
27. Conclusion: where does complexity and policy go from here?

Paul Cairney and Robert Geyer

After reviewing all of the chapters, trying to put them in a coherent order and then getting them edited and organized (with the help of our excellent Research Assistant, Nicola Mathie), what have we learned about the ‘state of complexity and policy thinking’, the nature of the ‘complexity dilemma’ that confronts academics and policy actors working in this area and some potential future directions?

THE STATE OF COMPLEXITY AND POLICY THINKING

As is well known, complexity-inspired approaches and interpretations in social science have been growing since the early 1990s. More than twenty years later, applying complexity to policymaking is now well established. Complexity thinking has been used in a number of governmental research and policy applications in countries such as the UK, Australia and USA and by international organizations like the OECD and EU. There are a number of academic departments, research institutes, academic journals, organizations and funding bodies that are working on complexity and policy. Typing ‘complexity and policy’ into an Amazon or Google search box generates a bewildering array of scholarly publications and areas to explore. The Edward Elgar book series on complexity (of which this book is a part) is just another general indication of how ‘mainstream’ complexity has become. Clearly, our edited book is just a small part of this larger wave.

Nevertheless, did we notice anything in particular about the contributors, chapters and book that may give us some pointers about the current state of complexity and policy? Looking down the list of contributors, three points immediately come to mind: they are predominately academic, UK/US/English language oriented, and male. The first observation is not surprising. When we sent out our announcements looking for contributors we sent them to academic and policymaker networks. Nevertheless, it is obviously very difficult for busy policy actors to take the time to write an unpaid chapter contribution. A key question for future efforts for complexity and policy thinkers is: can we find a format for encouraging policymakers to contribute to, and take part in, the development of complexity thinking, and make it worth their time? If we really want to engage with policymakers, and believe that complexity improves policymaking, do we need some form of more concise interactive formats to broaden the reach/appeal of complexity? Can academic books be interwoven with blog posts, websites, social media and other communication tools? This is clearly something that we need to think about and act upon in the future if we want to take complexity further out of the realm of academia.

Second, most of the chapters, with some key exceptions, were heavily oriented to the English-speaking world. This is an obvious bias that comes from who we are

(English-speaking academics working in the UK), the language that we work in, and our key reference points. Despite our desire to make the book as international as possible we were very limited in what we could achieve. Nevertheless, the few cases we were able to include, such as policing in Brazil, emergency preparedness in Sweden, firm networking in Italy, and migration policy in China, point to the possibility of further comparative and international areas that could be explored. Larger projects that are able to bring together and assess the development of complexity thinking and activities in the non-English-speaking world would be particularly fascinating and something we hope to see in the future. Moreover, despite some recent growth in complexity-oriented international academic organizations, work on complexity and development is still rare. How complexity relates to the developing world is a huge area of interest and potential. As Graham Room explored in his chapter on power, complexity does have a great deal to say about the global inequalities and the power imbalances that maintain them. Exploring this issue would clearly make complexity more relevant to academics and policy actors in those parts of the world.

Third, why is the book so male dominated? Again, we admit our obvious biases: we are both male, and the networks which we contacted were predominately male. In general, and as in many areas of social science such as political economy, complexity seems currently to be a largely male dominated academic area. We feel that this is partially a reflection of its links to the natural sciences, where men tend to be numerically dominant, and to the general dominance of men in the upper levels of academia. Nevertheless, it is an obvious weakness in a book applying complexity to policy because so many of the actors in policy sectors are women. Finding a strategy and language to reach out to these policy actors, to 'polish the gem of complexity' as Catherine Hobbs argues in her chapter on local policy, is a major challenge for complexity thinkers and researchers.

One small part of the solution may lie in our attempts to identify links to the current literature. We have identified the ties between the complexity theory literature, as applied to policy, and well-established literature in the social sciences. By identifying this broader knowledge, we can reflect on the extent to which we routinely draw on, and cite, the work of women. For example, complexity has potentially strong ties to new institutionalism, and rational choice variants such as the Institutional Analysis and Development framework pioneered by Elinor Ostrom. We may also reflect on the links between complexity theory, institutionalism and feminist research, since they have a common focus on the routine rules and biases that reflect and reinforce inequalities. In the face of a complex world and a limited ability to understand it, people often behave in quite predictable ways and produce regular patterns of behaviour when they interact. They produce simple rules to deal with complexity. They deal with an almost infinite amount of information, and ways in which to understand it, by relying on cognitive short cuts, to decide what information to process and how. These short cuts can include individual habits and social norms, many of which are difficult to change when they become established. People develop beliefs and groups of people often develop shared ways of thinking, which can involve the power to establish dominant ways of thinking and acting, to benefit some and often marginalize others. Governments operate in a comparable way, breaking their policy responsibilities into a series of departments and units, each of which has some potential to develop its own 'standard operating

procedures', to decide where to seek information and how to process it to make decisions. In that context, the study of policymaking is about identifying those rules, how stable they are, and how they might change. If we can draw further on feminist and related research, our studies may focus increasingly on how institutions and patterns of behaviour should be challenged.

A PRAGMATIC APPROACH TO THE COMPLEXITY DILEMMA

As academics who have been working with complexity and policy for over a decade, we are often struck by what can be called the 'complexity dilemma' or 'complexity tension'. Fundamentally, this means that we live in societies that are infused with the traditional rationalist and orderly 'scientific' framework. In this tradition, one is continually tempted to try and break a complex world into a simple model, and use a small set of simple rules, based on linear cause and effect, to help control the policymaking system and solve policy problems. From this perspective, with enough human effort, knowledge or evidence, the problem can be understood, responsibilities allocated to key actors, policy outputs applied and outcomes measured. The obvious difficulty for those working in the field of complexity is, as Derrida is claimed to have said, 'if things were that simple, word would have gotten round'!

Instead, we have to be pragmatic when faced with perhaps insurmountable problems regarding our knowledge and control of the world. Pragmatism involves a recognition and acceptance of the limits of our knowledge and understanding, and ability to gather evidence, developing models when we know that they only tell us part of the story, and adapting to policymaking situations that are often beyond our control. This does not mean that there is no such thing as progress. Human knowledge is progressing all of the time and at an incredible rate. The problem is that human interaction and social development, as well as its interaction with the natural world, continues to change. Hence, there is always more to learn. Complexity never dies unless the system becomes a closed linear one and we would certainly not want to live in such a system.

The difficulty is that such an uncertain and 'wishy-washy' approach is difficult to defend in the context of a policy process that demands clear evidence and solutions from academics and holds elected officials and policymakers to account for outcomes over which they have limited control. Again, this does not mean that complexity thinking implies that there should be no policy accountability or responsibility or that all policy audits/targets are a burden. What it demands is a balanced and pragmatic approach to the strengths and weaknesses of all types of policy. Again, this is difficult to 'sell' to pressured policy actors working in an open political and media context that demands policy action X should lead to policy outcome Y. Moreover, although this dilemma can be found in almost all areas covered by the book, the meaning and nature of the pragmatic response to this dilemma varies markedly by topic and according to the audience with which we engage. So, in the conclusion, we use these themes of complexity dilemmas and pragmatism to sum up a range of debates on complexity research, as they apply to theory and practice.

THE COMPLEXITY DILEMMA AND SCHOLARSHIP: THE IMPORTANCE OF CHALLENGING ‘REDUCTIONISM’

It is in this context of dilemma that we should understand the often bold challenge to ‘reductionism’ in science. The pursuit of complexity science has parallels in the historical pursuit of science and the modern scientific method. The latter’s merits were stated so boldly in the past because they represented a rejection of paradigmatic religious belief as the basis for understanding the world. Instead, ‘positivist’ science was based on gathering evidence through induction, with your own eyes, instead of relying on faith. Further, since the social stakes were so high, it was difficult for scientists to express uncertainty about their methods and results. Now, in a period of scientific ascendancy, the challenges of uncertainty and complexity can be articulated and addressed in a more open way.

This complexity challenge is often made in a polemical way, by setting up complexity science as a fundamental rejection of the assumptions and methods of the past, and with reference to a stylized form of naïve ‘positivism’. This tradition is continued in the chapter by Givel, who provides a critique of current policy science, particularly as it is practised in the US. Yet our broader aim is to reintroduce a sense of uncertainty about what science can achieve and how certain we should be, by rejecting the idea that we can understand complex systems by breaking them down into their component parts and determining the relationships between them. Rather, complex systems are greater than the sum of their parts, and elements interact in ways that are difficult to measure.

When applied to policymaking, in theory and practice, this broad complexity debate has two distinct elements. First, the key tenets of complexity may not represent such a radical rejection of social or political science because, while some ‘positivist’ methods and approaches may be more prominent in academic journals, there is not a sense of ‘one best way’ to do research. Ever since the rise and success (particularly during the industrial revolution) of linear rational science based on reductionism, causality, predictability and determinism, a whole range of scientific, philosophical and policy-related actors have been challenging its dominance. So, the issues and concerns we raise often chime with earlier debates – from the concerns of ‘instrumentalist’ policy thinkers in the 1950s and 1960s, the philosophical Pragmatists of the early twentieth century, and all the way back to Kant who argued against a ‘mechanical’ vision of nature and humanity. Of course, each policy area tends to have its own unique historical developments and language – see, for example, the chapter on the post-WWII development of complexity and planning by de Roo. Nevertheless, the general trends are remarkably similar.

Complexity theorists can therefore find elements of their arguments already rehearsed in debates on ontology and epistemology that have always been a feature of social science. For example, Morçöl draws on discussions of positivism and critical realism, while Little draws on discussions of reality, while both examine debates (which both relate to Bent Flyvbjerg) on the relative merits of in-depth case study versus broader quantitative analysis. Further, as we discuss in the introduction, we can trace many complexity themes to well-established studies of punctuated equilibrium, path dependence, governance and implementation studies. Complexity theory may represent a new package of ideas, described in a new way, with far greater parallels in the natural sciences than most theories, but many elements are already well understood in policy studies.

Second, however, as scholars we operate in a system that often seems to favour

particular academic activities. We are increasingly asked to reinforce a simple understanding of the world by demonstrating the ‘impact’ of our work on it, in a linear manner which suggests very simple mechanisms of cause (we provide new knowledge) and effect (it has an important impact on the way that other people think and act). Without this clear ‘evidence base’, and the identification of linear causal relationships, impact is difficult to demonstrate, and scholarship may be deemed invalid and become rejected or go unfunded. To compete in this context, complexity thinkers may be tempted to make large claims for their work. The difficulty is that complexity thinking is fundamentally about uncertainty and emergent processes, and complexity theorists face a choice of betraying their fundamental positions or continually losing out in the battle for influence. Though it sounds trite, complexity does force one to recognize that scholarship is both a political and academic enterprise.

How might we respond to such a dilemma? As a whole, the chapters in this book provide a mix of suggestions, from engaging in scholarly debates, providing the tools to have a direct impact on policymakers and organizations, and providing new analyses of case studies to better understand the real world. For example, the theoretical chapters provide various ways in which to respond to a sense of novelty and continuity, with some authors challenging (Givel) and others reinforcing the value of existing theories in their disciplines (Wellstead et al., Tenbensen), and some challenging their disciplines to combine established and complexity ideas (Webb, Little, Morçöl, Room). Others (particularly Mitleton-Kelly and Price and Haynes) argue that complexity does provide an overarching framework and practical tools that can make a clear impact on policy. They demonstrate this through the use of their policy toolkits and the way in which they have applied them to various policy situations. Similarly, the various chapters on modelling (in particular: Johnson, Edmonds and Gershenson, and Hadzikadic, Whitmeyer and Carmichael) explored the potential of complexity-inspired modelling tools to add to our understanding of particular policy areas and situations.

A collection of chapters demonstrate the descriptive and prescriptive aspects of complexity thinking, showing how policymakers and organizations deal with complexity and how they can reasonably be held to account. For example, Little argues that people and organizations deal with complexity by developing distinctive, simple understandings of the world, producing their own sets of rules about how to process information and act. These understandings and rules are based on a snapshot of time, and quickly become dated, but they also endure in common knowledge and institutions which are difficult to challenge and change. Policymaking therefore involves the interaction between a wide range of people, institutions, and new events and knowledge, in often unpredictable ways, partly because people respond to information using dated rules. Little’s contribution connects well with Haynes’ study of the economic crisis, which largely represents the outcome of multiple institutions furthering a very partial and often dated understanding of the global economic system, and struggling to adapt to key changes. It also informs Gray’s critique of healthcare responses to pandemics. If we combine their insights, we can begin to understand why people and organizations fail to adapt quickly to quickly-changing circumstances: they process information through well-established lenses, which often distorts their understanding of rapid and unpredictable change. While these insights perhaps entail a sense of hindsight bias – we can only really understand these events after they have occurred and, by then, the world has

moved on – they also prompt us to recognize the important limitations of established institutions and ways of thinking.

THE COMPLEXITY DILEMMA IN THE REAL WORLD: WHAT IS A PRAGMATIC PRACTITIONER?

If such ways of thinking are limited, and potentially damaging, what might we replace them with? How should people think and act pragmatically when they engage in complex policymaking systems? In the area of political practice, ‘pragmatic’ can mean very different things for each audience. For example, Wellstead et al.’s critique of complexity theorists in the natural sciences is that they identify complexity in the natural world but not the political process, which is often treated as a ‘black box’ in which to inject knowledge and expect a direct and proportionate response. In that sense, pragmatism refers to the need for scientists to understand the limited impact that they may make simply by raising problems and expecting knowledge to have a direct impact on policymaking.

Rather, they should adapt to the policymaking world in which they seek influence, by seeking to identify where the ‘action’ is in a political system, engage with the right people and organizations, form coalitions with like-minded actors, find the right time to identify problems, find the right way to ‘frame’ problems for powerful audiences – and, perhaps most importantly, recognize that, in democratic political systems, many other people have an as-legitimate role as providers of knowledge and opinions. In other words, they could learn a lot from interest groups which often maintain multi-level lobbying strategies, either directly or as part of networks.

In that context, many of our modelling chapters come into play, as a collection of strategies that can be used to engage with policymakers. Most notably, many chapters identify the role of agent based modelling, which can generate scenarios and outcomes that can be used to inform policymaking. The models do not tell us what will happen, or what we should do. Rather, they help provide some clarity by identifying the outcomes of a large number of interactions between people following simple rules, and encouraging policymakers to think about those outcomes and set priorities.

The dilemma for elected politicians and civil servants is more complicated, since there is often a large gap between how they can act and how they must account for their actions. So, on the one hand, complexity thinking can be used to reject the idea that power is concentrated in the hands of a small number of people in central government, or that a government can control policy outcomes. Instead, they can adapt to their policy environments and seek to influence various parts of it, while accepting that the interaction between large numbers of people and institutions makes control of a whole policymaking system impossible.

On the other hand, elected policymakers have to justify their activities with regard to well-established accountability mechanisms – such as in the UK where government ministers are accountable to the public via ministers and Parliament. The media and public expect ministers to deliver on their promises, and few ministers are brave enough to admit their limitations. Civil servants may also simultaneously receive policymaking training which encourages them to think about complexity and the limits to their influence, and management training to encourage them to use simple rules and techniques to

exert control over their policymaking tasks – again, because their knowledge of what is possible rubs up against what is expected of them.

Being pragmatic in this context is not easy. It is a topic which can be informed by complexity thinking, but only if we move some distance from our original polemical stance. In other words, it may be sensible to produce a range of measures based on a more realistic policymaking philosophy, and potential strategies including: relying less on centrally driven targets, and punitive performance management, in favour of giving local bodies more freedom to adapt to their environment; trial-and-error projects, that can provide lessons and be adopted or rejected quickly; and, to teach policymakers about complexity so that they are less surprised when things go wrong. Yet, as Tenbenschel makes clear, these strategies should not be selected simply because we reject a caricature of top-down policymaking. Rather, we should consider how complexity thinking can be compared to what actually happens in government, which forms relationships with organizations using a mix of government, market and network solutions. We should also reflect on the limited role of outcomes-based measures of policy success, since they involve outcomes that span decades and are therefore difficult to reconcile with elections that appear every four to five years.

Practitioners at the ‘street’ level do not operate in the same kinds of conditions. Indeed, Michael Lipsky’s classic study of street-level bureaucrats already highlights a degree of pragmatism in some professions, which recognize their inability to fulfil all government objectives and, instead, fulfil an adequate number while maintaining a degree of professional morale (see our introductory chapter). To do so, they draw on a simple set of rules generated through professional practice and experience. In this case, complexity thinking has relatively little to offer. In contrast, it may be profoundly useful to examine cases in which things go profoundly wrong, when their simple rules contribute to catastrophic events. An excellent policy example of what a complexity oriented approach can do is found in the 2011 *UK Munro Review of Child Protection* (<https://www.gov.uk/government/publications/munro-review-of-child-protection-final-report-a-child-centred-system>). Following a string of high-profile child abuse cases, Professor Eileen Munro was asked to carry out a wide-ranging and in-depth review of UK child protection policy. Inspired by systems and complexity thinking, Munro produced an impressive document that highlighted the failings of the former well-intentioned but misguided approach that resulted in a tick-box culture and a loss of focus on the needs of the child. These weaknesses were further amplified by a media and public culture which demanded that ‘lessons must be learned’ and some individual or process must take responsibility/blame.

The core problem, which the Review made clear, was that in highly complex situations there are no simple solutions, lines of responsibility or easy targets to blame. What made this situation even worse was a knee-jerk governmental response that demanded ever-growing targeting and audit regimes to show that ‘lessons’ had really been learned. The difficulty, as the Munro Review aptly demonstrated, was that this did little for the actual protection of children, while greatly complicating the policy process of child protection. Hence, one of the key conclusions of her report was that there needed to be a radical reduction in central prescription in order to help social workers move from a compliance to a learning culture, and that we had to recognize that the larger societal pressures to find ‘someone to blame’ (amplified by the mass media) misshaped the policy response to child protection.

Finally, the existence of complexity presents a dilemma for the public: it should accept that it cannot simply blame a small number of elected ministers for the ills of government. On the other hand, it should not absolve government entirely; complexity should not be an excuse used by policymakers to take no blame for their actions. In this case, Room's chapter develops insights regarding our ability to hold groups of people to account for the ways in which they act, and interact with each other, to produce outcomes that disadvantage other groups. He explores the argument that 'emergence' does not necessarily represent an unpredictable outcome that no one can control or be held to account for. Rather, people benefit from the outcomes that emerge from the simple rules maintained by some powerful groups. Accountability is about, for example, focusing on the ability of policymakers to challenge the simple rules that benefit some at the expense of others.

We have more work to do to produce clear and practical advice to policymakers that they can use and defend. Getting people to agree that policymaking systems are complex is easy. Working with them to produce pragmatic strategies, to adapt to complexity, is hard. Getting them to prioritize these strategies, in the face of media, public and parliamentary pressures to hold them to account for their decisions, may often seem impossible. Yet, in several chapters, we can see that these conversations are taking place. Price et al. use complexity thinking to engage with a range of local policymakers to further the spread of ideas. Mitleton-Kelly goes one step further, using complexity thinking to study and help reorganize policymaking organizations. Hobbs makes a clear argument for the role of complexity in local government. Meanwhile, Tenbensel and Gray identify applications to health, while de Roo makes similar arguments in the field of planning.

FUTURE DIRECTIONS, CURRENT CHALLENGES

In many ways, the challenges faced by complexity scholars now are similar to challenges faced in the past. First, it is difficult to get a sense of the 'state of the art' in complexity theory, to establish what we know and still need to know. We can, to some extent, address this question in edited volumes, but this Handbook highlights the diversity of understandings and approaches. It does not represent a 'systematic review', which seeks to identify a comprehensive list of sources and code the literature's main themes and conclusions – and it remains to be seen just how possible it is for a review to produce a consistent set of ideas. It also only scratches the surface (in an admittedly biased way!) of political practices across the globe, and we may need to go beyond the academic book, to invite a large number of people to tell their 'complexity stories', in theory and practice, before we know just how far the concept reaches, and how useful it is, as a source of a common language to describe policymaking.

Second, it is not clear just how far we have come in generating a language of complexity that everyone understands and shares. It is clear, even from the chapters of this book alone, that different people understand complexity, and seek to apply its insights, in very different ways. This can be a useful outcome, when the language of complexity is used widely, to challenge existing approaches in a range of disciplines, prompting scholars to modify their arguments to engage with the language of their audience. Terminological spread can be a good thing, if good ideas spread to many audiences, prompting new ideas to develop. However, as Edgar Morin noted in his 2005 essay on 'restricted and general

complexity', this outcome can also reflect a tendency to treat complexity primarily as a metaphor (or shorthand for complicated), which undermines our ability to tell if these arguments can be pulled together, or if we can accumulate insights in a meaningful way. This problem is magnified when we seek to combine insights from the natural and social sciences: we use the same language of complexity and emergence, but to refer to very different processes. As Morçöl describes, the social sciences seek to understand the operation of complex individuals in complex worlds, adding an extra layer to explanation. In this respect, this book represents a microcosm of that problem: each author engages, to a greater or larger extent, with key terms, focusing perhaps most on the idea of 'emergence', but not presenting detailed or common arguments about what it means and what its implications are.

Putting these ideas together often seems like an impossible task. Take, for example, a case study of mental health and policy. The instant problem is that we can identify *multiple* complex systems. When we apply these insights to individuals, we find that the brain is a complex system, in which thoughts, feelings and actions result from the interplay between nodes and neurons. That person may have 'complex needs', which refers to a wide variety of social and institutional responses to their demands on social and public services. Public organizations and institutions may operate within a complex policymaking system, in which mental health only appears very infrequently on the high-level political agenda, and in which policy is often made locally in the relative absence of central direction. The continually emerging and evolving cultural position of mental illness within a society adds another layer of complexity. Policymakers also operate within complex international systems, in which governments and organizations form networks, share information, and coordinate action. Even in this short example, we have identified multiple interrelated complex systems and types of complexity. Finding a language in which to study these issues as a whole, and a method that transcends each element of study, may seem like an insurmountable task, prompting us, again, to be pragmatic about the extent to which we can understand and influence our object of study.

In the end, we do not pretend to have the answers to these problems. Rather, our hope is that by continually adding 'bits and pieces' to the academic debates, working with policymakers on particular problems and teaching our students about complexity, small changes will continue to build and basic attitudes and beliefs will shift in a complexity direction. Whether you are a complexity 'convert', 'dabbler' or just curious about it, we hope that you have enjoyed this book, that it will spark your interest and help to add to the debate and larger process.

