New Media and the Turn to Experience in Environmental Communication

by

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Abstract

This dissertation explores the design of new media technologies for engaging the public on the political aspects of urban sustainability. Focusing on new media's "responsive aesthetics", it asks, *how are interactive experiences designed to mediate the underlying political culture of sustainability*? In order to provide initial answers to this question, this dissertation draws on phenomenological approaches to the philosophy of technology, critical theory and contemporary work in Human-Computer Interaction (HCI), to develop a framework for considering the politicizing aspects of interactive experiences. At its centre is a conception of interactivity as a form of *world disclosure* that mediates being, perception, action and meaning. The validity and utility of the conceptual framework is demonstrated with a variety of case studies that include Mash Notes, a public interactive installation; MetroQuest, a sustainability decision support tool; public engagement processes facilitated by UBC's Collaborative for Advanced Landscape Planning (CALP); and several "serious" games.

The design of interactive experiences is discussed on the background of what is identified here as an incipient *turn to experience* in environmental communication. Perceived as a response to the decline of the dominant science communication paradigm, known as the information deficit model, the turn to experience is explained as an appeal to resonant, felt, meaningful aspects of the public's perception of, and engagement with, environmental issues. It is illustrated by two communicative strategies: the first aims to evoke *resonant experiences with politicizing effects*, while the second aims to create *consonance between the public's everyday experiences and the issues underpinning political decision-making*. The dissertation's critical analysis of the relations between politics and design aims to provide environmental communicators with a better understanding of the potentials and limitations of designing interactive experiences to engage the public on sustainability, and provide technology designers with a more comprehensive and nuanced conception of the political significance of their creations.

Keywords: new media; design; interactivity; phenomenology; critical theory; political aspects of sustainability

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List of Acronyms

ABC	Attitude, Behaviour, Context (model)
ACM	Association for Computing Machinery
ANT	Actor-Network Theory
BC	British Columbia (province)
CALP	Collaborative for Advanced Landscape Planning (UBC)
CBC	Canadian Broadcasting Corporation
COP	Conference of the Parties (UN)
CRU	Climate Research Unit (University of East Anglia)
DEFRA	Department for Environment, Food and Rural Affairs (UK)
GHG	Greenhouse Gas
GIS	Geographic Information System
GSM	Global System for Mobile Communications
HCI	Human-Computer Interaction
ICT	Information and Communications Technology
IECA	International Environmental Communication Association
IPCC	Intergovernmental Panel on Climate Change (UN)
LEED	Leadership in Energy and Environmental Design
LiDAR	Laser Radar
MOV	Museum of Vancouver
MQ	MetroQuest
MQ-V	MetroQuest-Vancouver
NASA	National Aeronautics and Space Administration (US)
NEPA	National Environmental Policy Act
NGO	Non-Governmental Organization
NIMBY	Not in my back yard
NOAA	National Oceanic and Atmospheric Administration (US)
SCBD	Secretariat of the Convention on Biological Diversity
SCOT	Social Construction of Technology

SFU	Simon Fraser University
SID	Sustainable Interaction Design
SMS	Short Message Service
UBC	University of British Columbia
UX	User Experience
WTO	World Trade Organization
WWF	World Wildlife Foundation

1.
Introduction

We are always living ahead of our thinking.

–Marshall McLuhan[1]

[1] Marshall McLuhan in an interview to the CBC's *Take 30*, broadcasted Apr.1, 1965. Parts of the interview can be watched here: http://www.youtube.com/watch?v=NNhRCRAL6sY&feature=related (last accessed Mar.19, 2013).

1.1 Environmental Communication at the Crossroads

Environmental communication is at a crossroads.[2] On the one hand, environmental issues seem to occupy a much more prominent space in the mediascape and, consequently, in the public imaginaire, and the public appears much more willing to adopt environmentally friendly behaviours such as those represented by the triumvirate of reduce–reuse–recycle.[3] On the other hand, we still face a plethora of daunting global environmental challenges: loss of species and natural habitat continues at an alarming pace,[4] pollution and environmental degradation are suffocating the new industrial centres of the developing South,[5] and, most alarming of all, the velocity of manmade climate change remains largely unhampered by the meager steps taken to curb GHG emissions in the developed countries, with the anticipated arrival of shale gas fracking *en mas* and the continuous development of the tar sands in Alberta looming large.[6] The need to act on climate change has never been more urgent, as the window of

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[2] I provide a more thorough definition of environmental communication in section 2.1.1, but the International Environmental Communication Association (IECA) defines it as follows: "As an activity/phenomenon, environmental communication is all of the diverse forms of interpersonal, group, public, organizational, and mediated communication that make up the social discussion/debate about environmental issues and problems, and our relationship to non-human nature" (http://theieca.org/?q=what-environmental-communication (last accessed June 11, 2013)).

[3] See for instance the Greendex (2012), developed by the National Geographic Society in partnership with the research consultancy GlobeScan: http://environment.nationalgeographic.com/environment/greendex/ (last accessed Aug.25, 2013). As the report notes, while in several categories and countries green individual consumption seems to have lost some of its earlier momentum, the overall patterns show positive improvement.

[4] As represented by the 30% decrease in the living planet index since the 1970s (WWF, 2012, p.9). See also SCBD, 2010.

[5] During the first six months of 2013 in Beijing, only one in three days had clean air (http://www.globaltimes.cn/content/800650.shtml#.UgacD2S4GXQ (last accessed Aug.10, 2013)). In China, pollution and other environmental issues have become the focus of large popular protests, whose number has increased by 29% annually since 1996 (https://www.chinadialogue.net/article/show/single/en/5438-Officials-struggling-to-respond-to-China-s-year-of-environment-protests- (last accessed Aug.21, 2013)).

[6] IPCC, 2007; NOAA, 2013.

opportunity to avoid the more catastrophic outcomes of "runaway" climate change is closing fast.[7]

The challenges posed by such environmental issues beg the question of how to best address them communicatively. Answers, however, are anything but straightforward. Not only are the issues characterized by perceptive unobtrusiveness and perplexing complexity, but there is growing evidence that the main communication paradigm that has been used to frame public messaging and structure education campaigns on environmental issues over the last several decades is much less effective than previously thought. As will be discussed in detail in chapter 3, what has come to be known as the information deficit model or the diffusionist paradigm, developed predominantly as a framework for the public communication of science, is fast losing ground. The model's main tenet, that given adequate information human agents would act rationally to address the causes of the problem, was repeatedly shown to be premised on a deficient, sometimes fanciful conceptualization of the relations between human cognition, volition and behaviour, and between individual and collective agency.[8] Research undertaken in such diverse areas as cognitive science, linguistics, behavioural economics, risk management, social psychology and education testifies to the fact that we are much less reasonable than we think we are, and much more sensitive to social pressures than we are willing to admit. Since human action is premised in a combination of embodied and cognitive, rational and emotional, calculative and affective registers, and is significantly constrained by relevant social arrangements, structures and institutions, simply 'pouring information' into the public's minds seldom results in the kind of transformative social and political action necessitated by our current environmental predicament (Crompton, 2010, p.26).

As I describe in more detail in chapter 3, the need to adjust the means by which environmental issues are communicated to the public has led environmental

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[7] For a recent expression of the urgent need for action on climate change see the latest consensus statement from the Millennium Alliance for Humanity & The Biosphere (http://mahb.stanford.edu/consensus-statement-from-global-scientists (last accessed June 14, 2013)).

[8] See for example Brossard & Lewenstein, 2010; Bucchi, 2008; Burgess, Harrison & Filius, 1998.

communicators to pursue two different paths of action. The first targets the infocentric nature of the information deficit paradigm and its bias toward scientific (and other) expertise. It seeks to overcome the unobtrusiveness and complexity that characterize environmental issues by communicating the latter more persuasively, that is, in ways that appeal to both reason and emotion, and relate to the public's worldviews, values, beliefs and imagination. In short, it aims to create meaningful experiential resonance that may compel the public to act pro-environmentally.[9] The second path targets the decontextualized, top-down tactics of the information deficit model by focusing not on the psychological but on the structural conditions that may potentiate or hamper pro-environmental action. Rejecting the diffusionist paradigm's focus on individual behaviour and host of top-down, 'one size fits all' communicative strategies, environmental communicators pursuing this path of scholarship and action are concentrating their efforts on communicative interventions in the social, cultural and political conditions within which environmentally significant action may take place. Their efforts to facilitate inclusive and meaningful public participation in environmental decision-making, promote "green" citizenship and catalyze a political culture that advances sustainability can also be seen as part of a larger attempt to reshape the public's "structure of feeling" toward sustainability, a set of "meanings and values as they are actively lived and felt" (Williams, 1977, p.132). This is often pursued by making everyday experiences more congruent with the particularities of environmental and sustainability politics, and vice versa.

Both responses to the decline of the information deficit communication model indicate what I see as an incipient *turn to experience* as the premise for meaningful political engagement. In this mode, communicating environmental issues with lively, affective, compelling metaphors, tropes and imagery that resonate with the public's experiential (perceptive, embodied, emotional) registers, and attempting to bridge the public's everyday experience of environmental issues with the particularities of enviro-political decision-making, is fast becoming an important component of environmental

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[9] Throughout this work the term "pro-environmental" is used to describe forms of individual or collective action that are aimed at minimizing our negative impacts on the natural and built world (cf. Kollmuss & Agyeman, 2002, p.240).

communication. Importantly, what I suggest is a tangible turn to experience is influencing the design of new media for environmental communication. How it does so, and with what implications is the subject of this dissertation.

1.2 Participatory Media for Participatory Politics

Digital information and communication technologies (ICTs), sometimes referred to as participatory media, civic technologies or simply new media, are fast becoming a staple of environmental communication. Websites and list-serves are used to raise awareness and provide relevant information about environmental issues; social networks and online forums create virtual spaces for discussion and deliberation on the issues, and crowdsourcing tools are used to solicit possible solutions from the public; geographic information systems (GIS) are used to communicate the complexity of environmental issues; mobile technologies facilitate the formation and maintenance of collaborative networks and help organize and coordinate collective action on environmental issues; and a variety of internet-based tools and applications provide means for direct intervention in the issues.

Environmental communication's attitudes toward new media can be seen as part of a wider belief in the democratizing potential of digital technologies.[10] According to this view, new media – especially the internet – are vehicles for more equitable, responsive and transparent politics for they embody a de-hierarchized, decentralized and consensual image of politics, advancing "ever more fragmented, accelerated, pluralistic democracy" (Johnson & Bimber, 2004, p.240).[11] A typical statement of this position was given by a former political adviser to US President Clinton, who claimed that "Thomas Jefferson would have loved to see the Internet. His utopian vision of a democracy based

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[10] The belief in the democratizing powers of new technologies from print to radio and to television is not new (Mosco, 2004). Before the Occupy Movement's massive use of new media and the association of social networks with recent political turmoil in Arab countries (dubbed the Arab Spring), new media in particular were associated with the emancipatory struggles of Mexican Zapatistas in the mid 1990s, the anti-globalization movement organizing during the "battle in Seattle" in 1999, and in Howard Dean's innovative US presidential campaign in 2004 (Barney, 2004; Hansen, 2010; Karpf, 2012).

[11] In a sharp critique, Morozov (2013) claims that such positions represent an interest in what the internet *means*, not what it actually *does*.

on town meetings and direct popular participation is about to become a reality" (Morris, 1999, p.27). The growing equivalence between new media and democratic participation reached a significant milestone in the mid-2000's, as the latest generation of web applications that came to be known as "Web 2.0" took hold of the public's imagination.[12] With the integration of accessible tools for content creation and dissemination, and the exponential growth and popularity of social networking and media sharing platforms, the blurring boundaries between content producers and content consumers was taken to signal a transformation of social relations as a whole. *Maclean*'s, a Canadian current affairs weekly innocent of Marxist leanings, confirmed the coming of Web 2.0 as an indication of the imminent realization of Marx' vision since, finally, "the means of production are in the hands of the masses and a revolution is under way" (Johnson, 2005). In the same spirit, *Time Magazine* chose "Web users" as its 2006 Person of the Year, pronouncing without a shred of reticence or irony that Web 2.0 is "about the many wresting power from the few" (Grossman, 2006). Since then, the continuous growth of the web and the global penetration of mobile technologies has only fueled the cyber-optimist anticipation of the coming "hyperdemocracy" (Pesce, 2010), with recent events in Turkey and Brazil providing this view with additional tailwind. I return to these views from a more critical perspective in chapter 2.

While new media are often used to bring to life environmental issues, raise awareness of the issues and increase their clarity and urgency, they seem especially appealing to those interested in generating wide public engagement on the *political* constituents of environmental issues, and, in the context of the present work, involving the public in the politics of sustainability. This is because the latter, defined by the UN's World Commission on Environment and Development (1987) as "development that meets the needs of the present without compromising the ability of future generations to

[12] On the technical features associated with Web 2.0 see O'Reilly, 2005.

meet their own needs",[13] is increasingly perceived as an essentially political issue on three accounts:

First, sustainability involves a confounding array of interrelated social, economic, cultural and biotic issues that affect diverse social groups (Goodland, 2002; Hulme, 2009; Robinson, 2004). Relevant stakeholders may mobilize potentially conflicting interests and worldviews, interpreting the meaning and implications of sustainability in significantly different ways, and therefore requiring substantial (political) debate.[14] Writing about community sustainability planning, Smith and Snyder (2011, p.3) make this argument cogently:

> although good data, robust models, and a logical decision process all matter, the politics matter even more. How effectively a community planning process unfolds is determined in large part by who participates, how they participate, and what power they each wield. How effectively such a planning process incorporates good scientific information depends on how much credibility the experts and their tools have in the process. In other words, community planning efforts are not exercises in abstracted rationality, but rather they are fundamentally political processes involving multiple parties with divergent interests.

Second, the scale of the changes warranted by sustainability often require assistance from local and national governments. In this respect, it is becoming clearer that under the current capitalist, neoliberal regime politicians are quite unlikely to push for non-incremental changes without the existence of a tangible political constituency

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[13] Aside from calling to merge economic and environmental decision-making, the report emphasizes the links between sustainability and social justice, notes that there is no single path to a sustainable future since solutions are contingent on local socio-economic and environmental conditions, and calls, in response, to promote citizens' initiative, empower grassroots organizations, increase the involvement of local communities in public policy-making and strengthen local democracy overall.

[14] To this we should add the manner by which sustainability is often implicated with unanticipated, sprawling "second-order" problems that could not be solved exclusively by specialists (Voss & Kemp, 2006, pp.5-6). This is also the motivation behind what some identify as a wider move towards "reflexive governance" (cf. Shove, 2010a; Voss, Bauknecht & Kemp (eds.), 2006).

that would counteract the interests of big business (Klein, 2011; Kovel, 2007).[15] The dogged insistence of the current conservative government in Canada to pursue (anti-) environmental policies, dismantle environmental protections and undercut relevant scientific research provides a stark reminder of this.[16] And, of course, the failure of COP 15 in Copenhagen (and subsequent meetings in Cancun and Durban) has done even more to deflate hopes for environmental regulation on a global scale since, apparently, governments are unlikely to compromise on what they perceive as their national interests for the sake of planet-wide solutions – a pattern already visible in the early 1990s (see for instance Centre for Science and Environment, 1992).

Lastly, since moving toward sustainable futures requires more than individual lifestyle changes (Brulle, 2010; Gore, 2009; Monbiot, 2006; Speth, 2008),[17] public engagement on sustainability aims to build a collective willingness to make deep cultural and economic changes. Minimally, this includes policy buy-in, that is, providing the government with a mandate to pursue certain policies. But maximally, it signals the need to mobilize on environmental issues such as climate change on the widest possible scale, and to engage wide constituencies in a discussion on desirable futures.

On all three accounts, sustainability does not lend itself to singular, optimal or exclusively scientific solutions. Instead, realizing more sustainable futures calls for wide-reaching, inclusive and meaningful political participation – a form of participation that may change the very conditions of its own possibility. The growing consensus among environmental communicators, therefore, is that sustainability is best advanced by emergent, participatory processes that include relevant stakeholders and foreground the

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[15] While these reasons have largely motivated quests for new forms of environmental socialism (or "red green" politics), they also motivate very different political agendas. Shearman & Smith (2007), for instance, take the failure of liberal democracy to materialize sustainable policies as a reason to junk it altogether for the promise of a benevolent authoritarian ruler, "An altruistic, able, authoritarian leader, versed in science and personal skills" (p.13). I revisit the issue below.

[16] See for instance http://www.huffingtonpost.ca/2013/04/30/science-cuts-muzzling-canada-conservatives_n_3112348.html?ir=Canada (last accessed June 9, 2013).

[17] As is often the case, author and activist Bill McKibben makes the point acutely (and succinctly): "Changing light bulbs just isn't enough" (cited in Minion et al., 2009, p.269).

values, visions and worldviews of those involved.[18] It is in this sense that, "'participation' in the widest sense ... is what shapes the contours of sustainability itself" (Dobson, 2006, p.224).

The participatory imperative that animates public engagement on sustainability is present in the use of various new media technologies by local and national governments, and by activists seeking to apply pressure on governments to act faster and more decisively. While both government and activists are interested in adding actors to the politics of sustainability – to reach those who have previously shied away from active participation in sustainability decision-making – they do so for different reasons. Government seems to be chiefly responding to the growing capacities and corresponding expectations of citizens to be able to engage with elected officials and bureaucrats online (Holden, 2007; Leighninger, 2011a; Milakovich, 2012). A report from the Pew Institute, part of its Internet and American Life Project, has associated these expectations with the emergence of an "online government participatory class", stating that at least 31% of American internet users can be considered "government social media users" who watch a video online, read a government blog, sign up to receive email or cellular text notifications/alerts, follow or became a fan of a government blog, or follow a government blog or website through Twitter (Smith, 2010, pp.42-3). Sensing the growing public demand for reciprocity, governments are adopting social media tools with enthusiasm. In his report to Demos, Matt Leighninger notes that when "Faced with these new citizen capacities and expectations, government leaders have realized the need to be more proactive in their approach to the public, resulting in a wave of civic engagement efforts over the past 10 years" (2011a, p.3). Of course, governments are also attracted to online public engagement technologies for their communicative efficiency – their wide availability, relative ease of use, flexibility, scalability and cost-

[18] For a few examples see Espinosa & Walker, 2011; Innes & Booher, 2010; Leiserowitz, Kates & Parris, 2006; Robinson, 2004; 2008; Smith & Snyder, 2011; Talwar, Wiek & Robinson, 2011; van Kerkhoff & Lebel, 2006.

effectiveness. As Leighninger (ibid., p.4) puts it, “nothing can beat the convenience and choice of online tools”.[19]

While sharing government’s enthusiasm for their availability, cost-effectiveness and flexibility, environmental activists seem largely interested in new media as tactical means to incite, coordinate and support collective action. An often used example for this is the lightning-speed emergence of Step It Up, which long before Occupy and Kony 2012 became a worldwide phenomena and was able to successfully attract public attention and organize mass action, becoming in the process a symbol for a new and revitalized environmental movement.[20] In January 2007, Bill McKibben and a group of 6 students from Middlebury College in Vermont set in motion StepItUp2007.org, “the first open source, web-based day of action dedicated to stopping climate change”.[21] What started as brainstorming the next steps to follow Al Gore’s influential *An Inconvenient Truth*, turned into a social movement on a shoestring, inspiring over 2000 demonstrations in all 50 US States, and culminating in two National Days of Climate Action (in April and November 2007). In its later phase as 350.org (from 2008), named after the atmospherically benign quantity of CO_2 particles per million, the group helped organize in October 2009 what *Foreign Policy* called “the largest ever global coordinated rally of any kind”,[22] with 5,200 simultaneous demonstrations in 181 countries. In over 5 years of activity, Step It Up has helped to materialize a community of engaged climate activities that, with 350.org, swelled into a vocal and visible social movement – from organizing “national days of climate action” with Step It Up, to “building a global movement to solve the climate crisis” with 350.org, and to maintaining a global presence by organizing a host of “ethical spectacles” (Duncombe, 2007) such as 10/10/10 (a global day of concerted “iconic and small” action on climate change),[23] and 350 EARTH

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[19] See also Holden, 2007; Leighninger, 2011b; Milakovich, 2012; Price, 2009; Rowe & Gammack, 2004; Zavestoski, Shulman & Schlosberg, 2006.

[20] This is most pronounced in the 13 chapters collected in Endres, Sprain & Peterson (eds.), 2009.

[21] http://stepitup2007.org/article.php?list=type&type=48 (last accessed April 2, 2013).

[22] http://www.foreignpolicy.com/articles/2009/11/30/the_fp_top_100_global_thinkers?page=full (last accessed April 2, 2013; login may be required).

[23] http://www.1010global.org/101010 (last accessed April 2, 2013).

("the world's first ever global satellite art project" that featured 16 art installations viewable from space).[24]

The extremely distributed form the organization took, and the speed in which it organized (only three months passed between the website's inauguration and the first national day of action), were practically inconceivable without new media, which provided Step It Up with a wide geographic and demographic reach, the capacity to promote a diversity of actions and mobilize a wide array of related groups with a flexible, nimble and cost-effective organizational structure. Step It Up used email to approach other organizers and communities and invite them to partake in the national day of action. Their website generated media presence and provided activists with fact-sheets, presentation material, stencils, banners, organizing guides (or "cookbooks"), and links to external resources. They used media content-sharing platforms such as Flickr and Youtube to widely distribute images and videos and get their message across in a lively, compelling way. They also used social networks like Facebook and Twitter to coordinate events and provide opportunities for activists to network amongst themselves and with other organizations, encouraging the creation of useful strategic alliances and fostering a sense of collectivity and solidarity that is so essential to the success of budding social movements (Staggenborg, 2012, p.34). As evident in the way Step It Up describes its own work, new media technology was not only crucial for the organization's ability to get its plans for social action off the ground, but also in providing the organization with metaphors and concepts for identity-building. For instance, referring to the organization as "open source", a term designating non-proprietary, modifiable software products, created a sense of collective ownership and invited "anyone involved to add their flavor to the project" (McKibben et al., cited in Sprain et al., 2009, p.342). All this has prompted one advertising industry insider to state that 350.org is "one of the strongest examples of social media optimization the world has ever seen".[25]

While I am sympathetic to accounts that demonstrate the democratizing potential of new media, and find Step It Up's use of new media especially inspiring, I find that the

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[24] http://earth.350.org/ (last accessed April 2, 2013).

[25] http://experiencematters.criticalmass.com/tag/350-org (last accessed April 2, 2013).

way democratic participation, political empowerment and new media are entwined in what Mosco (2004) call our "digital sublime" is often naïve, and tends to fetishize new media at the expense of a more realistic view of the social and political contexts within which they are designed and used. Oscillating between a non-critical instrumental treatment of new media as neutral tools, and a deterministic, mystifying optimism that associates them with an ineluctable drive for democratization, our digital sublime manifests McLuhan's belief that we tend to embrace technology uncritically – often finding that our use of technology has outpaced our ability to soberly assess it. In a famous passage from *The Medium is the Massage*, McLuhan notes that when we do apply critical perspectives to media technologies we tend to do so by deploying anachronistic conceptual tools: "We look at the present through a rear-view mirror. We march backwards into the future" (McLuhan, 1967, p.75). In response, this work aims to add to existing accounts of new media's participatory potentials a more nuanced, balanced yet critical perspective, hoping to help our thinking catch up with our living, as McLuhan advocated.

1.3 Digital; Networked; Interactive

The embrace of new media as means for increasing democratic participation and, ultimately, for political transformation, is premised in both their material properties and their cultural meaning. This reflects what Feenberg (2012) sees as a fundamental aspect of all technologies, namely the way they feature function and meaning as their "double aspects". Media theorist Lev Manovich (2001) expresses a similar idea when he notes that the most important characteristic of new media is what he calls "transcoding": the way new media objects combine technical and cultural elements. The two levels, writes Manovich, the "computer layer" and the "cultural layer", interpenetrate in a "process of cultural reconceptualization" (p.47), by which he means that technical capabilities influence ways of thinking about, and acting in, the world, while those new modes of thinking and acting potentiate technical innovations. In other words, reducing new media to their material properties would be as essentializing as addressing them solely based on the social practices they enable. With this in mind, there seems to be a wide agreement that both material and cultural perceptions of new media are premised

in the way the latter are *digital*, meaning that they perform operations on information in numeric form.[26] Converting (or digitizing) continuous worldly phenomena – words, sound, images, etc. – into discrete numeric units produces digital information with two important features: digital information is *manipulable* (can be easily adapted, changed, replicated, compressed and stored); and *networkable* (discrete units can be segmented into "packets" and disseminated over distributed networks).

Accounts of the participatory nature of new media (such as those described above, especially *Time Magazine*'s celebration of web users), often emphasize the manner in which the manipulability of digital information lends itself to a myriad representations (or encodings) of text, sound, image and video, indicating a range of expressive modalities with political potentials. On the one hand, the manipulability of digital information unleashes new media's capacity to absorb (or "remediate" in Bolter & Grusin's (1999) terms) all other forms of media, catalyzing technological and cultural convergences (Jenkins, 2006). On the other hand, with the availability of accessible tools for media creation, manipulation and storage – be they local or "cloud" based – amateurs are able to produce multimedia content that is practically indistinguishable from that created by professionals (Stromer-Galley & Wichowski, 2011). This is evidenced by the popularity of personal blogs and microblogging services such as Twitter, social networks and media content sharing platforms like Flickr, Youtube, Instagram and Pinterest, and in the phenomenal growth and success of Wikipedia. It is also reflected in the cultural mainstreaming of web-based artistic forms of expression such as mashups and viral memes, and in the challenges that "citizen journalism" poses to mainstream and community news media (for the latter see Bruns, 2008; Lewis, Kaufhold & Lasorsa, 2010). Simply stated, authoring texts, capturing images and recording moving images have never been easier. And with only basic technical skills, most amateur internet users enjoy relatively easy access to the entire cycle of media production and therefore can express themselves by producing multimedia without

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[26] See for example Murray (2003) who refers to new media as the "digital medium", Manovich (2003, p.17) whose basic definition of new media is the "cultural objects that rely on digital representation and computer-based delivery", Lister et al. (2008, pp.16-21) who, while warning for the essentializing tendencies of singular definitions, note that new media rely on digitization, and Flew & Smith (2011, p.4) who note that new media can be thought of as "digital media".

relying on established media organizations.[27] While the emergence of "prosumers" may result in a form of cultural cacophony, or may lack the political gravitas expected by some, at the very least, new media offer channels for political expression as never before.[28]

Being networkable, digital information is often disseminated through many-to-many communication flows over distributed networks. These allow the simultaneous production and sharing of information by a large number of interconnected, possibly anonymous, semi-autonomous and geographically dispersed nodes (Barney, 2004; Castells, 2010), offering the public multiple channels to contribute to, and potentially refashion, the incipient virtual public sphere (see Cropf & Krummenacher (eds.), 2011). The members of a network may help generate politically salient ideas in a distributed manner ("crowdsourcing"), or act collaboratively as content filters – both knowingly as in websites such as Reddit, Technorati or Slashdot, or unknowingly when preference is aggregated algorithmically and used to recommend or rank products, services or information to others (Thomas, 2012). While the question whether distributed networks indeed offer truly decentralized communication remains contested,[29] Yochai Benkler (2006), observing the free and open source software community, argues that the productive exchanges enabled by digital networks do in fact carry democratizing effects:

> the networked environment makes possible a new modality of organizing production: radically decentralized, collaborative, and nonproprietary; based on sharing resources and outputs among widely distributed, loosely connected individuals who cooperate with each other without relying on either market signals or managerial commands. This is what I call "commons-based peer production." (p.60)

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[27] But see Keen (2007) who argues that the growth of amateur media creation is diluting cultural critique, and Dean (2009; 2012) who sees the swell of online participation as yet another symptom of the capitalist, neoliberal commodification of communication itself.

[28] Of course the situation in more authoritarian countries is radically different. In countries like China, Iran and North Korea the internet is highly regulated and censored (Kelly, Cook & Truong, 2012).

[29] See for instance Barney, 2004, p.137; Galloway, 2004; Terranova, 2004, ch.2.

When considered alongside the manipulability of digital information, these peer-production networks, Benkler adds, provide a model for the reorganization of the public sphere as a whole, and thus may help restore the democratic function of (and hopes invested in) the media:

> The emergence of a networked public sphere is attenuating, or even solving, the most basic failings of the mass-mediated public sphere. It attenuates the power of the commercial mass-media owners and those who can pay them. It provides an avenue for substantially more diverse and politically mobilized communication than was feasible in a commercial mass media with a small number of speakers and a vast number of passive recipients. The views of many more individuals and communities can be heard. Perhaps most interestingly, the phenomenon of peer production is now finding its way into the public sphere. It is allowing loosely affiliated individuals across the network to fulfill some of the basic and central functions of the mass media. We are seeing the rise of nonmarket, distributed, and collaborative investigative journalism, critical commentary, and platforms for political mobilization and organization. We are seeing the rise of collaborative filtering and accreditation, which allows individuals engaged in public discourse to be their own source of deciding whom to trust and whose words to question. (p.465)

In a recent interview to CBC's George Stroumboulopoulos, Arianna Huffington, whose *Huffington Post* is considered by many to be the model for successful online publishing,[30] put it more succinctly: "This is really a golden age for people to have their voices heard".[31]

While the manipulability and networkability of digital information are often cited as the material conditions for the democratic, participatory practices supported by new media, this dissertation sets its sights on the political significance of the *experiences* evoked by new media. These are largely premised in new media's interactivity. To clarify, in the context of this work, I am less interested in interactivity as a marker of the

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[30] *Huffington Post* was sold to America Online in 2011 for an astounding $315 Million (see http://www.guardian.co.uk/world/richard-adams-blog/2011/feb/07/huffington-post-sale-aol-ariana (last accessed April 16, 2013)). In comparison, the venerable *Washington Post* was recently sold for 'only' $250 Million (see http://articles.washingtonpost.com/2013-08-05/national/41085661_1_washington-post-co-jeff-bezos-graham (last accessed Aug.10, 2013)).

[31] *Tonight*, ep.131, aired March 27, 2012. See (11:03) here: http://www.cbc.ca/strombo/platform-videos/gst-s2-episode-131---larry-miller-arianna-huffington.html (last accessed June 10, 2013).

(functional) exchanges enabled by two-way communication networks – the communicative antithesis of unidirectional dissemination (Durham Peters, 1999) – but more in what virtual reality pioneer Myron Krueger (2003) calls the "responsive aesthetics" of new media: the way new media invite users to act upon and through them while reflecting the outcomes of those actions back to users through various feedback mechanisms.[32] To rephrase, by their very affordances,[33] new media objects allow users to affect them – to interact with them by manipulating, creating, duplicating, reshaping and appropriating content – signifying responsivity and giving rise to experiences that are characterized by it. This is distinctly different from the way the 'older', mass media address their audiences as passive recipients.[34] Jean Baudrillard, for example, argued provocatively that broadcast media embodied social control in the very way they blocked meaningful public response:

> it is not as vehicles of content, but in their form and very operation, that media induce a social relation; and this is not an exploitative relation: it involves the abstraction, separation and abolition of exchange itself…. the totality of the existing architecture of the media founds itself on this latter definition: *they are what always prevents response*, making all processes of exchange impossible.... This is the real abstraction of the media. And the system of social control and power is rooted in it. (1981, pp.169;170; emphasis in origin).[35]

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[32] Interactivity can also be addressed as a neuroscientific phenomenon, manifested as affective or afferent stimulation and response (see for instance Hazlett & Benedek, 2007). However, throughout this work interactivity is used to reference *conscious* acts upon and through new media objects.

[33] Affordances are "the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used" (Norman, 2002, p.9; cf. Gibson, 1977).

[34] Of course perception is never entirely passive, as shown persuasively by cognitive scientists, nor is reception devoid of active interpretation that may inflect the meaning of the message. The passivity of the mass media's audience, therefore, refers to their inability to *change the actual content of the media*.

[35] Interestingly, writing about the same technology McLuhan (1967, p.24) reached the inverse conclusion: "In an electric information environment, minority groups can no longer be contained – ignored. Too many people know too much about each other. *Our new environment compels commitment and participation*. We have become irrevocably involved with, and responsible for, each other" (emphasis added). This confirms McLuhan's position at the vanguard of thinking about new media, located somewhere between electronic media (television) and information technologies.

Unlike the broadcast media, the new media foreground exchange. Their *form* invites users to be active and participate in the creation and sharing of digital content – to provoke, respond, initiate and circulate – to "join the conversation online", "leave comments", "like us on Facebook", and so forth. But while new media's responsive aesthetics colour the way most people encounter them in everyday life, environmental communication has yet to treat the *political significance of interactive experiences* in a meaningful manner.[36] Furthermore, as I explain in more detail in the next chapter, by and large, when environmental communicators approach new media technologies they address them as *instruments* for environmental citizenship, with very little attention to the ways in which new media are designed. This dissertation aims to rectify this apparent blind-spot by placing environmental communication in a productive dialogue with disciplines that have already started to engage with the significance of interactive experience, most notably, the critical theory of technology, and research in Human-Computer Interaction (HCI). Fortunately, I am not alone in this task, as environmental issues (and sustainability in particular) increasingly attract the attention of contemporary HCI researchers (most notably as part of the sustainable HCI agenda).[37] However, when HCI researchers treat sustainability they tend to so in a rather decontextualized and, frankly, under-conceptualized manner that focuses on sustainability's biotic elements and on individual behaviour change – on ways to nudge users to adopt more environmentally benign behaviours such as using less electricity, riding public transit instead of cars, etc. Sustainability's political underpinning, therefore, are reduced to questions of individual behaviour or choices over consumption. I return to this issue with more detail in sections 2.1.4 and 2.3, but for the time being, suffice it to say that the relations between interactive experiences and the politics of sustainability are in need of exploration in a more sustained manner. In response, the question that orients this work is, *how are human-computer interactions designed to enroll the public into the politics of sustainability?*

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[36] Interactivity is practically absent from the most important treatments of new media in environmental communication, including Cox, 2010; DeLuca, Sun & Peeples, 2011; Hansen, 2010; O'Neill & Boykoff, 2011; and Scharl, 2004; 2006.

[37] See Blevis, 2007. For an overview of Sustainable HCI see DiSalvo, Sengers & Brynjarsdóttir, 2010; Mankoff et al., 2007; Nathan et al., 2008.

As mentioned above, I explore this question by bringing together the insights of environmental communication, critical theory, phenomenology and contemporary research in HCI. Environmental communication (including work on the communication of sustainability) gives this work its particular social and political contexts, understood here as the confluence of the urgency that underlies our environmental predicament and the current fork in the road faced by environmental communicators. The turn to experience in environmental communication locates the discussion in a particular moment in time, giving it its flavour, so to speak. The critical theory of technology provides this work with a useful way to approach the imbrication of the social, political and technical characteristics of new media. What Andrew Feenberg (1999; 2002) conceptualizes as "technical codes" are used here to unpack the way social and technical incentives shape concrete technological designs. From phenomenology I take the insight that technological artifacts mediate our perception of ourselves, the world, and the ways in which we can act on it. In this sense, technology is implicated in the very structure of what phenomenologists call the lifeworld – the world of everyday, pre-reflective experience with its "lived structures of meaning" (Van Manen, 1990, p.4). It is therefore part of the mutual-constitution of humans and their world. This approach was well summarized in the oft quoted words of Winograd & Flores (1986, p.xi): "in designing tools we are designing ways of being". I use the notion of "interactive world disclosure" to draw attention to the particular ways in which the semantic, embodied and behavioural aspects of interactive experiences mediate users' perceptions of the lifeworld, revealing a world that is characterized by responsivity. Lastly, contemporary work in HCI provides this work with ways to unpack the conceptual orientation and techniques of interaction design. When doing so, I often rely on critical approaches to interaction design,[38] and in particular the way game designer Ian Bogost (2007) understands the distinctness of interactivity as a way to model and translate "source worlds" into sequentially processed rules that are then expressed as a set of interactive affordances. What he calls "procedural rhetoric" thus explains the relations between world, design, computer logic and user experience. The novelty of my approach, then, derives from the way it

[38] See for instance Bardzell et al., 2012; Blyth et al., 2010; Bogost, 2007; DiSalvo, 2012; Obrist & Fuchs, 2010.

synthesizes insights from the four disciplines into a framework by which we can grasp the way new media are designed to provoke politically significant experiences. In this vein, I approach interactivity as a meaningful and meaning-giving mediation with political significance, and ask, how are interactive experiences designed to mediate the underlying political culture of sustainability? How are they designed to convey a sense of political agency or self-efficacy? How are they designed to create traffic between everyday experience and the issues that underpin the politics of sustainability? In asking, and providing initial answers to these questions, this dissertation aims to assist environmental communicators to better understand the potentials and limitations of designing and using interactive experiences to engage the public on the politics of sustainability, while providing technology designers with a more robust conception of the political significance of their creations. In more general terms, this dissertation makes visible the sociotechnical mediation of what Ulrich Beck (1995, p.17) sees as the "secret elective affinity between the ecologization and the democratization of society".

1.4 The Work's Organization

This dissertation's inquiry into the political significance of new media is focused on the design of interactive experiences, and takes place within the context of the politics of sustainability. It proceeds as follows:

Chapter 2 discusses the work's approach to new media technology. It starts by reviewing the way the political significance of new media is currently addressed in environmental communication, and then suggests it is in need of augmentation. Environmental communicators, it is argued, understand new media as *tools* with informational, discursive and coordinative (or tactical) effects, but pay scant attention to the interactive experiences they afford, or to their origins in (social) processes of design. I approach the first blind-spot by drawing from phenomenology and digital rhetoric, explaining interactive experiences as mediations of being, perception, action and meaning. To engage with new media, it will be argued, is to experience interactive world disclosure with potential political effects. The second blind-spot is addressed by reference to the critical theory of technology, especially what Feenberg calls "technical codes": the way social forces, imperatives and meanings shape technological artifacts.

Chapter 3 provides the dissertation with its socio-political context, explaining what kinds of political effects are sought by environmental communicators. It illustrates the current state of environmental communication, what I call its "turn to experience", in relation to the characteristics of environmental issues, and in response to the decline of the information deficit communication model. The chapter identifies two important directions in which environmental communication is moving: the first aims to persuade the public to adopt pro-environmental behaviour by developing clear, compelling and resonant messaging strategies. The second aims at political "scale-making" by facilitating inclusive, responsive, open-ended and meaningful public participation in environmental politics, thus promoting environmental citizenship and potentiating a new green political culture. The two directions, I argue, shape the design and use of new media for public engagement on the politics of sustainability.

The next two chapters explore concrete interactive media. The analysis foregrounds the sometimes contrasting, sometimes overlapping ways in which environmental communication's turn to experience shapes the design of interactive experiences. The analysis is based on interviews conducted with new media designers, my participation in processes of multi-stakeholder design, and on a close reading of the technologies themselves. The significant majority of the analyzed designs were created in Vancouver, Canada. The concentration of examples from a single locale was influenced, on the one hand, by issues of accessibility – living in Vancouver and being active in the local sustainability community gave me valuable access to design projects and the people involved in them. But happenstance is not everything in this case, since Vancouver is considered on the forefront of urban sustainability planning and public engagement. The City has repeatedly committed to reducing its environmental impact and has embarked on an ambitious plan to become the world's greenest city by 2020. Both government and non-governmental organizations are therefore keen to experiment with innovative methods for public engagement, making the city a perfect site for the kind of research pursued here.

Chapter 4 asks how interactive experiences are used to politicize users. It focuses on the way users are enrolled into the process of sustainability policy-making through a series of interactive scripts. Considering a public interactive art installation and several "serious" games, the chapter suggests that the interactive modalities afforded to

users carry political significance for the way they prefigure political culture in performative ways. To interact with such artifacts, it is argued, is to experience certain dimensions of sustainability politics. The chapter then discusses two prototypical interactive structures: the first, "tunneling", takes the user through a set of predefined activities and produces an immersive experience characterized by enclosure (what I call "diagetic inwardness").[39] The second, "rhizomatic wandering", allows users more freedom to move within the interactive space and explore reflexively a range of politically significant choices and outcomes.

Chapter 5 considers the way interactive experiences reflect and constitute the relations between users' everyday experience and environmental policy-making. Based on the analysis of the visualization strategies operative in the design of MetroQuest, a back-casting decision-support tool used to engage the public on urban sustainability planning, the chapter illustrates two contrasting approaches: the analytic approach enrolls users as objective adjudicators in what is essentially a consensus-driven process, while the deictic approach foregrounds the communication of difference and the provocation of dissensus as ways to create resonance between users' everyday experiences and the space of political decision-making.

The *conclusion* revisits the main themes of the work, articulates its main contributions, and provides an initial exploration of processes designed to involve users in sociotechnical design, what I call "participatory worldmaking". In the context of the latter, it asks whether new media-driven processes of collaborative design can help close the gap between those "closer to the machine" and those who merely use it. The conclusion also revisits the relations of democratic transformations and environmental issues – the affinity between democratization and ecologization in Beck's terms – and locates the work within an incipient, procedural approach to sustainability.

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[39] I borrow the term from film studies to indicate that which inhabits the digital environment, as opposed to extra-diegetic elements that reside in the non-digital world. I explain this in more detail in section 4.3.1.

2.
New Media as Forms of Interactive World Disclosure

> Every piece of software reflects an uncountable number of philosophical commitments and perspectives without which it could never be created. Software depends inevitably on our ideas about representation and reality.
>
> –Paul Dourish[40]

[40] 2001, p. viii.

2.1 New Media in Environmental Communication

When environmental communicators address new media's democratic, participatory qualities, their accounts tend to cluster around three central uses: creating awareness, informing and educating the public about environmental issues; providing the public with virtual spaces to discuss, debate and deliberate those issues and suggest potential solutions; and providing the public with the means to intervene and coordinate collective action on the issues. While these accounts highlight several important aspects of the deployment of digital technologies to activate the public politically, I argue that they tend to treat technology as a set of neutral, un-biased *tools* for environmental citizenship, instead of seeing them as important *mediations* of environmental citizenship. Digital technology, in other words, is perceived according to what can be done with it, and not what it may actually do. In response, this chapter seeks to augment our current thinking about the political significance of new media for environmental politics in two interrelated manners: first, it argues that we need to pay attention to the way new media technologies emerge in social processes of design, and as such embody and promote the worldviews, values and incentives of their designers. Second, it suggests that we need to consider the way the biases of new media are expressed in the kind of interactive experiences they afford their uses. These, as best illustrated by phenomenological approaches in the philosophy of technology and by contemporary research into HCI, have political significance based on the way they mediate being, perception, action and meaning, and the way they create resonances between offline ("source") and online ("virtual") environments. I call these accumulated operations, *interactive world disclosure*.

2.1.1 Informational Uses

Setting aside the critique of information-centric approaches to environmental communication (which will discussed in section 3.1), there is a strong consensus among environmental communicators that an informed citizenry is better positioned to be actively and meaningfully involved in environmental politics.[41] As Neal Gavin (2009,

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[41] For a few examples see Cox, 2010, ch.3; Minion et al., 2009; Newig, 2007; O'Neill & Boykoff, 2011; Speth, 2008, p.217.

p.129) writes, “Citizens need information to orient themselves towards developments, and to make educated political and lifestyle decisions with respect to it”. The arrival of the Internet (and later ‘smart’ mobile phones) was seen by many environmental communicators as a golden opportunity to increase the public’s awareness of environmental issues by making relevant information more readily available, compelling and emotionally resonant. Online information campaigns also promise unprecedented access to the public, that is, without having to comply with the editorial policies of the mainstream media. Blogs, online news sources, listservs, specialized and other social networks (like Facebook and Twitter), collaborative filtering sites (like Reddit), and independent environmental group websites, make diverse environmental information available in principle to anyone with access to a networked computer or a ‘smart’ mobile phone.[42] With the increased penetration of broadband connections and the popularity of Web 2.0 platforms, the relative ease and low cost of media production allow environmental groups to create engaging messages and communicate them while bypassing traditional media gatekeepers (Cox, 2010, p.172-3; DeLuca, Sun & Peeples, 2011). The hundreds of images sent by local groups to 350.org make this quite evident.[43] In a sense, then, the internet provides environmental groups with the possibility to control the entire cycle of information/message production and distribution, as Hansen (2010, p.59) argues:

> Perhaps one of the main attractions of the internet for environmental pressure groups and claim-makers is the prospect of altogether bypassing traditional news organisations and news media, instantly overcoming all the associated difficulties of gaining access and of controlling/managing the framing of campaign messages. Combined with developments in visual recording technology, the World Wide Web facilitated an unbroken chain of control – by activists themselves – over the orchestration of protest and public performance, the

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[42] But see Hansen’s (2010, p.68) assertion that publics “continue to turn to the major news media for authoritative, trustworthy and ‘trusted’ information and continue to exercise a healthy degree of skepticism as a well as a discerning and in many cases increasingly media-literate critical approach to information, whether provided by government, pressure groups or big business”. While there is much need for research that clarifies the relations between mainstream and alternative new media, this topic will not be addressed in detail here.

[43] See pictures here: http://www.flickr.com/photos/350org/sets/72157622455212282/ (last accessed April 26, 2013).

> recording and 'packaging' or framing of protest, and the communication to potential 'masses' or wider publics of such news/campaign messages.

Yet, as tempting as it may be, we should be careful not to treat the informational uses of new media as a panacea. The volume of available information, and the difficulty of assessing its relevance, quality and biases (and, in the case of Twitter, even its origins), necessitate what Gavin (2009) calls "web-savvyness":

> there is certainly a wealth of information and interactive commentary out there. But it does not in itself necessarily constitute useable information, any more than useable information constitutes a contribution to knowledge or to rational debate…. The question is not, can the Web give us access to information and dialogue? but where do we find authoritative commentary whose sources are known and can be trusted? (p.138).

Concerns over the public's ability to decipher and evaluate environmentally-relevant information have recently come to the surface with the fallout from what came to be known as 'climategate' – the leaking of email correspondence between scientists associated with the Climate Research Unit (CRU) in the University of East Anglia.[44] Aside from providing stark evidence of the ease with which digitally stored information can be hacked and distributed, 'climategate' shows how information with little intrinsic context can feed 'echo-chambers', injecting spin and ambiguity into the discourse of environmental science. On its own, as Walter Lippmann argued in the 1920s, access to information is an insufficient condition for meaningful political participation.

For the purposes of this chapter, we can address teaching and learning opportunities as part of the informational uses of new media. There are many independent, low-budget educational multimedia circulating on the web, of both the 'user-generated' and the more professionally crafted variety. Annie Leonard's *The Story of Stuff* series is perhaps the most acclaimed of them all.[45] My focus here, however, is on the recent fascination with "serious" digital games as learning platforms. While the

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[44] For more on 'climategate' in the popular press see http://www.nytimes.com/2009/11/21/science/earth/21climate.html and http://dotearth.blogs.nytimes.com/2010/07/07/gate-fever-breaks/ (last accessed April 26, 2013).

[45] See http://www.storyofstuff.org (last accessed Aug.20, 2013).

integration of digital games into school curriculums is slow and not without difficulties (Kirriemuir & McFarlane, 2006, p.3), digital games are increasingly promoted outside of the educational system as means for developing relevant skills, competences and literacies. In his influential account, James Paul Gee (2006) notes that effective uses of video games for educational purposes *empower learners* by treating them as active co-producers: allowing them to manipulate tools and customize their learning environment; develop learners' *problem solving* skills by scaffolding learning: escalating the difficulty of tasks in a well ordered, timely and repetitious manner, making tasks "pleasantly frustrating" ("Good games adjust challenges and give feedback in such a way that different players feel the game is challenging but doable and that their effort is paying off" (p.179)); and improve their *understanding* by allowing them to relate in practice particular information and skills to larger systems. In this sense, video games provide learners with opportunities for "behaviour rehearsal" with little risk involved (Lee, Peng & Park, 2009).

Since digital games are engaging and fun, they provide extra motivation for learners, making the learning topic more interesting and resulting in better learning outcomes (Doucet & Srinivasan, 2010). The appeal of digital games as learning tools can also be seen as part of what Juul (2010) sees as the normalization of videogame playing, as represented in the phenomenal popularity of "casual" games such as *Angry Birds* or *Farmville* and in what some identify as the imperative of "gamification".[46] The appeal of videogames as educational means is especially relevant for younger generations who, as Prensky (2005) notes, have different learning skills and habits and therefore require different educational approaches: "The 'stuff' to be learned can no longer be just 'told' to today's learners. It must be learned by them, through questions, discovery, construction, interaction, and, above all, fun" (p.103).

The educational qualities of digital games have caught the attention of environmental communicators, as evident in the popularity of such games as *World*

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[46] See Zichermann & Cunningham, 2011. Identified by some in the HCI community as yet another buzz term and marketing ploy, the notion and its application have come under heavy fire (see for instance game designer Ian Bogost's biting criticism here: http://www.bogost.com/blog/gamification_is_bullshit.shtml (last accessed April 26, 2013)).

Without Oil, *Super Energy Apocalypse*, *Spore*, *Evoke*, and many others. As Chang (2009) states, "digital games and networked media offer promising avenues not only for rendering the realities of environmental crisis – nature as problem space – but also for schematizing possible solutions in ways that leverage the unique affordances of the computer, the Internet, and player collectives". In other words, the interactivity and sociability of digital games make them an effective means to teach users about phenomena that either take place outside of their immediate experience, or that are considered too complex to be taught effectively using traditional teaching techniques. As the recent surfeit of literature on the learning benefits of videogames testifies, at least in the foreseeable future this trend will only become stronger.[47]

2.1.2 Discursive Uses

While older forms of media feature either a dialogical (one-to-one) or a broadcast (one-to-many) mode of communication, new media offer many-to-many connectivity.[48] This multi-directionality underlies their conviviality in a similar sense to that intended by Ivan Illich (1973, p.23) in the context of the telephone: "Tools foster conviviality to the extent to which they can be easily used, by anybody, as often or as seldom as desired, for the accomplishment of a purpose chosen by the user…. They allow the user to express his meaning in action".[49] Even more than the landline telephone, mobile phones and Web tools allow users to casually express themselves and communicate with others over large geographic distances and in several modalities, from the more onerous (writing formal e-letters or maintaining blogs regularly) to the less committed (following someone on Twitter or 'liking' something on Facebook), in text, sound, image and video, synchronously and asynchronously. This leads some to argue that

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[47] For only a few examples among many, see Antle et al., 2011; Gee, 2007; Shaffer, 2008; Squire & Jenkins, 2011.

[48] The radio and the telephone are somewhat of an exception: the former can be used as both a one-to-one, many-to-many (e.g., short-wave) and a broadcast medium, while the latter may be used for many-to-many communication but in a rather limited way (e.g., party-lines).

[49] Illich (1973, p.24) adds that a convivial tool may maximize liberty "even though in a broader context it can be abused for purposes of manipulation and control".

> The ability for moderately computer-savvy individuals to create content, to comment on the content created by others, and to converse with individuals in both asynchronous and real-time forums is arguably the most distinctive and revolutionary characteristic of the Internet as a communication medium. (Stromer-Galley & Wichovski, 2011, p.170)

Burgeoning "virtual communities" (Rheingold, 1993) dedicated to, or that feature occasional, political discussion, offer participants opportunities for convivial political discourse and create the conditions that enable lasting social bonds and social solidarity.[50] The way online discursive spaces enable free, inclusive exchange of ideas through a range of expressive modalities effectively extends the public sphere by providing the public more opportunities to develop political awareness and engage in political discourse. This deliberative thrust is also evident in environmental communication, where substantive – informed, meaningful, 'rational' – discussion of environmental issues is often seen as an improvement on existing processes of environmental scientific consultation and as a catalyst for the consolidation of pro-environmental action.[51]

The hopes environmental communicators share over the possibility of lowering the threshold for public participation in environmental politics by establishing new spaces for political exchange, seem to have found at least partial fulfillment with the discursive possibilities provided by new media. Free-flowing, lively conversations about environmental issues sprout as an addendum to mainstream media articles (in comment sections), on dedicated and other forums, listservs and blogs, on social networks and virtual worlds such as Second Life, and on Twitter. They are hosted by different levels of government and by environmental NGOs, and even take place on spaces altogether outside established political institutions (on social networks like Facebook, for instance).[52] They may be asynchronous and thus allow for more reflexivity and weighty

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[50] There is an extensive literature dedicated to explicating the difference and overlap between virtual and 'physical' communities whose nuanced analyses are beyond the scope of this work (for a brief overview see Flew & Smith, 2011, p.66-8; and Wilson, 2010).

[51] See Brulle, 2010; Cox, 2010; Depoe, Delicath & Elsenbeer (eds.), 2004; Hamilton & Wills-Toker, 2006; Lassen et al., 2011; Lorenzoni, Nicholson-Cole & Whitmarsh, 2007; Senecah, 2004; Walker, 2007.

[52] See Bendor, Haas Lyons & Robinson, 2012; Haas Lyons, 2012.

argumentation, or take place in realtime and be spontaneous and free spirited. They also afford various participatory modalities – from the more passive 'lurking' to more active, sustained expression – thus allowing participants to find the degree of involvement they feel most comfortable with. And lastly, they may also feature anonymous participation – a feature that seems to significantly lower the stakes for participation, making it more open and inclusive (O'Neill & Boykoff, 2011, p.243).

While much of the hopes invested in online discussion seem fairly realistic, both experience and research confirm that perhaps not all the accolades showered on online discourse are justified. Anonymity invites 'trolling' and 'flaming' that can fast derail conversations into cheap *ad hominem* exchanges, effectively turning the blogosphere into a "rantosphere" (Gavin, 2009, p.137).[53] The quality of discussion in some of the less formal forums may fall quite short of the standard hoped for by the proponents of deliberative democracy. Looking at reader comments on a George Monbiot item on the *Guardian*'s website, Gavin (ibid.) writes:

> The contributions do contain moderate exchange of evidence and argument, but there are high numbers of controversial and uncheckable assertions, plus more than a few questions with no obvious answers, or answers with no obvious questions. Entries are often highly disjoined and difficult to follow – part polemic, part rant, part ramble, part squabble, and often involving people flatly contradicting or sniping at one another. The calibre and tone of content is often 'uninspiring', and can in places descend to playground level. In all, this enormous interactive exchange, perhaps, obscures more than it illuminates, generating more heat than light in terms of rounded and balanced debate.

There are, of course, many examples of more structured and reasoned exchanges online (see Haas Lyons, 2012; Stromer-Galley & Wichowski, 2011), and while Gavin's (and others') criticism may simply be a case of looking for a certain kind of discussion in the wrong place (and really, do face-to-face conversation always transcend pettiness?), it may also evidence the way that perhaps not all political discussion needs to take the form of calculated, evidence-supported or 'rational' exchange. I will return to this matter in length in chapter 5, but suffice it to say that the quality of online discussion is

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[53] See also http://www.guardian.co.uk/technology/2012/apr/19/free-speech-haven-lawless-cesspool (last accessed April 26, 2013).

inherently tied to, even if not entirely determined by, the design and affordances of the platform itself (Bendor, Haas Lyons & Robinson, 2012; Stromer-Galley & Wichowski, 2011, p.178; Wright, 2005; Wright & Street, 2007). Expectations of 'rational' discourse should therefore adjust to the actual space of interaction.

Lastly, recent research shows that there may be a significant gap between who environmental communicators envision engaging in online discussion and who actually participates. Despite claims that since online media reach people "where they are" they would increase the chances that new publics will enter into political dialogue, it is not entirely clear whether online deliberation indeed reaches new constituencies or is simply a means for the same group of people to continue their involvement by other means (Stromer-Gally & Wichowski, 2011).[54] Some also express concerns that instead of bringing disparate political groups into productive dialogue, the personalization of online platforms (including search engines) may actually contribute to more 'silo thinking', homogeneity and fragmentation (O'Neill & Boykoff, 2011, pp.239-40; Stromer-Gally & Wichowski, 2011, p.171;176; Sunstein, 2007). And lastly, others have expressed concerns over the ongoing commodification of online expression, arguing that discourse that takes place on social networks effectively depoliticizes participants by substituting the appearance (or fantasy) of meaningful contribution for real political participation (Dean, 2009; 2012). Regardless, the appeal of new media as a means to extend the public sphere virtually, remains largely unhampered, kept afloat by the promise of inclusivity, discursive responsiveness and the free exchange of opinions.

2.1.3 Tactical and Coordinative Uses

From "smart mobs" to "cyberactivism", new media provide social movements and governments alike with effective forms of organizing and intervening in political issues

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[54] Stromer-Gally & Wichowski (2011) discuss the question of who participates in online political discourse in detail. Drawing from a variety of longitudinal empirical studies they suggest that those who are already engaged in politics are more likely to participate in online political discussion. They also note "a consistent and large gender gap in online political discussion" in the US and in several European countries (p.173). On a more positive note, they list several case studies that give evidence that younger people are "overrepresented" in online political discussion, confirming popular assumptions about the appeal of online spaces as means to draw youth into the political process (p.175).

(Hands, 2011; Howard, 2006; Karpf, 2012; McCaughey & Ayers, 2003). As forms of "tactical media" – "media of crisis, criticism and opposition" (Garcia & Lovink, 1997) – they enable virtual versions of traditional activism such as signing online petitions and online sit-ins, and new forms of civil disobedience such as hacking, disrupting online communication and building alternative digital infrastructures. New media are also useful for organizing offline forms of activism nimbly, efficiently and with lower costs. The distributed and practically omnipresent connectivity offered by mobile phones, and the way the internet enables the creation and mobilization of trans-spatial, spontaneous or carefully planned networks of activists has been celebrated by the popular press and by technology scholars alike. Recent events in Arab countries ("Arab Spring") and the emergence of the Occupy Wall Street movement, along with earlier events such as the anti-WTO demonstrations in Seattle and the Zapatista movement in Mexico, led some scholars to suggest that the immediacy and distributed connectivity of new media can help make political action more inclusive, changing both the face of activism and that of political organization (Karpf, 2012; Mercea, 2012; Zhuo, Wellman & Yu, 2011).

As illustrated in the introduction, Step It Up and 350.org are often used to demonstrate the organizing prowess of new media in the context of environmental activism. But while Step It Up and 350.org were undoubtedly successful in using new media to get people 'on the streets', not all online mobilization coalesces in physical activism. Derided sometimes as "clicktivism" or "slacktivism", some fear that instead of augmenting physical activism, virtual activism such as sending mass email action alerts or signing online petitions may actually take its place with much diminished results.[55] These concerns were recently voiced in a public exchange between writer and social critic Malcom Gladwell and technology guru Clay Shirky.[56] Their arguments are worth revisiting at length.

In an article in the *New Yorker*, Gladwell (Oct. 2010) opined that the hype around social media as the means to reinvent social activism is exaggerated and discounts the

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[55] See Karpf (2010) for a response to such concerns, and Mercea (2012) on the relations between online and offline protests.

[56] For a brief summary and re-evaluation of the debate, see: http://www.wired.com/threatlevel/2011/12/gladwell-vs-shirky/all/1 (last accessed April 26, 2013).

importance of “tight-knit” relations – the kind of intimate camaraderie that motivated civil-rights activists in the US to take a stand against race laws despite the certainty of the establishment responding with violence. Writes Gladwell:

> The kind of activism associated with social media isn’t like this at all. The platforms of social media are built around weak ties. Twitter is a way of following (or being followed by) people you may never have met. Facebook is a tool for efficiently managing your acquaintances, for keeping up with the people you would not otherwise be able to stay in touch with. That’s why you can have a thousand “friends” on Facebook, as you never could in real life.

This leads him to argue that “Where activists were once defined by their causes, they are now defined by their tools”; online activism simply begets “more of the same”.

Gladwell’s criticism can be understood as a questioning of the efficacy of online social networks in motivating activism where the latter requires activists to take tangible risks, or as McCaughey & Ayers (2003, p.5) put it, “Can you really put your body on the line online?”[57] But it can also be seen as a response to a kind of deterministic undercurrent he detects in the arguments of political techno-utopians: “The lesson here is that just because innovations in communications technology happen does not mean that they matter; or, to put it another way, in order for an innovation to make a real difference, it has to solve a problem that was actually a problem in the first place” (Gladwell, Mar/Apr. 2011). Shirky (Jan/Feb. 2011), in response, argues that “the fact that barely committed actors cannot click their way to a better world does not mean that committed actors cannot use social media effectively”. Further, he notes, “The use of social media tools – text messaging, e-mail, photo sharing, social networking, and the like – does not have a single preordained outcome. Therefore, attempts to outline their effects on political action are too often reduced to dueling anecdotes”. At the same time he is quite adamant that the new media are indeed altering the public sphere and that “the current changes will result in a net improvement for democracy” (Shirky, Mar/Apr. 2011), albeit this may take longer than some expect (Shirky, Jan/Feb. 2011).

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[57] Of course, in more totalitarian countries like China and Iran online protest may indeed result in bodily harm.

Setting aside the question of whether online activism directly leads to physical activism 'on the ground', a question that, as shown in the exchange between Gladwell and Shirky involves not only the tools of organization but the identities of the actors and the social contexts within which they act, there seems to be a growing agreement that new media tools give activists new opportunities to recruit, mobilize, organize and coordinate activities both online and offline, with flexibility, speed and efficiency. The "MoveOn effect", as Karpf (2012) calls it, is evident in more and more areas of social advocacy including environmental activism (as the story of StepItUp.org shows), government public engagement programs, and unfortunately, climate change denialism (cf. O'Neill & Boykof, 2011).

2.1.4 More Than Tools for Environmental Citizenship

As evident in the accounts given above, environmental communicators tend to perceive the political significance of new media technologies as a function of their use as *tools for environmental citizenship*. In this sense, the political utility of new media derives from what they can be used for: to inform the public and provide learning opportunities about the complex interrelated dimensions of environmental issues, to provide virtual spaces for dialogue on environmental issues, or to offer activists and government an efficient and cost-effective arsenal of organizational capabilities. While such accounts illustrate successfully some of the political effects of new media, foregrounding the various social, economic and political contexts within which they are used and the benefits and challenges these uses encounter, they largely disregard the technical apparatus itself – the technical affordances of new media, the experiences they create, and their origins in social processes of design. Instead of asking *what new media do*, environmental communication asks *what can we do with new media*, thus neglecting important dimensions of the political significance and effects of new media and potentially sliding into an approach to technology as "pure instrumentality":

> Instrumental theory offers the most widely accepted view of technology. It is based on the commonsense idea that technologies are 'tools' standing ready to serve the purposes of their uses. Technology is deemed 'neutral', without valuative content of its own…. Technology, as pure instrumentality, is indifferent to the variety of ends it can be employed to achieve. (Feenberg, 2002, p.5)

Arguing that environmental communication's approach to new media is instrumental implies two interrelated criticisms, one directed at questions of design, the other at questions of use.

First, most accounts of new media by environmental communicators tend to focus on social impacts with little regard to the actual affordances and origins of the technologies, effectively treating the technologies themselves as 'black-boxes': "A black box contains that which no longer needs to be reconsidered, those things whose contents have become a matter of indifference" (Callon & Latour, 1981, p.285). In this sense, environmental communication treats new media technologies as ready-made, off-the-shelf implements, ignoring their origins in concrete *social relations* – origins which affect the kind of biases interactive technologies carry. I will return to this in section 2.3.4 below.

Second, environmental communicators tend to understand the effects and implications of new media as a function of their utility, that is, as derived exclusively from what they are used for. For instance, informational uses of new media are usually evaluated according to the volume, range, reach and cost of producing and disseminating the information; discursive uses are evaluated in terms of the number of participants, how demographically representative they are and the quality of discussion; and organizational uses are evaluated according to the volume, inclusivity and impact of the events they help coordinate. What is missing from such accounts is an exploration of technological *mediation*: the way using new media creates meaningful *experiences* that impact the way users perceive the world, themselves, and available paths for action on environmental issues. These extend beyond the mere functionality of the technology and may be expressed in subtle and cumulative ways that often remain unexamined. As Verbeek (2006, p.3) puts it,

> technologies should not be understood as functional instruments, but as active mediators in relations between humans and reality. This mediating role is made possible by the specific ways in which technologies in use are present to their users: such technologies are not the terminus of human perception and action, but rather withdraw from our attention, making possible specific experiences and practices.

Since technology designers aim to create precisely those “experiences and practices” Verbeek is referring to, a comprehensive account of the political significance of new media for environmental communication must augment existing approaches to new media as *tools for environmental citizenship* with an approach to new media as *mediations of environmental citizenship*. Aiming to do exactly that, this dissertation seeks to put environmental communication in productive dialogue with theories of technological mediation drawn from the philosophy of technology and from contemporary research into HCI. As a starting point, the next section sketches theoretically an approach that foregrounds the mediating qualities of technology as they come to shape interactive experiences. My goal is to illustrate the discursive and persuasive aspects of new media experiences, part of what I will call *interactive world disclosure*.

2.2 Technology as Mediation

What does it mean to view new media technologies as mediations instead of tools? What do technology scholars mean when they argue that “technologies actively shape the character of human-world relations” (Verbeek, 2005, p.11)? Focusing on human experience, phenomenological theories of technology offer three answers to this question: the first, based on Heidegger’s existential-phenomenology, suggests that technology mediates human existence or Being. The second, part of Don Ihde’s phenomenology of technics, suggests that technology mediates perception and action. The third, based on an hermeneutic approach to technology, suggests that technology mediates meaning by engaging users in a dynamic, iterative and discursive process of meaning-making. Taken together these three theoretical positions indicate (but do not exhaust) the extent to which technological interactions modulate human experience.

2.2.1 Technological Mediation of Being

Most accounts of technological mediation begin with Martin Heidegger, who was one of the first to make modern technology a matter for philosophical concern (Ihde,

1979, p.103).[58] In his magnum opus, *Being and Time* (1927), Heidegger addresses human-artifact relations within his larger project of articulating the structure of Being ontologically (Dreyfus, 1991, p.3). As part of his call to shift the mode of philosophical inquiry from the disinterested, theoretical and objectifying position that typified Western philosophy since the time of Descartes, Heidegger begins his quest to explicate the essence of Being by unpacking "The kind of dealing which is closest to us … not a bare perceptual cognition, but rather that kind of concern which manipulates things and puts them to use" (Heidegger, 1962, p.95). Insofar as "*praxis* in *Being and Time* functions as the basic existential stratum *through* which world is revealed" (Ihde, 1979, p.124; emphasis in origin), modern technology, as the site of human concern and action, becomes a valuable subject for philosophical inquiry.

Rejecting a rationalist articulation of Being for one premised in worldly practical involvements – replacing rational philosophy's axiomatic "I-am-thinking" with an "I-am-acting" (Heidegger, 1982, p.145) – Heidegger's focus on our everyday moods, comportments and interactions with the entities that share our world leads him to argue that humans are essentially embedded and relational – as 'Dasein', literally meaning "being-there". He writes:

> [Dasein] never finds itself otherwise than in the things themselves, and in fact in those things that daily surround it. It finds itself primarily and constantly in things because, tending them, distressed by them, it always in some way or other rests in things. Each one of us is what he pursues and cares for. In everyday terms, we understand ourselves and our existence by way of activities we pursue and the things we take care of. We understand ourselves by starting from them because the Dasein finds itself primarily in things. The Dasein does not need a special kind of observation, nor does it need to conduct a sort of espionage on the ego in order to have the self; rather, as the Dasein gives itself over immediately and passionately to the world itself, its own self is reflected to it from things. (Heidegger, 1982, p.159)

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[58] Ihde (1990, p.21) further identifies Heidegger as "the founder of contemporary philosophy of technology".

Casting his sight on the way Dasein "finds itself" in things, Heidegger notes that technical artifacts (or "equipment") can be disclosed under two aspects, each implying a particular relationship between humans and artifacts.

In his famous Tool-Analysis in *Being and Time*, Heidegger notices that when we observe technical artifacts in a disinterested manner we relate to them as "present-at-hand" [*Vorhanden*]. In this mode technical artifacts are treated exclusively as *res extensa*, objects that occupy space and posses various observable and measurable properties such as volume, shape and colour. But when we act with technical artifacts they are disclosed as "ready-to-hand" [*Zuhanden*], consequently withdrawing into the thrust of activity or the "in-order-to":

> The ready-to-hand is not grasped theoretically at all, nor is it itself the sort of thing that circumspection takes proximally as a circumspective theme. The peculiarity of what is proximally ready-to-hand is that, in its readiness-to-hand it must, as it were, withdraw in order to be ready-to-hand quite authentically. (Heidegger, 1962, p.99)

As ready-to-hand, technical artifacts are engaged "authentically" (in accordance with their essence – as tools to be used) and in the process withdraw from our consciousness, lost in the overall thrust of action. We become so immersed in our activity that both the tools and the activity itself escape our "interpretive tendencies" (ibid., p.98). Thus, when engaging with ready-to-hand technical artifacts, "That with which our everyday dealings proximally dwell is not the tools themselves. On the contrary, that with which we concern ourselves primarily is the work – that which is to be produced at the time" (ibid., p.99). In Heidegger's example, when the cobbler uses a hammer to drive a nail into a shoe, the hammer, nail and shoe dissolve into a fundamental thrust, a "toward-which" that encompasses the worker, the assemblage of tools he is using, and the activity. The overall intention subsumes its specific activities, and the more absorbed in our activity we are, the more the technical artifacts we use withdraw and become transparent, forming a "symbiosis of artifact and user within a human action" whose ideal is "total transparency" (Ihde, 1990, p.73).

Heidegger's analysis of the authentic being of technical artifacts, the way they essentially withdraw upon use "into a dark subterranean reality that never becomes present to practical action any more than it does to theoretical awareness" as Harman

(2002, p.1) puts it, was used to articulate a new metaphysical outlook (as in Harman's "object oriented ontology"). But in the context of the present work it is interesting for what it says about human subjectivity. Heidegger explains that encountering the world through technically-mediated action unfolds a form of practical knowledge – a king of "sight" [*Umsicht*], a "discovering". When we use equipment we experience what Heidegger calls "circumspection" or "concernful absorption": we become immersed in the activity to the extent that we gain felt awareness of the entire complex of equipment, task and aim – "The work bears with it that referential totality within which the equipment is encountered" (Heidegger, 1962, p.99). This is not just any awareness but a *non-thematic awareness*, an awareness without self-awareness, in this case, the felt impression of pure relationality. When we are engaged with ready-to-hand equipment we do so for a certain purpose: in Heidegger's example, we pick up the hammer and hit the nail because we want to fix the shoe. In the thrust of action we discover (non-thematically!) that every technical artifact is related to (or involved in) an entire network of artifacts and materials which Heidegger calls the "equipmental contexture" (Heidegger, 1982, p.133). Every action also refers to a host of social praxes (wearing shoes, fashion), material objects and natural phenomena (the terrain, weather). So the cobbler's hammer is *essentially* related to an entire network of tools and materials (nails, knives, anvils, leather), within a particular activity (fixing of the shoe), which takes place within the larger cultural aim (the safeguarding of the body against hostile weather or rough terrains) that refers to the natural world. In Heidegger's hyper-hyphenated language, "The 'for-the-sake-of-which' signifies an 'in-order-to'; this in turn, a 'towards-this'; the latter, an 'in-which' of letting something be involved; and that in turn, the 'with-which' of an involvement" (Heidegger, 1962, p.120). In short, when engaged in technically-mediated action we become pre-reflexively, non-thematically aware of the essential embeddedness of Dasein in a constellation of artifacts, environments and practices: involvements, relations, meanings and significances. Heidegger calls this complex "World", indicating technically-mediated action as a form of world disclosure. It signifies an ontological openness to the world that is only possible through action.

Heidegger's concern with technology as a form of world disclosure continued, albeit more critically, in a series of lectures he delivered in Bremen during December 1949. In one of those lectures, later published as *The Question Concerning Technology* (1977), he argues that "the essence of technology is by no means anything

technological" (p.4). By this he means that instead of seeing technology instrumentally as "a means to an end" or "a human activity" we should understand it ontologically as a form of "revealing", "presencing", or "bringing forth" (p.11) – a way of perceiving and relating to the world. As a form of revealing, Heidegger continues, modern technology, in contrast to the Greek techné, craft or artisanry, represents an impoverished way of seeing the world as merely the object of calculative thinking, reducing entities to "standing reserve" [*Bestand*] – orderable, manipulable, replaceable and disposable – "directed from the beginning toward furthering something else, i.e., toward driving on to the maximum yield at the minimum expense":

> Agriculture is now the mechanized food industry. Air is now set upon to yield nitrogen, the earth to yield ore … The coal that has been hauled out in some mining district has not been supplied in order that it may simply be present somewhere or other. It is stockpiled; that is, it is on call, ready to deliver the sun's warmth that is stored in it. The sun's warmth is challenged forth for heat, which in turn is ordered to deliver steam whose pressure turns the wheels that keep a factory running. (1977, p.15)

Modern technology as "Enframing" [*Ge-stell*] discloses the world through a distinctly utilitarian lens as stockpiles of material waiting to be used by humans. It effectively conceals the true essence of worldly entities, stripping them of their autonomy and preventing humans from disclosing their multivalent nature as both "present-at-hand" and "ready-to-hand". As consequence, humans are denied from seeing the essence of Being itself as the interplay of concealment and revealing – effectively denying them *Ereignis*.[59] In Heidegger's words, "Enframing ... conceals revealing itself and with it That wherein unconcealment, i.e., truth, comes to pass" (p.27). Technology as a mediation of human-world relations promotes "a forgetting of the hiddenness of being and a reduction of things to their presence or outward look" (Harman, 2009, p.6).

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[59] For more on *Ereignis* see Inwood, 1999, pp.54-7; Kisiel, 1993, pp.494-495; and translators' introduction to Heidegger, 1999.

In another of the Bremen lectures, published as *The Thing* (1971), Heidegger continues to differentiate traditional craft from modern technology.[60] Traditional artifacts ("things"), he writes, are no mere objects:

> An independent, self-supporting thing may become an object if we place it before us, whether in immediate perception or by bringing it to mind in a recollective re-presentation. However, the thingly character of the thing does not consist in its being a represented object, nor can it be defined in any way in terms of the objectness, the over-againstness, of the object. (Heidegger, 1971, p.167)

As "things", artifacts act as gathering sites for the myriad praxes, contexts, relations and meanings they are involved with, functioning as cultural condensation points with world disclosure potential. In this sense, "The thing things world" (p.181), holding together and manifesting the "worldliness of the world": the complex of involvements and significances that give meaning to our actions (cf. Dreyfus, 1991, ch.5). Elsewhere, Heidegger describes a bridge as a "thing":

> The bridge swings over the stream 'with ease and power'. It does not just connect banks that are already there. The banks emerge as banks only as the bridge crosses the stream. The bridge expressly causes them to lie across from each other. One side is set off against the other by the bridge. Nor do the banks stretch along the stream as indifferent border strips of the dry land. With the banks, the bridge brings to the stream the one and other expanse of the landscape lying behind them. It brings stream and bank and land into each other's neighborhood. The bridge *gathers* the earth as landscape around the stream. (Heidegger, 1993, p.354).

Bridges relate the landscape around them, providing a site for those relations to materialize, be sustained and potentially disclosed. In this sense, and with similar results to those of the Tool Analysis in *Being and Time*, artifacts materialize and reveal the originary relationality of the world.

The three accounts of Heidegger's treatment of technological artifacts, despite their origins in different periods in his thinking,[61] present a view of the existentially

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[60] For a more detailed treatment of Heidegger's differentiation of traditional craft from modern technology see Feenberg, 2005.

mediating role of technology, the way technical interactions are forms of world disclosure that condition human existence. In this sense, *technical interactions mediate Being*.

2.2.2 Technological Mediation of Perception and Action

While Heidegger's existential account of the mediating nature of technological interactions is meant as a challenge to the fundamental metaphysical assumptions and philosophical stance of Cartesian philosophy (which he argued remained latent even in Husserls' phenomenology),[62] philosopher of technology Don Ihde provides us with a more pragmatically oriented catalogue of the structures of human-technology-world relations. Ihde's account is premised in what he calls "technological intentionality". Intentionality, perhaps the most fundamental concept in phenomenology,[63] denotes the way that every act of consciousness is always consciousness *of* something.

> Every act of consciousness, in order to be an act, demands a certain object because every conscious act intends something…. If, then, an act of a certain structure is present, then by that very fact a certain object is also present; moreover, the character of this object is co-determined by the character of the act in which the object appears. The character, therefore, of the known object depends on the character of the act by which it is grasped. (Kockelmans, 1967a, p.32-33).

For Husserl, acts of directed consciousness retrieve the essential relationality (or mutual-constitution) of objects and subjects, rejecting Kant's deduction of an insulated "object in itself". Through the prism of intentionality, "the intentional object is no longer conceived as the pre-existent referent to which the intending act refers as already given, but as something which originates in the act" (Spiegelberg, 1971, p.110). Objects and

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[61] While the analysis of Things in *The Thing* bears resemblance to that of equipment in *Being and Time*, others have noted that the first is meant as an explication of Dasein while the second can be seen as part of Heidegger's de-emphasizing of subjectivity. This shift of emphasis is associated with the turn [*Kehre*] in Heidegger's thought, and is expressed here in the difference between the way equipment in *Being and Time* relies on humans for its authentic disclosure while Things bear their disclosive capacities with no reference to their users.

[62] Cf. Kockelmans, 1967b, and Nakhnikian's introduction to Husserl, 1973, p.xix.

[63] "The investigation of the intentionality of consciousness … contains what Husserl always considered the central insight in his phenomenological analysis of consciousness" (Spiegelberg, 1971, p.107). See also Kockelmans, 1967a, p.32.

subjects are mutually-constituted as an outcome of intentional inter-relationality.[64] Insofar as acts of directed consciousness inflect both subject and object, by using "technological intentionally" Ihde means to call attention to the transformations implicit in the mediating position of technologies, the way they "form intentionalities and inclinations within which use-patterns take different shapes" (Ihde, 1990, p.141).

In *Technology and the Lifeworld* (1990) Ihde distinguishes between four prototypes of technological intentionality:

In *embodied relations* technology extends our body's capacities and "becomes maximally 'transparent'. It is, as it were, taken into my own perceptual-bodily self experience" (Ihde, 1990, p.73) in a way similar to that of a blind man using his cane. In this mode, "Technics is the symbiosis of artifact and user within a human action" (ibid.), an artificial augmentation that is nonetheless (and perhaps even paradoxically) part of the very human sensorium.[65]

In *hermeneutic relations* the technical artifact functions as a filter through which we interpret the world, providing an array of symbolic and physical translations with various degrees of isomorphism between phenomena and our perceptional apparatus. This is how a map, a thermometer or an electronic microscope mediate the world.

In *alterity* relations the technology itself becomes the focal point of our attention, not the world it mediates. Understood similarly to how Heidegger explains the tool's "presence-at-hand", these kinds of relations disclose the "quasi-otherness", "quasi-autonomy" or "objectness" of technological artifacts, in the same way we anthropomorphize robots, regard ceremonial chalices as sacred, or find mechanical automatons fascinating.

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[64] As McCullough (2004, p.35) puts it, "repeated encounters with objects in contexts let us become aware of those objects before any conscious deliberation about them and, furthermore, affects what is likely to rise to consciousness".

[65] Recent work on embodied relations in the context of new media includes Dourish (2001), Hansen (2004), and Munster (2006).

Lastly, in *background relations* technologies remain on the periphery of our perception, the way air-conditioning, refrigerating and lighting systems function. In this mode, despite their "present absence", technologies are still "part of the experienced field of the inhabitant, a piece of the immediate environment" (p.109). In fact, Ihde adds, "Background technologies, no less than focal ones, transform the gestalts of human experience and, precisely because they are absent presences, may exert more subtle indirect effects upon the way a world is experienced" (p.112).

In all four modes, technologies mediate – filter, modulate, inflect, transform – our experience, amplifying certain elements of our world while attenuating others. As Ihde puts it, "*for every revealing transformation there is a simultaneously concealing transformation of the world, which is given through a technological mediation*. Technologies transform experience, however subtly, and that is one root of their *non-neutrality*" (p.49; emphasis in origin). Far from merely revealing a pre-existing 'objective' world, technologically mediated interactions construct a world with bias, under a particular aspect.

While Ihde's focus is largely set on the way technologies mediate perception, Dutch philosopher of technology Peter-Paul Verbeek (2005) combines Ihde's theory with Bruno Latour's Actor-Network Theory (ANT) in order to articulate the action-mediating dimensions of human-technology-world relations. As discussed in chapter 1, Latour uses the term "translation" to illustrate the basic mechanism that allows chains of human and nonhuman actors (or "actants" in his terms) to create larger sociotechnical networks. Writing with Michel Callon he explains: "By translation we understand all the negotiations, intrigues, calculations, acts of persuasion and violence, thanks to which an actor or force takes, or causes to be conferred on itself, authority to speak or act on behalf of another actor or force" (Callon & Latour, 1981, p.279). In other words, the association of actors into networks depends on an actor's capacity and willingness to translate momentum (force, but also data, information or functionality) into a form or medium that is relevant for another actor – to "delegate" a certain function and "make a difference in the course of some other agent's action" (Latour, 2005, p.71). In this mode, humans delegate the task of slowing down traffic to speed bumps, the task of keeping doors shut to hydraulic door closers, and the responsibility to return hotel keys to bulky key-chains. Further, delegation also works in the opposite way, disclosing what Latour

sees as the essential symmetry between human and nonhuman actors: “things might authorize, allow, afford, encourage, permit, suggest, influence, block, render possible, forbid, and so on” (ibid., p.72). The hydraulic door closer forces those passing through the door to adapt to its speed, while making it practically impossible for those travelling by wheelchair to use the door at all. Verbeek translates Latour’s ANT vocabulary into phenomenological terms:

> Artifacts coshape the use that is made of them, and thereby the relations that arise between humans and their world. In this mediation emerges a translation of action, which parallels the transformation of perception … artifacts invite particular actions while discouraging others or even rendering them impossible. (p.171)

So in terms of perception, as Ihde argues, technologies *amplify* and *reduce* certain perceptible aspects of the world, while in terms of action, as Verbeek argues, technologies *invite* and *inhibit* certain behaviours. In both cases technology modulates human experience and praxis, as Verbeek (2005, p.172) summarizes:

> Technological artifacts appear to be present for human beings in a specific way. They hide themselves in the relations between humans and world, and from their ‘withdrawn position; they actively shape these relations by transforming both experience and action. The way they do so involves amplification and reduction, invitation and inhibition. In this way, they coshape both the way human beings are present in their world and the world is present for human beings.

A phenomenological account of technological mediation, to conclude, deploys the notion of technological intentionality to explain our interactions with technologies as a modulation of experience that transforms both our perception of the world and our possibility to act in and on it. Technological mediation, it follows, produces a world perceived through acting with technology and which potentiates and forecloses certain paths of action. But as explained in the next section, the technical modulation of human experience also has hermeneutic components that affect our capacity to make sense of the world – to interpret the world and make it meaningful – and do so in relation to social and culture factors.

2.2.3 Technological Mediation of Meaning

While the previous phenomenological accounts understand technology as coupled with action – *using* technology is akin to *acting* with or through technology – hermeneutic approaches add to this account a view of technology as the mediation of meaning, whereby the patterns of human-computer interaction are understood as linguistic or discursive structures. To experience new media's interactivity, in this sense, is akin to engaging in a dynamic process of meaning-making that is distributed along user, technology and world.

Terry Winograd and Fernando Flores's *Understanding Computers and Design* (1986) is widely considered a seminal application of hermeneutic-phenomenology to computer technology and new media. Setting themselves against what they perceive as the existing, rationalistic approach to technological design, Winograd & Flores argue (with resounding Heideggerian overtones) that "All new technologies develop within the background of a tacit understanding of human nature and human work. The use of technology in turn leads to fundamental changes in what we do, and ultimately in what it is to be human.... *in designing tools we are designing ways of being*" (1986, p.xi; emphasis added). While some understand new media according to their functionality (word processors produce documents), and others, more holistically, as nodes in a wide network of institutions, equipment, practices and conventions (word processors as situated in a larger context that includes the publishing industry, the social organization of knowledge and the structure of communication in general), Winograd & Flores argue that technologies are forms of meaning-making with material outcomes: "As the use of a new technology changes human practice, our ways of speaking about that technology change our language and our understanding. This new way of speaking in turn creates changes in the world we construct" (p.6). Language, it follows, is central to thinking about new media on two accounts: first as the *material* that technologies manipulate and transmit – the coding symbols (programs) that give instructions to processors and the on-screen symbols that represent digital and non-digital objects; and second, as the *medium* within which practice and expression mutually-shape each other and generate "the space of possibilities for action" (p.7). The latter reflects both the phenomenological insight that intentionality (or "technological intentionality" in Ihde's terms) transforms both subject and world, and speech act theory's thesis that language is not exclusively

representational (equivalent to a set of propositions that can be verified according to their relation to the 'objective' world), but is a form of social action or "mutual orientation" that "is not grounded in a correspondence between language and the world, but exists as a consensual domain – as interlinked patterns of activity" (p.76).[66] In this mode, "Understanding is not a fixed relationship between a representation and the things represented, but is a commitment to carry out a dialog within the full horizons of both speaker and hearer in a way that permits new distinctions to emerge" (p.124).

Augmenting phenomenological-hermeneutics with speech act theory allows Winograd & Flores to posit technological interactions as a form of conversation with dynamic effects. In this, they are able to move away from explaining interactions as an outcome of the individual mental states (intentionalities) of those engaged in the interaction, and focus instead on the shared (and thus socially constructed) background structure that allows these interactions to be meaningful. Entering the interactive space, users are guided by certain background suppositions and expectations that inform their interpretation of the interactive space and affect the consequences their interactions may have.[67] These background assumptions, a product of particular traditions, histories and social conditions, can either be reinforced by interactive recurrences and regularities or be called into question in the face of 'breakdowns', as when the technology fails to act the way users anticipate, or users fail to understand how they should interact with the technology. In both cases interaction re-articulates the background structure itself, potentiating new meanings and new possibilities for action that inform future technological interactions (and design). In other words, when we interact with computers we are engaged in hermeneutic world disclosure: we are constructing *in dialogue* new ways to not only act with technology but also to think about the entire nexus of practices, significances and meanings that technology relates. What Winograd & Flores offer as "ontological design" puts this co-emergence at the center of design by understanding technical interaction as a form of transformative dialogue. This is how they are able to assert that "Through the emergence of new tools, we come to a changing awareness of

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[66] For more on speech act theory see Mangion, 2011.

[67] This corresponds roughly to what Gadamer (2004) calls the "hermeneutic horizon" and Jauss (1982) calls the "horizon of expectations".

human nature and human action, which in turn leads to new technological development" (p.163).

The important aspect of this approach is the way it emphasizes the cultural conditions and dimensions of user experience, effectively "socializing" user experience by introducing into the analysis the presence of cultural structures and conventions that condition technical interactions (see also Ihde's (1990) notion of "cultural hermeneutics"). So not only is technological intentionality a creative act, materializing the mutual-constitution of subjects and objects – users, technologies and world; and not only does it imply perceptual and praxical orientations as result of embodied, hermeneutic, alterity or background human-technology-world relations; but it also introduces and inflects the social and cultural meanings within which we approach – anticipate, prefigure, cope with – technically mediated experiences (cf. Feenberg, 2012). Society, in other words, is present and remade in every technologically mediated interaction.

The phenomenological thread that runs through the three accounts presented above, locates human experience as the domain within which technological interactions are registered and become meaningful – the site where sensorial, perceptive, emotional and interpretive responses are stitched together to produce a sense of the world, our place in it, and the options available for us to act upon it (cf. McCarthy & Wright, 2004). Seen through the prism of experience, technological mediation foregrounds the continuous transformation of humans as they act with and through technologies. From a phenomenological point of view, as Hamman (2004, p.119) puts it, "The goal of interaction is thus not so much to orient the user into a particular way of regarding the things and events that define a problem domain, but to help the user discover something new about the problem domain and, consequently, to enlarge her understanding and ability to creatively think in that domain". We change with every technical interaction, even if those changes are often too nuanced for us to notice without in-depth circumspection. At the same time, these technologically-evoked transformations are always biased: we never approach technologies with a clean slate, just as we are never entirely free to interact with them as we please since the very *form* of the mediation influences the kind of world it discloses. In this sense, technological mediation functions as a form of discursive persuasion, whereby the design of technical interactions embodies and promotes a set of socially motivated perceptions and behaviours. The

question is, what makes the persuasive effects of *interactive* experiences distinct from, say, those that emerge from a cobbler using their hammer? How do interactive environments persuade? Recent work in Human-Computer Interaction (HCI) offers us important clues.

2.3 Mediation and Persuasion in HCI

HCI, as Carroll (2002, p.xxvii) defines it, "is about understanding and creating software and other technology that people will want to use, will be able to use, and will find effective when used". This is often understood as comprising three interrelated components: *utility* (does the artifact perform the task for which it was designed), *usability* (does the artifact perform the way users expect it to), and *desirability* (does the artifact give users pleasure). Utility, usability and desirability are increasingly seen as part of a more holistic, "user experience" (or UX). Inspired in part by Donald Norman's work in industrial design, over the last decade UX has moved away from focusing exclusively on questions of utility to incorporate a more diverse set of concerns associated with questions of mediation and meaning.[68] These are predominantly approached with the conceptual tools and vocabulary of phenomenology (in particular the influential work of Christopher Alexander, Paul Dourish, and Winograd & Flores), and with those of rhetoric. The latter is the focus of the next section.

2.3.1 Digital Rhetoric

If we accept that technological mediation potentiates and stultifies – invites or inhibits – certain perceptions, meanings and actions we can also see it as a form of rhetoric, that is, as comprising a set of discursive or expressive affordances with motivational potentials. While there are many competing definitions of rhetoric, most seem to focus on figurative language and/or persuasive power (Mailloux, 1989, p.xii). In its classic form, rhetoric is predominantly understood as "the faculty of observing in any given case the available means of persuasion" (Aristotle, 1984, p.2155). For Aristotle rhetoric involves questions of appropriateness, timing (*kairos*), style and composition, or

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[68] De Souza, 2005; Krippendorff, 2006; McCarthy & Wright, 2004; Norman, 2002; 2004.

in his terms, *ethos* (credibility), *pathos* (mood), *logos* (evidence), *lexis* (style and delivery) and *taxis* (organization or structure).[69] When all rhetorical components work together in harmony it becomes evident how, as the sophist Gorgias has put it in his famous defence of Helen of Troy, "Speech is a powerful lord who, with the finest and most invisible body achieves the most divine works" (2003, p.79).

In its modern interpretation, rhetoric is often seen as a form of epistemology, a means to discover and explain the world, and then to communicate one's experiences to others (Knoblauch, 1985, p.29).[70] Insofar as the rhetorical construction of reality provides communities with focal narratives, images and metaphors, rhetoric can also be seen as a medium of socialization, a means to "construct our personas and to seek communion in our society" (Smith, 2009, p.284).[71] This view relies heavily on Kenneth Burke's reworking of rhetoric around the notion of "identification". In Burke's view, and under the influence of Freud, rhetoric is a means for establishing an ordered image of the world. This is done by the rhetorical construction of identification and differentiation, that is, by drawing receivers to externalize their ego-ideals and project them unconsciously onto others (Smith, 2009, p.285), aligning their ways of being – experience, interests, values, etc. – with those illustrated and promoted by the author/sender. Aside from an inclination to enact certain behaviour, the upshot of this predominantly experiential process (Biesecker & Lucaites, 2009, p.3) is the effective building of a community around common (persuasive) ideas, representations and actions (cf. Day, 1960). So while Burke retains the Aristotelian view of rhetoric as a tool of influence, "to form attitudes or to induce actions in other human agents" (Burke, 1950, p.41), if we accept that human discourse is essentially a process of ordering by articulating identity/difference we can see it more generally as a medium of world disclosure: in rhetoric we continuously position ourselves vis-à-vis others, constitute relations and substantiate similarities and differences, promote identification and clarify meaning, indicate possible paths of action

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[69] See also Smith, 2009, pp.63-86.

[70] The view of rhetoric as communicative epistemology opens the door for definitions that are so expansive that rhetoric becomes equivalent to all forms of expression. See for instance Foss, Foss & Trapp's (2002, p.1) definition of rhetoric as "the human use of symbols to communicate".

[71] This gives Burke's statement that "Rhetoric is concerned with the state of Babel after the Fall" (Burke, 1950, p.23) a very particular meaning.

and seek validation for our choices of particular actions in shared values. In McGee's (2009, p.28) words, rhetoric is "a gestalt of relationships". The resonance with phenomenology is striking.[72]

If Aristotelian rhetoric focuses on persuading receivers to make particular judgments of salience, attitude, belief and action, and Burkean rhetoric explains the rhetorical act as the communication of a motivating collective will (McGee, 1990, p.282), digital rhetoric focuses on the relations between the novel materiality of digital texts and their reception – between materiality and aesthetics. This is guided by the assumption that "in practice, the computer often turns out to be a rhetorical device as well as a logical one" (Lanham, 1993, p.31). But how does the computer function as a rhetorical device? How are the rhetorical effects of the computer registered or experienced?

Elizabeth Losh (2009, pp.47-8) points out that digital rhetoric actually references several different things: (1) "The conventions of new digital genres that are used for everyday discourse"; (2) "Public rhetoric ... represented or recorded through digital technology and disseminated via electronic distributed networks"; (3) "The emerging scholarly discipline concerned with the rhetorical interpretation of computer-generated media as objects of study"; and (4) "Mathematical theories of communication from the field of information science". Similar to other, both classic and modern definitions of rhetoric, Losh's four-part definition shows digital rhetoric as both a set of phenomena and an approach (and a set of tools) designed to understand those phenomena. The underlying question is, what is the common denominator of the phenomena Losh identifies as instances of digital rhetoric? Does digital rhetoric reference the presence of

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[72] See for instance Stob's (2008, p.146) analysis of the similarities between Burke and William James: "For Burke and James, the world is not a finished place; it is, rather, a place of ceaseless addition and subtraction, of conjunctive and disjunctive relations, of composition and division. It is a place where we notice certain phenomena at the expense of other phenomena, and the selectivity of our perception shapes our subsequent response. Our project, they insist, is to speak in a way that can effectively manage and profitably direct the perpetual flux of our interconnected world. To convey that project, they speak in a vocabulary that emphasizes the novelty and possibility, the danger and precariousness, the richness of human experience".

Other work that seeks to extract a phenomenological essence from Burke's work or compare him to important phenomenologists includes Crusius (1999, ch.8), and Southwell (1987).

traditional forms of rhetoric online (see for instance Warnick, 2002; Warnick & Heinman, 2012), or is it a new form of rhetoric altogether?

In an early essay on electronic texts, Richard Lanham (1993) provides an initial answer to this question. He writes: "What happens when text moves from page to screen? First, the digital text becomes unfixed and interactive. The reader can change it, become writer" (p.31). Lanham's argument stems from literary studies and is pitched against canonical texts, which he finds are characterized by their unchangeability: "Canonical vision moves only in one direction, does justice to an external reality that exists independent of us, but never recreates reality in the act of perceiving it" (p.38). The canonical text's stasis represents and reproduces social stasis, a view of reality that remains perpetually at arm's length from the reader. The text's materiality, in this sense, provides an ideological function by producing a particular aesthetic experience: as the text remains beyond change so does the external world it mediates. The electronic text, on the other hand, invites manipulation, projecting a view of reality that responds to readers. Lanham's analysis of scale changing – the ability to manipulate the size of on-screen text – makes his argument clearer:

> scaling change is one of the truly enzymatic powers of electronic text. When you click in the zoom box, you make a big decision: you are deciding on the central decorum of a human event, on the boundary-conditions within which that event is going to be staged, and hence on the nature of the event itself.… To change scale is, as with repetition, to transform reality utterly, without changing it at all.… This interactivity is the very opposite of canonical passivity. (p.41-2)

Zooming-in, the text remains unchanged; after all, it is the same text. Yet at the same time its meaning changes and it becomes something different: a terrain that the reader/user is invited to enter and explore. In this mode, Lanham continues, "Language does indeed become a field of meaning over which we wander" (42). This is no mere slight of hand: the change of perspective afforded by textual interactivity creates different experiences that, in turn, affect our perception of reality and produce significant changes in reality itself, mirroring what Ihde (1990, pp.144-151) calls "multistability".

Another way to think about Lanham's argument about the interactivity characteristic of digital text is by reference to Heidegger's Tool-Analysis. The act of entering the textual terrain is akin to switching between looking *through* the text to

looking *at* the text, essentially flipping the text's mode of being from a transparent mediation of reality to its literal representation. The text become the focal object. In Heidegger's language, digital text, unlike canonical text, has the potential to switch from readiness-to-hand to presence-at-hand, from facilitating the act of reading, and thus withdrawing from consciousness, to becoming the focal object of reading. This oscillation, Lanham finds, is "the most powerful aesthetic attribute of electronic text" (1993, p.43). In other words, the most important experiential characteristic of digital objects is the experiential resonance of their manipulability and responsiveness; their "responsive aesthetics" (Krueger, 2003). Even if for most of us digital text has long become as functionally transparent as canonical text, that is, we manipulate it everyday and effectively look through it (evidencing the way in which perspective is very much a matter of habit), the space of interactions that is formed between readers/users and digital objects gives the experience of engaging with digital texts a distinct flavour brimming with dynamism, responsiveness, manipulability and control. To experience new media technologies is to participate in a set of control-response interactions that create new views of the world and new ways to act on it. Interactive experiences may evoke *interactive world disclosure*. But exactly how?

2.3.2 Procedural Rhetoric

If the digital text is characterized by its responsivity, what can we say about its rhetorical effects? How does interactivity "persuade", or, in the terms I use above, is implicated in world disclosure? One relatively early answer is given by B.J. Fogg (2003) in his proposed "captology": "the *design, research, and analysis of interactive computing products created for the purpose of changing people's attitudes or behaviors*" (p.5; emphasis in origin). Fogg argues that in order to see the persuasive potential of computers we should look at them as tools, media and social actors. As *tools*, computers can persuade by making certain behaviours easier or harder, lead through processes to particular outcomes, provide timely information and feedback, and perform calculations that exemplify certain facts or realities. He suggests seven such persuasive operations: reduction (simplification of tasks), tunneling (guiding through processes step-by-step), tailoring (customizing, personalizing), suggestion (interventions in specific moments), self-monitoring (providing continuous tracking), surveillance (observing others in order to use them as models), and conditioning (positive feedback and

reinforcement). As *media* (symbolic and sensory), computers persuade by providing users with vicarious experiences – simulating situations that manifest particular cause and effect relations, rehearse a desirable behaviour and provide virtual feedback and rewards. As *social actors*, computers persuade by providing socially significant cues to desired behaviour. Such cues include providing aesthetically or otherwise attractive, emotionally stirring, reciprocal and rewarding interactions, or by projecting authority.

Similarly, but with a vocabulary grounded in rhetoric,[73] game designer Ian Bogost (2007) argues that the persuasiveness of new media technologies is premised in what he calls their "procedural rhetoric": "the art of persuasion through rule-based representations and interactions rather than the spoken word, writing, images, or moving pictures" (p.ix). He adds, "This type of persuasion is tied to the core affordances of the computer: computers run processes, they execute calculations and rule-based symbolic manipulation" (ibid.) While computer interfaces include words, images and sound, and these clearly have rhetorical significance just like any other textual or symbolic instance, the novelty of digital rhetoric lies in the persuasiveness of the very interactivity it affords, in the "rules of execution, tasks and actions that can and cannot be performed" (p.4). Drawing from Janet Murray (1997), whose work I will revisit in more detail in chapter 4, he writes:

> Software is composed of algorithms that model the way things behave. To write procedurally, one authors code that enforces rules to generate some kind of representation, rather than authoring the representation itself. Procedural systems generate behaviors based on rule-based models; they are machines capable of producing many outcomes, each conforming to the same overall guidelines. Procedurality is the principal value of the computer, which creates meaning through the interaction of algorithms. (p.4)

When computer programmers or interaction designers create interfaces they effectively encode certain behaviours as a set of permissible or desirable actions – paths through the code, so to speak. In this sense, interactive affordances perform a set of behavioural restrictions in a way similar to what Latour (1992) calls "scripts" or "programs". Not only

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[73] While Bogost himself goes to much length to clarify that his procedural rhetoric and Fogg's captology are quite different in orientation and essence (see Bogost, 2007, pp.59-62), the question of whether the two are compatible or not remains largely irrelevant to the present work.

are some behaviours invited or discouraged, there are certain actions that the user simply cannot execute if they are not supported by the software's affordances. In this sense, when it comes to digital interaction, as Lessig (2006) famously puts it, "code is law". But Bogost adds a second layer to the argument by introducing the question of expression and meaning:

> As cultural critics, we can interrogate literature, art, film, and daily life for the underlying processes they trace. But computational procedurality places a greater emphasis on the *expressive capacity afforded by rules of execution*. *Computers run processes that invoke interpretations of processes in the material world*. (pp.4-5; emphasis added).

In what sense, then, are computer rules "expressive"? Similar to what Ihde (1990) termed hermeneutic relations, interactivity promotes certain interpretations of the world based on the quality of procedural referentiality, that is, the relations between the "source world" and its representation by computer processes. Here, the user *interprets* (mostly unconsciously) the rules of the technical system as representative of the 'real' world, and then *performs* those rules through a set of available interactive affordances. I revisit Bogost's procedural rhetoric in section 4.2.

We can also suggest a second way in which computer rules and procedures are expressive, which is more in line with what Lanham described in the context of canonical texts, and that interprets interactivity itself in symbolic terms. In this mode, the rhetorical capacity of digital objects lies in the way they use *responsivity itself* to express a quality of the real-world. As a form of knowledge acquisition, interactivity becomes rhetorical: the capacity for interactivity communicates certain things about the world and thus becomes persuasive in itself (perhaps matching the users' "will to interact"). In this second form, I will argue later, interactivity invites the user to make sense of new media experiences as participatory and inclusive regardless of (but sometimes in complementary ways to) the actual content of the interaction. Interactivity, i.e., the ability to manipulate digital objects and anticipate feedback, signals a certain responsivity on behalf of designers and facilitators, thus giving the experiences afforded by new media technologies a particular meaning that extends beyond the space of interaction itself. Interactivity discloses a responsive world.

2.3.3 Sustainability Interaction Design

With mounting concerns over the environmental impact of the electronics industry, and informed by the notion that interactive experiences mediate perception, meaning and action, sustainability has recently become a topic of interest for the HCI community. As evident in the number of events and working groups devoted to sustainability in recent HCI conferences,[74] interaction designers are increasingly committing to addressing sustainability with the tools and techniques of interaction design. While their work gives us a sense of how interactivity is already being leveraged for environmental purposes, it also indicates the ways in which existing thought and practice can be augmented by a more developed conceptualization of the *political* aspects of sustainability.

The HCI community's engagement with environmental issues has begun in earnest with Eli Blevis's (2007) calling out interaction designers for the role they play in promoting a culture of planned obsolescence.[75] Blevis suggests that sustainability be employed as "a core semantics for interaction design…. a lens through which design values, design methods, and designs themselves may be evaluated, especially in the context of interaction design" (p.503). What he calls Sustainable Interaction Design (SID) comprises two agendas: (1) sustainability *in* design – "how to take account of sustainability as part of the material design of products" with the aim of reducing the material impact of technology design and manufacture; and (2) sustainability *through* design – "how to support sustainable lifestyles and decision-making through the design of technology" (Mankoff et al., 2007, p. 2122, 2123). The first agenda echoes earlier work in industrial design (see fn.79) and overlaps with recent work on the material impacts of ICTs (Fuchs, 2008; Hilty & Ruddy, 2010; Tomlinson, 2010). But the second

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[74] Since its arrival to the HCI scene in 2007, sustainability remains an important area of interest, as evident in the ongoing success of the special interest group (SIG) devoted to it and the numerous workshops, sessions and papers that address sustainability in the largest HCI conference (the SIGCHI Conference on Human Factors in Computing Systems, or CHI).

[75] While environmental issues and sustainability in particular were subject to numerous explorations by industrial designers (see for instance Chapman & Gant (eds.), 2007; Manzini, 2007; Vezzoli & Manzini (eds.), 2008), they were practically absent from work in interaction design (and were only mentioned in passing as part of the influential "value-sensitive design" approach (Friedman, 1996; Friedman & Nissenbaum, 1996)).

agenda has inspired numerous attempts to create “durable human-product relationships” (Odom, 2008), such as, for instance, designing mobile phone interactions that add value to the artifact and thus may reduce the owner’s impetus to replace it (Huang & Truong, 2008).

Blevis’s interest in the intersection of consumer behaviour and product design is shared by several other streams (genres or clusters) of design research that address environmental issues.[76] For instance, “persuasive technology”, which is largely based on the principles suggested by Fogg’s “captology” (discussed in the previous chapter), focuses on designing interactions that would persuade, convince or “nudge” users to behave in more sustainable ways. Some examples of work in environmentally relevant persuasive technology include the iParrot, a friendly, “behavioural coaching mechanism” that nudges families to reduce energy consumption (Al Mahmud et al., 2007), SmartTrip, a mobile app that directs drivers to their destination in the least congested path (Johnson et al., 2007), and a car speedometer’s needle that bends to reflect inefficient fuel consumption (Sohn, Nam & Lee, 2009).

A similar cluster of design research, “ambient awareness”, aims to persuade users to behave more sustainably but does so less conspicuously. Instead of directing users into particular, pro-environmental behaviour, ambient awareness devices try to make users more aware of the environmental impacts of their actions under the assumption that exposure to relevant (and compelling) information will lead users to change behaviour. Some examples of ambient awareness design include electric power extension chords, lampshades, wallpapers and radiators that provide visual feedback of energy consumption (Backlund et al., 2006; Gustafsson & Gyllenswärd, 2005; Gyllenswärd, Gustafsson & Bång, 2006; Kim, Kim & Nam, 2009), WattBot, a mobile app that allows residents to monitor and analyze their household energy consumption (Petersen, Steele & Wilkerson, 2009), and UbiGreen, a mobile app that “semi-automatically senses and reveals information about transportation behavior” (Froehlich et al., 2009).

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[76] I am relying here on surveys done by DiSalvo, Sengers & Brynjarsdóttir, 2010; Fritsch & Brynskov, 2011; Goodman, 2009; and a review of recent relevant ACM publications.

2.3.4 Broaching the Political

Sustainability HCI's exploration of interactive experiences is a welcome corrective to the instrumentalism that characterizes the way mainstream environmental communication approaches new media, mainly because it posits user experience as a site of social and political significance – the technologically mediated touching point of an array of cognitive and social phenomena that may potentiate pro-environmental behaviour. However, it is precisely the manner in which HCI understands pro-environmental behaviour that is in need of critical augmentation. The overwhelming majority of the work associated with sustainability HCI operationalizes a very narrow and reductive understanding of sustainability as pertaining to questions of material metabolism or resource consumption. So while social science research on sustainability has already established the importance of social and political conditions to sustainable futures (Goodland, 2002; Hulme, 2009; Robinson, 2004), sustainability HCI remains focused on environmental impacts – resource consumption, waste and planned obsolescence.[77] DiSalvo, Sengers & Brynjarsdóttir (2010, p.1980) attribute this to the HCI community's more fundamental lack of connectivity with other fields and amongst itself, noting that "Despite the interdisciplinary nature of sustainability as a topic and the vast amount of related research in many fields, connections to these fields by works in sustainable HCI are fairly ad hoc". When sustainability HCI transcends "silo thinking" and does address social and political issues, the latter tend to be broached as questions of individual behaviour change and persuasion under the aegis of economic (market) rationality with little attention to collective action (ibid., p.1978; see also Brynjarsdóttir et al., 2012; Dourish, 2010). While this is slowly changing with the emergence of Critical Design,[78] in the most part, the HCI community still understands sustainability as a

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[77] Few exceptions include Mankoff, 2012; Nathan, Friedman & Hendry, 2009; and what DiSalvo, Sengers & Brynjarsdóttir (2010) call "formative user studies", which instead of predetermining what constitutes sustainable behaviour, "tend to legitimize differences in attitude towards sustainability and to show how individuals are embedded in social and cultural systems which constrain the potential sustainability of their behavior" (DiSalvo, Sengers & Brynjarsdóttir, 2010, p.1978). But even here, social and economic elements are seen as context and not substance of sustainability, whose conceptualization remains committed to questions of individual consumptive behaviour.

[78] Bardzell et al., 2012; Blyth et al., 2010; Dunne, 2005; Dunne & Raby, 2001.

function of lifestyle choices over transportation, energy consumption, product purchasing and recycling – the amalgamated impact of the actions of single actors in domestic or work environments. The upshot is a focus on technical solutions with little attention to the need to change the larger social and cultural conditions within which technological artifacts are designed and used. As Dourish (2010, p.1) aptly argues, this reflects a mismatch between "the scales of action and the scales of effects" – a concern I will revisit below.

While sustainable HCI's focus on domestic consumption has its merits, it skirts the larger issue – that shifting society towards more sustainable paths requires collective action mobilized against the culturally and politically entrenched, systemic practices of social and economic entities. As discussed above, many sustainable lifestyle choices depend on public utilities and infrastructure: sustainable mobility choices depend on the availability of efficient and convenient public transit; sustainable urban lifestyle are enabled by denser, mixed-use neighbourhoods which, in turn, necessitate appropriate zoning regulations, and so forth. Insofar as government has a central role to play in shaping the conditions that make sustainable choices available, a future sustainable society foremostly requires the galvanizing of a constituency for deep social and economic change. In other words, sustainability is foremostly a political issue. Dourish (2010) calls the principle of translating individual technically-mediated experiences into collective action "scale-making", and suggests that

> rather than using technology to provoke reflection on environmental impact of individual actions, we might use it instead to show how particular actions or concerns link one into a broader coalition of concerned citizens, social groups, and organizations…. By focusing not on connecting people *to* their actions and their consequences, but on connecting people *through* their actions and their consequences, we can approach persuasive technologies as ones whose intent is to persuade people of the effectiveness of collective action and of their own positions within those collectives. As an approach to the use of interactive technologies and environmentalism, it attempts to move from fostering environmental consumers to shaping environmental movements. If we see the problem of environmental responsibility to be a problem of the ways in which people are linked together through their commitments, interests, and actions, this approach takes these connections as the primary focus of design attention. (p.7; emphasis in origin)

In the spirit of Dourish's critique, scale-making interactive technologies will be discussed in chapters 4 and 5, but the larger point I want to make here is that if we want to better understand the political contexts and implications of interactive experiences we need to trace and unpack the way their design is informed, embodies and promotes particular worldviews, values and incentives – how the political itself is implicated in their creation.

2.3.5 Technical Codes

Technology is neither a force outside history nor merely an assortment of functions. As illustrated persuasively by researchers in the social construction of technology (SCOT) program, technological design is underdetermined by purely technical decisions (which we would largely associate with the technology's "efficiency").[79] Instead, SCOT researchers show, technical artifacts are materialized in a process of negotiation between often contrasting ideas about what the technology should do, who will use it and how, thus reflecting the plurality of interests of its design stakeholders ("social actors") and evidencing the technical artifact's "interpretative flexibility" (Pinch & Bijker, 1987). In this sense, the technical is always already social, or "sociotechnical".

Since technology folds into it the contexts of its design and use, the social and material relations, praxes and significances it is involved in, it has ideological dimensions. As first argued by Marx in the context of early industrial capitalism, and then by members of the Frankfurt School (especially Herbert Marcuse) in the context of advanced capitalism, technology relates to the ideological matrix as both a product and a producer of ideological dispositions.[80] More recently, Winner (1980) and Feenberg (1999; 2002) show that technical artifacts have politics in the sense that they promote materially particular ideological worldviews and agendas. Feenberg uses the term "technical code" to point to the way technologies feature the intermeshing of political interests and technical affordances.

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[79] For a useful overview of SCOT see MacKenzie & Wajcman, 1999.

[80] Marx, 1906, part iv; Marcuse, 1982; 1991.

As an index of the struggle between the hegemonic drive for what Feenberg calls "operational autonomy" (the social and economic interests of capital) and the emancipatory potential of counter-design and appropriation to promote what he calls "democratic rationalization", technical codes can be understood as the dynamic interfaces between social interests and technical language – the glue that keeps the 'socio-' and the 'technical' together. In this sense, the technical code is the material instantiation of social discourse; it is the often invisible, self-evident way in which social meanings are inscribed in the very form of the technical object, exhibiting the weaving of social norms into technical language, objects and practices – the way "ideological visions" are delegated to technical design (Feenberg, 2010, p.95). Yet, as Howard (2006, p.67) observes, despite the growing popularity and influence of social theories of technology, "research into political culture has largely excluded the material dimension of communication technology and treated political culture as ideological repertoires, not technological structures". Technical codes, in this view, tend to remain altogether outside the scope of the critique of ideology. It is therefore insufficient to pay attention only to the cognitive schemata available for political interventions, as is usually the case with traditional critiques of ideology that take their cues from Marx's famous observation that "The *ideas* of the ruling class are in every epoch the ruling ideas" (Marx, 1978, p.172; emphasis added).[81] Instead, as Feenberg and others have shown persuasively, we should pay attention to the technical affordances that promote particular ideological dispositions.

This chapter offered a conceptual framework with which to assess the political significance of new media technologies used to engage the public with environmental politics. It was suggested that in addition to viewing new media technologies as *tools* of environmental citizenship they should be seen as *mediations* of environmental citizenship. In this sense, some aspects of the political significance of new media can only be understood when we shift our attention from their informational, discursive and tactical (or coordinative) uses to the way they provoke meaningful interactive

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[81] Interestingly, while Marx's comment in *The German Ideology* locates ideology in society's superstructure, Marx's own analysis of the shaping of industrial machinery by the interests of capitalists in *Capital* (part iv) makes evident the way ideology also resides in the base structure of society (see Marx, 1906; and also MacKenzie, 1984).

experiences. This way, it was argued, we can avoid treating new media instrumentally, that is, as neutral, decontextualized implements. Such instrumental accounts lack critical attention to processes of design (treating technologies as 'blackboxes'), and to the experiences users have with new media technologies.

Drawing from the philosophy of technology and recent work in digital rhetoric, I suggested an alternative framework with which to assess the political significance of interactive technologies. This, largely phenomenological approach, foregrounds the way new media technologies modulate ways of being, perception and action – the way they amplify and attenuate certain phenomena, and invite and inhibit certain behaviour. To the emphasis on perception and action I added an account of technology as a form of meaning-making that corresponds with linguistic or discursive structures, arguing that this model socializes our understanding of interactivity. I called the kind of experiential effects generated by new media "interactive world disclosure", and explained that the latter represents a distinct way of disclosing the world and ourselves *through* interactive procedures. The kind of world revealed through interactive disclosure is itself interactive, foregrounding responsivity as the essential signifier of our technologically mediated lifeworld.

Lastly, returning to the question of interaction design through the prism of Feenberg's notion of the technical codes, it becomes possible to assess the way interactive experiences are designed to mediate social and political concerns. Their capacity to evoke interactive world disclosure emerges within particular social contexts, represented by the motivations of design stakeholders and integrated into the technologies themselves through the process of negotiating technical codes. In this sense, the intended effects of interactive experiences – the way they provoke interactive world disclosure – can be considered in relation to the political dispositions and interests of their designers, and the concrete affordances that embody technical codes. The former will be discussed next, while the latter will discussed in chapters 4 and 5.

3.
The Turn to Experience in Environmental Communication

> The idea of climate change should be used to rethink and renegotiate our wider social goals about how and why we live on this planet.... to rethink how we take forward our political, social, economic and personal projects over the decades to come.
>
> –Mike Hulme[82]

[82] 2009, p.361, 362.

3.1 Communicative Solutions to Environmental Problems

3.1.1 What is Environmental Communication?

Environmental communication emerged as a field of practice and scholarship aiming to question our relation to the environment, and inform, mobilize and consolidate meaningful action on environmental issues. Early efforts in what may be considered protean or pre-disciplinary environmental communication focused on raising awareness to the shifts in human-environment relations under modernity, with H.D. Thoreau's *Walden* (1854), Aldo Leopold's *A Sand County Almanac* (1949) and Rachel Carson's *Silent Spring* (1962) its most iconic representatives. Carson's work in particular is credited with a dramatic increase in public exposure to environmental degradation and the launching of the modern environmental movement (Dauvergne, 2009, p.26). As the environmental movement picked up momentum with growing pubic concerns over nuclear testing in the mid 1960s, the launch of Greenpeace in 1970 (and Greenpeace International in 1979), and the consequent rise of Green political parties in Europe during the 1980s, it attracted more academic interest. As a scholarly field, the emergence of environmental communication can be traced to the publication of Christine Oravec's study of the rhetoric used in a conflict around the construction of a new dam in 1984 (Milstein, 2009, p.345), and the establishment of the Environmental Communication Commission/Division within the Speech Communication Association (now the National Communication Association) in 1996 (Senecah, 2007). The recent launch of the International Environmental Communication Association (IECA) is evidence to both the field's popularity and its academic legitimacy, while the inauguration of the Association's flagship publication, *Environmental Communication: Nature and Culture*, testifies to the continuous expansion of the field to encompass a host of social, cultural and political issues – a process to which the present work contributes.[83]

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[83] In this sense, contemporary environmental communication can be seen as part of a much larger discourse about sustainability and progress. While the discussion that follows refers explicitly to recent developments in environmental communication, the kind of topics and themes that will be explored could have equally been broached within the context of sustainability communication.

Environmental communication features a kind of duality: on the one hand an activist orientation that aims to make concrete interventions in environmental discourses and politics either as part of a wide reaching social movement or as a set of ameliorative steps that may be enacted by citizens and governments, while on the other hand, a more scholarly approach to unpacking the cultural or symbolic dimensions of human-environment relations and their representations in the media. We can see this duality in play in the way the field is defined, for instance, on the IECA's website: "environmental communication is both an activity/phenomenon and a field of study that, not surprisingly, studies the activity/phenomenon".[84] Robert Cox (2010, p.20) defines environmental communication as "the *pragmatic* and *constitutive* vehicle for our understanding of the environment as well as our relationship to the natural world; it is the symbolic medium that we use in constructing environmental problems and negotiating society's different responses to them" (emphasis added). Environmental communication thus *pragmatically* informs, educates, alerts, persuades, mobilizes and helps us solve environmental problems, but no less important, it *constitutes* our very perceptions, symbolic representations and consequent valuations of nature, the environment, and environmental issues upon which the more action-oriented agenda rests. This duality of (symbolic) representation and (political) intervention results in a palpable tension: in a variation on Marx's *Theses on Feuerbach*, environmental communication represents *and* intervenes in the world – effectively interpreting the world in ways that will change it. Is this tension avoidable? Cox thinks not. Writing elsewhere he notes that "Social/symbolic representations of environment embody 'interested' orientations toward their object(s)", therefore reflecting both the ideological positions of those that create and disseminate these representations and the ways these "interested" parties envision action on the environment (Cox, 2007, p.13; emphasis removed). In other words, *to mediate human-environment relations is already to take a stance on how they should be perceived and, as consequence, how they should be acted upon*. In this regard, environmental communication is no different than any other subfield of communication for every communicative act is already political in that it represents an *actionable world*: an image of the world coupled, explicitly or implicitly, with a set of possible actions on and within it.

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[84] http://theieca.org/?q=what-environmental-communication (last accessed May 2, 2013).

Acknowledging the nature of the communicative act as always already a form of political mediation poses significant ethical challenges to environmental communicators, as was made evident in what come to be known as the "crisis discipline" debate in environmental communication.[85] Cox (2007, p.14), once again, frames the problem thus:

> Even in our cautious ways, as we propose that the objectives of our work are to ''appreciate'' the different constructions of wilderness, to help stakeholders to ''understand'' or ''participate in'' processes that affect them, or ''translate'' technical reports, we are straddling an ethical divide that implies choice.

Insofar as environmental communication operates in relation to real environmental crises, the choice over what to communicate, Cox argues, should be motivated by an ethical obligation "to enhance the ability of society to respond appropriately to environmental signals relevant to the well-being of both human communities and natural biological systems" (ibid., p.5).[86] The key problematic here is that there is no agreement on what qualifies as an "appropriate" response to environmental problems. And since such responses inherently include making decisions over the distribution of both individual and collective resources and affect the lives of millions on a global scale, they are explicitly political. What we have here, then, is an inescapable 'magical circle': environmental communication is always already political. Taking a page from Heidegger, we may suggest that the real question is not how to escape the circle but how to enter it properly.[87] In other words, environmental communication needs to be self-aware and realistic about its political aspirations, utility and implications.

3.1.2 The Behavioural Gap and the Characteristics of Environmental Issues

Although it has other topics of interest, environmental communication has increasingly focused on addressing what is most commonly termed the "behavioural

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[85] See essays by Cox, Killingsworth, Peterson et al., Schwarze, Senecah, and Plec in the first issue of *Environmental Communication: A Journal of Nature and Culture* (May 2007).

[86] Cox's approach was recently (June 1, 2013) validated by the IECA's decision to amend its vision statement to include the following: "IECA's mission is to foster effective and inspiring communication that alleviates environmental issues and conflicts, and solves the problems that cause them" (http://theieca.org/about/bylaws (last accessed June 12, 2013)).

[87] See Heidegger, 1962, p.195.

gap": the incongruence between the public's awareness of environmental issues (including climate change) and the evident lack of what Stern (2000) calls "environmentally significant behavior". The pivotal question is, if the public is aware of and concerned about environmental issues, as recent polls tell us,[88] and in fact, have been telling us since the late 1990s (Blake 1999), why does it not act on them? One of the reasons environmental communicators are finding this question increasingly frustrating is that despite the fact that the balance of the planet seems to hang on society's ability to act on the issues with resolution and expedience, there is no single or obvious way to do so. As Stern (2000, p.421) notes, "Environmentally significant behavior is dauntingly complex, both in its variety and in the causal influences on it". Yet, the more we learn about the processes of human decision-making and the political reality within which they take place, the closer we come to being able to propose communicative solutions.

To a large extent, environmentally significant behaviour is so "dauntingly complex" because of the characteristics of environmental issues. Cox (2010, p.157) suggests that the characteristic most essential to the communication of environmental issues is the extent to which the latter are *unobtrusive*. Since environmental problems such as nuclear leaks, loss of biodiversity, chemical contamination, the degradation of the Ozone layer and the onset of climate change tend to occur outside of the majority of the public's everyday experience, they remain discrete or time delayed, defying the sensory linking of causes with effects (see also Moser & Dilling, 2007, pp.5-6). In other words, environmental issues such as climate change lack in perceptual immediacy and intensity and therefore tend to send only "weak signals" that fail to trigger urgent action (Bord, O'Connor & Fisher, 2000, p.206). Further, the unobtrusiveness of environmental issues necessitates a higher degree of public reliance on the media for gaining

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[88] A cursory look at the plethora of polls that aim to take the public's pulse on climate change reveals that the public's awareness of the reality and severity of climate change is consistently strong. In the context of the UK, a recent BBC poll from June 2012 found that 57% of Britons believe that climate change is real and man made (http://www.noiseofthecrowd.com/climate-change-opinion-is-now-up-to-pre-climategate-levels/ (last accessed May 2, 2013)). A recent online poll conducted by Angus Reid (June 2012) found that 58% of Canadians and 42% of Americans believe in the factuality of manmade global climate change (http://www.angus-reid.com/wp-content/uploads/2012/06/2012.06.27_Climate.pdf (last accessed May 2, 2013)).

awareness and clarity on environmental issues, retrieving a host of related concerns and difficulties which I discuss at length below.

To the lack of our immediate experience of environmental issues we should add that the latter tend to be highly *complex*, involving multiple interrelated processes with diverse, emergent spatiotemporal dynamics and trajectories. In contrast with older models that viewed natural systems as essentially tending to orderly equilibrium,[89] scientists now espouse a view of nature that "is far from equilibrium, nonlinear and full of irreversible processes" (Prigogine, cited in Connolly, 2006, p.71) – "evolving, contingent, revolutionary, conflicted, catastrophic at times, always in a state of flux" (Worster, 1994, p.421).[90] Through this prism the natural world is seen to be made of a multitude of autonomous or semi-autonomous, nested or interconnected, linear, nonlinear or chaotic systems: "each system – when examined in the timescale appropriate to it – oscillates between periods of relative arrest and heightened imbalance and change, followed in turn by new stabilizations, some of which may assume a composition never fully manifest before" (Connolly, 2006, p.70). So while human cognition seeks simple patterns in the environment – patterns that evidence causality and allow the modelling and control (or management) of environmental processes – the environment itself exhibits a confounding tendency for nonlinear complexity and emergent processes with unpredictable outcomes. This is most evident in the case of climate change, which takes place over an extended period of time and involves a tremendous amount of relational properties, causes and effects. As stipulated in the latest report from the Intergovernmental Panel on Climate Change (AR4), "Anthropogenic warming and sea level rise would continue for centuries due to the time scales associated with climate processes and feedbacks, even if GHG concentrations were to be stabilized" (IPCC, 2007, p.46). This kind of unruly complexity, as some argue, tends to trigger "default perceptual and cognitive patterns that impede understanding and acting" on complex environmental problems (Grotzer & Lincoln, 2007, p.268) – a problem to which I return in the context of information heuristics below.

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[89] Earlier ecological models, including Eugene Odum's pioneering work, were influenced by systems theory (cf. Worster, 1994)

[90] See also essays by Capra, Worster, Bohm and Prigogine in Merchant (ed.), 2008.

The identification of environmental systems with nonlinearity poses significant challenges to our capacity to model environmental systems mentally and computationally, injecting *uncertainty* into the scientific projections we use to guide our personal and collective responses to environmental problems.[91] As Edwards (2010, p.6) explains, environmental modelling suffers from data lapses and poor integration of different datasets (data and metadata "friction" in his terms):

> over the last 160 years (the period of historical thermometer records) practically everything about the weather observing system has changed – often. Weather stations come and go. They move to new locations, or they move their instruments, or trees and buildings rise around them, or cities engulf their once rural environs. They get new instruments made by different manufacturers. Weather services change their observing hours and their ways of calculating monthly averages…. It's like trying to make a movie out of still photographs shot by millions of different photographers using thousands of different cameras.

The picture becomes even more muddied when we include oceanic or atmospheric measurements since they are even more sparing and inconsistent (although this will hopefully change soon with the addition of NASA's new generation of weather/climate satellites).[92] Further, as environmental models grow larger and more complex in order to integrate new ways to interpret climatic dynamics, they incorporate more and more variables, resulting in considerable data perturbation that decreases certainty (Orrell, 2007). This is why projected planetary warming is always given in a range of potential values ("climate sensitivity") instead of a single value. Thus, the more we turn to computer modeling to understand the complex dynamics of our environmental systems the more we find that computation by itself cannot provide us with the kind of certainty we desire (Stainforth et al., 2005). As Orrell (2007, p.14) puts it, "Mathematical models interpret the world in simple mechanical terms" but "Living things have properties that

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[91] It is important to clarify that there is hardly any uncertainty as to the reality of climate change, or that it is affected by human activities (GHG emissions). The uncertainty around climate change has more to do with scientific predictions of effects, extent and the degree to which human intervention may mitigate climate change (Bizikova et al., 2011; see IPCC, 2007, p.27 for a relevant typology of climate change-related uncertainties).

[92] http://www.msnbc.msn.com/id/45068419/ns/technology_and_science-space/t/nasa-launches-trailblazing-weatherclimate-satellite/#.TxXGxmPC4u8 (last accessed June 11, 2013).

elude prediction". In this sense, we may say that the equation of knowledge with predictability may have found its limits in climate science (cf. Hulme, 2009, p.181).

Lastly, understanding environmental issues and developing appropriate responses to them is also contingent on the practical entanglement of natural and social phenomena. This is not only because nature is itself a complex, culturally and historically contingent category (Cronon, 1996; Worster, 1994), but because problems concerning the natural environment always include human factors – cultural, social, economic and political dimensions (Goodland, 2002; Hulme, 2009; Robinson, 2004) – adding to their unpredictability. This means that both the definition of environmental problems and the outlining of potential solutions to them are never only about 'fixing' nature. Instead, they inherently refer to the cultural categories that allow us to understand the problem and envision possible courses of action on it, and to the political structures that constrain or enable those courses of action. In this sense, prospects of overcoming the behavioural gap are becoming less a matter of the scientific framing of the problem (as a question of the reality and extent of climate change), and more a function of viable cultural and political responses to it. I return to this issue in more detail below.

3.1.3 The Decline of the Information Deficit Paradigm

Until recently, environmental communicators addressed the complexity and unobtrusiveness of environmental issues within the dominant science communication paradigm, often referred to as the "information deficit" model (Burgess, Harrison & Filius, 1998) or the "diffusionist" approach (Bucchi, 2008). The information deficit model operationalizes a particular view of the linking of information and action. At its centre lies an image of man as "omniscient calculator" (Lupia, McCubbins & Popkin, 2000, p.8), an essentially rational, calculating and deliberative agent that, when given adequate – accurate, relevant, complete – information will reach logical conclusions and make proper decisions.[93] From this it follows that while the public's values and attitudes may constitute important conditions for pro-environmental behaviour, the primary task of

[93] Some variations on this theme include the 'economic rationality' model, and its somewhat improved successor, the theory of 'bounded rationality' (see Lupia, McCubbins & Popkin, 2000; Mackuen et al., 2007).

communicators is to “fill the gap of knowledge” by providing the public with appropriate information (Brossard & Lewenstein, 2010, p.13).

The information deficit model also viewed effective communication as a top-down, unilinear process, where members of the public were treated as passive recipients of information, waiting to be educated (or enlightened) by experts (Blake, 1999; Burgess, Harrison & Filius, 1998, p.1446; van Kerkhoff & Lebel, 2006). The various contexts of the information and the communicative situation, and the cognitive and cultural frames through which the public interprets the information were bracketed and discounted, along with media-specific affordances and biases (Bucchi, 2008). Knowledge, within this model, is considered tremendously elastic, “being transferable without significant alterations from one context to another, so that it is possible to take an idea or result from the scientific community and bring it to the general public” (ibid., p.58). The information deficit model thus underwrites a host of ‘one size fits all’ communication strategies.

Despite several decades of dominance, the information deficit model has proven to be inaccurate and insufficient. There is ample evidence, as Crompton (2010, p.26) puts it, “that simply conveying the *facts* about the scale and urgency of global challenges is unlikely to motivate the levels of public engagement that will be necessary if the political space and pressure to meet these challenges is to be created” (emphasis in origin). The ‘discovery’ that large-scale action requires more than just an informed citizenry motivates two major criticisms of the information deficit model. First, attaining knowledge about political (or otherwise) matters calls for more than just access to information. Developing an intention to behave pro-environmentally involves a host of mental and embodied elements that influence the way information is processed and potentially acted upon. Second, the communicative transfer of knowledge is not a unidirectional phenomena operating in a vacuum. Rather, it is contingent on and reflective of an array of social and cultural contexts, including the institutional (and other) arrangements that may enable or constrain environmentally significant behaviour. Combined, and in ways described with more detail below, the two lines of critique affected a “turn to experience” in environmental communication, motivating environmental communicators to rethink the relations between information, knowledge,

decision-making and action, and consider the effects of the specific cultural and political structures within which action on environmental issues is to take place.

Early evidence of the shortcomings of the information deficit model was provided by risk scholars. Paul Slovic, for instance, argued that while human responses to risk involve what he calls the “analytic system”, a more logical, calculative, conscious and therefore slower risk assessment modality, our responses to risk also rely on what he calls the “experiential system” which is triggered by embodied (sensorial) and emotional inputs and is much more intuitive, fast and effortless. So while “analysis is certainly important in some decision-making circumstances, reliance on affect and emotion is a quicker, easier, and more efficient way to navigate in a complex, uncertain, and sometimes dangerous world” (Slovic, 1987, p.313; cf. Kahneman, 2011; Slovic et al., 2004). Dessai et al. (2004) make a related differentiation between “external” or “top-down” perceptions of risk which are based on scientific analysis and are usually performed by experts, and “internal” or “bottom-up” perceptions of risk that make evident that “to be real, danger has to be either experienced or perceived” (p.11). On both accounts, we respond to threatening situations with a combination of calculation and instinct, reason and emotion.

On a different register, and continuing Douglas & Wildavsky’s (1982) pioneering work on the cultural conditions of risk perception, Wynne (1992) locates the perception of risk in a meshwork of social relations, practices and identities from which trust emerges. In a memorable study of the responses of sheep farmers in the UK to government programs designed to mitigate the fallout from the nuclear disaster in Chernobyl (1986), he writes:

> public experiences of risks, risk communications or any other scientific information is never, and can never be, a purely intellectual process, about reception of knowledge per se. People experience these in the form of material social relationships, interactions and interests, and thus they logically define and judge the risk, the risk information, or the scientific knowledge as part and parcel of that ‘social package’. (Wynne, 1992, p.281-2)

The processing of information is not only contingent on the trust one has in the source of information, but also on the way the information (and the potential behaviour it outlines) may confirm or contradict one’s group- and self-identity (Koger & Winter, 2010,

pp.103-4; Krimsky & Plough, 1988; Moser, 2007, p.71). In the case described by Wynne, the shepherds' knowledge, skills and experiences were severely discounted by the experts brought in by the government. The dissonance between the experts' view of the shepherds' knowledge and the shepherds' own view of themselves militated against any kind of collaborative, mutual learning. Asymmetrical relations of knowledge/power (to borrow from Foucault) may thus undermine communication, understanding and issue clarity first by creating a "trust deficit" (Wynne, 2006), and then by pushing people to default to their existing knowledge-base as a way to avoid identity-related confrontations. As Slovic (1987, p.285) cautions, "risk communication and risk management efforts are destined to fail unless they are structured as a two-way process".

Importantly, not all intuitive responses to immanent threats are appropriate or efficient, since our intuitive perceptions of risk rely heavily on what Tversky & Kahneman (1982) call "heuristics", that is, ingrained and intuitive mental strategies that allow people to "assess probabilities and predict values" with minimum effort (p.4). While these economies of attention were honed over millennia to save us energy in situations fogged by uncertainty, in more complex situations they introduce biases that may distort rather than reflect the real dimensions of the situation. Among these heuristics Tversky & Kahneman note our tendency to evaluate probabilities based on the similarity of one case to others ("representativeness") or on the resemblance of a situation to easily retrieved, past occurrences ("availableness"), and our tendency to start making estimates based on a factual anchor while adjusting according to the specifics of the problem ("adjustment and anchoring"). The blow delivered by the theory of heuristics to the dominant model of economic rationality (and for which Kahneman received the 2002 Nobel Prize in economics) is compound: under uncertainty, not only does logic tend to get short-circuited by more economical modes of reasoning, but the replacement of calculative by intuitive reasoning takes place in a mostly unconscious manner: "people take their heuristics off the shelf, use them unknowingly and automatically, and rarely worry about their accuracy" (Kuklinksi & Quirk, 2000, p.156). As such, our experiential risk assessment system is prone to ossified, snowballing behavioural patterns that are "resistant to change because they influence the way that subsequent information is interpreted. New evidence appears reliable and informative if it is consistent with one's initial beliefs; contrary evidence tends to be dismissed as unreliable, erroneous, or unrepresentative" (Slovic, 1987, p.281).

On this account, it becomes clearer why merely providing information about an environmental issue in a top-down manner does not always produce the kind of behavioural response we would expect. For environmental issues to trigger appropriate responses they have to be communicated with experiential resonance *and* be available for calculated responses – both of which are highly affected by the structure, dynamics and contexts of our cognition, and the social matrix of relations and identities within which the communicative act takes place; by our lived experiences. These include past events and situations that may have consolidated a particular way to assess the situation and that often rely unconsciously on information heuristics that are less than accurate. With that said, we should be careful not to throw the proverbial baby with the bathwater: the provision of accurate, reliable, relevant and culturally specific information is essential for developing in-depth knowledge of environmental issues that goes beyond mere issue awareness. It also may serve to form bulwarks against spin and emotional manipulation. As Bord, O'Connor & Fisher (2000, p.216) write:

> Effective public education on global warming, and other environmental threats, is essential. Occasional media coverage of environmental disasters might heighten or maintain general levels of concern, but they will not make Americans good environmental citizens. Training for environmental citizenship must go beyond merely sensitizing people to environmental problems. More in-depth knowledge is required. A basic understanding of cause and probable effects is necessary, with all the uncertainty and complexity included.

Bord et al. may be exaggerating the role of deep knowledge in mobilizing the public on environmental issues, but if "Responsible decision-making requires at least some minimal knowledge of cause and effect" (ibid.), then we can ill afford to dispense entirely with the provision of accessible, accurate, reliable and relevant environmental information. We might be better served, however, by taking into consideration the "real" world of actionable knowledge-making, where non-calculative cognitive registers, values and cultural conditions are at least as important as calculative ones (Kahan et al., 2012). Furthermore, and as I explain below, environmentally significant behaviour is also significantly mediated by structural or institutional arrangements. These too should be targeted by environmental communicators.

In the remainder of this chapter I sketch in more detail two major responses to the discrediting of the information deficit paradigm. The first, which is discussed next, is

articulated as a critique of the infocentrism of the diffusionist approach and suggests a more holistic and potentially more persuasive communication strategy. What makes communication strategies effective, this alternative approach argues, is the way they may combine informational, emotional and contextual elements into *significant – resonant, compelling – experiences*. The second response, which is discussed in section 3.4, comes as a critique of the top-down unidirectionality of the information deficit approach and seeks to support communicatively more participatory, inclusive and empowering environmental politics. By focusing on the larger social contexts of environmentally significant behaviour this approach seeks to create continuities between our *everyday experiences* and the political premise of environmental solutions. Taken together the two responses illustrate what I see as a turn to experience in environmental communication.

3.2 Persuasive Messaging

3.2.1 Understanding Pro-Environmental Behaviour

As noted above, criticisms of the information deficit paradigm hold that promoting pro-environmental behaviour requires more than merely providing the public with scientific information. Instead, communication is more persuasive when it is holistic – delivering accurate, relevant, emotionally resonant information that is coupled with concrete paths of action, thus promoting the public's political self-efficacy. Holistic communication strategies also consider both internal and external motivations and barriers to action. This is in line with what Stern (2000) calls the ABC model, whereby behaviour (B) is understood as the product of personal attitudinal variables (A) and contextual factors (C).[94] Since attitudinal and contextual variables, often referred to as *internal* and *external* factors, are so crucially inextricable, heeding Stern's (2000, p.418) warning that focusing solely on internal or external factors produces only partial explanations of behavioural choices, and may therefore offer a misleading guideline for intervention, in the following

[94] But as Shove (2010b) argues, the ABC model's treatment of external factors is done with an eye on individual and not collective action, essentially ignoring the larger social, economic and political structures that mediate environmental action. In this sense, she argues, the C of the ABC model stands for 'choice' and not 'context', reflecting the model's psychological bias.

analysis they are combined.[95] While each of the following sections addresses both internal and external factors, they are organized roughly according to what Lorenzoni, Nicholson-Cole & Whitmarsh (2007) consider the three main aspects of behavioural change: (1) questions of awareness, information processing and knowledge production, sometimes referred to as *cognitive* aspects;[96] (2) questions of the emotional appeal that help attribute salience and urgency to a particular issue, often referred to as *affective* aspects;[97] (3) questions concerning intentions to act pro-environmentally, including social norms, attitudes, values and perceptions of self-efficacy, sometimes referred to as *behavioural* aspects. However, if Kollmuss & Agyeman (2002, p.257) are correct in arguing that "The biggest positive influence on pro-environmental behavior ... is achieved when internal and external factors act synergistically", the conditions under which this synergy may materialize ultimately rest on the particular character of our political culture – a point I will reiterate below.

3.2.2 Information, Awareness and Clarity

Despite the above reservations, the view that "the main barrier between environmental concern and action is lack of appropriate information" (Blake, 1999, p.260) is still used to explain the public's lack of pro-environmental behaviour. Lorenzoni, Nicholson-Cole & Whitmarsh (2007, p.451), for example, write that in the context of climate change, "One of the most easily identifiable barriers to engagement is a lack of basic knowledge about causes, impacts and solutions to climate change" (see also Bord,

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[95] Other accounts that emphasize the need to combine internal and external factors include DEFRA, 2008; Jackson, 2005; Kollmuss & Agyeman, 2002; Lorenzoni, Nicholson-Cole & Whitmarsh, 2007; Tanner, 1999. They are all, however, susceptible to Shove's (2010b) critique (see previous footnote).

[96] While the term 'cognitive' may indicate a range of psycho-physiological phenomena including perception, attention, memory, visualization, reasoning, classification, understanding, verbalization, problem-solving and decision-making (Goldstein, 2011, p.4), I use it here in a wider (and perhaps simpler) sense to indicate the process by which we form our "beliefs about the real world" (Bryant & Thompson, 2002, p.182).

[97] As with the notion of 'cognitive', there is much definitional fuzziness surrounding affect, which is often used as a straightforward equivalent to emotion. Neuman et al. (2007, p.9) provide a useful definition of affect as "the evolved cognitive and physiological response to the detection of personal significance". For the purpose of the present work, *affect signifies intensity*: pre-linguistic (pre-representational or pre-symbolic), mostly unconscious, embodied responses that tend to impact us immediately, directly, regardless of our volition, and sometimes in surprising ways.

O'Connor & Fisher, 2000, p.216; Thorngate & Tavakoli, 2009; and Tribbia, 2007, p.242). Their position is somewhat qualified by Grotzer & Lincoln (2007, p.267), who suggest that the public lacks the *right* kind of information to allow them to weigh and enact pro-environmental behaviour: "People, even those deemed well educated, do not hold effective mental models of global climate change upon which to base decisions about their actions". Such "effective" mental models represent actionable knowledge, a clear understanding of causes, effects and potential implications for individuals and communities – "what something might do, how it might work, what it might mean" (Meisner & Osborne, 2009, p.91).

Environmental communicators offer three plausible, interrelated explanations for the informational basis of the public's lack of actionable knowledge around environmental issues. The first implicates our *information processing faculties* by suggesting that the way environmental communicators understand the cognitive processes that translate information into knowledge and action may be flawed and in need of updating. The second pins the lack of actionable knowledge on the character of *environmental issues* – the way they tend to be complex, unpredictable and involve uncertainty and thus challenge our capacity to understand them with clarity. The third explanation has to do with our *information environment*, suggesting that the information available to the public may be irrelevant, of less quality, biased, contradictory, or so overwhelming that it leaves the public even more confused than it was. It may also be communicated in ways that devalue certain opportunities and incentives to act. Since the first two potential explanations were already discussed in the context of critiques of the information deficit model, I focus here on the third.

As briefly mentioned above, the unobtrusiveness, complexity and uncertainty that characterize many environmental issues increase the reliance of environmental attitudes on media representations. On the one hand, this is partially derived from the uncertainty that characterizes all "new" science.[98] As Dunwoody (1999) observes, the introduction of new, uncertain science gives the media a crucial role in influencing the way it is

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[98] Newness is, of course, relative. Climate science has its roots in Tyndall's linking of gas emissions with climate change in 1859, and in Arrhenius's greenhouse calculations in 1896 (Weart, 2008).

interpreted by the public and by other scientists, manifesting the manner by which the popular media become part of the social production of scientific knowledge itself. On the other hand, as made aptly evident in the media's coverage of climate change, "some of the biggest impediments to effective climate coverage seem to lie not out in the examined world but back in the newsroom and in the nature of news itself" (Revkin, 2007, p.142). Such impediments include scheduling constraints and a shrinking "news hole", budgetary limitations on environmental beats, changing journalistic practices related to norms of objectivity and balance, the sensationalist equivalence of newsworthiness with drama, the imitation and homogenization of news due to the need to produce an abundance of items to satisfy the appetites of online news consumers, and the reality of convergent media ownership (Boczkowski, 2010; Carvalho, 2007; Cox, 2010; Moser & Dilling, 2007; Revkin, 2007). Although most of these impediments are not limited to the media's treatment of environmental issues, when the issues at hand are highly complex, dynamic, include a certain degree of uncertainty and take place outside of the public's immediate experience, the public seems much more vulnerable to the media's machinations (see in particular Hoggan & Littlemore, 2009; Oreskes, 2007; Oreskes & Conway, 2010).

Even when the public does enjoy open and free access to information about environmental issues, the way the information is presented is crucial to the public's ability to translate it into knowledge and action. This is because the media's delivery of information is never neutral, but is instead structured by a variety of 'selection', 'cultivation' (or 'priming'), and 'framing' techniques that are based on institutional constraints and ideological dispositions. *Selection* refers to the motivated choice to communicate certain facts and facets and not others, and *cultivation* or *priming* indicates the effects of "repeated exposure to a set of messages" (Shanahan, cited in Cox, 2010, p.178). Media *frames* are "a deductive set of mental boxes and interpretive storylines that can be used to bring diverse audiences together on common ground, shape personal behavior, or mobilize collective action" (Nisbet, 2009, p.22). Frames manipulate figure/ground relations by helping to shift the weight between different messaging elements, making some information more salient and relevant, and creating cognitive links or "interpretive shortcuts" that "integrate media presentations with preexisting interpretations forged through personal experience, partisanship, ideology, social identity, or conversations with others" (ibid., p.17). For example, a story about climate

change may emphasize a scientific angle, perhaps by deploying a "Pandora's box" media frame that portrays an out-of-control reality cumbered by severe climate events, mass species extinction and so forth. Or it may foreground its socioeconomic implications, perhaps by using a "green economy" frame as a means to portray a future brimming with renewable energy, green jobs, and prosperity for all. Importantly, in both cases the frame used already includes certain possibilities (and impossibilities) for action, collapsing the gap between information and action.[99] This also has to do with the kind of emotional responses particular frames may trigger, an issue to which I will return shortly.

The last point I wish to make in the context of the information environment, is that the degree to which media frames may resonate with individuals is also culturally contingent, that is, the effectiveness of certain frames may fluctuate depending on the cultural milieu within which they are deployed. As Nisbet (2009, p.28) writes, "the latent meaning of any frame is often translated instantaneously by specific types of frame devices such as catchphrases, metaphors, sound bites, graphics, and allusions to history, culture, or literature". These are all culture-specific, that is, they carry different meanings in different cultures and therefore do not readily translate from one culture to another. In this sense, media frames relate individual perception (or "mental models") with collective meaning-making or "cultural models": the matrix of social and cultural contexts and taxonomies that orient perception and behaviour (VanWynsberghe, Carmichal & Khan, 2007). Kahan, Jenkins-Smith & Braman (2011, p.148; see also Kahan et al., 2012), as part of the Cultural Cognition Project at Yale, make a similar observation when they point to "the tendency of individuals to fit their perceptions of risk and related factual beliefs to their shared moral evaluations of putatively dangerous activities". To paraphrase, the way we process information is contingent upon *shared* worldviews and values that we already posses – our belonging to particular "reference

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[99] This is the context for Nordhaus & Schellenberger's suggestion to shift framing from the "pollution paradigm" to the "economic development" one, "recasting climate change as an opportunity to grow the economy" (cited in Nesbit, 2009, p.20). It is also the motivation behind Hulme's (2009, p.227) suggestion to shift the discourse of climate change from its scientific-environmental roots to addressing it as a development issue, a political and economic problem, a security concern and a matter of values and social justice.

groups" (Koger & Winter, 2010, p.100) or "interpretive communities" (Leiserowitz, 2007, p.51) – and the specific situations in which we interpret the message. Perception is culturally contingent. I will return to the effect of "moral evaluations" on one's intention to act on environmental issues, but the more generic conclusion here is that information processing is active, dynamic, fluid and context-sensitive. Every act of interpretation that contributes to issue clarity variably blends content and context, ideological dispositions, values and life experience. Blake (1999, p.265; referencing Myers & Macnaghten), reiterates the point: "Different people will interpret and respond to the same environmental information in unpredictable and often highly variable ways, at times producing a quite opposite interpretation to the one expected by those (often in the policy community) who promulgate the information". Our shared and individual experiences and worldviews filter our perception of reality and consequently condition our forming of actionable knowledge.

3.2.3 Salience, Attitudes, and Affective Communication

As criticisms of the information deficit model show, being aware of an issue, or even having clarity about its causes, effects and implications is a necessary but insufficient motivation for sustained action on it. One has to feel that the issue is salient, and have an attitude that posits action as important, meaningful and potentially effective. The attribution of salience to an issue and the forming of attitudes in regards to it are largely the outcomes of valence – embodied, emotional or affective responses. In this sense, pro-environmental behaviour is equally dependent on reason and affect, rational and emotional registers. Davidson (2000, p.91) puts it thus: **"**Cognition would be rudderless without the accompaniment of emotion, just as emotion would be primitive without the participation of cognition".

There is a distinguished intellectual tradition that seeks to articulate in political terms the intricate relations between embodied, affective or emotional registers and the more conscious, calculative faculties we normally associate with reason. Plato has famously likened reason and emotion to two horses pulling in different directions, and made it clear in his *Republic* that reason, as represented by the status of philosopher kings, is the most virtuous political quality (Plato, 2000). Human rationality has become a dominant ontological principle precisely because humans are seemingly capable of extricating themselves from their particular situation or context – out of immediate

experience, so to speak – to make logical (purposive, categorical) choices. As made canonical by the philosophies of Descartes and Kant, humans can be differentiated from other organisms by their capacity to stop, evaluate and plan and not simply follow their instincts, desires or whims. However, what we are learning from contemporary cognitive science and social psychology is that this image was more fanciful than sober. We now have a much more nuanced understanding of exactly how and to what extent our worldviews, attitudes and intentions to act are shaped by embodied, affective responses, and scholars show a growing willingness to accept the latter *normatively*. Neuman et al. (2007, p.7) aptly note that "concerns about citizen irrationality are intimately intertwined with judgments about democratic practice itself". One may thus argue that our political imaginary as a whole is shifting by our adoption of a rehabilitated and non-apologetic notion of a more-than-rational political subject.[100]

In the tradition of the Enlightenment, sensorial, embodied, affective and emotional registers remained ostensibly subordinate to (calculative) reason, which was elevated to the degree of normative ideal (Flyvbjerg, 1998, p.2). Descartes' (1960) dichotomization of mind from body and thought from matter dominated the view of cognition in the humanities, cementing a distinct intellectual hierarchy that would remain more or less undisturbed until the twentieth century. According to the Enlightenment ideal, reason was the ultimate seat of judgment and, as famously expressed in Leibnitz's designs for a universal logic or calculus, the site of abstracted impartiality: "All inquiries which depend on reasoning would be performed by the transposition of characters and by a kind of calculus … and if someone would doubt my results, I should say to him: 'Let us calculate, Sir' and thus by taking pen and ink, we should soon settle the question" (cited in Rowland, 2008, p.266-7).

One early exception to Descartes' mind-body dualism was proffered by his contemporary, Baruch Spinoza.[101] Spinoza's articulation of *affectus* and *affectio* as determinates of the body's capacity to act indicates his belief in a strong, ontological

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[100] See especially Lakoff, 2008; Marcus, 2002; Westen, 2007; and the essays collected in Lupia, McCubbins & Popkin (eds.), 2000; Neuman et al., (eds.) 2007; and Szántó (ed.), 2007.

[101] For a brief discussion of the ways Spinoza may be seen to continue and contrast with Descartes see Morgan's Introduction to Spinoza, 2006, p.viii-xi.

mutuality between all entities, a mutuality that binds ideas and matter in a monism that stands over-against Descartes' dualism.[102] But it also foregrounds the political implications of certain embodied relations. While pleasure ("titillation" or "cheerfulness") may extend the body's capacity to act, pain ("anguish" or "melancholy") may diminish it (Spinoza, 2006, p.68). This allows Spinoza to argue that "Inspiring sad passions is necessary for the exercise of power" for it diminishes people's capacity to act, as Deleuze (1978, p.4) explains.[103] In other words, affects colour our moods, influencing both our attitudes toward a particular issue and our will and capacity to act on that issue.

While Spinoza's ideas would serve a new generation of twentieth century political philosophers aiming to escape the trappings of all dualisms and dialectics,[104] the political significance of affect was also explored in less philosophical terms. Sigmund Freud, for instance, saw affect as yet another indication of the extent to which humans are moved to act by forces that remain beneath the threshold of consciousness: desires, drives and affects represent excesses that are active in the id, exert pressures on the ego and tend to be expressed symptomatically in behaviour. An integral part of his economic model (Rapaport & Gill, 1959), Freud (1952, p.433) defines affects as the qualitative expression of "the quantitative factor in the instinctual impulse", the sensed, intense aspects of instinctual energy. Affects can be either maintained as they are in the unconscious, "transformed into a qualitatively different charge of affect, above all into anxiety", or be suppressed altogether (ibid.) In the context of the linguistic (or representational) nature of reason, the difference between affects and ideas is that "ideas are cathexes – ultimately of memory-traces – whilst affects and emotions correspond with processes of discharge, the final expression of which is perceived as feeling" (ibid.) Like other unconscious impulses, affects "exert driving force without the ego noticing the compulsion" (Freud, 1989, p.15), manifesting a situation in which we are effectively

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[102] Spinoza's treatment of ideas and matter (or "thought" and "extension") as two aspects of the same substance ("God" or "nature") is the core of his double aspect theory (see especially Spinoza, 2006, p.30).

[103] Of course, contra Spinoza's association of only 'positive' affects with a compulsion to act, affects erupting as anger, extreme anguish and sorrow may also impel one to act. We see it every day across various sites of conflict (cf. Marcus, 2002).

[104] See especially works by Deleuze, Agamben, Hardt and Negri (cf. Clough, 2007).

blocked from identifying (through deliberate, intentional self-reflection) the sources of our behaviour. Affects can be felt, but when they become 'feelable' they are already detached from, and thus effectively conceal, their sources in the unconscious. While psychoanalysis may help discover those sources and mitigate their negative impacts by perhaps "educating the emotions" (Bantock, 1968), PR, marketing and propaganda agencies took active interest in triggering or tapping into those very same affective responses precisely because they are both compelling and tend to remain largely unconscious.[105] Despite Freud's articulation of the (diminished) role of calculative reason in orienting behaviour, the attribution of behavioural choices (including political decision-making) to rational, conscious and calculative thought maintained its normative status as evident in the lingering influence of theories of economic rationality. This may explain why information deficit models lasted as long as they did despite evidence of their ineffectiveness: they offered an irresistible image of human virtue.

Support for both the Spinozan and the Freudian accounts of affect has come more recently as result of what Gardner (1985; see also Beniger & Gusek, 1995), calls the "cognitivist revolution": the growing tendency to introduce concepts and methodologies developed in the cognitive sciences into the social sciences writ large. Most notably represented by the pioneering work of Bandura in psychology, Damasio, Maturana and Varela in neuroscience, and Lakoff and Johnson in linguistics, the cognitivist view suggests that calculative reason is so essentially dependent on a substratum of neurophysiological processes and dynamics that the very differentiation between mind and matter cannot be sustained. What we consider to be thought, cognitivists argue, is not reducible to 'mental' information processing and calculation. Instead, thought should be seen as both acutely reliant on the physical registration of affect by the sensorimotor system, and as unavoidably filtered by our emotional state. In this sense, any and all Cartesian dichotomizations of mind from body are shown to be false for their inability to account for the way "The mind is inherently embodied" (Lakoff & Johnson, 1999, p.3; see also Varela, Thompson & Rosch, 1991).

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[105] For a relatively recent analysis of the import of Freudian thinking on the PR and marketing world see Samuel, 2010. There is also a more direct link between Freud and the PR industry: Freud's nephew, Edward Bernays, is considered "one of the most influential pioneers of American public relations" (Ewen, 1996, p.3).

The view that "reason and emotion are cooperatively entangled" (Marcus, 2002, p.147) has influenced contemporary approaches to environmental communication in several important ways. Going from the more general to the more specific, first, it initiated an ongoing discussion about the implicit, unconscious yet lasting effects of the relations between the cultural and cognitive resources upon which rely the perception and interpretation of environmental issues and, consequently, the shaping of attitudes and motivations to act pro-environmentally. In this mode, it is not uncommon to find environmental communicators espouse the view that "our collective decisions are based importantly upon a set of factors that often lie beyond conscious awareness, and which are informed in important part by emotion – in particular, dominant cultural values, which are tied to emotion" (Crompton, 2010, p.8). Second, it drew attention to the importance of the emotional tone and content of environmental messaging, positing affective registers firmly within the complex that Kollmuss & Agyeman (2002, p.256) call "pro-environmental consciousness". In this context, it also revealed the relative futility of attempts to communicate the facts, and *only* the facts of environmental issues as the information deficit model held. As Moser (2007, p.65) warns (in the context of climate change), "neglecting the emotional reception of climate-related news makes communication and outreach efforts more likely to fail".[106] And third, since in reality the facts about environmental issues are never transmitted free of affect (as I note above in the context of the information environment), and since "affect is the wellspring of action" (Weber, 2006, p.104), environmental communicators seem increasingly interested in identifying the media frames most likely to encourage or compel the public to act in pro-environmental ways (cf. DeLuca, Sun & Peeples, 2011; Nisbet, 2009). But as demonstrated in recent debates on the advantages and limitations of using fear to communicate climate change,[107] the effects caused by triggering powerful affective or emotional responses associated with environmental issues are contingent on the way these affects are associated (or framed) with behavioural strategies that may potentially

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[106] See for instance, Crompton, 2010; Ereaut & Segnit, 2006; Howell, 2011; Hulme, 2009, p.199; Kollmuss & Agyeman, 2002; Leiserowitz, 2007; Lorenzoni, Nicholson-Cole & Whitmarsh, 2007; Moser & Dilling, 2007; Tribbia, 2007; Weber, 2006.

[107] See Hart & Leiserowitz, 2009; Leiserowitz, 2004; Lowe et al., 2006; Moser, 2007; Moser & Dilling, 2007, p.11; O'Neill & Nicholson-Cole, 2009.

alleviate the situation causing the emotional distress. So while affective elements may indeed successfully draw attention to an issue, raise its salience and urgency and help shape attitudes towards it, their potential to generate actual behavioural change and not disbelief, paralysis or apathy, depends on their coupling with messages of individual and collective agency, and in relation to social institutions, values and opportunities to act. In this sense, despite operating through *individual* registers (embodiment, emotion) affect is not an extra-social phenomenon detached from the social structures within which it is produced.[108] It is perhaps more useful to see it, with Spinoza, as a means to invoke the felt, deep mutuality that weaves together subjects and the extra-subjective structures that mediate their actions. The effects of these structures on behaviour are discussed next.

3.2.4 Perceived Behavioural Controls

In an article in the *NY Times*' Green Issue from April 2008, Michael Pollan poses a problem familiar to many environmental communicators:

> Let's say I do bother, big time. I turn my life upside-down, start biking to work, plant a big garden, turn down the thermostat so low I need the Jimmy Carter signature cardigan, forsake the clothes dryer for a laundry line across the yard, trade in the station wagon for a hybrid, get off the beef, go completely local. I could theoretically do all that, but what would be the point when I know full well that halfway around the world there lives my evil twin, some carbon-footprint *doppelgänger* in Shanghai or Chongqing who has just bought his first car (Chinese car ownership is where ours was back in 1918), is eager to swallow every bite of meat I forswear and who's positively itching to replace every last pound of CO_2 I'm struggling no longer to emit. So what exactly would I have to show for all my trouble?

From this version of what Finger (1994) calls the "social dilemma",[109] Pollan goes on to argue that even if one is still intent on changing their behaviour and act pro-environmentally, with so many correlative and contradictory elements involved,

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[108] The socialization of affect is illustrated well in Grossberg's (1992) notion of "mattering maps".

[109] "the individual understands that his or her individual pro-environmental behavior is not going to make a difference unless a majority of fellow individuals behave similarly" (Finger, 1994, p.142).

evaluating and deciding on an appropriate course of action seems almost impossible. This is echoed in a recent report from the UK's Department for Environment, Food and Rural Affairs, that notes that while the UK public shows a "widespread awareness of environmental problems" and a willingness to change their environmental impact, "people have a much lower level of understanding about what they can do and what will make a difference" (DEFRA, 2008, p.28). And then there is that daunting feeling that all action on issues such as climate change is futile anyway, since "whatever we do manage to do, it will be too little too late" (Pollan, 2008). I call the situation underlying our perceived lack of environmental agency the *magnitudinal gap*, connoting the seemingly unbridgeable chasm between the immense scale of the problem and our meager capacity to effectively act on it.

The magnitudinal gap is related to what Ajzen (1991) calls "perceived behavioral control": one's contextual and situation-specific perception of "the ease or difficulty of performing the behavior of interest" (p.183), which already assumes the presence of a will to act and the capacity to assess the adequacy of resources and opportunities to act. Perceived behavioural control is also closely aligned with what Bandura calls "self-efficacy", which "is concerned with judgments of how well one can execute courses of action required to deal with prospective situations" (cited in Ajzen, 1991, p.184). Self-efficacy influences "choice of activities, preparation for an activity, effort expended during performance, as well as thought patterns and emotional reactions" (ibid.) Ajzen further notes that "Perceived behavioral control may not be particularly realistic when a person has relatively little information about the behavior, when requirements or available resources have changed, or when new and unfamiliar elements have entered into the situation" (p.185). As Bamberg & Möser (2007, p.21) conclude,

> on average, the intention to perform a pro-environmental behavioural option can be described as a weighted balance of information concerning the three questions 'How many positive/negative personal consequences would result from choosing this pro-environmental option compared to other options?', 'How difficult would be the performance of the pro-environmental option compared to other options?', and 'Are there reasons indicating a moral obligation for performing the pro-environmental option?'

Locating the roots of the magnitudinal gap in a combination of information deficiency (over available courses of action and their effectiveness) and lack of opportunity (or

resources) helps us qualify the concerns raised by Pollan (2008) and begin charting strategies that may materialize actual behavioural change. But Bamberg & Möser's implication of moral reasoning in the formation of a willingness to act introduces the importance of norms and values to the formation of pro-environmental behaviour.

The question of *norms* is influentially addressed in Ajzen's (sometimes with Fishbein) theory of planned behaviour. Stressing the link between norms and beliefs, Ajzen (1991) argues that "subjective" (intrinsic) norms are premised in "normative" (extrinsic) beliefs.[110] Subjective norms are therefore 'subjective' because they reflect what individuals perceive to be the likelihood of social responses and sanctions to their behaviour. The effectiveness of social norms can thus be at least partially associated with the way they are internalized, appearing often as personal norms or moral dispositions. While social norms may appear as explicit injunctions ('no smoking in public places') they often operate unconsciously, functioning as habituated rather than reasoned guidelines for behaviour (Ajzen, 1991, p.203).[111] Nonetheless, the effects of social norms are still quite pronounced regardless of our ability or willingness to self-reflectively identify them as such. As has been well documented in the (in)famous Third Wave (1967) and Stanford prison (1971) experiments, social norms, often expressed as the need to conform to a socially defined role or identity, may remove or reinforce inhibitions and desensitize individuals to extreme forms of behaviour, effectively overriding what we may otherwise consider deep seated moral dispositions.

While Ajzen's model views beliefs as the most basic premise of behavioural intentions, Stern (2000) suggests that beliefs are already mediated by *values*, defined as "desirable end states that transcend specific situations" (Koger & Winter, 2010, p.107), and which are "tied inextricably to emotion, not objective, cold ideas" (Schwartz, 2006; cf. Crompton, 2010, p.9; Finger, 1994, p.142). In this view, the social norms we

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[110] Ajzen (1991) defines "subjective norms" as "perceived social pressure to perform or not to perform the behavior" (p.188), and writes that "Normative beliefs are concerned with the likelihood that important referent individuals or groups approve or disapprove of performing a given behavior" (p.195).

[111] The way we tend to misidentify the influence of (extrinsic) social norms by attributing them to (intrinsic) commonsense or logic is called the "introspection illusion" (Koger & Winter, 2010, p.99).

internalize are already filtered by our value system. The question is, which values are most conducive for promoting pro-environmental behaviour? Stern (2000, p.411) notes several types of values that have environmental relevance: *individualist* or competitive values that subordinate the environment to individual advancement, *postmaterialist* values that foreground quality of life and self expression instead of excessive or conspicuous consumption, *religious* values that view the environment as a sacred object to be protected, and *self-transcendent* values that place concerns for those outside of our immediate social circle at the top of the value ladder. He further categorize them into three major groups, egoistic, biospheric and altruistic, and notes that "Data from several studies indicate that the values most strongly implicated in activating proenvironmental personal norms are … altruistic or self-transcendent values" (p.414; cf. Compton, 2010, p.10; Koger & Winter, 2010, p.107).[112] In other words, when triggering self-interest fails to provoke meaningful pro-environmental behaviour, messaging that resonates with self-transcendent values that promote appreciation, understanding, tolerance and protection of others may be more effective.

As in the case of norms, personal values are tightly connected to social structures and collective experiences. As Crompton (2010, p.25) argues,

> people tend to internalise, and attach greater importance to, the values of those around them – those expressed by their parents, teachers, peers, cultural role-models, and the commercial marketing to which they are exposed and the media they consume…. All this is to be expected: values are beliefs about what is important in life, and, like other beliefs, they are learned. (see also Chawla, 1998; Kollmuss & Agyeman, 2002, p.251)

The lessons for environmental communication are valuable. First, in more general terms, environmental communicators need to pay attention to the values that are communicated with all environmental messages for they contribute to the shaping of norms, attitudes and intentions to act pro-environmentally. Columnist George Monbiot

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[112] While the meaning of egoistic and altruistic values seems fairly commonsensical, biospheric values indicate the valuation of biotic systems in themselves, beyond what they mean for human survival (as altruistic values hold) or personal advancement (as egoistic values hold) (see Kollmuss & Agyeman, 2002, p.245). The introduction of the term is largely associated with Deep Ecology (see Koger & Winter, 2010, p.109).

(2011) reiterates the interrelations of values, awareness, attitudes and motivation when he writes that "we accept information which confirms our identity and values, and reject information that conflicts with them. We mould our thinking around our social identity, protecting it from serious challenge. Confronting people with inconvenient facts is likely only to harden their resistance to change". When developing media messages environmental communicators need to consider the various values that underlie the public's environmental attitudes instead of focusing exclusively on the informational premise of the attitudes themselves. With that said, the public may hold different, contrasting and even contradictory values, making the task of value identification and message framing quite challenging. Second, media messages may heighten concerns over environmental issues and increase motivations to act on them if they activate self-transcendent values. This has a particularly interesting upshot. Activating values that may be helpful for achieving short-term goals may undermine efforts to address other, systemic problems. For example, appeals to prestige or status associated with self-enhancing (even if responsible) behaviour like green consumption (Jackson, 2005) may suppress altruistic values that are important for promoting "de-growth" in general. It follows that since value structures are dynamic and culturally contingent it is important to pay attention to the way they may amplify or cancel each other. In this context, the tension between the self interest promoted by the ethos of liberal capitalism and the altruism that may be useful for addressing systemic problems is especially troubling, even if some commentators find it to be indicative of promising new political strategies.[113]

As noted above, the relative failure of the information deficit paradigm to affect significant action on environmental issues can be explained in two ways: the first suggests that the model's infocentric (or logocentric) presuppositions do not match the 'real world' of human cognition, and, therefore, messaging strategies based on the model tended to rely too heavily on decontextualized information delivery that simply failed to trigger effective and consistent pro-environmental behaviour. Environmental communicators are responding to this failure by formulating more holistic, persuasive communication strategies that seek to evoke politically salient experiences. Hoping to

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[113] See for instance Klein, 2011; Kovel & Lowy, 2001; Leiserowitz, Kates & Parris, 2006; Speth, 2008; Urry, 2010.

increase the public's perception of self-efficacy and willingness to act pro-environmentally, such communicative strategies do not reject the importance of information altogether but seek to locate it within a wider set of cognitive characteristics. These include engaging individual and societal values, beliefs and norms; not shying away from evoking emotional resonance; and aiming to couple descriptions of environmental problems with concrete, relevant and feasible solutions. The second critique of the information deficit paradigm targeted its unidirectional, top-down *modus operandi*, and argued that since social contexts, institutional arrangements and structural allowances and barriers are crucial to the public's capacity to act pro-environmentally, they too should be considered by environmental communicators. The implication of this line of critique for environmental communicators, I explain next, is a growing emphasis on facilitating inclusive, responsive, collective and emergent modes of participation in environmental politics – ways to create more consonance between the public's everyday experiences and the issues that underlie environmental politics.

3.3 Communicative Facilitation of Participatory Politics

3.3.1 Bigger-Than-Self Problems; Bigger-Than-Self Solutions

While efforts to engage the public in environmental politics can be seen as part of a larger "deliberative turn" in democratic practice (Dryzek, 2000), they were made explicitly integral to the pursuit of sustainability in Local Agenda 21 – one of the main outcomes of the UN's Conference on Environment and Development in Rio (1992). It states:

> One of the fundamental prerequisites for the achievement of sustainable development is broad public participation in decision-making. Furthermore, in the more specific context of environment and development, the need for new forms of participation has emerged. This includes the need of individuals, groups and organizations to participate in environmental impact assessment procedures and to know about and participate in decisions, particularly those which potentially affect the communities in which they live and work. (UNCED, 1992, paragraph 23.2)

The need to include the public in environmental decision-making, it follows, is a direct response to the scale, scope and reach of environmental issues, "bigger-than-self" problems in Tom Crompton's (2010) terms.[114]

Crompton explains that while the notion of bigger-than-self may apply to a variety of phenomena, including human rights abuses, different forms of prejudice, public health concerns, loss of biodiversity and global climate change, what characterizes such problems is the apparent insufficiency of motivations based on self-interest to provoke effective public response to them. When it comes to bigger-than-self problems, he notes, "the 'return' on an individual's *personal* effort to help address this problem is unlikely to justify his or her expenditure of resources in helping to tackle the problem" (Crompton, 2010, p.8; emphasis in origin). As consequence, and as briefly mentioned above, when self-interest does not provide sufficient motivation, tackling bigger-than-self problems often calls for framing strategies that foreground altruistic values, prompting individuals to behave in pro-environmental ways out of concern for others' welfare. However, many bigger-than-self problems necessitate bigger-than-self solutions which, in turn, call for *collective action*:

> Bolder leadership from both political and business leaders is necessary if proportional responses to these challenges are to emerge, but active public engagement with these problems is of crucial importance. This is partly because of the direct material impacts of an individual's behaviour (for example, his or her environmental footprint), partly because of lack of consumer demand for ambitious changes in business practice, and partly because of the lack of political space and pressure for governments to enact change. (ibid.)

While the private acts of individuals in aggregate may offer remedies for certain environmental issues, bigger-than-self problems often require collective action. This is because some solutions to bigger-than-self problems can only be facilitated by government (as in the case of BC's carbon tax, for instance), and because individual action may be constrained – potentiated or hindered – by social, economic and political structures and their corresponding institutional arrangements (Barry, 2006; Dobson, 2006; 2007; Hulme, 2009; Leiserowitz, 2007; Shove, 2010b). An individual may decide

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[114] See also Rittel & Webber's (1973) notion of "wicked" problems.

to reduce their environmental impact by changing their transportation habits and, for instance, choose to commute by public transit. But unless their home is served by affordable and convenient public transit they stand little chance of actually succeeding in changing their behaviour. The availability of alternative, pro-environmental behaviour options, it follows, relies heavily on public utilities and infrastructure which are subject to decisions made by political institutions. Influencing those institutions may be best addressed by collective action in the public sphere, thus, as Brulle (2010, p.83) argues, even the most sophisticated messaging campaigns ("identity campaigns" he calls them), "are most likely incapable of developing the large-scale mobilization necessary to enact the massive social and economic changes necessary to address global warming". Of course, the result of "identity campaigns" may be different if they targeted political institutions by encouraging collective action instead of focusing on individual lifestyle choices. Such campaigns may posit environmental citizenship and civic action as an essential component of the public's *collective* identity, urging the public to act as a political lever and force political institutions to develop the policies and regulations required to address bigger-than-self problems.

3.3.2 Environmental Citizenship

Insofar as sustainability requires both "a framework of rules and regulations" and "daily vigilance by citizens themselves in regard to their impact on the environment", it calls for active citizenship (Dobson, 2006, p.224). Identifying active engagement with environmental politics as an act of citizenship helps shift our focus from individual to collective modes of action, "scale-making" as Dourish (2010) calls it. Labeled "ecological", "environmental", "sustainable" or "green", such acts of citizenship foreground two important elements: first, that action on environmental issues is inherently political, or as Dobson (2007, p.280-281) states, "citizenship is about activity with public implications". While this linkage has already been made in the preceding sections, articulating environmental action with the notion of citizenship situates the always-already political nature of pro-environmental behaviour within the wider historical context of citizenship, while making explicit the relations between acting in private and in the public sphere. Second, using the notion of citizenship suggests that pro-environmental behaviour should be understood as a moral responsibility to pursue the common good, and not only as a set of acts motivated by self-interest. Environmental

citizenship is therefore entwined with questions of virtue, rights and responsibilities, political identity, power and agency (Barry, 2006, p.24; Clarke & Agyeman, 2011, p.1779; Dobson, 2003).

While warning repeatedly that the meaning of environmental citizenship is neither fixed nor determinate,[115] Andrew Dobson maintains that environmentalism (or political ecology) challenges several features of "the general architecture of citizenship" (Dobson, 2006, p.225). First, it challenges the human-centric view of political *membership* by pointing out that animals and other natural entities may have rights too.[116] Second, and not exclusive to environmental issues, it expands the *domain* of citizenship to include in addition to acts in the public sphere acts in the private sphere since they too impact the (ecological) common good. Third, it challenges the exclusive view of the nation state as the proper *space* of citizenship since environmental issues often cross national borders. In regards to the rights and responsibilities of citizenship – the site of disagreement between liberal and republican conceptions of citizenship[117] – Dobson takes a distinct civic-republican approach and sees environmental citizenship as predominantly a question of responsibility derived from the collective pursuit of a common good – reducing our ecological footprint. While economic incentives may affect certain environmentally relevant behaviour by aligning those behaviours with actors' self-interest, Dobson argues that environmental citizenship "gets at things at a different level. It works at a *deeper* level by asking people to reflect on the attitudes that inform their behaviour. More specifically, it asks people to consider their behaviour in the context of justice and injustice" (Dobson, 2007, p.282; emphasis in origin).

Dobson's association of political participation with virtuous acts of citizenship aimed at the common good illustrates environmental citizenship as a normative principle.

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[115] Dobson (2006, p.227-8) notes that the discourse of citizenship reflects historical changes and the political interests of those engaged in it, thus evidencing the malleability of the concept (see also Dobson & Bell, 2006). Barry (2006, p.22) adds that since environmental citizenship is subject to interpretation, it is often co-opted by corporate interests that focus on environmental effects and not the political-economic underpinnings of environmental issues.

[116] See also Latour's (2004) notion of "the collective of humans and non-humans".

[117] Dobson (2006) writes that focusing on rights reflects a liberal conception of citizenship while emphasizing responsibilities is at the heart of civic-republican approaches.

However, the pursuit of the common good (or the advancement of NIMBY-istic self-interest)[118] is only one possible incentive for public involvement in political decision-making. Andrew Stirling (2006; based on Fiorino, 1989) notes that public participation in environmental politics is often justified on three different grounds: *normatively* as a categorical imperative, 'the right thing to do' (which is fairly similar to Dobson's suggestion); *substantively* as a means to achieve better decisions and more effective policies; and *instrumentally* as a source of political trust and legitimation. Since each justification is premised in different assumptions about the political roles and capacities of citizens, they foreground questions of social power in significantly different ways, and carry different implications for the democratic system as a whole.

Normative justifications reflect the belief that citizens have the right to influence the political processes that affect their lives. Public participation is posited as a virtuous end in and of itself – a way to promote citizen self-improvement, social learning and civic competence, to build democratic skills, to overcome "feelings of powerlessness and alienation" (Fiorino, 1989, p.536), to advance social justice, and to form a countervailing political power that may keep government actions in check. When it comes to bigger-than-self problems such as climate change, normative justifications gain added impetus from the fact that bigger-than-self solutions often imply deep cultural, social and economic transformations. Leaving the public outside of the relevant decision-making processes not only flies in the face of democratic inclusivity but also makes public oversight of collective responses to bigger-than-self problems much more difficult.

Substantive justifications for public participation suggest that including a more diverse set of perspectives, values, skills, knowledges and interests in processes of environmental decision-making will improve the quality of the decisions made. This is largely due to the scope, extent and complexity of both environmental issues and their possible solutions which, as mentioned above, are entwined with an array of social, economic, environmental and cultural domains and therefore cannot be solved by a single actor (Innes & Booher, 2010; Robinson, 2004; Robinson & Tansey, 2006; Talwar, Wiek & Robinson, 2011; van Kerkhoff & Lebel, 2006). Substantive justifications also

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[118] NIMBY: Not In My Back Yard.

draw from the insights provided by the social construction of science program which pointed to the socially contingent nature of what were previously considered domains of specialized knowledge.[119] Social constructivism thus inspires calls to include the public ("lay persons") explicitly in processes of knowledge production – especially those that carry immediate cultural and normative implications. In the context of scientific research, this often appears as calls to shift from what Callon, Lascoumes & Barthe, (2009) call "research in the lab" to less secluded, more dynamic and inclusive forms of "research in the wild". They are also associated with what some call "post normal science" (Funtowicz & Ravetz, 2003) or "mode 2 science" (Nowotny, Scott & Gibbons, 2001), and identify with the emergence of "interactive social science research":[120]

> The term interactive research has been coined to refer to a style of activity where researchers, funding agencies and user groups interact throughout the entire research process, including the definition of the research agenda, project selection, project execution and the application of research insights. Research users include policymakers, planners, business, non-governmental organisations and others who benefit from the product of the research. (Scott et al., 1999, p.4)[121]

Of course questions of who, when and how to engage the public in environmental research and decision-making do not lend themselves to easy, definite answers since they depend on the context and particularities of the decision space and situation (Talwar, Wiek & Robinson, 2011).

Lastly, instrumental motivations value public participation for its raising awareness to the decision process, making it more accessible and transparent, and thus bolstering the policy's legitimacy. In Stirling's (2006, p.96) words, "For beleaguered institutions of environmental governance, an ability credibly to claim a commitment to broad based public engagement is an important way to sustain or restore public

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[119] There is no shortage of works that explore the origins, tenets and genres of social constructivism, but see Hacking (1999) for a more polemical view.

[120] See also *Science and Public Policy* 27(3) special issue on interactive social science research.

[121] The entanglement of science and policy motivates Funtowicz & Ravetz (2003, p.7) to make a similar suggestion to expand scientific research to include non-scientists as part of what they call "extended peer community".

credibility and trust". The underlying rationale for instrumental justifications, it follows, is the need to build trust between citizens and elected officials and thus promote the ability of policy-makers to make significant changes while increasing the public's acceptance and support of those changes. As mentioned above, this is especially important when it comes to bigger-than-self problems where the public's nudging of politicians to take the necessary steps is proving to be as difficult as it is crucial.

Instrumental justifications have become increasingly important to government as it tries to adopt more dynamic or fluid modes of decision-making. What some term "gov.2.0" (O'Reilly, 2009) or "reflexive governance" (Voss & Kemp, 2006) references the way governments are dealing with the growing complexity of social and economic planning by involving the public in an ongoing dialogue on the aims and means of policy-making. But even here we can differentiate between public engagement that merely seeks "implementation effectiveness" (Newig, 2007), that is, is designed to promote policy 'buy-in' first by informing the public about the policy and then by preempting the most vociferous forms of resistance to it, and public engagement that seeks genuine public partnership in, and even ownership of, the process of political decision-making itself.[122] While both modalities operationalize a view of democratic legitimation as a product of justification (on the part of government) and acceptance (on the part of citizens), "implementation effectiveness" seems to embody a "one-dimensional conception of democracy", to use Bachrach's term (cited in Fiorino, 1989, p.547), where the focus on the end result takes precedence over the dynamics and benefits of the participatory process itself.[123] In this mode, public participation falls short of forming a genuinely countervailing political power.

3.3.3 Green Political Culture

Noting the range of possibilities within each justification for public participation illustrates the way different justifications may coalesce, contrast, and even contradict

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[122] This difference is captured in Arnstein's (1969) influential "ladder of participation" model.

[123] In a sense, the emergence of new ways to conceptualize public participation in sustainability politics, such as the procedural approach to sustainability (which will be discussed in chapter 6), try to invert the preference of outcome over process.

each other. As mentioned above, when instrumental justifications come closer to promote "implementation effectiveness" than to facilitate true stakeholder partnership, they undermine the pursuit of countervailing political power that motivates normative justifications. Similarly, instrumental objectives may contrast with substantive justifications. The public may be extended what appears to be a genuine invitation to contribute to decision-making but the results of the engagement may never find their way into actual policy. In such cases we can argue that the real rationale for the invitation is to create trust between participants and the convening party – trust that may be reinvested in other decision spaces or political issues. Importantly, presenting the question of political participation as equally composed of (institutionally enabled or constrained) possibilities to act and participants' perceptions of their ability to act – their political self-efficacy – helps us expand the scope of our discussion from the domain of citizenship to that of culture, more precisely, political culture.

Political culture references the framework within which citizens negotiate political participation and the values and attitudes that orient it.[124] Howard's (2006, p.71) definition touches on its most important aspects:

> Political culture is a set of cognitive and material schemata for organizing the movement of socially significant objects through scripted political process in political events and for organizing the way we remember those objects, events, and processes. *Political culture consists of cognitive representations, concrete social relations, and the information communication technologies that mediate these representations and relations*. These schema [sic], whether ideological or material, constrain some forms of political action and provide capacity for other forms of political action. (emphasis added)

Thus explained, political culture features a set of attitudes and values that orient political behaviour, corresponding cognitive and affective predispositions, and the wealth of skills and knowledges that help individuals chart and consolidate paths of action across the political field. Political culture also includes structural allowances for particular political activities, allowances produced by the social, economic and political mechanisms and institutions that structure any given society. In this sense political culture is comprised of

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[124] See Welch (1993) for a more detailed discussion of political culture.

the various interrelations, interstices and interfaces between (subjective) individual experience of the political domain and the (objective) political structures that constitute that domain – between political *consciousness* and political *procedures* (Hirschkop, 1999). In a green political culture, or a political culture that encourages the consideration and development of sustainable futures, the public's pro-environmental values and attitudes are matched with democratic institutions and procedures that respond and promote those very same values and attitudes. Another way to put it is to argue that in a green political culture environmental citizenship is both valued and promoted.

Whether we talk about political participation, environmental citizenship or a green political culture, the emphasis remains on collective environmentally significant action. While it is possible to consider aggregated acts of individuals attempting to reduce their ecological footprint as a form of political action – indeed, Dobson's notion of environmental citizenship pivots on the view that since such individual acts are aimed at achieving the common good they should be considered forms of environmental citizenship – the present work is more interested in *collective action aimed at the political structures, institutions and arrangements within which decision-making on sustainable futures takes place*. In this context, the translation of the willingness and intention to participate in politics into meaningful collective action can be seen as a process of *scale-making*.

3.3.4 Public Participation and Environmental Communication

Questions of citizen involvement in environmental science and policy have long been the focus of attention by environmental communicators – at least since the US passed the National Environmental Policy Act (NEPA) in 1969 (Depoe & Delicath, 2004, p.1).[125] This is reflected in an extensive literature on the structural elements of formal or institutional participatory processes such as public hearings and consultations, community-based collaborations, community advisory boards, citizen review panels and

[125] In the European context pubic participation in environmental politics was mandated institutionally following the adoption of the Aarhus convention in 2001.

juries, and more recently, online discursive spaces.[126] Such accounts, Depoe & Delicath (2004) note, tend to either focus on the communicative *mechanisms* of public participation,[127] or on the communicative sharing of the *presuppositions, assumptions* and *values* that underlie those processes. Both types of accounts, they argue, share the following three principles:

> (1) people should have a say in decisions that will affect their lives; (2) early and ongoing, informed and empowered public participation is the hallmark of sound public policy; and (3) the public must be involved in determining how they will participate in choosing what forums and mechanisms will be used in identifying what resources are needed to ensure informed participation, and in determining how public input will affect decision-making outcomes. (ibid., p.3)

These principles are made more or less explicit depending on the orientation of the particular account: while some focus on critiques of existing structures, processes and mechanisms for public participation, others offer new frameworks within which participatory processes may become more meaningful and effective. Most accounts, however, feature a mix of critical and constructive elements. Senecah's (2004) "trinity of voice" model, for instance, uses a critique of the lack of participant empowerment in existing processes of public engagement to launch a three pronged model that emphasizes 'access' to opportunities to participate, safeguarding the right to be heard ('standing'), and promoting real 'influence' by providing opportunities for affecting outcomes. With an emphasis on the hermeneutic instead of the procedural premise for public participation, Walker (2007) suggests that what he calls "participatory communication" may promote a pluralistic imperative for collaborative meaning-making (or "sense-making discourse" in Hamilton & Wills-Toker's (2006) terms). In his words,

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[126] See for instance Brulle, 2010; Burgess, Harrison & Filius, 1998; Cox, 2010, ch.3; Depoe, Delicath & Elsenbeer (eds.), 2004; Dryzek, 2005; Hamilton & Wills-Toker, 2006; Innes & Booher, 2010; Lassen et al., 2011; Lorenzoni, Nicholson-Cole & Whitmarsh, 2007; Newig, 2007; Senecah, 2004; Schlosberg, Shulman & Zavestoski, 2006; Stirling, 2006; Todhunter, 2011; van Kerkhoff & Lebel, 2006; Walker, 2007; Zavestoski, Shulman & Schlosberg, 2006.

[127] These may include a more legalistic perspective that focuses on the communicative facilitation and protection of the public's right to know about processes of public consultation and receive appropriate information about them, the right to comment on process and proposed outcomes, and the right of standing, that is, to use the courts in the case that the other rights are not respected (Cox, 2010, ch.3).

"Pluralistic public participation processes encourage negotiation of shared meanings and interpretations in order to generate shared understanding" (Walker, 2007, p.102). This shared understanding is what allows a diverse group of participants to engage different forms of knowledge and recommend certain paths for policy-making.

As the above accounts indicate, the outcomes of participatory processes largely depend on the convening party's willingness and ability to share ownership over the decision space and respond appropriately to participant expectations about the real extent of their contribution – corresponding to the third principle noted by Depoe & Delicath above.[128] This can further be seen as comprised of two separate issues: the first is the extent to which these processes are responsive and flexible enough to allow a diverse set of perspectives, knowledges and skills to bear on the issues at hand. This is often addressed within larger discussions of fairness and representation, and may be premised in critiques of the disproportional weight expertise carries in public engagement processes (see for instance Kinsella 2004). As result, "new modes of reasoning", including everyday experience, stories and role playing, are increasingly integrated into mainstream public engagement processes (Innes & Booher, 2010; Todhunter, 2011). The addition of these less formal and less instrumental modes of reckoning, part of environmental communication's turn to experience, paint public participation processes as "a kind of intellectual bricolage" (Innes & Booher, 2010, p.6).

The second issue has to do with the degree to which the process itself prefigures its outcomes by structurally prompting participants to arrive at a set of 'adequate', 'desirable' or 'acceptable' conclusions. Referring back to Stirling's (2006) three justifications for public participation (see section 3.3.2), the need to keep public participation processes flexible and open-ended reflects a normative desire to make participation meaningful and empowering, an instrumental incentive to give participants a real sense of ownership over the process and develop trust between them and the process's conveners, and a substantive need to accept and address the way complex issues often carry unanticipated results. Seen through this lens, public participation processes may benefit from adopting communicative modalities that allow, and even

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[128] On the importance of public expectations for participation see Höppner & Whitmarsh, 2011.

encourage, *emergence*.[129] The latter, in this sense, stands for the interplay of change and stability, and the potential of new phenomena to immanently arise and affect the process of engagement itself – the ability of stakeholders to affect the engagement process's very conditions of possibility. Insofar as emergence represents an emphasis on *process* and not just on *outcome*, it illustrates the potentials of public participation processes to becomes sites of social learning, in which participant views interact with lay and expert knowledge, can influence the view of other participants, and can change over the process of engagement. In other words, emergent public participation processes maintain a pronounced openness to potentially transformative interactions that may empower participants, expand the space for new meanings to emerge, and continuously push against the boundaries of the engagement process and its goals. These, I argue, capture some of the deeper political implications of participatory environmental politics.

3.4 Political Enrolment

3.4.1 Enrolment

To describe a process of public engagement as one that is oriented toward emergence retrieves a familiar tension: are citizens engaged on the terms set by political power (represented by government, but also by NGOs with their own agendas), or are they given the opportunity to renegotiate the very conditions upon which they engage with political questions. In both cases, communicative means are directed toward activating the public politically – adding actors to environmental politics by raising their awareness of the underlying issues and providing them with tangible, direct and indirect ways to participate in decision-making on sustainability. However they do so in very different ways, that lend themselves to very different outcomes. Borrowing the terminology of Actor Network Theory (ANT), I call the process of adding political actors *political enrolment*. I do so in order to draw attention to the role technology plays in the

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[129] The term 'emergence' originates in complex systems theory, where it represents the potential for unanticipated, complexyfying "higher-level" effects (Espinosa & Walker, 2011). Johnson (2001, p.18), for instance, defines emergence as "The movement from low-level rules to higher-level sophistication", and De Landa (2011, p.385) writes that "a property of a whole is said to be emergent if it is produced by causal interactions among its component parts. Those interactions, in which the parts exercise their capacities to affect and be affected, constitute the mechanism of emergence behind the properties of the whole".

process of political activation and to emphasize the contingent nature of the process, but especially to call attention to the way that adding actors to political process (represented here by the network) may affect the conditions of possibility of those very processes.

In ANT, enrolment references the process of extending actor-networks to include new actors. The social (or sociotechnical) world, ANT holds, can be treated as a system of interconnected, overlapping or nested networks, each one made of chains (or "associations") of human and non-human actors ("actants") whose interaction conducts (or "translates") information, forming a "circulating reference".[130] The emergence of a network is the result of the temporary stabilization of the circulating reference: the uninterrupted translation of information from one actor to another. A network, it follows, is not so much a constant state or a durable structure but a dynamic, recurrent process by which the aggregated actions of individual, micro-actors temporarily congeal into larger associations, or macro-actors. As Latour (2005, p.132) puts it,

> a network is not made of nylon thread, words or any durable substance but is the trace left behind by some moving agent. You can hang your fish nets to dry, but you can't hang an actor-network: it has to be traced anew by the passage of another vehicle, another circulating entity.

Networks are formed on a variety of scales, reflecting the multiple, simultaneous connections that may link any one node (actor) with several others. The scale of the network we trace – its depth and width – relies on the identity of the actors we choose to follow, and reflects our decision to bound or "punctualize" the network analytically (and thus simplify some of its underlying components, relations and dynamics).[131] In other words, the features and extent of the network we trace reflect the level at which we pitch our own analysis. Take for example the network that emerges as I flick the on/off switch of my desk lamp. We can trace one network by focusing on larger, macro-actors such as the power utility that produces the current, the raw material used to produce energy (coal, running water, natural gas, etc.), the physical laws that allow the transformation of one form of energy into another, the transmission system that delivers electricity to

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[130] For a comprehensive account of Actor Network Theory see Latour, 1999; 2005.

[131] See Law, 1992.

distribution substations and then to consumers, the people who oversee and maintain the system, the household or office electric circuitry, the lamp with its cord, lightbulb and switch, and the actor who flicks it on or off. We can also look inside each of these actors and discover that they actually represent smaller-scale networks that include additional actors. Take for example the power utility, which in my case may be one of several hydroelectric facilities located on the Peace and Columbia river basins in British Columbia. Aside from their human operators, every such facility includes the water that powers its turbines, the dam that traps water and regulates its flow through the utility (unless it is a run-of-the-river facility which instead of damming the river diverts only part of its flow into the turbines), the penstock that leads the water into the turbine's generator unit, the busbar that leads the current from the turbine to a transformer that increases the voltage in preparation of the current's transmission, and then the transmission system that sends the electric current from the facility to a substation near my office in downtown Vancouver. The process of tracing the network can be repeated with increasing resolution and thus reach smaller and smaller actors. The turbine's generator unit, for instance, includes a runner, a rotor, a set of tubes and rings, a shaft, and so on. Depending on its particular type, the runner may include a hub, a blade and a ring, and so forth.

Although the decision which network to trace (i.e., which actors to follow) is analytical, reflecting particular research foci or agendas, the relations between multi-scaled actor/networks is both *functional* and *semiotic*. Functionally, since the network is not a *perpetuum mobile*, its continuous functioning depends on the cooperation of each of its actors. For electricity to arrive at my office and power my desk lamp (which is itself comprised of more micro-actors!), each of the actors listed above *must act in accordance with the network's overall goal* (or "program"); they have to maintain the informational momentum (in this case the flow of electricity) so that the network will act as expected. If only one actor fails to conduct or translate the information, say, a shaft within the turbine's generator unit shatters or a transmission line breaks, the entire network fails and upon flicking the desk lamp's switch nothing will happen. However, as long as the network performs according to its program, we tend to treat its myriad nested

actors and networks as a single entity, or "black box".[132] Semiotically, ANT describes the relations between actors as a process of "translation", where a certain vector or nucleus of meaning must be maintained for the network's program to materialize and become durable.[133] Latour (1999, p.179) describes "translation" as "displacement, drift, invention, mediation, the creation of a link that did not exist before and that to some degree *modifies the original two*" (emphasis added). Translation indicates both the mechanism by which the circulating reference moves along the network's nodes (it is translated from actor to actor), and the principle by which uncertainty, understood as the ability to change, shift or transform the circulating reference, is injected into the network. Within this scheme actors may function as transparent *intermediaries* that transport "meaning or force without transformation", or they may act as *mediators* that "transform, translate, distort, and modify the meaning or the elements they are supposed to carry" (Latour, 2005, p.39).[134] In the latter mode they may even become disruptive, causing "a bifurcation, an event, or the origin of a new translation" (p.128), in the process transforming or re-programming the network. However, regardless of whether actors perform as intermediaries or as mediators, the potential for mutual-transformation carried by acts of translation frames the relations between actors as both contingent, and involving force. Callon & Latour (1981, p.279) make this point when they describe translation as including "all the negotiations, intrigues, calculations, acts of persuasion and violence, thanks to which an actor or force takes, or causes to be conferred on itself,

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[132] In *Science in Action* (1987), Latour explains the origins of the term in cybernetics: "The word black box is used by cyberneticians whenever a piece of machinery or a set of commands is too complex. In its place they draw a little box about which they need to know nothing but its input and output" (pp.2-3). In ANT, the term has come to express not only the methodical closing off of processes, but the sign of cohesion and the smooth conduction of power – "When many elements are made to act as one" (ibid., p.131).

[133] Interestingly, the glue that binds what Deleuze & Guattari call "assemblages" is less semiotic and more affective, posing intensity and not meaning as the essence of the circulating reference: "We think the material or machinic aspect of an assemblage relates not to the production of goods but rather to a precise state of intermingling of bodies in a society, including *all the attractions and repulsions, sympathies and antipathies, alterations, amalgamations, penetrations, and expansions that affect bodies of all kinds in their relations to one another*" (Deleuze & Guattari, 1987, p.90; emphasis added; see also Bennett, 2010, pp.23-24). Chronologically Deleuze & Guattari's more nebulous assemblages precede (and perhaps influence) Latour's Actor-Networks.

[134] See Verbeek (2005, ch.5) for a more detailed discussion of the four types of mediation in Latour's work.

authority to speak or act on behalf of another actor or force". In other words, translation indicates both the autonomy of actors and, by extension, the network's contingency as a whole, and, inversely, the network's capacity to enforce its program and thus consolidate its power.[135]

As part of the consolidation of their power, networks struggle to extend themselves in *time* by maintaining the functioning relations between the different actors of which they are comprised, thus keeping the movement of the circulating reference, and in *space* by adding new members to the network. Both are aspects of what ANT calls "enrolment":

> The theory of enrolment is concerned with the ways in which provisional order is proposed, and sometimes achieved…. Actors great and small try to persuade by telling one another that 'it is in your interests to...'. They seek to define their own position in relation to others by noting that 'it is in our interests to...'. What are they doing when they so attempt to map and transform interests? Our view is that they are trying to impose order on a part of the social world. They are trying to build a version of social structure. (Callon & Law, 1982, p.622)

As a mechanism for establishing enduring relations and thus imposing order in the network, enrolment is always motivated and deliberate: actors may wish to join a network, or the network may wish to add actors. It can also be seen as an index of the network's power on two interrelated accounts. First, and equivalent to the network's extension in time, enrolment is a means for a network to sustain itself by keeping actors in check, that is, making sure the circulating reference continues its movement along existing actors. Second, and in the context of the network's extension in space, we can understand enrolment as an ideological process by which actors are persuaded (or forced) to comply with, or adopt a particular set of values and worldviews in order to join the network. While ANT tries to avoid discussing networks as ideological structures, in fact, Latour goes to much pain to distance ANT's understanding of power from the

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[135] However, before we rush to impute agency to an amorphous network we should remember that networks are aligned by what Law (1987) calls the "heterogeneous engineer", and Latour (1992) calls the "enunciator" – "The one who is able to stabilize a particular state of power relations by associating the largest number or irreversibly linked elements" (Callon & Latour, 1981, p.293).

critique of ideology offered by Marxism or Critical Theory,[136] his collaborators Callon & Law note that "the formal strategies of enrolment" include "the allocation of initial value to the world and the subsequent attempts to transform that value" (1982, p.619). This may strike the reader as precisely the makings of ideological conflict.

When applied to the relations of nonhuman actors enrolment may be as simple as implementing a common protocol, interface (or API) that would establish communication between different actors and allow the circulating reference to pass uninterrupted. When applied to the relations between human and nonhuman actors, enrolment may take the form of "delegation", when humans force nonhumans to act in a certain way, or "prescription", whereby humans are forced to act in a certain way based on the coded restrictions of nonhuman actors. In Latour's (1992) famous example, humans *delegate* the task of closing a door slowly to an automatic door closer, while the door closer *prescribes* a particular walking speed for humans to be able to pass through the doorway without interruption (walk faster and you may crash into the door; walk any slower and you will need to hold the door open yourself).[137] Of course neither delegation nor prescription are guaranteed to work: door closers malfunction, and people may choose to disregard recommended walking speeds or keep the door open themselves. In these cases we may say that enrolment has failed: the actor did not translate the circulating reference in a way that maintains the network's program.

When enrolment fails networks may remain intact and seek to enroll other actors as intermediaries, or they may disintegrate altogether. A third possibility is that the network is sustained but in a new, re-programmed manner.[138] This happens when actors inject disturbances into the process of reference circulation – instead of entering the

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[136] See especially Latour, 1986. There are several reasons for this, but chief among them is Latour's insistence that ideological power is not an *explanans* but an *explanandum*: "it's important to maintain that power, like society, is the final result of a process and not a reservoir, a stock, or a capital that will automatically provide an explanation. Power and domination have to be produced, made up, composed" (Latour, 2005, p.64).

[137] For ANT, the co-existence of delegation and prescription is evidence of the ontological symmetry between humans and nonhumans. This view is expressed most forcefully in Latour, 1993.

[138] See also Feenberg (1999, p.119) on "anti-program".

network based on the latter's conditions they seek to change the conditions themselves by translating the circulating reference in disruptive, refracting, meaning-changing ways. In social or political terms, this is akin to a radical transformation of the political system, whereby the actions of political subjects change the meaning and, by extension, the functions that underlie political culture. As a means to re-program the network, enrolment may catalyze what French political philosopher Jacques Rancière (1999) sees as the true essence of politics.

3.4.2 Political Subjectification

For Rancière, liberal democracy is maintained by the continuous disenfranchisement of those that are not only barred from making meaningful interventions in political processes, but whose voice or capacity for political expression is discounted as such. In Rancière's terms, the disenfranchised or the "*sans-part*", are regarded by those in power as lacking *logos*, or more accurately, as having a semblance (*aesthesis*) of logos without possessing it (*hexis*). Their speech is considered irrational noise and therefore remains unacknowledged: they may speak, but are never heard. The actions we may associate with politics, "the aggregation and consent of collectivities … the organization of powers, the distribution of places and roles, and the systems for legitimizing this distribution", Rancière (1999, p.28) holds, are just means to keep the masses disempowered by maintaining exclusive control over the terms of political discourse and, as result, pushing the *sans-part* off the political stage. In this mode, politics-as-usual ("the police" in Rancière's terms) is concerned with "the allocation of ways of doing, ways of being, and ways of saying", assigning bodies "by name to a particular place and task", and ordering "the visible and the sayable" in ways that ensure that "a particular activity is visible and another is not, that this speech is understood as discourse and another as noise" (p.29).

Rancière contrasts politics-as-police with what he sees as true emancipatory politics, which he argues foreground disagreement [*la mésentente*] or dissensus by interrupting the status-quo. It exists when "those who have no right to be counted as speaking beings make themselves of some account, setting up a community by the fact of placing in common a wrong", or, in other words, by insisting on alternative ways of "being-together" (p.27). It is in this way that the *sans-part* are able to disrupt the harmonious façade of politics-as-police, appearing on the political stage while

challenging its very premise and boundaries. This kind of political agency, Rancière argues, is enabled by political subjectivity, or what he calls "subjectification":[139]

> By *subjectification* I mean production through a series of actions of a body and a capacity for enunciation not previously identifiable within a given field of experience, whose identification is thus part of the reconfiguration of the field of experience (p.35; emphasis in origin).[140]

Elsewhere, Rancière (1995) adds that at the root of political subjectification is the rejection of mechanisms of forced, or fixed identification, for the latter efface the very differences that he sees as the conditions for emancipatory politics. While identification fosters a conformist unity or a "oneness" – the formation of an autonomous, substantive Self – subjectification foregrounds relationality and difference. "[T]he politics of emancipation is the politics of the self as an other, or, in Greek terms, a *heteron*. The logic of emancipation is a heterology" (p.65). A politics based on equality without fixed identification or classification can be characterized by continuous change, dynamical group formation, a constant movement away from ossifying, hegemonizing categories and a search for that in-betweenness that challenges fixity.[141] Political transformation, thus articulated, relies on the emergence of new ways of being – new perceptions, new experiences and new sensibilities – a new "structure of feeling" in Raymond Williams's terms.

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[139] Hewlett (2007, p.84) suggests that Rancière's use of the term can be seen as part of his emphasis on "the role of the subject in human history", a result of his breaking with Althusser's more structure-centric political philosophy (and vocabulary).

[140] In an interview to *Diacritics* Rancière defines political subjectivity in a similar way: "Political subjectivity thus refers to an enunciative and demonstrative capacity to reconfigure the relation between the visible and the sayable, the relation between words and bodies: namely, what I refer to as 'the partition of the sensible'" (Panagia & Rancière, 2000, p.115).

[141] Hewlett (2007) notes that "in Rancière's work, the political is ephemeral and fleeting. It emerges only at points of tension and polemic between two or more areas, at boundaries and divisions and points of flux, and never in areas or times of stability and calm" (p.104). This, he interprets as a shortcoming for it leaves outside the analytical purview questions about maintaining emancipatory politics. As Hewlett puts it, Rancière is missing a positive definition of the *sans-part*, one that may account for democratic politics once the marginalized emerge from the margins and take hold of the political field (p.111). Rancière's is a political theory of transformation not of stasis.

3.4.3 The Turn to Experience

This chapter suggested that the larger context for the design of interactive experiences for public engagement with sustainability is an incipient turn to experience in environmental communication. This shift in perspective has come as result of the insufficiency of the information deficit communication paradigm to contribute to meaningful pro-environmental behaviour on a large scale, and the consequent need to pursue new frameworks for communicating the complexity and urgency of environmental issues. It was suggested that in response to the discrediting of the information deficit model, environmental communication is moving in two, sometimes contrasting and sometimes complementary directions: (1) the pursuit of more effective, holistic or persuasive messaging, aimed at individual behaviour change; and (2) the communicative facilitation of emergent participatory processes that promote a green political culture.

New designs for more *persuasive messaging* were explained as an outcome of environmental communication's rejection of the information deficit model's 'one size fits all' infocentrism. Drawing from cognitive science and social psychology, environmental communicators working within this approach are adopting a more holistic approach to communication, one that understands the premise of intentions to act pro-environmentally in a combination of cognitive, affective and behavioural elements. In Berger & Luckmann's (1989) terms, the way we construct our world is equally dependent on "plausibility structures" as it is on "affective identification": conceptual knowledge remains meaningless without the emotional tonality that orients its use. Mike Hulme (2009, pp.215-6) puts it this way:

> it is not sufficient to argue that more or clearer information about climate change from scientists will lead to greater public engagement with the issue. Neither can it be argued that more scientific *certainty* about future climate change, or better representations of scientific *uncertainty*, will necessarily lead to greater public agreement about what to do in response. There are barriers other than lack of scientific knowledge to changing the status of climate change in the minds of citizens – psychological, emotional and behavioural barriers. (emphasis in origin)

In pursuit of persuasive messaging that would overcome the unobtrusiveness and complexity of environmental issues and compel the public to take action on them (and thus close the "behavioural gap"), environmental communicators seek to provoke

meaningful experiences. This involves not only promoting awareness of environmental issues, but also attributing to those issues significance and salience by communicating with concrete, personally relevant and emotionally resonant messages – messages that appeal to particular individual and societal values and that may boost the public's perceptions of its political self-efficacy.

The impetus to communicatively facilitate more *participatory, inclusive environmental politics* (part of a new green political culture with its concomitant modes of environmental citizenship), I argued, emerges in response to the unidirectional, top-down orientation of the information deficit model, and in relation to the scope and extent of possible solutions to environmental issues. As made evident by the disappointing results of recent negotiations over a new binding framework for curbing global GHG emissions, leaving the pursuit of large scale solutions to climate change (and the pursuit of more sustainable futures) exclusively in the hands of government seems more and more like a chimera. On the other hand, government involvement cannot be replaced by simply adopting more green lifestyle choices. Political problems require political action.

Involving the public meaningfully in environmental politics, it was explained, can be justified in normative, substantive and instrumental terms, and can be seen as part of efforts to expand the domain and spaces of environmental citizenship. Insofar as environmental issues are inextricably cultural, economic and political, inclusive public participation in environmental decision-making may promote social transformations that reflect and advance the common good, forcing government (and business) to pursue the deep structural changes required to overcome environmental problems. In this mode, environmental communicators increasingly address the political structures within which pro-environmental behaviour takes place – the structures, institutions and mechanisms that hinder or potentiate both private-sphere and public-sphere environmentalism. Since the transformation of these structures involves changing their perception by the public – matching "objective facticity" and "subjective meaning" in Berger & Luckmann's (1989) phenomenological terminology – I argue that the fundamental challenge faced by environmental communication is finding ways to help the public shape a political culture that is best suited to promote sustainable futures. In this sense, communicatively facilitating public participation in the politics of sustainability may lead to the public's reimagining of the *political itself*.

Both directions foreground the importance of experience to overcoming the behavioural gap. First by creating resonances between rational (or calculative) and emotional (or affective) perceptions of environmental issues, and second by creating consonances between the public's "structure of feeling" and the concerns that feed into environmental citizenship. Together they outline potentials for the emergence of a new, green political culture. They also influence the design of interactive experiences aimed at enrolling the public into the politics of sustainability, acting as what Feenberg (1999) calls "technical codes". How they do so is the subject of the next two chapters.

4.
The Design of Politicizing Experiences

> When something seems 'the most obvious thing in the world' it means that any attempt to understand the world has been given up.
>
> –Bertolt Brecht[142]

[142] 1987, p.217.

4.1 “Your City, Your Say”

Over two weeks in spring 2011, Vancouverites were invited to express their opinions about the direction the city’s urban design was taking. “Celebrate Vancouver’s 125th anniversary by taking part in a citizen powered conversation about the city’s architecture and built future”, was the invitation adorning the three, bright-red interactive, Voice It kiosks located at the Atrium of the Woodwards complex on West Hastings Street, at the Yaletown Roundhouse Community Centre, and on the 700 block of Granville Street (see figure 4.1). Also inscribed on the kiosks was the reason for reaching out to the public: “The decisions we make today will have a huge impact on the way our city works, looks and feels in the decades to come”.

Figure 4.1: Voice It kiosk on Granville Street. (image courtesy of Tangible Interaction).

Leveraging their eye-catching colours, unusual shape and surprising location to grab passing pedestrians' attention, the kiosks invited the public to interact with them: "This is your chance to have a direct say by answering the provocative question posed on this kiosk". Each kiosk featured a different question, addressing one of the city's high-profile urban design issues and inviting people to vote by pressing one of two clearly marked buttons located immediately below the kiosk's slender screen. The kiosk on Granville Street asked participants to choose between inner-city densification and expansion of the highway system that links the City with other Lower Mainland communities. The question reads, "Should we create more density in the city and expand laneway housing or create projects like the Gateway to make it easier to get to the suburbs?", and the two potential answers were "laneway" and "gateway". The kiosk at the Woodwards atrium offered a choice between high-rise and low-rise architectural styles, asking: "Vancouver is a young city whose look has shifted with the trends. What should be our signature architectural style?" The two alternatives were "super-tower" and "low-rise". And the kiosk at the Roundhouse Community Centre asked participants to choose between green and social public spaces: "What is more important, spaces like the seawall or places where we can see wall to wall people?" Possible choices were "seawall" and "wall to wall".

Votes cast through the kiosks were collected using the Arduino open-source, microcontroller platform, sent over the cellular (GSM) network, collated with votes that were sent by text messages (SMS) and by clicking on a set of buttons located on the project's (now defunct) website. They were then aggregated and displayed over a set of live data visualizations projected on large screens at the Museum of Vancouver's (MOV) main gallery space (see figure 4.2). The museum's gallery also featured a 'light table' that allowed visitors to pose open-ended questions and interact with them by using natural hand gesture (figure 4.3). According to the MOV, the kiosks attracted more than 2000 votes.[143]

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[143] Personal communication with Hanna Cho, the MOV's current curator for engagement and dialogue.

Figure 4.2: Live data visualization of votes collected by Voice It kiosks at the Museum of Vancouver.

Figure 4.3: Voice It light table allows natural gesture interaction. (image courtesy of Tangible Interaction).

The three Voice It kiosks were part of an installation titled "Mashnotes". It was commissioned by the Museum of Vancouver (MOV), funded by a grant from the Canada Council for the Arts, and designed and built by Vancouver-based design outfit, Tangible Interaction.[144] Mashnotes, named after the childhood game of Mansion, Apartment, Shack and House, was the third and last installment in the Museum's This Is Not An Architectural Speaker's Series, reflecting the Museum's new vision, as stated in the press release that accompanied the installation:

> PROVOKE, ENGAGE, ANIMATE. Our new Vision at MOV is to hold a mirror up to the city and lead provocative conversations about its past, present and future. Linking the historical record and the living experiences of its visitors to what is happening socially, politically, and culturally NOW; we honour the material culture of the city: mixing history, archaeology, visual arts, design, architecture, urban planning, music, performance, new media, design, fashion, popular culture and photography.[145]

As explained in the same press release, the installation was designed to spark a "fun and engaging conversation in the city" on questions of urban design, in "an attempt to broaden conversations about architecture and design outside of the normal architect, planner and academic circles". The installation was well timed. Not only was Vancouver celebrating its 125th anniversary, but the City was in the process of revisiting its growth strategy and revising several of its long-term development plans.[146] These coincided with the City's ambitious plan to become "the world's greenest city by 2020", as outlined in the City's vision statement, *Vancouver 2020: A Bright Green Future* (Vancouver 2010), and fleshed out with more detail in the *Greenest City Action Plan* (Vancouver 2012).

Mashnotes was clearly designed to make a political impact, but in what way? While the MOV does receive part of its budget from the City, the latter was not involved

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[144] "Tangible Interaction creates sensory installations where people participation is key. Our work taps into some of the most basic human instincts, to play and explore. It also generates talk value through a shared experience". More on Tangible Interaction on their website: www.tangibleinteraction.com (last accessed May 8, 2013).

[145] http://ebookbrowse.com/for-immediate-release-mov-mash-notes-pdf-d303001534 (last accessed Feb.5, 2013).

[146] Of which the City's 30-year transportation plan ("Transportation 2040"), which is the context for the next chapter, was of especial importance.

in designing the installation or wording the polling questions, nor did it make any formal commitment to consider the public's input via the installation. In this sense, inviting the public to voice their opinion and "have a direct say", while taken at face value by at least several people who took to making their selection repeatedly under the impression that votes would indeed affect the City's policy, seems rather disingenuous.[147] The only addressee of the public's voice was the public itself (if they bothered to go to the Museum or check the results online). But if the installation was not to provide a direct channel from the public to policymakers, how then can we understand its political significance? When asked this question in a private interview, the installation's designer, Alex Beim, explained that "People don't talk enough in the city. They hide their opinions". In response, the installation was to take the "museum experience" to the streets, create an appealing attraction and give people "something to talk about". The installation's aim, then, was to create a *politically significant experience*: provide the public with an opportunity to start thinking about urban design in the particular contexts of Vancouver, that is, to kick-start a civic conversation that may catalyze local change. And indeed, reveals Beim in an interview with vancouverisawesome.com,

> On the city streets in particular, we noticed people didn't just walk up to the Mash Notes Voice it Kiosks, read the question and simply press an answer button. They'd actually start debating the topic with their friends or family right there. We've no way of knowing if those conversations continued or if they led to any action but it's a pretty good indication that the installations sparked something.[148]

What the installation "sparked" can be understood as the beginning of a process of politicization – making visible the contours of the City's sustainability politics and giving the public a sense of their own ability to participate and affect it. The three issues that underlie the polling questions – urban density, green public space, and transit priorities – were unmistakably related to the City's efforts to maintain public support for its sustainability policies, touching directly upon the same issues that were raised in past

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[147] When this story was conveyed in the Mashnotes opening night, the general sentiment in the room was that this was a token of the alienation and rejection felt by residents of the City's Downtown Lower East Side. But it also indicates the simplicity and limitation of the voting mechanism, which allowed multiple voting without a built-in vote pause to deter such practices.

[148] http://vancouverisawesome.com/2011/04/08/tangible-iteraction-and-mash-notes-at-mov/ (last accessed Feb.5, 2013).

debates on the City's contentious EcoDensity policy.[149] The kiosks' polemical prompting, it follows, retrieved the political dimensions of sustainability while concretizing them in particular choices over urban design and policy. They sought to enroll the public into sustainability politics by simultaneously illustrating a political space and outlining ways to act upon it. In the terms introduced in chapter 2, they were designed to produce politically significant interactive world disclosure.

Mashnotes kiosks' production of interactive world disclosure begins with an invitation to interact in three distinct modalities. First, as a clear expression of the impetus to "reach the public where they are", the installation extended an *explicit* invitation for political participation in everyday public spaces. In the same interview with Vancouverisawesome.com, Beim explains:

> Although there's more public debate and discussion taking place online these days, if people want their voice to be heard, they more often than not still have to visit a venue at a time set by an institution. Mash Notes is an example of how an important discussion can be taken to the public and they can get involved when it suits them. I'd guess probably 90% of the Vancouver citizens who took part in Mash Notes and engaged with our Voice it system wouldn't have done so if we hadn't installed an interactive component on the city streets.

Taking the conversation to the public was bolstered by the way the kiosks were designed to trigger the public's curiosity – by attracting, provoking, enticing them to interact, promising, in Beim's words, "moments of excitement or pleasure".[150]

Second, the kiosks sought to enroll the public *symbolically*, by deploying the kiosks' interactivity as a way to communicate political agency. In this sense, the responsivity embodied in interactive scripts – the back and forth dialogue present in interactive exchanges – stands for the political system as a whole, attributing the latter with immediacy and responsivity. This is one of the most important reasons why

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[149] See for example: http://www.cbc.ca/news/canada/british-columbia/story/2008/02/27/bc-ecodensity-hearing-protests.html (last accessed Feb.15, 2013).

[150] http://ebookbrowse.com/for-immediate-release-mov-mash-notes-pdf-d303001534 (last accessed Feb.5, 2013). When describing their own installation, aimed at engaging the public on climate change in Aarhus, Denmark, Fritsch & Brynskov (2011) note the sheer attractiveness of interactivity as well.

governments are anxious to design and implement interactive engagement tools, for the latter signal a responsive, open political system regardless of whether the government actually heeds the input collected (or at least as long as the illusion that the government may be listening is kept intact).[151]

Third, the kiosks sought to enroll the public by extending them an opportunity to *perform* citizenship. In this mode, in what I call *procedural enrolment*, the user's interaction with digital objects is equivalent to enacting a set of political behaviours largely associated with contemporary citizenship. Insofar as this form of enrolment takes place through the user's interaction with the logical processes of the kiosk's program – the set of prompts and choices that correspond with the kiosk's software operations – it is based on the kiosks' procedurality, which is the subject of the next section.

4.2 Procedurality

4.2.1 Procedurality Explained

Janet Murray (1997) explains that one of the most important characteristics of digital environments is that they are "procedural". By this she is referring to the way computer calculation advances as a sequential process of executing line after line of code. She writes:

> the computer is not fundamentally a wire or a pathway but an *engine*. It was designed not to carry static information but to embody complex, contingent behaviors. To be a computer scientist is to think in terms of algorithms and heuristics, that is, to be constantly identifying the exact or general rules of behavior that describe any process, from running a payroll to flying an airplane. (p.72; emphasis in origin)

Procedurality thus expresses the way digital computation works by translating a myriad worldly phenomena into a series of discrete, individualized units (Bogost, 2006). These units are then manipulated according to circuitry-level representations of basic Boolean

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[151] I explain this in chapter 1 as part of government's response to the public's expectation to engage with elected officials online, and to a more general perception that, as Holden (2007, p.9) puts it, contemporary culture features "a movement from passivity to engagement, from uni-directional flows to interactivity, and from the few to the many".

operators – AND, OR, NOR – upon which computers are based. Procedurality, therefore, describes both the (sequential) logic of computation and the mechanism for its control.[152] However, the import of Murray's observation goes beyond pointing to the sequential logic of computation. The procedural construction of digital environments as the unfolding series of pre-programmed rules also embodies the *prescriptive* elements of software, that is, the ways in which computer processes enable or disable, encourage or prohibit certain user behaviour. As game designer Ian Bogost (2007) argues, the way sequentially processed rules construct the digital environment while regulating user behaviour within that environment illustrates the *expressive* and *persuasive* capacity of digital interactivity, what he calls "procedural rhetoric".

By appending the notion of rhetoric to that of procedurality, Bogost aims to draw attention to the way constructing rule-based representations is always motivated and selective:

> Procedural representation models only some subset of a source system, in order to draw attention to that portion as the subject of the representation. Interactivity follows suit: the total number and credibility of user actions is not necessarily important; rather, the relevance of the interaction in the context of the representational goals of the system is paramount. (pp.45-6)

The selectivity that undergirds procedural rhetoric manifests the way computer-based rules function essentially as interpretive encodings of the world, providing a structured representation of spatial and temporal relations that govern virtual objects and actions. Since modeling a virtual world amounts to encoding enduring cause-effect relations that serve as containers for user behaviour, procedural rhetoric represents, on the one hand, the coupling of the digital environment with the 'real world' (or "source" environment), and, on the other hand, the range or repertoire of available human-computer interactions. The important insight here is that the two dimensions are inseparable: representing the world and enabling action on it always go hand in hand. This inseparability is a fundamental aspect of interactive world disclosure.

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[152] Manovich (2001, p.47) calls this "programmability", "the most fundamental quality of new media that has no historical precedent".

To reiterate, procedural rhetoric holds that the persuasiveness of interactive environments emerges at the conjunction of two interrelated components: the procedural coupling of the digital environment to its "source" world, and the availability of user actions within the digital environment. The relation between these two components is what conditions (but does not determine!) the outcome of particular instances of procedural rhetoric. So if the power of rhetoric in general is equivalent to its capacity to locate the addressee within a particular formulation of the relations between the lifeworld and its (rhetorical) representation, in the case of procedural rhetoric that formulation (its claims about the real world) is produced by computer code and enacted or performed by the user; it takes form as the inhabiting of an interactive world. And this is what makes procedural rhetoric so qualitatively different from rhetoric based on spoken words, writing, images or moving pictures.

When digital environments aim to represent political systems and processes, their procedural rhetoric manifests both the boundaries around politics and available forms of political agency. It is from here that we can start explaining the political significance of Mashnotes kiosks: to interact with the kiosks is to inhabit an interactive world that is created procedurally, and which represents a particular view of politics as a series of sequentially processed rules. To interact with the kiosks is to *perform citizenship within a procedurally represented political system*. Within this scheme, how is political agency, whose materialization is a condition of effective politicization, communicated and experienced?

4.2.2 Procedural Authorship and Interactive Agency

The first step in understanding agency in procedural environments is to recognize that designers and users do not enjoy the same kind of agency. While the latter merely act within the digital environment, the former actually create it. Murray (1997), deploying narratological terminology, calls the agency of designers, "procedural authorship". She explains this as such:

> Authorship in electronic media is procedural. Procedural authorship means writing the rules by which the texts appear as well as writing the texts themselves. It means writing the rules for the interactor's involvement, that is, the conditions under which things will happen in response to the participant's actions. It means establishing the properties of the objects and potential objects in the

> virtual world and the formulas for how they will relate to one another. The procedural author creates not just a set of scenes but a world of narrative possibilities. (pp.152-3).

We can identify procedural authorship with the act of 'worldmaking': pre-programing a set of rules (procedures) that structure the digital environment, regulate potential user behaviour within it, and may potentiate interactive world disclosure. In other words, both the coupling of the digital environment to its source world and the development of interactive repertoires are the exclusive domain of procedural authors – although, we should keep in mind that just as users do not enter the digital environment *tabula rasa*, neither is the range of meaning they may derive from inhabiting the digital environment entirely encapsulated (or pre-determined) by the environment's procedurality. Regardless, while users may enjoy a certain degree of agency equivalent to their control over virtual activities – choosing to take path A instead of path B, for instance – procedural authors set the conditions and limitations for any such user action to take place. Procedural authors are, as Ellen Ullman (1997) puts it, much "closer to the machine".

Nonetheless, users do enjoy a significant degree of agency as well. Within the space of interaction, understood as the performance of rule-based scripts through which the virtual world and the non-virtual world are coupled, agency can be understood as emerging from the observation of distinct outcomes to particular actions. As Janet Murray (1997, p.126) puts it, "Agency is the satisfying power to take meaningful action and see the results of our decisions and choices". For Murray, interactive agency combines pleasure (satisfaction) and power. It can be experienced in different ways, with a range of intensities and effects: it can emerge from the simple response of on-screen objects to the click of a mouse, or the orchestration of elaborate avatar actions in complex virtual environments. While some digital environments offer users a limited range of choices to select from – a series of 'yes' or 'no' questions, or horizontal-only navigation, for instance – others may offer a larger interactive repertoire that includes a wide range of actions, objects and environments to manipulate. Some even offer the tools to make new interactive repertoires, opening to users aspects of the programing

mechanism itself. Interactive agency, it follows, is expressed as a spectrum: from merely following rules, to filling in gaps in narrative structures (interacting with "lazy machines" as Umberto Eco puts it),[153] to producing virtual worlds by deploying foundational metaphors (as with *Minecraft* or *The Sims*), to being able to write the rules themselves (as with *StarLogo*). The important point is that merely acting and observing the results of the action does not encompass the full gamut of interactive agency. Like 'participation', interactive agency is multidimensional, polysemic and experienced.

As Murray notes, the experiential premise of agency is a combination of empowerment and pleasure. We can see how they blend together when considering how users intentionally navigate virtual space – "orienting ourselves by landmarks, mapping a space mentally to match our experience, and admiring the juxtaposition and changes in perspective that derive from moving through an intricate environment" (Murray, 1997, p.129). The pleasure evoked by this kind of interactivity has embodied or kinesthetic elements such as the choreographic matching of physical and virtual actions, and the sense of achievement that arises from mentally mastering a particular terrain: "As I move forward, I feel a sense of powerfulness, of significant action" (p.132). Kinesthetic and mental pleasures can be further seen as comprising two separate elements: first there is the joy of movement as the discovery of space – an evolutionary or developmental phenomenon according to geographer Yi-Fi Tuan (1977, p.12).[154] In well-crafted digital environments this may coalesce into what Ihde (1990, p.73) describes in the context of embodied technics as a "symbiosis of artifact and user within a human action". And then there is the joy of recognition – the matching of (mental) concepts with (physical) percepts, finding correlations between our image of the space and our movement within it. In complex spatial arrangements such as a maze, writes Tuan (1977, p.72), "Encountering a familiar landmark … is almost an emotional experience. The subject will often express satisfaction, for the landmark suggests to him that he is on the right track".

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[153] See Eco, 1994, p.3.

[154] See also Csikszentmihalyi (1990, pp.99-100) on the joy of movement.

Navigation, like all other forms of interactivity, depends on the user's familiarity with (or ability to discover) the rules that govern the activity, its objective, and the repertoire of interactive affordances at their disposal. Another way to articulate the conditions for such familiarity is by reference to Piaget's notions of schema and script:

> Schemas are the building-blocks of information-processing, a cognitive framework that determines what we know about the world, the objects it contains, the tasks we perform within it, even what we see…. Schemas enable us to perceive objects and occurrences around us and to make efficient sense out of them by consulting our ready-made store of similar occurrences and understandings. (Douglas & Hargadon, 2001, p.154)

Operating within a particular schema, scripts are flexible sets of tasks or appropriate actions "that shape our perception, navigation, and interaction within a scenario" (p.155). To put it plainly, when we engage with a new media object or inhabit an interactive environment, certain expectations based on conventions (schemas) orient our interactions by pointing us toward a set of available affordances (scripts). For instance, when I interact with my word processor I apply a 'word processing' schema, which mediates my expectations from the software. I locate the processor within the larger framework of textual production and publication, and expect the word processor to allow me to insert and manipulate text, display my key strokes readily and accurately ("what you see is what you get"), and to allow me to save and print my text. Within the 'word processing' schema, and depending on the particular software I am using, I can draw from a variety of scripts that allow me to execute the particular actions I am interested in. For instance, holding the 'control' (or 'command' in an Apple operating system) button along with the 'C' key will copy the text I highlighted onto my clipboard. I can also achieve the same result by enacting a different script – navigating to the 'Edit' menu and selecting the 'Copy' option.

Regardless of whether we set our sights on the pleasure of movement or on the pleasure of recognition, it becomes clear that navigation is not a uniform experience. It is shaped by the structure of interactivity: the *kind* of virtual space the user navigates and the navigational *means* afforded to them. The same can be said about interactive agency. Accordingly, the remainder of this chapter illustrates two distinct interactive structures, the experience of which gives rise to different kinds of interactive agency. The first describes a fairly linear interactive structure which I call, following B.J. Fogg,

“tunneling”. The second, “rhizomatic wandering”, pertains to a more complex interactive structure. I describe the two modalities with an eye on their potential political effects, aiming to show how *different forms of interactive worlds suggest different political potentials*.

4.3 Two Interactive Structures

4.3.1 Tunneling (or, Inward Diegetic Immersion)

When interaction takes place in tightly controlled, linear environments, pleasure and agency emerge predominantly from a sense of accomplishment – overcoming obstacles, reaching the goal, solving the puzzle, and so forth. The simpler (or more generic) the interactive scenario (or navigational narrative), the easier it may be for the user to discover the underlying schema and select among the appropriate scripts. However, more than its complexity, it is the degree to which the interactive scenario matches the user’s expectations and skills that determines the kind of interactive experience they may have (McMahan, 2003, pp.68-69).[155] This is one of the conclusions reached by psychologist Mihalyi Csikszentmihalyi (1990) in his research on what he calls “flow”, or “optimal experience”.

Csikszentmihalyi defines flow as “a sense that one's skills are adequate to cope with the challenges at hand, in a goal-directed, rule-bound action system that provides clear clues as to how well one is performing. Concentration is so intense that there is no attention left over to think about anything irrelevant, or to worry about problems. Self-consciousness disappears, and the sense of time becomes distorted” (p.71). The disappearing of self-consciousness renders the person fully immersed in the activity, producing a sense of inner order, control and, ultimately, deep enjoyment. Since the attainment of flow requires a kind of congruence between the information a person needs to process and the goals of the activity, it can be achieved by finely matching the person’s skills with the task’s challenges, navigating the psychic space between

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[155] A discrepancy between actual affordances and the “maps of possibility” (Krippendorff, 2006, p.125) provided to the user will create confusion. See also Poole (2000, p.51) on three types of incoherence: causality, function and space.

boredom and anxiety. If the challenge is too complex or difficult, requiring the person to stretch their skills beyond their capacity, the activity will produce anxiety. Inversely, if the challenges are overmatched by the person's skills they will become bored. In both cases, the person's attention may drift away from the task at hand, destabilizing their inner-order and inviting what Csikszentmihalyi calls "psychic entropy": "a disorganization of the self that impairs its effectiveness" (p.37).[156] But when the "flow channel" unfolds optimally, the activity becomes "autotelic" – an end to itself (p.67). As such, it manifests a kind of activity-centred enclosure – self-consciousness disappears, and with it the sensation of time and space. Flow can thus be seen as total immersion, a state of pleasurable absorption in the activity and nothing but the activity.

Csikszentmihalyi's account of the pleasurable absorption experienced in fine-tuned activity is echoed in Sherry Turkle's examination of interactivity. The gamers she interviewed for *The Second Self* (2005) describe a "highly focused, and highly charged state of mind" often resulting in a "melding of the body and the mind" similar to that experienced by athletes when they feel they are "in the zone" (p.84, 74). The combination of total concentration with visceral stimulation and response underlies immersion as an "altered state" of heightened receptivity, of "oneness" with the fictional (or game-) world, akin to a real trans-like state, as Murray suggests. But therein lies the rub. While immersive experiences may bring about a heightened state of consciousness, the latter is often directed toward the activity itself, producing a kind of *inward diegetic absorption*. In other words, to be immersed is to not only lack self-consciousness but to be relatively closed to the extra-diegetic world.[157]

The experience of enclosure that underlies immersion and flow-like situations can be manufactured. This idea stands at the centre of what B.J. Fogg (2003) calls "tunneling". Digital environments, Fogg argues, "can persuade through creating

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[156] It is not surprising that for Heidegger the two extremes Csikszentmihalyi aims to avoid – anxiety and boredom – are triggers for existential reflection with world disclosure potentials precisely because they give a person a respite from the drive for "effectiveness". On Anxiety see Heidegger, 1962, pp.227-235. On boredom see Part One in Heidegger, 1995.

[157] While 'diegetic' pertains to on-screen entities and events (part of the virtual environment), 'extra-diegetic' pertains to off-screen entities and events (the 'source' world). The two, naturally, are always in relation to one another.

situations that reward and motivate people for a target behavior; allow users to practice a target behavior; control exposure to new or frightening situations; and facilitate role-playing, adopting another person's perspective" (p.69). To "tunnel" users is to tightly control the unfolding of the interactive narrative, "leading users through a predetermined sequence of actions or events, step by step" (p.34).

> Tunneling technologies can be quite effective. For users, tunnelling makes it easier to go through a process. For designers, tunnelling controls what the user experiences – the content, possible pathways, and the nature of the activities. In essence, the user becomes a captive audience.... tunnelling technologies are effective because people value consistency. Once they commit to an idea or a process, most people try to stick with it, even in the face of contrary evidence. This is particularly true in the case of tunnel situations that people have freely chosen. (p.36)

The persuasive power of tunneling, therefore, lies in exploiting the momentum of linear interactive environments, influencing the user's actions under the promise of achievement at the end. As an expression of the interactive narrative's procedural rhetoric, the foreclosing of the digital environment in relation to the infinite variability of the extra-diegetic world becomes persuasive because it promises consistency and a tangible outcome. For these, users may be willing to go through a series of pre-designed steps through which particular objects are introduced and attributed with meaning, particular elements of the real world are foregrounded, and particular behaviour is prescribed and rehearsed. What distinguishes tunneling from other ways of unfolding interactive narratives is that the world is modeled and enacted in a highly *singular* manner. Movement, outcomes and effects are tightly controlled as to eliminate vagueness and ambiguity.

Carbon Chaos, a mobile game designed by students at the Centre for Digital Media in Vancouver, provides us with an example of a tunneling environment.[158] The objective of the game is to transport quickly passengers from one side of a city block to their destination on the other edge of the screen (see figure 4.4). The user may choose

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[158] The game can be downloaded for free through the iPhone app store. A short video of gameplay can be found here: http://thecdm.ca/projects/archives/carbon-chaos-2010 (last accessed Feb.22, 2013).

one of three modes of transportation: bikes carry only one person, cars carry up to 3 persons, and buses carry up to 10 persons. While bikes do not emit carbon dioxide, cars and busses do, leaving behind a thick cloudy trail that halts other cars and buses while it slowly dissipates. Bikes, on the other hand, remain immune to the halting effects of the carbon dioxide trail. Once passengers are dropped successfully at their destination, the player receives a score and their “Greenroof Meter” is charged. If the Meter is full, the player can tap on a destination and release a “shockwave” that clears all carbon clouds from the map.

Figure 4.4: Screen capture of *Carbon Chaos* (game created at Centre for Digital Media).

Carbon Chaos’s tunneling effects are evident in the game’s schema and scripts, its outcome and the interactivity it affords its players, but mostly in the ‘towardness’ that characterizes gameplay. The game’s singular objective, to score more points and “level-up”, colours the gameplay experience. The kind of interactive agency the player enjoys remains largely subordinated to a principle of efficiency: the player cannot change the scene, nor add or remove means of transportation or manipulate the rules governing emission or scoring. What they can do, is play the game better, that is, score more points by being more efficient. Under these conditions it is unclear whether playing the game successfully conjures a deeper understanding of the physical underpinnings or

political implications of transit related choices, or whether it merely teaches players how to play the game with more dexterity.[159] The game's persuasiveness, however, does not rely on the depth or accuracy of the information it offers players. Instead, it relies on the fact that there is only one way to play the game, with very little room for exploration, experimentation and reflection. To play the game 'right', that is, to score high and win, the player needs to repeatedly enact the underlying principle that bicycles and public transportation are better environmental choices than cars. Players may be hard pressed to find other meanings in the game, but it is precisely this one-dimensionality that reflects the game's designers intent to persuade.

Compared to the interactivity afforded by *Carbon Chaos*, Mashnotes kiosks seem very basic, almost too rudimentary to be persuasive. Yet they too manifest several of the principles of tunneling: users are invited to interact with a clear goal in mind, are given a limited set of options to choose from, and must go through the process of voting in order to achieve the stated objective of the installation – to have their "say". Once the user commits to interacting with the kiosk they have only one navigational path, a path that ends in a binary choice between competing policy alternatives (see figure 4.5). This sets up the installation's politicizing capacities, as I explain below.

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[159] It appears the team developing the game "didn't have the resources to determine if the game actually increases environmental awareness", admitted the Professor who guided the process of development (http://www.vancouverobserver.com/blogs/megabytes/2010/07/18/digital-media-students-want-raise-your-carbon-consciousness (last accessed Feb.22, 2013)).

Figure 4.5: Granville Street kiosk voting buttons and display.

4.3.2 Rhizomatic Wandering (or, Extra-Diegetic Reflexivity)

The second kind of interactive structure, "rhizomatic wandering", offers a more "complicated pleasure" (to borrow from Dunne & Raby),[160] and is not coloured by the drive to achieve an end-goal. It takes place in interactive narratives that are modeled after what Murray (1997) calls the "entangled rhizome", which is like "a set of index cards that have been scattered on the floor and then connected with multiple segments of tangled twine" (p.132). Her description follows Gilles Deleuze & Felix Guattari's conceptualization of the rhizome as a socio-spatial configuration with no discernible beginning nor end.[161]

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[160] Dunne & Raby (2001, p.63), in turn, borrow the phrase from essayist Martin Amis to argue that design can serve as a critical medium when it produces transgressive experiences for which "A slight strangeness is the key – too weird and they are instantly dismissed, not strange enough and they're absorbed into everyday reality".

[161] The rhizome is intended to introduce disequilibrium and paradox into ordinary thought, and as such it can be seen as a true philosophical concept according to Deleuze & Guattari's own definitions (see Deleuze & Guattari, 1994, ch.1; and Bogue, 1989, p.155).

A rhizome, Deleuze & Guattari (1987) write, is all smooth inbetweenness. It has "multiple entryways" and is "not amenable to any structural or generative model" (p.12) since "any point of a rhizome can be connected to anything other, and must be" (p.7). As such, the rhizome serves as a counter-figure to the more rigid, striated, hierarchical socio-spatial configuration they call "arborescent". While arborescent forms represent the concretization of binary logic, linearity and hierarchy, resonating with a kind of power formation where the whole ("the One") totalizes any of its components, rhizomes are "very different from the tree or root, which plots a point, fixes an order" (p.7), consisting entirely of simultaneous, omnidirectional vectors, or "intensive states" (p.17).

> unlike trees or their roots, the rhizome connects any point to any other point, and its traits are not necessarily linked to traits of the same nature; it brings into play very different regimes of signs, and even nonsign states. The rhizome is reducible neither to the One nor the multiple.... It has neither beginning nor end, but always a middle (milieu) from which it grows and which it overspills. It constitutes linear multiplicities with n dimensions having neither subject nor object, which can be laid out on a plane of consistency, and from which the One is always subtracted (n- 1). When a multiplicity of this kind changes dimension, it necessarily changes in nature as well, undergoes a metamorphosis. Unlike a structure, which is defined by a set of points and positions, with binary relations between the points and biunivocal relationships between the positions, the rhizome is made only of lines: lines of segmentarity and stratification as its dimensions, and the line of flight or deterritorialization as the maximum dimension after which the multiplicity undergoes metamorphosis, changes in nature.... Unlike the tree, the rhizome is not the object of reproduction: neither external reproduction as image-tree nor internal reproduction as tree-structure. The rhizome is an antigenealogy. It is a short-term memory, or antimemory. The rhizome operates by variation, expansion, conquest, capture, offshoots.... In contrast to centered (even polycentric) systems with hierarchical modes of communication and preestablished paths, the rhizome is an acentered, nonhierarchical, nonsignifying system without a General and without an organizing memory or central automaton, defined solely by a circulation of states. (p.21)

For Murray the rhizome produces interesting narrational and, by extension, navigational effects. It models digital environments in which the user is free to wander with no explicit objective or orientation, at once enclosed in the sprawling topology of an endlessly navigable space and open to the rhizome's equally endless variability. Inhabiting such a space, or engaging in rhizomatic wandering, gives rise to certain experiences. These can be glimpsed by referring, as Murray does, to J.L. Borges's

famous short story, *The Garden of Forking Paths*. Here the garden is a literary expression of the narrator's sense that "everything happens to a man precisely, precisely now" (Borges, 2007, p.20). The Garden, "an invisible labyrinth of time" (p.25), "a labyrinth of labyrinths … one sinuous spreading labyrinth that would encompass the past and the future and in some way involve the stars" (p.23), offers a metaphor for the continuous folding and unfolding of multiple temporalities, of parallel bifurcations that breed more and more bifurcations, "an infinite series of times … a growing, dizzying net of divergent, convergent and parallel times. This network of times which approached one another, forked, broke off, or were unaware of one another for centuries, embraces *all* possibilities of time" (p.28; emphasis in origin). To wander in an entangled rhizome, therefore, is to experience the continuous unfolding of infinite potentiality, or what Deleuze & Guattari call "the virtual".

So what does it feel like to navigate an entangled rhizome, to move without a singular trajectory, without an orienting towardness, without the need to comply with a pre-formed plan or program? Murray (1997, p.133) describes the experience as follows:

> Walking through a rhizome one enacts a story of wandering, of being enticed in conflicting directions, of remaining always open to surprise, of feeling helpless to orient oneself or to find an exit. But the story is also oddly reassuring. In the rhizome, one is constantly threatened but also continuously enclosed. The fact that the plot will not resolve means that no irreparable loss will be suffered.

To wander in an entangled rhizome gives rise to a puzzling mixture of anxiety and comfort: anxiety, doubt and perplexity because the lack of measurable progression leaves the user devoid of the same sense of achievement they would get from moving through a more linearly structured environment. In other words, wandering in a rhizome lacks precisely the kind of pleasure one finds in being tunneled; "our desire for narrational agency, for using the act of navigation to unfold a story that flows from our own meaningful choices" is frustrated (ibid.)[162] On the other hand, because the user is

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[162] Krueger (2003, p.384) describes a similar experience in the context of his Maze installation: "From the initial impression that it was a problem to solve, they [users] moved to the realization that the maze was a vehicle for whimsy, playing with the concept of a maze and poking fun at their compulsion to walk it".

enclosed in a seemingly never-ending narrative structure the possibility of failure, not reaching the end or not achieving the pre-defined goal, does not loom large over the experience itself. It is in this sense that rhizomatic wandering is also comforting.

We can get a more concrete sense of rhizomatic wandering by analyzing Jason Rohrer's *Passage*, a videogame designed to evoke emotions and thinking about life, mortality and the passage of time – a *memento mori* game, as described by its creator.[163] Both *Passage*'s aesthetics (sound, graphics, character design) and mechanics (controls, objective, scoring) are so ascetic that they seem almost too simple to be effective. In fact, they are even simpler than those deployed by *Carbon Chaos*. The player, represented by a male avatar fashioned after Rohrer himself, starts the game on the very left hand side of a small, pixelated, strip screen (100x16 pixels) that reveals only a fraction of the game's playing space (see figure 4.6). From here the player can move in any direction, but only moving rightward grants the player points ("passage points"). On his path the player encounters a woman avatar (fashioned after Rohrer's own partner) which he can marry, navigates a variety of obstacles and landscapes, and opens treasure boxes, some of which give him more points. As time passes the avatars start showing the signs of old age (a hunched-over posture, thinning, hair loss for the man avatar, and greying hair for the women). As the centre of the game (where the avatar is located) slowly shifts to the right, the right-most part of the screen (representing the future) becomes less and less fuzzy, while the left-most part of the screen (representing the past) becomes more and more fuzzy. After exactly 5 minutes time runs out, the avatar dies and is replaced by a tombstone. This happens regardless of what the player has accomplished; points accumulated mean nothing.

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[163] The game can be download for most platforms here: http://hcsoftware.sourceforge.net/passage/ (last accessed May 8, 2013).
For a video demo of gameplay see http://www.youtube.com/watch?v=n3o0HFXPfco (last accessed Feb.19, 2013). For more on the game and its designer, see http://online.wsj.com/article/SB120034796455789469.html, and http://www.esquire.com/print-this/future-of-video-game-design-1208#_jmp0_ (last accessed Feb.18, 2013).

Figure 4.6: Screen capture of *Passage* (game created by Jason Rohrer).

The game, as players quickly realize, is a metaphor for life. Every choice the player makes impacts future choices and scoring options. For instance, choosing to wander into more open spaces gives players time to explore the game's different landscapes and collect more passage points. But by choosing to do so they relinquish the opportunity to find a more plentiful bounty of treasure boxes, which are located inside mazes. Choosing to marry (when encountering the woman avatar) will result in the binding of the two avatars. While this increases the accumulation of passage points, being attached to a spouse makes it more difficult to move through mazes, making it that much harder (and at times plain impossible) to encounter treasure boxes. Additionally, the game is programmed in such a way that the spouse always dies before the player. In this sense, getting attached to a partner guarantees their loss. This seems to affect some players in significant ways, some admitting to feeling a deep sense of loss, others professing to being moved to tears. Take for example the following remark on the neoGAF discussion thread dedicated to the game:[164]

> i played through the game on my laptop, sitting on the couch with my wife next to me reading a book. after playing the game, it made me feel down. i looked over at my wife reading her book and just seeing her there made me smile, and made me think to myself that even though we're going to die eventually and lose eachother, we are here now. it made me realize how much I love her.

Or this one:

> I went in to the game with only a vague idea that it was supposed to have some emotional depth, without having read the statement or paid much attention to the

[164] http://www.neogaf.com/forum/showthread.php?t=215988&page=3 (last accessed Feb.18, 2013).

> discussion that followed the link on another forum.
>
> And I played it.....I met the girl, and I looked around, and looked for treasures, and I thought about the time limit that was becoming apparent, and I started thinking about how I wanted to spend my time. I wanted to go after treasure chests that were in my way, because I could tell from the blooming star and the points rising that this was an action meant to instill a sense of reward. But I also wanted to keep going, seeing new landscapes, because I find that also rewarding, and ultimately I became more curious about what was ahead of me than what was around me.
>
> And then the girl, who had walked with me that whole time because that's the way she was programmed and because that is what I ran into her for, died. And I realized at that moment that, in this video game world and as a shade of who I am as an actual person, I was not going to leave her grave behind. At that moment I didn't care for what it meant to be attached to a bit of code or what it might imply about me that I didn't want to let go, even though I thought about those things later.
>
> From that moment, and to the moment my character died, I stayed at the grave. I walked around a little bit, but I didn't want to leave it. And it honestly didn't matter why I felt that way.

Of course not all players expressed the same admiration for the game's symbolism, or were as deeply impacted as the players quoted above. Judging from the back-and-forth on the same discussion thread, the game was received with equal amounts frustration and enthusiasm, denigration and accolades. While some users expressed wonderment and heartfelt appreciation of the game's openness, others felt that their expectations were frustrated: "What a boring experience", accused one user; "Am I the only one who just walked forward, walked, walked, walked, walked, and then just suddenly died of age? WTF are you supposed to do?" asked another. "Playing the game with no instruction is a boring, stupid affair with nothing to recommend it", wrote yet another frustrated player. But even users that have expressed their lack of enthusiasm for the game seemed willing to engage with the game's themes. The message-board user 'border', for instance, claimed first that "it's terrifyily dull stuff that's more entertaining in concept than execution", but then proceeded to offer a more serious interpretation:

> If the woman only contributes to score and the score is meaningless, then what exactly does that say about marriage or women? Not what the creator intends, I

> don't think. To have her only as a multiplier for score shows that she is little more than a status object and a burden.

Such responses are not surprising considering the fact that the game offers no instructions to players. In the statement that accompanied the game's release, Rohrer writes: "Your interpretation of the game is more important than my intentions…. There's no 'right' way to play *Passage*, just as there's no right way to interpret it…. Part of the goal, in fact, is to get you to reflect on the choices that you make while playing".[165] Of course one *can* play the game linearly – trying to gather as many points as possible – but that is hardly the game's point; "in the end, death is still coming for you" (ibid.)

Unlike the 'ideal' entangled rhizome, *Passage* does have a clear beginning and an end. But it lacks a pre-defined objective, eschews any single way to play the game, and offers players a space to wander about and reflect on the game's deeper meanings. It substitutes the more standard tunneling game environment, like those that underlie first-person shooter games, for one that is infinitely open to interpretation. As such, it embodies several of the experiential markers of rhizomatic wandering, most importantly the combination of perplexity and insight, anxiety and joy, frustration as well as satisfaction. It is clearly successful in evoking a "complicated pleasure" that may potentially redirect the player's attention from diegetic elements (how to play the game, how to score more points) to the extra-diegetic phenomena it models – the meaning of life and the inevitability of death. Can such an experience be directed toward more political aims? How may rhizomatic wandering politicize users? I offer suggestions in the next section.

4.4 Interactive Political Enrolment

I have argued above that interactive agency is not reducible to the user's ability to act on the digital environment and see the effects of their action, nor to their ability to accomplish tasks. Since interactivity carries meaning that refers to extra-diegetic entities the agency we attribute to it must be considered in a larger context. "Making a meaningful activity the unit of analysis means that not only an interaction between

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[165] http://hcsoftware.sourceforge.net/passage/statement.html (last accessed Feb.18, 2013).

people and technology is considered, but also the objects in the world with which subjects are interacting via technology" (Kaptelinin & Nardi, 2006, p.34). The meaning and potential effects of interactive agency are derived from both the digital environment the user navigates, and the way that environment relates to the "source" world which it models. Together they produce an interactive world into which the user is invited.

I have also outlined two different interactive structures that manifest different modes of interactive agency. Tunneling described linear, goal-oriented interactivity that is characterized by a towardness – the thrust to accomplish certain, achievable end-goals. In this kind of interactive structure the user is likely to become enclosed in the activity, producing an inward diegetic immersion that essentially closes off the user from reflecting on the relations between the extra-diegetic "source" world and the digital environment they inhabit. Agency in tunneling interactive structures emerges from the user's ability to achieve their goals and experience "flow". Rhizomatic wandering, on the other hand, refers to a kind of interactive structure in which goal-achievement is secondary to disclosing deeper meanings that emerge at the conjunction of diegetic and extra-diegetic elements. Replacing the towardness of tunneling with serendipitous discovery, rhizomatic wandering evokes a sense of sprawling potentiality. And since wandering may produce emotional combinations of anxiety and comfort, it may potentiate reflection about the very structure of the interactive world, effectively shifting the user's attention from the digital (diegetic) environment to its extra-diegetic constituents (the "source" world). The question I ask in this section is, what kind of political effects may these two modes of interactive agency evoke?

When it comes to tunneling, the design of narrow interactive structures that lack ambiguity aims to push users to arrive at certain conclusions. The towardness that characterizes the structure of interactivity is operationalized as a means to persuade. We have seen how this works in *Carbon Chaos*, where the game's singular objective tunnels users to arrive at the conclusion that bicycles and public transit are better environmental choices. Of course this is not surprising since the game was sponsored by Translink, the Lower Mainland's public transportation authority. One can imagine a similar game with diametrically opposed conclusions, but the point remains: *the style and structure of interaction are persuasive.*

The same principle is operative in Mashnotes kiosks, albeit in a more rudimentary manner since the kiosks afford users very limited interaction. Nonetheless, the towardness that characterizes tunneling is mobilized by Mashnotes kiosks to lead users to engage explicitly with political alternatives. This is how the kiosks intend to politicize: by prompting the user to make a choice with political implications, Mashnotes communicates to users the inexorable existence of conflictual alternatives. This has politicizing effects since "politicizing cannot exist without the production of a conflictual representation of the world, with opposed claims, with which people can identify, thereby allowing for passions to be mobilized within the spectrum of the democratic process" (Mouffe, cited in DiSalvo, 2012, p.53-4). The choices available to users are secondary to the realization that choices exist, disclosing the agonism that underlies Vancouver's sustainability politics. The kiosks, then, embody what DiSalvo (2012) calls "adversarial design": "the kind of cultural production that does the work of agonism through the conceptualization and making of products and services and our experiences with them" (p.2). Viewed through the lens of adversarial design, Mashnotes kiosks can be seen to "prompt recognition of political issues and relations, express dissensus, and enable contestational claims and arguments.… and serve as a kind of material evidence in political discourse" (p.12, 13). In other words, Mashnotes kiosks leverage the persuasive effects of tunneling interactive structures to undermine the notion of 'politics as usual' and convey experientially the conflictual nature of Vancouver's sustainability politics.

However, posing political issues as solvable dyads is not without its problems. Especially in the context of sustainability, presenting political choice as a set of mutually negating tradeoffs elicits a fairly limited image of political agency as reducible to choice between available, competing, yet fixed possibilities. We can see this in the form of the questions featured on Mashnotes kiosks: "laneway or gateway?", "Super-tower or low rise?", "Seawall or wall-to-wall?" The assumption that undergirds these polemic dyads is that indeed, solutions are readily available and the public must choose between them since they are mutually exclusive. The problem is not only that in many cases these tradeoffs conceal a reality in which multiple options may indeed co-exist – we *can* reduce CO_2 emissions *and* retain jobs; we *can* expand public transportation *and* increase the speed and convenience of mobility, etc. – but that by posing the question as a solvable dyad the public is precluded from thinking about the very conditions within which the questions are posed and options are made available. As Deleuze & Guattari

(1987, p.105) put it, “you are given a choice, but on the condition that your choice conform to the limits of the constant”. This is where the political significance of rhizomatic wandering becomes important. While tunneling produces self-contained interactions that limit agency to choices within an existing, static state of affairs, rhizomatic wandering may potentially trigger reflections on the very conditions within which interactions and choices takes place. Both enroll users into political culture by offering them an opportunity to perform citizenship, but they conjure entirely different images of political culture and what citizenship means.

The politicizing potentials of rhizomatic wandering seem more about conveying a political sensibility, and less about performing a particular political choice. The combination of anxiety and comfort elicited by rhizomatic wandering, that which makes it a more “complicated pleasure”, may potentially break the immersive spell of flow experiences such as those produced by tunneling, turning transparency into opacity: “people act until they experience a breakdown, this breakdown leads them to reflect upon their activities, and in this context they are motivated to explore information spaces associated with the activity” (Arias et al., 2002, p.362). Since such moments of “user-unfriendliness” (Dunne, 2005, p.35) substitute the unambiguous smoothness of immersive flows with a defamiliarizing experience, they may potentiate reflection on the very structure of the activity and therefore carry politicizing effects.[166] They may also reveal the way technical design itself is ideological, disclosing the artifact’s technical codes. Rhizomatic wandering, it follows, may be associated with an inverse effect on consciousness than tunneling: where tunneling is characterized by inward consciousness and the enclosure of awareness to the outside world (the “source” of the virtual environment), rhizomatic wandering produces an expanding awareness, turning the intensity of the situation into extensity. When taking place in a political context this

[166] This is similar to Brecht’s formulation of alienation (or “A-Effect”) as a mechanism for denaturalizing ideology. Dunne (2005) suggests that what he calls “para-functionality” may achieve a similar distanciating effect: “The term means here a form of design where function is used to encourage reflection on how electronic products condition our behavior” (p.44). Grey (2009) makes a similar argument but uses Adorno’s articulation of the “enigmatic” character of art as her conceptual framework. She writes, “Interrupted flow may reveal why and how the player has lost herself in playing” (p.232).

may have politicizing effects in the very same way Rancière understands political subjectification – by shifting attention from political acts to acting on the political.

Aside from the potential shifting of the user's attention from diegetic to extra-diegetic elements – from inwardly immersion to outwardly reflection – rhizomatic wandering may carry another potentially politicizing effect. As Murray (1997) notes, the lack of towardness that characterizes rhizomatic wandering gives rise to the sensation of sprawling possibilities, the experience of *multivariance or multiplicity*, of sending forth different arms or shoots, where the act of sprawling in all directions mirrors the pullulating structure of the entangled rhizome itself. This is precisely what Borges describes as the sensation of "everything happening now" – the folding of different perspectives into a single moment. This experience, Murray argues, has transformative effects:

> Because we increasingly see the world and even our own identities as such complex, centerless, open-ended systems, we need a story environment that allows us to make sense of them by enticing us into exploring a dense narrative world from every possible perspective. One of the results of such an exploration will be a more immediate appreciation of process. (p.181)

The shifting of attention from outcome to process, from considering a limited set of alternatives to sensing 'pure possibility' echoes the political utility of the rhizome, as put forth by Deleuze & Guattari. Recall that for Deleuze & Guattari the rhizome represents multiplicity *par excellence*, foregrounding contingency, dynamism and multivariance, and as such serves as a model for unfixed (or "deterritorialized"), contingent or fluctuating alliances. Rhizomes defy the reifying momentum of centralized power structures, preserving a kind of paradoxical freedom for individual entities to be simultaneously part of a larger structure or "assemblage" in Deleuze & Guattari's terms, while maintaining their singularity and relative autonomy. The logic of association that undergirds rhizomes is hybridizing and relational and not identitarian; it is about constant change and not fixity; about forming temporary alliances instead of assimilation, absorption or usurpation. "The tree imposes the verb 'to be,' but the fabric of the rhizome is the conjunction, 'and...and...and...'" (Deleuze & Guattari, 1987, p.25).

The same elements that characterize the rhizome as a socio-spatial concretization of multiplicity undergird Hardt & Negri's (2004) designs for a new political subject they call "the multitude":

> The multitude is composed of a set of *singularities* – and by singularity here we mean a social subject whose difference cannot be reduced to sameness, a difference that remains different. The component parts of the people are indifferent in their unity; they become an identity by negating or setting aside their differences. The plural singularities of the multitude thus stand in contrast to the undifferentiated unity of the people.… The components of the masses, the mob, and the crowd are not singularities – and this is obvious from the fact that their differences so easily collapse into the indifference of the whole.… The multitude, designates an active social subject, which acts on the basis of what the singularities share in common. The multitude is an entirely different, multiple social subject whose constitutions and action is based not on identity or unity (or, much less, indifference) but on what it has in common. (p.99, 100; emphasis in origin)[167]

The value of the multitude as a philosophical, political and transformational concept (Negri & Dufourmantelle, 2004, pp.111-112) is based on the way it reconciles its constituents' irreducible difference (as *singularities*) with the need to retrieve the *commonality* that would bind them into a more powerful political force. Where liberalism focuses on the former (producing at the extreme something like absolute or "possessive" individualism),[168] and Marxism concentrates on the latter (downplaying differences in the name of a singular class consciousness), the multitude – "an ensemble of singularities", "A multiplicity of irreducible activities" (p.73) – offers an alternative – a model of "irreducible multiplicity". From this perspective, the multitude can be likened to musical notes, "which, although they are completely singular, are capable of creating life, of combining with each other to produce harmony" (pp.149-150). Whether or not the multitude is a "fanciful construction" as Laclau (2004, p.25) asserts seems beside the point: the multitude is far more productive as an imaginative political concept than as a description of actually existing political configurations.

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[167] Dyer-Witheford & de Peuter (2009, pp.187-188) explain that the multitude carries three different meanings for Hard & Negri: first as a form of subjectivity, second as a form of social movement, and third as a set of capacities to develop alternatives.

[168] See Macpherson, 1962.

We can conclude that the political import of the rhizome as a concept emerges from the way it gives the multiplicity a tangible form, foregrounding hybridization and relationality over-against identity and fixity; irreducible difference over-against assimilation or subsumption; the logic of addition (and…and...and) over-against the logic of equivalency (or…or…or). As Lazzarato (2010, p.26) puts it, "In the same way that there is a multiplicity of relations, there is also a multiplicity of different modes of unification, different degrees of unity, different ways of being 'one', and a multiplicity of ways of realising it". Wandering in an interactive rhizome creates the conditions for such multiplicities to be experienced in a non-thematic manner – for "Multitudinous subjectivity" to emerge.[169]

4.5 Designed for Failure

So far I have described two interactive structures that give rise to interactive experiences with different potentials for world disclosure. Since each interactive structure on its own may evoke only a limited mode of political agency, and since every single interaction may materialize only one of them, in the last part of this chapter I ask whether they could be combined into a more comprehensive concretization of interactive world disclosure. I do so by briefly discussing *Futura: The Sustainable Future Game*.

Designed by researchers at SFU's School of Interactive Arts and Technology, *Futura* aims to facilitate collaborative learning about sustainability (Antle et al., 2011).[170] It is played on a large multi-touch digital table-top platform by groups of variable size and age (see figure 4.7). The game's objective is to balance the needs of a growing population while minimizing environmental impacts. Players do so by locating different types of entities on the game's map, which is loosely based on the Fraser River basin that surrounds Vancouver (see figure 4.8). Virtual entities represent the population's needs for food, shelter and energy, and include different food production units, housing facilities and energy production utilities. To maximize scoring, players must meet the needs of both the population and the environment, which requires that they "begin to

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[169] The term is from Dyer-Witheford & de Peuter, 2009, p.187.

[170] For more on *Futura* see http://www.antle.iat.sfu.ca/Futura/ (last accessed Feb.19, 2013).

understand the complexity of the problem and develop strategies to address it" (Antle et al., 2011, p.97). No less important, the game seeks to give players a sense of the collaborative effort required to address the challenges of sustainability. The need for extra-diegetic collaboration (in the 'real world') is enforced through the game's affordances: "The size of the table and interface design precludes one player from taking over the game. It is physically not possible to reach all the toolbars from one position. These choices, enabled by the tabletop form and interface design, provide opportunities to learn through a *collaborative process*" (ibid.; emphasis in origin). The game, through its procedural rhetoric, manifests the nature and dynamics of its "source world". Players *perform* the relations between collaboration and sustainability, *experiencing* the underlying argument.

Figure 4.7: *Futura: The Sustainable Futures Game* (image courtesy of Alissa N. Antle, 2011).

Figure 4.8: *Futura*'s interactive map is based on the Fraser River basin (image courtesy of Alissa N. Antle, 2011).

Futura's gameplay clearly resonates with the principles of tunneling, that is, it includes a scoring system that rewards certain actions, giving the game that sense of towardness identified with tunneling. But *Futura* also features important aspects of rhizomatic wandering. Since the rules that govern gameplay are not made explicit, and there is no singular or obvious way to win, players are afforded a considerable degree of freedom to explore different configurations, causes and effects, and even play against the game's objectives if they so desire. The game's open-endedness reflects its designers' aims:

> The learning outcomes for Futura are not related to the learning of specific concepts (e.g. about ecology or urban planning) but instead our goal is to give players a chance to experience the tradeoffs and complexity involved in planning for a sustainable future. In doing so, Futura supports players to become more aware of the contradictory demands of maintaining environmental health and supporting population growth in an urban environment. (Antle et al., 2011, p.93)

While the complexity of urban sustainability planning is experienced through a series of in-game decisions – put this house here, that recycling facility there, and so

forth – it is also experienced as moments of conflict, perplexity and reflection during in-play pauses caused by "world events", and in-between instances of gameplay. These moments of planned breakdown are not coincidental since the game was designed to introduce "epistemic conflict":

> Futura's challenge level was designed so that most groups of players would lose the first few times they played. From a constructivist perspective, we intentionally use game challenge to introduce *epistemic conflict*. From this starting point, we designed the game rules so that in order to get better at playing, players must also get better at thinking about the challenges of sustainable development. To facilitate this kind of thinking, there are various design features that explicitly support opportunities for *reflection* and *self-regulation*. These occur both during continuous action and in discrete pauses or breaks in game play. (Antle et al., 2011, p.97; emphasis in origin)

Moments of reflection between failed attempts are integral to gameplay for they allow players to discuss and develop their strategies collaboratively. But they are also essential for communicating the game's deeper meaning for it is here that the links between the diegetic elements and their real-world equivalences are made conscious and available for group reflection. Another way to put it is to point out that the game's tunneling structure is punctuated by moments of rhizomatic wandering, where the rules of successful gameplay are re-interpreted and filtered through players' anxiety, frustration and sense of accomplishment. The combination of tunneling elements and moments of rhizomatic wandering, embodied in the way gameplay is designed for failure, make *Futura* both an engaging and a thought-provoking experience.

This chapter asked how interactive experiences may politicize users, and suggested that they may do so by communicating certain aspects of political culture symbolically (by indicating a degree of responsivity on behalf of the interaction's convener) and performatively (by allowing users to enact certain modes of citizenship). The way interactivity is designed to evoke politicizing experiences, I explained, is an outcome of the "procedural rhetoric" (Bogost, 2007) that underlies it: the way virtual environments operationalize the relations between the "source" world and its digital counterpart as a set of interactive affordances. The chapter then illustrated two archetypical interactive structures with political implications, each embodying a different form of procedural rhetoric. The first, "tunneling", guides users through a set of predefined activities toward a clearly articulated goal. The immersive experience

tunneling structures seek to evoke is characterized by what I called “diegetic inwardness”: the narrowing of consciousness to focus exclusively on on-screen entities, aimed at achieving a particular, pre-defined outcome – be more efficient, finish a task, score more points, “level up”, etc. The politicizing effects such scripts may trigger are predominantly an outcome of the way those in-game outcomes match political goals. In the case of Mashnotes kiosks, the act of selection between alternative urban design options reproduces a conflictual view of politics. To vote on one of the kiosks is to enact agonistic politics.

The second structure, “rhizomatic wandering”, allows users more freedom to move within the interactive space without forcing them to embark on a particular path or reach a certain goal. The kind of experience such rhizomatic structures evoke is characterized by a combination of anxiety and comfort. These, more “complicated pleasures” than those that emerge from tunneling structures, may be channeled toward reflexive considerations of the very interactive structure itself – what I called “extra-diegetic reflexivity”. When rhizomatic wandering takes place in an interactive structure whose procedural rhetoric relates to a political context, those moments of reflexivity may lead users to explore a range of politically significant choices and outcomes. The politicizing potential of rhizomatic wandering, then, as illustrated by the analysis of *Futura*, emerges from moments of breakdown, frustration or failure that point from the diegetic to its extra-diegetic contexts. While this chapter focused on experiences with politicizing potentials, the next chapter looks at the design of interactive experiences of the political.

5.
Designing Experiences of the Political

> The great traveler is the person who passes through cities and countries with anamnesis; and because everything seems closer to everything else, and hence to him, since he is in their midst, all his senses respond to every nuance as truth.
>
> –Walter Benjamin[171]

[171] 1999, p.248.

5.1 "Explore and Learn, Vancouver"

In September 2010 a group of stakeholders including members of the City of Vancouver's transportation and community services departments, the sustainability office, and researchers from UBC and SFU gathered to discuss the possibility of developing a new version of MetroQuest (MQ), customized for Vancouver. MQ is a planning decision-support tool that uses back-casting simulation and visualization techniques to engage the public with issues of urban design and policy-making. Back-casting is the process of "envisioning desirable futures … in order to stimulate discussions on how to get there" (Swart et al., 2004, p.140), allowing users to generate and compare future urban development scenarios and then trace back the assumptions and conditions that led to those outcomes.[172] The new version was to be part of the City's public engagement on its incipient transportation plan ('Transportation 2040'), and in relation to the City's plans to become "the world's greenest city" by 2020 (Vancouver, 2010). It was to be used online, on mobile kiosks and in facilitated workshops. Eight months later, in May 2011, the design team's efforts bore fruit as MetroQuest-Vancouver's (MQ-V) beta version was ready for evaluation. However, following tepid responses from policy stakeholders and in light of the City's changing public engagement priorities, MQ-V was not deployed in the field.

MQ (or Quest as it was previously named) was originally created by graduate students at UBC, and is currently developed and sold by the same-name company based in Vancouver. The version developed for Vancouver was commissioned by the City of Vancouver as part of a larger public engagement effort centred on a new transportation plan, and it includes design elements pertaining to land use (location and density of buildings and amenities), energy (the kind of energy produced and the location of energy facilities), and transportation (road allocation and designation of certain roads as high-capacity arteries).

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[172] For more on MetroQuest (or Quest) see http://www.metroquest.com (last accessed May 13, 2013), and Carmichael, Tansey & Robinson, 2004; Rothman, Robinson & Biggs, 2002; Robinson et al., 2006; 2011; Shapka, Law & VanWynsberghe, 2008; and VanWynsberghe, Carmichal & Khan, 2007.

MQ-V features a challenge-based interactive flow (Ermi & Mäyrä, 2005). It begins with a set of screens explaining the rationale behind the transportation plan, linking the issues with the greater goal of making Vancouver green, and asking users to help the City decide on the degree to which it should pursue density, green transportation, and different energy production strategies (see figure 5.1).

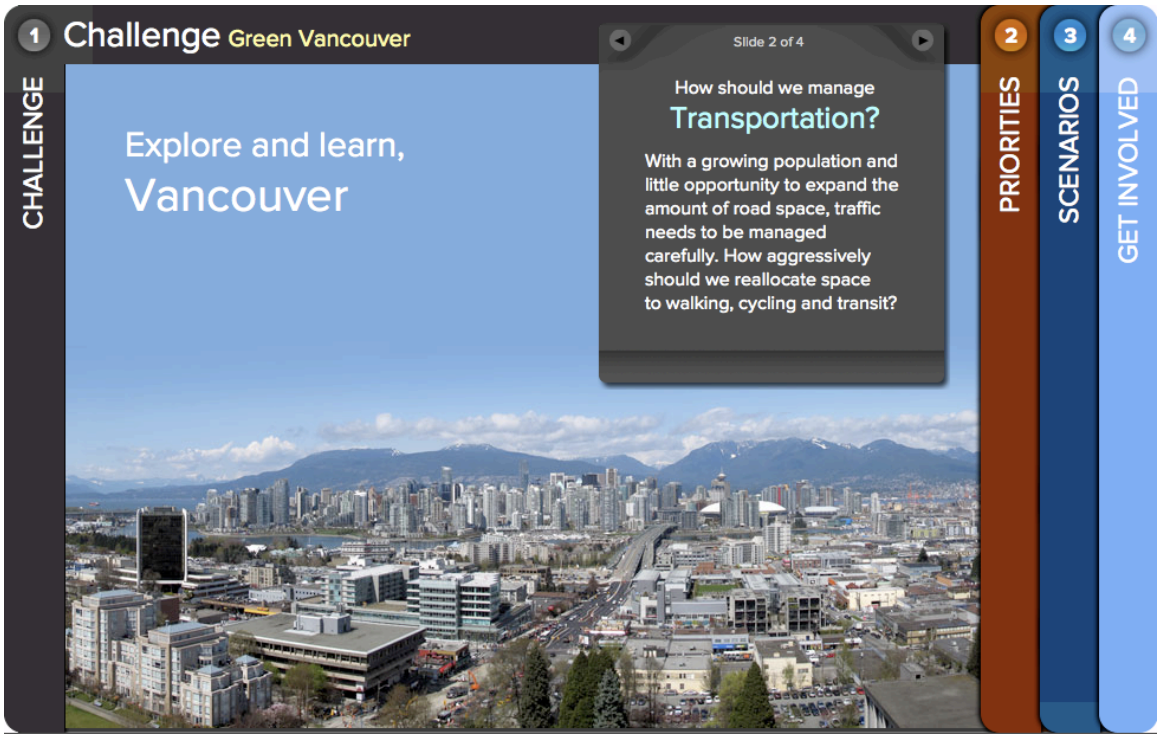

Figure 5.1: Introducing the transportation challenge (image courtesy of City of Vancouver).

Introduction slides are followed by a set of 12 priorities that the user is asked to hierarchize (see figure 5.2). These are later used to communicate the effects of user choice: a green arrow indicates that the priority is served well by the user's choice, while a red arrow in the opposite direction means the inverse. It is here that we find the first indication of the way MQ-V is designed to create congruence between everyday experience and the policy issues it seeks to communicate. While all priorities are potentially quantifiable, that is, are representable numerically in the model, the wording of some priorities evokes experiential attributes such as convenience and comfort. The blending of the two, as will be illustrated below, is one of MQ-V's strongest features.

Once the list of priorities is put in order, the user can select one of three options for each of the three design elements, resulting in a scenario space of 27 options (see table 1).

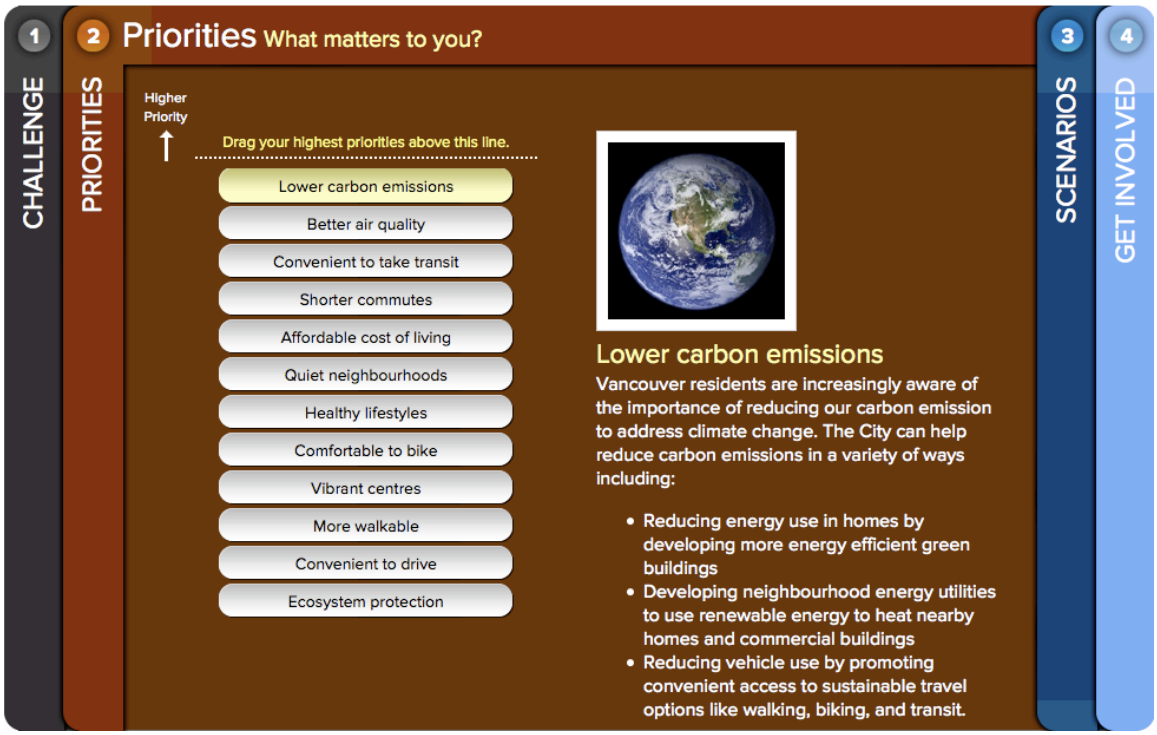

Figure 5.2: Priorities (image courtesy of City of Vancouver).

For each combination of selected elements (one of 27 possible scenarios) MQ-V generates a set of three corresponding visualizations: a wide-scope view of the transportation hub taken from a relatively high vantage point and which includes the adjacent neighbourhoods and a detached, smaller scale profile view of downtown; a street view of a high volume transportation corridor that includes a transportation hub; and a street view of a single-family, detached home neighbourhood located at the periphery of the transportation hub (see images 12, 13 & 14 below). Working within a particular scenario, users can switch between views, focus on a limited set of features ('highlights'), or get more information about the different urban design elements. The ability to navigate within and between scenarios and visualizations reflects the assumption that guides MQ-V's interaction design – that the movement between scenario selection and comparison will help users gain a better understanding of the tradeoffs involved in sustainable urban design, and in particular the way specific choices

over transit development carry implications for energy production and land use design (expressed, for instance, as zoning policies) and vice versa. After users complete their iterative select-and-compare process they are invited to rank scenarios on a 1-to-5 star scale and see how their choices compare to others.

Design element	Options		
Land use	*Downtown focus*	*Distributed growth*	*Growth near transit*
Energy	*Status quo*	*Green building*	*District energy*
Transportation	*Status quo*	*Reactive*	*Proactive*

Table 5.1: MetroQuest Vancouver's scenario space.

MQ-V's design process included several meetings and workshops where design stakeholders were invited to define and articulate the scenario space and available options for prioritization, and guide the process of visualization. After the beta version was completed in May 2011, the City held two review workshops with key members of the transportation plan stakeholder group whose comments were passed on to MQ-V's development team.

At the very beginning of the design process it became apparent that various design stakeholders had different ideas about the very goals and utility of MQ-V. When stakeholders were asked what they thought were the objectives of MQ-V or what constitutes a successful deployment of MQ-V, answers tended to cluster around three goals: (1) *inform* users about the incipient transit plan, invite them to engage with the plan outside of the virtual space created by MQ-V, and ideally create an "eco-constituency" for the plan; (2) *teach* users about the variables, relations and tradeoffs involved in sustainable urban development; and (3) *gather* public opinion which can then serve as input to the transportation plan. While the co-existence of these goals is not uncommon to designing decision support tools (Moser 2009), it does make evident the differences in strategic priorities held by stakeholders, and, more importantly, the very way in which those strategic priorities reflect two different visions for Vancouver's civic

political culture. While both views share the assumption that political participation is desired, they draw from different characterizations of the public, feature different reasoning and methods for engaging them, and reflect different expectations from participatory processes as a whole. In the terms discussed in chapter 3, each view combines persuasive and participatory (or emergent) elements in a different way. In the terms introduced in chapter 2, these visions are translated into contrasting technical codes that inform and motivate design decisions that result in different interactive experiences.

5.2 Two Approaches to Political Culture

The first approach to designing MQ-V I will call *analytic*. It emphasizes the benefits of involving informed citizens in a 'rational' process of consensual decision-making, thus helping to build citizen competence and contribute to more effective, inclusive and legitimate decisions. The analytic approach aims to improve the public's access to relevant, accurate and comprehensive information under the assumption that a more informed citizenry will be capable of making better decisions. By appealing to a substantive argument for democratic participation – that public participation improves the quality of decisions made (Stirling, 2006) – the analytic approach aims to inform the public and engage them in a deliberative process in order to solicit quality input on how to deal with particular problems.

The second approach, which I will call *deictic*, highlights the communicative benefits of finding correlations between everyday experiences and the premises and principles of policymaking. It seeks to bring differences in identities and predispositions to the surface and create an environment where disagreement become as instructive and valuable as rational consensus. Reflective of the turn to experience, the deictic approach is more sensitive to the relevance of the form and content of communication – the mode of delivery or platform, the language, imagery, narrative, etc. – to the lived experience of the users. Its goal is not so much to inform the public but to create the *experiential resonance* that would help them engage the problem meaningfully; it is about making evident in a non-didactic manner the ways in which the complex set of interrelated environmental, social and economic problems that comprise sustainability politics are made meaningful in everyday experience. This can be done by creating immersive user experiences that reproduce the sensation of 'being there', using

narrative and storytelling, tapping into collective memories, and triggering emotional responses by using evocative examples, resonant metaphors and compelling imagery – in sum, by linking the public's personal experience of the issues with the ways the issues can be addressed in policymaking (cf. Gordon, Schirra & Hollander, 2011). The deictic approach, it follows, is very much about allowing certain experiential aspects of politics to come forth, instead of providing the public with compelling scientific evidence and expecting them to come to rational conclusions. As such, it is more open to emergent, unanticipated outcomes.

In the next section I will describe the philosophical premise of both approaches and illustrate their most important characteristics. My aim here is not to provide a comprehensive account of intellectual genealogies but to show how each approach takes a particular communicative experience and projects from it a model for political participation and a vision of political culture. In this mode, both approaches mobilize ideas developed in other domains – discourse analysis, hermeneutics, literary analysis – to consider human-computer interactions and their political implications. Once we have a more robust understanding of the approaches and the explicit and implicit assumptions behind them, I will return to the sociotechnical sphere and illustrate how the two approaches came to shape the visual components of MQ-V's interactive experiences.

5.2.1 The Analytic Approach: In Pursuit of Rational-Critical Consensus

The analytic approach is heavily influenced by German philosopher Jürgen Habermas's work on communicative rationality and the public sphere. Habermas's position calls attention to both the importance and the insufficiency of lived experience for validating truth claims and in a sense represents a retreat from the vicissitudes of lived experience to the shores of impartial reason. As he writes in *Truth and Society* (2001, p.89):

> Experiences support the truth claims of assertions; we maintain the claim as long as there are no dissonant experiences. But these truth claims can be redeemed only through argument. A claim grounded in experience enjoys provisional backing; as soon as it becomes problematic, we can see that a claim grounded in experiences is not yet by any means a justified claim.

While valid truth claims *can* be grounded in experience, they *must* be discursively redeemable. But what does it mean to redeem valid truth claims in discourse? Here

Habermas points to the consensus theory of truth whereby something is deemed valid if it is agreed upon by informed discussants, thus embodying "rational consensus". Simply stated, truth becomes a matter of *socially achievable consensus* brought about by *ethical procedures*, which are designed to provide optimum conditions for what Habermas calls "ideal speech acts":[173]

> we call a speech act ideal if communication is impeded neither by external contingent forces nor, more importantly, by constraints arising from the structure of communication itself. The ideal speech situation excludes systematic distortion of communication. Only then is the sole prevailing force the characteristic *unforced force of the better argument*, which allows assertions to be methodically verified in an expert manner and decisions about practical issues to be rationally motivated. (ibid., p.97-8; emphasis added)

Importantly, enabling the "unforced force of the better argument" to shine through necessitates a degree of expertise, and requires discourse ethics that foreground equality, open access, evidence-based argumentation, mutual understanding and consensus. Without them truth remains subjugated by power, merely a reflection of the interests of the powerful, and deliberation looks more like an exercise in the manufacture of consent than an emergent process of arriving at shared opinions – nothing like true democratic participation.

5.2.2 The Public Sphere

Habermas developed his model for democratic participation in his earlier work on the public sphere, written as his *Habilitationsschrift* and published in German in 1962.[174] It is well known and remains quite influential despite several important criticisms that

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[173] Webler (1995, p.49) notes that Habermasian discourse ethics are primarily focused on practical/normative discourse, that is, on one particular kind of speech. He suggests that with minor alterations they may also serve to evaluate other types of speech, as long as the following principle is conserved: "no norm can be considered valid unless all those affected can accept the consequences associated, to the extent those consequences can be known". In other words, Habermasian discourse ethics are premised in collaborative procedure-setting for participation, for speaking, for evaluating, and for agreeing.

[174] It is important to note that Habermas's theory of public sphere underwent changes that some attribute to a "linguistic turn" in his thought (see for instance Hirschkop, 2004). My work here refers to the original model.

followed its publication in English in 1989.[175] The work combines historical narrative and sociological analysis to illustrate the emergence, institutionalization and then disintegration of a particular form of publicity noted for the way it featured the "critical reasoning of private persons on political issues" (Habermas, 1989, p.29), very much in the spirit of Kant's *An Answer to the question: 'What is Enlightenment?'* (1784).[176] In Habermas's account, the emergence of the bourgeois public sphere in 18th century Europe was a result of three interrelated processes: (1) the rise of modern capitalism from earlier forms of mercantilism and the corresponding arrival of a popular press first dedicated to transmitting market-related news; (2) changes to the ways private households conducted themselves, in particular the formation of smaller and more intimate bourgeois family units; and (3) the emergence of new literary and artistic forms and the concomitant appearance of reader forums dedicated to critical debates about these new literary forms. The new public sphere replaced a former mode of publicity that was characterized by the authority of absolutist regimes. It injected public scrutiny into political discourse and created new forms of political subjectivity and democratic legitimation. As result,

> a public sphere that without question had counted as a sphere of public authority ... was now casting itself loose as a forum in which the private people, come together to form a public, readied themselves to compel public authority to legitimate itself before public opinion. The *publicum* developed into the public, the *subjectum* into the (reasoning) subject, the receiver of regulations from above into the ruling authorities' adversary. (Habermas, 1989, p.25-6)

The emergence of the public sphere in Europe could thus be seen as a catalyst for much of Europe's democratization, modelling "an important portion of the procedures to which the political exercise and balance of power are factually bound" (p.237). The public sphere, then, crucially shaped the self-understanding of modern European political

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[175] For critical essays on the Public Sphere see Benhabib (ed.), 1996; Calhoun (ed.), 1992; Meehan (ed.), 1995; and Robbins (ed.), 1993.

[176] Kant (2010, p.4) famously wrote: "The public use of one's reason must always be free, and it alone can bring about enlightenment among men".

culture.[177] Its echoes can still be heard in such contemporary political projects as the media democracy movement.

The newly formed public sphere was foremostly characterized by “people's public use of their reason” (p.27), that is, rational-critical public debate became the underlying organizational principle (and signifier) of the public sphere. It was practiced by the members of the bourgeoisie that frequented 18th century English coffee houses, French salons and German table societies (*Tischgesellschaften*), and was underlined by what Habermas notes is “a certain parity of the educated” (p.32):[178] “In the *salon* the mind was no longer in the service of a patron; 'opinion' became emancipated from the bonds of economic dependence” (p.33-4), and the public sphere overcame “state-governed publicity”. In this sense, the public sphere represents the confluence of epistemology and social conditions, more specifically, the way that social arrangements crucially subtend discursive structures. Aside from parity among participants (participants had equal speaking and evaluation rights), these social arrangements were premised in inclusivity (everyone could participate, at least theoretically), and freedom of discussion (all matters of “common concern” would be legitimate topics for discussion). Together they constitute deliberative *fairness*, whose goal is to give equal opportunity to participants to employ what Habermas calls “communicatives”, that is, “to initiate communication and continue it through speaking and responding or asking questions and giving answers, then ... equally distributing the opportunities to put forth interpretations, assertions, explanations, and justifications and to establish or refute their claims to validity” (Habermas, 2001, p.98). When fairness is institutionalized it is often translated into the following three imperatives: (1) ensuring equality of access, expression and influence among participants (the *conditions* for participation); (2) establishing free and open discussion among participants (the *form* of participation); (3) directing effort toward tangible decisions that represent “the general public will” (the

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[177] Habermas has been subjected to ‘historical’ critiques that accuse him of treating the *ideal* public sphere as historical *fact* (see for instance Eder, 1992; Hirschkop, 1999; 2004). That particular debate, however, is beyond the scope of the present work.

[178] This parity between intellectuals, capitalists and aristocrats was exercised quite differently in England and in France. Where in the former women were not part of coffee shop culture, literary salons in the latter were typically organized and run by women.

output of participation).[179] We can conclude that a fair ideal speech situation is one where participants have equal opportunity to affect the discussion's outcome (Webler, 1995, p.47), or in Habermas's (1993, p.50) words: "only moral rules that could win the assent of all affected as participants in a practical discourse can claim validity".

Alongside procedures designed to safeguard the fairness of deliberative processes, the Habermasian model of deliberative discourse also includes the meta-category of *competence*, which concerns the conditions required for mutual understanding – shared knowledge, values and trust – including linguistic competence (grammar, syntax, dialect) and meta-linguistic, contextual or pragmatic competence (Habermas, 1991). Competence, much like fairness, relates intelligibility to the procedures that guarantee its emergence. As Abelson et al. (2003, p.244) explain: "A competent process ensures that appropriate knowledge and understanding of the issue is achieved through access to information and the interpretation of the information. Competence also requires that appropriate procedures be used to select the knowledge that will be considered in the process". While the question of what constitutes "appropriate knowledge and understanding of the issue" is not only circular but also includes normative content (a matter to which I return below),[180] in the final analysis, Habermasian deliberative (rational-critical) discourse is determined by its structure: a pre-discursive epistemological clarification of the terms of communication itself (*communicative rationality*, matching participant *competencies*) and the organization of procedures that guarantee equal and equitable expression (*discourse ethics*, guaranteeing *fairness*). Participants' skills, the information at their disposal, and the way the process itself unfolds are all measured against the procedural soundness of the process, which, as noted above, reflects a drive to reach rational consensus communicatively. As Habermas notes elsewhere, "the success of deliberative politics depend not on collectively acting citizenry but on the institutionalization of the corresponding procedures and conditions of communication" (Habermas, 1996, p.27).

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[179] See also Hamilton & Wills-Toker, 2006, p.758.

[180] How do we know participants had appropriate tools? If rational consensus has emerged. How do we know that the consensus is rational? If the participants had the appropriate tools.

5.2.3 From "the Public Sphere in the World of Letters" to "the Public Sphere in the Political Realm"

While others have noted that the extension of individual rights and the popular institutionalization of private property manifest the political-economic conditions that allowed something like the bourgeois political sphere to emerge,[181] Habermas's account also includes phenomenological and cultural elements that receive less attention despite their import to his position. What I am referring to is what he identifies as the interiorization and consequent exteriorization of a particular kind of subjectivity that was first developed in the "intimate sphere" of "the patriarchal conjugal family", and was later honed in the "world of letters". It is worth recounting in detail for it illustrates how at the bottom of the public sphere model lies a particular "structure of feeling" (Williams, 1977) – an incipient mode of social experience or social Being.

Habermas writes that, "To the autonomy of property owners in the market corresponds a self-presentation of human beings in the family" (1989, p.46). But in what sense does the familial experience of the 18th century bourgeois household prepare for the more complex matrix of interrelations that form the public sphere? Here, Habermas describes the process by which the bourgeois family became simultaneously closely knit (featuring "permanent intimacy") and closed off (more private and smaller), resulting in a shared sense of cultivation and community, autonomy and privacy, and producing a "sphere of humanity-generating closeness" (p.48). This self-image found expression in the conventions and practices of the literary world:

> In the intimate sphere of the conjugal family privatized individuals viewed themselves as independent even from the private sphere of their economic activity – as persons capable of entering into 'purely human' relations with one another. The literary form of these at the time was the letter…. through letter writing the individual unfolded himself in his subjectivity. (ibid.)

Publishing personal letters matured into a recognizable genre (i.e., letter novels), giving rise to a whole new field of artistic writing obsessed with blurring the boundaries between reality and illusion, collectively known as "fiction" (p.50). It was animated by the

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[181] See for instance Hohendahl, 1979, p.94.

way it facilitated a deep identification of readers and literary characters: "The psychological novel fashioned for the first time the kind of realism that allowed anyone to enter into the literary action as a substitute for his own, to use the relationships between the figures, between the author, the characters, and the reader as substitute relationships for reality" (p.51). The new forms of identification unleashed by letter novels were so captivating that they stimulated the emergence of a bourgeoning public discourse about novels and initiated the creation of the first public libraries.

The discursive dynamics of these literary fora were later reproduced in the coffee houses, salons and table societies that were to become the harbingers of the political public sphere. We can describe the process overall, with Habermas, as one in which a "public sphere of rational-critical debate in the world of letters within which the subjectivity originating in the interiority of the conjugal family, by communicating with itself, attained clarity about itself" (1989, p.51). This clarity – a self-image furnished by the experience of privacy and autonomy – was carried into the political public sphere where it produced a mirroring effect: what public sphere members saw in other members was essentially themselves – the same educated, middle class, family-oriented, rational and secular individuals. But while this mirroring effect may result in the kind of shared values and respect for others that enable a public discourse between equals, as Negt & Kluge (1993) argue, it may also become a mechanism for a discriminatory and homogenizing socialization of experience along those very same bourgeois values. To put it differently, the political public sphere that emerges from the newly created self-image of the cultured, privatized bourgeoisie, may externalize and then universalize the sameness of its members – duplicating a particular cultural sensibility (or "structure of feeling") the world over.[182] To what extent, then, can we say that rational-critical discourse represents a genuinely inclusive, democratizing, and potentially transformative mechanism? Is it possible that Habermas's view of language as predominantly a means

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[182] In this mode, Young (1996), identifies in the Habermasian model of deliberative democracy "an imperative for unity", and Mouffe (1999, p.756), suggests that "When we accept that every consensus exists as a temporary result of a provisional hegemony, as a stabilization of power and that always entails some form of exclusion, we can begin to envisage the nature of a democratic public sphere in a different way". One way to pluralize Habermas's notion of the public sphere is to acknowledge the emergence of "counter-publics" in Negt & Kluge's (1993) terms.

to reach agreement (cf. Webler, 1995) effectively obscures the less-than-democratic potentials of deliberative processes that are driven to reach agreement at all costs? Furthermore, such questions also express concerns over what constitutes "appropriate knowledge" or relevant skills in deliberative processes. As explained above, the rationale for Habermasian discourse ethics is the need to allow the "better argument" to emerge. Recall that for Habermas making better decisions (delivering the "unforced force of the better argument") often requires both expertise and the capacity to mitigate the effects of participants' biases. However, as previously formulated by the likes of Weber, Foucault, and the Frankfurt School, when serving as the arbitrator of consensus, reason itself may become a form of normalizing (and hence ideological) heuristic meant to establish firm boundaries around liberal-bourgeois politics. Under what conditions, then, may the preference for expertise that is implicit in rational-critical discourse foreclose instead of potentiate emergent modes of decision-making? When does rational-critical discourse risk effacing differences in knowledges, values and identities and thus losing sight of the different perspectives that contribute to the success of deliberative processes? This is especially important in light of Rancière's (1999, p.29) observation that politics are predominantly about "the allocation of ways of doing, ways of being, and ways of saying". When does the drive for consensus reflect and protect ideological definitions of acceptable experience, thus signifying not the beginning but "the end of politics" (Rancière, 2010, p.42)? Even if they could not be fully answered here, such questions motivate an alternative vision of political culture, to which I now turn.

5.2.4 The Deictic Approach: Dialogism and Otherness

A deliberative (analytic) political culture is one that projects the communicative experience of rational-critical debate onto the political field as whole. The autonomy of the educated individual – the competent citizen in pursuit of rational decisions – frames political participation as a particular form of social experience that is not only desirable but universally so. Politics becomes the site of rational consensus-building, operationalized as a set of procedures designed to mitigate participants' biases and allow the "unforced force of the better argument" to come through. The alternative political culture I want to illustrate here shares the analytic approach's emphasis on sound procedure and strategy of extending a particular communicative experience to model political culture writ large. However, both the communicative experience and the

ontological structure upon which it is based are quite different. The private, autonomous individual that is the foundation of the analytic approach is substituted for a more fluid conception of self that is ontologically tied to entities other than itself. A clear articulation of such an ontological model can be found in Russian literary theorist Mikhail Bakhtin's dialogism.

In Bakhtin's (1981) terms, the rational-critical discourse that stands at the centre of the analytic approach can be seen as an effect of "centripetal forces of language", those tending towards producing a "unitary language" that "gives expression to forces working toward concrete verbal and ideological unification and centralization, which develop in vital connection with the process of sociopolitical and cultural centralization" (Bakhtin, 1981, p.271). A unitary language constrains meaning ideologically, protecting a "firm, stable linguistic nucleus" against the destabilizing effects of polysemy (ibid.) Yet, these unifying forces are always countered by the pluralizing forces of language, what Bakhtin calls "centrifugal forces of language": "Alongside the centripetal forces, the centrifugal forces of language carry on their uninterrupted work; alongside verbal-ideological centralization and unification, the uninterrupted processes of decentralization and disunification go forward" (p.272). Bakhtin calls this state of affairs "heteroglossia" (*raznorečie*): "social diversity of speech types", or, "multiplicity of social voices and a wide variety of their links and interrelationships" (p.263). Simply stated, heteroglossia denotes the simultaneous presence of different languages, viewpoints, voices and meanings. But more importantly, it reflects the insight that *all discourse is social discourse* and therefore all meanings emerge at the intersection of social structures, individual and collective identities. The social nature of discourse has two corresponding dimensions, one located at the level of sociocultural (and ideological) structures, the other at the level of the individual's linguistic expression.[183] I will describe them in this order.

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[183] Bernard-Donals (1994) points out that the two dimensions of dialogism represent the two modalities of Bakhtin's oeuvre: the "social" (Marxian) and the "individual" (phenomenological). The question of how to reconcile these two modes motivates Hirschkop's (1999; 2000) inquiry, from which my own account draws significantly.

In his *Discourse in the Novel*, originally written in 1934-5 and first published in Russian in 1975 (the year of his death), Bakhtin demonstrates the social nature of discourse in a lengthy and comprehensive analysis of the novel, arguing that the latter represents a quintessential heteroglossic text. As with Habermas's public sphere, the analysis of the novel's aesthetics is used by Bakhtin to illustrate a trajectory of discourse, according to which the novel epitomizes a particular socio-historical moment where linguistic heteroglossia can no longer be resisted.[184] As such, the novel manifests a "radical revolution in the destinies of human discourse: the fundamental liberation of cultural-semantic and emotional intentions from the hegemony of a single and unitary language" (p.367). Looking at literary discourse socio-historically, Bakhtin argues, discloses the "organic unity" of style and semantics that is always operative in discourse as "Form and content in discourse are one, once we understand that verbal discourse is a social phenomenon – social throughout its entire range and in each and every of its factors, from the sound image to the furthest reaches of abstract meaning" (p.259). Every linguistic utterance is thus a "living utterance" that

> finds the object at which it was directed already as it were overlain with qualifications, open to dispute, charged with value, already enveloped in an obscuring mist – or, on the contrary, by the 'light' of alien words that have already been spoken about it. It is entangled, shot through with shared thoughts, points of view, alien value judgments and accents. The word, directed toward its object, enters a dialogically agitated and tension-filled environment of alien words, value judgments and accents, weaves in and out of complex interrelationships, merges with some, recoils from others, intersects with yet a third group: and all this may crucially shape discourse, may leave a trace in all its semantic layers, may complicate its expression and influence its entire stylistic profile. (p.276)

It follows that

> The living utterance, having taken meaning and shape at a particular historical moment in a socially specific environment, cannot fail to brush up against thousands of living dialogic threads, woven by socio-ideological consciousness

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[184] Hirschkop (1999) adds that the very condition of heteroglossia depends historically on the creation of national "cultures of print" that simultaneously bear the traces of orality while promoting a new unitary print culture. Thus, "Bakhtin knows perfectly well that heteroglossia depended on the displacement of a controlled Latinate culture by a printed vernacular one with open lines to orality" (p.23; see Hirschkop, 2000 for more on Bakhtin's historicization of dialogue).

> around the given object of an utterance; it cannot fail to become an active participant in social dialogue. (ibid.)

On a sociocultural level, and as demonstrated by the novel, the essence of the living utterance is evident in the gap between the text's explicit expression (mouthed by characters) and its context, or what Bakhtin calls the text's "double-voicedness":

> Heteroglossia, once incorporated into the novel … is *another's speech in another's language*, serving to express authorial intentions but in a refracted way. Such speech constitutes a special type of *double-voiced discourse*. It serves two speakers at the same time and expresses simultaneously two different intentions: the direct intention of the character who is speaking, and the refracted intention of the author. In such discourse there are two voices, two meanings and two expressions. (p.324; emphasis in origin)

It is precisely the gap between the two modes of expression that is the site for the text's deeper meaning, the way it dialogizes the social world within which it was created and is experienced (cf. Hirschkop, 2004, p.53). As Bakhtin writes elsewhere:

> A meaning only reveals its depths once it has encountered and come into contact with another, foreign meaning: they engage in a kind of dialogue, which surmounts the closedness and one-sidedness of these particular meanings, these cultures. (1986, p.7)

The heteroglossic nature of literary texts (in this case the novel), we can conclude, is expressed as its double-voicedness: the way it creatively features gaps between content and context, centripetal and centrifugal forces, on whose background the text's deeper meanings emerges. In this sense, we can say that novelistic discourse is always situated and relational. So while some encounters with texts take place within an environment that promotes a particular, singular interpretation, heteroglossic texts always include elements such as irony onto which alternative, counter-readings can latch. The emancipatory power of dialogue, as encoded in the notion of heteroglossia, lies in its capacity to foreground the co-existence of alternatives, stratifying (or striating in Deleuze & Guattari's language) the discourse and therefore undermining ideologically motivated claims for a singular, monological meaning.

Yet on an even deeper level dialogism retrieves a phenomenological insight on the way self-other relations form the bedrock of consciousness, positing the self as "an event with a structure" (Holquist, 2002, p.21). In *Discourse in the Novel* Bakhtin argues

that utterances always anticipate a response; they are ontologically oriented toward a "future answer-word". Every utterance "provokes an answer, anticipates it and structures itself in the answer's direction" and is thus "determined by that which has not yet been said but which is needed" (1981, p.280). Dialogism assumes responsiveness, represented by the encounter of utterances with the listener's "apperceptive background of understanding, which is not a linguistic background but rather one composed of specific objects and emotional expressions" (p.281). This encounter results in "complex interrelationships, consonances and dissonances" (p.282), manifesting the manner in which "Understanding comes to fruition only in the response. Understanding and response are dialectically merged and mutually condition each other; one is impossible without the other" (ibid.)

The phenomenological insight that every subjective expression relies fundamentally on something other-than-itself is turned by Bakhtin into a signifier of subjectivity *qua* subjectivity. As Michael Holquist (2002) explains, in this sense dialogism denotes a form of ontological relativity – a fundamental de-centering of the self that takes place in every act of expression (which, in a sense, 'bounces' between self and world). "In dialogism, the very capacity to have consciousness is based on *otherness*" (p.18; emphasis in origin). Since in dialogism every utterance anticipates a response, expression always includes – retrieves and manifests – the Other. No utterance is self-sufficient: it always produces a pluralistic simultaneity with other utterances and their corresponding 'selves'. In this mode, what in Kant served to anchor a fundamental difference between self and other – an alienating gap that can never be truly bridged – Bakhtin turns into a powerful mechanism for identification, producing "affirmative alienation" (Hitchcock, 1993, p.206). As Holquist (2002, p.38) concludes, "the most primary of Bakhtinian a prioris is that nothing is anything in itself".

Both in literary (novelistic) and interpersonal dialogue, subjectivity is continuously and fluidly reshaped by a set of dynamic interstices – gaps, consonances, dissonances and refractions – between self and other, social contexts and situated perception. Bakhtin's model of an ontologically socialized subjectivity, it follows, embodies a principle of discursive otherness, a fundamental non-unity that posits in ontological terms the unfolding of the relations between self and Other.

5.2.5 Transformation or Aporia?

When referring to texts, heteroglossia indicates the way meaning-making is a continuous, open-ended (without resolution or closure), decentralized and generative process, where the situated subject's encounter with difference and otherness becomes the very horizon for meaningfulness (unfolding as a kind of co-authorship). When describing interpersonal discourse, it signifies a conversation that is much more open-ended, an emergent discourse whose goal is "to invite meaning rather than impose it" (Hamilton & Wills-Toker, 2006, p.761). A discourse that foregrounds dialogism, it follows, allows participants "to explore more fully the complexities of other people's commitments and perspectives as well as their own" (Black, 2008, p.96) – but do so in a way that allows meaning to emerge through *decentralized interactions*. And it is the valuation of difference that undergirds the transformative potential of such a discursive model:

> when one person says something, the other person does not in general respond with exactly the same meaning as that seen by the first person. Rather, the meanings are only similar and not identical. Thus, when the second person replies, the first person sees a difference between what he meant to say and what the other person understood. *On considering this difference, he may then be able to see something new, which is relevant both to his own views and to those of the other person*. And so it can go back and forth, with the continual emergence of a new content that is common to both participants. Thus, *in a dialogue, each person does not attempt to make common certain ideas or items of information that are already known to him. Rather, it may be said that the two people are making something in common, i.e., creating something new together*. (Bohm, 2004, p.2; emphasis added)

Of course, a discourse that foregrounds dialogism can never guarantee the kind of transformative experience Bohm seeks since, like all other modes of discourse (including rational-critical discourse), it too is constrained by its contexts (Condit, 1989). Insofar as meaning-making is a situated practice, it always involves pre-understandings that reflect the interpreter's position within a particular cultural milieu or "horizon" (Gadamer, 2004). In this sense, whether it grounds speech explicitly or implicitly, "all of culture is implicated in every instance of discourse" (McGee, 1990, p.281). What this means is that no form of discourse can neutralize the effects of history and ideology on individual and collective strategies of meaning-making. Further, as McGee (1990) notes, the very cultural conditions of modernity whereby our society seems much more pluralistic and fragmented produce a kind of discourse that tends to decouple content

from context. “If by ‘text’ we mean the sort of finished discourse anticipated in consequence of an essentially homogenous culture, no texts exist today. We have instead fragments of ‘information’ that constitute our *context*” (ibid., p.287; emphasis in origin). This is a phenomenon painfully familiar to conveners of public participation events: unstructured spaces for expression risk descending into “talkfests” (Lenihan, 2012) – longwinded, aimless speeches and publicly performed soliloquy.

Nonetheless, through the lens provided by dialogism, rational-critical discourse’s consensual thrust risks effacing differences in knowledge, values and experience which give discourse its transformative potential. What may seem to deliberative processes aimed at rational consensus as hindrances or obstacles to arriving at agreement, may in fact be essential components of a truly transformative political discourse. Seemingly unrelated stories, expressions of emotional dissatisfaction, or what may appear as endless attempts to clarify one’s value positions, are not just excesses of rational discourse in need of purging,[185] but may in fact help motivate participation even in more structured deliberative processes (Ryfe, 2005). From the position of rational-critical discourse, however, dialogism’s celebration and perpetual production of difference, the result of which may be the fragmentation of collective meaning-making, seems incapable of advancing discussion toward concrete conclusions. It remains unclear at what point the observation of difference may translate into the collectivity that galvanizes political action. In this sense, dialogism may lead to aporia.

Dialogism, as described above, offers an alternative to the consensual thrust of rational-critical discourse, foregrounding difference as a generative discursive force. Differences in knowledge, values, skills and experience are not to be transcended in order to reach better – more informed, competent, or efficient – conclusions, but are observed and valued. Mutual understanding is pursued but in a more open ended, less “tunneled” manner, allowing it to emerge, so to speak. In this sense, dialogism shares some of the dynamics of what Albert Borgmann (1984) calls deictic discourse. As I describe next, like dialogism, deictic discourse appeals to lived experience instead of

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[185] “Stories are the means by which values are made coherent in particular situations” (Holquist, 2002, p.37; cf. Black, 2008).

aiming to transcended it for the sake of a desired, rational outcome. At the same time, deictic discourse is “guided by an eminent, publicly accessible, and tangible concern which can be pointed up and explained" (p.169), and thus may potentially avoid the kind of aporetic consequences dialogism encounters.

5.2.6 Deictic Discourse

Borgmann (1984) is primarily concerned by what he sees as the diminishing presence of moral concerns in the discourses of technological society, noting “the immunity of technology to traditional moral analysis” (p.167). Lamenting the manner by which concerns about how technology can serve the “good life” tend to get swept aside in favour of narrow questions of efficient commodity production and consumption, he notes that when moral critiques of technoscientific practice are introduced as questions of honesty, compassion and fortitude, they are easy to disregard since they seem too lofty, subjective and irrelevant to the idiomatic scope of the technological paradigm. Because the terms of moral critique lack cogency and “its insights cannot be procured” (that is, do not lend themselves to the kind of controlled utility material commodities possess), “This leads to the ironical circumstance where a practice that is based on cogent insight and embodies a commitment to control is to be questioned by a kind of discourse that is forever contestable” (p.174). The problem he wishes to tackle, then, is “how is one to travel the distance from the morally self-sufficient posture of the technological society and its insistence on effective procedures to a transcendent moral standard and social ideal?” (p.175).

The answer, Borgmann suggests, is to address the entanglement of moral and technoscientific concerns with a mode of discourse that refuses to adopt technoscientific modes of explanation, avoiding the kind of forceful cogency that he identifies with apodeictic (deductive) or paradeictic (inductive) rhetoric, but that still manages to articulate moral critique in ways that ring truthful to the public. In this mode, deictic discourse “does not strive after cogency since it cannot, nor does it wish to, control its subject matter” (p.169). It is disclosive but non-didactic, putting forth a “softer” combination of self-validating testimony – self-validating in the sense that it does not

need to be "discursively redeemable" (in Habermas's terms) – and sympathy-garnering appeal; replacing outright *persuasion* with *demonstration*. In this sense, deictic discourse seeks to raise concerns and significances, not assertions and facts; it is phronetic,[186] and "explanatory and in a good and common sense of the word. It illuminates what concerns me and, if successful, provides you with an understanding that will move you to act as I have been moved" (pp.180-1). Instead of mobilizing persuasive – cajoling, threatening or overwhelming – measures, deictic discourse points to common experiences, drawing "continued strength from something that is present visibly, forcibly, and in its own right", in order to "address others by inviting them to see for themselves" (p.178). Thus,

> Speakers of deictic discourse never finally warrant the validity of what they tell but point away from themselves to what finally matters; they speak essentially as witnesses. Enthusiasm gives deictic discourse the force of testimony. Sympathy requires that one testify not simply by setting out in some way what matters but by reaching out to the peculiar condition in which one finds the listener, by inviting the listener to search his or her experiences and aspirations; and so one ensures that the listener is as fully engaged as possible by the concern to be conveyed. Sympathy gives deictic discourse the force of appeal. (p.178)

By bringing tangible experiences to bear on issues of moral significance, deictic discourse attempts to avoid the "confusion and chaos" that Borgmann identifies with more traditional moral arguments. In this mode, political discourse based on deictic principles, "forcefully reaches out to its listeners, takes account of their situation, and searches out the strongest existing bonds between the audience and the matter of concern. Thus it is most likely to create conditions of collective assent and the basis of common action. But it does so by referring to the ultimate concern itself in general and common terms" (p.179). Differences in knowledge, values and experience are not cast aside but worked through in order to find common significances and articulate collective concerns. So while rational-critical discourse may focus on the instrumental exchange of information and opinion, promoting expert-driven argumentation aimed at persuasion,

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[186] "We will see that in their role as *phronesis*, the social sciences are strongest where the natural sciences are weakest: just as the social sciences have not contributed much to explanatory and predictive theory, neither have the natural sciences contributed to the reflexive analysis and discussion of values and interests, which is the prerequisite for an enlightened political, economic, and cultural development in any society, and which is at the core of phronesis" (Flyvbjerg, 2001, p.3; emphasis in origin).

deictic discourse is much more attuned to those predispositions that crucially shape participants' opinions and concerns. Its existence makes apparent (instead of sweeping aside) the tension that underlies all deliberative processes, between the contrastive imperatives of *difference* (a plurality of voices, views and knowledges) and *unity* (a sense of collectivity garnered by the collaborative event), or as Pearce & Pearce (2004, p.55) phrase it, "between standing one's own ground and being profoundly open to the other". In this sense, deictic discourse seems more suitable to addressing those questions that elude the rational-critical mode of address, questions of well-being, care and the good life, which are the makings of sustainability. A political culture that draws from deictic discourse, it follows, allows difference to emerge and restores the weight we normally give to everyday experience not in place of, but in addition to the emphasis currently given to 'rational' argument.

To briefly summarize the discussion so far, the analytic approach (based on rational-critical discourse) aims to build understanding and form consensual solutions by extracting (ideally and methodically, but never completely) participants out of their everyday life contexts (Habermas, 1993, p.7-8) and by boosting the competence participants require to reach informed agreement. While the pursuit of informed agreement should not be discounted, for it promotes rational solutions to complex technical problems, in the process of shifting from experience to rational consensus (recall Habermas's position that experience is not sufficient to validate truth claims) the way otherness and difference are valued may be lost in the thrust of what may transpire as monological discourse. The comparative weight of expertise, we may say, skews discourse away from more experientially resonant modalities. The deictic approach, on the other hand, builds on participants' everyday experience under the assumption that acknowledging the inseparability of values, identities and emotions from political decision-making is not an avoidable phenomena. Its thrust is not so much the reaching of agreement as the facilitation of meaningful experiences that may leave participants with a lasting, politically salient impression. However, discourse based on the principles of dialogism alone can easily escalate into self-absorbed yet publicly performed soliloquy. It is also not entirely clear when and how the celebration of difference may translate into the collectivity without which political interventions remain fanciful, or, in other words, when dialogue produces sympathy and solidarity (consolidating something like the multitude in Hardt & Negri's terms). While these challenges are partially

addressed by deictic discourse's orientation towards common experience, concerns and significances and mobilization of enthusiasm, sympathy and tolerance, the question of its applicability needs to be considered. Clearly not all matters of concern are best approached through deictic principles. It seems that neither approach is self-sufficient. Yet, although they are considerably contrastive, they may be reconciled as different 'moments' within larger processes of political engagement (Black, 2008), or as part of what French philosopher Gilbert Simondon (1958) calls "concretization". I return to this subject after illustrating how several of the characteristics of both the analytic and the deictic approach informed the design of MQ-V's visuals.

5.3 Analytic and Deictic Visualizations

Part of its procedural rhetoric, MQ-V's representation of reality includes the model it uses to formalize the set of interrelated variables that make up the "source" world, and the symbolic and interactive affordances it provides its users as a means to explore that modeled world. To a large extent, the linking of virtual and physical space is done through a set of visualizations that give these interrelations tangible form. My aim in this section is to trace the way MQ-V's visualization was shaped and, as result, expresses the two approaches – the *analytic approach* that seeks to engage, inform and then poll participants as competent rational agents, and the *deictic approach* that seeks to offer participants meaningful experiences that make explicit the entanglement of values, identities and knowledges that animate political dispositions. This will allow us to relate particular design choices to competing technical codes and, by extension, to alternative images of political culture. But first, a brief discussion of perspective will help contextualize the more detailed analysis that follows, in questions of experience and subjectivity.

5.3.1 Perspective

Perspective can be defined as the set of conventions required to formalize a stable, consistent and familiar system of sensorial representation (Ivins, 1975).[187] It

[187] On perspective in general see Gombrich, 1972; and Panofsky, 1997.

entails both the use of duplicable, invariant pictorial *symbols* to represent sensorially registered visual elements, and a systematic *grammar* that makes it possible "to establish logical relations not only within the system of symbols but between that system and the forms and locations of the objects that it symbolizes" (ibid., p.13). The result, Panofsky (1997) writes, is "spatial unity": a stable structure or "picture plane" that fixes the relations between visualized objects and the world they populate. As such, perspective transforms "psychophysiological" (visual, tactile, directly experienced, aggregate) space into "mathematical" (infinite, unchanging, homogenous, systematic) space. While perspective establishes the rules for depicting the visualized environment – objects and their relations – it also has significant implications for the spectator's self-perception. This is because perspective is tied to the spectator's point of view: on the one hand, the spectator's point of view anchors perspective (perspective is always perspective *for someone*), and on the other, the spectator's point of view is derived from the visualized field: the viewer's position is determined by the image's perspective. As Manovich (2001, p.112) puts it, perspective effectively "imprisons" the viewer, fixing their position in a visual field that extends all the way to the image's vanishing horizon. In this sense, perspective binds the material objects of vision and the social-symbolic forms that give vision meaning: the 'objective' represented world and our 'subjective' perception of it. Since, as Crary (1990, p.5) observes, vision, or more accurately, the embodied spectator "is both the historical product and the site of certain practices, techniques, institutions, and procedures of subjectification", perspective, as the nexus of vision and world, is a dynamic symbolic form (see also Panofsky, 1997).

Take for instance what Martin Jay (1988, p.5) identifies as the expression of "the 'natural' experience of sight valorized by the scientific world view" in Cartesian perspectivalism.[188] To Jay, the "geometrically isotropic, rectilinear, abstract and uniform" concept of space reflected in the 'classic' perspective discovered by Alberti (and later developed by Viator and Dürer)[189] was taken as an "objective optical order", a

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[188] Jay (1988) differentiates between the Renaissance's rationalizing Cartesian perspectivalism, the rich description that characterizes seventeenth century Dutch painters, and the spectacular, "ocular madness" of the Baroque.

[189] But see Gombrich (1972, p.171) who argues that it was Brunelleschi who invented linear perspective.

“transparent window” (p.6; 7) through which nature can be glimpsed *as it is* (cf. Friedberg, 2006, p.1). Cartesian perspectivalism thus embodies Dürer’s very definition of perspective as merely “seeing through” (Panofsky, 1997, p. 27): a form of concealed mediation. Since the beholder’s eye was singular (not binocular) and static (unblinking and stationary), such perspective manifests a disembodied and dispassionate (and therefore ‘rational’) gaze. In this mode, Norman Bryson notes, “the gaze of the painter arrests the flux of phenomena, contemplates the visual field from a vantage point outside the mobility of duration, in an eternal moment of disclosed presence” (cited in Jay, 1988, p.7). The widening of the gap between spectator and image effectively decontextualizes the latter while increasing its autonomy (ibid., p.9), but it also gives the spectator a sense of fixed exteriority: what the spectator sees remains outside of its sphere of immediate influence, a reality seemingly unchanged by the spectator’s gaze. When this feeling is internalized we get something like the tenets of a modern scientific subjectivity that prided itself on its capacity to remain outside the field of phenomena it observes and dissects (see Ivins, 1975, pp.12-13). The choice of perspective, we can argue, represents an epistemological and ideological position on a field that stretches between visual “truth” and visual “experience” (Crary, 1990, p.14), reflecting a degree of commitment to what Van Gough derisively called “stereoscopic reality” (in Gombrich, 1972, p.438). So not only does perspective order the represented world, it does so while reflecting back on the viewer and interpolating them into the depicted world. The viewer and the image are mutually constituted.

5.3.2 Positioning the Viewer: Location and Scale

Throughout the process of MQ-V’s design, stakeholders discussed the interrelated questions of perspective, positionality and scale, weighing the benefits of two potential points of view: (1) a bird’s eye view that is higher in altitude and farther from the image’s centre (see figure 5.3); and (2) a street level view which locates the user within the visualized field at more or less normal height (see figures 5.4 and 5.5, below). While earlier, GIS-based decision-support tools relied almost exclusively on a map perspective, with the increased adoption of 3D visualization techniques immersive

perspectives can now be found complementing map views in several tools and games.[190]

Figure 5.3: Bird's-eye view of transportation corridor and hub (visuals created by Nick Sinkewicz; image courtesy of City of Vancouver).

A bird's eye perspective gives users a more comprehensive view of the transportation corridor, situating the transportation hub in a wider context that includes adjacent neighbourhoods and green spaces. It therefore may communicate high-level tradeoffs more effectively (especially the relations between land use density and the designation of particular roads as fast transit corridors). It also implies an external viewer position, that is, the user is located outside the visualized space, divinely floating in high altitude. As such, a bird's eye perspective seems like a more effective way to detach

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[190] See Scenario 3D from Pathways for a representative example: http://placeways.com/communityviz/productinfo/scenario3d (last accessed May 13, 2013). To some extent the addition of immersive visual perspectives has been accelerated by the popularization of Google Earth. Immersive visuals are also part of the latest SimCity version (2013).

users from the everyday settings and circumstances that may hamper their ability to be impartial participants, preparing users to make decisions in a more 'clinical' manner. On the other hand, a street level view where the viewer's location is more congruent with their everyday experiences of urban space is much more immersive, inviting and relatable, for after all, most city dwellers do not fly over their city but walk its streets.[191] So while from the analytic approach a bird's eye view seems preferable, it may erode the users' capacity to translate their everyday experiences of urban space, which, to a large degree, shape their opinions on urban policies, into debatable propositions (or discursively redeemable communicatives in Habermas's terms). The difference in scale may simply be unbridgeable. Instead, a more immersive point of view may furnish participants with a set of relatable images and narratives around which to evaluate and reconstruct their understanding of the situation. It may not only resonate more closely with users' everyday experiences but also help disclose the socio-cultural tropes that make these experiences meaningful: the movement between familiar and unfamiliar experiences may trigger moments of reflexivity. In any case, the fact that both approaches were equally valuable was reflected in the decision to use both positions and scales. This did, however, significantly increase the amount of visuals from 27 (one per each scenario) to 81 (three per each scenario).

Positionality is inseparable from location (or locale), that is, the question of where to locate the user geographically. On the one hand, "The ability to localize and ground the information by detailed depiction of recognisable and well-known sites as they would be seen by local residents or users" (Sheppard, 2005, p.640), is considered a key element in the process of linking perception with action (Grotzer & Lincoln, 2007; Leiserowitz, 2006; 2007; Nicholson-Cole, 2005). Simply stated, we are much more inclined to move into action when we recognize the effects of the issue on a concrete and not abstract environment, allowing us to fit what is otherwise abstract information into existing frames of reference (Bruner, 1990; Shapka, Law & VanWynsberghe, 2008). On the other hand, designers were concerned that making the locale recognizable will

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[191] Interestingly, some stakeholders were concerned about the height of the street level view for fear that triggering the sensation of someone "sitting in traffic" may bias user perceptions and opinions.

not only bias user responses (a form of NIMBY-ism), but may give the impression that the City is already committed to developing particular sites and thus potentially provoke citizen pushback. This was especially the case when it came to visualizing downtown Vancouver, where designers argued that providing only a small, abstract and mountain-less view of the downtown core was the best way to keep its recognizability in check and thus help avoid questions about particular development sites (see mid-left-hand side of figure 5.3). So while a recognizable locale may have been preferable for providing users with the most accurate and relevant information, thus allowing them to make more informed and competent decisions, a more abstract locale may reduce political fallout – as long as the visualized environment maintains familiar landmarks. At the end, designers chose to base all three views on a real existing location, but some of the location's features were intentionally altered to reduce recognizability. It was familiar but not identifiable, realistic but not real.

5.3.3 Realism

Visual realism pertains to the aesthetic conventions that relate visual representations to the world they depict on a spectrum that spans between an abstract, expressionistic image and one that is photorealistic (or isomorphic). The crux of the matter, then, is style and not indexicality per se, that is, not *whether* visual objects correspond perfectly with the real objects they depict, but *how* they correspond, i.e., whether that relation is plausible and convincing, and therefore credible.[192] The question that captures visual realism, then, is whether visually depicted objects look and feel as if they belong in the real world: can users situate them in a concrete reality without relying too heavily on their imagination (although some filling-in is always required)? A related issue is the degree of realism that characterizes the relations between the visually depicted objects: as long as cause and effect and other forms of mutuality submit to real world principles, diagetic consistency (which is a condition of realism) can be maintained.

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[192] Coupling realism with plausibility explains why such disaster films like *The Day After Tomorrow* did not register the kind of politically potent effect some may have expected (see for instance Hart & Leiserowitz, 2009). The film was simply not credible enough (Sheppard, 2005, p.642).

As a stylistic marker, realism clearly affects the visual experience, however, it does not necessarily determine it. McMahan (2003, p.68), for instance, notes that “Most scholars and scientists seem to agree that total photo- and audio-realism is not necessary for a virtual reality environment to produce in the viewer a sense of immersion”. So while realism may contribute to stronger immersive experiences, its effects depend on other elements such as the consistency and extent of the interactive responsiveness afforded by the visual/virtual environment, and the social dimensions of immersion (Gordon, Schirra & Hollander, 2011). Lange (2001, p.180), using flight simulators as an example, argues similarly that, “even simulations with a lower degree of realism can still contain the most important information needed for a specific purpose”. The question is, what is “the most important information” to the user: is it the information that grounds their thought processes in the actual, concrete environment, or is it the information that may trigger strong emotional resonances and therefore compel users to re-evaluate their positions? In the terms used above, is it information that designers deem necessary for making rational, analytical decisions, or is it information that communicates deictic elements – experiential narratives, images and metaphors? Since “realistic representation will lead to more direct and more robust knowledge construction” (Furness et al., cited in Sheppard, 2005, p.646), from an analytic approach a highly realistic environment that simulates as accurately as possible the relevant site is preferable. To a certain extent, more realism would also comply with the deictic approach as it may strengthen the experiential quality of the engagement, creating emotional resonances that may contribute to a stronger sense of identification and urgency (Finger, 1994; Grotzer & Lincoln, 2007; Leiserowitz, 2006; 2007; Weber, 2006). The question, then, is *how* realistic should the visuals be: should visualizations derive exclusively from a set of ‘scientifically valid’ representations (bolstering the visualization’s credibility and “defensibility” in Sheppard’s terms), or could they maintain “defensibility” while using less realistic representations? Can users perceive the relations between land use, energy and transportation even in a visual setting that blurs their origins in the “source” world? MQ-V’s designers were unanimous that a certain degree of realism was required to tie MQ-V with its real world site, so while the option to use a more cartoonish style was tabled, the overwhelming majority view was that since visual realism can be perceived as indicator of the scientific validity of the scenarios, more realism is preferable. This was further expressed in discussions on two related concerns, namely, keeping the visualized building topology with already existing standards

(focusing on low-mid rise development (up to 12 stories high)), and avoiding visualizations of non-realistic policy options (such as reallocating road-space away from cars altogether).

There was, however, one area in which realism was not a significant concern. When it came to indicating graphically some of the important changes caused by particular scenario choices, designers felt comfortable using non-realistic colours to draw users' attention to some of the most pertinent transformations. For instance, bike lanes were coloured bright blue and "green" (LEED certified) buildings were coloured bright green (see figure 5.4). A less realistic visual depiction, as this case shows, may actually increase analytical clarity by nudging users to focus cognitive efforts on what designers perceive as the primary implications of user choices.

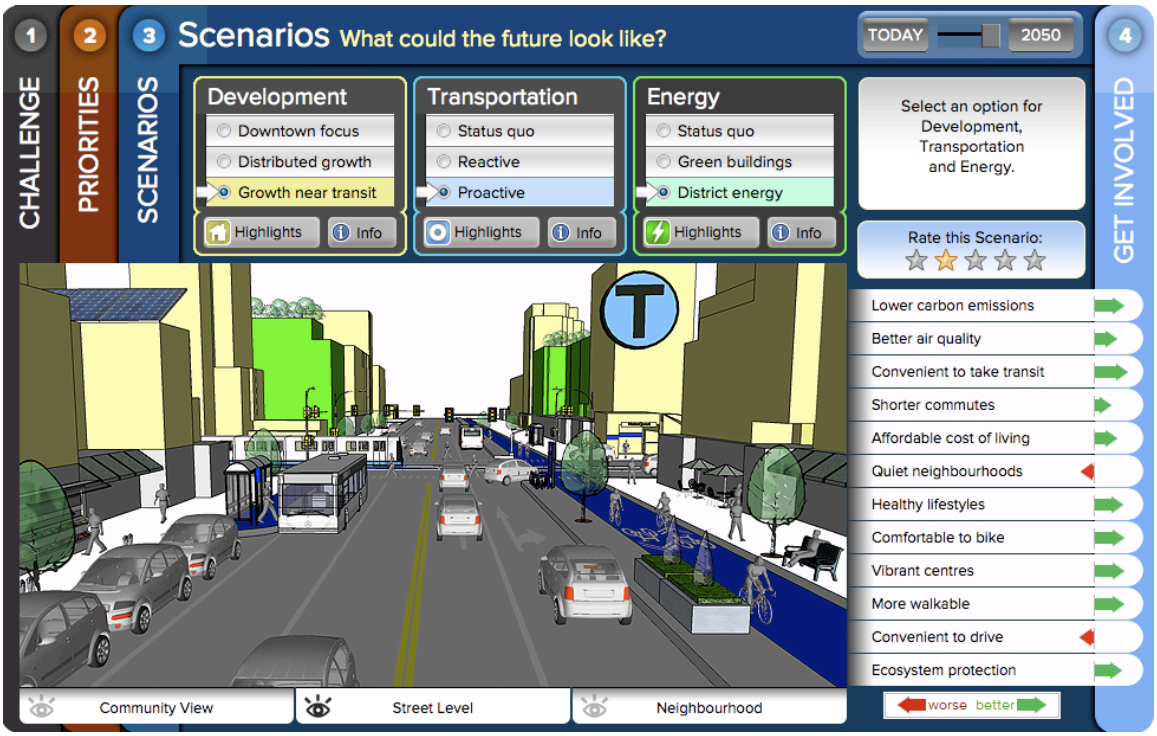

Figure 5.4: Street-level view of transportation corridor and hub (visuals created by Nick Sinkewicz; image courtesy of City of Vancouver).

5.3.4 Detail

Detail, as mentioned above, is instrumental to the construction of realistic representations, but it is also derived from the scope and extent of the model that

underlies the visuals. It also affects the toll of computation since more detail requires more rendering efforts. Since urban design is a highly complex practice every decision involves a sizeable set of variables and outcomes, and includes a large degree of contingency and uncertainty. While we experience this complexity when we navigate the urban environment in our everyday life, we are hardly conscious of all the assumptions and calculations that go into each and every urban design detail that we experience. Recall that one of MQ-V's central objectives was to make this complex array of variables and implications tangible. While this is clearly a large amount of information to communicate, from an analytic perspective, providing the user with all the information they need to make a reasonable choice is imperative. The variables, tradeoffs, indicators and implications are all important for understanding the full extent of sustainable urban planning and thus for being able to rationally weigh options and possible actions. Paradoxically, this amount of detail and complexity may also undermine the user's capacity to abstract from the complex model the most important lessons (the basic rules of urban design), resulting in "cognitive friction" (Cooper, 2004, p.19). Instead of inundating the user with information – even if it is comprehensive and defensible – perhaps a more effective way to communicate complex systems is by producing "teachable moments", moments of heightened attention and concern that enable deeper learning (Hart & Leiserowitz, 2009; see also Lawson & Flocke, 2009). As Finger (1994, p.144) notes, "learning is less contributing to a developmental process than it constitutes a means of giving meaning to experiences". Teachable moments can create meaningful experiences in a non-didactic, deictic manner.

The question remains, however, whether the production of meaningful experiences requires more or less detailed visualizations: how much detail does one require in order to possess the capacity to make an informed decision? What degree of visual detail is required to make the images look and feel real? It seems there are no straightforward answers. Sheppard (2005, p.648-9), for instance, warns that increasing the intensity of visual stimulus by providing more dynamic detail may result in information "overkill" and confusion. Like MacFarlane et al. (2005, p.347), he argues that the degree of visual detail needs to be weighed against the intended effects of the

visualization.[193] This is especially the case when designing visual interfaces for tools that are used in relatively short time intervals, where impressionistic learning is often more common than a generative learning process.[194] MQ-V designers, aware of common use patterns, were adamant about limiting the amount of priorities that the user ranks (and that then serve as indicators for the different scenarios) to twelve, and chose not to inundate users with gratuitous visual detail that although it may enhance the interactive experience may also detract from the cognitive tasks of identifying change in context (see figure 5.5). This reflects their adherence to the notion that the physiological, and consequently, the cognitive perception of change depends on the persistence of invariant elements against which change can be registered (cf. Gibson, 1986). The ratio of static vs. dynamic elements needs to be optimized: too much change may leave important changes undetected.

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[193] There is also a technical problem here as the more detailed the visualizations are, the heavier their computation toll. The need for more intensive graphic rendering contributes to extended loading times and less than optimal responsiveness (which is a crucial component of interactive environments and a major factor in immersion. See for instance McCullough, 2004; McMahan, 2003; Murray, 1997; Sheridan, 2000). Another consequence of attempts to minimize rendering time is that the amount of scenario combinations that could be run is limited. Early versions of MQ "pre-ran" all the scenarios instead of calculating them in realtime.

[194] Based on previous experience in Chicago (cf. Haas Lyons et al., forthcoming), the working assumption held by MQ-V designers was that the average user in kiosks will interact with MQ-V for an average of 5 minutes, while the average online user will interact with MQ-V for an average of 10-15 minutes.

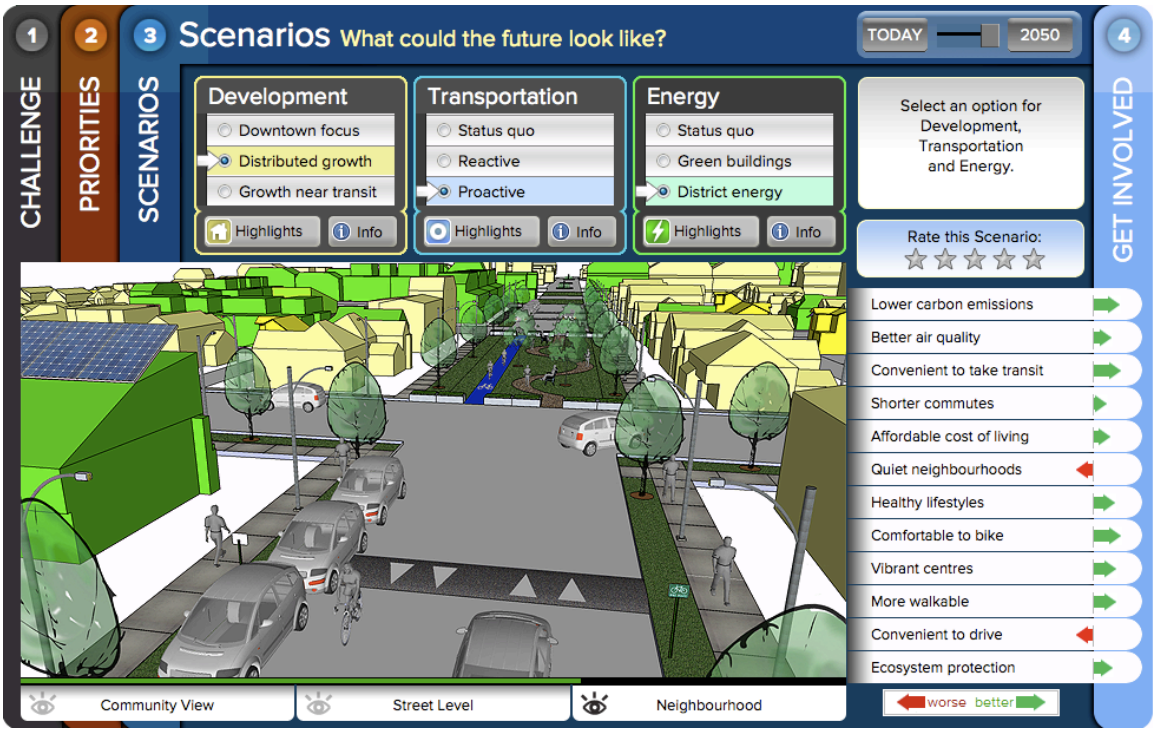

Figure 5.5: Street-level view of neighbourhood adjacent to transportation corridor and hub (visuals created by Nick Sinkewicz; image courtesy of City of Vancouver).

5.4 The Role of Interactivity

This chapter illustrated the way in which MQ-V shares the participatory thrust of sustainability politics, according to which public participation in sustainability policymaking is justified instrumentally (as providing trust and legitimacy), substantively (as improving the quality of decisions), and normatively (as reflecting participatory-democratic ideals) (Stirling, 2006; see section 3.3 above). As previous experience shows, delivering MQ-V on the internet and in kiosks can potentially engage thousands of citizens on urban sustainability policy making.[195] In this mode, the degree to which MQ-V may contribute to new structural allowances for participation hinges on the volume of use (how many users), on user demographics (ideally reaching traditionally under-represented constituencies), and on the political weight the City gives to user input via

[195] In Chicago, MQ attracted over 25,000 users (see Haas Lyons et al., forthcoming).

MQ-V. On the other hand, the meaning of MQ-V is also influenced by the way it contributes to the shaping of political subjectivity, which, it was argued, is mediated by the user experience it affords. In this mode, MQ-V's capacity to affect political dispositions hinges on its ability to reproduce "the sensual, emotional, volitional, and dialogically imaginative aspects of felt experience" (McCarthy & Wright, 2004, p.184) and relate those experiences to political concerns, procedures and outcomes – to create experiences of the political. It does so by modeling the social and material substrate of sustainable urban design, transforming that model into a navigable scenario space (MQ-V's procedural rhetoric), and situating users in a distinct, 'felt' urban environment that influences political identity and agency. Since the images used to visualize the scenario space are a crucial component of MQ-V's user experience, they were the focus of analysis in the latter part of the chapter.

The discussion of MQ-V's visualization strategies illustrated how different choices reflect different interpretations of MQ-V's goals, the cognitive and political traits of its users, and how they may be affected – reflecting different images of political culture, potentiating different modes of interactive world disclosure, and affecting different politically salient subjectifications. In this context, visuals produced from an *analytic* perspective aim to produce a distancing effect that is believed to help users transcend their individual predispositions and biases. Hence the emphasis on 'external', comprehensive view points and accurate, defensible, realistic and detailed visual representations. In this sense, MQ-V brings a citywide perspective to bear on what is increasingly practiced as a neighborhood-centred participatory planning process, allowing users to step outside their everyday experiences and 'think like a city'. Analytically designed visualizations, it follows, promote the achievement of rational consensus by helping to build citizen competence, understood as a set of desirable skills and knowledges. They promote the shaping of 'rational' subjects as means to support disambiguated and frictionless communication, and aim at achieving consensual decisions.

Visuals produced from the *deictic* perspective, on the other hand, aim to provide users with opportunities to revisit their positions and reflect on the experiences, narratives and images that bear on politically relevant decisions. MQ-V's deictic strengths are its capacity to communicate complex information with compelling,

immersive imagery and the way it affords its users with multiple scenarios and viewing perspectives, balancing static and dynamic visual details, and unfolding a plurality of futures. The use of an 'internalist' view point, immersive images, a degree of realism that avoids cognitive friction and just enough detail to make the visualized world seem familiar, expresses the deictic strategy of showing instead of telling, and makes MQ-V's user experience compelling and meaningful. Furthermore, insofar as deictic design may provoke a reflection on the kind of questions that are considered political to begin with, it may shed light on political practices that are chiefly concerned with the maintenance of the political status-quo (or policing the boundaries of the political, as Rancière holds). A political culture that foregrounds deictic elements may help restore to lived experience its political value *institutionally*, and thus resist the discriminatory normalization of a very particular form of (deliberative) discourse with its correlative roles and rules.

There are clearly important differences between the analytic and deictic approaches to interaction design, and these contrasts posit them as possible theoretical and ideological antinomies. Yet, there are also ways in which the two approaches may combine, either as 'moments' within the larger interactive flow (as exemplified in the capacity to switch between views), or as coinciding, convergent imperatives (as with the choice of a realistic but not real locale as geographical premise for the visuals). I have also noted the co-existence of the two approaches in the brief discussion of the language used to articulate the priorities which users are invited to hierarchize before generating scenarios. MQ-V's capacity to provide users with both analytic and deictic cues, essentially enrolling them into the political decision-making space under both aspects, is one of its most important strengths. Interactivity, in this mode, is what allows the co-existence of both analytic and deictic technical codes, giving users the possibility to dynamically experience sustainable urban design from both perspectives. In this sense, MQ-V's interactivity demonstrates what French philosopher Gilbert Simondon (1958) calls "concretization": the way the process of technological evolution – the selective materialization of *abstract* potentialities into a particular, *concrete* object – features the structural integration of disparate, sometimes contrasting functionalities into a singular technical framework. "The essence of the concretization of a technical object is the organizing of functional sub-systems into the total functioning" (1958, p.31). In this sense, technical evolution is akin to a process of convergence "according to a principle of internal resonance" (p.13), whereby instead of seeking compromise, divergent design

requirements, along with secondary effects and unforeseen resistances, converge in synergetic bi-valence. This, Simondon explains, is the case with cooling gills in modern engines. Whereas in old engines cooling gills served exclusively to reduce the engine's temperature, in newer models they assumed an additional, more mechanical function, helping to strengthen the engine's physical structure. The same, singular element now functions in two seamlessly integrated manners. MQ-V's interactivity functions similarly, combining seemingly disparate visual strategies into a single interactive experience.

6.
Conclusion

> [T]echnology is not a thing ... but a scene of struggle. It is a social battlefield.
>
> –Andrew Feenberg[196]

[196] 2002, p.15.

6.1 Contributions

This dissertation suggests that environmental communication would benefit from a more nuanced understanding of the political significance of new digital technologies – the ways in which they enroll the public into environmental politics. Such an understanding would relate the politicizing potential of new media as means to increase and support democratic participation in environmental politics, to the kind of interactive experiences they afford. Drawing from phenomenological approaches to the philosophy of technology, in chapter 2 digital technologies were discussed as mediations of environmental citizenship, quasi-environments within which users may disclose the properties of political culture and their own potentials as political actors. I called the effect such meaningful interactions may have "interactive world disclosure", and explained that it includes existential (ways of being), cognitive (ways of perceiving and knowing), social (ways of relating within sociolinguistic contexts) and actionable (ways of evaluating and acting) dimensions. Interacting with new media, therefore, can open up ways to perceive the political, to question the assumptions upon which it is based, and to potentially act within and, more importantly, upon it. The latter possibility, reflecting a more radical or transformative approach to political change, resonates with what DiSalvo (2012) calls "political design", in contrast with a more conservatively oriented approach he calls "design for politics". While design for politics "most often works to improve access to information (such as public health information of information regarding organizations and candidates) or to improve the access to various forms of ordered expression and action (such as petitions, balloting, and voting)", political design "reveals, questions, and challenges conditions and structures... opens a space for contestation" (p.8). It denaturalizes existing power structures and communicates experientially the possibility of a different state of affairs.

In chapter 3 the political motivations behind the design of interactive experiences – the ideological orientations of what Feenberg calls "technical codes" – were contextualized in the twin responses of environmental communication to the decline of the dominant communication paradigm (the information deficit model). The pursuit of more effective and persuasive communication strategies, and the impetus to expand democratic participation in environmental politics, were explained as an outcome of the urgent need to enact large societal changes in response to the scope and extent of

environmental issues. They were also explained as part of an incipient “turn to experience”, where creating resonant experiences, and consonance between everyday experiences and the issues that underpin environmental politics, are fast becoming a focal point for environmental communicators. The turn to experience, explained differently, foregrounds the relation between political culture – the interstices of political institutions and political consciousness – and what Williams (1977) calls a “structure of feeling”. While persuasive and participatory strategies (with emergent outcomes) may contrast with each other and produce mutually-undermining effects, they can also co-exist as mutually-enforcing ways to enroll the public into environmental politics and to catalyze what Rancière calls political subjectifications. Working together, persuasive and participatory communication modalities may increase both the reach and the extent of political enrolment by better communicating the urgency of environmental issues while helping to build the public’s political self-efficacy. The ideal result is a new, greener political culture that is more suitable to promote sustainability.

As chapters 4 and 5 illustrate, the lynchpin that holds together interactive experiences and political enrollment is the process of sociotechnical design. It is here that ideas about the political culture best suited to promote sustainability and about the role of users as political agents are made particular (even if not always explicit), and translated into technical affordances – manifesting the technical codes of interactive experiences. Two dimensions of interactive experiences were used to exemplify the political underpinnings and significance of interaction design: the design of *politicizing experiences,* that is, interactive experiences with political resonance, and the design of *experiences of the political*, where political issues are communicated in ways that are consonant with everyday experience. They each represent a manifestation of the turn to experience in environmental communication.

The design of politicizing experiences was explored in chapter 4 through an analysis of the ways interactive structures are used to create immersive experiences with political implications. Two such interactive structures were contrasted and exemplified with the analysis of interactive installations and “serious games”: linear structures that “tunnel” users through a set of predefined decision points toward particular, potentially politicizing goals, and rhizomatic structures that evoke a mixture of anxiety and comfort that may promote reflection with politicizing potentials. The

underlying argument made in this chapter is that while both interactive structures may produce politicizing effects, the way interactive flows based on “rhizomatic wandering” structures promote more “complicated pleasures” render their politicizing effects especially intriguing, and perhaps more useful for triggering considerations of the political framework itself. In this sense, rhizomatic wandering seems to resonate with “political design” more than with “design for politics”. It is also more compatible with communicative modalities that encourages emergent, unanticipated outcomes.

Chapter 5 focused on the design of continuities and resonances between users’ everyday experiences and the premise of sustainability urban policymaking. An analysis of the visualization strategies of a sustainability decision-support tool was used to illustrate the positioning of users within two alternative political viewpoints: one that foregrounds rational (critical or analytical) discourse aimed at informed consensus building, and one that is based on dialogism and deictic discourse and is more tolerant to differences in participants’ knowledges, skills and experiences. Building on the contrasting ways Habermas and Bakhtin understand dialogue, the chapter argued that while designing interactive structures from an analytic approach may usefully advance the discussion toward operative conclusions, it may also efface some of the fundamental differences in perspective that are needed to make sustainable politics truly participatory. What I called deictic design locates those differences in experience, identity and worldview at the heart of the procedural-rhetorical production of politically relevant interactive experiences, replacing persuasion with demonstration as the key rhetorical operation.

While neither chapter exhausted the many ways in which interaction design may facilitate political enrolment by affecting political subjectivity, they help illustrate a method of analysis that combines the social orientation of critical theory with the conceptual lenses of the phenomenology of technics. As such, this dissertation makes two distinct contributions to knowledge, each oriented toward a particular academic discourse.

In the context of environmental communication, this work augments existing accounts of the participatory, democratizing possibilities proffered by new media technologies with a more nuanced way to account for their potentially politicizing effects. While previous accounts focus on the informational, discursive and coordinative (or tactical) uses of new media, this work focuses on the latter’s capacity to evoke

interactive experiences aimed at political enrolment. The shift of focus from *how* new media can be used, to *what* new media can do, and the concomitant concentration on the experiential – resonant, felt, meaningful – dimensions of interactivity can be seen as part of a larger shift or "turn to experience" in environmental communication. As described in detail in chapter 3, this shift contrasts with the logocentrism, unidirectionality and focus on individual behaviour that characterize the previous communication model, and is evident in the increased attention environmental communicators are giving to questions of culture and identity, social norms and practices, emotional resonance, the use of metaphor, narrative and imaginative faculties.

In the context of sociotechnical design, this work responds to recent calls to address questions of collective politics (or scale-making) in processes of interaction design, and augments current work in critical design with a more developed account of politicization. Within this account, what I called political enrolment encompasses the various process that aim to raise the public's awareness of the underlying issues and provide them with tangible, direct and indirect ways to participate in political decision-making. Insofar as political enrolment may engage a range of possible dispositions, choices and actions, its outcomes are affected by the degree to which actors may choose to act, in Latour's terms, either as intermediaries or as mediators. While the former indicates the kind of political involvement that takes place within existing political conditions and ultimately conserves them, the latter indicates a more transformative mode of political action that takes aim at the very premise of the political. To enroll into sustainability politics in this sense, would imply considering and acting upon the very social and cultural conditions in which political action may indeed materialize. In Rancière's terms, action aimed at perceiving politics *as such*, is a function of successful processes of political subjectification: the self-perception of political actors that is based on difference and relationality; the rejection of homogenizing political forces (what he calls "the police") and embrace of political heteronomy. Political subjectification can thus be seen as the principle that drives the emergence of new "structures of feeling", and with them the redrawing of political culture as a whole.

Before I present some concluding remarks, one issue that was not addressed extensively in this work needs to be raised, namely the question of user agency over the sociotechnical apparatus itself. When discussing interactive agency in chapter 4, I noted

that there are different degrees of agency and ownership over the interactive structures and processes afforded to users, but have not pursued the issue further. Since this is an important dimension of the potentially politicizing impacts of new media, I revisit the subject here as a way to highlight paths for further research that may sharpen the differentiation between design for politics and political design.

6.2 Participatory Worldmaking

While users may enjoy a range of interactive repertoires – from the simplest navigational toggles to a complex arsenal of actions – they seldom have control over the repertoire itself. Players of the latest version of *SimCIty* (2013), for instance, enjoy a remarkable freedom to construct urban entities that respond to complex and nuanced physical and economic dynamics, but are still unable to contribute themselves to the game's simulation engine. In the same vein, when members of the public interacted with one of the Mashnotes kiosks discussed in chapter 4, their procedural agency was limited to making a simple choice between two conflicting options. They were unable to change the questions or add additional options to choose from. Although MQ-V users (as discussed in chapter 5) have a much larger interactive repertoire at their disposal – they are able to prioritize different elements of urban design, select and compare 27 different scenarios, navigate between different visualizations, and express their preferences by rating scenarios – they too cannot add scenarios, priorities or visual perspectives.[197] Enjoying an expanded interactive repertoire, then, may increase procedural authorship quantitatively, but not necessarily qualitatively. So while users may be able to do more within the digital environment, they remain largely devoid of the powers to shape it. In Murray's (1997) terms, users enjoy less procedural authorship than designers. In Ullman's (1997) terms, they are not as close to the machine.

Referring back to the notion of procedural rhetoric, the question of interactive agency can be addressed through two interrelated prisms: (1) the ability to shape the models that underlie interactive environments, and (2) the capacity to add to or modify

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[197] This was not the case with earlier versions of Metro-Quest (in particular GB-Quest), where the design of the model itself included various stakeholders (see VanWynsberghe, Carmichal & Khan, 2007).

the interactive repertoire (ways to act on modeled objects). Both represent substantial ways to incorporate user preference into the very codes of the technologies used, however, since the benefits and challenges associated with the latter have been comprehensively explored by the HCI community (in both research and commercial contexts),[198] in what follows I focus on the former, that is, on efforts to involve users in creating correlations between the "source" environment and the digital one. In phenomenological terms, we may call this kind of design *participatory worldmaking*.

Significant developments in participatory worldmaking derive in part from the popularity of public engagement approaches that target local communities, the availability of relatively cheap and flexible modeling and visualization tools, and improved access to the raw data required for modelling. While participatory worldmaking no doubt reflects the influence of the social constructivist approach to science, more precisely, what Callon, Lascoumes & Barthe (2009) see as a movement from conducting research in the lab to conducting research in "the wild",[199] it is also grounded in more pragmatic reasons: the need to address the complex and uncertain nature of environmental issues by integrating a plurality of viewpoints (as discussed in chapter 3), and the need to synthesize global and local data, perspectives and responses to climate change into a single comprehensive framework (Sheppard et al., 2011, p.406).

Inspired in part by earlier uses of participatory Geographic Information Systems (GIS) to increase public participation and social representativeness in environmental politics,[200] research units such as the Collaborative for Advanced Landscape Planning (CALP) at the University of British Columbia deploy new media to facilitate bottom-up,

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[198] Early work in participatory design, which came to be known as "cooperative design", emerged in Scandinavia in the 1970s in the context of worker empowerment (see for instance Ehn, 1989). As the issues underlying participatory design became the objects of sustained attention from the HCI community, some of the earlier emphasis on empowerment was retained – especially in such approaches as critical design and community informatics. However, in more commercial contexts, and often labeled "user-centred design", these have largely been substituted for concerns over usability (see Muller & Druin, 2012; Simonsen & Robertson (eds.), 2013).

[199] This is also the rationale behind participatory integrated assessment (Salter, Robinson & Wiek, 2010; Talwar, Wiek & Robinson, 2011).

[200] On participatory GIS see the essays collected in Craig, Harris & Weiner (eds.), 2002, and the chapters of section 5 in Nyerges, Couclelis & McMaster (eds.), 2011.

participatory sustainable planning processes.[201] CALP is often called upon by local communities to assist them in updating their community development plans, especially in the context of adaptation to climate change. While CALP's involvement varies depending on the particular needs of local communities and the conditions under which the engagement process takes place, their collaborative modelling and visualization framework is designed to add scientific credibility (or "defensibility") to the process while building awareness, capacity and agency at the local level.

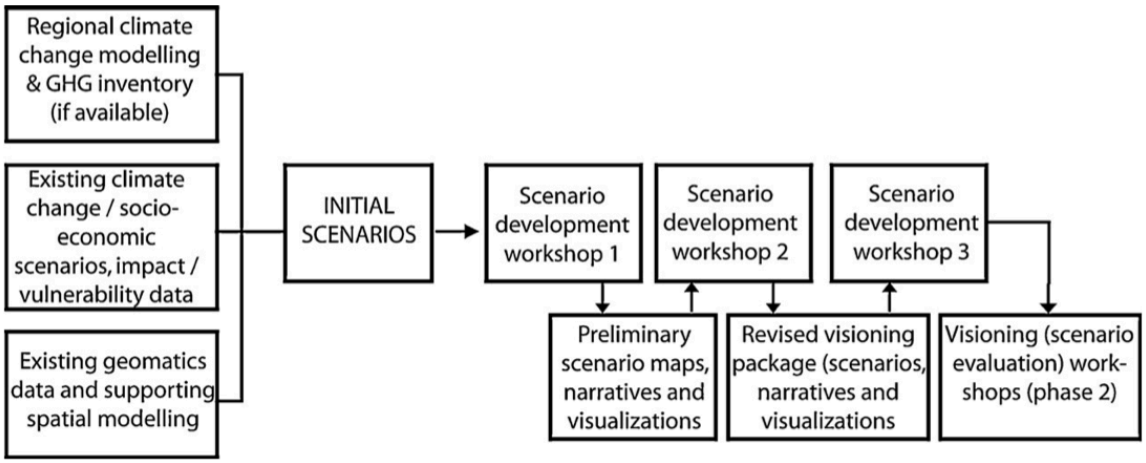

Figure 6.1: A typical workflow for CALP's participatory modeling processes (image courtesy of CALP).

CALP's involvement often features a series of iterative workshops (see figure 6.1) with local working groups whose role is "to help fill key data gaps, develop final scenarios, and advise on visualisation preparation" (Sheppard et al., 2011, p.406). In workshops scientists, practitioners and community stakeholders draw on available data and best practices to combine expert and local knowledge and develop a set of customized scenarios. These scenarios model various localized climate change processes and impacts in relation to available means for mitigation and adaptation, and over time. They reflect a collaborative assessment of local vulnerabilities, policy based and other adaptive capacities, and measures of social acceptability to available action

[201] The following is based on Barron et al., 2012, Bizikova et al., 2011, Sheppard et al., 2011, and interviews conducted with CALP team members.

paths. Scenarios are then visualized using 2D, 3D and 4D tools and techniques (see figure 6.2),[202] and serve to engage the community in discussions over possible decision- and policymaking options. Throughout the process CALP integrates input from local stakeholders into the model, scenarios and visuals, helping to focus the model on the most pertinent elements, themes and conditions as they are perceived by the stakeholders themselves. As Sheppard et al. (2011) note, combining the different sources and perspectives provides a valuable experience for all those involved, "initiating considerable exploration and mutual learning among stakeholders, practitioners, and researchers" (p.409).

Figure 6.2: Two visualizations created by CALP of potential water rising as consequence of climate change in Ladner, BC (visuals created by David Flanders; image courtesy of CALP).

[202] 4D images provide a future perspective, thus integrating a temporal dimension.

CALP's facilitation of engagement processes tend to address stakeholders on the community level. This is largely because both mitigation and adaptation to climate change need to be considered from the perspective of a particular community, reflecting local barriers, challenges and opportunities. CALP's opening up of modelling and visualization processes to stakeholder participation, it follows, is equally directed at advancing social learning and at increasing the local community's capacity to formulate adequate policy responses to climate change. Within this framework, participatory modelling and assessment aim to empower local communities to play a significant part in sustainable decision-making by adding "clarity" (in the words of several members of the CALP team) to the situation, helping communities to "'connect the dots' between global scenarios and local storylines, and between local actions or policies and their consequences under certain assumptions about future global and local climate conditions" (Sheppard et al., 2011, p.409). In CALP's work "connecting the dots" translates into three requirements: first, that bigger-than-self issues be localized, and done so while involving all the relevant stakeholders. Second, that scenarios be built holistically and incorporate as many relevant factors, drivers, impacts and responses as possible. And third, that visualizations promote cognitive and emotional engagement, advance social learning and trigger collective thinking about future action paths.

To a large extent, what allows the convergent materialization of all three requirements – to localize, spatialize and visualize – is the availability of new media technologies. Off-the-shelf applications like Adobe's Photoshop make 2D image editing quick and cheap; 3D imaging programs such as ESRI's ArcScene, Sketch-up, Visual Nature Studio and CommunityViz help create realistic, detailed and easily customizable environments; and platforms such as Google Earth add to 3D environments a more dynamic, immersive perspective. The long anticipated integration of gaming engines to create customizable, immersive and navigable environments promises to turn participatory modeling into an even more compelling activity. Furthermore, modeling and visualization processes rely heavily on the availability of comprehensive and accurate datasets. CALP's scenarios, for instance, often incorporate key biophysical and socioeconomic drivers drawn from the IPCC's Special Report on Emissions Scenarios, from the Millennium Ecosystem Assessment, and scenario's produced by the Global Scenario Group. To these global-scaled datasets, CALP adds regional impact assessment data and GHG emission assumptions produced by local governments and

municipalities. Visualizations may incorporate 3D LiDAR (laser radar) data and urban design forms taken from UBC's elementsdb. While accessing disparate, often partial datasets and molding them into a single model – what Edwards (2010) calls "data friction" – remains a formidable challenge (and the most time consuming activity within CALP's work process), it stands to benefit from initiatives that are part of the "open data" movement, and from the further availability of "open tools".[203]

The participatory processes facilitated by CALP and others like it demonstrate the feasibility of opening up and democratizing even the early stages of sociotechnical design. Instead of merely deploying new media technologies to encourage political participation, political participation becomes co-extensive with the process of design itself. *Design for politics* thus turns into *political design*, materializing aspects of what Feenberg calls "democratic rationalization": when social groups "turn back reflexively on the framework that defines and organizes them" (1999, p.105), making meaningful and effective contributions to the technologies they use. However, so far evaluations of participatory modeling and visualization processes such as those facilitated by CALP have tended to focus on the learning and policy effects of visual communication, leaving questions about the politicizing potentials of participatory worldmaking processes relatively unexplored.[204] With the availability of more flexible tools, increased access to a range of comprehensive and compatible data sources, and by adopting the principles of critical design, participatory worldmaking may become a more popular means to enroll the public in the politics of sustainability. While the question of whether the inherent gap

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[203] "Open data" has a clear connection to political agendas. In the words of BC's Premier, Christy Clark: "Opening up government data and information are key foundations to enabling engagement with citizens by using new technologies to connect the public to government and to one another. Making government data and information available online invites individuals and organizations to transform data and information into tools and applications that help individuals, institutions and communities; and to promote partnerships with government to create innovative solutions to the opportunities and challenges faced by British Columbians" (Province of British Columbia, 2011).

[204] For instance, Sheppard et al. (2011, p.409) argue that "localized visual media in general, and 3D visualisation in particular, can increase engagement, build awareness of complex environmental issues related to local climate change, and foster increased support for climate change policy", but they leave questions of politicization outside the scope of their analysis. Similarly, Schroth (2007) finds that interactive visualizations increase inclusion and participants' cognitive and emotional engagement but does not address explicit political questions about empowerment, voice and self-efficacy.

between designers and users – those who are closer to the machine and those who merely use it – can ever be bridged remains open, participatory worldmaking seems like a step in the right direction.

6.3 Concluding Remarks

In advocating the view that substantial changes to our political culture are necessary if society is to take meaningful action on environmental issues, this dissertation adds its voice to others who (perhaps wishfully) detect a "secret elective affinity between the ecologization and the democratization of society" as Ulrich Beck (1995, p.17) puts it.[205] The kind of challenges we face as individuals and as a collective seem too formidable to be addressed within the boundaries of our current political culture, where self-interest, short sightedness and the drive for profit reign largely unchallenged. Yet while this view may seem almost commonsensical, after all, current environmental efforts within the existing political culture have not yielded the kind of changes we so urgently need, advocating for political transformation under an environmental or sustainability aegis may also testify to a growing "impatience with democracy" as Stehr (2012) puts it. The problem is two-fold: first, it is less than certain that any single political arrangement is inherently better for the environment. Neither a benevolent authoritarian regime as Shearman & Smith (2007) advocate, nor an enlightened socialism as Klein (2011) holds, would guarantee that sustainability becomes integral to political culture. Second, evaluating political culture based on its treatment of environmental issues and advancement of sustainability begs the question of whether these ends justify any means. To put it differently, who gets to decide what are appropriate sustainability policies? Scientists? Politicians? Pressure groups and lobbyists? The public? And what if a constituency for sustainability fails to materialize? What if the measures prove less successful than what is required to avoid runaway climate change? Simply stated, there are no guarantees that the pursuit of a greener, political culture that advances sustainability would deliver a more equitable, democratic

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[205] For Beck (1995) the complexity and uncertainty of modern society require both a more sophisticated approach to natural systems (hence ecologization), and a more reflexive and dynamically adaptive approach to governance (hence democratization).

society. The affinity between ecologization and democratization should be assumed a priori. But while this conclusion may lead some to despair, I believe that it would be much more productive to focus instead on improving those processes that seem most likely to yield the kind of social and political conditions within which solutions to our environmental predicament may emerge. In this sense, this dissertation suggests that the remedy to the perceived lack of attention to sustainability issues in our current political culture is *not* less but *more* democracy, albeit in a more participatory, responsive and transparent form. I point to two potential paths that may help us get there.

First, since transformative politics begin with processes of subjectification, it would be beneficial to proceed by establishing the conditions for a meaningful discussion on sustainability – one that would foreground social, cultural and political elements; would communicate the limitations of current political arrangements when it comes to tackling bigger-than-self problems; would demonstrate the possible roles the public can play in advancing political changes; and would offer an "antidote to political cynicism" by balancing accounts of impending climate doom with inspiring success stories (Gunster, May 3, 2013; see also Turner, 2007). This is much in line with what is coming to be known as the "procedural approach to sustainability" (Robinson, 2004; 2008; Robinson & Tansey, 2006; Miller, 2012), according to which sustainability is seen not as an end-state but as a process with which new opportunities for imagining and realizing sustainable futures may emerge. As Robinson (2004, p.381) puts it,

> sustainability can usefully be thought of as the emergent property of a conversation about desired futures that is informed by some understanding of the ecological, social and economic consequences of different courses of action…. This view acknowledges the inherently normative and political nature of sustainability, the need for integration of different perspectives, and the recognition that sustainability is a process, not an end-state. It must be constructed through an essentially social process whereby scientific and other 'expert' information is combined with the values, preferences and beliefs of affected communities, to give rise to an emergent, 'co-produced' understanding of possibilities and preferred outcomes.

In no small measure, then, the present work can be seen as a partial articulation of the sociotechnical components of the procedural approach to sustainability, an exploration of the ways in which the design of interactive experiences may potentiate, instead of foreclose, the outcomes of such conversations about desired futures.

Second, since the affinity between democratization and ecologization is increasingly mediated by our everyday engagement with new media technologies, it seems crucial that we pay more attention to the ways in which the latter are designed and used. This is, of course, the premise of this dissertation. However, of much importance in this context is what Beck identifies as the marker of the aforementioned affinity – a rapprochement between “the science of data and the science of experience” (1995, p.15). It is here that new media seem to offer a much needed lift to environmental politics by integrating enviro-political considerations into our everyday experiences with interactive media. While the precise role sociotechnical design may play in the advancing of more sustainable futures remains to be seen, it is certain to be formidable.

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