P09 / Public Policy for Emerging and Disruptive Technologies: Governing Big Data, Artificial Intelligence, Robotics, and More

Topic : POLICY FORMULATION, ADMINISTRATION AND POLICYMAKERS

Chair : Eric Lindquist (Boise State University)

Second Chair : Jenny Lewis (University of Melbourne)

Third Chair : Gosia Mikolaczak (University of Melbourne)

GENERAL OBJECTIVES, RESEARCH QUESTIONS AND SCIENTIFIC RELEVANCE

The objectives of this panel are to 1) generate discussion surrounding the policy implications from a range of emerging technologies, from the benign, to the truly life changing and potentially lethal, 2) discuss potential policy models and frames to best understand and explore these technologies from the policy perspective, and 3) discuss governance frames, and 4) generate topics and issues for future discussion, research and collaboration.

The scientific relevance for this topic is significant as technologies always outpace public policy or governance considerations. What are the implications, or perhaps opportunities, from this situation? The context for the topic is all encompassing in that technologies connect communities and nations. Are traditional intergovernmental perspectives capable of transitioning to governance structures appropriate for emerging technologies? Theoretically, this topic can be placed squarely in the policy process literature, across multiple theories and frameworks. Moe specifically, what is the relationship between emerging and disruptive technologies and the definition of solutions to social problems.

As a relatively new public policy issue, we are unclear if there is a state of the art. Or is there nothing new in this topic? Should policy scholars build on the existing STS literature in an effort to develop integrative models or theories? Is the existing literature on STS, which is more sociology derived, appropriate for policy studies of emerging technologies? On the opposite side, what is the STS literature missing from a policy perspective? All of these questions are ripe for discussion and development at the ICPP.

CALL FOR PAPERS

What are the policy implications from rapidly emerging technologies? What are governance challenges and opportunities with regard to disruptive technologies in the public sector? These, and other, questions frame this session on public policy for emerging and disruptive technologies. We are encouraging submissions on theoretical approaches to emerging technologies, comparative perspectives, both geographic and technology-focused, and discussion papers. Emerging technologies such as Big Data, artificial intelligence, and robotics are creating challenges, and opportunities for new emphasis on the nexus of science and policy. We are seeking papers that explore this linkage through creative and provocative hypotheses and perspectives.

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Session 1

Thursday, June 27th 10:30 to 12:30 (MB S1.115)

Co-production of technology and socio-political orders

Catherine Fallon (Liege University)

This paper discusses how two theoretical frameworks from the STS field (co-production and critical realism) can help understand the dynamics of policy development with emerging technologies.

The point of departure of this paper is the comparison of the inscription of two emerging technologies in public health sectors. The NIPT (non invasive prenatal testing) for pregnant women very recently developed in many countries, for the detection of foetus anomalities based of the analysis of the mother's blood (Fallon 2017). The valuation of "big data" collected in hospitals on the patients' treatments and outcomes is now widespread in most countries. The development of these emerging technologies can be followed through analysing the investments of professionals of the health sector, with public administrations, and with emerging demands from the endusers (parents for NIPT and information companies for BD) : I use these innovations as examples of co-construction of new patterns of "social orders" (Jasanoff 2004,2005) et technologies.

The fieldwork was organised to "follow the actors and the objects", with a comparative interpretative methodology of science/politics relations (analysing framings, boundaries, institutional discourses, actors identities): it helped understand the close and parallel development of technico-scientific and socio-political changes simultaneously. For NIPT we compared the inscription in two very different countries (Belgium and Argentina) of a given technology, available worldwide thanks to the internet, but which followed very diverse trajectories of inscriptions in the local public health system. For the issue of BD valuations, we propose to discuss the strategies developed by different sets of actors in Belgium and in the UK when facing the request of international info companies (IMS) to buy their patients data. The comparative approaches (two different technologies within two different countries) highlights the importance to complement the co-productionist approach by integrating specific national modes of production and valuation of scientific knowledge and technological innovations (Tyfield 2012).

Fallon C., 2017, De l'information (légale) à l'action (illégale) : Tests génétiques et technologies de pouvoir. Revue de la Faculté de Droit de l'Université de Liège. March 2017

Jasanoff S., 2004, States of knowledge, Routledge

Jasanoff S., 2005, Design on nature, Princeton University Press

Tyfield D., 2012, The Economics of Science: A Critical Realist Overview. Towards a synthesis of political economy and STS, Volume 2, Routledge

Governing Scholarly Knowledge Production: New Private Actors and Regulations on the Global Stage

Tony Porter (McMaster University)

Karsten Ronit (Department of Political Science)

In recent decades, important changes have been occurring on a global scale in the production, vetting and dissemination of scholarly knowledge. Although public sector organizations such as governments,

intergovernmental agencies, libraries and universities and traditional sources of governance such as professions, scientific societies and academies have a hand in these changes, increasingly these changes have been driven by actors in the private sector. These include, for instance, publishing houses, digital libraries, scholarly databases and platforms, consulting firms, rating organizations, and university rankings. This development is related to the process of globalization where initiatives are increasingly launched at the global level and are often take precedence over domestic schemes. It is important to more clearly understand how these new private governance initiatives combine market logics, involvement of scholarly communities, the governance and commercial properties of digital platforms, and more conventional measures of scholarly quality based in universities such as traditional peer review. These changes intersect with others, such pressures on scholarly researchers for greater public accountability, more intense scrutiny from funders, campaigns for open access which challenge the dominance of transitional subscription-based scholarly journals, and more pluralistic epistemologies that make quality assessment more complicated. In this paper we address this challenge in three steps. In our first section we draw on existing theories of regulation, global governance, new public management, the transformation of professions, and the platform economy to understand better the shifting balance between state, market and civil society. In our second section we provide a mapping of the new actors, identifying variation by function, by region and country, by discipline, across time, by their mixes of state, market, civil society, and professional elements in them, by their accountability structures, and by their relationship to more traditional scholarly governance mechanisms. In our third section we assess the practical and normative implications of these developments, placing them in the context of the intersecting challenges noted above. Our goal is to provide a clear and integrated map and assessment of the newly emergent mechanisms for governing scholarly knowledge production, and to link these to broader related trends in national and global governance. We will identify implications of these mechanisms for the quality and goals of scholarly research and provide recommendations for enhancing positive impacts and minimizing negative ones.

Adaptive governance for incoming disruptive technology: public innovation under constraint

Julie-Maude Normandin (Ecole nationale d'administration publique)

Marie-Christine Therrien (École nationale d'administration publique, Université du Québec)

Recently, new technological phenomena have challenged local governments (Hodson & Marvin, 2010; Taylor Buck & While, 2017), with developments such as the smart cities, public wifi and the expected introduction of autonomous cars and 5G technology. Municipal authorities are confronted with the ongoing implementation of technological changes and potentially disruptive technologies. Infrastructure networks, such as electric grids, public transportation systems and new information technologies, act as non-neutral mediators between nature, people and production (Graham & Marvin, 2002, p. 8), creating zones of power and zones of vulnerability in urban areas (Graham, 2001). Cities are complex socio-technical systems in which physical, technological and human subsystems intersect (Graham, 2001; Hillier, 2012). Among disruptive technologies, the fifth generation of cellular technology (5G) is often presented as a paradigm shift with increased download speed, shorter latency, optimal connection of individuals and the connection of billions of objects to the Internet (Andrews et al., 2014; Boccardi et al., 2004).

Since June 2018, our interdisciplinary team has been conducting participatory action research (Kemmis and McTaggart, 2005) with public servants in a large Canadian city to accompany the development of a global strategy for the implementation of 5G on the territory and within the administration. The elected officials, senior and middle managers and experts who make up the municipal authority face multiple challenges in this adaptation. Equipped with limited legal, economic and organizational instruments, they must steer the deployment of a new technology, emerging globally, to meet the multiple interests and needs of municipal departments, business communities and citizens. In order to fulfill their responsibility, public servants are acting on three aspects of this challenge. First, they are seeking to understand the evolving eco-system around 5G, which includes international organizations, federal and provincial ministries, other public regulators, privates companies, associations, lobby groups and citizen movements, in order to identify opportunities and assess the balance of power and constraints on city objectives. Second, they are developing cognitive »slack» (Shulman, 1993) to make sense of this disruptive technology and its potential implications, while accepting a high level of uncertainty. Third, they are embarking on a reflection around organizational transformations and new capacities needed to manage the direct and indirect implications of this new technology, while being realistic about their own political, economic and organizational limitations.

Based on the analysis of observations, we propose to 1) elucidate the processes put in place to address these three aspects based on the challenge of guiding new technology implementation at city level, and 2) identify contextual factors that influence these processes. With our empirical observations we construct a conceptual framework weaving the literature on disruptive technology, adaptive governance, public value and middle manager capacities. This conceptual framework considers the multiple issues and interests involved in the deployment of a disruptive technology and the central role of middle managers in its

implementation. From this framework, we identify three strategic issues specifically targeted by middle managers that underline the constraints they face and how they resolve them within their own divisions, and sometimes horizontally, creating innovation under constraint.

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Session 2

Thursday, June 27th 16:30 to 18:30 (MB 3.270)

Discussants

Erik Baekkeskov (University of Melbourne)

Artificial Intelligence Policies: A Cultural Divide?

Jean-François Gagné (Université de Montréal)

In recent years, many governments around the world published an AI strategy. Significant variations exist between nations. What are the factors explaining these differences? We want to examine the cultural thesis. With two leaders in AI policies, Asia and Europe, the East-West framework receives increase attention among scholars. We argue that although cultural attitudes mirror this cleavage, how these differences translate into AI policies is less clear. Reflecting on this outcome, we discuss limits of causal mechanisms as well as other factors that might come into play. The comparative analysis of AI strategies uses the UK, France, China and South Korea as case studies and existing surveys (World Values Survey, Eurobarometer and Asian barometer) to map cultural attitudes. Overall, the link between people's beliefs and AI policies remains understudy. The research contributes to the literature on AI policies, which is mostly idiosyncratic and descriptive. It tests working hypotheses and explores news ones. In doing so, it examines under which conditions cultural attitudes have an impact on AI policies, hence helps to refine cultural-based theories on public policies.

Linking political debate to policy decisions: Can using big data help advance policy theory?

Gosia Mikolaczak (University of Melbourne)

Jenny Lewis (University of Melbourne)

Erik Baekkeskov (University of Melbourne)

Andrea Carson (La Trobe)

Many theories of the policy process operate in different fields and have different aims but share key elements. These include consideration of: actors and how they make choices; the role of institutions as rules or venues for decision-making; the characteristics of networks and subsystems; the role of ideas or beliefs; the broader socio-political context; and the role of events (Cairney and Heikkila 2014). In this paper, we use a configuration of these elements to present a theory of political debate and its link to policy decisions. Because we are privileging 'debate' as our key interest, ideation – the process of generating, developing and communicating ideas - is a key focus. Our theory consists of three interrelated components: 1) the actors involved; 2) their framing of policy problems and solutions (related to ideas); and 3) the forums in which discussion occurs (related to institutions, networks and subsystems). This debate occurs within a broader context of institutions, events, public opinion, and general economic and social trends (context and events).

We postulate that these three elements, and their interrelationships, change over time, either because of

deliberate attempts to include a different range of actors, to change the framing of problems and solutions, or to shift the venue, or because of some exogenous force (or any combination thereof). We further postulate that, at certain points in time, the changed debate might result in policy change in the form of decision-making. The question is: What pattern of characteristics of the political debate space results in policy decision-making? The aim of our paper is to use textual data to test our theory and attempt to explain the link from political debate to policy decision-making.

The explosion of digital sources of information and developments in computational approaches for harvesting data on these relationships provide major new opportunities for researching this topic, providing 'big data' that was previously not available. The digitisation of records of parliament (Hansard), government committees, and expert submissions, means there are large amounts of textual data available for analysing political debates held in the public realm. Mass media, and the rise of online news sources and social media, also generate substantial 'big data' available for analysing these debates, from the perspective of the media and the public. There appears to be enormous potential to harness these data to understand the shape of political debates, how they change over time, and their relationship (if any) to government policy decisions.

Our paper will present a more developed outline of our theory and an initial analysis of case studies on same-sex marriage, antimicrobial resistance and public sector innovation. We will discuss some of the challenges in accessing and using 'big data' for these topics and provide a preliminary answer to the question: Can using big data help advance policy theory?

Climate change adaptation policy framing among local governments

Alexandra Lesnikowski (Concordia University)

Evidence that our climate is already changing due to rising greenhouse gas emissions has significantly increased the importance and visibility of adaptation within the climate change policy agenda over the past decade. Local and national governments are committing to develop adaptation policy frameworks, and are beginning to implement various measures to achieve targets and policy goals. Adaptation policy research suggests that differences in policy frames that emerge around adaptation have implications for how policy goals are articulated, the strategies that local governments adopt to achieve these goals, and challenges that arise in policy implementing. Divergences in framing and issue prioritization can create disagreement over the nature of the adaptation problem itself, and is regarded as a key challenge for the design of coherent policy approaches on adaptation. Conversely, convergence in framing and issue prioritization are more likely to lead to coherent policy adoption.

This paper examines how adaptation is being formalized within local policy agendas by identifying adaptation policy frames and interpreting what they signal about underlying beliefs and perceptions about the nature of climate change vulnerability as a public policy issue. It uses topic modelling to examine nearly 2000 policy documents retrieved from the city council archives of 125 local governments in five countries (Canada, France, Germany, Netherlands, and the United Kingdom) in what is one of the first large comparative studies about policy framing to use computational text analysis techniques.

The contested nature of adaptation presents an interpretive challenge for researchers attempting to identify policy frames and attribute meaning to them within a conceptually unstable field where the language of policy-makers may not always be consistent with the language of scientists. Topic modelling has been proposed as a promising technique for frame detection in political research (Boräng et al. 2014; Nowlin 2016; Quinn et al. 2010; DiMaggio, Nag, and Blei 2013), and there is growing use of the technique to analyze framing in public debates about climate change denialism (Boussalis and Coan 2016), public opinion and preferences on climate change (Jiang et al. 2018; Tvinnereim et al. 2017; Cody et al. 2015; Lynam 2016; Tvinnereim and Fløttum 2015), climate change representation in the media (Büchi 2017; Cody et al. 2017; Elgesem, Steskal, and Diakopoulos 2015), and elite discourses around climate change (Bagozzi 2015; Benites-Lazaro, Giatti, and Giarolla 2018; Jun Hyun Ryoo and Bendle 2017). To conduct the analysis we use Structural Topic Modelling (STM), a mixed-membership topic modelling technique that allows researchers to discover latent topics in texts based on word frequency and co-occurrences across a corpus of documents. STM was selected because it permits the introduction of meta-data at the document level that enables hypothesis-testing to better understanding patterns in topic prevalence and distribution. Here we introduce one meta variable, country, to examine whether local policy frames vary between country contexts.