

Informed Governance: Complexity and the Commons

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1. Acknowledgement

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2. Informed Governance: Complexity and the Commons

Governance challenges are persistent. Persistence may mean that meaningful solutions are not feasible within the current frame of thinking or with the current approach or tool we are employing. Different lenses – new frames of reference, wider viewpoints, inclusion, – may offer new opportunities of examination of essential patterns of interaction that need attention. As indicated with the articles of this issue, complexity theory offers a different framework for addressing wicked, persistent problems found in highly interdependence spatial domains – the *Commons*.

The relevancy of complexity theory continues to reveal itself as academicians and practitioners continue to explore its essence and insights. While complexity theory's origin is in the physical sciences, it is not new to the social sciences as demonstrated by observations dating back to Aristotle (Morcol, 2014;), as well as by the more recent observations of the likes of Smith, Ferguson, von Mises, Hayek, and Ostrom (Marshall, 2014; Morcol, 2014). Renewed attention to complexity theory is rapidly transcending and transforming disciplinary boundaries, establishing cross-boundary linkages between and within the differentiated landscapes of all the physical and social sciences. And perhaps most importantly, at least with respect to the mission of this publication, it is triggering a paradigm shift with respect to exploring, critiquing and designing social system constructs as demonstrated by the following articles.

A challenge of the administrative sciences lies in coordinating competing interests in the highly interdependent space of the *Commons*. Exploring this challenge and developing coordination and allocation strategies with respect to the many and varied stakeholders and constituents is one of the central interests of policy and administration research. It is central to policy orientation (Morcol, 2012), as well as to the management of complex systems and policy (Teisman, van Buuren, & Gerrits, 2009; Tait & Richardson, 2011). With this collection of essays, we continue this exploration and include both theoretical assessments and empirical interpretations of patterns found within the contested space of the *Commons*.

We face enormous challenges in managing the *Commons*, especially in the age of globalization and international linkages. The research presented here is importantly relevant to these challenges. The complexity of the global-sphere is compounded by an ever expanding global commons with an ever expanding need to coordinate and administer the many competing and interdependent interests within multi-dimensional and multi-jurisdictional spaces. The challenges in water management, in preserving environmental quality, in protecting public health, in resource management, in maintaining institutional integrity is confounded by global-transcendence. "Global-transcendence" is a term we use to capture the essence of the emergent properties of the global-sphere's highly interdependent public spaces in which collective actions and strategies at the local, regional, national or transnational levels can, and often, transcend the dimensional and jurisdictional origins of a specific collective initiative. As globalization and the global-sphere continue to manifest and reveal itself so too does the complexity of the *Commons*. It is this complexity that imposes challenging limitations

on public administration and the managerial sciences ability to address and implement collective actions and strategies. And it is this complexity that renders the following articles significant and relevant to the administration of governance and networks.

In order to construct solutions and strategies for administrating and managing the *Commons* it is important that we recognize the following principles:

- We articulate the nature of the challenge and the role of institutions (Ostrom, 1990; Young, 2010).
- We recognize conflicting stakeholder interests can be placed along different scales – individual, group and system-wide – at the same time (Koliba, Meek, & Zia, 2011);
- We acknowledge the many different types of actors that influence governance patterns, including non-human actors (Gerrits, 2012).
- We recognize that interaction among stakeholders in contested arenas is dynamic and full of uncertainties (Koppenjan & Klijn, 2004); and
- We seek to understand how our institutions behave within contested arenas.

By embracing the above, we are more able to understand patterns of interaction that arise from the many institutions designed to respond to human and environmental interactions within the *Commons*. All of the essays that follow provided insight to the above principles, as well as illustrate their relevance with respect to understanding of and administering to the many contested issues confronted within the *Commons*. Complexity theory is utilized to inform the administration of contested public ‘commons’ in terms of allocation strategies, the rules regulating open space, simulated institutional patterns, system intersection analysis, co-evolution of metropolitan space, isomorphic properties of network governance and contributions to self-organization in the theory of collective action.

In assessing governance concerns, applications of complexity theory offers opportunities to draw upon differentiated methodologies as a way of conceptualizing the commons and to visualize and examine patterns not previously considered and perhaps not previously observed. The papers collected for this issue each seek to address governance through the application of differentiated methods – economic philosophy, law, simulation, co-evolution, intersection analysis and network analysis.

As researchers, we continue to refine our lens in the examination of interdependencies and intersections in search of patterns that inform governance within spatial areas. We seek to understand complex systems. In doing so, the papers presented in this issue demonstrate:

1. Current complexity research with previous intellectual efforts;
2. Complexity-informed rules that create and nurture innovative capacities and outcomes in the *Commons*;
3. Complex behavior of hierarchies under conditions of entropy;
4. Complex patterns of metropolitan evolution and dissipation;
5. Complex intersection of the delta region and human interests; and
6. Isomorphic patterns among watershed networks

Five of the six papers for this volume were presented at the second conference on ‘The Challenge of Making Public Administration and Complexity Theory Work’ held at the University of La Verne (California) in June 2013. This conference was sponsored by the Section for Complexity and Network Studies (SCNS) of the *American Society of Public Administration* (ASPA), the Governance of Complex Systems Group of Erasmus University, and the College of Business and Public Management of the University of La zVerne. The sixth paper was selected from a previous ASPA/SCNS conference. All of the papers were subjected to and selected as a result of a two-staged, peer-reviewed process. This selection of papers continues efforts of the SCNS Section of ASPA in publishing works presented at national meetings (Meek, 2010) and conferences (Gerrits & Marks, 2012). What follows is a summary of the complexity-related governance themes and papers outlined for this issue of *Complexity, Governance and Networks*.

2.1. *Self-Organization – Governance of the Commons*

We begin this collection of papers with the examination of a central concept in complexity theory – self-organization. Goktug Morcol, in his paper “Self-Organization In Collective Action: Elinor Ostrom’s Contributions And Complexity Theory” examines the value of connecting current research on self-organization with previous theoretical efforts. Morcol notes that the concept of self-organization has deep historical roots and is a central concept in complexity theory as well as in theories of policy processes. For Morcol, the work of Ostrom instructs our current work on self-organization in how institutions of collective action – including hierarchical structures – emerge through self-organization and how the nature of the environmental characteristics – structured environments – influence collective action processes.

2.2. *Complexity Informed Rules for the Commons – Innovative Space*

Kevin Marshall in “Creating and Maintaining Innovative Space—A Framework for Unraveling the Complexities of Entrepreneurial Systems” develops a framework, informed by complexity theory, establishing the conditions necessary for the creation and maintenance of innovative spaces. The role of complexity theory, Marshall posits, is central to developing public arenas wherein ideas are allowed to develop, evolve and mature. Marshall builds and expands on the principle that the structure of the environment or space influences the emergence of self-organization, as well as influences the collective action processes. Such spatial structure is chiseled from the many rules implemented within the space, and thus we must be ever so cognizant of the rules that define and form the space. Marshall argues that differentiation and integration are essential components of an adaptive, progressive space, and that the administrative and managerial rules implemented and administered within the space not only define the parameters of the space in question, but also influence the innovative, progressive nature of the space.

2.3. *Entropy – Hierarchical Behavior in the Commons*

“Defining the Entropy of Hierarchical Organizations,” by David Chappell and Greg Dewey, seeks to understand the entropy of organizational structure given personnel shifts within units and under conditions when organizational units are expanded or contracted. They propose a measure of order within a hierarchical organizational structure based on an analogy drawn from thermodynamic entropy of physical sciences. Using computer simulations of hierarchical structures, they reveal the boundaries of both vertical and horizontal entropies and their influence with respect to aggregate, organizational entropy patterns and that each organization is likely to have unique entropic patterns that influence organizational functions. (Chappell & Dewey, 2014).

2.4. *Coevolution Analysis – Metropolitan Governance Over Time in the Commons*

Danny Schipper and Lasse Gerrits, in “The Emergence of Metropolitan Governance” draw upon a co-evolutionary framework to analyze governance patterns constructed in the city of Amsterdam over almost three decades. Schipper and Gerrits argue that, while institutional design and network approaches each have their theoretical merits, they fail “to provide an explanation for the highly metropolitan governance arrangements that have emerged, with within countries.” (Schipper & Gerrits, 2014.) They further argue that “a co-evolutionary analysis of metropolitan governance is necessary to understand the emergence of metropolitan governance systems as a complex process of reciprocal selection.” (Schipper & Gerrits, 2014). Through the lens of interpreting environmental conditions and selection mechanisms, their paper interprets policy documents and newspaper accounts during the time in question to assess the development of governance strategies. The authors find that dynamic environments challenge the fitness of existing structures and, as a result, metropolitan governance evolves in a punctuated fashion.

2.5. *Intersection Analysis – Delta Governance in the Commons*

Delta areas are commons areas full of contending actors and interests, including those from agriculture, industry, shipping and energy. Appropriate concerns are raised for delta areas faced with flood risks and ecological decline. Delta areas are also full of overlapping jurisdictional interests challenging the ability to coordinate competing interests. The work of Bonno Pel, Jitske van Popering-Verkerk, Arwin van Buuren, & Jurian Edelenbos, “Intersections in delta development; analyzing actors for complexity-sensitive spatial concepts” seeks to develop an integrative solution to delta governance. In the examination of The Dutch Southwest Delta, the authors conduct stakeholder analysis to assess differentiated interests and co-evolving properties within the system. The authors develop subsystem configurations based on a ‘synthesis of intersections’ among stakeholders for governance consideration. In this work, the authors demonstrate how a complex adaptive system framework can inform the development of ‘complexity-sensitive spatial concepts.’

2.6. *Isomorphic Properties – Watershed Governance in the Commons*

“Isomorphic Properties of Network Governance: Comparing Two Watershed Governance Initiatives in the Lake Champlain Basin Using Institutional Network Analysis” by Christopher Koliba, Adam Reynolds, Asim Zia, Steven Scheinert examines two governance networks – one regulatory and the other a collaborative partnership network – established in watershed planning documents for the Lake Champlain basin. Institutional network analysis was conducted, measuring network centrality, structures and clusters and a statistical comparison of the task structures of the two networks. The authors examined the degree these two planning networks – in structure and function – reify themselves in the plans they create. The authors used institutional isomorphism theory “to anticipate and explain any mirroring effects observed in the data.” (Koliba, Reynolds, Zia, & Scheinert, 2014). The authors found that, while isomorphic tendencies were found in structural design, these tendencies did not appear in policy tool selection. The latter outcome lead the authors to offer pattern outcomes attributed to different kinds of isomorphism.

2.7. *Summary*

These papers extend the dialogue the governance utilizing complexity and network theory while drawing upon a diversity of methodological approaches in exploring complex systems. Through the lens of complexity, these papers inform the art of collaboration in developing forms of collective action, innovation spaces; these papers inform our understanding of institutional evolution, design and adaptive institutional properties. One promising tenant of complexity theory may be that the examination allows for a wide variety of viewpoints to be included. This approach likely enhances the prospect of better solutions.

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