoritarian politics (Lijphart 1999) may not sufficiently capture the integration of informal gatekeepers into policy-making or implementation. The distribution of structurally relevant positions among state and nonstate actors beyond crude measures like a corporatism dummy variable is likely to add explanatory power to the analysis of political outcomes in cross-national or cross-sectoral perspectives. Future research should try to find clever ways to accommodate this variable at a lower cost than previous and current policy network studies, and test whether the

horizontal integration of nonstate actors is sufficiently captured by existing macro variables like corporatism.

Future research should also try to disentangle whether the structurally advantageous positions of political actors—gatekeepers or brokers—are the result of strategic, rational behavior (Ingold and Varone 2011), or whether these positions are a byproduct of other processes that may be going on between actors.

Moreover, there is one further limitation that future research may try to overcome. Although the results seem to be valid across decision-making and implementation contexts, and in local as well as national settings, all of the case studies conducted here are based on data from consensual political systems: Switzerland and Germany. There is evidence that policy networks also operate in majoritarian settings like Great Britain (Marsh and Rhodes 1992) and the United States (Laumann, Knoke, and Kim 1985), but whether influence reputation can be similarly deconstructed into an institutional and a structural component in these polities remains an unanswered question.

Finally, the research presented here touches upon deep normative questions related to democratic legitimacy. Should a democratic society prefer a system where power is concentrated in state actors that can be held accountable and were legitimized through elections? Or should a democratic society prefer a system where power is distributed across the civil society and in polycentric governance arrangements (Ostrom 2010), which may lead to checks and balances and opportunities for control and participation, but at the expense of formal accountability and procedural legitimacy? Mayntz (1993) argues that policy networks as a new horizontal mode of governance are a response to an "escalating functional differentiation of social subsystems" due to social modernization. Our results indicate that policy networks do actually fulfill this horizontally differentiated role and integrate nonstate actors into the inner power structure of the polity. They are not merely a "metaphor" (Dowding 1995; Pappi and Henning 1998); policy networks as a "new mode of governance" (Börzel 1998) and their relevance for political outcomes can indeed be pinpointed by the "methodological toolbox" (Kenis and Schneider 1991) of social network analysis—policy networks do seem to matter, even in the originally metaphorical sense. What remains unanswered is the question whether this is beneficial or detrimental to the welfare of a society, and whether we can steer these developments in the sense of a second-order governance of governance arrangements (Kooiman 1999).

## Supplementary Material

Supplementary material is available at the *Journal of Public Administration Research and Theory* online (www.jpart.oxfordjournals.org). The replication data set including the R source code can be downloaded from http://dx.doi.org/10.7910/DVN/27456.

## References


Andrews, Rhys, George Boyne, Kenneth Meier, Larry O'Toole, and Richard Walker. 2005. Representative bureaucracy, organizational strategy, and public service performance: An empirical analysis of English local government. *Journal of Public Administration Research and Theory* **15** (4):489–504.

Barro, Robert J. 1973. The control of politicians: An economic model. *Public Choice* **14**:19–42.

Baumgartner, Frank, and Beth Leech. 2001. Interest niches and policy bandwagons: Patterns of interest group involvement in national politics. *The Journal of Politics* **63**:1191–213.

Baumgartner, Frank, and Bryan Jones. 1991. Agenda dynamics and policy subsystems. *The Journal of Politics* **53** (4):1044–74.

———. 1993. *Agendas and instability in American politics*. Chicago, IL: Chicago Univ. Press.

Bei, Xiaohui, Wei Chen, Shang-Hua Teng, Jialin Zhang, and Jiajie Zhu. 2011. Bounded budget betweenness centrality game for strategic network formations. *Theoretical Computer Science* **412** (52):7147–68.

Berardo, Ramiro, and John T. Scholz. 2010. Micro-incentives and the dynamics of policy networks. *American Journal of Political Science* **54** (3):632–49.

Besley, Timothy, and Anne Case. 1995. Does electoral accountability affect economic policy choices? Evidence from gubernatorial term limits. *The Quarterly Journal of Economics* **110** (3):769–98.

Beyers, Jan, and Caelesta Braun. 2013. Ties that count: Explaining interest group access to policymakers. *Journal of Public Policy*. doi:10.1017/S0143814X13000263

Bodin, Öjan, and Beatrice Crona. 2009. The role of social networks in natural resource governance: What relational patterns make a difference. *Global Environmental Change* **19**:366–74.

Bolleyer, Nicole, and Tanja A. Börzel. 2010. Non-hierarchical policy coordination in multilevel systems. *European Political Science Review* **2** (2):157–85.

Börzel, Tanja A. 1997. What's so special about policy networks? An exploration of the concept and its usefulness in studying European governance. *European Integration Online Papers* **1** (16):1–28.

———. 1998. Organizing Babylon – On the different conceptions of policy networks. *Public Administration* **76** (2):253–73.

Burt, Ronald S. 1992. *Structural holes: The social structure of competition*. Cambridge, MA: Harvard Univ. Press.

———.2005. *Brokerage and closure: An introduction to social capital*. New York, NY: Oxford Univ. Press.

———. 2008. *Gossip and reputation*. Seminar presented at the Globalisation Series of Seminars and Lectures, Univ. of London, London, February 13.

Calanni, John C., Saba N. Siddiki, Christopher M. Weible, and William D. Leach. 2014. Explaining coordination in collaborative partnerships and clarifying the scope of the belief homophily hypothesis [published online May 20, 2014]. *Journal of Public Administration Research and Theory*.

Carpenter, Daniel. 2010. *Reputation and power: Organizational image and pharmaceutical regulation at the FDA*. Princeton, NJ: Princeton Univ. Press.

Carpenter, Daniel, and George Krause. 2012. Reputation and public administration. *Public Administration Review* **72** (1):26–32.

Choi, Taehyon C., and Peter J. Robertson. 2013. Deliberation and decision in collaborative governance: A simulation of approaches to mitigate power imbalance [published online February 18, 2013]. *Journal of Public Administration Research and Theory*.

Coleman, James. 1986. Social theory, social research, and a theory of action. *American Journal of Sociology* **91** (6):1309–35.

Cranmer, Skyler J., and Bruce A. Desmarais. 2011. Inferential network analysis with exponential random graph models. *Political Analysis* **19** (1):66–86.

Dahl, Robert A. 1994. A democratic dilemma: System effectiveness versus citizen participation. *Political Science Quarterly* **109** (1):23–34.

Desmarais, Bruce A., and Skyler J. Cranmer. (2012). Statistical mechanics of networks: Estimation and uncertainty. Physica A: Statistical Mechanics and its Applications 391 (4):1865–76.

Dowding, Keith. 1995. Model or metaphor? A critical review of the policy network approach. *Political Studies* **43** (1):136–58.

Fairholm, Gilbert. 2001. *Mastering inner leadership*. Westport, CT: Quorum Books.

Feiock, Richard C., Jeong, Moon-Gi, and Jaehoon Kim. 2003. Credible commitment and council-manager government: Implications for policy instrument choices. *Public Administration Review* **63**:616–23.

Fernandez, Roberto M., and Roger V. Gould. 1994. A dilemma of state power: Brokerage and influence in the national health policy domain. *American Journal of Sociology* **99** (6):1455–99.

Ferris, Gerald, Darren Treadway, Pamela Perrewé, Robyn Brouer, Ceasar Douglas, and Sean Lux. 2007. Political skill in organizations. *Journal of Management* **33**:290–320.

Fischer, Manuel, and Pascal Sciarini. 2013. *Unpacking reputational power: Actors' attributes and relations*. Dübendorf, Switzerland: Eawag. Eawag ESS Working Paper Series 2013-02.

Freeman, Linton C. 1979. Centrality in social networks: Conceptual clarification. *Social Networks* **1** (3):215–39.

Freeman, Linton C., Thomas J. Fararo, Warner Bloomberg, and Morris H. Sunshine. 1963. Locating leaders in local communities: A comparison of some alternative approaches. *American Sociological Review* **28** (5):791–8.

French, Robert Mills. 1969. Effectiveness of the various techniques employed in the study of community power. *Journal of Politics* **31** (03):818–20.

Galaskiewicz, Joseph. 1979. The structure of community organizational networks. *Social Forces* **57**:1346–64.

Granovetter, Mark. 1973. The strength of weak ties. *American Journal of Sociology* **78** (6):1360–80.

Handcock, Mark S., David Hunter, Carter T. Butts, Steven Goodreau, and Martina Morris. 2008. statnet: Software tools for the representation, visualization, analysis and simulation of network data. *Journal of Statistical Software* **24** (1):1548–7660.

Hanneke, Steve, Wenjie Fu, and Eric Xing. 2010. Discrete temporal models of social networks. *Electronic Journal of Statistics* **4**:585–605.

Heaney, Michael T. 2006. Brokering health policy: Coalitions, parties, and interest group influence. *Journal of Health Politics, Policy and Law* **31**:887–944.

———. 2014. Multiplex networks and interest group influence reputation: An exponential random graph model. *Social Networks* **36**:66–81.

Henning, Christian. 2009. Networks of power in the CAP system of the EU-15 and EU-27. *Journal of Public Policy* **29** (02):153–77.

Henry, Adam D., Mark Lubell, and Michael McCoy. 2011. Belief systems and social capital as drivers of policy network structure: The case of California regional planning. *Journal of Public Administration Research and Theory* **39** (3):361–83.

Howlett, Michael, and M. Ramesh 1995. *Studying public policy: Policy cycles and policy subsystems*. Toronto, Canada: Oxford Univ. Press.

Huang, Kun, and Keith G. Provan. 2007. Resource tangibility and patterns of interaction in a publicly funded health and human services network. *Journal of Public Administration Research and Theory* **17** (3):435–54.

———. 2013. Structural embeddedness and organizational social outcomes in a centrally governed mental health service network. *Public Management Review* **9** (2):169–89.

Hunter, David R., Goodreau M. Steven, and Mark S. Handcock. 2008. Goodness of fit of social network models. *Journal of the American Statistical Association* **103** (481):248–58.

Hunter, Floyd. 1953. *Community power structure: A study of decision-makers*. Chapel Hill, NC: Univ. of North Carolina Press.

Ibarra, Herminia. 1993. Network centrality, power, and innovation involvement: Determinants of technical and administrative roles. *The Academy of Management Journal* **36** (3):471–501.

Ingold, Karin. 2008. *Les Mécanismes de Décision: Le Cas de la Politique Climatique Suisse*. Zürich, Switzerland: Politikanalysen, Rüegger Verlag.

———. 2011. Network structures within policy processes: Coalitions, power, and brokerage in swiss climate policy. *Policy Studies Journal* **39** (3):435–59.

Ingold, Karin, and Frédéric Varone. 2011. Treating policy brokers seriously: Evidence from the climate policy. *Journal of Public Administration Research and Theory* **22** (2):319–46.

Ingold, Karin, Jörg Balsiger, and Christian Hirschi. 2010. Climate change in mountain regions: How local communities adapt to extreme events. *Local Environment* **15** (7):651–61.

Jann, Werner, and Kai Wegrich. 2007. Theories of the policy cycle. In *Handbook of public policy analysis*, eds. Frank Fischer, Gerald J. Miller, and Mara S. Sidney, 43–62. Boca Raton, FL: CRC.

Kenis, Patrick, and Volker Schneider. 1991. Policy networks and policy analysis: Scrutinizing a new analytical toolbox. In *Policy networks: Empirical evidence and theoretical considerations*, eds. Bernd Marin and Renate Mayntz, 25–59. Boulder, CO: Westview.

Kilduff, Martin, and David Krackhardt. 1994. Bringing the individual back in: A structural analysis of the internal market for reputation in organizations. *The Academy of Management Journal* **37** (1):87–108.

Kiser, Larry, and Elinor Ostrom. 1982. The three worlds of action: A metatheoretical synthesis of institutional approaches. In *Strategies of political inquiry*, ed. Elinor Ostrom, 179–222. Beverly Hills, CA: Sage.

Klijn, Erik-Hans. 1996. Analyzing and managing policy processes in complex networks: A theoretical examination of the concept policy network and its problems. *Administration & Society* **28** (1):90–119.

———. 2005. Designing and managing networks: Possibilities and limitations for network management. *European Political Science* **4** (3):328–39.

Knill, Christoph, and JaleTosun. 2012. *Public policy: A new introduction*. New York, NY: Palgrave Macmillan.

Knoke, David, Franz Urban Pappi, Jeffrey Broadbent, and Yutaka Tsujinaka. 1996. *Comparing policy networks: Labor politics in the US, Germany, and Japan*. Cambridge: Cambridge Univ. Press.

Kooiman, Jan. 1999. Social-political governance. *Public Management: An International Journal of Research and Theory* **1** (1):67–92.

Kriesi, Hanspeter. 1980. *Entscheidungsstrukturen und Entscheidungsprozesse in der Schweizer Politik*. Frankfurt am Main/New York, Germany and NY: Campus-Verlag.

Krivitsky, Pavel N., and Mark S. Handcock. 2014. A separable model for dynamic networks. *Journal of the Royal Statistical Society Series B* **76** (1): 29–46.

Lamothe, Meeyoung, and Scott Lamothe. 2012. To trust or not to trust? What matters in local government-vendor relationships? *Journal of Public Administration Research and Theory* **22** (4):867–92.

Landry, Réjean, and Frédéric Varone. 2005. Choice of policy instruments: Confronting the deductive and the interaction approaches. In *Designing government. From instruments to governance*, eds. P. Eliadis, M. M. Hill, and M. Howlett, 106–31.Montreal & Kingston, Canada and NY: McGill-Queen's Univ. Press.

Laumann, Edward O., and David Knoke. 1987. *The organizational state: Social choice in national policy domains*. Madison, WI: Univ. of Wisconsin Press.

Laumann, Edward O., and Franz U. Pappi. 1976. *Networks of collective action: A perspective on community influence systems*. New York, NY: Academic.

Laumann, Edward O., David Knoke, and Yong-Hak Kim. 1985. An organizational approach to state policy formation: A comparative study of energy and health domains. *American Sociological Review* **50** (1):1–19.

Laumann, Edward O., Peter V. Marsden, and David Prensky. 1983. The boundary specification problem in network analysis. In *Applied network analysis: A methodological introduction*, eds. Ronald S. Burt and Michael J. Minor, 18–34. London, UK: Sage Publications.

Lee, Soo-Young, and Andrew B. Whitford. 2012. Assessing the effects of organizational resources on public agency performance: Evidence from

the US federal government. *Journal of Public Administration Research and Theory*. doi:10.1093/jopart/mus050

Leech, Beth, Frank Baumgartner, Jeffery Berry, Marie Hojnacki, and David Kimball. 2009. *Lobbying and policy change: Who wins, who loses, and why*. Chicago, IL: Chicago Univ. Press.

Leifeld, Philip, Skyler J. Cranmer, and Bruce A. Desmarais. 2014. *Xergm: Extensions of exponential random graph models*. R package version 1.1. http://cran.r-project.org/package=xergm (accessed August 29, 2014).

Leifeld, Philip, and Volker Schneider. 2012. Information exchange in policy networks. *American Journal of Political Science* **53** (3):731–44.

Lijphart, Arend. 1999. *Patterns of democracy*. New Haven, CT: Yale Univ. Press.

Lin, Nan. 2001. *Social capital. A theory of social structure and action*. London/New York, UK/NY: Cambridge Univ. Press.

Locke, Edwin A. 2003. Foundations for a theory of leadership. In *The future of leadership*, eds. S. Murphy and R. Riggio, 29–46. Mahwah, NJ: L. Erlbaum.

Lubell, Mark, and Allan Fulton. 2007. Local policy networks and agricultural watershed management. *Journal of Public Administration Research and Theory* **18** (4):673–96.

Lubell, Mark, and John T. Scholz. 2001. Cooperation, reciprocity, and the collective action heuristic. *American Journal of Political Science* **45**:160–78.

Lukes, Stephen. 1974. *Power: A radical view*. London, UK: Macmillan.

Maor, Moshe, Sharon Gilad, and Pazit Ben-Nun Bloom. 2012. *Organizational reputation, regulatory talk and strategic silence*. Journal of Public Administration Research and Theory. doi:10.1093/jopart/mus047

Marsh, David, and R. A. W. Rhodes, eds. 1992. *Policy networks in British government*. Oxford, UK: Clarendon.

Mayntz, Renate. 1993. Policy-Netzwerke und die Logik von Verhandlungssystemen. In *Policy-Analyse: Kritik und Neuorientierung. PVS-Sonderheft*, ed. Adrienne Héritier, 39–56. Opladen, Germany: Westdeutscher Verlag.

Mayntz, Renate, and Fritz W. Scharpf. 1995. Der Ansatz des akteurszentrierten Institutionalismus. In *Gesellschaftliche Selbstregelung und politische Steuerung*, eds. Renate Mayntz and Fritz W. Scharpf, 39–72. Frankfurt and New York, Germany and NY: Campus.

McConnell, Allan. 2010. Policy success, policy failure and grey areas in-between. *Journal of Public Policy* **30** (3):345–62.

Mills, Wright C. 1956. *The power elite*. New York, NY: Oxford Univ. Press.

Montjoy, Robert S., and Douglas J. Watson. 1995. A case for reinterpreted dichotomy of politics and administration as a professional standard in council-manager government. *Public Administration Review* **55** (3):231–39.

Muñoz-Erickson, Tischa A., Bethany Cutts, Elisabeth Larson, Kate Darby, Mark Neff, Amber Wutich, and Bob Bolin. 2010. Spanning boundaries in an Arizona watershed partnership: Information networks as tools for entrenchment or ties for collaboration? *Ecology and Society* **15** (22):1–22.

Novell, Branda and Toddi Steelman. 2014. Communication under fire: The role of embeddedness in the emergence and efficacy of disaster response communication networks [published online July 1, 2014]. *Journal of Public Administration Research and Theory*.

O'Toole, Larry. 1997. Treating networks seriously: Practical and research-based agendas in public administration. *Public Administration Review* **57**:45–52.

Ostrom, Elinor. 2010. Beyond markets and states: Polycentric governance of complex economic systems. *American Economic Review* **100** (3): 641–72.

Pappi, Franz U., and Christian H. C. A. Henning. 1998. Policy networks: More than a metaphor? *Journal of Theoretical Politics* **10** (4):553–75.

———. 1999. The organization of influence on the EC's common agricultural policy: A network approach. *European Journal of Political Research* **36** (2):257–81.

Park, Hyun H., and Karl R. Rethemeyer. 2012. The politics of connections: Assessing the determinants of social structure in policy networks. *Journal of Public Administration Research and Theory*. doi:10.1093/jopart/mus021

Peterson, John, and Elisabeth Bomberg. 2009. *Decision-making in the European Union. European Union series*. New York, NY: St. Martin's.

Pralle, Sarah. 2003. Venue shopping, political strategy, and policy change: The internationalization of Canadian forest advocacy. *Journal of Public Policy* **23** (3):233–60.

———.2006. *Branching out, digging in: Environmental advocacy and agenda setting*. Washington, DC: Georgetown Univ. Press.

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

Provan, Keith G., and Patrick Kenis. 2008. Modes of network governance: Structure, management, and effectiveness. *Journal of Public Administration Research and Theory* **18** (2), 229–52.

Raab, Jörg, and Patrick Kenis. 2009. Heading towards a society of network governance. *Journal of Management Inquiry* **18** (3):198–210.

Raab, Jörg, Remco S. Mannak, and Bart Cambré. 2013. Combining structure, governance, and context: A configurational approach to network effectiveness [published online August 23, 2013]. *Journal of Public Administration Research and Theory*. doi:10.1093/jopart/mut039

Raub, Werner, and Jeroen Weesie. 1990. Reputation and efficiency in social interactions: An example of network effects. American Journal of Sociology 96 (3):626–54.

Rethemeyer, Karl R. 2007. Policymaking in the age of internet: Is the internet tending to make policy networks more or less inclusive? *Journal of Public Administration Research and Theory* **17** (2):259–84.

Rethemeyer, Karl R., and Debeeb M. Hatmaker. 2007. Network management reconsidered: An inquiry into management of network structures in public sector service provision. *Journal of Public Administration Research and Theory* **18**:617–46.

Robins, Garry L., Pattison Pip, Kalish Yuval, and Dean Lusher. 2007a. An introduction to exponential random graph (p*) models for social networks. *Social Networks* **29** (2):173–91.

Robins, Garry L., Snijders Tom, Wang Peng, Handcock Mark, and Pip Pattison. 2007b. Recent developments in exponential random graph (p*) models for social networks. *Social Networks* **29** (2):192–215.

R Development Core Team. 2009. *A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. http://www.R-project.org (accessed February 4, 2013).

Sabatier, Paul A., and Hank C. Jenkins-Smith. 1993. *Policy change and learning: An advocacy coalition approach*. Boulder, CO: Westview.

Schalk, Jelmer, Torenvlied René, and Jim Allen. 2009. Network embeddedness and public agency performance: The strength of strong ties in Dutch higher education. *Journal of Public Administration Research and Theory* **20** (3):629–53.

Schneider, Mark, Scholz John, Lubell Mark, Mindruta Denisa, and Matthew Edwardsen. 2003. Building consensual institutions: Networks and the national estuary program. *American Journal of Political Science* **47** (1):143–58.

Schneider, Volker. 1988. *Politiknetzwerke der Chemikalienkontrolle: Eine Analyse einer transnationalen Politikentwicklung*. New York/Berlin, NY/Germany: de Gruyter.

———. 1992. The structure of policy networks: A comparison of the "chemicals control" and "telecommunications" policy domains in Germany. *European Journal of Political Research* **21** (1–2):109–29.

Scholz, John, and Cheng-Lung Wang. 2006. Cooptation or transformation? Local policy networks and federal regulatory enforcement. *American Journal of Political Science* **50** (1):81–97.

Schumpeter, Joseph, ed. 1943. *Capitalism, socialism and democracy*. New York, NY: Harper.

Scott, John. 2000. *Social network analysis: A handbook*. London, UK: Sage Publications.

Shrestha, Manoj K. 2012. Self-organizing network capital and the success of collaborative public programs. *Journal of Public Administration Research and Theory* **23** (2):307–29.

Smith, Jason M., Halgin Daniel, Kidwell-Lopez Virginie, Labianca Giuseppe, Brass Daniel, Stephen P. Borgatti. 2014. Power in politically charged networks. *Social Networks* **36**:162–76.

Stokman, Frans N., and Evelien P. H. Zeggelink. 1996. Is politics power or policy oriented? A comparative analysis of dynamic access models in policy networks. *Journal of Mathematical Sociology* **21** (1–2):77–111.

Stokman, Frans N., and Jan M. M. van den Bos. 1992. A two-stage model of policy analysis with an empirical test in the U.S. energy policy domain. In *The political consequences of social networks. Research in politics and society*, eds. Gwen Moore and J. Allen Whitt, 219–53. Greenwich, CT: JAI.

Streeck, Wolfgang, and Philippe C. Schmitter. 1985. Community, market, state – and associations? The prospective contribution of interest governance to social order. *European Sociological Review* **1** (2):119–38.

Svara, James H. 1998. The politics-administration dichotomy model as aberration. *Public Administration Review* **58**:51–8.

Terman, Jessica N., and Richard C. Feiock. 2014. Improving outcomes in fiscal federalism: Local political leadership and administrative capacity [published online June 12, 2014]. *Journal of Public Administration Research and Theory*. doi:10.1093/jopart/muu027

Tsebelis, George. 2002. *Veto players: How political institutions work*. Princeton, NJ: Princeton Univ. Press.

Watkins, Michael, and Susan Rosengrant. 1996. Sources on power in coalition building. *Negotiation Journal* **12**:47–68.

Weigelt, Keith, and Colin Camerer. 1988. Reputation and corporate strategy: A review of recent theory and applications. *Strategic Management Journal* **9** (5):443–54.

Wellman, Barry, and Stephen D. Berkowitz. 1988. *Social structures: A network approach*. Cambridge, NY: Cambridge Univ. Press.

Zhang, Yahong, and Richard C. Feiock. 2010. City managers' policy leadership in council-manager cities. *Journal of Public Administration Research and Theory* **20** (2):461–76.