‘Pragmatic complexity’ a new foundation for moving beyond ‘evidence-based policy making’?

Professor Chris Ansell
Professor Robert Geyer

Introduction

Despite a plethora of academic criticism for the past few decades, the realm of policy still remains dominated by the rational, positivist and quantitative approaches of New Public Management (NPM), ‘evidence-based’ approaches (EBPM) and target/accountancy oriented ‘scientific’ management. These approaches tend to have a top-down, centralising and hierarchical tendency in relation to policy actors and stakeholders and often imply a much greater degree of certainty and knowledge than is realistic within most policy situations. This dominance (despite its weaknesses) rests on its ‘scientific’ foundation, perceived utility and lack of an acceptable and practical alternative framework. Two notable attempts to develop an alternative to this dominant framework, however, have come from the older tradition of American pragmatism and the newer approach of complexity. We propose to bring them together to provide a positive alternative to these modernist ideas, one that conditions but does not reject the value of scientific rationality.

In this article, we will focus our attention on EBPM, whose star is still on the rise. Evidence-based policy making is an extension of the movement for “evidence-based medicine” (EBM), which predated it and sought to harness hospital and physician decision-making more tightly to scientific evidence. By the late 1990s, the idea of EBPM began to be extended from clinical medicine to policymaking in general. A key impetus came from the UK Labour Government, which adopted evidence-based policymaking as a core framework for evaluating policy ideas. While social scientific knowledge about policy has never been absent from policymaking, what was distinct about this movement was the breadth and primacy given to the role of knowledge in setting and implementing policy. Many critiques of evidence-based policymaking followed. Parsons (2002) argued that EBPM assumes a managerial and mechanistic model of policymaking that depoliticizes knowledge and ignores uncertainty and public values. Sanderson (2002) observed that EBPM underestimates the challenges of establishing causality in order to determine “what works.” Greenhalgh and Russell (2009) argued that EBPM downplays how policymaking fundamentally requires democratic deliberation about values.

The theoretical challenge of this critique is how to avoid throwing the baby out with the bath water. Clearly scientific knowledge is valued in policymaking and can have great legitimacy with citizens. Many of the critics are not arguing against the value of scientific knowledge per se, but against the way it is harnessed to a model of top-down rational policymaking. We argue that a marriage of pragmatism and complexity theory can provide a positive alternative conception of the relationship between scientific knowledge and decision-making. Both acknowledge the value of knowledge, while appreciating its limits. While pragmatism offers a way to integrate science together with democratic deliberation and values, complexity theory offers an alternative conception of science appropriate for policy process.

In this article we will introduce some of the core concepts of pragmatist philosophy and complexity theory relating to policy making and governance and position ourselves relative to the broad sweep of both perspectives. Then, we will examine the implications of 'pragmatic complexity' for EBPM and briefly explore drug policy as a case study of how pragmatic complexity might be applicable and conclude with a short discussion of the potential for pragmatic complexity to function as a new framework of public policy.

What do we mean by pragmatist philosophy?

Pragmatism developed as a distinct philosophy and political perspective in the 19th century U.S., though in constant interchange with European philosophical traditions and political developments (Menand 2001; West 1989). On a philosophical level, the first generation of Pragmatist philosophers—notably, Charles Peirce, William James, John Dewey, and George Herbert Mead—took up the task of breaking down the dualisms they saw as plaguing Cartesian and Kantian philosophical traditions. In response, they developed a practical, experiential philosophical perspective that emphasized the dynamic process of individual and societal development.

Beginning in the 1970's, a number of intellectual and political developments came together that eventually led to a major revival of Pragmatism. Inspired by the linguistic turn in philosophy, the post-analytical American philosopher Richard Rorty wrote *Philosophy and the Mirror of Nature* (1981)—a spirited attack on the conception of philosophy as the bedrock of all knowledge. Rorty counter posed this conception of philosophy with John Dewey's appreciation of philosophy as a practical enterprise that rejected "the quest for certainty." In *Between Objectivism and Relativism* (1983), American philosopher Richard Bernstein wrote approvingly of the philosophical turn towards more practical notions of rationality and highlighted important pragmatist contributions to the understanding of practical rationality. Similarly, Donald Schön's *The Reflective Practitioner: How Professionals Think in Action* (1983) built on Dewey's model of inquiry to demonstrate how different professions used experience, reflection, and improvisation to solve problems. Finally, building in part on George Herbert Mead's understanding of the role of communication in social development, German philosopher Jürgen Habermas published *A Theory of Communicative Action* (1989), sparking an interest in "deliberative" forms of democracy.

Pragmatism is not an easy philosophy to summarize in a few short sentences. The interests of the early pragmatists ranged across logic, semiotics, aesthetics, psychology, learning, social theory, and political theory, and contemporary pragmatists have equally broad interests. A common theme running through pragmatism is a dynamic conception of human development that can be referred to as "evolutionary learning" (Ansell 2011). Pragmatists emphasize that learning is an on-going process of problem-solving, deliberation, experimentation, sedimented over time as experience, identity, habit, skill, and knowledge. Knight and Johnson (1999) have argued that pragmatism is compatible with a rational choice conception of action and they are correct in the sense that both stress that actors are purposive and both are concerned about the consequences of action. However, a pragmatist conception of action diverges from rational choice by emphasizing that 1) much of behavior is habitual, reflecting sedimented experience and learned skills; 2) that values arise in the

process of problem-solving and are often incommensurable; 3) that actors confront specific contextual challenges creatively, often using imagination to rehearse possible courses of action; 4) that communication is central not only for social coordination, but also in the constitution of identity; 5) that emotion is intertwined (often positively) with cognition; and 6) that means and ends continuously influence each other (Whitford 2002; Beckert 2003; Cohen 2007; Hodgson 2010). Taken together, this attention to learning, problem-solving, habit, experience, skill, creativity, communication, and iterative action represent a distinctive conception of practical rationality.

Pragmatism uses a 'both/and' approach to empirical or normative perspectives and the fact/value dichotomy. For example, with respect to learning, pragmatism may be read as saying "learning is good" (normative) or "be attentive to the way that much behavior is learned" (empirical). In any case, pragmatism's anti-foundationalism and its naturalization of ethics lead it to be more concerned about the *process* of ethical action than its philosophical *first principles*. Even where pragmatism is being normative, it tends to shift attention from the "context of justification" to the "context of discovery" (Caspary 2000). Yet Pragmatism does not preach an opportunistic "whatever works" view of the world, as sometimes accused. It is vitally interested in human values and a Pragmatist ethics has been advanced for several policy-related fields—environmental ethics (Pearson, 2014), bioethics (Pamental 2013) and science and technology ethics (Keulartz et al. 2004).

A number of authors have noted how pragmatism helps us address the challenges of incorporating knowledge into policymaking. In the field of health psychology, for instance, Cornish and Gillespie (2009) argue that the attraction of Pragmatism is that it is pluralist with respect to knowledge, but at the same time non-relativist (However, for a recent debate about pragmatism and pluralism, see Talisse and Aikin 2005). Thus, it is able to appreciate different kinds of knowledge, while viewing this knowledge as warranted by different uses, purposes, and contexts. Thus, randomized controlled trials are understood to be useful for certain purposes, but not the "the gold standard" of a hierarchy of knowledge. Other types of knowledge—including practitioner's qualitative knowledge—may be equally valid or useful for other purposes and contexts. Because of this respect for different kinds of knowledge, Pragmatism has been regarded as providing a philosophical foundation for "mixed method" evaluation (Maxcy 2003; Hall 2013).

Popa et al. (2015) argue that pragmatism provides a model for integrating different types of knowledge together to address challenging sustainability problems—an idea known as "transdisciplinarity" in the field of sustainability research. They argue that sustainability problems are "characterized by uncertainty, instability, uniqueness and value conflict" and therefore they "do not fit the prevalent model of technical-instrumental rationality" (2014, 47). Under such conditions, transdisciplinarity can avail itself of a pragmatist conception of reflexivity, which they define as "open-ended processes of inquiry geared towards a broadening of the community of practice through social innovation and experimentation" (2014, 48). This conception of reflexivity moves away from the "reductionist model of positivism" and instead conceives of research as a "socially-mediated process of problem-solving based on experimentation, learning and context specificity" (2014, 48).

In a critique of the evidence-based movement in education, Biesta (2007) advances a similar argument, suggesting that a fundamental problem with this movement is that it assumes a clear

technical separation between ends and means. Such an assumption is unwarranted in the field of education, which is an "open and recursive system" and a "process of *symbolic* or *symbolically mediated* interaction" (2007, 8; author's emphasis). As such, education requires on-going and adaptive value judgments. He argues that Dewey's ideas about the continuous interaction of ends and means and the idea that ends—as well as means—are subject in inquiry and revision are better suited to the domain of education. Moreover, he argues that for Dewey, evidence would not be regarded as "rules of action," but rather as "hypotheses of intelligent problem solving" (2007, 17). A similar of saying this is that evidence can be treated as heuristic as opposed to algorithmic (van Aken 2005).

Thus, pragmatism contextualizes, but does not abandon the goal of collecting and using of knowledge. It is sensitive to the need to bring different types of knowledge together and reflexive about the values inherent in knowledge production. To deepen this analysis, we can further explore how pragmatism orients us to three fundamental questions about any public policy situation: *What is problematic? What values are at stake?* And *what is possible?* These questions lead to appreciation of three corresponding dimensions of the policy process: *problem-setting*, *deliberation*, and *experimentation*.

What is Problematic?

Whether as a normative lens or an empirical perspective, pragmatism encourages us to orient ourselves to the concrete situations in which policy issues arise, focusing in particular on the opportunities or demands for action entailed by these situations. For example, a pragmatist conception of democracy opposes ideal conceptions of democracy by taking the world as it is and focusing on the concrete challenges it presents (Fung 2012). The focus on the concrete situation orients us to the embeddedness of individuals and groups in historically specific webs of activity and focuses on the *problems* that arise in the course of this activity.

For a pragmatist, *problems are themselves problematic*. The precise contours, definition and full meaning of a problem are often uncertain and contested, prompting inquiry into the problem and deliberation about what it means and how to solve it. Thus, problem-solving is a skilled and creative endeavor, which means that individuals and groups will vary in their capacity to address problems. Because problems trigger reflexivity and are opportunities for learning and growth, and because they are problematic, a pragmatist approach to public policy is vitally interested in the problem-solving strategies adopted by individuals and groups (Ansell 2011).

If problems are themselves problematic, the first step in any problem-solving process is problem-setting or problem definition. Schön makes the point clearly:

> When ends are fixed and clear, then the decision to act can present itself as an instrumental problem. But when ends are confused and conflicting, there is as yet no 'problem' to solve. A conflict of ends cannot be resolved by techniques derived from applied research. It is rather through the non-technical process of framing the problematic situation that we may organize and clarify both the ends to be achieved and the possible means of achieving them (1983, loc. 665).

Pragmatism, however, does not consider problem definition a neat and compartmentalized stage that simply precedes the more important business of problem solving, particularly under complex and uncertain conditions. The definition of the problem is provisional and must be revisited in the face of feedback from attempts to solve the problem. Andrews, Pritchett and Woolcock's (2013) discussion of problem driven iterative adaptation as a strategy for dealing for development programs provides a good example of how the interaction of problem-setting and problem-solving can work in practice.

What Values are at Stake?

Pragmatism's focus on problem-solving is often read as a narrow instrumentalism. But a wider reading demonstrates a more humanistic concern with the source and fate of values (Selznick 2008). Pragmatism encourages us to see values as contextual and valuation as a process, as opposed to understanding them as objective qualities of things or as embodied in fixed moral rules (Stuhr 2003; Klamer 2003; Stark 2011). Furthermore, by shifting away from a "spectator model of knowledge" towards a more practical conception of knowledge, pragmatism rejects the notion that knowledge can be value-neutral. Knowledge must therefore be assessed in terms of "whose problems" are being addressed. Yet because valuation is a contextual and processual and because knowledge is fallible and provisional, the articulation of the relationship between knowledge and values is at least partially emergent and constructed rather than fixed and transcendent. This stance towards the relationship between knowledge and values leads pragmatism to stress a collaborative process of communication and deliberation in surfacing, understanding, and negotiating values (Ansell 2016).

A distinctive feature of the pragmatist model of deliberation is that it is linked to inquiry (Bowman 2004). Inquiry involves the "elucidation of meaning" (Festenstein 2001, p.734) and requires self-reflection on one's own beliefs, interests, and values. pragmatist inquiry does not somehow magically dissolve political conflict, but rather helps to illuminate and deepen our understanding of our own and others' beliefs, values, and interests (Evans 2000; Atkins, Hassan and Dunn 2007). Deliberation and community create one another. As Cohen notes, deliberation does not merely bridge between the gaps in human minds, it is also an activity that "constitutes" individuals and communities (Cohen 2012, p.147). This conception of deliberation has encouraged democratic theorists and governance scholars to investigate "publics" (Fung 2002, 2003; Goodin and Dryzek 2006) where they have found that deliberation allows groups to "emancipate" themselves to some degree from "symbolic politics," opening up these publics to a wider discussion of issues. For the 'critical pragmatist' John Forester, knowledge claims are not only fallible (the conventional pragmatist stance) but also systematically represent power relations (Forester 2013).

One implication of Pragmatism's concern for reflexively surfacing and deliberating about values is that it is often problematic to sharply separate deliberation about values and production of knowledge (see also Parsons 2002). Davoudi (2006) describes the development of an evidence-based approach to waste management in the UK that sought to keep technical issues separate from larger political concerns. He observes that "[t]he cost of this insistence on keeping the process

apparently free from political controversies was the loss of legitimacy and political support for the outcome" (2006, 687).

What is Possible?

After focusing on what is problematic and inquiring into the values at stake, pragmatism asks what can be done to advance the situation. This focus on what is possible is sometimes described as *meliorism*—a belief that the world can be improved by human effort. However, there is more to it than moral optimism. The "possible" draws together past, present, and future. Asking "what is possible?" inflects the problem with an orientation toward the future. What can be done in the present situation, given what we bring from the past, to productively move us in to the future? This problem-solving triangulation between past, present, and future leads to at least three important consequences for governance and policy making—an emphasis on the creativity of action, a focus on the value of experimentation, and an active search for governance forms that improve the quality of public policies and democratic governance.

Experimentation is an important pragmatist motif reflecting an acknowledgement of the fundamental uncertainty of the world, an emphasis on learning-by-doing, and an openness to creative discovery. However, its conception of experimentation calls for the development and use of a range of experimental tools that go beyond randomized controlled trials (Ansell 2012; Ansell and Bartenberger forthcoming). For example, it might embrace concepts of experimentation connected with "design experiments," (Stoker and Johns 2009), "adaptive governance" (Brunner 2010) and "democratic experimentalism" (Dorf and Sabel 1998; Sabel and Zeitlin 2008; De Búrca, Keohane and Sabel 2014).

What do we mean by complexity?

Complexity, a general term covering a wide range of complex, adaptive, emergent systems and phenomena, has grown rapidly since the 1970s (Coveney and Highfield 1995; Mainzer 1997). Institutionally, there are now a wide variety of complexity centres and institutes around the world and a growing list of MOOC (Massive Open Online Courses) on various aspects of complexity. Since the 1990s, it has established footholds in all of the major areas of social science. A few of the more recent examples include: in philosophy, sociology and social theory (Byrne and Callaghan 2013; Castellani and Hafferty 2009; Smith and Jenks 2006), in politics and general public policy (Colander and Kupers 2014; Geyer and Rihani 2010; Geyer and Cairney 2015; Morçöl 2012; Room 2011), in management and economics (Arthur 2014; Beinhocker 2005; Stacey 2012) and in international relations (Clemens 2013; Harrison 2006; Root 2013). There is also a wide range of works in particular policy areas including: Blackman (2006) in social policy, Davis and Sumara (2006) and Trueit (2012) in education policy, Kernick (2004), Sweeney (2006) and Sturmberg and Martin (2014) in health policy to name just a few. Since the early 2000s a range of new journals have also emerged. Some of those that focus on policy include: *Emergence: Complexity and Organization*, *Journal of Policy and Complex Systems*, and *Complexity, Governance and Networks*. Even governments and international organisations are beginning to support complexity-based research programmes and approaches see: OECD Global Science Forum 'Applications of Complexity Science for Public Policy' (2009), UK Munro

Review (2011) and Australian Government 'Tackling Wicked Problems Report' (2007). In a recent article, L. Douglas Kiel (2014) argued that complexity theory has already gone through an 'emergence', 'convergence' and 'proliferance' phase and now expects to see a final 'divergence' phase develop. Clearly, complexity has come a long way.

In a field with such interdisciplinary and paradigmatic potential there are multiple debates over the breadth, definition and implications of complexity. Richardson and Cilliers (2001) divided the field into three main schools: reductionist complexity science, soft complexity science, and complexity thinking. For Morin (2008) there is just one central division within the field of complexity between more 'restricted' and 'general' interpretations. This is similar to Byrne's (2005) division between 'simple' and 'complex' complexity. The restricted form is based in the mathematical, physical and computer sciences and is focused on the creation of a number of computer based quantitative methodological tools (agent-based and network modelling in particular). On the other hand, general complexity for Morin required an 'epistemological rethinking' and a much more substantial paradigmatic challenge to the reductionism, determinism, simplification, causality and linearity of the traditional scientific perspective. For Morin, with the development of concepts like irreversibility, chaos, emergence and self-organisation, complexity could not be reduced to a restricted array of methods and fields, but reshaped the entire meaning and endeavour of science and public policy.

Our approach to complexity is positioned within Richardson and Cilliers' complexity thinking school, Morin's 'general' complexity interpretation and Byrne's 'complex' complexity approach. In this tradition, complexity:

> is about systems whose internal structure are not reducible to a mechanical system. In particular, it is about connected complex systems, for which the assumptions of average types and average interactions are not appropriate and are not made. Such systems coevolve with their environment, being "open" to flows of energy, matter, and information across whatever boundaries we have chosen to define. These flows do not obey simple, fixed laws, but instead result from the internal "sense making" going on inside them, as experience, conjectures and experiments are used to modify the interpretive frameworks within. (Allen 2001, pp. 39-40).

From this perspective, complexity theory argues, at the meta-theoretical level, that physical and social reality is composed of a wide range of interacting orderly, complex and disorderly phenomena. One can focus on different aspects: orderly (gravity or basic aspects of existence: life/death), complex (species evolution or institutional development) or disorderly (random chance or irrationality), but that does not mean that the others do not exist. Consequently, complexity theory argues against "hard" modernism and postmodernism while at the same time as acting as a bridge between the two. In this sense it can appear to be both 'foundationalist'- demonstrating that there are basic foundational ideas and concepts that structure our understanding of the world-, and 'anti-foundationalist' in that the world is an 'open system' that is constantly emerging and developing and that the search for knowledge and understanding is never ending. In essence, the physical, biological and social worlds have orderly (modern), disorderly (postmodern) and complex (complexity) elements – all of which interweave to create diverse and emergent whole.

Complexity has obvious implications for both naturalists and anti-naturalists (those who support and oppose the use of physical science theories and methods in the social sciences). Again, drawing on critical realism and the 'non-positivist' or 'critical' naturalism of Bhaskar (1979) and the works of Cilliers and Byrne, one can see that complexity acts as a bridge or link between the natural and social sciences. This desire to break down the barriers between the major fields of knowledge mirrors the conclusions of the famous Gulbenkian Commission (1996). This is not an attempt to impose a new unifying 'scientific' law on the social realm but a push to open up the sciences, 'not only towards the world, but also internally. The barriers between the various scientific disciplines need to be crossed' (Cilliers 1998, p. 127). In this sense, complexity theory is a direct challenge to strong naturalists and anti-naturalists who argue for the complete dominance or distinctiveness of one type of science over or from another, or who firmly reject the possibility of some types of generalisable scientific knowledge.

In regards to policy, complexity is a rejection of the traditional modernist world view of order, causality, reductionism, predictability and determinism that marks the foundation of the more extreme versions of New Public Management (NPM) and Evidence-Based Policy Making (EBPM). It is, as Byrne and Callaghan argue, 'a meta-theoretical position which remains within the modernist programme of progressive thought whilst at the same time rejecting the canons of reductionist positivism' (Byrne and Callaghan 2013, p. 9). It is, 'a way of thinking… which can help guide inquiries into the workings of complex social systems…but not to verify laws and law-like generalizations (Morçöl 2012, p. 266). From a Complexity perspective, the world can only be fully understood in terms of:

- Partial Causality: phenomena can exhibit both orderly and chaotic behaviours, cause may not lead to effect –*targets may improve a system, particularly basic ones, but direct causality will be uncertain*.
- Reductionism and Holism: some phenomena are reducible, others are not –*at best, there are degrees of separation between targets, limiting their relevance and ability to evaluate them*.
- Predictability and Uncertainty: phenomena can be partially modelled, predicted and controlled –*basic targets do matter, but so may minor ones that can have unpredictable 'butterfly effects'*.
- Probabilistic: there are general boundaries to most phenomena, but within these boundaries exact outcomes are uncertain –*unknown long-term impact of all major targets and policies*.
- Emergence: policy systems exhibit elements of adaptation and emergence –*targets create new strategies which create new targets and so on*.
- Interpretation: the actors in the system are aware of themselves, the system and their history and strive to interpret and direct themselves and the system –*public opinion shapes targets and vice versa*. (Geyer and Rihani 2010)

These core elements have a range of expectations and implications for our understanding of governance and policy and policy making, and both academics and policy actors have been keen to explore them. Some of the key expectations and implications include:

Expectations

- Over time human knowledge increases, but physical, biological and human phenomena are unpredictable and evolve into new patterns within general boundaries. *Policy actors can*

know more, but the systems they are observing do not stand still, are unpredictable within general boundaries and are constantly evolving and reinterpreting themselves.

- Knowledge is powerful and useful and more knowledge can be more powerful and more useful. *However, due to the fundamentally unpredictable, probabilistic, emergent and interpretive nature of human existence, there is no way for policy actors to know the final order. Knowledge is always limited and learning never stops.*
- Greater knowledge does not guarantee greater prediction or control. *Policy actors with greater knowledge must constantly recognise the limits of their knowledge and must act democratically rather than in an authoritarian fashion.*
- There are general boundaries to all phenomena, but a huge and evolving range of variation and emergence within those boundaries. There is *no endpoint but a continual search for policy change within a bounded but emergent framework.*
- There is no fundamental hierarchy of knowledge or methods in policy studies. *However, certain policy methods are more appropriate for some phenomena than others.*

Implications

- Policy actors must take an open-minded and flexible approach to the orderly and disorderly foundations of all phenomena
- There are continual bounded and emerging limits to human knowledge and public policy despite the exponential increase in evidence/data.
- Policy actors can obtain some degree of predictive and experimental results but must often combine them with uncertainty and interpretation, at best probabilistic strategies.
- Recognising the strengths and weaknesses of quantitative/qualitative methodological or evidence-based and interpretive strategies and balancing them against each other is the primary methodological strategy for supporting reasonable public policies.
- Creation of an understanding of fundamental boundaries combined with an acceptance of continual discovery and openness is the ultimate goal. The key isn't to find the final order and implement it, but encourage the actors in the policy area to adapt and adjust to the continual evolutionary changes.
- At best, policy actors can pursue a continual balancing of probabilities in a bounded evolving situation. Enabling local actors to maximise their complexity within a stable framework creates the greatest likelihood for healthy evolution and adaptation. (Geyer and Rihani, 2010).

Challenges for Complexity and policy

Unsurprisingly there have been a range of critics to the concept of 'general' complexity. For example, the very breadth of complexity implies that 'The value of complexity exists in the eye of its beholder. For some it is merely a passing fad, for others an interesting complement to accepted conceptual frameworks, and for others it is a pioneering break from a moribund Newtonian worldview.' (Manson 2001). At the same time as being accused of 'being all things to all people', in regards to policy analysis, despite the reality of day-to-day complexity in everyday life and the growing degree of complexity created by globalisation and the internet communications revolution,

the belief in a modernist vision of hierarchical state, business and social structures remains remarkably entrenched (Munro 2011). Complexity does provide the intellectual tools to undermine this perspective, but it is an uphill struggle.

Moreover, it is a challenge to translate a meta-theoretical perspective into local action. Complexity does have implications at all levels of social organisation. Individuals, groups, nations and the global system can all be conceptualised in complexity terms. However, due to the fundamentally open and uncertain nature of complexity, detailed local direction is limited. Different complexity authors have identified a range of tools or toolkits (Room 2011; Stacey 2012). Others have focused on new modelling techniques (Geyer and Cairney 2015; Rosser 2009 for recent examples). Nevertheless, they do not provide detailed plans for local action nor a detailed strategy for future action.

Finally, though complexity generates a range of policy expectations and implications it does not offer a clear moral or value framework for these expectations/implications. For example, from a complexity perspective basic human rights (rights to food, education, expression for example) are fundamental to the successful functioning of a complex society. These basic rights allow the 'agents' within the system to 'satisfice' their potential and increases the probability that the society will prosper under varying conditions (commonly found in generally open societies). However, what is the value of this outcome?

Key premises for bringing pragmatism and complexity together

From the reviews above, it is obvious that there is a substantial degree of overlap in the fields of pragmatism and complexity. These overlaps have been touched upon by a number of academics in different fields (Doll et al. 2005; Rescher 1998; Sanderson 2002, 2006 and 2009). Building on this and the work of Sanderson in particular, we argue that a framework of pragmatist complexity can be articulated around the following premises:

1) Complexity theory is primarily a way of understanding the world, while pragmatism is primarily a perspective on how we do or should act in the world. Nevertheless, they are complementary in that they arrive at similar attitudes about the importance and limits of knowledge in the face of complex social and natural environments.
2) Not all policy problems are complex. For some problems, goals may be well-defined and broadly agreed upon and the problems themselves may be stable, relatively independent of context and have tractable dimensions. Such problems are more amenable to the technical rationality and positivist scientific techniques embraced by evidence-based policymaking. However, as problems become more complex, they become less amenable to these strategies. It is useful to parse policy problems with respect to their complexity and to imagine more composite strategies to handle their different aspects.
3) As policy problems become more complex, the knowledge of the problem becomes more partial and multiple perspectives on the problem proliferate; under these conditions, problem-solving must be more attentive to context and must mobilize and align different points of view and different types of knowledge with respect to that context.

4) As knowledge becomes more partial, it also becomes more fallible and provisional; knowledge claims should therefore be regarded as more heuristic than algorithmic and policymakers should treat knowledge as hypotheses subject to further refinement.
5) As policy problems become more complex, it becomes less realistic to expect goals to be stable and well-ordered; instead, ends and means should be expected to continuously interact. Under these conditions, assumptions of a technical model of rationality falter and an iterative and adaptive learning process is more suited to the challenge of emergent dynamics.
6) An iterative and adaptive learning process treats problem-solving efforts as experiments and opportunities to learn; however, the implied conception of experimentation is broader than the model of controlled experimentation entailed by randomized controlled trials and includes trial and error, design experiments, etc.
7) As the perspectives on a policy problem proliferate, actionable knowledge must be mobilized in conjunction with a reflexive and deliberative inquiry into the values at stake.
8) The less that goals are well-formed and agreed upon and the more diverse the values, the more crucial it becomes to collaboratively define problems.
9) As policy problems become more complex, (a) reflexive and deliberative inquiry into values, (b) collaborative definition of the problem, (c) strategies for mobilizing actionable knowledge; and an (d) iterative and adaptive learning process become different dimensions of the same problem-solving process.

A brief case study: Drug policy

Over the last decade or so, there have been strong calls in the UK and elsewhere for greater use of evidence in drug policy (Valentine 2009; Bennett and Holloway 2010; Monaghan 2010). Indeed, on October 30, 2014, MPs voted overwhelmingly (e.g., without division) for a proposal that the UK adopt a more evidence-based drugs policy (UK Parliament 2014). However, the limits of this EBPM strategy in drug policy have also become clearer over time. Evidence is definitely utilized in drug policymaking in the U.K. and in other countries (Ritter 2009; Monaghan 2010; Strang et al. 2012; Tieberghien and Decorte 2013). However, evidence is often inconclusive (Stevens 2011; Monaghan 2012; Roberts 2014) or brandished selectively as a political strategy (Stevens 2011; Tieberghien and Decorte 2013). Drug policy is often politicized, placing limits on the use of scientific evidence (MacGregor 2013; Monaghan 2010, 2014; Roberts 2014).

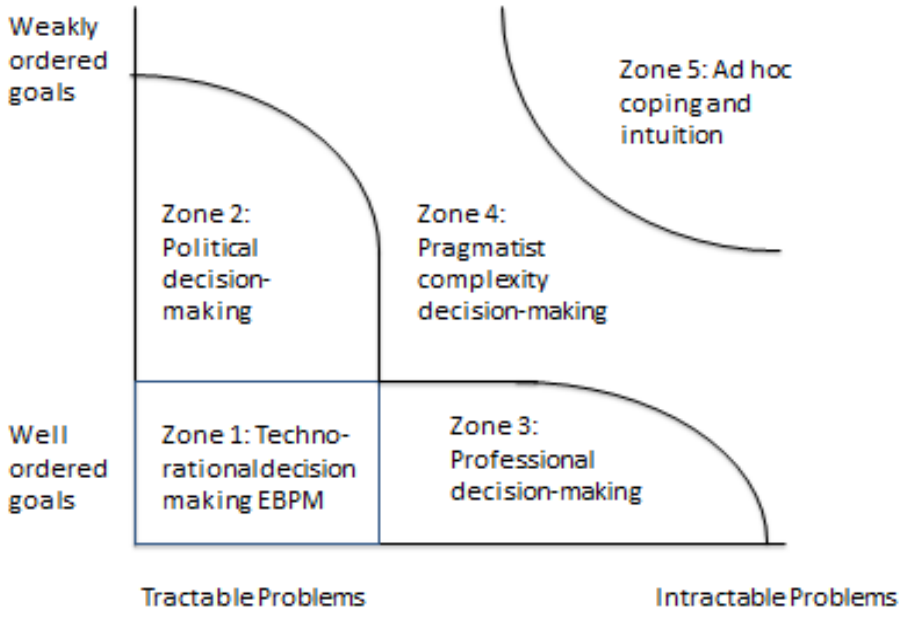
Drug policy is also complex, as described by Singleton and Rubin:

> Drug policy is a complex area beset by ideological divisions. It has both international and domestic dimensions, affects individuals and society in a wide variety of ways, and the many policy options for seeking to address drug-related challenges often evoke strong responses. There is widespread public concern about the control of drugs, their illicit supply and their use, and some drug use poses considerable public health risks for individuals, families and communities. Crime associated with illicit

> drugs impacts internationally, nationally and locally…[D]rug policy is a quintessential multi-level and inter-departmental issue, requiring major contributions from health, criminal justice, education, welfare and foreign ministries (2014, p.936).

A pragmatist complexity approach might begin by trying to parse this complexity, identifying areas or dimensions of the problem amenable to different approaches. A Stacey diagram--one of the most parsimonious and effective tools of complexity thinking for public policy and management—can be used to conceptualize this parsing process (Stacey 1993). We modify the diagram here to reflect our earlier discussion. On one dimension, we refer to well-ordered versus weakly-ordered goals. Well-ordered goals are clearly defined and widely accepted, while weakly-ordered goals may be poorly defined, highly contested, or both. On the other dimension, we refer to tractable versus intractable problems. When problems are tractable, they manifest themselves in a stable way over time, are relatively independent of context, and have a low dimensionality. By contrast, intractable problems are less stable, highly context-specific, and have a high dimensionality. Following the logic of the Stacey diagram, we also suggest different zones that capture in a very approximate sense our analysis of the relationship between evidence and policymaking.

Figure One: Modified Stacey Diagram



In Zone I, goals are well-ordered and the problems are tractable. This is the terrain where we expect evidence-based drug policy to have a greater chance of succeeding. This would include technical aspects such as the chemical compositions of psycho-active substances, the collection of data relating to aspects such as the number of drug related arrests, drug related hospital admissions/deaths, or the cost-benefit analysis of different types of drug treatment policies/interventions.

If problems remain tractable but goals become less well ordered, we move into Zone II—political decision-making. Although gaining knowledge about the problem may be quite tractable, different stakeholders view the issue very differently (users vs. non-users, young vs. old, consumer vs. producer). Illegal drugs (as well as many legal ones) generate a huge amount of political disagreement and debate and touch upon core societal values. As Roberts summarises, 'it is impossible to cleanse policy debates of values, even where these can be concealed more or less successfully for a while' (Roberts 2014, p.953). In this zone, the varying types of political decision-making (electoral, representative and/or collaborative) are the best available strategies.

Reciprocally, there may be a high level of agreement in Zone III (addiction/dependence is a problem or illegal drugs are often closely associated with criminal activity), but even the experts disagree significantly over how best to solve the problems. What treatments are best for differing types of addiction? What the best strategies for minimising criminal activity associated with drugs? In this Zone, experts weighing the probabilities of different pathways is the best that can be achieved. Often, success in this zone requires delegating decision-making to professionals who exercise their best judgment and rely on case-by-case discretion. This is the zone that Schön (1983) is primarily describing in his exploration of the design thinking of professionals.

Zone IV is the zone of complexity and is arguably the most common one in the field of drug policy. This is a situation where value conflicts interact with problem intractability to deeply challenge an authoritative evidence-based policy making logic, while also complicating straightforward political negotiation or professional judgment. It is in this zone where the logic of pragmatic complexity must come to the fore.

A number of authors have offered suggested courses of action on drug policy that are compatible with the pragmatist complexity ideas laid out in the previous section. Valentine argues that a value-based policy can counteract the narrowing of evidentiary standards implied by EBPM: "A political-pragmatic 'community values' approach would assess the relative claims of different stakeholders (methadone clients, service providers, neighbours and business-people who want nothing to do with drug treatment) and make decisions based on the relative weights of each of these" (2009, p.460). This approach mirrors the pragmatist complexity call for collaborative value inquiry. Roberts (2014) argues that drug

policy is characterized by various kinds of potential evidence, which is rarely definitive and notes that experts are more likely to disagree as the issue becomes more important. No amount of science, he argues, can escape the fact that drug policymaking is fundamentally about values. He argues that a consultative process to bring together different kinds of knowledge and values together.

Several scholars have also examined the basic framing of the drug problem and commented on how the construction of the problem is itself problematic. Macgregor notes that the narrative "Drugs are dangerous" is deeply connected to the "disreputable poor" and that this narrative creates a strong barrier to the use of evidence, which is reinforced by a sensationalist media; consequently, politicians are incentivized to compete in taking a hard line and politicians and experts critical of the hard line against drugs are silenced. Lancaster (2014) develops a social constructivist approach to drug policy that encourages reflexivity about how problems are constructed. She argues that this approach shifts the focus from problem-solving to problem-questioning and to an appreciation that policy knowledge must be oriented around the "…context, discourse, practices and participants within the policy process" (2014, p.950). Lancaster and Ritter (2014) and Lenton (2004) describe successful collaborative processes for drug policymaking in Australia, suggesting that such processes have potential for reflexive and deliberative problem definition.

Beyond drug policy, we can also draw some concrete strategies that might be called upon to flesh out a pragmatist complexity approach to drug policy. In a study of health inequalities, for example, Cacari-Stone et al. describe a model for community-based participatory research that engages "…partners through the research process, from problem definition, through data collection and analysis, to dissemination and use of findings to help effect change" (2014, p.1615).

Finally, Zone V is the area of extreme uncertainty and disagreement. Here is where evidence and expert advice is very limited and highly contested. For example, the treatment of drug addicts who have a range of health problems (including mental health issues), living in impoverished communities, and experiencing high levels of dependence is highly problematic. Trying to have a positive impact on their chaotic lives is like, 'walking through a maze whose walls rearrange themselves with every step you take' (Gleick 1987, p.24). We call this zone "ad hoc coping and intuition" to indicate the difficulty of systematically engaging a body of knowledge to address drug problems. Incrementalism is often the best approach, though one never knows which small step may lead to catastrophe. In these cases, experiential knowledge and intuition may be the best that one can achieve.

Can 'pragmatist complexity' be a new framework for public policy?

Fundamentally, complexity theory reflects the growing economic, social and political complexity and uncertainty that we see in our everyday lives and is reflected in the shift from 'government' to 'governance' in the core political science/policy literature. The problem with complexity is that it lacks a normative framework. Basically, so long as a system maintains core boundaries, is relatively stable and open and encourages a wide variety of interactions, a plethora of particular structures and systems are possible. Detailed practical interventions and/or normative choices are uncertain. Hence, policy makers and societal actors have a right to say 'what is the use of complexity?' At the same time, society (amplified by the mass media and willing political actors) continues to try to reassert a more causal/modernist policy position. Someone must be in control and in democracies this should be our democratic representatives (and the bureaucratic machinery of national/regional/local policy that it is supposed to control). This implies a limited view of democracy where:

> The trend in political life is to insist on controlling responsibility by tightening the external standards of accountability. Yet the real problem of our public life is the failure of responsibility, not accountability. Increasing demands for accountability often obscure actual responsibility and enhance the gap between responsibility and accountability (Ansell 2011, p. 134).

Similar to complexity, pragmatism is based on an engaged view of democracy and society that does not know or propose a final societal outcome but knows that the best way forward is through an open, educated, democratic society engaged in continual learning and dialogue with itself (free expression, debate, speech and interaction) and its governmental structures. It is the philosophy of 'evolutionary learning' and 'democratic experimentalism' (Ansell 2011, p. 5). In essence, complexity provides the meta-theoretical position, linking the natural and human societies, while pragmatism provides the justification and framework for societal/public action in a complex and uncertain world. Pragmatic complexity is based on a reasonably optimistic vision of human rationality and a belief in the ability of well-intentioned individuals and societies to progress, in a generally positive direction, through discussion, learning, experimentation, debate and interaction. We believe this is both an accurate description of the policy world and a normative framework that promotes the betterment of society in whatever exact form that future society may take.

References

Allen, P. (2001) 'What is Complexity Science? Knowledge of the Limits to Knowledge', *Emergence: A Journal of Complexity*, 3 (1), 24-43.

Andrews, M., Pritchett, L., & Woolcock, M. (2013). Escaping capability traps through problem driven iterative adaptation (PDIA). *World Development*, 51, 234-244.

Ansell, C. K. (2011) *Pragmatist Democracy: Evolutionary Learning as Public Philosophy*. New York: Oxford University Press.

Ansell, C. (2012) 'What is a Democratic Experiment?', *Contemporary Pragmatism*, 9 (2), 159-180.

Ansell, C. (2016) 'Pragmatist intepretivism,' in M. Bevir and R. A. W. Rhodes. *Routledge Handbook of Interpretive Political Science.* Abingdon: Routledge.

Arthur, W. B. (2014), *Complexity and the Economy*. New York: Oxford University Press.

Atkins P., Hassan, M, Dunn, C. (2007) 'Environmental irony: summoning death in Bangladesh', *Environment and Planning A*, 39 (11), 2699 – 2714.

Beckert, J. (2003) 'Economic sociology and embeddedness: how shall we conceptualize economic action?', *Journal of Economic Issues*, 37 (3), 769-787.

Beinhocker, E. D. (2005) *The Origin Of Wealth: Evolution, Complexity, and the Radical Remaking of Economics*. McKinsey & Company, Inc.

Bennett, T., & Holloway, K. (2010). Is UK drug policy evidence based?. *International journal of drug policy*, *21*(5), 411-417.

Bernstein, R. J. (1983) *Beyond Objectivism and Relativism: Science, Hermeneutics, and Praxis*. Philadelphia, Pennsylvania: The University of Pennsylvania Press.

Bhaskar, R. (1979) *The Possiblity of Naturalism*. London: Routledge.

Biesta, G. (2007). Why "what works" won't work: Evidence-based practice and the democratic deficit in educational research. *Educational theory*, 57(1), 1-22.

Blackman, T. (2006) *Placing Health: Neighbourhood Renewal, Health Improvement and Complexity*. Bristol: Policy Press.

Bohman, J. (2004) 'Realizing deliberative democracy as a mode of inquiry: Pragmatism, social facts, and normative theory', *The Journal of Speculative Philosophy*, 18 (1), 23-43.

Brunner, R. D. (2010) 'Adaptive governance as a reform strategy', *Policy Sciences*, 43 (4), 301-341.

Búrca, G. De., Keohane, R. O, and Sabel, C. (2014) 'Global Experimentalist Governance', *British Journal of Political Science*, 44 (3), 477-486.

Byrne, D. S. (2005) 'Complexity, Configuration and Cases', *Theory, Culture & Society* 22 (5), 95-111.

Byrne, D. and Callaghan, G. (2013) *Complexity Theory and the Social Sciences: The state of the art*. Abingdon, Oxon: Routledge.

Cacari-Stone, L., Wallerstein, N., Garcia, A. P., & Minkler, M. (2014). The promise of community-based participatory research for health equity: a conceptual model for bridging evidence with policy. *American journal of public health*, 104(9), 1615-1623.

Caspary, W. R. (2000) *Dewey on Democracy*. New York: Cornell University Press.

Castellani, B. and Hafferty, F. W. (2009) *Sociology and Complexity Science: A New Field of Inquiry*, Berlin Heidelberg: Springer.

Cilliers, P. (1998) *Complexity and Postmodernism: Understanding Complex Systems*. London: Routledge.

Clemens, W. C. Jr. (2013) *Complexity Science and World Affairs*. New York: State University of New York Press.

Cohen, M. D. (2007) 'Reading Dewey: Reflections on the tudy of routine', *Organization Studies*, 28 (5), 773-786.

Cohen, A. J. (2012) 'Producing Publics: Dewey, Democratic Experimentalism, and the Idea of Communication', *Contemporary Pragmatism*, 9 (2), 143-157.

Colander, D. and Kupers, R. (2014) *Complexity and the Art of Public Policy: Solving Society's Problems from the Bottom Up*. Princeton, New Jersey: Princeton University Press.

Cornish, F., & Gillespie, A. (2009). A pragmatist approach to the problem of knowledge in health psychology. *Journal of Health Psychology*, *14*(6), 800-809.

Coveney, P. V. and Highfield, R. (1995) *Frontiers of complexity: the search for order in a chaotic world*. New York: Ballantine Books.

Davis, B. and Sumara, D. (2006) *Complexity and Education: Inquiries Into Learning, Teaching, and Research*. New Jersey: Lawrence Erlbaum Associates, Inc.

Davoudi, S. (2006). The evidence–policy interface in strategic waste planning for urban environments: the 'technical'and the 'social'dimensions. *Environment and planning C: government and policy*, 24(5), 681-700.

Doll, W., Fleener, M. J., Trueit, D. and St. Julien, J. (eds.) (2005) *Chaos, Complexity, Curriculum and Culture*. New York: Lang.

Dorf, M. C. and Sabel, C. F. (1998) 'A Constitution of Democratic Experimentalism', *Columbia Law Review*, 98 (2), 267-473.

Dryzek, J. S. (1990) *Discursive Democracy: Politics, Policy, and Political Science. New York: Cambridge University Press.*

Evans, K. G. (2000) 'Reclaiming John Dewey: Democracy, inquiry, pragmatism, and public management', *Administration & Society*, 32 (3), 308–328.

Festenstein, M. (2011) 'Inquiry as Critique: on the Legacy of Deweyan Pragmatism for Political Theory', *Political Studies*, 49 (4), 730–748.

Forester, J. (2013) 'On the theory and practice of critical pragmatism: Deliberative practice and creative negotiations', *Planning Theory*, 12 (1), 5-22.

Fung, A. (2002) 'Creating Deliberative Publics: Governance After Devolution and Democratic Centralism', *The Good Society*, 11 (1), 66-71.

Fung, A. (2003) 'Survey Article: Recipes for Public Spheres: Eight Institutional Design Choices and Their Consequences', *The Journal of Political Philosophy*, 11 (3), 338-367.

Fung, A. (2012) 'Continuous Institutional Innovation and the Pragmatic Conception of Democracy', *Polity*, 44, 609-624.

Geyer, R. and Rihani, S. (2010) *Complexity and Public Policy: A New Approach to 21st Century Politics, Policy & Society*. London: Routledge.

Geyer, R. and Cairney, P. (eds.) (2015) *Handbook on complexity and public* policy. Cheltenham: Edward Elgar.

Gleick, J. (1987) *Chaos*, London: Sphere.

Goodin, R. & Dryzek, J. (2006) 'Deliberative Impacts: The Macro-Political Uptake of Mini-Publics', *Politics and Society*, 34 (2), 219-243.

Greenhalgh, T. & Russell, J. (2009) 'Evidence-based policymaking: a critique', *Perspectives in Biology and Medicine*, 52 (2), 304-318.

Gulbenkian Commission (1996*) Open the Social Sciences: Report of the Gulbenkian Commission on the Restructuring of the Social Sciences*. Stanford: Stanford University Press.

Hodgson, G. M. (2010) 'Choice, habit and evolution', *Journal of Evolutionary Economics*, 20 (1), 1-18.

Habermas, J. (1989) *The Theory of Communicative Action: Lifeworld and Systems, a Critique of Functionalist Reason: Critique of Functionalist Reason, v. 2*, trans. T. McCarthy. Oxford: Polity Press.

Hall, J. N. (2013). Pragmatism, evidence, and mixed methods evaluation. *New Directions for Evaluation*, 2013(138), 15-26.

Harrison, N. E. (ed.) (2006) *Complexity in World Politics: Concepts and Methods of a New Paradigm*. Albany: State University of New York Press.

Kernick, D. (ed.) (2004) *Complexity and Healthcare Organization: a view from the street*. Oxon: Radcliffe Medical Press Ltd.

Keulartz, J., Schermer, M., Korthals, M., & Swierstra, T. (2004) 'Ethics in technological culture: a programmatic proposal for a pragmatist approach', *Science, Technology & Human Values*, 29 (1), 3-29.

Kiel, L. D. (2014) 'Reducing the Complexity Gap: Expanding the Period of Human Nurturance', *Complicity: An International Journal of Complexity and Education*, 11 (2), 9-21.

Klamer, A. (2003) 'A pragmatic view on values in economics', *Journal of Economic Methodology*, 10 (2), 191-212.

Knight, J. and Johnson, J. (1999) 'Inquiry Into Democracy', *American Journal of Political Science*, 43, 566-589.

Lancaster, K. (2014). Social construction and the evidence-based drug policy endeavour. *International Journal of Drug Policy*, 25(5), 948-951.

Lancaster, K., & Ritter, A. (2014). Making change happen: A case study of the successful establishment of a peer-administered naloxone program in one Australian jurisdiction. *International Journal of Drug Policy*, 25(5), 985-991.

Lenton, S. (2004). Pot, politics and the press—reflections on cannabis law reform in Western Australia. *Drug and alcohol review*, 23(2), 223-233.

MacGregor, S. (2013). Barriers to the influence of evidence on policy: Are politicians the problem?. *Drugs: education, prevention and policy*, 20(3), 225-233.

Mainzer, K. (1997) *Thinking in Complexity: The Computational Dynamics of Matter, Mind, and Mankind*, 3rd edition. Berlin Heidelberg: Springer-Verlag.

Manson, S. (2001) 'Simplifying Complexity: A review of complexity theory', *Geoforum*, 32 (3), 405-414.

Maxcy, S. J. (2003). Pragmatic threads in mixed methods research in the social sciences: The search for multiple modes of inquiry and the end of the philosophy of formalism. *Handbook of mixed methods in social and behavioral research*, 51-89.

Menand, L. (2001) *The metaphysical club: A story of ideas in America*. New York: Farra, Straus, and Giroux.

Monaghan, M. (2014). Drug Policy Governance in the UK: Lessons from changes to and debates concerning the classification of cannabis under the 1971 Misuse of Drugs Act. *International Journal of Drug Policy*, 25(5), 1025-1030.

Monaghan, M. (2010). The complexity of evidence: reflections on research utilisation in a heavily politicised policy area. *Social Policy and Society*, 9(01), 1-12.

Morçöl, G. (2012) *A Complexity Theory for Public Policy*. New York: Routledge.

Morin, E. (2008) *On Complexity*. New York: Hampton Press

Munro, E. (2011) *The Munro Review of Child Protection: Final Report*. Department For Education. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/175391/Munro-Review.pdf (accessed 9 October 2015).

Parsons, W. (2002). From muddling through to muddling up-evidence based policy making and the modernisation of British Government. *Public policy and administration*, *17*(3), 43-60.

Pearson, C. H. (2014), 'Does environmental pragmatism shirk philosophical duty?', *Environmental Values*, 23 (3), 335-352.

Pamental, M. (2013) 'Pragmatism, metaphysics, and bioethics: beyond a theory of moral deliberation', *Journal of Medicine and Philosophy*, 38 (6), 725-742.

Parsons, W. (2002) 'From muddling through to muddling up-evidence based policy making and the modernisation of British Government', *Public policy and administration*, 17 (3), 43-60.

Rescher, N. (1998) *Complexity: A Philosophical Overview*. New Brunswick: Transaction Publishers.

Richardson, K. and Cilliers, P. (2000) 'What is complexity science? A view from different directions', *Emergence: Complexity and Organization*, 3 (1), 5-23.

Ritter, A. (2009). How do drug policy makers access research evidence?. *International Journal of Drug Policy*, 20(1), 70-75.

Roberts, M. (2014). Making drug policy together: Reflections on evidence, engagement and participation. *International Journal of Drug Policy*, 25(5), 952-956.

Room, G. (2011) *Complexity, Institutions and Public Policy: Agile Decision-Making in a Turbulent World*. Cheltenham: Edward Elgar Publishing.

Root, H. L. (2013) *Dynamics among nations: the evolution of legitimacy and development in modern states*. Cambridge: MIT Press.

Rorty, R. (1981) *Philosophy and the Mirror of Nature.* New York: Princeton University Press.

Rosser, J. B. Jr. (ed.) (2009), *Handbook of Research on Complexity*. Cheltenham: Edward Elgar.

Sabel, C. F. and Zeitlin, J. (2008) 'Learning from Difference: The New Architecture of Experimentalist Governance in the EU', *European Law Journal*, 14, 271–327,

Sanderson, I. (2002) 'Evaluation, Policy Learning and Evidence-Based Policy Making,' *Public Administration*, 80, 1-22.

Sanderson, I. (2006) 'Complexity, 'practical rationality' and evidence-based policy making', *Policy & Politics*, 34 (1), 115-132.

Sanderson, I. (2009) 'Intelligent Policy Making for a Complex World: Pragmatism, Evidence and Learning', *Political Studies*, 57 (4), 699–719.

Schön, D. A. (1983) *The Reflective Practitioner: How Professionals Think in Action*, USA: Basic Books Inc.

Selznick, P. (2008) *A Humanist Science: Values and Ideals in Social Inquiry*, Palo Alto: Stanford University Press.

Singleton, N., & Rubin, J. (2014). What is good governance in the context of drug policy? *International Journal of Drug Policy*, 25(5), 935-941.

Smith, J. A. and Jenks, C. (2006) *Qualitative Complexity: Ecology, Cognitive Processes and the Re-emergence of Structures in Post-humanist Social Theory*. London: Routledge.

Stacey, R. (1993) *Strategic Management and Organizational Dynamics*, London: Financial Times/Prentice Hall.

Stacey, R. (2012) *The Tools and Techniques of Leadership and Management: Meeting the challenge of complexity*. London: Routledge.

Stark, D. (2011) *The Sense of Dissonance: Accounts of Worth in Economic Life*, Princeton: Princeton University Press.

Stevens, A. (2011). Telling policy stories: an ethnographic study of the use of evidence in policy-making in the UK. *Journal of Social Policy*, 40(02), 237-255.

Strang, J., Babor, T., Caulkins, J., Fischer, B., Foxcroft, D., & Humphreys, K. (2012). Drug policy and the public good: evidence for effective interventions. *The Lancet*, 379(9810), 71-83.

Stoker, G. and John, P. (2009) 'Design Experiments: Engaging Policy Makers in the Search for Evidence about What Works', *Political Studies*, 57 (2), 356–373.

Stuhr, J. J. (2003) *Pragmatism, Postmodernism, and the Future of Philosophy*. London: Routledge .

Sturmberg , J. P. and Martin, C. (eds.) (2014) *Handbook of Systems and Complexity in Health*, New York: Springer.

Sweeney, K. (2006) *Complexity in Primary Care*, Oxford: Radcliffe.

Talisse, R. B., & Aikin, S. F. (2005). Why pragmatists cannot be pluralists. *Transactions of the Charles S. Peirce Society*, 41(1), 101-118.

Tieberghien, J., & Decorte, T. (2013). Understanding the science–policy nexus in Belgium: An analysis of the drug policy debate (1996–2003). *Drugs: education, prevention and policy*, 20(3), 241-248.

Trueit, D. (2012), *Pragmatism, Post-modernism and Complexity Theory: The "Fascinating Imaginative Realm" of William E. Doll, Jr.* London: Routledge

UK Parliament. 2014. http://www.parliament.uk/business/committees/committees-a-z/commons-select/backbench-business-committee/news/mps-to-debate-uk-drugs-policy/. Visited June 5, 2016.

Valentine, K. (2009). Evidence, values and drug treatment policy. *Critical Social Policy*, 29(3), 443-464.

Van Aken, J. E. (2005). Management research as a design science: articulating the research products of mode 2 knowledge production in management. British journal of management, 16(1), 19-36.

West, C. (1989) *The American Evasion of Philosophy: A Genealogy of* Pragmatism. USA: University of Wisconsin Press.

Whitford, J. (2002) 'Pragmatism and the untenable dualism of means and ends: Why rational choice theory does not deserve paradigmatic privilege,' *Theory and Society*, 31 (3), 325-363.