Polycentric Orders and the Governance of Public Economies

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Abstract: This paper provides a working definition of polycentric orders as a governance system that allows overlapping jurisdictions and a certain degree of autonomy to consumers of public goods. The definition clarifies that polycentricity is not a static but rather a dynamic property of polycentric orders that enables spontaneous governance changes. The paper also relates the concept of polycentricity to other organizational literatures in economics and sociology, and notes the similarity between empirical studies of polycentricity and modern social network analysis.

Key words: governance, polycentricity, public economies, social network analysis

1. Introduction

The concept of polycentricity as a framework to understand the relational nature of public administration has long been a core concern of the Workshop in Political Theory and Policy Analysis (henceforth, The Workshop) at Indiana University (See Jagger, Bauer, and Walker 2009). In fact, the study of polycentricity, with an empirical focus on metropolitan governance in the US, served as the foundation for a new research program that gave rise to the formal establishment of The Workshop in the early 1970s by Vincent and Elinor Ostrom (henceforth, V. and E. Ostrom, respectively). This polycentric approach brought The Workshop much distinction as an innovative research tradition in the emerging field of public choice (Mitchell 1988).

Among a wide variety of governance topics studied at The Workshop, the concept of polycentricity is also noteworthy because it points to one line of research to which The Workshop’s co-founders have made original and independent contributions. Although there was a collaborative effort that included other scholars, a retrospective assessment also indicates a clear division of labor in these initial efforts with V. Ostrom providing conceptual and theoretical guidance while E. Ostrom focused more on empirical studies.

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However, despite its theoretical and historical importance, polycentricity is not as readily recognized as a major contribution of The Workshop. Better known is the related, but distinct, framework for Institutional Analysis and Development (IAD) as well as empirical studies of Common-Pool Resources (CPR) that increasingly adopted a more international orientation—away from the national focus of early polycentric studies (E. Ostrom 1990; Ostrom 2005).¹ Indeed, the greater salience of The Workshop’s subsequent theoretical developments like IAD is reflected in the citation for E. Ostrom’s Nobel Prize that points to “her analysis of economic governance, especially the commons” (my emphasis added).²

Scholars associated with The Workshop can surely point to ways in which polycentricity informed subsequent intellectual developments such as the IAD framework.³ Moreover, there continue to be empirical studies that are motivated by polycentricity rather than the IAD framework. However, the connections among The Workshop’s various research programs may be far from obvious to non-specialists. Discussing how The Workshop’s various intellectual endeavors relate to one another is beyond the scope of this paper. Interested readers are invited to read a couple of edited compilations of theoretical and empirical work that illustrate how polycentricity has been applied to development and international issues beyond the original concern about metropolitan governance in the US (McGinnis 1999b; McGinnis 1999c) and a volume that reviews the Workshop’s intellectual tradition (Aligica and Boettke 2009).

Instead of a broad intellectual history of The Workshop, the main goal of this paper is to provide to a general audience a brief overview and assessment of polycentricity in two respects: by exploring similarities and differences between polycentric and other intellectual approaches that highlight the importance of relations and complex organizational forms; and, by examining the potential and limits of polycentric approaches to inform our general understanding of governance issues. To address these general concerns, the following sections are organized around three specific questions: (1) What is polycentricity and how can this concept inform our understanding of governance? (2) How does the study of polycentricity relate to more recent efforts to study networked and multilevel governance? and (3) What room is there for further refinement of polycentric approaches?

2. What is polycentricity?

¹ In fact, the term polycentricity is used frequently in various other literatures that appear to be unaware of The Workshop’s contributions to that topic. For instance, in the context of urban and regional studies with an obvious relevance to the study of metropolitan governance, Green (2007) presents a rather comprehensive historical overview of polycentric studies dating back to the early 20th century but does not mention V. Ostrom’s theoretical contributions or The Workshop’s various empirical studies.


³ E. Ostrom’s institutional analysis is strongly inspired by polycentricity with ideas that have a “polycentric” character such as holons and multi-level governance (E. Ostrom 2005).
A simple definition of polycentricity entails the existence of multiple centers of power as opposed to a monistic one (V. Ostrom 1999a). At this level of generality, the concept seems apt to describe a wide range of institutional settings where power is dispersed among various actors or entities. For instance, one would be tempted to use the concept to readily classify unitary and federal systems as monocentric and polycentric, respectively. However, this application would not capture the most important properties of polycentricity, which entail a richer institutional framework that also establishes a public order to govern the provision of public goods. In other words, polycentricity is about the dispersion and organization of authority towards the pursuit of a particular public goal.

To delineate the concept of polycentricity, it will be helpful to first establish the conditions or setting in which it is theorized to exist. This task is done below by first defining the concepts of a public economy and underlying public order. Having done that, we can then identify key properties of that public order that would distinguish it as a polycentric order. In the end, polycentricity will be conceptualized as a dynamic property of governance systems.

2.1. Setting

The concept of polycentricity was originally used for “large” entities such as a compound republic (Ostrom 2008 [1971]). Empirical studies, however, have had more of a “local” character. In what follows, I will build upon the more local depiction of polycentricity for both conceptual and empirical reasons. On the conceptual side, if polycentricity entails connections among various centers of power at different levels, then the concept would necessarily require—without a prior restriction on the number of levels (i.e., scope) — the ultimate inclusion of all centers of power. On the empirical side, if polycentricity were to have a global scope or be equivalent to the global (public) economy, then it would prevent studies that do not explicitly adopt a worldwide perspective. In effect, I will argue that for polycentricity to be a useful concept for empirical analysis, it must be conceptualized as a property of a closed system with well-defined boundaries. To that effect, I first provide the definition for a local public economy, followed by an explanation of its concomitant governance.

First, to mirror the scope of empirical studies, the context to which polycentricity applies will be denoted by a local public economy. Elaborating on the definition in McGinnis (1999a), a (local) public economy has five components: (1) A set of relevant public goods; (2) A well-defined geographical area to identify both a locality as well as a desirable scale of production; (3) a collective consumption unit within the locality with political demands for various public goods; (4) a set of private or public producers with...
various technologies to produce required public goods; and (3) a set of intermediary agents to manage provision of public goods; that is, to connect producers to consumers.

From the definition above, it follows that a local public economy is a special type of public economy where the locality is embedded in a larger political entity; that is, it is of a relatively small scale. To clarify, the term ‘locality’ is used loosely here to define an area of variable (but less than global) size. The “area” need not be restricted to cities or metropolitan areas, and could in principle refer to larger entities such as states, regions or even countries.

Conditions (1) and (2) make explicit the underlying geographical and societal aspects of extant definitions of polycentricity that focus on actors (McGinnis 1999a). Incidentally, membership in the three sets of actors need not be mutually exclusive, so it is possible for individuals to have multiple roles in this setting. Moreover, actors are not excluded from participation in other settings; hence, it is possible for some actors, especially producers, to transcend the boundaries of the local public economy. For analytical purposes, however, we consider other settings or public economies to be irrelevant (again, to avoid the problems of global or ill defined scope of analysis).

Second, a governance system or public order for a public economy entails the organization of both production and provision activities. Viewed as distinct tasks, one organizational option would be to merge production and provision tasks into one public agency, corresponding to the case of centralized public administration. Another option exists where private firms could internalize both tasks and deal directly with the collective consumption unit without any political interference. Indeed, these options represent the well-known dichotomy between states and markets, but these options do not encompass all available organizational arrangements, especially because this dichotomy ignores political relationships between the consumption unit and public authorities.

In fact, two related features of a local public economy make it more likely that one would observe a wider variety of organizational arrangements beyond exclusive reliance on either states or markets. First, public economies are not managed exclusively through price mechanisms. In contrast to a market for private goods, a local public economy not only includes buyers and sellers, but also has an underlying political
dimension that separates the production of public goods from provision. That political dimension stems from two distinct sources: a political imperative for the participation of various government agencies as well as the aggregation of individual preferences within consumption units. Of the two, it is reasonable to assume that the political imperative is ever present to a certain extent. That is, consumption units may sometimes solve their collective action problems. In contrast, even if agencies choose to outsource production to private actors, the agencies nonetheless retain at least some oversight political responsibilities.

The second feature is that the underlying set of political relationships enables a dual role for consumers: (1) they can simply consume public goods by taking the governance system as given; but (2) depending on the strength of political imperatives, consumers can also help shape the governance system. In other words, it is possible for consumers to have preferences not just for public goods but also for the specific governance system or organizational arrangement that provides those goods. Put another way, consumers—as political actors—care about both ends and means.

Underlying both features is the fact that, in addition to the more direct exchange of taxes for public goods, one can readily observe non-market mechanisms for political support and accountability that explicitly link the collective consumption unit to the set of intermediary agents. In fact, the added relational and political dimensions are most useful in explaining the origins and intended scope of the concept of polycentricity. V. Ostrom did not coin the concept of polycentricity, but his seminar 1961 paper (with Tiebout and Warren) on metropolitan governance relies heavily upon the notion advanced earlier by (Tiebout 1956) that consumption units were “mobile” political actors. A useful way to think about polycentricity is therefore as a generalization of Tiebout’s earlier argument regarding the ability of citizens to “vote with their feet” to bring about more accountability and exert pressure for a more efficient provision of public goods (McGinnis 1999a).

2.2. Polycentric governance

Given its broader construction, the concept of polycentricity can serve to generalize Tiebout’s argument in two respects. First, polycentricity does not require disjoint localities to induce competition among different governments. Second, and most importantly, the scope of mobility is not restricted to physical space. The application to physical space, as in the case of the large literature on federalism inspired by Tiebout’s work (Inman and Rubinfeld 1997; Treisman 2007), hides the fact that underlying relocations are essentially political acts: by voting with their feet, voters also choose to affiliate or interact with specific governments.

But, if desired, these specific features could be accounted for with an appropriate redefinition of the component sets of a public economy to reflect a larger scale.
The analogy to “voting with their feet” in the context of polycentricity stems directly from the above definition of a governance system in terms of the interactive components of a public economy—what V. Ostrom (1999b) denotes as “ordered relationships” (p. 52). If what physical space does in a Tiebout framework is simply mediate the interaction between private actors and public authorities, then the concept of mobility can be readily extended to incorporate a more abstract notion of social space that induces political externalities. That is, excluded political entities—regardless of their actual physical location—incur a cost if they lose ties to consumption units. From this more general perspective, it is also noteworthy that federalist structures—denoting a partition of physical space-- are not strictly necessary to empower citizens as long as interactions entail some (political) exclusivity. This assumption is defensible if we think that established ties are costly to dissolve.¹⁰

In general, one can expect a wide variety of complex interactions within and between the three actor sets, but not all such interactions would be polycentric even when they disperse power among multiple units. To illustrate, a particular governance system may prescribe overlapping jurisdictions for various government agencies to co-provide public goods to a given consumption unit without the latter’s input or participation, which is at odds with the normative dimension of polycentricity as potentially more participative or democratic. In fact, for a governance system or public order to qualify as polycentric, it requires three additional conditions beyond multiple actors.

**Definition:** A *polycentric order* is a public economy with an underlying governance system that exhibits:

1. Overlapping jurisdictions;
2. An accountability relation between the consuming unit and the overlapping jurisdiction; and
3. Autonomy for the consumer unit to alter the governance system.

In other words, a polycentric order characterizes a public economy—not in a vacuum—but in the context of a very particular public order with constrained authority and explicit links between citizens and government. For instance, the first property excludes one single authority because the various overlapping jurisdictions effectively identify multiple “locations” to which citizens could move or attach.¹¹ The second property is simply a requirement that jurisdictions be required to provide at least some level of public goods for some political reason. This political requirement enables a credible threat that consumer units may “exit” in search of better opportunities. Put together, the first two properties are closely associated with the *current* existence (or manifest structure) of a polycentric order. In fact, previous work

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¹⁰ For example, if a collective consumption unit establishes a relationship with a particular set of providers, it may be very costly to seek other providers for some time.

¹¹ Building upon V. Ostrom’s notion of structured relationships, this first property effectively enlarges the set of potential relationships to go beyond a many-to-one relationship, as in a centralized—that is, monistic—arrangement to also a many-to-many relationships.
on polycentricity often defines polycentric orders as "complex systems of overlapping jurisdiction." (McGinnis 1999a)

The third condition serves to identify a distinctive aspect of polycentricity that need not be evident by simply examining existing relationships among various relevant actors. The need for clarification stems from the unfortunate use of two closely related words, polycentric and polycentricity, as basically equivalent terms, which gives rise to major semantic problems. The first term is an adjective that describes existing structure; hence, it refers to a static property of the underlying public order. Polycentricity, in contrast, is a dynamic property of the public order. In fact, V. Ostrom’s intended use of polycentricity was to refer to changing or (inherently) dynamic public orders. For instance, V. Ostrom (1999b) notes that his conceptual application of polycentricity to the study of public economies was inspired by Polanyi’s earlier work where the term was used to distinguish between (stable) directed and spontaneous (so-called polycentric) public orders (pp. 57-60).

Therefore, the key distinction that emanates from the third property is that, in addition to existing accountability and relational structures, polycentricity affords consumer units a degree of autonomy that they can use to alter the existing pattern of interactions. To understand the underlying dynamics, it is helpful to think of political interactions in relational terms. That is, if we think of these interactions as constituting some type of network structure, then one way to conceive autonomy is to think about consumer units being able to “rewire” the network. It is this possibility of rewiring the network that brings about an element of spontaneity to polycentric orders. Regardless of existing polycentric arrangements (that must still satisfy the first two properties), the set of actual overlapping jurisdictions is not restricted to the “official” responsibilities of government agencies. Not only are jurisdictions malleable, but they also “spill over” to (that is, overlap with) the consumer unit. Put another way, polycentricity entails even more dispersion of authority than suggested by formal organizational arrangements.

Because of the third property, the concept of polycentricity is inherently dynamic. Although the definition of a polycentric order makes some structural assumptions about overlapping jurisdictions, polycentricity is not defined exclusively in terms of a particular configuration at one point in time. A better way to think about polycentric orders is to think about a system with the internal capacity to change. Simply put, polycentricity exists with the possibility of spontaneous changes in ongoing governance systems. As a

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12 The definition above does not restrict the source of rewiring. The normative assumptions of polycentricity, as in V. Ostrom (1971), would seem to privilege some type of bottom-up rewiring, but in principle, it is also feasible that public entrepreneurs, and indeed the government, can also attempt to rewire the network for some purpose.

13 The implication is that a governance system with overlapping jurisdictions that has reached some type of steady state (i.e., its structure no longer changes) can no longer exhibit (or experience) polycentricity. This distinction between static structure and concomitant dynamics has been largely ignored in applications of polycentricity, so this is a ripe area for future research.
caveat, it remains unclear whether one can characterize polycentricity as a process of creative destruction, especially in the case where there are multiple actors attempting to rewire the network to advance their respective private interests.\textsuperscript{14}

Given the above definition, it is also possible to readily identify what polycentricity is not. Polycentricity can be readily discarded as a property of governance systems where political authority resides exclusively with one entity at any administrative level, whether this level is the highest as in the case of centralization or some intermediate or lower one as in the case of decentralization. In other words, polycentricity is not a feature of all federal systems or local governments because being closer to the people does not always bring about accountability and autonomy. Moreover, as noted above, federalism is not absolutely required as long as a polity can replicate the existence of potentially exclusive political relationships.

2.3. Related social science approaches

Scholars from various traditions have long recognized that organizational responses to the provision of public services need not be restricted to hierarchies (e.g., the state) or markets. In fact, rejection of that dichotomy is a common theme in many literatures, especially among students of organizational theory (Thompson 2003). An exhaustive review of related approaches is beyond the scope of the paper, so the discussion below focuses briefly on two dominant approaches from economics and sociology, respectively.

There is an extensive literature in economics spurred by seminal work on the theory of the firm and subsequent work on the boundaries of the firm and organization of capitalist production that is clearly relevant to studies of public economies (Coase 1937; Williamson 1985). Although this literature was motivated by economic concerns, an application to the functioning of public economies is not only straightforward but also captures important contextual elements of polycentricity. In particular, the notion of “hybrid” organizational arrangements recognizes the possibility that production need not be contained within the boundaries of any organization (Williams on 1991). In fact, between the polar extremes of states and markets, there exists a wide range of formal and informal organizational arrangements that are neither state nor market. These alternatives, which Williamson denotes as hybrid organizational arrangements, appear to be the same phenomenon as the property of overlapping jurisdictions within a polycentric order.

There is a critical distinction between the economic and polycentric approaches to the study of governance despite their common focus on overlapping modes of organization. The former attempted to

\textsuperscript{14} Because of the malleability of polycentric orders, it is highly probable for polycentricity to be disruptive depending on the nature and frequency of spontaneous changes, an issue that remains outside the scope of this paper.
formulate general theories of organizational choice in capitalist societies; for instance, why are there firms? Why do firms integrate vertically? Why do industries organize in various ways? In contrast, the study of polycentricity focuses more on describing the properties of existing arrangements rather than their origins. Although the term does have a dynamic and normative dimension in terms of desirable autonomy that may bring about spontaneous changes, the focus of research on polycentricity is not necessarily on specifying general conditions that give rise to a variety of polycentric orders. The scope of the theory is also more specialized to public rather than all types of economies. One justification for the more axiomatic approach of V. Ostrom and co-authors is that the proposed structural properties are deemed to be a more realistic depiction of the functioning of public economies—at least in the context of the US for which the theory was initially developed (V. Ostrom, Tiebout, and Warren 1961).

Clearly, there are ways in which the two approaches can be integrated. Despite the underlying political dimension of public economies, Williamson’s organizational theory can help explain the emergence of some components of polycentric orders in terms of functional overlapping or cooperation among multiple agencies. There are, of course, significant differences between markets for privates and public goods, a point made by V. and E. Ostrom (1999). Moreover, organizational choice in a political setting need not be guided solely by a quest for more efficiency, lower transaction costs, or other strictly economic criteria. Because Williamson’s focus is primarily on economic matters with a great deal of agency for relevant decision makers, there is not an explicit political foundation to incorporate the public authority inherent in polycentric orders. Hence, a Williamsonian framework can complement but not substitute entirely for the concept of polycentricity.

A related approach to polycentricity that bears mentioning comes from the new institutionalism in sociology and organizational theory (Powell and DiMaggio1991). A couple of decades ago, for instance, Powell (1990) argued that the venues for economic exchange are not restricted to impersonal markets nor to authority within a well-defined boundary. Oftentimes, economic exchange took place through informal or formal relationships or networks. Although Powell’s empirical work has focused on high tech industries, the structural or relational component of the so-called “network paradigm” approach is clearly related to the overlapping jurisdictions of polycentric orders.

To be sure, there are important differences between the sociological and polycentric approaches, but in some sense, the sociological approach lies closer to the study of polycentricity than the economic

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15 “Public” here refers not just to the nature of public goods, but to a complex web of overlapping jurisdictions and responsibilities in the underlying public order that make it more difficult to internalize conflict and mitigate opportunism as would be the case in a Williamsonian approach.

16 For an overview of the network paradigm see Borgatti and Foster (2003).
approach.\footnote{To clarify, this paragraph refers solely to the internal arrangements of particular contexts (e.g., particular industries, etc.). That is, public economies, fields, or other social settings, are analyzed as self-contained and independent entities with their own dynamics, which is an incomplete depiction of sociological approaches. For instance, the sociological literature also has a comparative dimension that allows a broader study of various contexts: that is, beyond the description of a particular context, scholars in this tradition also ask whether different contexts develop similar (that is, isomorphic) organizational arrangements, a topic that is beyond the scope of this paper.} Although networks are important components of sociological organizational theories, scholars in this tradition also account for other important components. Owen-Smith and Powell (2008), for instance, discuss organizational fields with institutional logics that affect the behavior of participants within networks. Although organizational fields are not spatially contiguous, the notion of a field corresponds roughly to the physical space of public economies. In turn, the institutional logic serves a type of underlying “public” order that regularizes or constrains the set of possible interactions (corresponding to the governance system of a public economy). Moreover, organizational fields are constantly evolving, which highlight not just the static structural properties of a system but its capacity to change continuously.

Students of governance and development will also readily recognize some parallels between polycentric approaches and recent fascination with the study of multilevel and networked governance structures. There is a burgeoning literature on these topics applied to governance issues which warrants separate treatment, but interested readers can consult Thompson (2003) and Armitage (2008) for an overview of the main ideas. For purposes of this paper, the similarity between polycentricity and the newer approaches lies with the attention to overlapping jurisdictions. The range of questions and settings also varies a great deal as opposed to the narrower scope of polycentricity on local public economies. In fact, a distinctive feature of newer network approaches is examining relational issues under a wider range of scales, including supranational settings (Ansell 2006; Kahler 2009).

Embedded in the concern with overlapping governance structures is also a renewed interest on policy networks, which has some parallels to the condition for autonomy of polycentric orders. There is no consensus on the definition of a policy network, but beyond the relative autonomy of participants, it appears that policy networks define a more general scope for political interactions than polycentric orders; that is, the analysis of policy networks is certainly not restricted to the provision of public goods (Bomberg 1998; Knoke 1990; Marsh 1998).

3. How to identify and study polycentric orders

The theoretical definition of polycentric orders by V. Ostrom admits a wide variety of complex arrangements. Moreover, it could be argued that the ideal type of a monocentric (or heavily centralized)
order would be hard to find in the real world, which suggests that polycentric governance is not just the norm, but that most public orders are somewhat polycentric. If so, does polycentricity make a difference?

Recall that the definition of polycentric orders is essentially structural and thus remains separate from the actual performance of a public economy. Therefore, a better appreciation of how polycentricity makes a difference—for better or for worse—requires a careful selection of available evidence. However, in the absence of a classification of polycentric orders—yet to be developed—the application of the concept of polycentricity to empirical studies entails a formidable task.

Although aware of the applicability of polycentricity to various scales, including compound republics, V. Ostrom initially outlined a research strategy that focused on metropolitan governance. The rationale for such (more local) settings is that they could enable practical research designs that could isolate the effect of polycentricity on the performance of public economies. Beyond practicality, V. Ostrom also offers a theoretical reason involving inherent cognitive limits of participants. As V. Ostrom (1999a) notes: "The complexity of relationships involved in the government of metropolitan areas is such that mortal human beings can never observe the 'whole' picture" (p. 125). Partly in response to this cognition problem, but also for research design considerations, V. Ostrom proposed metropolitan areas as ideal laboratories to study polycentricity: "The center city approximates a monocentric solution for all residents within its jurisdiction. Within the same jurisdiction, citizens living in the suburbs may be served by large number of jurisdictions with some aspects of overlap among jurisdictions" (p. 126).

Elinor Ostrom and her students subsequently took upon the task of studying polycentricity in the real world of metropolitan governance. In celebrated studies of public services such as policing and education, E. Ostrom and collaborators brought to bear a large body of evidence that illuminated both the advantages as well as the limits of polycentric arrangements. Contrary to prevailing opinion at that time, they discovered that the quality of public services was not proportional to the scale of production. Other factors, especially patterns of interaction between consumption units and intermediary actors were better predictors of performance (E. Ostrom and Whitaker 1973).

The focus on interactions and various patterns of co-production (and co-provision) brought to the forefront a novel relational perspective that also required a distinct data collection strategy and concomitant analysis. Although sociometric approaches were available at the time, these were not widely known or available beyond a small and highly specialized research community of social network analysts.

Although there are some inherent normative concerns in polycentricity regarding autonomy and self-organizations, V. Ostrom and co-authors are quite explicit about the separation of polycentric orders from performance. They do not claim that polycentric orders are always superior or otherwise give better results that a monocentric arrangement (V. Ostrom 1999b, p. 53).
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(Freeman 2004). Hence, E. Ostrom and collaborators had to devise their own relational approach (E. Ostrom, Parks, and Whitaker 1974).

It is noteworthy that despite the lack of knowledge about sociometric methods, the empirical research on polycentricity nonetheless followed a strategy that resembles modern social network analysis (SNA). The conceptual and methodological innovation that highlights this similarity was the formulation of a so-called “service structure matrix” (SSM) as illustrated below in Table 1.

### Table 1. Sample service structure matrix

<table>
<thead>
<tr>
<th></th>
<th>Consumption Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Community 1</td>
</tr>
<tr>
<td><strong>Producers</strong></td>
<td>Agency 1</td>
</tr>
<tr>
<td>Agency 2</td>
<td>I</td>
</tr>
</tbody>
</table>

*Note:* Adapted from E. Ostrom et al. (1973), Table 1.

SSM rows refer to producers of public services within a metropolitan area. The columns identify two types of consumption units: (1) consumption units for direct services, typically communities; and (2) producers of direct services, typically agencies, who also consume intermediate services. The fact that there are different types of services is also a fundamental refinement of the theoretical definition of a public economy: a public service need not refer to a single good; in fact, the term most commonly defines a bundle of services, each of which can be organized in various ways. For this reason, there is not just one matrix that defines the governance system. A complete analysis of a public service requires the coding of a collection of service structure matrices to account for all required tasks or components of the bundled public service.

Today’s network analysts can readily appreciate the parallels between a service structure matrix and the adjacency (socio) matrices that define networks. In effect, the service structure matrix is similar to an affiliation matrix. If we assume that non-empty cells in Table 1 indicate a connection, for example, then the corresponding sociomatrix can also be represented in terms of a sociogram.

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19 See Scott (2000) and Knoke and Yang (2008) for an overview of these methods.
20 A network can be defined in terms of a set of nodes and a theoretical or empirical connection among the nodes (Knoke and Yang 2008, p. 8). Equivalently, a network can be described in terms of a set of nodes and an exhaustive listing of all pairwise connections.
21 Social network analysts will readily recognize, however, that the SSM matrix does not strictly represent a two-mode network or bipartite graph that would prevent ties between agencies.
Polycentric studies of public services also shared a concern with SNA in defining relevant structural properties. For instance, E. Ostrom and collaborators provided operational definitions for properties such as fragmentation and independence (related to the division of labor among agencies) as well as other interactive features such as duplication, multiplicity, and coordination of service delivery. The latter are not evident in the sample sociogram, but could be represented in similar manner by defining a network that also incorporates task nodes.

Despite what appears to be a common representational scheme, however, there is one critical difference between SNA and the empirical polycentric studies. Unlike the former, which specifies values for matrix cells that explicitly identify ties (whether a zero or a one to denote the existence of a connection or other numbers to account for valued relations), the polycentric approach was to use cells to codify various properties of service delivery. For instance, researchers made a distinction between regular (R), irregular (I), and alternative (A) provision patterns.

Other features such as coordinated tasks were also encoded in cell values, suggesting that cells themselves could define additional relations (not necessarily between actors but between tasks in simultaneous production); however, these structures were not explicitly defined as would be required by SNA. In other words, the service structure matrix approach was a condensed representation of all relevant relations and, in that sense, foreshadowed the eventual emergence of social network analysis as the preeminent methodology for relational data analysis.22

4. Conclusion: the future of polycentricity

The study of polycentricity is a foundational concept for the institutional analysis that characterizes the Workshop in Political Theory and Policy Analysis. This paper argued that polycentricity is best thought of as a public economy with a malleable governance system that generalizes Tiebout’s argument about the ability of citizens to “vote with their feet.”

The concept polycentricity has not always been, however, at the core of The Workshop’s research initiatives, not so much because of lack of theoretical originality, but mostly for practical reasons. Studying complex organizational forms empirically was and remains a complex task. In fact, the police

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22 Because SSM representations collapse structural information, their use would no longer be recommended as the starting point for a relational analysis of the governance of public economies. The main problem is that SSM cell entries do not just specify dependencies between two nodes, but other dependencies that may be qualitatively different. For example, a SSM cell that denotes a coordinated task obscures connections across tasks (and across those actors performing such related tasks).
studies of the 1970s represent a pioneering effort at collecting systematic relational data at a time when network analytic techniques and tools were not widely available.

Although instructive, these pioneering empirical efforts did not spearhead a systematic approach to empirical studies of polycentric orders. Missing therefore is a more comprehensive collection of studies that examine the wider variety of potential polycentric orders. Understanding the variety of polycentric orders would enable a more comparative perspective along the lines of sociological studies of isomorphism. However, the lack of classification is also a gap in the study on polycentricity that is ripe for future empirical contributions. The inherent relational nature of the concept of polycentricity invites the use of a systematic methodology to study the structure and impact of actual polycentric orders. An approach that can accomplish such task is SNA. For a long time, SNA was restricted to a small community of researchers in sociology and organization studies (Freeman 2004). Moreover, because of limited statistical tools, the field remained largely analytical, so even if Workshop researchers had been aware of extant network analysis, there would have been practical impediments to the formulation of polycentric studies of large-scale production given stringent computing requirements to analyze large networks. The situation today is drastically different, however, with the recent surge of statistical and computational innovations that could be harnessed for the purpose of exploring the diversity of polycentric governance (Carrington, Scott, and Wasserman 2005).23

There is also room on the theoretical front to enhance our understanding of polycentricity. Although normatively attractive in some respects, polycentric orders need not generate good outcomes.24 However, there is limited guidance in the verbal theory to explain how polycentric structures map onto specific outcomes. One obvious extension would entail the formalization of polycentric orders to make crisper predictions about their impact on performance. Indeed, there were some earlier attempts along these lines but they did not develop into a persistent and cumulative effort (Parks and Ostrom 1981). Moreover, it is surprising that whereas Tiebout’s argument generated an extensive literature of related formal models, polycentricity—as a generalization of Tiebout’s argument—did not receive the same treatment.

Formal models could also be useful to hone in on particular questions about the functioning of polycentric orders. From a static perspective, there are important political questions that demand more analysis. For instance, polycentricity enables joint responsibilities that also diffuse accountability: the greater the set of overlapping jurisdictions, the greater the opportunity for one jurisdiction to blame others for negative

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23 For a sample application, see Green (2007) who uses social network analysis to develop a measure of functional polycentricity in urban regions.

24 Polycentric orders are also vulnerable to the implications of Arrow’s Impossibility Theorem given a large number of participants with varying preferences (Arrow 1951).
outcomes. If, as V. Ostrom noted, consumption units may be subject to cognitive constraints that limit their knowledge of the system, it can therefore be a difficult task for the latter to demand better services.\footnote{Even if collective consumption units knew all relevant aspects of the system, collective action problems could still impede such demands.}

From a dynamic perspective, one is immediately confronted with questions about emergence and durability.\footnote{In this respect, it would be interesting to examine how a Williamsonian framework could help predict the emergence of certain polycentric orders. Clearly, a criterion such as transaction costs minimization may not guide all members of a public economy, but if coupled with an equally parsimonious political criterion, there may be enough of a behavioral foundation for all relevant actors to further explore system dynamics, which is the essence of polycentricity.} Under what conditions do certain polycentric orders emerge? How do varying degrees of autonomy affect the stability of polycentric orders?

In conclusion, although the study of the Commons is perhaps E. Ostrom's and The Workshop’s best-known work, there are in fact deep connections between the study of the commons and polycentricity. The connections have been studied in specific substantive areas like natural resource management, but perhaps they ought to be made more salient in other applications. With a renewed interest on networked governance across various disciplines, perhaps this may be a good time to revisit and refine the concept of polycentricity to fully assess its potential to explain (and maybe solve) societal problems.

References


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