Polycentricity: From Polanyi to Ostrom, and Beyond

PAUL D. ALIGICA* and VLAD TARKO*

The article overviews and elaborates the concept of polycentricity, defined as a structural feature of social systems of many decision centers having limited and autonomous prerogatives and operating under an overarching set of rules. The article starts by introducing the concept as it was advanced by Michael Polanyi and developed by Elinor and Vincent Ostrom. It continues introducing possible instances of polycentricity as well as related notions, as part of an attempt to further elaborate the concept through a concept design approach that systematically applies the logic of necessary and sufficient conditions. The article concludes by arguing that the polycentricity conceptual framework is not only a robust analytical structure for the study of complex social phenomena, but is also a challenging method of drawing non-ad hoc analogies between different types of self-organizing complex social systems.

The concept of polycentricity (tentatively defined as a social system of many decision centers having limited and autonomous prerogatives and operating under an overarching set of rules) was first envisaged by Michael Polanyi (1951) in his book *The Logic of Liberty*. From there it diffused to law studies, thanks to Lon Fuller (1978) and others (Chayes 1976; Horowitz 1977), to urban networks studies (Davoudi 2002; Hague and Kirk 2003), and, even more importantly, to governance studies, thanks to Vincent and Elinor Ostrom and the Bloomington School of institutional analysis (Aligica and Boettke 2009). The 2009 Nobel Prize in economics awarded to Elinor Ostrom pushed this concept to renewed attention. Indeed, the notion of polycentricity has a pivotal role in the Bloomington School of institutional analysis. Yet, although the concept is often recognized as important, not much has been done to further clarify and elaborate it, beyond the work of the aforementioned authors. This article is an attempt to deal with this challenge.

Initial Developments

Michael Polanyi's original development of the concept of polycentricity was the outcome of his interest in the social conditions preserving the freedom of expression and the rule of law (Prosch 1986, 178). His approach

*George Mason University

was highly original in that he based his social analysis on an analogy to the organization of the scientific community. This was facilitated by his anti-positivist approach to the philosophy of science, as he considered the success of science to be the outcome of a certain kind of social organization, rather than of scientists following a rigidly defined "scientific method" (Polanyi 1951).

Polanyi argued that the success of science was mainly due to its "polycentric organization." In such organizational systems, participants enjoy the freedom to make individual and personal contributions, and to structure their research activities in the best way they considered fit. Researchers' efforts do not usually dissipate in unproductive directions because they share a common ideal; that is, their freedom is utilized to search for an abstract end goal (objective truth). Polanyi's key point is that such an abstract and underoperationalized ideal cannot be imposed on the participants by an overarching authority. Thus, the authority structure has to allow a multitude of opinions to exist, and to allow them not just as hypotheticals but as ideas actually implemented into practice. The attempt to impose progress toward an abstract ideal is doomed to failure, as progress is the outcome of a trial-and-error evolutionary process of many agents interacting freely. Polanyi argued that the same applies to art, religion, or the law as it applies to science because these other activities are also polycentric in nature and are driven by certain ideals (beauty, transcendent truth, and justice).

Polanyi did not stop at these observations. He used the concept of polycentricity as a particularly well-suited tool for addressing the well-known socialist calculation problem (Lange 1938; Mises 1922). His arguments about the impossibility of economic calculation in a socialist system were closely related to Hayek's, yet they also benefited from the more general perspective provided by the concept of polycentricity. The market, he wrote, should be seen as a polycentric system involving a web of many agents that constantly adjust their behavior to the decisions made by others. Socialism implies the transformation of the system into a monocentric one. To make his point, Polanyi drives an analogy between scientists trying to discover the truth and entrepreneurs trying to discover the best way to make profit. In some sense, the market can also be said to have an ideal, namely, to deliver the optimal distribution of goods and the optimal production processes (i.e., to reach a Pareto equilibrium), and real markets always fall short of this ideal as agents lack perfect information and human activities often involve externalities.

The socialist system is an attempt to reach at (Pareto) economic optimum states faster and better than the market by means of a command-and-control strategy that is supposed to reduce the misallocation of resources, something supposedly inherent and unavoidable in a polycentric market system. In other words, centralized socialism was expected to work better than the free market and to deliver faster economic growth. However, the Pareto equilibrium ideal is not exactly easy to operational-

ize. First of all, preferences are subjective and thus the information about the demand of any good or service cannot be guessed from an outside vantage point. It is only revealed by the actual behavior of agents. Second, the amount of information required to manage all the production processes is enormous and cannot possibly be gathered and analyzed in a centralized fashion.

Consequently, in a monocentric-socialist system, the economic ideal can neither be derived nor imposed by central authorities. The system has to be allowed to move toward the "optimum" (ideal) in a trial-and-error fashion. In the same way as scientific progress cannot be guided by an authority (or by some rigid method), economic growth cannot be delivered using a command-and-control strategy.

> [S]elf-coordination of independent initiatives leads to a joint result which is unpremeditated by any of those who bring it about. Their coordination is guided as by an "invisible hand" toward the joint discovery of a hidden system of things. Since its end-result is unknown, this kind of co-operation can only advance stepwise, and the total performance will be the best possible if each consecutive step is decided upon by the person most competent to do so. . . . Any attempt to organize the group . . . under a single authority would eliminate their independent initiatives and thus reduce their joint effectiveness to that of the single person directing them from the centre. It would, in effect, paralyze their cooperation. (Polanyi 1951)

This argument is obviously related to Hayek's, but Polanyi parted ways with Hayek in regard to one important aspect, namely, the issue of social justice. The difference is important for our current understanding of polycentricism. While Hayek (1973) argued that the concept of social justice is literally meaningless, Polanyi was concerned that the market system comes into conflict with certain religious or secular moral values and that it may actually generate incentives undermining moral behavior (Polanyi and Prosch 1975). This way of reframing the issue of market-and-morality by reference to individual behavior avoids the types of collectivist arguments that Hayek tried to debunk, while keeping the issue of morality on the table.

Nonetheless, Polanyi's epistemic brand of moral relativism also meant that he believed that any attempt to impose morality by a central authority was not likely to succeed. Moreover, as a side effect of centralized enforcement, such attempts would only diminish freedom. In this regard, Polanyi argued that socialism was in fact not so much an economic theory but a moral system, and the claims to scientific status were merely a rhetorical device meant to facilitate the spread of the system. As such, to the economic critique of socialism, Polanyi added the argument of moral relativism, that is, the idea that justice itself is an ideal one can only hope to approach by means of a gradual trial-and-error process. This idea and Polanyi's concept of polycentricity, in general, proved to be a source of inspiration in legal studies.

Lon Fuller (1978) remarked that many problems that judges are called to settle are polycentric in the sense that disputes often involve many

decision centers and the network of cause and effect relationships is not understood very well. This makes any decision not only more difficult but also a source of unintended consequences. Therefore, attaining justice can be quite a remote ideal. Fuller argues that when problems appear in polycentric systems, many of the affected parties are often not called to express their point of view in court.

> Many unrepresented parties are affected by the most conventional forms of litigation. Significant losses under a contract can close businesses. A criminal conviction can wreak havoc on an entire town. A finding of negligence, products liability or fraud can bankrupt a business and send shock waves throughout a large network of contracts. Likewise, a contractual dispute concerning the management of a city's water and sewage system could affect millions of people, without the justifiability of any issue being called into question. Constitutional law questions, human rights, and statutory interpretation routinely involve settling legal questions with incalculable implications for unrepresented parties. Furthermore, the fact that judicial decisions affect the rights of parties not before the court is not only a collateral effect, but a fundamental responsibility of the courts. They are to clarify the applicable law for all to follow. (King 2006)

Given this existing complexity, Fuller (1978, 354–355) asked the following question: Which issues should be settled in court, which should be settled by political means, and which should be left to the market? As a general rule of thumb, Fuller argued that when there are many parties affected by an issue, the probability of judicial error increases because of the impossibility of avoiding generating unintended consequences. As such, there should be a threshold defined by the level of polycentricity in a system, beyond which courts should not rule but instead leave the matter either to markets or to the political process. Polycentric nonjuridical processes could offer better solutions (Fuller 1978; King 2006).

In other words, Fuller makes out of the notion of polycentricity a key element (i.e., an operational criterion) in his system of justice. Both Polanyi and Fuller's approaches highlighted the contours and relevance of the concept. However, it was the work of Vincent and Elinor Ostrom that operationalized it and gave it empirical substance.

The Ostroms and the Polycentric Perspective in Institutional Theory

In the 1960s, the Ostroms became interested in the concept in the midst of a heated debate on the nature and objectives of the public administration reform in American metropolitan areas. However, their work transcended the "metropolitan governance" debate and evolved in two directions: The first was foundational—a social theory or social philosophy of social order built around the concept of polycentricism; the second was empirical and applied, focusing on a variety of case studies that acquired new relevance once seen through the lenses of a polycentric paradigm.

Political Economy, Polycentricity, and the Metropolitan Reform Debate

The conventional wisdom in the 1960s was that a metropolitan region should be one large community, functionally integrated by economic and social relationships. However, its functional unity was artificially divided administratively by ad hoc, governmental units. A metropolitan region had no unitary administrative identity. Instead, there were many federal and state governmental agencies, counties, cities, and special districts each with its separate jurisdiction, overlapping and subverting each other. The result, argued the mainstream, was making efficient administration impossible because the disparate units were acting autarchic and were thus unable to perform the functions they were meant to perform. Without an overarching coordination center, each local government unit acted in its own interest, without regard for the public interest of the metropolitan community (E. Ostrom 1972 in Institute for Local Self-Government 1970; McGinnis 1999). Out of this diagnostic grew an entire literature converging around the idea that the "problem of metropolitan government" was that "the multiplicity of political units" made governance in metropolitan areas "a pathological phenomenon." There were "too many governments and not enough government" and, as a result, a "duplication of functions," a confusing "overlapping jurisdictions," and an "organized chaos." These arguments were relatively similar to the socialist arguments about the supposed economic superiority of central planning over free markets.

Vincent and Elinor Ostrom and their associates responded by challenging one of the basic theoretical tenets of the "reformers." (For an extended discussion, see Aligica and Boettke 2009—on which this section is based.) Quoting political economist after political economist, they hammered the crucial fact that the optimum scale of production is not the same for all urban public goods and services. Some services may be produced "more efficiently on a large scale while other services may be produced more efficiently on a small scale" (E. Ostrom 1972 in McGinnis 1999; Oakerson 1999; Ostrom, Bish, and Ostrom 1988). Therefore, the existence of multiple agencies interacting and overlapping, far from being a pathological situation, "may be in fact a natural and healthy one." This overlapping and duplication is the result of the fact that different services require a different scale for efficient provision and that principles of division of labor, cooperation, and exchange function in the public sector, too.

> Duplication of functions is assumed to be wasteful and inefficient. Presumably efficiency can be increased by eliminating "duplication of services" and "overlapping jurisdictions." Yet we know that efficiency can be realized in a market economy only if multiple firms serve the same market. Overlapping service areas and duplicate facilities are necessary conditions for the maintenance of competition in a market economy. Can we expect similar forces to operate in a public economy? (Ostrom and Ostrom 1965, 135–136)

The Ostroms explained that the variety of relationships between governmental units, public agencies, and private businesses coexisting and functioning in a public economy "can be coordinated through patterns of interorganizational arrangements."

> Interorganizational arrangements, in that case, would manifest market-like characteristics and display both efficiency-inducing and error-correcting behavior. Coordination in the public sector need not, in those circumstances, rely exclusively upon bureaucratic command structures controlled by chief executives. Instead, the structure of interorganizational arrangements may create important economic opportunities and evoke self-regulating tendencies. (Ostrom and Ostrom 1965, 135–136)

The insights brought by applying the standard political economy perspective were remarkable and instructive, yet they were not considered sufficient. The political economy conceptual framework needed special adjustments in order to get adapted to a phenomenon that was, in the end, quite different from the standard market-based phenomena. Some of the concepts and insights derived from the private economy could find a direct application. Others needed further adjustments. But one idea was clear: The political economy approach did not assume a priori that competition among public agencies is necessarily inefficient (Bish 1971; Ostrom, Tiebout, and Warren 1961; Wagner and Warren 1975).

To move further the argument and avoid sterile debates, it was not enough to note the differences between the two approaches to metropolitan governance (metropolitan reform vs. political economy) and to suggest that one is better. A mere comparative assessment of the most salient elements of the two theories was inconclusive:

> With basic differences in theoretical perspectives, scholars will adopt quite different orientations to their subject matter, will use different concepts and languages, and will pursue their inquiries in quite different ways. These differences will not be resolved by discussion and deliberation alone. Instead . . . we can attempt to undertake critical tests where divergent theories imply contradictory conclusions. The theory that has the weaker explanatory capability presumably would give way in the course of time. (Ostrom and Ostrom 1965, 135–136)

And thus, the parameters of an empirically grounded debate were set up for the first time. Once stripped from their ideological and theoretical mantle and formulated in empirical form, the claims implicit in the metropolitan reform literature became very plain. Empirical analysis was possible. The analysis was possible by pairing up propositions such as: (1a) "Urban public goods and services are relatively homogeneous and similarly affect all neighborhoods within a metropolitan area" versus (1b) "Urban public goods and services differ substantially in regard to their production functions and their scale of effects" or (2a), "Urban voters share relatively similar preferences for urban goods and services" versus (2b) "Individuals with relatively similar preferences for public

goods and services tend to cluster in neighborhoods; preferences will tend to be more homogeneous within neighborhoods than across an entire metropolitan area." The objective was to match the two parallel sets of propositions and to make the empiric intercomparisons as substantive as possible (Ostrom 1972 in McGinnis 1999, 148).

To explore the issue, a very concrete empirical agenda was put together by Elinor and Vincent Ostrom and their team. For instance, one key theme of the metropolitan debate was focused on how the size of the governmental unit affects the output and efficiency of service provision—that is, the impact of the size of a government producing a service. Ostroms' team decided that instead of speculating, they should simply get out in the field and try to collect the data needed to measure the relationship. It was an attempt first to test the opposed theories of urban governance focused on the size of governmental units and second to focus on the number of such units in a metropolitan area.

The studies on police services are, in that respect, exemplary. Studies started in Indianapolis with a comparative analysis of independent, small police departments that were serving neighborhoods next to and very similar to the neighborhoods served by the larger Indianapolis City Police Department. They extended the study to the Chicago Police Department, the St. Louis metropolitan area, and then developed replications in Grand Rapids, Michigan, in the Nashville–Davidson County area of Tennessee, and again in Indianapolis. They also tested for external validity, using a large survey of citizens living in 109 cities with populations of more than 10,000. The findings challenged the notion that larger urban governments would always produce superior public services: "The presumption that economies of scale were prevalent was wrong; the presumption that you needed a single police department was wrong; and the presumption that individual departments wouldn't be smart enough to work out ways of coordinating was wrong," Ostrom says. On the whole, "polycentric arrangements with small, medium, and large departmental systems generally outperformed cities that had only one or two large departments" (Ostrom 1972 in McGinnis 1999, 148; Ostrom and Parks 1973a, 1973b; Ostrom, Parks, and Whitaker 1973, 1978).

Out of this effort grew a solid empirical research agenda, an entire new domain out of which the outstanding work on commons and common pool resources was later to emerge, as well as the applied institutional analysis tools for which the Ostroms' Bloomington school is well known today. However, the inquiry into the two models of metropolitan governance analysis and their implicit policy recommendations revealed that the differences between the two were not merely theoretical and methodological (political economy vs. traditional public administration theory; individualism vs. holism). A deeper and more profound difference of vision was revealed. A paradigmatic pair of correlate concepts seemed to define those visions. Understanding the nature and implications of the differences between the two seemed crucial for the fate of the debate. The

two concepts were: "polycentricism" and "monocentrism." Developing them was not just a "normal science" task—replicating or applying an existing model or concept to an additional domain. Instead, it was an effort to change the paradigm. A new domain was to be defined and that required an entire new conceptual framework.

> By conceptualizing metropolitan areas as polycentric political systems, we were suggesting that a system of ordered relationships underlies the fragmentation of authority and overlapping jurisdictions that had frequently been identified as "chaotic" and as the principal source of institutional failure in the government of metropolitan areas. We identified a polycentric political system as having many centers of decision making that were formally independent of each other. A "system" was viewed as a set of ordered relationships that persists through time. (Ostrom 1972 in McGinnis 1999, 53)

Of special importance is the fact that the two notions defining the conceptual space are interlinked. Studying policentricity is also a study of monocenticity. The relation is not only logical—the two being correlated concepts—but also empirical. "A predominantly monocentric political system need not preclude the possibility that elements of polycentricity may exist in the organization of such a system." Conversely, "the existence of a predominantly polycentric political system need not preclude elements of monocentricity from existing in such a system" (Ostrom 1972 in McGinnis 1999, 52).

It was clear that reformers and the mainstream political scientists were going in different directions as they saw the fragmentation of authority and overlapping jurisdictions as generating something described as "chaotic." Elucidating the problem of polycentricity and chaos (defined as lack of order or perceived lack of order) was thus central in the effort of defining the tasks and advancing the agenda. The real stake was to identify and chart the patterns of order looming underneath the apparent chaos intrinsically associated to the experience of polycentricity.

But if that was the case, at stake was noting less than a theory of hidden order, a theory of the "invisible hand" directing the "social mechanism," a theory applicable to many instances of social order. Polycentricity, as intuitively foreseen by Michael Polanyi, was indeed applicable to a large range of social phenomena. That is to say that a discussion of polycentrism in political-administrative systems was one way, out of many possible ways, to approach the issue via an empirical example. If polycentric systems of government in metropolitan areas are just one case of polycentricism, if metropolitan areas were just one instance of polycentric order, then that specific case could be used as a vehicle for building a working definition or a general description of the phenomenon in point. That is to say that polycentricity raises fundamental challenges to political theory that have broader ramifications that go beyond the issue of the governance of metropolitan areas.

Specifying the Concept: The Ostrom Perspective

In specifying the concept, it is no surprise that the issue of monopoly of power is a major element. One of the key features in defining a polycentric—or for that matter, a monocentric—order is the issue of the monopoly over the legitimate exercise of coercive capabilities. A mono-centric political system is one where the prerogatives for determining and enforcing the rules are "vested in a single decision structure that has an ultimate monopoly over the legitimate exercise of coercive capabilities." On the other hand, a polycentric political system is one where "many officials and decision structures are assigned limited and relatively autonomous prerogatives to determine, enforce and alter legal relation-ships" (Ostrom 1972 in McGinnis 1999, 55–56). In a polycentric political system, no one has an ultimate monopoly over the legitimate use of force and the "rulers" are constrained and limited under a "rule of law."

Thus, ultimately, polycentric systems are rule of law systems. That is the reason why in defining a polycentric system, the notion of "rule" is as important as the notions of "legitimacy," "power," or multiplicity of "deci-sion centers" are. Ostrom, Tiebout, and Warren (1961) considered it the real functional principle behind polycentricity. The multiplicity of decision centers was a meaningful way of defining polycentricity only under the rule of law. There are many forms of organization that might seem analo-gous to a polycentric order. However, not all of them had the attributes associated to polycentricity as long as they were lacking an encompassing system of rules.

While starting to understand the meaning and conditions of polycen-tricity, Vincent Ostrom and his associates realized that the study of polycentricity (and even more precisely the problem of whether the gov-ernment of a political system can be organized in a polycentric manner) had a considerable history. There was no historical accident that Alexis de Tocqueville made his observations about the invisible mechanisms of social order while studying the democracy in America. According to Ostrom, designing the American constitution could be viewed as an experiment in polycentricity while federalism could be seen as one way to capture the meaning and to operationalize one aspect of this type of order. And, in light of that insight, polycentricity seems to be a necessary condi-tion for achieving "political objectives" such as liberty and justice. The dispersion of decision-making capabilities associated to polycentricity, wrote Ostrom, "allows for substantial discretion or freedom to individuals and for effective and regular constraint upon the actions of governmental officials" and as such is an essential characteristic of democratic societies (Ostrom 1972).

The historical and normative note is important. It suggests that if one is interested in the conditions preserving and enhancing the aforementioned "political objectives," one needs to better understand what makes polycen-tric systems so special. The conclusion was that a polycentric arrangement

has a built-in mechanism of self-correction. Self-correction is the crucial functional or operational feature of polycentricity that explains in good measure an important part of its performance.

> While all institutions are subject to takeover by opportunistic individuals and to the potential for perverse dynamics, a political system that has multiple centers of power at differing scales provides more opportunity for citizens and their officials to innovate and to intervene so as to correct maldistributions of authority and outcomes. Thus, polycentric systems are more likely than monocentric systems to provide incentives leading to self-organized, self-corrective institutional change. (E. Ostrom 1998)

The study of the U.S. constitutional experiment as an experiment in polycentricity leads to other interesting insights. For instance, if polycentric systems depend on the value and culture of the individuals creating them, then whether or not a significant number of individuals share or aspire to those values is critical for the operation of the system. And thus, Ostroms' exploration led to the conclusion that the discussion on polycentricity is not just a discussion about multiple decision-making centers and monopolies of power, but also a discussion about rules, constitutions, fundamental political values, and cultural adaptability in maintaining them.

Sooner or later, any discussion of polycentricity had to deal with the issue of spontaneity or spontaneous order. Polanyi's use of the term "spontaneous" as synonymous with "polycentric" implied that the attribute of spontaneity is in a deeper sense an additional defining characteristic of polycentricity (or at least theoretically related to it). In his attempt to put forward a coherent concept of polycentricity, Vincent Ostrom (1972 in McGinnis 1999, 60) embarked on an effort to elaborate Polanyi's point: Spontaneity means that "patterns of organization within a polycentric system will be self-generating or self-organizing" in the sense that "individuals acting at all levels will have the incentives to create or institute appropriate patterns of ordered relationships." That is to say that, in a polycentric system, the "spontaneity" is a function of self-organizing tendencies occurring under specific conditions at several different levels. Outlining these conditions is a step further in specifying the concept of polycentricity as seen through the Ostrom perspective.

The first condition is the freedom of entry and exit in a particular system. If the establishment of new decision centers under the existing rules is blocked, then one could not expect a polycentric order to emerge. The freedom of entry ensures the spontaneous development of the system. (Ostrom 1972 in McGinnis 1999, 60). The second condition is related to the enforcement of general rules of conduct that provide the legal framework for a polycentric order. "If individuals or units operating in a polycentric order have incentives to take actions to enforce general rules of conduct, then polycentricity will become an increasingly viable form of organization" (Ostrom 1972 in McGinnis 1999, 60). Finally, the third condition is that spontaneity should be manifested is the reformulation and revision of the basic rules that define the framework of a specific polycentric order.

The idea is that individuals should be free not only to play the game or have the incentives to self-enforce the rules of the game but also to change those rules in an orderly way.

In this respect, there are two prerequisites. One is procedural. There should be rules on changing rules. The other is cognitive: an understanding of the relationship between particular rules and the consequences of those rules under given conditions. "If conditions were to change and a particular set of rules failed to evoke an appropriate set of responses, rules could then be altered to evoke appropriate responses" (Ostrom 1972 in McGinnis 1999, 60). This has an important implication for the very way the relationship between spontaneous order and design is understood. Understanding and learning from experience are in fact the vectors of an ongoing process of knowledge integration in the institutional system and the prerequisites of subsequent adaptations to the changing environment. Institutional design, the application of our understanding of rules and consequences and the conditions that determine their interplay, is part and parcel of spontaneous order and not inimical to it. That is to say that design and spontaneous order are not irreconcilable. Design is possible within the overarching rules and within the broader process of the ever-evolving spontaneous order. The link between the two is given by the notion of knowledge and its correlate concepts such as learning (Ostrom 1972 in McGinnis 1999, 60).

Finally, one should note that one of Ostrom's most interesting conjectures was that the structure and dynamics of a polycentric system is a function of the presence of polycentrism in the governance of the other related and adjoined systems. The basic social functions or institutional arenas of a society could be organized in various degrees under a polycentric order: polycentricity in the structure of governmental arrangements, polycentricity in economic affairs, polycentricity in political processes and the formation of political coalitions, polycentricity in judicial affairs, and polycentricity in constitutional rule (Ostrom 1972 in McGinnis 1999, 56). The relationship between these domains is extremely important.

Ostrom thought that examples and cases of polycentric order (in economy, law, and politics) show that a polycentric order means more than just a matter of different centers of decision operating in competition with each other in a specific domain or area. Polycentricity is a complex system of powers, incentives, rules, values, and individual attitudes combined in a complex system of relationships at different levels. Even more important, one may detect a very interesting dynamics at work. Market polycentricism seems to entail judicial polycentricism, judicial polycentricism to entail political polycentricism, and political polycentricism to entail constitutional polycentricism. If one accepts the hypothesis of the existence of such a systemic logic, one may visualize the entire social system shaped by underlying currents originating in pulsating polycentric domains. Any island of polycentric order entails and presses for polycentricism in other areas, creating a tension toward change in its direction.

However, at the same time, one can imagine monocentricity operating under a similar dynamics. The result of the ongoing tension between the two principles is an unstable coexistence. One area or domain opened to polycentricity strives for polycentricity in another area; one area or domain under monocentricity strives for monocentricity in other domains. To capture, conceptualize, and analyze the entire dynamics of the field of tensions and friction between monocentrism and polycentricity, becomes an important challenge. If that is the case, then it should be no surprise that finding or building the proper conceptual apparatus for this task was declared to be in fact the priority task of an approach to social order from the perspective of polycentricity scholarship. As Vincent Ostrom put it:

> Penetrating an illusion of chaos and discerning regularities that appear to be created by an "invisible hand" imply that the tasks of scholarship . . . will be presented with serious difficulties. Relevant events may occur without the appropriate proper names being attached to them. Presumably events implicated by definitions used in scholarship may deviate from conventions that apply to the use of proper names. Patterns and regularities which occur under an illusion of chaos may involve an order of complexity that is counterintuitive. (V. Ostrom 1972, 20)

Vincent Ostrom argued that the fact that the concept of polycentricity was polar and correlated to that of monocentricity and the fact that the monocentric vision dominated political sciences for such an extended time had left their mark. Not only that a proper language and concepts needed to map, describe, and analyze polycentric systems were lacking, but even worse, the existent language in political science was deeply contaminated by the monocentric vision. Perceiving polycentricity through the lenses shaped by a monocentric vision and describing it using the vocabulary growing out of that vision was doomed to be deeply distorting and misleading. That meant that the existent conceptual frameworks and their associated vocabulary needed to be tested, refocused, and reconfigured in way that would make their limits and preconceptions explicit.

At the same time, the Ostroms were aware that all conceptual development would not have led too far without a full-blown expansion of the empirical agenda. Hence, a tension and a trade-off. The final result was that the much needed elaboration and development of the conceptual framework had to be somewhat stalled. And thus, although the point at which the concept was brought had a very important potential, that potential is yet to be theoretically explored. "Polycentricity," as developed by the Bloomington researchers, is not anymore a mere mixture of intuitions and functionalist descriptions. Ostroms' work offers us today a clearly articulated building block or reference point for further developments. The rest of this article will take as a starting point the notion as developed by them and will try to make several steps further in exploring the conceptual space of polycentricity.

Related Concepts and Further Elaborations

Before engaging in any attempt to elaborate the concept of polycentricity, it is useful to revisit a set of examples that may be used to illustrate the notion. While we look at some of those examples, we also need to look at some references that, although do not use the term "polycentricity," do illuminate or emphasize phenomena akin to polycentricity.

Any list of real-world examples of polycentricity (other than municipal governments) used at one point or another either to directly exemplify the concept or that could be used to illuminate it, cannot circumvent the following: science (Feyerabend 1975; Polanyi 1951), representative constitutional democracy (Ostrom 1972), free market (Polanyi 1951), and common law (Fuller 1978; Hayek 1973; King 2006). The diversity is evident. For instance, in some cases the decision centers are nonterritorial (they have overlapping jurisdiction), in some cases they are territorially delimitated, and some cases can be in both ways. Hence, the underlying crucial question: Do indeed all those phenomena share something? Would that common element really be something called "polycentricity"? Or maybe we are talking about a series of overlapping "family resemblances"? One way or another, even a mere list of phenomena that are suspected of polycentrism, in some degree or another, makes for a challenging research agenda.

To the list of "suspected of polycentricity" phenomena, we should also add examples of notions that are related, in the sense that they point out to processes and phenomena related to polycentrism as defined in the Polanyi–Ostrom tradition. These are notions that, once defined and elaborated, display many features that are associated to polycentricity (but also some significant differences): polyarchy (Dahl 1971), multiplism (Lindblom and Woodhouse 1993), market-preserving federalism (Weingast 1995), and federation of liberty (Kukathas 2009).

A final element of the list of phenomena and related notions that are or could be associated to the themes of polycentricity and that deserves special note is anarchy as a social phenomenon (Powell and Stringham 2009; Stringham, 2005; Tullock 1972). This special attention is due to the fact that there is a huge potential of confusion between the two. The most well-known literature on anarchism (from Godwin to Rothbard) is *normative*. These normative theories have been accused of being impossible to put into practice (Buchanan 1975; Nozick 1974). The field of *positive* anarchy (as opposed to the normative strand) emerged with the goal of testing scientifically the validity of Nozick–Buchanan-like intuitions and, consequently, gauge the general importance of institutional enforcement for the creation and maintenance of social order in large groups of quasi-strangers, as opposed to the culturally mediated spontaneous order (Boettke 2005).

The preliminary conclusions of such "positive anarchy studies," especially the empiric ones, are threefold. First, in the same way as there are

many varieties of states, there are also many varieties of possible anarchic systems, based on different rules and modes of enforcement of those rules, and these varieties are widely divergent in terms of peacefulness and security. Second, there are cases in which Hobbes–Buchanan's pessimism about peaceful anarchy is unjustified as the emergent social order is preserved in the absence of a monopoly of force or even, in certain cases, *despite* the existence of a monopoly of force acting contrary to the preservation of peace and failing to promote prosperity. Third, not all anarchic organizations are peaceful and promote prosperity; in certain cases, Hobbes–Buchanan's intuition proves entirely correct.

Positive anarchy studies overlap to a certain extent with the literature on polycentricity, as anarchism involves, by definition, multiple centers of decision making. The connection between the two fields has two aspects. On one hand, one can see some of the positive anarchy studies as studies of the dangers of polycentricity, of how the existence of multiple centers of decision making can degenerate into social chaos. Although anarchy presupposes multiple centers of decision making, not all anarchic systems are instances of polycentricity. It is important to hold in mind that polycentricity involves the existence of multiple centers of decision making *within an accepted set of rules*. In other words, only peaceful variants of anarchy are instances of polycentricity as these variants are peaceful precisely because rules exist and function (albeit in the absence of a single enforcer having the monopoly of force). In turn, the concept of polycentricity provides the theoretical branch of positive anarchy studies a comprehensive way of modeling the boundary between peaceful anarchy (i.e., polycentricity) and chaotic and violent anarchy.

On the other hand, one can see positive anarchy studies as studies of the most fundamental aspects of polycentricity, namely of how emergent social order originally arises out of the interactions of individuals. While one can of course study polycentric systems that are already strongly embedded in a system of rules, one's analysis is not really pushed to its natural end unless it is understood how and why these systems of rules came about. Moreover, and most importantly, such understanding is not just of historic interest. In the same way as in biology, ontogenesis is not just the process by which an adult living being develops from a single cell, but also the day-by-day process at cellular level by means of which the living beings maintain its structural integrity in time by being constantly rebuilt, positive anarchy studies describe a form of social ontogenesis— the historic process by which the complex social order of contemporary societies developed is also an ongoing, pervasive process responsible for the day-by-day functioning of those complex social orders. These original social forces are still present and they constitute the raw material out of which the complex social order is built and that are merely constrained and modeled by modern culture and institutions. As such, positive anarchy studies provide important data for understanding contemporary social phenomena.

All of the above allows us to get a somewhat better understanding of polycentricity. Polycentricity emerges as a nonhierarchical, institutional, and cultural framework that makes possible the coexistence of multiple centers of decision making with different objectives and values, and that sets up the stage for an evolutionary competition between the complementary ideas and methods of those different decision centers. The multiple centers of decision making may act either all on the same territory or may be territorially delimited from each other in a mutually agreed fashion. Based on the above overview, we are now in a position to restate an important point. Implied in the effort to untangle and elaborate the concept of polycentricity is the crucial assumption and expectation that it provides a unified conceptual framework for analyzing and comparing different "spontaneous order" phenomena, that is, for understanding different forms of social self-organization as special cases of a more general unique evolutionary phenomenon. This phenomenon is manifesting in social groups and networks made up of very different kinds of actors (from scientists to entrepreneurs to politicians to judges to urban planners to military leaders) and relative to very different kinds of overarching end goals (such as truth seeking, maximizing economic profits, gaining and maintaining political power, seeking justice, or maintaining social order). Understanding these social phenomena as special cases of polycentricity may make it easier to draw informed analogies from one field to another.

Moreover, it may be the case that, as the Ostrom conjecture suggests, in the real world, many of these different cases of polycentricity are not independent of each other but in constant interaction. As such, the concept of polycentricity may provide a better foundation for understanding the interactions between, say, economic order and democratic order, and for analyzing possible social changes (such as the possible transition from a market-based democracy to a centrally planned dictatorship, the well-known Hayek's "road to serfdom" conjecture). Thus, Polanyi and Ostroms' original goal in defining the concept—the facilitation of useful and productive analogies among various cases of spontaneous order phenomena—could be further extended. In the end, whether or not all or only some of the earlier examples, and others like them, will be accepted as instances of polycentricity, depends in large measure on (1) whether the polycentric conceptual framework provides useful insights about their functioning and, conversely (2) whether they in turn provide useful insights into the other already accepted cases of polycentric phenomena. The bottom line is that, at this point, the literature has not yet reached a sufficiently robust and rigorous level of analytical development for such questions to be constructively addressed. This is the context in which one should consider the subsequently goal of the present article, that is, to move us closer toward an analytical development of the concept able to serve such investigations.

Polycentricity: Conceptual Structure and Boundaries

The brief overview of potential examples of polycentrism, as well as of related notions, leaves us in the position to ask again whether and how it is possible to identify a core common element. At the end of the preceding section, we have outlined a basic conceptualization of polycentricity as it emerges from the assumption that the provided examples do indeed share a set of common features. We now wish to push the matter further. Although a variety of possible directions of development are possible, we will use the direction outlined by the Ostromian perspective.

The fundamental dilemma in concept design regards the issue of whether one is dealing with such "core elements" or with "family resemblances" or, for that matter, with neither. In most cases involving complex notions, such as those used to deal with social science problems, it is difficult to define a concept in the traditional Aristotelian genus–differentia fashion. On the other hand, Wittgenstein's (1953) "family resemblance" approach, based on the idea that various empiric instances of a given concept may not all share a set of fundamental "essential" properties, offers no intrinsic criterion for establishing a concept's border, a criterion for keeping the concept from becoming utterly vague. This is the point when the solutions offered by Gerring (2001) and Goertz (2007) become important. First of all, they provide a more formalized approach to the issue of family resemblances allowing researchers to map exactly how various instances of a concept morph from one to another as certain attributes change. Second, Gerring provides several pragmatic criteria for establishing the legitimate boundaries of a concept: resonance and relevance, parsimony, coherence and boundedness, commensurability, and operationalization.

In his work, Goertz (2007) develops a simple, yet powerful, framework for stirring the analysis from the more or less vague and difficult to measure attributes toward the more clear-cut indicators. A concept is defined by means of its attributes (basic features) and those attributes are further explicated by means of more detailed empiric indicators. Goertz thus proposes a three-level framework for concepts (50–53). At the first level there is the *concept* we are trying to define, in our case "polycentricity." The second level contains the *attributes* in terms of which we are defining the concept. In our case, these are the basic features of polycentricity outlined by the definition of the preceding section, features emphasized by the Bloomington school approach, namely: (1) The existence of many centers for decision making, (2) the existence of a single system of rules (be they institutionally or culturally enforced), and (3) the existence of a spontaneous social order as the outcome of an evolutionary competition between different ideas, methods, and ways of life. The third level contains *indicators* with the help of which we make the definition more operational and empirically powerful. The possible values of those indicators are incorporated in a general logical formula involving both

conjunctions and disjunctions. (The traditional Aristotelian approach allows only the conjunction of attributes/indicators, hence its limitation.) This logical formula opens the path to an analytic, rigorous definition of the concept.

We may now make a real step further and try to determine the logical structure of polycentricity in terms of deeper-level indicators, rather than just in terms of the three basic attributes. The main output of this logical analysis is the capability to map the conceptual space of the different kinds of possible (hypothetical or real) polycentric systems. In order to accomplish this, we need to perform an initial analysis of the candidate cases for polycentricity, based on the conceptual guidelines emerging in the previous discussion. The following set of features summarizes the Bloomington school perspective on polycentricity: many centers of decision making, ordered relationships that persist in time; many legitimate rules enforcers, single system of rules, centers of power at different organizational levels, spontaneous order resulting from free entry and exit, the alignment between rules and incentives (rules are considered useful), and the public involvement in rule design (rules about changing rules, connection between rules and consequences relatively transparent). We are further elaborating the concept later in order to encompass a more general perspective.

As far as our analysis of polycentricity is concerned, we have to decide whether the candidates of polycentricity mentioned in the previous section (municipal governments and urban networks, science, representative constitutional democracy, free market, common law) should indeed be all classified as such. The only way to approach this dilemma is to start by treating the examples *as if* they truly are cases of polycentricity and see what happens. In other words, to see (1) whether the resulting concept has any obviously counterintuitive or seriously objectionable consequences and (2) whether it provides us with any useful new insights about the workings of the phenomena it is meant to capture. As we shall see, the resulting concept does indeed offer intriguing insights, for instance, about the conditions under which polycentric order breaks down (into either authoritarianism or violent chaos). Moreover, it allows us to better understand the manner in which spontaneous order phenomena fit within the larger framework of social order, that is, how such phenomena interact with other social phenomena (be they polycentric or monocentric). Thus, there are solid grounds to consider that the examples are indeed different manifestations of the same general phenomenon of polycentricity. Finally, there are other potential examples, such as international law, that have not been considered but that nonetheless seem to fit the definition of polycentricity. Thus, the resulting concept seems to have a certain amount of traction outside the original set of empiric cases used in its creation.

The first step in concept design is to map more explicitly the detailed attributes and indicators characterizing the different paradigmatic cases of the phenomenon of interest (Gerring 2001; Goertz, 2007). This allows us to

determine the necessary and sufficient conditions for polycentricity and to detail the family resemblances. In the previous sections we have already got a set of insights about what attributes are relevant and why. We are now building up on these insights. Analyzing the real-world candidate examples of polycentricity provided in the previous section according to those attributes, leads to a tentative synthetic picture of the cases.

The result of this analysis can be summed up as follows. Polycentricity has three basic features, which are to be explored in more detail in the following way: (1) The *multiplicity of decision centers* is analyzed in terms of those centers' ability to implement their different methods into practice (what we call the "active exercise of different opinions"), in terms of the presence of autonomous decision-making layers, and in terms of the existence of a set of common/shared goals. (2) The institutional and cultural framework that provides *the overarching system of rules* defining the polycentric system is analyzed in terms of whether the jurisdiction of decision centers is territory based or superimposing, in terms of whether the decision centers are involved in drafting the overarching rules, in terms of whether the rules are seen as useful by the decision centers (regardless of whether or not they are involved in their drafting—that is, the alignment between rules and incentives) and in terms of the nature of the collective choice aggregating mechanism (market, consensus, or majority rule). (The idea is that the general rules cover all subunits within a polycentric system. But that does not mean that the many subunits that may exist in a polycentric system all have the same rules regarding all of the many relevant action situations.) (3) Finally, the spontaneous order generated by evolutionary competition between the different decision centers' ideas, methods, and ways of doing things is analyzed in terms of whether there exists free exit, in terms of whether the relevant information for decision making is public (available to all decision centers equally) or secret, and finally, in terms of the nature of entry in the polycentric system—free, meritocratic, or spontaneous. That is to say, in case of "free entry" a decision center can *decide* to enter the polycentric system and existing decision centers cannot prevent this, while in case of the "spontaneous entry" no decision is involved—either on the part of the newcomer or of the existing decision centers, but the entry happens naturally (and more or less unavoidably).

The idea of "an overarching system of rules" deserves a brief elaboration and further clarification. We have already summarized in the previous section Ostroms' analysis of the problem of the system of rules, an analysis elaborated in the context of the debate about the meaning of federalism and the nature of metropolitan governance. At this juncture, another point should be added. The idea of an "overarching system of rules" has the function of an operational criterion that allows us to clearly distinguish between the members of a polycentric system and its outsiders. "Outsiders" are those agents who are not subjected to the same system of rules as "insiders" are. This might be the case either by design,

with a clear functional role in mind (e.g., creates the possibility of impartial arbiters), or it may be the result of failure and systemic imperfections (e.g., because of outsiders' lack of commitment and will, because of their institutional inability to integrate, or because of the inability of enforcers to integrate them). The outsider might either have some additional rights (as in the case of an arbiter) or fewer rights than the members (as in the case of an agent that fails to integrate and commit to the system of rules, which can bring various disadvantages). In a polycentric system, one may be an outsider to a unit but insider to another and thus, ultimately, part of the overarching system.

This idea of identifying the members of a particular polycentric system based on the system of rules to which they are subjected stems directly from the Institutional Analysis and Development framework (Ostrom 1990, 2005). According to the "institutional factors" component of this framework, the institutional positions (or roles) could be identified by looking at how the rules in use regulate access and other rights to various resources and information. That not only creates certain structures of authority but at the most basic level separates insiders from outsiders. In addition to that, one of the important aspects in such an approach is to identify nested structures of authority. These nested structures correspond to the relationships between different polycentric systems that coexist and interact. Thus, when one identifies the "outsiders" of a polycentric system, especially those that act as outsiders because they have additional rights, one often identifies the connection points between different polycentric systems. For example, the judge in a commercial dispute can be seen as the connection point between two polycentric systems: the market and the juridical system. Last but not least, it is also important to mention that when we are talking about the members of a polycentric system, we are talking not so much about the flesh and blood individuals but about institutional roles within that system (i.e., about the institutional rules consisting of a bundle of rights and obligations attached to an individual). This is noteworthy because the same individual may be acting in different circumstances and at different moments in time, as part of different polycentric systems.

Based on the catalog of relevant attributes and indicators, we are in the position to analyze each candidate for polycentricity and see how it fares in terms of each considered characteristic. The most important outcome is to tentatively define the necessary conditions for polycentricity, that is, those indicators that are found in all cases:

- Active exercise of diverse opinions and preferences (denoted P_1 later): By "active exercise" we mean that the opinions (ideas or methods about how to conduct something) are actually implemented into practice by at least one decision center, rather than just being enounced by someone (i.e., existing merely as a proposal or a hypothesis).

- Incentives compatibility—alignment between rules and incentives (P_3): The rules are considered useful by the agents subjected to them and the consequences of the rules are relatively transparent. If the alignment between rules and incentives does not exist, we are *not* dealing with an instance of polycentricity even if there is a multiplicity of decision centers actively exercising their opinions and preferences (as we shall see later, this corresponds to a case of polycentricity degenerating into violent anarchy).

These two essential conditions for polycentricity are in line with the Ostromian, Bloomington school definition we have already seen in a previous section. In other words, the Bloomington school, although focused on a rather small number of cases, stumbled upon a definition that, at least relatively, is of far greater generality than one might expect.
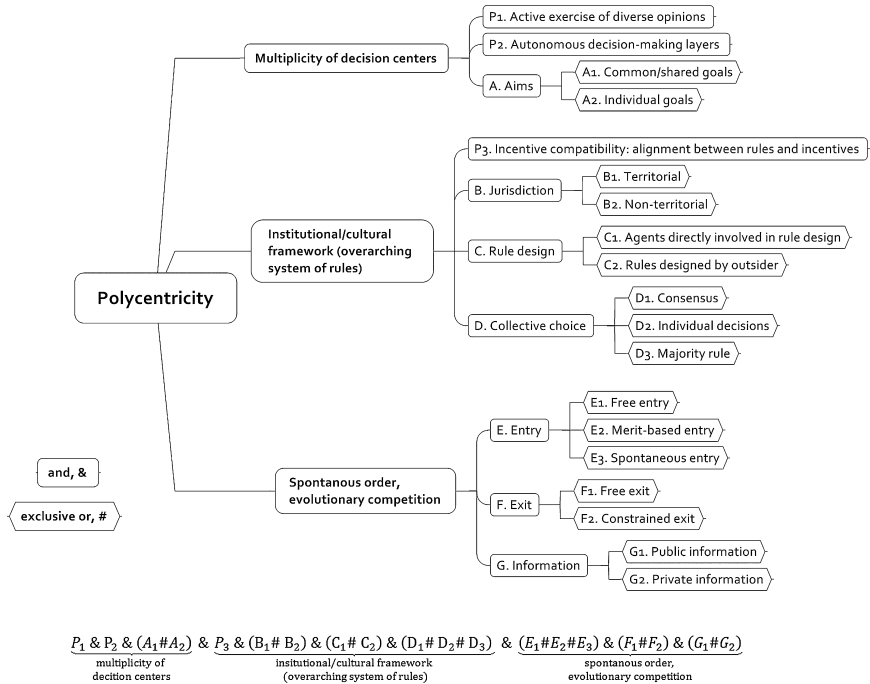
An interesting and important aspect of the issue is the problem of decision-making levels. One could easily construe a division of the candidate cases between hierarchical and nonhierarchical cases, that is, cases in which prima facie there are multiple layers of decision makers and cases in which there is an unstructured ensemble of decision makers. For this reason one could legitimately see the supposedly hierarchical polycentric systems as a bundle of two or more nonhierarchical polycentric systems. This is an area where the concept of "subsidiarity" may provide some help. Thus, we suggest that the autonomous decision-making layers aspect is also part of the essential attributes of polycentricity:

- Autonomous decision-making layers (P_2): The different overlapping decision centers make operational decisions autonomously from the higher level.

The issue of hierarchy in polycentricity is definitely more complex than this (see, for instance, the problem of overlapping and nestedness in Sproule-Jones 1993). However, even if debatable, the lack of steep and intrusive hierarchies coupled with "subsidiarity" rings closer to the truth than potential alternatives. But one should recognize the ambiguities and complexities involved, especially as an intriguing point about polycentric systems is the fact that rule enforcers are in many cases outsiders (a different type of agent) and thus a polycentric (sub)system depends either on the functioning of another system or on recognized mutual interest.

Once the core area has been tentatively outlined, we move now to the differences between the various instances of polycentricity. A tentative list such as the following offers a good way to advance the argument by highlighting non-necessary conditions and thus mapping the varieties of polycentricity. First, related to *decision centers and how they work*: (A_1) Common/shared goals and (A_2) Individual goals. To that one

FIGURE 1
Logical Structure of Polycentricity

$$\underline{P_1 \& P_2 \& (A_1 \# A_2)} \ \& \ \underline{P_3 \& (B_1 \# B_2) \& (C_1 \# C_2) \& (D_1 \# D_2 \# D_3)} \ \& \ \underline{(E_1 \# E_2 \# E_3) \& (F_1 \# F_2) \& (G_1 \# G_2)}$$

multiplicity of decision centers | institutional/cultural framework (overarching system of rules) | spontaneous order, evolutionary competition

should add the P_1 and P_2 conditions: (P_1) Active exercise of diverse opinions and preferences and (P_2) Autonomous decision making layers. Second, related to *the characteristics of the institutional/cultural framework (the overarching system of rules)*: (B_1) Territorial jurisdiction of decision centers or (B_2) Nonterritorial jurisdiction of decision centers. (C_1) Agents directly involved in rule design or (C_2) Rules designed by outsider. (D_1) Consensus or (D_2) Individual decisions or (D_3) Majority rule. To that one should add the P3 condition: (P_3) Incentives compatibility—alignment between rules and incentives. Last but not least, *related to the spontaneous order process—how the evolutionary competition works, and how information flows in the process:* (E_1) Free entry or (E_2) Merit-based entry or (E_3) Spontaneous entry. (F_1) Free exit or (F_2) Constrained exit. (G_1) Public information or (G_2) Private information. We have now the elements needed to articulate a possible logical structure of polycentricity (Figure 1).

In other words, if one takes as parameters the features used in our tentative analysis, the logical structure derived from the paradigmatic cases considered, allows for 288 different possible types of polycentric systems (there are 288 possible combinations of the basic indicators permitted by the above logical formula). Needless to say, as in any formal

typology, some of those exist while others have a purely conceptual and hypothetical nature.

One of the most interesting implications of this analysis is that one could explore not only the nature and structure of polycentric systems but also their pathologies and breakdown. If one accepts our approach, there are nine fundamental ways in which polycentricity may break down:

- Multiplicity of decision centers breakdown:
  - Non-P_1: active exercise of diverse opinions eliminated;
  - Non-P_2: the system becomes hierarchical; and
  - Non-(A_1 # A_2): the activity becomes considered meaningless (the goals disappear, the polycentric system disappears because it no longer serves a function).

- Overarching system of rules breakdown:
  - Non-P_3: rules no longer considered useful by agents;
  - Non-(B_1 # B_2): agreement about territoriality disappears (decision centers fight over territorial authority);
  - Non-(C_1 # C_2): no agreement about rule design (rules are no longer considered legitimate and their enforcement becomes difficult to impossible); and
  - Non-(D_1 # D_2 # D_3): the rule of law breaks down—power-based decisions (authority rule).

- Spontaneous order breakdown:
  - Non-(E_1 # E_2 # E_3): no entry (monopoly);
  - Non-(F_1 # F_2): the constituency of the system is unclear (some decision centers accept X as part of the system while others do not);
  - Non-(G_1 # G_2): no available information relevant to decision making (random decisions, relation between consequences and rules unclear, spontaneous order turns into drift).

The breakdown of polycentricity may give way either to a monocentric system (authoritarian or not), or to chaotic violent anarchy. It is clear that certain versions of polycentricity are closer to these breakdown conditions than others. In the light of our approach, it looks like the following attributes make the polycentric system more vulnerable: A_1, B_1, C_2, D_3, E_2, F_2, and G_2. These particular attributes are closest to the corresponding breakdown condition described earlier; for example, if rules are designed by outsider (C_2) it is more likely that they will be seen as illegitimate, or majority rule (D_3) is closer to a power-based decision than consensus or individual decisions, or a system based on shared goals (A_1) can lose

meaning (if the sense of common purpose is lost) easier than one that is based on individual goals. Needless to say, this may also prove an important insight for the field of positive anarchy studies, as peaceful anarchy may come about from violent anarchy via the same attributes. For example, peaceful anarchy may appear as interacting agents develop a sense that certain rules are mutually useful (Leeson 2005, 2009).

The implications of an analysis along the lines defined above could go even further. Proposed reforms of existing polycentric systems often involve changing the value of one of the six non-necessary attributes. For example, critics of the free market system often argue that in case of certain goods or services (such as education or health care), the D attribute should be changed from D_2 to D_3 (i.e., individual decision should be replaced by majority rule). Similarly, in regard to other issues, such as banking, libertarians argue that the existing D_3 attribute should be changed to D_2 (i.e., interest rates determined by the Central Bank should be freed and left entirely at the decision of individual banks). Or, advocates of market regulations, such as licensing, propose that the E_1 attribute of the market should be changed to E_2 (i.e., that free entry should be replaced by merit-based entry). As yet another example, advocates of human rights propose that the B_1 attribute of international law should be changed to B_2 with regard to certain instances (i.e., that certain rights should be territory independent). Finally, it is interesting to point out that there has been a historic transition of the juridical system from C_1 to C_2, transition that marked the separation between the juridical power and the legislative and executive powers (i.e., ideally, the rules that constrain the executive power are no longer designed by the executive power itself), and the separation between constitutional rules and common law. Similarly, it is usually considered undesirable when firms and corporations get involved, mainly via lobbying, in the design of market regulations; that is, the C_2 attribute of the market (agents not involved in rule design) is considered desirable and, historically, the transition from mercantilism to modern capitalism may be seen as being in a sense a transition from C_1 to C_2. However, in case of democracy, the transition from C_2 to C_1 was of crucial importance (citizens are no longer completely separated from the process of rule design) and C_1 can be considered the essential attribute of a democratic system. To sum up, the framework provided by a conceptualization and analysis on the lines introduced above has the potential to illuminate an entire set of issues related not only to the way we understand polycentric systems but also to the design and policy change in social systems in general.

Conclusions

The concept of polycentricity, as developed and defined in the Polanyi–Ostrom tradition and as elaborated earlier, is not only useful as an analytical framework but also for making analogies between different complex systems. At the same time, it could open up the possibility for very

challenging and interesting analytical and normative speculations based on the comparative analysis of different forms of polycentric arrangements and governance systems.

The point is that a polycentricity framework on the lines defined earlier provides, at minimum, an analytical structure for the study of certain social phenomena. However, our point is that there is more into it: It provides a method for drawing *non-ad hoc analogies* between different forms of self-organizing complex social systems as well as a means to challenge and bolster our institutional imagination. These analogical insights have to be tested and *if* many of them turn out to be correct, *then* the concept of polycentricity is indeed useful in additional ways. In the light of the previous work by the Bloomington school and others, it seems very likely that it can generate interesting new lines of inquiry as well as shed new light on existing debates. In the end, if our approach is correct, one could identify not just one but many multifaceted forms of polycentricity. The stake of this whole approach is to provide a way of discovering how to improve the functioning of different configurations and complex social systems by means of drawing analogies between them. Different complex systems have weak and strong points. The challenge is how to bring the strong points from one area into another in order to counter the weak points. The classic approaches so far have usually drawn upon analogies with markets; for example, Ostrom's idea of market-like interorganizational arrangements or of public entrepreneurship brings market-like attributes to public administration, or Hayek's emphasis of common law and Weingast's idea of market-preserving federalism bring market-like attributes to the evolution of legal systems. On the other hand, most advocates of market regulation propose to make the market more like democracy. Unfortunately most of these arguments lack any supporting overall conceptual framework. At minimum, one needs a more systematic approach to how analogies between complex systems should or can be made. Polycentricity can be utilized as a conceptual framework for drawing inspiration not only from the market but also from democracy or any other complex system incorporating the simultaneous functioning of multiple centers of governance and decision making with different interests, perspectives, and values.

References

Aligica, Paul D., and Peter Boettke. 2009. *Challenging Institutional Analysis and Development: The Bloomington School*. London: Routledge.

Bish, Robert L. 1971. *The Public Economy of Metropolitan Areas*. Chicago, IL: Markham Publishing Company.

Boettke, Peter J. 2005. "Anarchism as a Progressive Research Program in Political Economy." In *Anarchy, State and Public Choice*, ed. E. Stringham, 206–219. Cheltenham, UK: Edward Elgar Publishing.

Buchanan, James M. 1975. *The Limits of Liberty: Between Anarchy and Leviathan*. Indianapolis, IN: Liberty Fund.

Chayes, A. 1976. "The Role of the Judge in Public Law Litigation." *Harvard Law Review* 89: 1281–1284.

Dahl, Robert A. 1971. *Polyarchy: Participation and Opposition*. New Haven, CT: Yale University Press.

Davoudi, Simin. 2002. "Polycentricity—Modelling or Determining Reality?" *Town and Country Planning*, April, 114–117.

Feyerabend, Paul K. 1975. *Against Method: Outline of An Anarchistic Theory of Knowledge*. Atlantic Highlands, NJ: Humanities Press.

Fuller, Lon. 1978. "The Forms and Limits of Adjudication." *Harvard Law Review* 92: 353–409.

Gerring, John. 2001. *Social Science Methodology: A Criterial Framework*. Cambridge: Cambridge University Press.

Goertz, Gary. 2007. *Social Science Concepts: A User's Guide Exercises*. Princeton, NJ: Princeton University Press.

Hague, Charles, and Kesten Kirk. 2003. *Policentricity Scoping Study*. Edinburgh: School of the Built Environment, Heriot-Watt University.

Hayek, Friedrich. 1973 [1976]. *Law, Legislation and Liberty*. Chicago, IL: University of Chicago Press.

Horowitz, Donald. 1977. *The Courts and Social Policy*. Washington, DC: Brookings Institution Press.

Institute for Local Self-Government. 1970. *Special Districts or Special Dynasties?* San Francisco: Institute for Local Self-Government.

King, Jeff. 2006. *Polycentricity and Resource Allocation: A Critique and Refinement*. Oxford: Oxford Jurisprudence Discussion Group.

Kukathas, Chandras. 2009. "Two Constructions of Libertarianism." *Libertarian Papers* 1 (11): 1–14.

Lange, Oskar. 1938. *On the Economic Theory of Socialism*, ed. B. Lippincott. Minneapolis, MN: University of Minnesota Press.

Leeson, Peter T. 2005. "Do Contracts Require Formal Enforcement?" In *Anarchy, State, and Public Choice*, ed. E. Stringham. Cheltenham, UK: Edward Elgar Publishing.

———. 2009. "The Laws of Lawlessness." *Journal of Legal Studies* 38 (2): 471–503.

Lindblom, Charles E., and Edward J. Woodhouse. 1993. *The Policy-Making Process*, 3rd ed. Upper Saddle River, NJ: Prentice Hall.

McGinnis, Michael D. 1999. *Polycentricity and Local Public Economies: Readings from the Workshop in Political Theory and Policy Analysis*. Ann Arbor, MI: University of Michigan Press.

Mises, Ludwig. 1922 [1981]. *Socialism: An Economic and Sociological Analysis*. Indianapolis, IN: Liberty Fund.

Nozick, Robert. 1974. *Anarchy, State, and Utopia*. New York: Basic Books.

Oakerson, Ron J. 1999. *Governing Local Public Economies: Creating the Civic Metropolis*. Ithaca, NY: ICS Press.

Ostrom, Elinor. 1972. "Metropolitan Reform: Propositions Derived from Two Traditions." *Social Science Quarterly* 53: 474–493.

———. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.

———. 1998. "The Comparative Study of Public Economies." Presented upon acceptance of the Frank E. Seidman Distinguished Award in Political Economy, (P.K. Seidman Foundation, Memphis, TN).

———. 2005. *Understanding Institutional Diversity*. Princeton, NJ: Princeton University Press.

Ostrom, Elinor, and Roger B. Parks. 1973a. "Suburban Police Departments: Too Many and Too Small?" In *The Urbanization of the Suburbs*, ed. L. H. Masotti and J. K. Hadden. Beverly Hills, CA: Sage.

———. 1973b. "Neither Gargantua nor the Land of Lilliputs: Conjectures on Mixed Systems of Metropolitan Organization." In *Polycentricity and Local Public Economies: Readings from the Workshop in Political Theory and Policy Analysis*, ed. Michael D. McGinnis. Ann Arbor, MI: University of Michigan Press.

Ostrom, Elinor, Roger B. Parks, and Gordon P. Whitaker. 1973. "Do We Really Want to Consolidate Urban Police Forces? A Reappraisal of Some Old Assertions." *Public Administration Review* 33: 423–432.

———. 1978. *Patterns of Metropolitan Policing*. Cambridge, MA: Ballinger.

Ostrom, Vincent. 1972. "Polycentricity." Workshop Working Paper Series, Workshop in Political Theory and Policy Analysis, Presented at the Annual Meeting of the American Political Science Association, September 5–9.

Ostrom, Vincent, Robert Bish, and Elinor Ostrom. 1988. *Local Government in the United States*. Ithaca, NY: ICS Press.

Ostrom, Vincent, and Elinor Ostrom. 1965. "A Behavioral Approach to the Study of Intergovernmental Relations." *Annals of the American Academy of Political and Social Science* 359 (May): 135–146.

Ostrom, Vincent, C. M. Tiebout, and R. Warren. 1961. "The Organization of Government in Metropolitan Areas: A Theoretical Inquiry." *American Political Science Review* 55 (December): 831–842.

Polanyi, Michael. 1951. *The Logic of Liberty*. Chicago, IL: University of Chicago Press.

Polanyi, Michael, and Harry Prosch. 1975. *Meaning*. Chicago, IL: University of Chicago Press.

Powell, Ben, and Edward Stringham. 2009. "Public Choice and the Economic Analysis of Anarchy: A Survey." *Public Choice* 140 (3): 503–538.

Prosch, Harry. 1986. *Michael Polanyi: A Critical Exposition*. Albany, NY: State University of New York Press.

Sproule-Jones, Mark. 1993. *Governments at Work*. Toronto: University of Toronto Press.

Stringham, Edward, ed. 2005. *Anarchy, State, and Public Choice*. Cheltenham, UK: Edward Elgar Publishing.

Tullock, Gordon. 1972. "The Edge of the Jungle." In *Explorations in the Theory of Anarchy*, ed. Gordon Tullock. Blacksburg, VA: Center for the Study of Public Choice.

Wagner, Richard, and Warren E. Warren. 1975. "Competition, Monopoly, and the Organization of Government in Metropolitan Areas." *Journal of Law and Economics* 18 (December): 661–684.

Weingast, Barry. 1995. "The Economic Role of Political Institutions." *Journal of Law, Economics and Organization* 11: 1–31.

Wittgenstein, Ludwig. 1953 [1999]. *Philosophical Investigations*. Upper Saddle River, NJ: Prentice Hall.