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## Research Policy

journal homepage: [www.elsevier.com/locate/respol](http://www.elsevier.com/locate/respol)



# Organizing the entrepreneurial hospital: Hybridizing the logics of healthcare and innovation

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### ARTICLE INFO

#### Article history:

Received 15 January 2016

Accepted 17 January 2016

Available online xxx

#### Keywords:

Entrepreneurial hospital

Research hospital

Innovation studies

Healthcare policy

Research systems

### ABSTRACT

Contemporary research hospitals occupy a vexed position in the policy landscape. On the one hand, as healthcare providers, they must abide by the logic of healthcare policy, which expects health research to support improved health outcomes and high quality healthcare systems. On the other hand, as research facilities, they are beholden to the logic of innovation policy, which seeks to advance research-driven, science and technology-derived innovations, where industry is the key customer and client. At the intersection of these policy logics, the research hospital must orchestrate a range of interests that may not always coexist harmoniously. Through a detailed case study of a Canadian research hospital, we illustrate organizational efforts to hybridize healthcare and innovation logics. The need to be more ‘business like’ and the expected financial and reputational rewards encourage acceptance of a mandate for technology transfer and commercialization. As well, there is hope that the entrepreneurial turn can serve the hospital’s own mission, by prioritizing the needs of patients and the organization itself as a user of its own innovations. Further, insofar as successful technology transfer and commercialization is a transformative force, it is expected to enable the research hospital to achieve its goal of translational and impactful health research. As we illustrate, there is much optimism that these hybridizing efforts will produce a successful cross. Yet the trajectory of change in the context of mixed logics is necessarily uncertain, and other hybrid futures cannot be foreclosed. More sterile or monstrous outcomes remain possible, with potentially significant implications for the intellectual, economic and health benefits that will arise as a result.

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The health and healthcare sector should be viewed not as a cost to be endured, but as an opportunity to be explored, embracing a vision for Canada to create the most innovative, high quality healthcare system committed to continuous quality improvement . . . It should be the prime and prized example of innovation around the world. Implementing the vision of the health sector as an engine of economic growth will contribute greatly to a sustainable healthcare system (Mayer, 2002).

With the right policy and funding conditions, . . . [research hospitals] can bring more products and services to market and

to patients. They revolutionize the way we address disease, disability, and quality of life issues; provide a mechanism for bending our healthcare cost curve; and generate wealth for decades to come (ACAHO-CHA, 2014).

## 1. Introduction

How do health care, health research, and contemporary innovation imperatives fit together? The elusive answer to this vexed question is perhaps nowhere more intensively debated than within the ‘entrepreneurial hospital’ (French and Miller, 2012). Yet, in spite of its centrality to the more generalized effort of mobilizing academic research for economic gain, attention to the entrepreneurial hospital, and the particular significance of efforts that implicate both *wealth* and *health*, has been surprisingly limited. As the above quotations illustrate, health innovation involves healthcare systems, and especially those organizations within healthcare systems that are most closely aligned with research and innovation policy,

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namely research hospitals. Yet innovation processes within health-care organizations mobilize distinct goals and means, emanating from the imperatives of healthcare on the one hand, and research and innovation on the other.

In previous work, we argued that the entrepreneurial hospital is distinct from other entrepreneurial organizations, like the entrepreneurial university, because it can leverage its patient population – its ‘living laboratory’ – to support its entrepreneurial aspirations (French and Miller, 2012). Although this distinct capacity may empower the entrepreneurial hospital as a force of innovation – the hoped-for result expressed in the quotations that preface this article – it has complex implications for the conduct and outcomes of both research and care. To consider these implications, we first draw on policy documents to conceptualize the field level institutional logics that are the “socially constructed, historical patterns of material practices, assumptions, values, beliefs and rules” (Thornton and Ocasio, 2008) that “govern the understandings and behaviors of individual and collective actors within a particular institutional sector” (Zilber, 2013). Next, we review literature in innovation studies on the confluence of academic and entrepreneurial logics and the workings of largely “hidden” hospital-based research systems (Hicks and Katz, 1996), to consider how multiple institutional logics are instantiated within organizations (Besharov and Smith, 2014; Lounsbury, 2007; Sauermann and Stephan, 2013). Finally, drawing on a review of organizational documents from the mid-1990s through the present, and key informant interviews from 2008 to 2009, we show how a nascent entrepreneurial hospital in Canada mediates the multiple logics of healthcare and innovation, and negotiates the hybrid logic at their intersection. The desired consequence of these hybridizing efforts is the production of a successful cross, which mobilizes commercialization and technology transfer to serve and enhance the hospital’s healthcare mandate. Yet the possibility that the hybrid may prove sterile or more monstrous cannot be foreclosed. We conclude with a reflection on this possibility, and on the broader implications of the entrepreneurial hospital.

## 2. Literature review

### 2.1. Hybridizing logics: At the intersection of healthcare and innovation policy

As Lehoux and colleagues (2008) have argued, two largely-disconnected public policy domains – healthcare policy and innovation policy – mobilize health innovation, and “emphasize goals that may diverge starkly, e.g., promoting commercial success versus fulfilling health care needs” (Lehoux et al., 2008). Their separate demands have become more insistent in recent years, driven by common concerns, such as constraints on public finances, and by sector specific concerns, such as the growing incidence of common and complex disease in aging populations and the underperformance of so-called knowledge economies.

For healthcare policy, the long-term sustainability of collectively financed healthcare systems is a pervasive international concern (Hacker, 2004). Technological innovation in these contexts invites concern about costs (Canadian Institutes for Health Information, 2012; United States Congressional Budget Office, 2008), skepticism about benefits, and criticism of continued emphasis on specialized, illness-centered technological interventions (Ham et al., 2011; Starfield, 2011). Health policy conversation in Canada mirrors international discourse, with attention to technological and demographic cost drivers (Canadian Institutes for Health Information, 2011), concerns about sustainability, and emphasis on new models of integrated, patient-centered care (Marchildon, 2013). As a corollary, innovation is typically understood to imply transformations

in service delivery and system design, to improve coordination, quality and efficiency (Health Council of Canada, 2013; Woolf and Johnson, 2005). However, Canadian health policy documents reflect growing awareness of national policy interest in technological innovation and the economic opportunities arising therein (Table 1). Indeed, while the bulk of a recent national report on “healthcare innovation” focused on innovation in the organization, regulation and financing of care, one chapter was devoted to the potential to achieve “economic prosperity” through “the development, commercialization, adoption and export of innovative healthcare products and services.” (Health Canada, 2015).

Within research and innovation policy, by contrast, interest in innovative health technologies as drivers of economic benefits is a dominant and consistent logic. National research systems have been steadily reformed in recent decades, to increase technology transfer and the commercialization of academic research (Mowery and Sampat, 2005), and to leverage public sector demand as a support for innovation (Industry Canada, 2014; OECD, 2014). Further, the potential yield of the life sciences in the translation of academic discoveries into economic benefits is a frequent focus of policy efforts (McMillan et al., 2000). Innovation has been a dominant national policy topic since the mid-1990s in Canada (Halliwell and Smith, 2011). The higher educational sector has largely endorsed the emphasis on academic entrepreneurship (Metcalfe, 2010), though concern at the perceived gap between academic productivity and its subsequent translation into patents and licenses, successful business ventures and economic gain persists (Conference Board of Canada, 2013; Industry Canada, 2011; Science Technology and Innovation Council, 2015). Health and healthcare are featured in national innovation policy documents as benefiting from economic prosperity, as areas where technological innovations will yield benefits, and as fields in which Canadian researchers have a strategic advantage. Research hospitals are only sometimes explicitly noted alongside universities and other organizations as part of the infrastructure that drives innovation, and their status as components of a system devoted principally to the delivery of healthcare goes unacknowledged.

While Canadian healthcare policy documents largely de-emphasize the economic promise of scientific and technological innovation, and innovation policy documents give little attention to the distinctive role of healthcare organizations within knowledge economies, a growing discourse is developing at the intersection of these logics, with particular attention to the role of research hospitals. These discussions frame what we can heuristically describe as a third, or hybrid logic, which emphasizes the mutuality of interest between firm-focused innovation systems on the one hand, and the quality and sustainability of healthcare on the other. It is argued in the UK, for example, that research hospitals can lead “the transformation of medicine through the development of a discovery-care continuum” because of their roles in both discovery science and the delivery of clinical care (Dzau et al., 2010; see also Dzau et al., 2013). In Canada, commentators have also called attention to research hospitals as, “the driving force of health research,” because they undertake “not just clinical studies, but also the full spectrum of research from fundamental discovery to development to application and evaluation” (Wright et al., 2011).

Seeking to leverage concurrent but largely disconnected national discussions about the future of Canada’s healthcare system on the one hand, and the organization of Canada’s research and innovation system on the other, leaders within Canada’s health research system, prominently including the national association representing research and other hospitals, HealthCareCAN (previously ACAHO), have intervened actively in public policy discussion since the early 2000s, seeking to “Bridg[e] the gap between health care and innovation ... to sustain Canada’s health care system” (Brimacombe, 2005; see also Canada’s Public Policy Forum, 2005;

**Table 1**  
Institutional logics informing research hospitals – Selected national reports.

Healthcare logic	Healthcare and hospital-based “hybrid” innovation logic	Innovation logic
<p><b>2002:</b> Commission on the Future of Health Care. <i>Building on Values: The Future of Health Care in Canada, Final Report:</i> “Promising advances in medical technology are occurring almost daily. While they have the potential to provide better treatments and cures, their costs are often substantial.”</p> <p><b>2004:</b> Canada, <i>First Ministers’ Ten Year Plan to Strengthen Health Care:</i> “A strong, modern health care system is a cornerstone of a healthy economy. Investments in health system innovation through science, technology and research help to strengthen health care as well as our competitiveness and productivity”</p> <p><b>2012:</b> Standing Senate Committee on Social Affairs, Science and Technology, <i>Time for Transformative Change: A Review of the 2004 Health Accord:</i> “The committee’s study revealed that the federal government was making significant investments in health research that was allowing for discoveries currently being implemented in health-care systems across Canada. . . . However, the committee heard that there were concerns among witnesses that insufficient resources were being dedicated to health services or health-systems research.”</p> <p><b>2015:</b> Advisory Panel on Healthcare Innovation. <i>Unleashing Innovation: Excellent Healthcare for Canada.</i> “Healthcare has become both a social program and an economic asset. The health sector directly and indirectly supports more than two million workers in hundreds of communities across the country, oversees sophisticated infrastructure and procurement of advanced technology, and supports leading-edge research with significant commercial potential. In Canada, the notion of partnering with the private sector to improve the healthcare system has gained little traction. Some see this as anathema to the underlying values of Canadian Medicare. Others see the potential to reap economic benefits for Canadians while improving the quality and sustainability of the healthcare system. Leading systems in other countries are taking the latter position, and Canada should follow suit.”</p>	<p><b>2004:</b> Health Innovation Canada, <i>Moving Health Innovations to Market, Draft Proposal:</i> “The lack of attention given to seeing the health care sector as an engine of economic growth is quite similar to that which existed at Universities (boards, presidents and faculty) more than fifteen years ago. Little attention or focus was given to identifying products and services generated by professors as opportunities with commercial potential to be developed by Canadians and supported by Canadian capital for Canadian benefit.”</p> <p><b>2007:</b> ACAHO, <i>Moving at the Speed of Discovery – From Bench to Bedside to Business:</i> “The view of ACAHO is that health research innovation and commercialization builds on the publicly-funded platform of Medicare, and looks to improve the health of Canadians, the cost-effective manner in which health services are delivered, and how we can contribute to sustained economic prosperity.”</p> <p><b>2013:</b> ACAHO, <i>From Bench to Bedside to Business. . . The Commercialization Opportunity of Academic Healthcare Organizations: A Submission to the House of Commons Standing Committee on Health:</i> “. . . when new Canadian products or services are brought to market, there is no mechanism in Canada to help them penetrate the healthcare market. The result is lost opportunity to use and support made in Canada healthcare innovations that can meet patient care needs, bend the cost curve, create jobs, attract capital formation, and generate wealth.”</p> <p><b>2014:</b> HealthcareCan, <i>From Invention by Accident to Innovation by Design: Collaborating to Improve Health and Compete Globally, A Submission to the Federal Advisory Panel on Healthcare Innovation From Canada’s Leading Healthcare Organizations.</i> “As necessity is the mother of invention, patient care environments are exceptionally nurturing grounds for the development, commercialization and spread of innovation. Canada’s leading healthcare organizations have demonstrated this through major achievements in discovery science and in the generation of a significant number of spin-off companies, world-first medical discoveries, new treatments, products and services.”</p>	<p><b>2002:</b> Industry Canada, <i>Achieving Excellence – Investing in People, Knowledge and Opportunity. Canada’s Innovation Strategy:</i> “Innovation clusters” include “one or more institutions devoted to R&amp;D – universities, colleges, technical institutes, research hospitals, government laboratories or private sector facilities.”</p> <p><b>2007:</b> Industry Canada, <i>Mobilizing Science and Technology to Canada’s Advantage:</i> “Science and technology is also a driving force behind successful health outcomes for Canadians. Health research is tackling big issues for all Canadians – finding cures or treatments for cancer, heart disease, HIV/AIDS, and a vast range of other acute and chronic diseases; developing vaccines; and understanding how to limit the spread of diseases and potential pandemics. New drugs, medical devices, nutraceuticals, and functional foods are the result of research that improves the health of Canadians and generates wealth to support our economy.”</p> <p><b>2009:</b> Industry Canada, <i>Mobilizing Science and Technology to Canada’s Advantage: Progress Report:</i> “For Canada to be more productive and competitive, Canadian researchers must be at the forefront of important developments in science and technology (S&amp;T) that will generate health, social, environmental and economic benefits for Canadians.”</p> <p><b>2015:</b> Science, Technology and Innovation Council, <i>State of the Nation 2014. Canada’s Science, Technology and Innovation System:</i> “Science, technology and innovation (ST&amp;I) excellence is critical to Canada’s wealth and well-being. Through ST&amp;I, firms enhance their productivity and competitiveness, and transform ideas and inventions into new goods and services that power markets. With increased profitability through innovation, firms create more high-value jobs for Canadians and contribute to increased national wealth. At the same time, advances in ST&amp;I drive solutions to society’s perennial challenges, whether related to health care, the environment, hunger or poverty.”</p>

Health Innovation Canada, 2004). In press releases, policy documents and commentaries, these actors rehearse familiar themes in innovation and healthcare policy, including the value of technological innovation and the unremitting pressure to compete in a global race, as well as persistent challenges in assuring timely access to care, patient safety and healthcare quality in the context of resource constraints. But alongside such arguments, these actors also articulate a distinctive role for teaching hospitals as a “national resource” within healthcare (ACAHO, 2002a,b), and assert the importance of a distinctive “health research ‘ecosystem’” within innovation (e.g., ACAHO, 2008), reflecting the mission: “To create an environment in which research discovery, innovation and learning benefit patients, populations, health systems and the economy” (ACAHO, 2013).

In sum, research hospitals are positioned at the intersection of the logics of healthcare and innovation. We see in numerous statements a reflection of the demands articulated from both policy domains, acknowledging the legitimacy of concerns about high

quality, accessible, equitable and sustainable healthcare systems on the one hand, and imperatives related to the pursuit of innovation, economic development and knowledge economies on the other. This discourse articulates a hybrid logic, attentive to the particularities of a hospital-based innovation system, with its commitment to the full spectrum of health research and innovation, and enthusiasm for the role of healthcare systems in the pursuit of economic and social returns. To consider the implications of this hybridizing logic, we turn to recent literature in innovation and organization studies.

## 2.2. Collaboration, conflict, or convergence? The intersection of entrepreneurial and academic logics

The mixing of multiple logics is a consistent theme in innovation studies, and underpins much discussion about the intersection of entrepreneurial and academic missions within a reformed

academy. For some authors, the mixing of these missions has led to transformation, with a shift in the goals and operation of public research organizations as they adopt an innovation mandate – shifts that are sometimes criticized (Bok, 2003; Slaughter, 2004) and sometimes celebrated (Gibbons, 2000; Nowotny et al., 2003). Considerable work in this vein tracks the development of collaborative networks between industry and academy, suggesting the mutually supportive nature of the merging of previously distinct worlds (Owen-Smith and Powell, 2004), and analyzing the processes through which previously foreign norms have been institutionalized (Bjerregaard, 2010; Colyvas and Powell, 2006; Thune and Gulbrandsen, 2011).

Several other authors, however, have called into question the stability or consistency of such a transformation. For Tuunainen and Knuuttila, the argument that academic and commercial logics will hybridize to enable productive collaboration ignores the stable nature of the boundaries between university and commerce, arising from the legal and fiscal responsibilities of these organizations as well as the longstanding cultural norms that guide them (Tuunainen and Knuuttila, 2009). Other authors emphasize the heterogeneous nature of academic accommodation to commercial norms, as scientists attempt to “adapt to external challenges without undermining the core logic of academic science” (Lam, 2010), reframe commercial expectations along more academic lines (Sanders and Miller, 2010), or engage in a process of asymmetric convergence that favors the norms of industry over those of the university (Vallas and Kleinman, 2008).

Inconsistent findings regarding the implications of mixing academic and entrepreneurial missions are replicated in the wider literature on institutional logics. The presence of multiple logics within organizations is common, as Greenwood and colleagues note (Greenwood et al., 2011). But while conflict is often assumed to arise from logic multiplicity, many outcomes are possible, including “coexistence,” or “logic blending” (see also Battilana and Lee, 2014; Besharov and Smith, 2014). Besharov and Smith (2014) identify the critical dimensions along which the mixing of logics might differ within organizations. These comprise the degree to which logics are compatible in guiding interpretation and action, and the extent to which more than one logic is central to organizational functioning. For Besharov and Smith (2014) reduced conflict is likely where logics are compatible, with compatibility in mission and strategy being especially salient. Reduced conflict is also likely where only one logic is central to organizational functioning, with others relegated to peripheral status. Yet many factors at field level, in organizations and among individuals will affect the nature and stability of these accommodations. Further, processes of change in response to the demands of multiple logics may be partial and mixed, subject to acceleration or reversal, while individual or organizational efforts to adapt may implicate changes for field level logics themselves (Besharov and Smith, 2014; Greenwood et al., 2011).

### 2.3. *Biomedical innovation and the ‘hidden’ research system*

To date, analysis of the mixing of academic and innovation logics has focused mainly on the implications for science and the university. Biomedical innovation is often captured within such studies (Chapple et al., 2005; Siegel et al., 2003), as health research is seen to have a key role to play in efforts to mobilize academic research for economic gain (Czarnitzki and Toole, 2010; Estabrooks et al., 2008). Yet the locus of health innovation is often under-theorized, and the fact that institutional logics beyond those of science and commerce may be implicated – arising from the policy and practice of healthcare – has gone largely unexplored.

Nevertheless, a small but growing literature takes the distinctive features of the health sector as its starting point. Beginning with Hicks and Katz in 1996, who characterized the health sector

as a “hidden” research system, several scholars have demonstrated the hospital’s central role in health research and innovation, the distinctive pattern of hospitals’ networked relations with private firms, and the productivity of the hospital-based research system (Cox and Webster, 2013; Hopkins, 2006; Lander and Atkinson-Grosjean, 2010). Additionally, the importance of iterative relations between developers and users within this ‘hidden’ system has been emphasized as key to medical advance (Marceau, 2000; Morlacchi and Nelson, 2011; Nelson et al., 2011).

Studies of the practice-based nature of much medical advance also highlight the role of heterogeneous users in biomedical innovation. For example, research on academic technology transfer for health innovations identifies trade-offs in serving the interests of proximate users (i.e., industry) as distinct from more distant users (i.e., patients, payers) in decisions about which technologies to commercialize (Miller et al., 2009). Similarly, research on the development of medical technology innovations by academic spin offs points to the competing interests and contrary valuations of user needs among the commercial stakeholders (company owners, capital investors, shareholders) who guide technology design and development, and between them and the patients and health systems that will ultimately use these technologies (Lehoux et al., 2014a,b). Finally, work by Gelijns and colleagues highlights the growing influence of patients and payers as ‘users’ in the innovation process, displacing the traditionally dominant role of physicians. This work also points to the trade-offs that necessarily arise among users’ several – not necessarily aligned – interests (Gelijns et al., 2001; Gelijns and Rosenberg, 1994).

In sum, healthcare-centered and hospital-based innovation has been manifoldly present but largely unaccounted for in innovation studies. While studies of the ‘hidden’ research system have identified some differences in the operation of hospital-based innovation networks, and highlighted the importance of clinically-oriented and practice-based innovation in medical advance, no research (to our knowledge) has yet considered the influence of hospital or healthcare specific institutional logics in the dynamics of biomedical innovation. Nonetheless, research emphasizing the heterogeneous interests of innovation users, alongside the conflicting rationales of commercial and public sector stakeholders, provides an alternate rendering of a similar theme. Translated into the language of logics, this research identifies several healthcare logics arising from the beliefs and practices of healthcare’s several users, which may align or conflict with the logics of the multiple stakeholders who mobilize innovation processes.

### 3. **Material and methods**

To understand how multiple logics are interpreted and negotiated at the organizational level, we draw on an in-depth case study of a research hospital within one Canadian province. The research hospital we selected was comprised of several networked organizations at a number of physical sites, with responsibility for the provision of care for a geographically defined population. It possessed substantial research infrastructure and well-developed affiliations with the local university-based medical school, as well as other universities.

Our interest in this research hospital was provoked by its early development of a hospital-based technology transfer office (TTO), which terminated the hospital’s previous reliance on the technology transfer capacity of its main university partner, and provided dedicated in-house capacity for commercial and industry-facing activities, including research contracts, technology screening, intellectual property protection, technology marketing, and start-up assistance for spin-off companies. While little is known about the development of technology transfer capacity in hospitals, it

is apparent that this research hospital is one of several in Canada that have developed their own on-site capacity (Miller et al., 2012). In doing so, they have followed the lead of Canada's universities, which have been supported by several initiatives (though not a single act assigning intellectual property rights, such as the US Bayh-Dole Act) to adopt the TTO model (Metcalfe, 2010).

The main sources of data for our case study were qualitative interviews and organizational documents, supplemented by 75 h of ethnographic observation, with field-notes taken to inform our inquiry (see French and Miller, 2012 for a more detailed description of methodology). We received ethics approval from the University of Toronto Health Sciences Research Ethics Board.

We conducted semi-structured, open-ended interviews ( $n = 26$ ) between September 2008 and August 2009. Our respondent sample was purposefully selected. Informed by an initial review of organizational documents, we began by gathering the views of technology transfer professionals within the on-site technology transfer office ( $n = 5$ ). We then cascaded beyond the TTO to capture the views of members of the senior executive team ( $n = 4$ ), leaders of research groups ( $n = 6$ ), clinicians ( $n = 3$ ), and administrative, research and clinical staff working on bio-banking initiatives ( $n = 8$ ). Interviews averaged 1 h in length; they were conducted in person or by telephone and were audio recorded and transcribed verbatim.

Interview questions were informed by our interest in the development of the on-site technology transfer office, and in particular, why the organization had pursued this approach, and how the initiative had been received. As well, we explored the organization's interest in technology transfer and commercialization more generally, the range of resources possessed and mobilized by this initiative, and the mission for research and innovation that the organization sought to marshal. Throughout, we sought actors' views on what the organization was attempting or intending, alongside the individual's own beliefs about these efforts. While we solicited input from respondents about the contexts that informed their engagement in health technology innovation, we did not seek detailed input on the 'logics' informing their work. Instead, interest in these logics was an emergent theme of qualitative data analysis.

We analyzed our interview data drawing on the techniques of grounded theory and situational analysis (Clarke, 2005; Clarke et al., 2015), which offers structured approaches to developing and organizing key categories of practices and meaning. As well, these approaches guide data collection in the context of an iterative and constant comparative analytic method, and support the qualitative saturation of themes within and across transcripts (Charmaz, 2006). We collaboratively coded transcripts in memos highlighting technology transfer, innovation and commercialization processes, organizing the data around two core themes – how the organization sought to *adopt* and *adapt* the means and ends of technology transfer and commercialization, in support of an enduring healthcare mandate as well as an emergent economic development mandate. Drawing on literature on institutional logics, we then identified the several logics present within these processes of adoption and adaptation. Next, we reviewed organizational documents, to gain longitudinal insight into the formal discourse characterizing these logics.

We collected documents from the organization's website, and archival materials from the organization's library. We focused our review on official histories ( $n = 1$ , published book), annual reports ( $n = 9$ , mid-1990s through mid-2000s, excluding more recent reports that focus exclusively on research fundraising efforts; NB. To preserve organizational anonymity, we avoid providing exact dates; instead, we have assigned different letters to different reports), strategic plans ( $n = 2$ , mid and late 2000s), and web-based overview documents ( $n = 6$ , collected March 2014, including the organization's overview, history and strategic plan, and documents about the mission and activities of the technology transfer office).

We used a qualitative descriptive approach to analyze these documents, organizing the data around the themes arising from our interviews (Thorne, 2008). We present combined findings from the organizational documents and qualitative interviews in three parts, representing the logics of healthcare and innovation, followed by a third – emergent – logic that intermingles and hybridizes the first two.

## 4. Results

### 4.1. Healthcare logic: Translating research into improved healthcare

The organization's commitment to improved health outcomes was the central theme of all the documentary sources we reviewed. Updates on health statistics and healthcare programs dominated the pages of annual reports, alongside developments in healthcare policy within the region, such as structural reforms and fiscal challenges. As well, the commitment to research in this healthcare organization was longstanding, and was featured prominently as core to the hospital's mission.

The organization's research mandate was presented as aligning with, and in service of, the healthcare mandate. Research was characterized as supporting improvements in care, with frequent reference to the belief that, because of close connections between the laboratory and the clinic, "innovative discoveries are rapidly translated into better prevention and treatment programs" (Annual Report A). In the mid-2000s, the hospital intensified this commitment to translational research, advancing the aspiration to become a "translational research organization" (Strategic Plan, mid-2000s). Drawing on a frequently cited concern with two translational gaps (Woolf, 2008), the plan's emphasis on translation involved "innovation," in seeking to move basic discoveries to the clinic, but also "adoption," to ensure that evidence-based approaches to the provision of care were robustly taken up. The translational organization envisioned in strategic planning documents was expected to deliver improved health outcomes and optimal system performance in the context of under-served health needs, elevated consumer expectations and growing resource constraints.

This emphasis on translational research and translational gaps was replicated in our interviews. Respondents highlighted the clinical orientation of this translational mission and conveyed the argument that a commitment to tangible clinical outcomes distinguished the research hospital from the university. The research hospital, our respondents argued, must foster a research culture that is focused on and applied to the end goal of health improvement. As this senior executive noted, "We'd say the real reason for us to be in health science is for it to have an impact on health outcomes" (Senior Executive-30). Elaborating further, this participant emphasized the need to push back against university-like expectations for the performance of hospital-based research, in defense of a hospital-specific concern with patient outcomes:

Our board has members from the university on it. And, I've been sort of chastised from time to time [...]: 'Why don't we just let the scientists be creative with whatever they want to do and if they can get money, that's fine?' And, I generally push back fairly hard and say, 'You know, that's a luxury that hospitals don't have. Patients come here because they're expecting the research is going to have something to do with them at some point in time' (Senior Executive-30).

This emphasis on outcomes meant that researchers were expected to have an interest in the ultimate patient-related impact of their work. Administrators stressed a light touch in emphasizing such a mission, noting the need to support serendipity in research.

But they believed that certain types of scientists were attracted to research hospitals – ones with an interest in the clinical relevance and potential application of their work. This view was endorsed by technology transfer professionals, who quoted the hospital's mission in arguing that, “all the researchers should be able to say how their research directly affects – is of a translational nature – and directly affects patient outcome, or could affect that” (Technology Transfer-27). As well, researchers and research leaders endorsed this mission, noting that, “We're not in a university. We're in a healthcare organization where . . . the research that we're doing should be of benefit to the patients. Otherwise, it might as well just be being done in a university” (Researcher-47).

Because hospital based research was seen as needing “to actually have some sort of measurable improvement in patient outcomes and patient quality of life; and, preferably, preferably, with [. . .] greater cost effectiveness” (Research Leader-36), the required translational research included developing new drugs and technologies to prevent and treat disease, as well as developing new ways to deliver the most effective healthcare. Yet while the organization was seen to have well-established capacity to do the latter, using research in support of the evidence-based adoption of new or existing services, its capacity to do the former, in translating new discoveries to the clinic, was seen as more limited. Thus, the organization needed to pursue various collaborations, including with industry, to facilitate the mandate for innovation translation. As the next section will show, while the hospital's research mandate was clearly and forcefully advanced in service of a healthcare logic related to improved patient care, it also supported a parallel ‘business-like’ logic of innovation.

#### 4.2. Innovation logic: Being more business like

When we conducted our interviews, the involvement of the research hospital in commercialization was longstanding. The economic and industrial aspects of a translational research mission were present, if lacking in prominence, in most of the organizational documents we reviewed. Current website documents suggest the organization's involvement in technology transfer dates from the 1980s, and annual reports identified the development of organizational policy on patents, licenses and industrial contracts in the mid-1990s, with the creation of an in-house technology transfer office in the late 1990s. As well, organizational reports featured the hospital's involvement with commercial projects in several ways – emphasizing the need to collaborate with business to ensure that promising discoveries not “sit on the shelf” (Annual Report B), celebrating the development of “a research culture that has already spun off important biotechnology companies” (Annual Report D), and pointing to the employment and economic activity arising from such commercial endeavors (Annual Report G). Further, technology transfer and commercialization featured among the supports for the translational research organization that was envisaged through the strategic planning of the mid- to late-2000s. Yet, even despite this longstanding involvement, our respondents reflected on their participation in commercialization and the development of an on-site technology transfer office as still emergent undertakings, and somewhat novel for a research hospital.

The rationales articulated for pursuing these activities evoked both appropriateness and consequence, which, as Entwistle has argued, is typical where organizations undertake change (Entwistle, 2011). Respondents suggested that the hospital needed to collaborate with industry, since “a new technology . . . could not be rapidly translated without commercial participation and commercial know how” (Senior Executive-35). As well, investment in technology transfer was seen to have some potential to yield returns for patients and research funders, and even financial rewards that could address some of the organization's funding

constraints. But in addition to these hoped for consequences, respondents evoked the importance of evolving norms about the ‘best’ ways to organize, in suggesting that the pursuit of material and economic returns from research in a ‘business-like’ manner could also yield credibility.

“Commercialization and technology transfer,” as one senior executive put it, “has always been adopted by universities and [is] now increasingly adopted by health sciences organizations that have a significant research mandate” (Senior Executive-37). Echoing the commitment in the strategic plan (mid-2000s) to “our business of mutual interest” this participant argued for the need to pursue commercialization in part because of the necessity of being, and being seen as, more ‘business-like’:

. . . We also need to be business-like and it's been very interesting in the health sciences or healthcare world to realize how business-like we have to be, not only for the delivery of research but for the commercialization of research. So, [. . .] we assure some of our pay masters, not just only the granting organizations, but the provincial government, the federal government that invest in our research [that] we're actually being fiscally very, very business-like and that we're producing some useful productivity after years of accessing a variety of grants both from philanthropic organizations, NGOs, and governments, [and] it's making a meaningful difference in the lives of our population or our patients (Senior Executive-37).

Pursuit of these organizational goals implied the need for professional capacity to facilitate the commercial translation of biomedical research and manage the ensuing risks. Echoing themes of legitimacy and financial reward, another senior executive suggested the importance of bringing technology transfer within the walls of the research hospital, “because there is a strong belief that it represents a skill set that you have to have to be competitive, and a skill set that you need if you want to have any independence from pure government funding to run the operations. . . . to maximize revenues where you can legitimately maximize them” (Senior Executive-30). As well, acknowledging that the interests of research and the interests of industry are not necessarily well aligned, the technology transfer office was discussed as a resource to protect research assets and researchers: “to protect, obviously the interests of, and risk of the [organization] and our researchers” (Technology Transfer-24).

The innovation mandate of the research hospital was both enduring and novel. Pressed to explain the development of the on-site TTO, one senior executive admitted that “It's no slam dunk that we have one” – that, if you walked the halls and asked people, “You'd probably find ten percent of people who'd say, ‘It's absolutely fundamental, couldn't live without it.’ You'd find ten percent who'd say, ‘It's absolutely useless, I can't understand why we have one.’ And then you'd probably find eighty percent of people who'd say, ‘Well, can you rephrase the question and put some meaning to it for me?’” (Senior Executive-30). The innovation mandate was accepted as necessary to accomplish specific goals, including facilitating commercial translation and managing associated risks. It was also accepted as legitimate, in mobilizing professional skill sets and exemplifying the hospital's commitment to being ‘business-like’. At the same time it was seen as a new mandate for the research hospital – one whose purpose was still under negotiation, as the next section will show.

#### 4.3. Hybridizing logics: Organizing the entrepreneurial hospital

The organizational documents we reviewed provide evidence that the logics of healthcare and innovation co-existed in organizational planning and policy, but it is largely through interviews that we can explore how this hybridization was negotiated. These

interviews suggest subtle reinterpretations of the norms and expectations of each logic, as they intermingled within the research hospital (Sanders and Miller, 2010; Vallas and Kleinman, 2008). We showcase, below, five sub-themes that illustrate the complex efforts to hybridize field-level logics within the walls of the entrepreneurial hospital.

#### 4.3.1. Technology transfer to serve the hospital's mission – prioritizing patient need

Respondents were clear that the TTO was expected – and intended – to serve the hospital's mission. When we asked for comment on the technology transfer office's mission statement, respondents argued that it was expected to work, “as a facilitator, not necessarily a driver. . . . to oil the wheels for the organization as a whole” (Research Leader-29). As a senior executive put, “I think this [TTO] vision statement has less to do with what is the mission and vision of technology transfer offices as some generic statement of technology transfer offices, and more to do with the context of [the organization]” (Senior Executive-30). Technology transfer professionals also characterized their work as serving the organization's healthcare mission, noting that, “we always have to ask ourselves . . . how the money we're spending is relevant to helping the patient” (Technology Transfer-27). Suggesting alignment between the wealth and health goals of the office, one technology transfer professional argued that, “We have a good situation here in that I don't have two bosses, one saying, ‘Benefit the health system,’ the other saying, ‘We didn't bring in enough money last quarter.’ So, we're good in that sense” (Technology Transfer-26).

Importantly, respondents argued that hospital-based technology transfer professionals might behave somewhat differently than their university-based colleagues, reflecting the specific mission and capacity of the research hospital. Viewing university-based TTOs as preoccupied with issues related to market share – chasing patents on incremental innovations in order to improve organizational bottom-lines – our interviewees emphasized issues such as clinical significance, “patient impact” (Technology Transfer 27), “health factors” (Technology Transfer 26), and cost effectiveness in their technology transfer decisions. Further, in pursuit of “best impact” for the hospital, they might even de-emphasize market imperatives in their commercialization decisions: “we've actually proceeded . . . where the actual market didn't look fantastic . . . but it's a very impactful outcome” (Technology Transfer-24).

#### 4.3.2. Technology transfer to serve the hospital's mission – healthcare organizations as users of commercial innovation

Technology transfer professionals identified the hospital as a key user of its own inventions, with the capacity to evaluate and uptake innovative technologies that might address the organization's need to deliver effective and cost effective care. Noting that, “we're actually positioned where we can take our technologies, our drugs and our diagnostics and run national clinical trials here” (Technology Transfer-27), our interviewees stressed that, unlike universities, hospitals might be directly affected by the technologies they developed or the results emanating from technologies they evaluated. Though largely aspirational, these responses identified the potential for a virtuous cycle between the hospital's role as a producer and user of technology: “. . . the hope is a lot of the inventions [. . .] can be used to mitigate the cost pressures that our institution is feeling. And, that wouldn't really occur in a university, but here we can say, ‘Wow, if this test really works as it says it does, well we could deploy it in the clinic and we'd save a fair amount of cash in terms of these new drugs.’ Because maybe it'll tell you, ‘Give the new drugs to this half of the population but not that half of the population.’ So, we have an eye on that sort of strategy, of trying to link the technologies a bit back to the institution” (Technology Transfer-26).

Beyond this direct utility, interviewees also identified an indirect utility – asserting that, in the absence of the capacity and culture of technology transfer and commercialization, the ability to assess and apply new innovations would be compromised. As one senior executive put it, without “intimate knowledge of what sort of new technology is out there, you'd be buying it from some other jurisdiction if you wished to apply it in your own system. So, your ability to, I think, evaluate which new innovation, which new technology, to incorporate into your system would be compromised” (Senior Executive-35).

#### 4.3.3. Technology transfer as a transformative force – a productive change

Yet even as our respondents characterized technology transfer as serving the hospital's healthcare mission of improved clinical care, they also emphasized that commercial translation would enable and oblige the research hospital to change. In part this was a productive change. Our respondents noted that getting research to the bedside was a clear and shared goal. At the same time, it was widely acknowledged to be difficult to do. Researcher respondents voiced concerns about the “bottleneck” (Research Leader-28) between discovery and successful commercialization, identifying the need for an approach that could “push” basic science toward the clinic. As one researcher noted, “there's a reason why a huge number of people just publish and then drop it” (Researcher-32). Similarly, senior executives noted the lack of incentives for research to “travel horizontally”:

. . . all of the incentives reward the depth of scientific discovery or they reward the depth of clinical research, but none of them cause it to travel horizontally. . . . And, so, I think the challenge in our system is, if you said what we really want is to get innovation into application so the population could benefit, the big challenge is that there's no incentive for that to actually happen anywhere in the system (Senior Executive-30).

Against this backdrop, professional technology transfer was seen as a resource to address the gap. Senior executives emphasized the importance of building an incentive structure that could reinforce the organization's commitment to developing commercially transferable technologies, “so that we develop more and more the focus around the drive to achieve a useful product that will ultimately be transferred into technology that will improve healthcare or anything else” (Senior Executive-37). Organized technology transfer was thus viewed as a force that could encourage and support researchers who would pursue the commercial translation of their discoveries, and enable reward and recognition, as “people are rather proud that they've got something patented or that they have an opportunity to develop their technology external to the organization, and that fosters this sense of achievement and more productivity and more focus” (Senior Executive-37). As well, commitment to technology transfer and commercialization was seen as part of the organization's commitment to “best practice” and the corollary need to attract and retain the “best minds.” As this senior executive put it, “In the absence of such a commitment, “the best academic people that you want to drive your organization will not be attracted to an organization that isn't interested in innovation” (Senior Executive-35).

#### 4.3.4. Technology transfer as a transformative force – a contested change

Yet not all of our interviewees were convinced that the transformations initiated by the hospital's technology transfer efforts were going to have a positive effect. For instance, in response to a question about the increasing importance of commercialization initiatives in healthcare, a clinician we interviewed remarked: “Whether it's good or bad, I don't know. I certainly find it frustrating

and it's not the way we've operated traditionally, or at least in my experience, but I am feeling constrained and forced into this system and I'm objecting a little bit" (Clinician-31). As this quotation suggests, the hybridization of innovation logics with healthcare logics is not always a straightforward proposition. Indeed, some in the organization may "object" to elements of the transformations initiated by hybridizing efforts, and reassert a stable boundary between research and commerce (Guston, 1999; Tuunainen, 2005). In fact, as we learned, a key task of hospital-based technology transfer professionals – and, we argue, of the entrepreneurial hospital more generally – is to navigate amongst, and mediate between, standpoints that are brought into association with each other through the hybridization of commercial and healthcare logics.

The technology transfer professionals we interviewed wrestled with the possibility that the "complexities and controversies" accompanying hybridization may sometimes cause hybridization to fail (Tuunainen, 2005, p. 202). Describing efforts to ensure the success of their initiatives, TTO professionals reiterated the fundamental alignment between healthcare and innovation aims. For instance, having encountered people in the hospital who "objected" to (aspects of) their efforts, one interviewee described an "onus" borne by the TTO to explicate the benefits of the commercial process for healthcare. He argued that objections to the TTO's hybridizing vision were, "when you drill down," largely "due to a lack of understanding of the commercial process, or the commercialization process and more specifically the intellectual property protection process" (Technology Transfer-27). Using the example of a patent, this interviewee stated:

One common perception that a patent is a secretive type of mechanism, whereby the technologies that are patented or covered by patents are not made available to the public. Well, actually the purpose is exactly the opposite. So, but, I think it's an educational thing and I think, you're right, [...] even if you try to educate them, some of them you'll move and some of them you won't. If somebody's really anti-patent or anti-IP, that is hard to change in some instances (Technology Transfer-27).

In this description, selling sometimes-unwelcome change is described as an important component of the TTOs hybridizing efforts even as the prospects for change are recognized as being, "in some instances," limited. Based on this observation, we may note that hybridization efforts may change organizations in asymmetric ways, as different elements within the organization become more or less well aligned with the mission and vision that hybridizers articulate.

#### 4.3.5. Technology Transfer as a Transformative Force – a resource-intensive change

There were many expectations and aspirations for commercial translation and the dedicated technology transfer capacity that might support it, but such capacity comes at a cost. Indeed, technology transfer offices are rarely profit centers (Blakeslee, 2012). To probe these issues, we asked our respondents to complete a brief questionnaire and then sought elaboration on responses to facilitate our conversation. For several senior executives, questions about the operating expenditures of the technology transfer office – whether it should make money for the organization or run at a loss – elicited discussion of the need to invest in innovation. One senior administrator, who hoped that the office would ultimately make money, acknowledged that it would be a "loss leader" for a few years, and that there "has to be a recognition that there must be some upfront investment in this process if it's to lead to focus in science, commercialization of ideas, improvement in health outcomes, and ultimately, you know, economic benefit" (Senior Executive-37). For another senior executive, our question highlighted the importance of assuming the expense of technology

transfer within the organization's budget, in order to embed the mission of innovation within the research hospital's mandate.

I think the healthcare system should be thinking about sustaining such activity as part of its regular operating mandate. And this will then help to overcome some of the things that the Conference Board of Canada says, [when it asserts, for example] that we are not very interested in innovation. . . . But, if you say that technology development, innovation is part of, you know, our budget line, then I think it sends a very clear message (Senior Executive-35).

Professionalized technology transfer within the research hospital was expected to serve the core mandate of the hospital – improved patient outcomes, and to a lesser extent, affordable healthcare. For our respondents, this was clearly different than technology transfer within the university, where opportunities for financial benefit dictated commercialization decisions and limited potential existed to validate or use resulting technologies. Yet even as organized technology transfer adapted itself to the hospital's mission, it also worked to change this mission. The research hospital's mandate for translation was longstanding, in seeking to serve patients and healthcare systems as users. But it was also comparatively novel, in approaching this mandate through the 'business like' activities of commercial science – activities that needed to be formalized and incented through the opportunities, rewards, recognition, support and protection of technology transfer. The research hospital must become more innovative, our respondents suggested, by embedding the commitment to technology transfer and commercialization within the research hospital's core mandate.

## 5. Discussion and conclusion

In an earlier paper, we offered a preliminary definition of the entrepreneurial hospital as "one that explicitly seeks to constitute patient populations and care infrastructure as distinctive assets (or resources) in pursuit of entrepreneurial aims" (French and Miller, 2012). This initial definition emphasized the resources at the disposal of the research hospital in its efforts to support technology transfer and commercialization. In the current paper, we seek to elaborate *how* and *why* those resources were mobilized – to explore what the emergence of the entrepreneurial hospital means for the conduct and outcomes of health research and innovation.

A first elaboration concerns how the research hospital is positioned within the organizational field to pursue entrepreneurial aims. We have suggested that health innovation implicates healthcare, and especially those organizations that are located at the intersection of the logics of healthcare policy and innovation policy – research hospitals. Through analysis of policy documents and published commentary, which provide empirical insight into these multiple logics, we suggest a considered attempt by the health research community to align the logics of healthcare and innovation – to leverage a joint solution to parallel problems of constrained public finances, growing need, and the limited success of persistent, independent efforts at reform.

A second elaboration concerns how the hospital negotiates these logics at the level of the organization. Drawing on work that explores how multiple institutional logics (Besharov and Smith, 2014) are instantiated within organizations, we explored these issues through a qualitative case study of a large research hospital in one Canadian province. This gave us access to a largely enthusiastic vision, one that sought to clearly differentiate the research hospital from the university in mobilizing an entrepreneurial ethos and the professionalized model of technology transfer and commercialization that this ethos enjoins.



We see in this vision the potential for the entrepreneurial hospital to embody a hybrid logic that successfully aligns its parent logics. Specifically, as Besharov and Smith (2014) have noted ‘aligned’ logics may ensue where multiple logics are core to organizational functioning and provide compatible prescriptions for action. Leaders within organizations, such as the senior executives, technology transfer professionals, and research leaders we interviewed, are highly exposed to field level arguments about the complementarity of healthcare and innovation mandates. They are well placed to integrate new mandates into the organization’s central functioning and to demand compatibility of mission and strategy, even if the commercial logic implies using new means to pursue traditional ends. And they hope that efforts to hybridize logics will produce a successful cross, analogous to the productivity of the collaborative networks involving industry and the university identified in much innovation scholarship (Owen-Smith and Powell, 2004; Powell et al., 1996). For the health research and innovation system, such a successful cross would prioritize patient needs and population health in the development and adoption of economically relevant knowledge and technologies while increasing the hospital’s capacity to deliver high quality and affordable healthcare.

Yet hybrid logics do not always prove productive. There may, for example, be durable boundaries between clinical, research and entrepreneurial missions that impede success (Knuutila, 2012; Tuunainen, 2005; Tuunainen and Knuutila, 2009). Even though the organization’s leadership aspired to integrate technology transfer and commercialization as a core function of the research hospital – one of the key axes of potential alignment identified by Besharov and Smith (2014) – it might prove a more peripheral activity within these large and complex organizations, perhaps the remit of a sub-unit loosely coupled to the daily demands of organizational functioning (Orton and Weick, 1990). While the need to be more “business like” and the hoped-for financial and reputational rewards encouraged acceptance of in house capacity for technology transfer and commercialization (Entwistle, 2011), the adoption of this relatively novel undertaking was acknowledged to be “no slam dunk”. From this more guarded perspective then, the entrepreneurial hospital’s efforts to hybridize logics might prove sterile.

Finally, hybrid logics might fail to align, and instead provide inconsistent guidance for action (Besharov and Smith, 2014). That technology transfer and commercialization decisions could prioritize patient needs over the demands of profitability was offered as a possibility only at the margins, and the hope that technological innovations from hospital-based research might be used by the hospital to address healthcare challenges was largely aspirational. Thus, long term responsibility for the resources required to support the strategy and mission of commercialization might prove a diversion from – rather than a support for – the healthcare mandate. Moreover, the intent to use technology transfer and commercialization to transform the research hospital is open to contest, with the possibility of heterogeneous patterns of accommodation or resistance by researchers, clinicians, or patients (Lam, 2010; Sanders and Miller, 2010; Vallas and Kleinman, 2008). Even among our enthusiastic respondents there is some reticence and uncertainty, which might expand in scope and strength were one to investigate further among the rank and file. Efforts to hybridize logics might, in this case, effect something more “monstrous” (Jacobs, 1992: 78).

What then are the implications of the entrepreneurial turn for the research hospital? Will the sharing of norms support “asymmetric convergence” (Vallas and Kleinman, 2008), privileging commercial imperatives within the walls of healthcare facilities? There is certainly more attention to the demands of innovation with healthcare policy discourse than to the demands of healthcare within innovation policy. Moreover, there are many ‘users’ of health technology innovation, whose interests are not necessarily

congruent, and whose capacity to mobilize innovation processes in their favor is highly variable (Lehoux et al., 2014a,b; Miller et al., 2009) – a point also made by Sauermann and Stephan (2013) in suggesting that the “conflicting logics” literature may overstate differences between, and ignore heterogeneity within, each logic. The user needs addressed by the research hospital are likely to be those present within the high acuity populations that research hospitals seek to serve. Further, commercial technology transfer locates prospects for health and healthcare improvements within biomedical research and marketable products, contrary to much discussion within healthcare policy, which suggests that fidelity to what is known, rather than novelty, is likely to yield greatest rewards (Woolf and Johnson, 2005).

A final lesson from recent innovation and organization studies literature is that the trajectory of change in the context of mixed logics is necessarily uncertain: these arrangements may prove durable, herald more profound transformation, or be subject to resistance and retreat (Greenwood et al., 2011; Lam, 2010). Indeed, our study charts hybridizing efforts, not a completed project. While a successful-cross is anticipated, other hybrid futures cannot be foreclosed. The hope that hospital-based technology transfer and commercialization will be used to serve a healthcare mission may go unrealized in key ways, with potentially significant implications for the intellectual, economic and health benefits that will arise as a result.

#### Acknowledgements

We are indebted to the many busy people who agreed to speak with us about their work, and thank the Canadian Institutes of Health Research (CIHR) for funding for this project (81195). While conducting this research, Fiona A. Miller was supported by a New Investigator Award from the Institute of Health Services and Policy Research of CIHR (80495), and Martin French was supported by a Fellowship from the CIHR-funded ‘Health Care, Technology and Place’ Strategic Training Program and a postdoctoral fellowship from the Social Sciences and Humanities Research Council (SSHRC) (756-2010-0741). Sponsors’ support of this work should not imply endorsement of the conclusions, for which the authors retain sole responsibility.

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