

ROUTLEDGE RESEARCH IN PUBLIC ADMINISTRATION  
AND PUBLIC POLICY

# A Complexity Theory for Public Policy

Göktuğ Morçöl

ROUTLEDGE



# **A Complexity Theory for Public Policy**

**Göktuğ Morçöl**

 **Routledge**  
Taylor & Francis Group  
NEW YORK LONDON

First published 2012  
by Routledge  
711 Third Avenue, New York, NY 10017

Simultaneously published in the UK  
by Routledge  
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

*Routledge is an imprint of the Taylor & Francis Group,  
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*Library of Congress Cataloging-in-Publication Data*

Morçöl, Gökтуğ.

A complexity theory for public policy / Gökтуğ Morçöl.

p. cm. — (Routledge research in public administration and public  
policy ; 1)

Includes bibliographical references and index.

1. Policy sciences. 2. Policy sciences—Mathematical models.
3. Political planning. I. Title.

H97.M673 2012

320.601—dc23

2011052508

ISBN13: 978-0-415-51827-7 (hbk)

ISBN13: 978-0-203-11269-4 (ebk)

Typeset in Sabon by IBT Global.

# A Complexity Theory for Public Policy

**1 A Complexity Theory  
for Public Policy**

*Göktuğ Morçöl*

**I dedicate this book to all those who dedicated their lives to understanding the complexities of our world and those who deal with the complexities of life every day.**

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# Preface

As with any other book, there is a personal and intellectual history behind this book. It was almost two years of intensive writing and revising that led to the final product, but the thinking process behind this book began when I finished my earlier book *A New Mind for Policy Analysis* (Greenwood, 2002). In *A New Mind* I argued that policy scholars should pay attention to the implications of quantum mechanics, the sciences of complexity, and cognitive science. Soon I realized that the most relevant and important of these three areas of advances in sciences was the sciences of complexity, or *complexity theory* as it is more properly called, and the name I use in this book.

I published papers and chapters on complexity theory and public policy/administration in between the two books. I have used some of the material published in those papers and chapters in this book. In the meantime it occurred to me that there was no commonly agreed upon conceptual framework among those researchers who applied the concepts of complexity theory in public policy/administration or in any other area of study. Complexity theory is not a complete framework, yet. It is quite possible that it will never be a complete framework. I discuss the reasons for this possibility in the following chapters. There are good epistemological reasons for this: It may not be possible to develop a framework to know the incessantly dynamic complex systems in their entirety. Yet, we need to develop a more-or-less commonly agreed upon framework for complexity theory so that we can call it a theory and apply its concepts in a more-or-less coherent fashion. This need was the motivation behind writing this book.

My first goal in writing this book was to articulate a complexity theory for public policy. This is a theoretical framework, obviously, not the final word. I hope others will critique it and build on it. I aimed to develop a theoretical framework for understanding particularly public policy processes. The aim of the book is limited in that sense. The reader will notice, however, that the topics I cover in the book span a wide range, from phase transitions in water molecules to the problems in phenomenology, hermeneutics, and post-structuralism. These are not typical topics covered in public policy texts. This is why some of the reviewers of earlier versions



of this book commented that I should change the title of the book to one that will represent its wide contents more accurately. I did not take that route because despite the wide range of the topics I covered in the book, I centered the discussions on the issues in public policy processes. This is a book about public policy, although some of the discussions may sound like distracting detours. I hope the reader will be patient with me when we take these detours together.

There are good reasons for centering the discussion on a particular area, like public policy, when developing a framework for complexity theory. First, for reasons that will become apparent in the following chapters, it may not be possible at all to develop an overarching framework for complexity theory—a framework that would encompass all realms of human experience, natural and social. One has to focus on the problems of a particular area to be able to conceptualize their complexity in a coherent fashion. I chose public policy processes for that. Second, there is a potential hazard in trying to develop an all-encompassing complexity theory. As the discussions in the chapters of this book will illustrate, there are several complexity theory concepts that are transferred from one area of study to another rather casually. These concept transfers are necessary and potentially useful, but much more work needs to be done to clarify them in the areas to which they have been transferred. That takes focused attention to a particular area of study.

When I began thinking of this book project, I had a second goal in mind. It was to compare the implications of complexity theory with those of other theories of policy processes, particularly with well-established theories like the institutional analysis and development framework and advocacy coalition framework. I highlight these two because they are the ones that place the problems of micro–macro relations, or agency–structure relations, at the center of their conceptualizations of policy processes. I argue in this book that this micro–macro problem is the core problem of applying complexity theory to public policy. Each framework in its own way has made significant contributions to our understanding of policy processes. Elinor Ostrom, the main architect of the institutional analysis and development framework, won a Nobel Prize in Economics in 2009 for a good reason. If complexity theory is going to be a serious alternative, complexity theorists must deal with and interact with these theories, either to show why theirs is better or acknowledge the compatibilities and differences between theirs and these theories. Ostrom acknowledges some of the implications of complexity theory and incorporates them into her own work.<sup>1</sup>

I was unable to accomplish my second goal for this book, because it turned out to be a much bigger task than what I had naively anticipated. Instead, I ended up making a few references to the institutional analysis and development framework in the book. A comprehensive discussion of the institutional analysis and development framework and the advocacy coalition framework remains to the task of a future work.

Certainly whatever I have accomplished in articulating a complexity theory for public policy in this book stands on what several other colleagues had accomplished before. I cite their articles and books extensively. In a way, this book is a reframed résumé of the accomplishments of these colleagues. I will not list their names here because the reader will read about them extensively in the following chapters.

I do want to acknowledge the contributions of four colleagues who read the earlier versions of the manuscript and gave me immensely good and helpful feedback. These colleagues are listed in alphabetic order by last name: Lasse Gerrits of Erasmus University, Erik Johnston of Arizona State University, Christopher Koliba of the University of Vermont, and Asim Zia of the University of Vermont. I also want to acknowledge the equally valuable feedback and advice the two anonymous reviewers of the last draft of the book gave me. Thanks to the comments and contributions of all these colleagues; this is a better book. I did not agree with all of their advice, however, so all the errors are mine.

There is one stylistic issue a couple of the reviewers raised, but I disagree with them. They suggested that I should refrain from using the first person in my discussions. I am aware of the long-running controversy among scholars on whether or not to use the first person. I prefer to use “I” for two reasons. First, in many occasions, the usage of the first person makes the statements and intentions behind them clearer. I follow the advice of the *Publication Manual of the American Psychological Association* (2010, p. 69) on this and try to avoid the use of the third person, the editorial we, and passive voice for more clarity in my expressions. Second, I believe that the author should take direct responsibility for what he/she argues for and his/her findings. I think using the first person and active voice helps the reader locate the responsibility for thoughts and research findings better. There are numerous references to other authors’ thoughts and other researchers’ findings in this book. If I did not use the first person, I would run the risk of not clarifying where the responsibility lies in many of those occasions.

I want thank my colleagues Aaron Wachhaus, Triparna Vasavada, and Sohee Kim who allowed me to use the ideas in parts of the products of our collaborative works in this book.

This may be unusual, but I also want to thank the creators, managers, and workers of Google, Wikipedia, and the *New York Times*. These three were the most valuable sources of information for me during the writing of this book.

I also owe thanks to Pennsylvania State University for allowing me to take time off for my sabbatical leave. I really needed that time to be able to focus on writing my manuscript without distractions.

Last, but not least, I want to thank the Routledge editorial and production staff, particularly acquisitions editor Natalja Mortensen and editorial assistants Mary Altman and Darcy Bullock, for handling the review, editorial, and production processes efficiently and professionally.

# Copyright Acknowledgments

The author and publisher gratefully acknowledge permissions granted to use selected material in the following publications in this book by the publishers or editors of them.

Seven figures from and summaries of the descriptions in Bin, H., and Zhang, D. (2006). Cellular-automata based qualitative simulation for nonprofit group behavior. *Journal of Artificial Societies and Social Simulation*, 10(1), (<http://jasss.soc.surrey.ac.uk/10/1/1.html>); accessed on February 17, 2012).

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Selected material from Morçöl, G. (2008). A complexity theory for policy analysis: an outline and proposals. In L. F. Dennard, K. A. Richardson, and G. Morçöl (Eds.), *Complexity and policy analysis: Tools and concepts for designing robust policies in a complex world* (pp. 23–35). Goodyear, AZ: ISCE Publishing.

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# Introduction

## WHAT THIS BOOK IS ABOUT

Public policy processes are complex. Nobody would dispute this. Then why do we need a complexity theory for public policy? What would it add to our intuitive understanding that it is a complex world out there? In this book I make the case, hopefully a convincing one, that complexity is not just a negative designation (that “the world is too complex to comprehend”) but a positive one. Complexity theory is a broad framework of positively describing the complexity of the world.

It is not a fully articulated theory, however, at least not yet. A series of concepts have been formulated by different theorists and considered as components of complexity theory (nonlinearity, emergence, self-organization, coevolution, dissipative structures, power laws, and the like). These concepts do connect with each other intuitively; it is meaningful to talk about a “complexity theory” in this sense. Complexity theorists have not specifically synthesized them into a coherent whole, however.

My goal in writing this book was to take on this problem, particularly in the context of public policy. I define public policy as a complex system in Chapter 1 and elaborate on the characteristics of complex systems in that chapter and the following chapters. Articulating a complexity theory for public policy in the absence of a general coherent framework is a challenge. This is partly because the concepts of complexity theory originated in evolutionary biology, chemistry, physics, and information sciences, and they need to be translated to the language of public policy and re-interpreted. This is not merely a problem of translation and re-interpretation, however. As one translates the concepts, gaps and holes appear in the body of the theory. To fill those gaps and holes, other concepts should be borrowed from the existing theories of social life. For example, I borrow concepts and conceptualizations from Anthony Giddens’ theory of structuration.

Articulating a complexity theory for public policy is a challenge also because, as the reader will notice in the following chapters, complexity theorists and researchers interpret the key concepts of the theory somewhat differently and disagree among themselves over their meanings and significance (e.g., see the issues with the concept of emergence in Chapter 3). One has to choose between these different interpretations. I did make choices

when writing the following chapters, but I also aimed to present the different interpretations and the disagreements among the theorists as fairly and comprehensively as I could. When there were unresolved conceptual issues, I presented the issues without taking sides or reaching any conclusions. This is why the theory I present in this book is neither completely articulate, nor is it complete. Instead, I chose to articulate a general framework and left further developments to future studies.

### COMPLEXITY THEORY: A BACKGROUND

In one of the most comprehensive books that have been written on the concepts and history of complexity theory to this date, Melanie Mitchell (2009) states that there is no unified complexity theory, but still we can talk about a complexity theory in the sense that there are some conceptual tools commonly used in different conceptualizations (pp. 14, 95). In her own words

There is no single theory of complexity or complexity science. There are multiple conceptualizations that share some concepts and tools. Despite this disparate nature of the research and conceptualization, complex systems research has made a significant contribution to our understanding of science. It challenges some long-held views of science [reductionism, linearity] and offers a new set of concepts to understand complex problems. (pp. 300–301)

In her historical account of complexity science, Mitchell cites a few strains of philosophical thought and scientific theory as its predecessors and/or components: from dynamical systems theory, to chaos theory, theories of information and computation, theories of biological evolution and genetics, cybernetics, game theory, and the science of networks. As she notes, there is no universal agreement on the boundaries of the complexity theory that is constituted by these components. In this book, I discuss the philosophies and theories Mitchell mentions and the more specific models and methodologies that have been developed within these theoretical frameworks (e.g., agent-based simulations and social network analyses). I also include in my discussions the general system theory of Ludwig von Bertalanffy (1968) and the theory of autopoiesis (Maturana and Varela, 1980). General system theory is important, because the roots of today's conceptualizations of complex systems can be found in it (see Chapter 2). Autopoiesis theory has serious and intriguing implications for understanding complex social systems, as I discuss in Chapters 4, 5, and 6.

Sawyer (2005, chap. 2) points out that complexity theory is a descendent of systems theories. He cites the general systems theory, chaos theory, and autopoiesis theory as the “second wave of systems theories” and separates

them from what he calls the “third wave of systems theories,” which is the theory of emergence (see Chapter 3 of this book). He notes that the term “complexity theory” refers to both the second and third waves. I use the term complexity theory in this comprehensive meaning.

The histories of the multiple strains of complexity theory, or the “science(s) of complexity,” have been narrated by Prigogine and Stengers (1984), Gleick (1987), Waldrop (1992), Michaels (1995) and M. Mitchell (2009). In each book the author(s)’ particular conceptualization of complexity theory is presented. I do not cite these historical accounts extensively in this book; I only make brief references to them.

When the concepts of a theory have disparate sources, as is the case for complexity theory, a common vocabulary is necessary for the advancement of that theory, as M. Mitchell (2009, p. 301) points out. I would add to Mitchell’s point that a common conceptual framework in which the terms of such a vocabulary would take on specific meanings is also necessary. This book is an attempt to develop such a framework. In the first part of the book, I describe and elaborate on the basic terms of this vocabulary: nonlinearity, systems, complexity, emergence, self-organization, system dynamics, coevolution, and the like. In the second part, I discuss the epistemological underpinnings and implications of these concepts. The third part of this book is about the methods with which these concepts are operationalized and applied in empirical studies.

## HUMAN PROPENSITY TO SIMPLIFY AND COMPLEXITY THEORY

As M. Mitchell (2009) notes, the concepts and methods of complexity theory are “moving into mainstream science” (p. 301), which in itself is a significant development. But, I think, complexity theory has broader implications. Even in the absence of a coherent framework for it, complexity theory offers a perspective that helps us appreciate the complexity of all aspects of life. In doing so, the theory runs against a basic human propensity: the propensity to simplify. One can find examples of this human propensity in all aspects of life. I want to cite a few examples here.

Conspiracy theories are the most extreme examples of the human propensity to simplify. In these theories complex realities of social life and politics are reduced to simple explanations. The most common theme in conspiracy theories is that there is an omnipotent outside force/entity/actor that meddles in the affairs of our team, tribe, party, nation, etc., to harm us. The complexity of all the events one experiences are reduced to a simple explanation: One omnipotent actor designs and executes a conspiracy to achieve his/her/its own goals and, in doing so, controls all the other actors and forces. If something goes wrong in one’s life, if things change in an undesirable direction, it/they must be caused by this omnipotent actor and



his/her/its ill intentions. In the mindset conspiracy theories are hatched, there is a simple explanation for everything; there are no accidents, no uncertainty, nothing unknown, or unknowable. Stories different conspiracy theorists tell may have different actors and different settings, and the stories may have different variants and some imaginative elements in them, but there still is one core storyline: one omnipotent actor designing and executing a conspiracy. No complexity is allowed into conspiracy theorists' pictures of the world.

Zaitchik (2010) compiled a list of the most popular conspiracy theories in the US in the early 21<sup>st</sup> century. Most of these theories were constructed by the members of various right-wing political groups, the so-called "Patriot" groups, but some by those on the left. Zaitchik notes that conspiracy theories have a long history in American politics. At different points in US history, conspiracy theorists warned against imaginary "malicious intentions" of and the "threats" posed by Catholics, Mormons, Jews, American Communists, Freemasons, bankers, and the US government or its officials and agencies. As these stories went, all these supposedly powerful actors conspired against "the American people" and tried to manipulate, control, or even subdue them, one way or the other.

He notes that recently most conspiracy theories merged into one grand narrative: The omnipotent forces of the "New World Order" trying to take over the US with the ultimate goal of creating one big world government. This is the common theme in various conspiracy stories. In the "chemtrail" stories, air and water vapor contrails that form in the wake of high-altitude aircraft are in fact "clouds of toxic soup being deliberately sprayed by secret government planes executing the designs of the New World Order" (Chemtrails section, para. 2). In the "Federal Emergency Management Agency (FEMA) concentration camps" stories, the federal government is in cahoots with the United Nations (UN), and possibly with some foreign countries, to send urban gangs and foreign troops into the US. These gangs and troops will sweep in from the coasts, confiscate the guns of the people, and round them up to send them to internment camps run by FEMA (FEMA Concentration Camps section, para.1). In the "population control" conspiracy stories, the US will be depopulated by the government in compliance with the "United Nations' plan to create a 'biosphere' out of most of the United States" (Population Control section, para. 4). The reason the UN wants to do this is because it wants to eliminate those humans who put pressure on the environment. These and other conspiracies are all parts of the grand plan to create the New World Order. The conspiracy theorist may disagree on who the omnipotent actors in these stories are, but they agree that there are individual or collective actors with malicious intentions and enough power to control all the other actors to reach their goals.

Conspiracy theories are extreme examples of simplification, but they are not the only ones. The US war on Iraq, which was started by President Bush in the March 2003 and "officially ended" by President Obama