Science, expertise and environmental controversies.
Some reflections about the Canadian case.

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Abstract
The place taken by environmental issues in contemporary social interaction (interpersonal, public and technologically mediated) grew very significantly over the past twenty years. Environment has become a key issue in public and social communications and discourses in Canada and throughout the world. Based on their expectations and resources, different categories of actors (politicians, industrialists, lobbyists, grassroots, the media, experts, ...) strive to shape and structure the public debate. Hence has come to emerge and grow a field of practice, intervention and research dubbed *environmental communication*.
Environmental issues in Canadian society operate symbolically as a legitimation instance of participatory democracy. However, the broader participation of citizens and grassroots does not prevent scientific expertise from prevailing in public dialogue and policy decision. Specific to the Canadian context is the existence of fora (public participation procedures of *Environment Canada* and *Bureau d'audiences publiques sur l'environnement* in the province of Quebec) dedicated to the expression of the citizens (and other interested parties) when economic ventures are expected to have *notable* consequences on the environment. In these Canadian fora, the public expression of citizens' concern is allowed and encouraged but the expertise usually imposes its knowledge and legitimacy over the lines of arguments of the other categories of actors. Therefore the impact of traditional expertise over the process of Policy/Decision making used to be unquestioned.
Scientific expertise is often understood in functional terms without questioning its emergence, its disproportionate power in the structuring of the public debate and its influence on the policy making process.
In this paper, we will problematize expertise as a scientific category to explore new avenues for rethinking communication not only in terms of content of interactions (environment as a topic) but also in terms of distortions and power relationships between the different categories of actors.

Keywords: science, expertise, environmental communication, controversies, public spaces

The context

> To appreciate the diversity in types and levels of public participation in Canada, readers from other countries need to understand that Canada is not a unitary state, like Italy, but a federation of provinces, each of which has a unique history and subculture. The continuous tension between the provinces, and between the provinces and the federal government, is both a cause and an effect of the different types and levels of public participation (Connor 1996).

In line with Michael Soulé's (1985) analysis of conservation biology, Cox (2010: 316) contends that environmental communication was as well a "crisis discipline" coping with environmental issues and controversies in a large variety of fora.

This notion of "crisis" is related to the emergence of the category of "risk" and its growing awareness in contemporary societies. According to Beck, the main theoretician of *Risk Society* (1986), the concept of risk refers to the practices and methods by which the future consequences of individual and institutional actions are controlled in the present. Risk is, in such a perspective, a phenomenon specifically linked to modernity. Since the second half of the twentieth century, there is a form of *radicalization* because the risks at issue are no longer controllable. The characteristic of this new category of risk is that they have a low probability of occurrence but unpredictable and incalculable consequences (in the sense that we cannot assess them through the currently available mathematical or statistical tools).

One possible area of application of this theory of risk is environment since the radicalization of risks involved a delayed but real attempt to regain control through an environmental awareness and involvement. Social movements and charismatic figures of the new environmental consciousness (Suzuki 1999) played an important role in this process. Radicalization of risk and civic consciousness are in this regard the terms of a dialectic in environmental communication.

This radicalization of the concept of risk in the contemporary world has practical implications on the way the issue is dealt with in public spaces and arenas (Cefaï & Trom 2001). The available scientific knowledge on the probability of occurrence and risk assessment (Laramée 1997) and the decision process about the measures to be taken are the two terms of an equation almost undecidable on strict technical grounds. It is a dilemma in that huge irreversible consequences are linked to an event which probability to happen is in fact very low (Godard & *al.* 2002).

Our topical purpose here requires a reassessment of the *Beckian* terms of the issue regarding the main risk of the present times: environment may experience a major degradation of terrestrial ecosystems hence endangering future generations and the survival of mankind on the planet. This issue is central because the terms of current scientific and public debate seem to globally converge towards the conclusion that the pace and standards of living today will not be sustainable over long periods of time in the future. A partial reversal of the terms in which Beck defines risk as radicalized would be to address the issue of certainty of occurrence in relation with consensus/dissensus building processes.

In this regard, the *United Nations' Convention on Climate Change* in 1994 has significantly contributed to the reconfiguration of the discursive conjuncture and to a rise of environmental protection advocacy in national and international fora worldwide. Such an internationalization of awareness is congruent with risk globalization but doesn't seem alien to globalization and trade issues with the formation of international social movements facing transnational economic interests. Controversies arise in this process. At stake is the legitimacy to define (or redefine) the framework of shared interpretation (Berger & Luckmann 2006) and subsequent actions to be taken collectively in relation to environmental issues broadly defined (Allan & *al.* 2000). The struggle for the definition of legitimate perceptions of environment and its regime of management would gain with a more agonistic perspective in analyzing the interactions within environmental communication fora: « Even as science has become an important source of symbolic legitimacy in society, science itself is increasingly a site of conflict among disputing parties – industry, public health officials, and environmentalists – as they attempt to influence public perceptions of the scope or severity of problems » (Cox 2010: 303). This would necessitate analyzing how the conflict arises, is borne by individuals and specific groups, is managed by certain categories of actors and finally possibly open the way for a repertoire of collective action.

In Canada, the spectrum of actors, interests and positions regarding environmental issues is very broad. The temporal span of involvement, the degree of the actors' organization, their financial resources, their level of knowledge or of expertise, the form of legitimacy that they claim and their degree of proximity to the Canadian authorities are very variable. The public stances on environmental issues do not have the same shape or the same temporality across Canada. In this respect, Quebec has historically been more assertive than the rest of Canada regarding environmental protection (Weissenberger 2004). The existence in the different provinces of original structures (*Bureau des audiences publiques sur l'environnement*, BAPE, in Quebec) in charge of building the broadest consensus possible on public decisions on the environment related issues plays an important role in environmental communication in Canada by ensuring inputs are gained from the citizenry throughout the country.

From strict *policy making* perspective, the managing process has gradually evolved towards *governance* with a far bigger implication of civil society, single citizens and various grassroots involved in prompting change in environmental policy making. One of the specific shifts occurring in the decision making process is the enlargement and diversification of expertise. This process is not specific to environment issues since it affects medical and other issues as well. Expertise is being divulgated and democratized thanks to the growing organization of citizenry and grassroots in the mid nineties.

1. The legal framework of public participation in Canada

> Shared responsibility for environmental management requires communication, collaboration and consultation among federal, provincial and territorial governments. Three principle structures promote inter-jurisdictional cooperation in environmental matters: the Canadian Council of Ministers for the Environment (CCME), the Joint Meeting of Ministers of Energy and Environment (JMM), and the Wildlife Ministers' Council of Canada. (Environment Canada 2010, online).

In Canada, the emergence of counter publics, especially through the involvement of activists, NGOs and citizens is a trend of the institutionalization of the environmental question. In the nineteenth century, the issue of environment is institutionalized as a matter of hygiene and public health. The *Society of Hygiene* of the Province of Quebec was founded in 1884 and the *Law of Public Health of Quebec* fell within the competence of the Ministry of Health in 1930. It is not before the 1960s that the environmental theme becomes independent from public health even if links subsist. At the federal level, it is indeed in the early 1970s that Canada establishes a Ministry of Environment (*Environment Canada* was founded in 1971) through the consolidation of administrations and departments in charge of management, protection and forecasting (water management, the forest and wildlife, environmental protection, ...). In 1987, the Canadian Environmental Protection Act (CEPA) extends the mandate of *Environment Canada* to air pollution.

Due to federal political organization of Canada, many administrative jurisdictions are involved in the policy making process at the federal, provincial and local levels. Consultations are organized nationwide in order to get inputs from the citizenry in the policy making process regarding environmental issues. Consultations in Canada are organized by legal and administrative dispositions aimed at ensuring the largest democratic participation. Dating back to 1999, the Social Union Framework Agreement (SUFA) gives under certain conditions the grassroots (individually or through their representative bodies or networks), the industry, the academics and individual citizens the legally guaranteed right to express their concerns when comes the time of consultations. The case of the media is peculiar since they are considered as a mere vehicle of communication between Canadians and their government. Under the provisions of the Canadian Environmental Assessment Act (CEAA) passed in 1992, environmental assessment is mandatory under legally specified conditions. The Canadian Environmental Protection Act (CEPA) of 1999 entitles the industry and the public to be consulted in order to prevent environmental pollution. The consultations can be held in physical locations or through the Internet by logging onto the websites of the jurisdictions managing the process (Environment Canada 2010).

A large number of stakeholders take part to the process. Especially worth mentioning is the Institute for Sustainable Development (IISD) that tries to push advocacy to make the policymakers more sensitive to sustainable development principles in Canada and abroad whereas the well known Canadian Environmental Network (CEN) has a different rationale. The CEN aims at fostering the widest participation possible in environmental issues. Self-defined as an non-advocacy network, it has a nationwide implementation and its members transcend ideological and professional borders (Environment Canada 2010). Hence the CEN restrains its mandate to promote more comprehensive and equitable procedures of consultation at all levels without voicing any organizational *mot d'ordre* on the content of the issues at stake.

2. Expertise and public communication: theoretical considerations

A heated controversy arose in the past decades over the role scientists should play in controversial environmental issues[1]. Should they restrain themselves from entering public arenas and confine themselves in their research laboratories or should scientists engage as experts in public controversies as citizens but also as scientists *per se*?

Some professional contexts render scientists' stepping in the public debate more difficult than others. For example, in the United States, scientists working in public agencies under the Bush Administration were under threat if they were to publicly take positions contrary to the well known agendas of the federal administration[2]. Scientists working for the industry are as well under the scrutiny of their employers and sometimes face fierce reaction when their public statements come to challenge the interests of the firms they work for.

It is worth mentioning that an enduring debate in philosophy of science pertains to the relation of science and society. Science is sometimes viewed as a disinterested force which ancillary mission is to provide relevant facts to feed the policy making process. In this view, as long as science is kept far from politics, everything's fine. But an opposing view strongly challenges such a vision by stating that scientists are doubly biased: personally through their own personal values and epistemically because disciplines tend to be aligned with certain political orientations. Hence, as Kourany (2010: 45) mentions, some would suggest that:

> … Current rules guiding the formation and functioning of science advisory committees – current rules for deciding who the experts are (including conflict-of-interest provisions), what kinds of evidence and other considerations they may bring to their deliberations, and how they may settle their disagreements – should be opened to public scrutiny and evaluation and further articulation. And the application of these rules should be a matter of public accountability as well.

Hence, when some suggest that the public's views as well as experts' advice should be taken into account and call for a politicization of science (Guston 2004), others contend that the real issue is rather to descientize the politics (Sarewitz 2004). Regarding highly complex issues such as climate change « which can be variously understood as a problem of climate impacts, weather impacts, biodiversity, land use, energy production and consumption, agricultural productivity, public health, economic development patterns, material wealth, demographic patterns, and so forth. » (Kourany 2010: 45), scientific inputs in the policy making process makes any legitimate decision nearly impossible. The reason why is because various disciplines « bring with them different, even incompatible, methods, standards of proof, interests, and values, as well as different, even incompatible, bodies of knowledge. Conversely, different value perspectives may find in such diverse bodies of scientific information diverse supporting facts and theories. » (Kourany 2010: 45). In other words, disciplines as well as individuals, be they experts or laypersons, tend to be biased for structural reasons.

[1] In the US, the position of the *Union of Concerned Scientists* (UCS) is quite clear since it urges scientists to voice publicly their standings and share their expertise with the public by making known the rationale behind their statements.

[2] The case of James E. Hansen at NASA is well known for the troubles he encountered after his public speeches to sound the alarm on climate change (Cox 2010).

Hence, the argument of Sarewitz (2004) is that since in climate change different discipline come up with incompatible methodologies, findings and epistemologies, politics rather than science should have the final word. Highly complex issues such as the environmental one seem to definitely call for a political rationale, even if science is to play its partition. But science should be given no special privilege since it is a single factor: «… among a plurality of cultural factors that help determine how people frame a particular problem or position – it is a part of the cognitive ether, and the claim to special authority vanishes » (Sarewitz 2004: 45).

Such an analysis is opposed by Collins and Evans (2007) who strongly argue that expertise needs to stay the *property* of highly experimented people whose practice in a field doesn't commensurate the discursive abilities of other people mastering the language but who have not necessarily been intensely trained in the field. Expertise in this perspective is explicitly defined against interactional perspective and is constructed as a property that certain agents do have in regard to scientific fields. So, the problem of *extension* of expertise comes at the forefront of environmental public controversies.

3. Environment, Science and the Public

> The sociology of attribution is the study of the way actors negotiate the right to judge expertise; public legitimacy can be assigned to judgments made in any direction, and those judgments, which do in fact gain public legitimacy, gain it as an outcome of the interplay of power, alliance-building and so forth. For example, in recent years, the folk wisdom view has given a great deal of legitimacy to upward judgments while reducing the potency of downward judgments (Collins & Evans 2007: 63).

A recent trend regarding environmental issues is linked to the fact that more and more scientists and experts voice their concerns about health or ecological threats in new media. Thus the public comes to be more knowledgeable of highly technical issues until then exclusively debated and understood by scientists only at the price of narrowing the field of technical expertise. This puts on the forefront the question of the publicization of expertise, dubbed by Collins and Evans (2007) the « Problem of Extension »: « Greater involvement of the public has, however, given rise to the 'Problem of Extension: how do we know, when, and why, to limit participation in technological decision-making so that the boundary between the knowledge of the expert and that of the layperson does not disappear? » (Collins & Evans 2007: 10). For these two authors, popular understanding of scientific matters is to unambiguously be distinguished from expertise. When science is consensual about scientists, the gap between popular and deep understanding of science is narrower than when science is highly disputed, as environmental controversies tend to show.

But such statements raise the risk that the experts ultimately become the policymakers because of the high degree of technical complexity of the issues, leading to the emergence of a *technocracy* to the detriment of democratic principles pertaining to decisions about the common good (Dewey 1927). In this regard, the expertise is contested on two fronts. On the one hand by those who believe that expertise should "remain in its place ", that is, scientists should bring their technical knowledge and leave the last word to politics. On the other hand, expertise is contested by those whose

interests, whatever they are, are challenged by scientific expertise outputs and who question the scientific methods used or the results supposed to leave too much room for uncertainty. In this perspective, it is considered that policy making should not be constrained by the dictates of *uncertain* science. At the heart of these controversies of scientific expertise lie opposing views about *uncertainty*: the advocates of precautionary principle contend that measures of anticipation of the realization of the risk should prevail while their detractors believe that the burden of proof lies with science and that economic activity should not suffer because of the personal reluctance of certain scientists.

The recent trends in environment related issues in Canadian public arenas tend to make ordinary citizens more knowledgeable of what is really at stake in the field. Thus, citizens come to have a « folk wisdom » that allows them to make their opinion about the decisions that should be taken. So the public interactions between experts and « citizens amateurs » is to help the latter be more aware and to improve their understanding of highly complex and controversial issues.

4. Nature's silence, narratives and the question of environmental communication

The debate on expertise thus pertains to the legitimacy of some actors to take a stand about an issue certainly technical but social and political as well. In this sense, citizens are recognized the right to raise their voice and uphold their arguments. A major change in recent years is the much higher level of knowledge of certain people who have invested in the fight for the preservation of the environment or in issues related to the preservation of the quality of life. This is ultimately a matter of ventriloquism:

> Although, in one sense, nature is silent, others – politicians, business leaders, environmentalists, the media – claim the right to *speak for* nature, or for their own interests in the use of natural resources. Hence, the dilemma: If nature cannot speak, who has the right to speak on nature's behalf? (Cox 2010: 4).

The question of expertise in environmental communication in an ecological perspective is ultimately that of the way society « structures its capacity for processing environmental information » (Luhmann 1989: 32). Luhmann discusses the issue from a different perspective than Cox when he asserts (29):

> Communication is an exclusively social operation. On the level of this exclusively social mode of operation there is neither input nor output. The environment can make itself noticed only by means of communicative irritations or disturbances, and then these have to react to themselves. Just as one's own lived-body cannot announce itself to consciousness through conscious channels but only through irritations, feelings of pressure, annoyance, pain, etc., that is, only in a way that can produce resonance for consciousness.

This statement means that society cannot communicate *with* its environment but *within* itself even though the relationship between the two lies at the heart of environmental communication. The aim of Luhmann is not helpful in managing the way

society should cope with environmental dangers (hence the role of expertise). He rather questions the way society come to terms with environmental threats through communication (public arenas). In Luhmann's terms, *ecological* communication aims at producing resonance between society and environment. This is the locus of a huge hermeneutics battlefield regarding environmental communication.

In this regard, appeal to expertise is one strategy among others for the legitimate interpretation of nature's pain (ecology) and its translation into human discourse (communication). The closer the expertise invoked is with the opposite part, the stronger the rhetorical benefit is in the controversy. The recourse to scientific expertise is therefore a resource in a rhetorical argument in public arenas that are ideologically polarized.

Narrative Framing is at stake here since it « refers to the ways in which media organize the bits and facts of phenomena through stories to aid audiences' understanding and the potential for this organization to affect our relationships to the phenomena being represented » (Cox 2010: 177). In other terms, stories are built through the recourse to « narrative packages » in order to constrain the interpretation by the public of controversial environmental issues. This procedure occurs even in scientific domain. Hoberg & Rivers (2011) in their trial to characterize the rhetoric strategies in Canadian controversies regarding tar sands identify eleven strategies mobilized by the actors taking part to the debate.

FRAMING STRATEGY	**Nikiforuk* (con tar sands)**	**Levant** (pro tar sands)**
1. Label favorably	Tar sands, dirty oil	Ethical oil
2. Challenge a factual claim	Oil companies are not here for ethical reasons they are here for: "low royalties/taxes, $2 billion subsidies, the water give aways, and industry funded regulators." Industry funded regional aquatic monitoring program (RAMP) finds oil sands development has no harmful effects on Athabasca River beyond baseline. Yet, peer-reviewed scientific papers showing heavy metal pollutions, bitumen residues in the Athabasca River	"Tar comes from pine trees or coal not oil mixed with clay and sand" "The air quality in downtown Toronto is worse than Fort Mac" "Every industrial project has environmental side effects"
3. Establish perspective by placing facts in a broader context that supports your viewpoint	"A Canadian accounting firm has calculated it will cost $20 billion to separate water from waste and the Alberta Government has set aside $1 billion"" Oil sands projects burn ¼ of the countries natural gas, create enough toxic mining waste to fill a 10 by 10 meter wide canal across the 49th parallel" The Alberta Government "makes almost as much money w/ gambling and alcohol as bitumen revenues– and gives 1 billion dollar subsides to industry"	"I took the 300,000 people the UN says were killed in Darfur, multiplied by 185 ounces of blood per dead body, divided that into the number of barrels of oil Sudan exported at that time, and every god damn barrel of oil sold from Sudan is a thumb or an eyeball's worth of oil" You could talk about 230 ducks, which is sort of like wing night in my neighborhood or you could talk about 300,000 human beings murdered in Darfur""1,000 ducks or 300, 000 murders, 9/11 terrorists, and a nuclear bomb in Iran, which would you prefer?"
4. Draw favourable comparisons	"Norway has saved $400 billion of its oil revenues, Alberta has saved $14	"Mellissa Blake [Mayor of Fort McMurray] would be stoned to death

	billion" Proponents of rapid development are as blind to the risks and liabilities as most economists were to the 2008 collapse" Let's compare ourselves to countries with comparable institutions"	for adultery if she lived in Saudi Arabia" Journalists like Nikiforuk would be assassinated in OPEC countries, here journalists get awards" You could talk about 230 ducks, which is sort of like wing night in my neighborhood or you could talk about 300,000 human beings murdered in Darfur"
5. Appeal to expertise (stronger if your source is ideologically affiliated with the opposing position)	Quotes US Military on lessons learned in Iraq and Afghanistan:" Fossil fuels are a security risk, BAU is not a viable option, Oil cannot renew America, but aggressive investments in clean energy can."	"Oil Sands were 38% more intensive then they are now – we are only getting cleaner!" There are individual power plants in China emitting more than the oil sands. Underground coal fires in China 30 megatons a month-almost as much as oil sands."
6. Focus on your preferred criteria	The primary purposes of Nikiforuk's argument is to shift the focus from the economic benefits of oil sands to environmental impacts and how the intensity of economic activity in the oil sands is distorting Canadian economic development. Pace and scale of oil sands development – Canadian politics, economics, and environmental issues	The primary purpose of Levant's argument is to shift the focus for evaluating oil sands from environmental issues to ethical issues of human rights records in OPEC countries
7. Use appealing metaphors	"We are addicted to a pricey drug, our governments are addicted to oil revenue"	"Canadian ethical oil is the fair trade coffee of the world's oil"
8. Question credentials or allege bias	Levant takes money from the Oil Industry and from the Tories	"[Nikiforuk] takes money from Greenpeace, I want to talk to someone who has no axe to grind"
9. Identify hypocrisy	Oil companies operating in Alberta do not have "ethical" records: • Shell (1/4 oil sands ownership): environmental/human rights issues, corruption in Nigeria • Total: support for military dictatorship in Burma • BP: bad safety records in Alaska, Gulf of Mexico • Exxon Mobile: funded climate change smear campaign • Petro China responsible for Sudan operations	James Cameron flying up to the Oil Sands, filling his plane with Oil Sands oil" Norway is a model? They are investing in oil sands because their supply is running out, we are the most moral place to invest their money"
10. Use sarcasm to ridicule opposing viewpoint	On Dutch disease: "If oil is so good, than where are all the magical jobs?"	On comparisons: "Its pretty tough to defend the oil sands when you are comparing it to the perfect energy source: dilithium crystals in Star Trek"
11. Ad hominem attacks (criticizing the person, not	"The US Military is a more reliable source than Ezra Levant."	Nikiforuk is "evading his moral responsibilities to make a judgment

the argument)		call”

Source: Hoberg & Rivers (2011 online)
* Andrew Nikiforuk is a voiceless critic of tar sands
** Ezra Levant is a strong advocate of tar sands that he dubs « ethical oil »

In the case of tar sands in Canada, expertise becomes an issue of public relations. The industry has invested significant financial resources to promote and defend its extractive activities. Arguments are very diverse. For example, by arguing that carbon dioxide emissions from industry are lower than those of the City of Toronto or contending that Canadian production makes North America less dependent on Persian Gulf monarchies that use their resources to finance terrorism, the oil extraction industry strives to legitimize its activities and counterbalance environmentalists' communication strategies.

Concluding remarks about expertise and uncertainty

Environment related issues are of great relevance in the contemporary context. The way the debate is set is linked to the institutional framework that used to define, organize and assess the action of *legitimate* stakeholders. Since the new media have critically aroused the production and circulation of information, the coordination and the communication of various actors, the global landscape of environment governance has greatly changed.

In this process of democratization of knowledge, science and expertise remain very specific, as they are important resources in the policy making process. The tension between the public as producing or consuming expertise is crucial here, even if many consider that the public should « align their understanding with that of the producer [the expert], not to produce new meaning » (Collins & Evans 2007: 119). It is the conviction of these authors that « democracy cannot dominate every domain », meaning that highly technical domains requiring deep training and skills cannot by investigated by the laypersons.

By and large, the characterization of human interaction with environment as a threat or as a resource lie at the heart of narratives in environmental communication. Expertise can sustain both sides, thus becoming itself a highly valued resource in environmental communication since it is still deemed valuable by its very nature. The value of expertise is used in the production of public skepticism through « manufacturing uncertainty » (Jacques & *al.*: 2008). This is the core strategy of some industrial lobbies that so challenge scientific warnings against the imminence of a tipping point concerning climate change.

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