Shifting Vantage and Conceptual Puzzles in Understanding Public Organization Networks[1]

Todd R. La Porte
University of California, Berkeley

ABSTRACT

Practitioners and students of public organizations experience and observe network phenomena at a quickening pace in a wide variety of policy domains. These phenomena appear to be sufficiently complex to raise questions about the adequacy of conceptual formulations of organizational and management relations rooted mainly in organization centric assumptions adequate as a basis for the understanding of this evolution. This article explores the implications of viewing public organizational networks (PONs) from three vantages of conceptual observation, and discusses variations in conceptual salience, theoretical interests, and insights regarding innovation as these vantages change. A short discussion of the challenges of networks and innovation to the attainment of public trust and confidence and institutional constancy concludes the article.

Practitioners and students of public organizations are encountering networks at an expanding and quickening pace. At least two characteristics typify these encounters: We become acutely aware of networks when they emerge in important policy domains where operational problems seem to erode expected performance (cf. Nohria 1992); the encounters present organizational relationships that are descriptively, analytically, and operationally problematic. The variety of networked domains is substantial and raises questions about the adequacy of familiar organization and management formulations for understanding the implications of this evolution. This is signaled by the proliferation of descriptive concepts about organizational arrangements emerging between the so-called extremes of hierarchies and markets (Williamson 1975; Powell 1987).[2] The result is an uncomfortable sense of analytical uncertainty and mild to moderate frustration with the inabilities of researchers to describe or analyze these situations in a crisp, potentially cumulative fashion.[3] Put as a question: Are the error terms in our

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[2]In the study of public organizations, many of these were introduced either before or independent of the development of institutional economics and the reactions to it from sociology (cf. Stinchcombe 1989). For example, different terms have been applied to the phenomena, e.g., webs, complexity, complex systems, interdependence, and interconnectedness—connotations quite different from differentiation, market, division of labor, and a bit distantly, specialization, unorganized complexity, and environmental turbulence (Luke 1992; Luke and Caiden 1988; Hanf and O'Toole 1992).

[3]Many practitioners face increased difficulty in navigating the nets, coordinating with net members, and discharging their missions (Pressman and Wildavsky 1984; Maynard-Moody 1989.)

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descriptions remaining constant or perhaps growing? There is no reason to suppose they are improving (La Porte 1994a).

The evidence of quite complex networks in and among public organizations is a key change in the context of public work and a major stumbling block in understanding and improving public contributions to social well-being (e.g., Gage and Mandell 1990; Luke 1992). I take up the task of exploring the implications of conceptualizing public organizational networks (PONs) from different vantage points with some trepidation. The conceptual views of these phenomena are quite variegated, the sweep of public organizations involved is remarkable, and the literature is sprawling. The article is a provisional attempt to provide a bit of order.[4]

NETWORKS AS OBJECTS/PHENOMENA/FOCI OF INTEREST

Public sector interest in networks is a current expression of many of the concerns that have animated those who labor in the fields of federalism, intergovernmental relations, administrative reform and strategic management (e.g., Gage and Mandell 1990; esp. Wright 1990). It also underlies the efforts of those who detect ineffectiveness in the public service and those who worry that efforts to effect economies in scope and scale of the public sector, such as the current National Performance Review (NPR) enthusiasms for "reinvention," will actually degrade it, perhaps irrevocably.[5]

Certainly, students of the public sector recognize that modern organizational life is characterized increasingly by a growing number of intra-, inter-, and transorganizational relationships.[6] These phenomena are signaled by terms for

- structure, such as complex systems, coalitions, various forms of federalism, for example, marble cake federalism, communication nets, and allusion to the computer/electric circuitry metaphor, (i.e., as networks);
- characteristics of component relationships, such as interdependence, tight (or loose) coupling, multiple horizontal or vertical relationships between elements/members of a network; and
- dynamics or process, such as bargaining, action, or information flows, and resource exchanges between net members.

[4]This project was taken up in the context of a conference stressing innovation in public management. It was perhaps foolhardy but apt, for this gathering's subtext could be: When is an innovation new, and when is it history? When is an innovation genuinely an improvement, and when is it an unexpected source of performance degradation? Answers depend on where one sits—in the net.

[5]For an affirmative view, see Gaebler and Osborne (1992) and Osborne and Gaebler (1992). Some applaud trends that show public organizations are abandoning or being forced to terminate former functions. Public networkers are not often among them due in part to their intuition that the quality of public and social life is likely in the long run to suffer perhaps irreparable damage (Moe 1994; Jordan 1994). Others are more sanguine. They are rarely interested in understanding public networks.

[6]I note in passing the enthusiasm/relief expressed by sociological/business administration communities in welcoming the introduction of *networks* as a metaphor intermediate between hierarchies and markets (e.g., Powell 1987). From a political science/public administration and management view, we welcome network theorizing that might inform. However, what one sees suggests a constrained focus on economic organizations and little acquaintance with the skeins of public organizations in evidence since at least the end of World War II (e.g., NASA, or military organizations, including the Joint Chiefs). If these are to be classified as hierarchies, they are mainly so in formal charts only, for internal behavioral dynamics are importantly shaped by formal and informal networks and internal political relations. I wish for a more heterogeneous range of empirical referents upon which to base social theorizing and our work.

The metaphor of *networks* advances the descriptive discussion at least one useful step toward more specificity in characterizing the webs, interconnected systems, and interdependencies of modern public organizations. In the process, it presents a number of important conceptual problems and opportunities.

A variety of formal, theoretical languages seems apropos for giving a degree of conceptual and quantitative precision in depicting networks. Theorists have turned, for example, to graph theory, lattice theory, and social network concepts (e.g., Burt 1983; Friedell 1967; Wasserman and Faust 1994). But these analytic languages are thin, limited mainly to small nets, and often too abstract to capture the nuances of relationships within the networks (dare I say systems) of interest or the more salient characteristics of different net/system architectures. We confront a theoretical shortfall, limited by uncertain, ambiguous, analytical languages and a paucity of elaborated formal languages to describe what we can perceive, imagine, and indeed converse about on the basis of implicit, analogical language and stories (Benz 1993).

This situation need not call for practical or vigorous response. How urgently should we attend to public networks? After all, situations of conceptual and empirical ambiguity are more or less familiar, a usual state in a variety of academic fields. But most academic topics do not engage behaviors that include the potential that operational failure will exact large penalties and citizen suffering. Put another way, failing to understand network dynamics either in situations of change, like policy reform or implementation, or in operating systems that face severe external challenges that can lead to grievous, unintended, but induced, error. "Messing with networks is not always, maybe nearly ever, all that good." Improved understanding and caution at this time of very substantial, induced institutional change is an unusually cogent objective. But what I suggest ranges across a much wider analytical and descriptive landscape than can be accommodated in this venue.

LIMITING THE SCOPE

Interest in network phenomena spans various stages or phases of organizational development:

- the formation and emergence of coherent policy, of issue and organizational networks, of self-organized nets contrasted to imposed or coerced ones, and of varied processes of market-like to hierarchical net stimulation (e.g., Cook and Emerson 1978; Benson 1983; Ansell 1993);

- the dynamics of post emergent nets that involve the operation of extended/distributed networks where goal making is shared responsibility and accountability is equivocal, or that implement systematic change, the reordering of relationships within established networks that are beyond the stages of early equivocality (Weick 1979), and to a lesser degree, the decline or devolution of networks as they decay and reassemble as a consequence of downsizing and/or decentralization; and

- the evolution and propagation of network dynamics and effects on the broader, superordinate nets of modern society, including the politics of public policy/operational networks (Galaskiewicz 1979; Laumann and Knoke 1987; Marin and Mayntz 1992; O'Toole 1993b; Scharpf 1993).[7]

Each of these perspectives poses somewhat novel, but related, analytical and empirical questions and conceptual puzzles. Each contributes answers to the others. To address all of them in the compass of one article would tax the readers' patience. Therefore, I will limit my attention to the second emphasis—the behavior of *established, operating organizational networks*—addressing the conceptual puzzles rather than the equally important policy implications of network operations.[8]

My empirical referents are large-scale organizational combines, networks of at least moderately coherent, integrated units (e.g., administrative agencies, contracting firms, regulatory agencies, overseeing bodies).[9] Further, as a definitional matter, such units exhibit more or less consistent relationships of exchange and acknowledgement that each organizational actor (and its member representatives) can count on; organizational roles are more or less stable, at least within the last legislative cycle, and there has been a moderate consensus on the legitimacy of the net and its rules of engagement.[10] A key connotation is that network members are in regular, cooperative, or at least symbiotic, relations with one another and that relationships are informed by a cohering, collective, or superordinate logic.

OF SHIFTING VANTAGES

The metaphor of networks connotes a skein of relationships between actors held together in horizontal, multilinked fashion and bound by a view of commonality, common function, and jointly won benefit. There is the tacit image of nets—fish nets, butterfly nets, electronic nets, road nets, computer circuitry, or coalitions of the like minded.[11] Less frequently one might see an algebraic matrix (Schwartz and Sprinzer 1989; Wasserman and

[7]Issues here would include questions about how the public interest is defined, and agreed upon, and the shifting responsibilities of citizens and citizenship when nets evolve and are transformed beyond citizens' abilities to comprehend. I am grateful to Don Kettl for pointing out these and other aspects of the second and third items.

[8]Some readers may also notice another limit to this discussion. I shall hold to the tradition of examining those networks that are based on functional or policy design rather than those that are exhibited in social groups such as families, clans, or small communities (see Ekeh 1974; cf. Mizruchi 1994). My thanks to Chris Ansell for this reference and distinction.

[9]Examples range from the technoplexes of NASA and the FAA's air traffic control system, and the CDC's equally widespread systems for monitoring the spread of contagion to the legal rule-based systems of financial regulation and the federal judicial appeal process.

[10]Defining networks becomes a slippery, swampy business. While intuitively the notion has considerable appeal, there is little consensus on details. Definitions range from the most general (Mulford and Rogers 1982; Fine and Kleinman 1983), to quite specific (e.g., Wasserman and Faust 1994).

[11]The implicit underlying images of *network* is more than a synonym for system or an assertion of connectedness. The language suggests the root metaphor of *nets* that could be used in distinguishing the architecture of nets, understanding something of their generic properties, and the particulars of their dynamics in various political and operational circumstances. At the same time, metaphors have pitfalls as well as the utility in conceptualizing organizations (e.g., Landau 1979; Morgan 1986). I ask the reader's indulgence for the whimsy that may creep in. Ambiguity of received language sometimes invites linguistic diversions.

Faust 1994). When imaging *public organizational networks,* these horizontal nets, often spread across a wide geographic sweep, are joined by peaks of vertical links, status (hierarchical) levels in the interest of endorsement and adjudication, less often strong direction (cf. Cook 1977; Scott 1991). Increasingly, there also have been symbiotic links to oversight and regulating net members. Our fishnet thus takes on a third dimension. Other dimensions acrete like coral (or perhaps barnacles)—nets of skill association, some of them professional (Galaskiewicz 1985b); nets of employee associations, some of them labor unions. Most public organizational nets contain (and are parts of) a number of nested nets that encompass (or embed) them—n-dimensional fishnets, so to say. These nets have many members; many members are parts of several nets. Nets often spread over many political jurisdictions, hence, then add more local members to the wider net (Wellman and Berkowitz 1988). Our n-dimensional fishnet now is quite large with many links between many members—a virtual cloud of members in huge "fuzzy sets" of connections.[12]

Organizational network analysis, intuitively attractive, faces a strong challenge of parts and wholes and levels of aggregation (cf. Haas 1975; DiMaggio 1991). How does one focus on a cloud, a swarm, an n-dimensional fishnet? For reasons of research economy and analytical parsimony, we necessarily take a partial view. Each has advantages; each has its grounds for error. From the many locations possible in relation to an organizational network, consider three conceptual vantages that place analysts in quite different relationships to them: from within a net; in an elevated position above it; and alongside/among the nets[13] (see exhibit 1). Each vantage gives us a different prospect from which to *see* the network, its shape and architecture, its sources of coherence, and its flows of intra- and inter-net exchanges.[14] After an initial characterization, I return these vantages' menu of preferred conceptual interests.

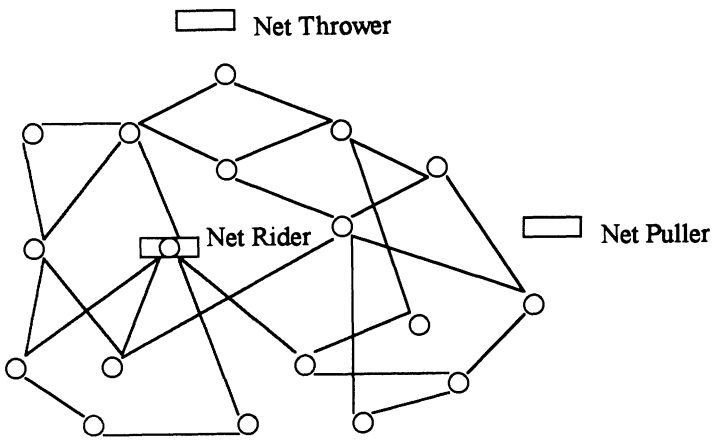
First, consider the view of a net *(knot/node) rider,* near the middle levels riding on a fishnet node, a knot in the net, one of many organizational members. This is the view from a particular focal organization, a relatively tightly coupled concentration, a nodal cluster, floating within a dispersed, stochastic, often fuzzy set of net relations. It is an organization centric (OC) view, as seen by a major network actor looking out/up/across/down at other actors with whom it/he/she must deal. Take as an example the Office of Civilian Radioactive Waste Management within the Department of Energy (DOE) viewing the remarkable range of DOE contractors, research units, federal and state regulators, and stakeholder units of all stripes, and, more distantly, the specter of

[12]With only slight apologies to "fuzzy set" devotees (e.g., Klir and Folger 1988). One begins to sense an affinity to descriptions of pluralist, interest group politics.

[13]There are, of course, other locations as well—as a "weaver of nets," as an observer in the exchanges that flow across links between particular net members, or as a wary outsider, a member of a group distant from the net proper but dependent and vulnerable to its collective effects, e.g., citizens, consumers, or the netted.

[14]Note the parallels of role theory and notions of organizational sets, (DiMaggio 1991) and various languages that have over the years attempted to catch the sense of networkedness (Stinchcombe 1989).

Exhibit 1
Viewing the Net



court scrutiny, surrounding it as a swirling cloud of beckoning attractors, sometime repelling interactors.[15]

Second, take another view, that of a *net thrower,* positioned above the net looking down upon it as in an Olympian or plan view. It is a superordinate (SO) view, so to speak, seeing most fully the wider skeins of PONs that make up a modern society. From a U.S. state or a national perspective, for example, one's conceptual mind's eye rises above the views of its public nets as seen from within that of a particular organizational net member or a coalition of actors. From this elevated vantage, attempt to see a sector in a plan view or top down dimension, depicting the situation in terms of overlapping nets with different horizonal and vertical structures. View the Federal Aviation Administration's (FAA) Air Traffic Control function, for example, as a system spreading far beyond the technical network of some twenty highly complex regions, each with closely linked enroute (high altitude) traffic control centers, (intermediate altitude) radar approach and departure controls (TRACONs), and local airport traffic and ground control units. Each facility also has an FAA Air Ways Facility (station keeping) element, an on-site National Oceanic and Atmospheric Adminstration (NOAA) meteorology service representative, and often military liaison representatives. Each facility also has regular relations with state and county aviation units, national and local user group organizations (airline operators, pilots), general aviation (GA) associates, a wide assortment of regulators, and myriad service contractors. At the

[15]With apologies to chaos theorists (Gleick 1987). The reader will notice that our analyst/observer has been placed in what J.D. Thompson (1967, following Parsons) terms the institutional level of the organization. It is obvious that the interests our observer has in the surrounding net will in part be a function of the character of the managerial and technical nets around and beneath him/her. These internal aspects of network dynamics, drawing a good deal of attention from social network analysis (Wasserman and Faust 1994), will not draw much of mine here.

national level, more links will be evident, with the Department of Transportation (DOT), the Office of Management and Budget (OMB), congressional committees, the General Accounting Office (GAO), the National Transportation Safety Board (NTSB), the Environmental Protection Agency (EPA), the Federal Emergency Managament Administration (FEMA), and the Department of Defense (DOD). Finally, FAA's central role in global aviation cooperation and integration would be taken into account via its links to international air traffic associations, air carrier peak associations, and global emergency response regimes.

A third, and somewhat different, view comes from a vantage among the nets, viewing the multiple nets of public organizations from the side, from a location midway along the operational vertical dimensions, running in parallel outside the net—a *side long view* (SL). This is the vantage of the attentive outsider, a *net puller* perhaps hankering to become a major member or at least to be influential from a distance, at some remove from immediate membership, less vulnerable than a member within the net. This place among the nets, outside of several, is a location of someone (some organization) who has limited stakes in any particular member but is an agent who operates from institutional status level similar to some of those within the nets. A portion of the nets of interest would tower in institutional status over this observer, and some portion of the nets would seem to be below (perhaps beneath) observation. This vantage might be that of a professional association viewing organizational networks as habitats for the familiar informal crosscutting relations among professionals of various breeds as they follow their callings (Galaskiesicz 1985b). Or it could be that of an association, various employees banding together from a number of agencies in pursuit of some aspects of interest or issues nets. It almost certainly is the view of those who wish to impose change upon ongoing networks that dissatisfy them—the policy implementors and reformers of every ilk. (It is also, I suspect, the subjective vantage of we who are students of public organizations.)

These three vantages or *conceptual locations* represent different research traditions—respectively, resource dependence/contingency perspectives (OC views); recently resuscitated (new) institutionalism (SO views); and the views expressed in the study of federalism, intergovernmental relations, and implementation studies (SL views). Do the insights from one perspective inform us as fully and accurately on questions prompted by another perspective? As the intensity of network relations increases, do the errors stemming from the partial view of a perspective differ in seriousness? Put as an affirmative null hypothesis, as the complexity of networks increases, there are no significant differences

in the quality and completeness of insights or in the seriousness of errors involved in the perspectives derived from one location as contrasted with another.

The claim here is that this null hypothesis should be rejected. Just as in the matter of policy preferences, in which "where you stand depends on where you sit," the location of one's conceptual vantage significantly colors what questions are asked, what explanatory puzzles are salient, and what meaning prescriptions for change/innovation take on. And, to recall what we know from other fields, it is likely that each perspective or location generates a spurious sense of completeness in which the observer systematically underestimates the degree of error attached to his/her views when they are generalized to the whole net (cf. Metlay 1975; Brunner and Brewer 1971). We turn now to a more detailed exploration of the three vantages.[16]

The OC View of a Net Member

Much of organization theory, especially that pertaining to organizations within complex environments, is salient here. If you are an observer/analyst looking outward into the net, conceptions of resource dependence and structural responses to internal and environmental contingencies provide fruitful insight (Warren 1967; Benson 1975; Aldrich 1976; Van de Ven and Walker 1984). Your interests will include ways of perceiving potentially ordered but opaque organizational networks (Mizruchi 1994), and fields (DiMaggio 1983), or sectors (Scott 1994).[17] While a focal organization may have reasonable information and discretion about relations with the first ring of net members, how is it to know with equal accuracy the degree of dependence or uncertainty attributed to the members in the second or third ring of the net within which it is embedded, surrounded (cf. Granovetter 1985; Dow 1990)? And the dynamics of decision processes, as well as structural accommodations in response to these more distant sources of contingencies, need explanation (e.g., Scharpf 1993b).

Further, the political dynamics occasioned by the focal organization's network disposition begs to be examined, because conceptions of power, stability, and discretion—as a function of the matrix of network relations—are often only dimly perceived.[18] Understanding these external network dynamics informs the views of organizational leaders/analysts about the potential for maintaining the coherence of internal action groups, such as its dominant executive coalition (Emerson 1962; Thompson 1967; cf. Scott 1991) so that its productive effectiveness is assured and, as important, the organization will be in a strong position to exert

[16]The range of conceptual matters of most interest to analysts of each orientation is considerable. I shall note only those that seem to me to be especially salient from that vantage, leaving other important but less particular issues for later development.

[17]See Scott (1991) for perhaps the best summary of this sweep of organization theoretic notions.

[18]Note the salience here of the conditions that vary relative organizational power, administrative productivity, authority structures, managerial discretion/accountability for our understanding of public organizations in advanced industrial democracies.

influence on other net members in its own or its valued clients' behalf.

There is another OC issue—the role of regulatory bodies and agencies as net members—that is more salient for students of public organizations than for those observing other sectors. Many organizational networks in our society, while they must confront regulations imposed via the legal system, do not include regulatory bodies as full net members. But for some networks, from an OC perspective, the analyst sees and must deal with regulatory nodes as regular members of the network—for example, the Nuclear Regulatory Commission for those in the nuclear power industry. Or observers see their networks' relations from the perspective of a regulatory agency itself—for example, the GAO with its field offices on-site in many executive agencies—and again the NRC with its network of on-site nuclear power plant residents. Thus, students of public organizations confront networks that include regulators as net members, at least as symbiotic—resistance generators—if not fully cooperating members. While net members with regulatory functions raise interesting strategic and tactical problems for other members, their presence poses more problematic questions for network analysis when seen from the global perspective of the (SO) view.

The SO View of a Net Thrower

Observers and analysts taking this view would be drawn to consider the general properties of networks, their architecture and overall net dynamics. Analytical issues would include considerations of

- the basis upon which nets are stably structured, (i.e., their cohering logic);
- the form and structural properties characterizing network architecture;
- how network structures and dynamics reflect institutional norms and how their key processes respond to various types of institutional surround (e.g., DiMaggio and Powell 1983; March and Olsen 1989); and,
- the analytical problems of describing networks when some net members play a formal regulatory constraining role rather than a formally cooperative one (Bardach and Kagan 1990)—this is of particular interest in the public domain.

The Logics of Network Coherence. The network metaphor connotes relationships, between net members, that are cooperative, and to a significant degree self-reenforcing. That is, the relationships are cemented by something other than purely directive and punishment-centered hierarchical bonds (Gouldner 1954). If not wholly self-organized (a property not required as a defining characteristic), networks are based on some common informing logic that is persuasive to its members in providing guides that order their relations with each other (cf. Scharpf 1993a). These cohering logics are a source of legitimizing and ordering member relationships. They provide frames of reference, order the net's functional core, and are a central influence in shaping the net's structure and sources of the net's rules of engagement.[19]

One can imagine different types of cohering logics with varied consequences for net stability and behavior. An obvious though sometimes overlooked logic is that of the network's technical requirements to function more or less effectively (i.e., the rules of physical functioning that constrain the character and content of member roles and exchanges). In the public sector, examples abound: the requirements of infrastructure systems, such as transportation, communications, energy production/distribution, and water resources. Less fully technical in the engineering sense are the operating requirements of the public safety functions, for example, fire, police, the military, for which there is a kind of received technical wisdom. (In many respects, these are taking on many of the properties of the infrastructure systems as public safety processes become increasingly technicalized.) Such technical bases for ordering network relationships generate a relatively constraining series of imperatives—"If you don't do these things, these few ways, the x technology won't work."[20]

Clearly there are other cohering logics that are not held up to the test of physical outcomes as a source of discipline. These include the numerous bodies of professional norms that inform their practitioners (many of them pretenders to technical status), and orient their network relationships and their rules of network engagement—for example, social welfare, accounting, mental health, perhaps prison management, and certainly all forms of public and private administration, policy analysis, and other forms of professional ideologies. Chief among these in its coercive power are those norms of exchange based on cultural and political ideology, including various notions of economic exchanges.[21]

[19]An important determinant of the specific cohering logic would be, of course, the nature of the goals and objectives of members and the net, the central incentives employed with the net, and the net's political governance ideology (Helco 1978; Walker 1981; Baumgartner 1989; Berry 1989; T. Moe 1990; Kingdon 1995).

[20]See von Meier 1996, ch 2. for a useful summary of the conceptual grounds for this view. To these examples could be added many more: the public health imperatives, the imperatives of space technologies, those of agriculture and forest management, of research and development in myriad fields. Nearly everything done via technologies in modern society is done through the agency of public organizations.

[21]Students of public organizations need no recital of this argument and know the network implications of holding to free market vs. centrally mediated rules or beliefs in economic redistribution vs. concentrations of capital. And to this list we could add the cohering logic of organized crime, e.g., Mafia, rooted in something like familial loyalty, terror, and greed. This logic seems to have taken hold in some third world countries and some of the networks in the FSU. It may be on the wane in southern Europe, with a possibility of increasing in the U.S.

Organization network research has not thus far systematically distinguished networks on the basis of their intrinsic ordering logics or principles, but the effort could prove fruitful. It is likely that different logics of network coherence produce significantly different structures and rules of engagement. For example, the functional logic of research and development lifts collegial teamwork between technical groups and organizations nearly to a principle of management; this resulted in the early forms of matrix organization both within and between agencies and contractors (Galbraith 1974). This differs sharply from the logics of centralized management or market discipline as legitimating notions for network member interactions. Each of these is likely to prompt different responses in terms of network relations with regulatory members. Further, the basis for a network's rationale is likely to have different effects on internal dynamics and on the nature of the network as well. One increasingly salient matter would be more rigorous study of the dynamics associated with different network logics as expansion occurs, or especially of the downsizing of network members in various domains. It is likely that an innovation introduced beneficially in a net based on one logic could have negligible effects in another network based on a different logic.

Questions of Structure. An analyst of the SO view would also be interested in the architecture of nets, their shapes, and the character of their structures. PONs are likely to be large, with many members, spread over wide geographies. Salient descriptive characteristics would include[22]

- the scale and general structure of the net (i.e., the number of members, the general pattern in its distribution of relationships [dispersed/concentrated], and the number of status levels within it. [cf. Boorman and Harrison 1976; Hall 1977; Aldrich and Whetten 1981; DiMaggio 1986; Burt 1992]);
- the properties of its ties or connectivity (i.e., the degree to which ties are loose or tightly coupled/weak or strongly linked, and the degree of stability within the connected membership—their temporary, stochastic, or long-lived character, and maturity [cf. Niemeyer 1973; Cook and Emerson 1978; Povan, Beyer, and Kruytbosch 1980; Ibarra and Anderson 1993; Markovsky et al. 1993]);
- the patterns of exchanges among net members (i.e., types and mix of resources exchanged, the relative strength of partners as a function of the types of resources exchanged [Ford and Fulkerson 1974; Aldrich 1976; Laumann, Galaskiewicz, and Marsden 1978]); and

[22]I list many of the properties the readers will recognize as significant in understanding the performance, dynamics and evolution of large-scale organizations (cf. Oliver 1990). The analytical challenges are in developing rigorous indicators and assembling credible data.

- the problem more salient in public networks than in private, economic ones—the structural accommodation to the requirements for legal regulatory and net members charged with assuring safety and quality performances (see below and cf. Laumann and Knoke 1987; Knoke 1990).

Elaborating the structural properties of organizations, especially networks of organizations, has proved so far to be both difficult and subjectively unrewarding. This work requires more rigorous concepts and unambiguous indicators than have been available. Gathering the empirical data needed to give life to the indicators has posed a steep challenge (e.g., Blau and Schoenherr 1971). But research programs that attempt this elaboration are necessary to complement network analysis based mainly on formal models of small scale nets (Mizruchi 1994) and to ventilate the heterogeneity of PONs that confront us.[23] At the same time, this work should assist in developing means to detect the significance of mixed informal and formal elements in PONs.

Nets and the Dynamics of Institutional Norms and Constraints. With the work of parsing the consequences of differing cohering logics and network architecture in process, an SO, net throwing analysts would also be eager to examine the dynamics of different types of networks as they respond to outside, perhaps institutional, forces. Such forces would include the legal constraints and social/economic norms that influence the net due to the imposition and/or insinuation of social or political norms imported into the net by its members. These norms, along with the net's central cohering logic, provide the rules used by net members to moderate their behavior and shape the modus operandi for net-related decisions.

In part, this work is taken up by the new institutionalists, who remind us that network structures and dynamics reflect institutional norms as well as the processes of resource dependence and contingency reduction, and who examine the ways various types of organizations respond to their institutional surround (Zucker 1987; North 1990; DiMaggio and Powell 1991). Little of this work has been directed toward PONs though this would be most instructive for testing the generalizability of institutionalist findings (cf. DiMaggio and Powell 1983; Mizruchi 1994). For example, do legal or professional norms evoke similar dynamics in public organizations as seen in private sector organizations? How do rules that typify public organizations play out in networks equally made up, say, of public agencies and large, private contractors?

[23]It will also provide a better basis for realistically estimating the cost of conducting such research, something those sources of public support for it seem to grossly underestimate.

Net throwers' interests could also turn to questions about the capacity for nets of different types and dynamics to maintain their coherence in the face of precipitous and disruptive external events.[24] Particularly interesting questions are those that pertain to the net's coping strategies and reactions, its power relative to competitors, and the character of its internal stability. Examples would be the unexpected demands faced by FEMA due to closely spaced, major, multiple disasters; the FAA coping with the loss of nearly all its air traffic controllers; or, more globally, the world's transportation or financial networks confronting the tumult of the Gulf War and Desert Storm.

Hollow PONs and Regulatory Members. Networks made of public organizations today almost necessitate dealing with net members from the private sector as well.[25] In extreme cases, much of what goes on in some public policy domains is enacted largely by private contracts, a trend that has gone so far in some areas that it represents the "hollowing of the state" (Milward et al. 1994; Kettl 1993). At the same time, a number of PONs, as well as organizational nets made up predominantly of profit and nonprofit members, must accept members charged formally with constraining, assuring quality, and stimulating conflict as well as the usually cooperating demeanor that sustains network relationships. Rarely have SO network analysts taken up the challenge of formally characterizing *mixed nets,* so to speak, or nets significantly made up of organizations legitimately (sometimes symbiotically) charged with constraint, quality control, arousing conflict and other means of reducing the independence of other members. The analytical problems of describing networks when some net members play formally competitive roles or roles of regulatory constraint rather than of cooperation are formidable, but they are necessary if we are to make much progress in using network analysis in the public sphere. Of special interest would be SO network analysis of those public regulatory sectors that the institutionalists assume will enforce the norms they argue affect the types of organizations they do study (e.g., Zuker 1988).

The SL View of Attentive Outsiders

This is a view of an analyst from outside the net proper at some remove from actual membership, placed among the nets. It is the view of someone (or some organization) without an important formal stake in any particular net member, an observer operating from an institutional status, for instance, of upper middle managers within the nets. A portion of the net would tower in institutional status over the analysts, and some portion of it could seem to be below observational salience. Analytical interests stem from concerns over penetrating the net to influence

[24]I thank Carol Evans for discussions of this point.

[25]For a comparison with thinking about networks primarily from the view of economic organizations, see Nohira and Eccles (1992) and Axelsson and Easton (1992).

some aspects of its dynamics, for example, to decrease conflict between net members as in intergovernmental relations, and/or to assure the interests of a particular class of employee represented in many of the net's membership, as in the interests of medical professionals within health care networks.

This view informs a number of current formulations of public organizational network theory, and it is familiar to those who study intergovernmental relations, Federalism, policy implementation,[26] administrative reform, and national security studies. I limit my discussion to three of the many issues derived from these fields and the SL perspective: the relationships between net members commanding different system status; the internal permeability of nets; and the effects of network dynamics upon the effectiveness of service.[27]

The effects of various formal divisions of authority among governmental units from different strata of a federal system upon system articulation is an enduring issue for attentive outsiders (e.g., Anton 1989; Elazar 1984; Kettl 1983; Wright 1990). When these relationships are conceptualized as PONs, an important analytical issue centers on different mixes of hierarchical functions—directive, coordinative or adjudicative (Thompson 1967)—and their effects in networks carrying out various operational missions. Hierarchies are designed to play—or come to play—different functions for PONs. Increasingly, hierarchies play as important and adjudicative function as either a directive or a coordinative function, especially as the technical content of the nets' work takes on a more and more sophisticated cast.[28] At the same time, different governmental units claim or are compelled to manage various substantive functions (e.g., education for state and local jurisdictions, the national military), sometimes on behalf of another status level in the net (e.g., when states or counties have to respond to legislation from the federal or state governments on social welfare matters). It is likely that one mix of hierarchical functions—combined with the operational requisites of a particular substantive function—produces more (or less) strain within a PON than in another mix of functions. A better analytical understanding of these dynamics would considerably improve analyses and proposals for administrative change.[29]

Another analytical interest from the SL view would be the degree of permeability, penetrability, and coalescence that might characterize subgroups or net members when they share common concerns but are dispersed widely across a large network. These matters are more salient to crosscutting, horizontal relationships between subgroups among net members than are the hierarchical interests just discussed. They raise conceptual questions about

[26]Policy implementation could be, perhaps is, a perspective of a net throwing CAO or of a very senior Congress member, who wishes to restructure the nets he/she throws—the organizations called on for assistance, or for which he/she has oversight responsibility. It would be useful for such throwers to give the sort of rigorous attention to net characteristics, and so forth, that I have suggested, but it is in fact quite rare, and systematic reporting in the literature is nearly absent. Interest formally in implementation seems almost exclusively the province of the attentive outsiders I discuss below. Few of them/us actually come to positions where we can carry out implementation as authoritative net throwers. More's the pity?

[27]Other topics could include the effects of changes in internal network relationships on economic costs, the politics of competition among net member elites, and the effects on vertical network dynamics as a function of national economic policy or cycles.

[28]A *net's work* is the notion examined by Gene Rochlin (1996) when exploring the implications of parsing a term with such a construction.

[29]At present we have a very slim basis for advocating one type of administrative reform instead of another (Thomas 1993).

the distinction between formal crosscutting arrangements (e.g., contract agreements or explicitly encouraged and perhaps supported occupational or professional associations), and the informal relationships forged between high-status groups or officials in one net member with like-minded groups in other net members, whether high-status groups or not.

Crosscutting, nonhierarchical relations between groups across a net can have both consensus building and/or conflict-arousing consequences. The reader will think of myriad examples.[30] Studies of the familiar crosscutting subnets of professions and union associations are, of course, important. But so are studies of informal group subnets and individually based nets that cohere without formal sanction—or perhaps even notice—in the interest of occupational stability but as importantly are drawn together on the basis of shared policy preferences and program implementation urges. The research challenges are substantial because data collection can be arduous and difficult, requiring anthropological skills, inventive conceptual work, and very considerable effort and resources (e.g., Ansell 1993; Thomas 1995).

Finally, the relationships between PON characteristics and the decline or improvement of services to important constituencies is also of interest to an attentive outsider. These questions, perhaps in service to one constituency or another, are particularly apt in times of substantial, externally imposed restructuring, especially *innovative downsizing*. Such restructuring usually represents changes in the institutional norms or setting of the net. It almost certainly raises concerns from established constituencies about trustworthiness in their relations to the net's members. To what degree do structural innovations signal changes in the net's stability, in its capacity to continue confidence enhancing exchange relations, or its willingness to excise marginal or unproductive members? One of the more interesting questions has to do with the effects of restructuring that bears on network functions about which there is high consensus and perceived effectiveness (e.g., keeping safety as the top priority for air traffic control) when network changes are imposed in the interest of other network functions (e.g., swift deployment of highly complex technical changes in the operating system). Those who promote imposed changes seem almost invariably to discuss such changes with the tacit assumption—or thoughtlessness—that the functions deemed beneficial will continue with unabated effectiveness. While this may be true in networks with some characteristics (e.g., with designed functional redundance and member loyalty), it may not be the case for nets with other characteristics (e.g., the substantive requirements of highly technical operating knowledge).

[30]For my part, one of the most unexpected was the discovery that the flight deck operations of some fifteen aircraft carriers and their shore bases support groups in the U.S. Navy are, in a sense, represented by a quasi-professional association of Air Bosuns (the senior Chiefs specializing in managing carrier flight desks operations, one of the most demanding work environments in the world). Every year Air Bosuns assemble with the blessing, if not the full monetary support, of the Navy to discuss issues of concern about flight deck safety, new operational techniques, and advanced design of technical equipment. These engage uniquely skilled men in discussions, in part, through the medium of formal papers and conduct them in the company of contractors and potential equipment vendors. As far as I could tell, Naval officers attend by invitation only. "This is Chief's country," as one officer put it.

The SL analyst is confronted with changes that are imposed by status levels of the relevant networks, often well removed from and usually much higher than the analyst, either as sources of data or as channels for feedback. Yet, as an attentive outsider, the analyst may have particularly acute, analytically grounded views that could enhance understanding and be the basis for alerting the net's constituents—other, less sharp-eyed outsiders. The analytical issues here would include factors that vary the net's permeability *at the elite level,* for example, the conditions of multiple access to elites (Ansell, Darken, and Parsons 1994). But they must also focus on clarifying information on net structure and dynamics and the implications for continued net coherence as it faces changes imposed on political, economic, or social ideological grounds with little regard for functional requisites.

IMPLICATIONS FOR RESEARCH AGENDA

Each conceptual vantage of PONs discussed here prompts somewhat different analytical and research priorities. Each vantage implies a somewhat different characterization of the present network state and network dynamics due to intranet generated or imposed change (even innovation). Each vantage also necessarily produces incomplete description and analysis with its own sources of error. A key analytical challenge is to characterize the architecture or structure of a network so that errors of description and analysis are minimized. This immediately suggests the need for conceptual development, data gathering, empirical description, and more robust means of analysis. An obvious, perhaps foolhardy, course of action would be to attempt work that clearly draws on and tries to integrate two or more vantages. One senses, however, that the analytical bases for any one of these vantages is meager. Would combination result merely in the multiplication of error?

Space and wits are too limited to develop a rationale for the degree and character of errors, but they are surely there and a matter of importance, not only from a research perspective. For some large-scale, tightly coupled organizational nets, errors can be very consequential. For many PONs there is only a slim likelihood that alternative nets would be available as substitutes for ineffective or failing ones. In PON management, then, errors in understanding, in judgment about the sensibility of imposed changes—even innovations—can lead to serious suffering and can threaten the loss of political legitimacy (La Porte 1994b).

Almost any conceptual or policy problem of interest regarding PONs (e.g., conditions of network coherence, strength of ties, reorganization in the interest of improved productivity,

power shifts, or the dynamics of policy nets), involves the assumption at least tacitly that some types of changes in a large network will result in beneficial new structures, dynamics, and/or levels of productivity. This immediately suggests the need for wholesale mapping structure and estimation of the dynamics of many net members in a variety of conditions. If my impressions are correct, we are not well blessed with method or conceptual categories to do this for much more than small groups, i.e., nets with n = 3-6 (for exceptions cf. Laumann and Knoke 1987; Turk 1977). To the degree this is so, it is nearly impossible to examining anything of interest in public organizations with any degree of precision. An exception could be the analysis of small groups, say of decision makers, with such insights limited pretty much to the behavior of small groups.

I believe we are severely handicapped by limited means for cogent description, data collection, and formal analysis of PONs. As a result, our capacity to say much about the dynamics of existing nets or their relation to the formation of emergent nets is also limited. A major opportunity exists, therefore, for work that provides the concepts and empirical materials to explicate something like the following generic proposition:

Given network properties a,b then implementation of changes i,j will lead to dynamics and structural adaptations x,y.

One should hasten to say that this line of work will require substantial development in concept, techniques of access, data collection and analytical methods, and means of funding. It will be rather more expensive than the usual public organizational research fare.

With this brief exercise in exploring conceptual vantages and some of the attendant research implications, I turn to two matters of particular interest in today's public policy climate—public organizational innovation, and matters of public trust and confidence in an increasingly networked world.

NETWORKS, INNOVATION, AND THE PROBLEMATIC OF PUBLIC TRUST, CONFIDENCE, AND INSTITUTIONAL CONSTANCY

Innovation in organizational practice and technical means is one category of changes that is sought by or imposed on public organizations. All changes said to be innovations are thought to be positive by those who seek and propose them. Those who impose them believe that they will be sufficietly beneficial to exceed the costs of damage done, either intended or unintended.

In effect, innovations, whether administrative or technical, are imposed by a few (individuals or net members) upon many others in the name of their collective benefit.

But seeing networks through the lens of our different vantages, it seems clear that what is positively innovative from one view—say of the dominant coalition—may be the source of production decline or political degradation from another—say from the view of lower level net riders (cf. Polsby 1983). Some changes may seem new or innovative to one part of the receiving net or community—say several net riders—but the same change may be viewed as old hat from another perspective—say to attentive outsiders—merely technological transfer or the diffusion of innovation. Network analysis from a variety of vantages, complicated as this may be, is needed not only to get a sense of the newness of change but to garner experience from the "old hatters" regarding the likelihood that a proposed innovation will sustain network coherence, stability, and assured service. This is particularly the case when innovation is really a euphemism for hierarchical disaggregation, deregulation, privatization, and increased technical virtuosity in the name of the so-called lean and mean.

The development of public organizational networks, especially those that deepen and extend a symbiosis with private organizations, combined with enthusiasm for innovation erodes two rationales upon which to claim the public's confidence

- that someone is in charge and can be held accountable, that a person with strong hierarchical power over subordinates will, if necessary, use coercive discipline to assure coherence and compliance in the interest of those served; and

- that market-based competition will root out poor performers, limit damage by the devious and criminally opportunistic, and provide substitutes more honest, more effective, and more trustworthy from among those available.

PONs as a natural and functionally necessary evolution either beyond hierarchy, or as an expression of the need for formerly incoherent, technically symbiotic groups to cohere cooperatively, can certainly be the source of inspiration. On one hand, the limits of hierarchical direction and inflexibility in the pursuit of some objectives may diminish. But on the other hand, without strong direction or effective substitutes for declining agencies, services that were once well delivered to groups can formally be denied to them.

And, while innovation in the public sector may lead to better uses of economic and human resources, it is also a source of worry, suspicion, mistrust, and the potential loss of legitimacy. As I suggested above, one person's glowing innovation is another's source of dyspepsia. For example, if I do not believe that there are agents worthy of the public's trust within the deploying organization (now read PON), what is promoted as innovation can just as easily be seen as a devious way for promoters to enhance their network status, reduce mine, and perhaps alter the emphasis on my worthy policy agenda.

With the relative decline of directive hierarchy, the increase in networked relationships, and attempts to innovate, the importance of trust grows as an adhesive or bond among net members and as a foundation of net legitimacy for citizens as well as consumers. A simultaneous encouraging of the extension of public organizational networks[31] and the diffusion of technical and/or administrative innovations raises a problem too seldom confronted—the conceptual elaboration of the relationships of trust within networks and the conditions that earn distrust of networks as well as those that assure trustworthiness and institutional constancy.

To the degree that coercive, directed hierarchical power is replaced by cooperative network relationships of interdependence as the basis for integrating functional activity and exchange, relationships of trust between individuals, as well as net members become crucial for sustained operations. The importance of trust or trustworthiness is heightened when the parties involved—individuals or net members—are functionally interdependent and when the failure of operations can lead to serious injury for one or the other. Networks employ fewer superordinately imposed means for assuring consistent operational behavior than either hierarchies or markets made up of competing hierarchies. As the criticality of operations increases, all members involved in exchanges seek nonpunitive, trustworthy assurances that their interests will be taken into account by those upon whom they depend (DOE 1994). But we have little systematic insight into the conditions that produce and sustain institutional trustworthiness (Thomas 1994). We have even less insight regarding the conditions that would result in the recovery of trust in organizations or networks, especially public ones, once it has been lost (La Porte 1994a).

Public organizational networks bear an additional obligation. The necessarily quasi-self-organized, limited hierarchical nature of PONs, and their position of near functional monopoly, means that the net's service consumers and citizens are likely to

[31]Especially by means of third party providers, and contracting out.

perceive themselves as vulnerable and dependent on network leaders' faithfulness to public values and goals. Yet network accountability is more difficult to effect: who is in charge, who to reward or punish? The unseating of an elected official is a gross and ineffective tool of last resort. PONs managing critical (and hazardous) functions where errors can result in grievous harm to citizens *over several generations* are at particular political risk in maintaining the public's trust and confidence. This situation extends the analytical challenge to include the problem of *institutional constancy* as well public trust and confidence (La Porte and Keller 1994).

Institutional constancy[32] refers primarily to faithfulness and unchanging commitment to and repeated attainment of *performance, effects, or outcomes* in accord with agreements by agents of an institution made at one time as expressed or experienced at a future time. It would include assuring continued or improved performance in the spirit of the original agreement as new information, technology, or changed conditions develop. The demand for assurances that public institutions (often PONs) will exhibit conditions that evoke public trust and confidence and that seem to assure institutional (network) constancy escalate to the degree that

- institutions are perceived to engage in activities that can have significant, possibly irreversible, effects on future generations, especially if these outcomes might occur across broad spatial and temporal spans;

- stakeholders perceive that the discovery of potentially grievous failure may not occur until well after the working lifetimes of those leaders who set the programs into effect; and

- stakeholders suspect that agreements made in the present may be changed, denied, or abrogated in the future with little penalty for those responsible.

When these conditions obtain, our society's processes of accountability lose much of their meaning. When risks are likely to be borne by future generations, constancy will be demanded as a substitute for short-term production accountability. If the public cannot evaluate the network's performance on the basis of familiarity (the knowledge and information required being too esoteric) or on the basis for timely outcome (success or failure issuing too far in the future), they seek assurances that these institutions will not compromise in pursuing the highest quality operations through the relevant lifetimes of the systems in question. This means that the quality of both external net

[32]Defined as "unchanging, repeated, faithful." *New York Times Dictionary*. 1982. New York: Times Books.

relations and internal operations should reassure communities of interest and stakeholders that their views will be taken seriously and that organizational processes will result in immediate adjustment to the discovery of potential error (DOE 1994).

When matters of institutional trust and constancy for public organizations are conceptualized from three net vantages, different aspects of exchange and the stakes in assuring conditions that produce trust and constancy become evident. Net riders seek to arrange relationships with other net members so that they can trust them and work out the efficient monitoring means to be assured that other exchange partners can continue to be trusted within more or less fixed system of incentives. (In a sense, they seek to reduce the transaction costs of incipient suspicion.) Net throwers examine the political, legal, and economic conditions that foster or diminish the likelihood that net members will become and will stay trustworthy. Attentive outsiders seek insights about the leverage outsiders can play as monitors or enhancers of trustworthiness, or as destroyers of trusted relations.

AN AFTERWORD

At the outset, I eschewed policy concerns in an effort to make this task more manageable. But I cannot avoid a foray in that direction before concluding. The metaphorical and conceptual hopscotch among the fishnets, net riders, and attentive outsiders of PONs prompts me to begin rethinking key public policy/politics issues in light of engulfing public network phenomena, especially in the context of advanced industrial democracies. Three bedeviling questions emerge as central challenges:

- To what degree do the properties of different policy domains lead to unfamiliar political dynamics in the face of intensifying network relations (or networkedness)? For example, do the dynamics of environmental politics and policy procress differ much or at all from these dynamics in the agriculture, space, and oceans exploration, or in public safety areas?

- To what degree (in the U.S. context) are transcendent, democratic, normative concerns transformed due to greatly intensified and dispersed public and mixed public/private network configurations? Do the same issues stimulate different manifestations, enhancing or moderating processes as a function of network types?

- To what degree (and to what effect) does the increasing phenomena of U.S. involved, crossnational networks alter

the dynamics of and contexts for national agencies? As involvement grows, directly or indirectly, to what degree does this alter the operational efficacy of current practices, and contemporary, nationally oriented public administration/ management theory?

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