

COMPARING CLIMATE CHANGE COVERAGE IN CANADIAN ENGLISH- AND FRENCH- LANGUAGE PRINT MEDIA: ENVIRONMENTAL VALUES, MEDIA CULTURES, AND THE NARRATION OF GLOBAL WARMING¹

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Abstract. This article compares how climate change is presented in English- and French-language print media in Canada. In recent years, climate change has become an increasingly divisive issue, with the media playing a central role in the promotion of competing claims and narratives in the public sphere. Using concepts from environmental sociology and the sociology of journalism, we examine content from six English- and two French-language newspapers from 2007–2008 (N=2,249), and find significant evidence of both convergence and divergence across the language divide. Among the most significant findings are differences in how complexity is handled: English outlets present diverse coverage that is highly compartmentalized, while the French newspapers present a narrower range of coverage but with thematically richer articles that better link climate change issues to the realms of culture, politics, and economy.

Keywords: climate change, media, language, journalism, environmental values, framing

Résumé. Dans cet article, nous comparons la façon dont sont présentés les changements climatiques dans des médias écrites de langue française et anglaise distribuées au Canada. Les changements climatiques deviennent, depuis quelques années, un enjeu de plus en plus polarisant et les médias occupent un rôle fon-

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damental quant à l'avancement de revendications et de récits concurrents dans le domaine public. Mobilisant des concepts issus de la sociologie environnementale et de la sociologie du journalisme, nous examinons le contenu de six journaux anglophones et deux journaux francophones publiés dans la période 2007 à 2008 (N=2 249) et découvrons des preuves significatives de divergences et de convergences entre ces regroupements linguistiques. Parmi nos constats les plus notoires sont les différences observées quant à la gestion discursive de la complexité : les journaux anglophones reflètent une couverture diverse mais dont les articles sont hautement cloisonnés sur le plan thématique alors que les journaux francophones exhibent une couverture plus étroite dont les articles sont d'une richesse thématique accrue explicitant plus clairement les liens entre les enjeux découlant des changements climatiques et les domaines de la culture, la politique et l'économie. **Mots clés:** changements climatiques, médias, langue, journalisme, valeurs environnementales

INTRODUCTION

This article explores how climate change issues are being presented in English- and French-language print media in Canada. Climate change issues are tremendously complex, and disagreements and debates have been the norm since the public “discovery” of the issue in the mid-1980s. However, recent research in North America, Europe, and Asia has shown that anthropogenic climate change has become *more* divisive as the issue has matured and moved into everyday parlance (Weaver 2008; Hulme 2009; Sampei and Aoyagi-Usui, 2009; Maibach et al. 2010). While climate change is a science-heavy topic, it has also developed a substantial and highly varied social and cultural life. Some prominent social theorists have even come to argue that conflicts over climate change are increasingly alienated from science, and have instead become a proxy or marker for deeper debates about politics, freedom and responsibility, development, and values (e.g., Hulme 2009; Swyngedouw 2010).

At root, such arguments imply that climate change is a highly variable idea, and that climate change issues “look different” from differing political and cultural perspectives. Researchers in the United States, for instance, have identified six major cultural-political stances on climate change, ranging from “the alarmed” to “the dismissive” (Maibach et al. 2009; 2010). We seek to further explore variance in the social and cultural life of climate change by looking at one of the most significant demarcations in Canadian society, that of language.

It has frequently been suggested that English- and French-speaking Canadians inhabit “two solitudes” (Baillargeon 1994; Fletcher 1998; Rioux 2005). This metaphor (now a cliché), popularized by Hugh Mac-

Lennan's 1945 novel of the same name, is taken to mean that the two language groups hold different core values, political perspectives, and priorities. While this view has been strongly criticized over the years (e.g., Taylor 1993; Saul 1997; Fraser 2007), the largely francophone province of Québec is widely thought to be a dissenter on climate change issues (relative to the tepid stance of successive Canadian governments) and a place where the consensus view of climate change (that it is occurring and is predominantly caused by human activities) has found the most purchase and resilience.

The purpose of this article is to investigate whether evidence of a narrative break exists between English and French Canada on climate change issues on one key dimension of public discourse: the daily print media. Newspapers, in both print and online formats, remain the predominant source of information on environmental issues for most people (Antilla 2010:245). While nonjournalistic weblogs and other forms of online information have become important contributors to the public life of the climate change issue, they cannot match the breadth of reach still enjoyed by mainstream media outlets. Moreover, recent research has found that the amount of original content in blogs is lower than generally presumed, and that "the blogosphere relies heavily on professional news reports" as sources of raw information upon which to comment (Reese et al. 2007:235). In short, newspapers remain an important contributor to public discourse on controversial issues, and are a key means by which claims and narratives are communicated and legitimized to the "lay" public (Young and Matthews 2007).

Our analysis is based on findings from a large study of newspaper coverage of climate change across six English-language newspapers (*The Calgary Herald*, *The Globe and Mail*, *The National Post*, *The New Brunswick Telegraph-Journal*, *The Toronto Star*, and *The Vancouver Sun*), and two French-language dailies (*Le Devoir* and *La Presse*) across a twelve month period (October, 2007 to October, 2008). We will draw on concepts from environmental sociology, the sociology of journalism, and existing research about cultural and political differences in English- and French-speaking Canada to advance a series of hypotheses regarding expected convergences and divergences in coverage of climate change issues across the linguistic divide.

ENVIRONMENTAL CULTURES IN ENGLISH- AND FRENCH-SPEAKING CANADA

Two main literatures suggest that English- and French-language media are likely to demonstrate substantial differences in their coverage of climate change issues. The first are studies of social, political, and environ-

mental values, and the second are studies of media cultures, which we consider in the next section. The extent and magnitude of differences between English- and French-speaking Canadians in terms of values, culture, and politics is controversial. Adams' (2003:81–9) extensive survey of North American social values, while not predicated on language *per se*, found that Québec residents are the most tolerant, fulfillment-oriented (in the broad quality-of-life sense), politically progressive, and least deferential to traditional authority of all provinces or regions in Canada. That said, the same study clearly shows that Québécois have much more in common with other Canadians than with Americans — in other words, all regions of Canada show these tendencies, Québec only more so. Other research confirms that francophone Québécois generally hold a unique set of cultural-political values, but that these are not (necessarily) radically different from those found among English-speaking Canadians. For instance, Henderson (2004) found that French-speaking Québécois are the most left-leaning group in Canada (self-reported), as well as the most engaged in questions and issues of governance and civil society. Longitudinal survey research reported by Langlois (1990) shows evidence of an abrupt decline in religious-conservative social values in Québec from the 1960s onwards, and the concurrent rise of values concerning equality (gender, class, and civil rights in particular), environment, and a broadly defined “solidarité,” which bundles together ideas about collective rights, language rights, and labour rights (Langlois 1990:934).

With respect to environmental values, existing research suggests that Québécois tend to hold slightly “greener” attitudes than do residents of most other regions of Canada. Vaillancourt (1981) points out that environmental awareness and activism in Québec emerged in the mid-1970s, a few years later than in Europe and English-speaking North America, but rapidly became a part of mainstream political discourse in the province. While the modern Anglo-American environmental movement was essentially “born global” (early activism centring around Earth Day, nuclear weapons testing, and the “limits to growth” debates involving the Club of Rome and celebrity scholars such as Rachel Carson and Paul Ehrlich), Québec groups tended to focus on local and provincial issues, particularly around agriculture, water pollution, and waste (Julien et al. 1976; Vaillancourt 1981:82–3). From these humble beginnings, environmental activism has taken on a particularly prominent role in Québec society. As several Québec scholars have noted, “l’écologisme” has become a predominant theme in broader discussions of economy, governance, and equity (particularly under the notion of “économie sociale” or socially responsible and even noncapitalist forms of economic development) (Langlois 1990:6; Gendron 2007; Vaillancourt 2010).

There are several possible reasons for the saliency of environmental themes in contemporary Québec society. According to Cardinal (2007), the environmental movement's rapid rise to legitimacy and even prominence in the province is partly attributable to a concern among successive provincial governments (both sovereigntist and federalist) as well as among cultural elites (particularly the media) to position Québec as a virtuous foil to a dirtier Canada and United States. Interestingly, Cardinal argues that this self-image has been bolstered by prominent English-speaking environmentalists, such as David Suzuki and Al Gore, who have picked up this narrative as a means of shaming Canadian and American governments, particularly on climate change and energy files (2007:129–35). Labelle (2006) argues that environmental narratives resonate in the sovereigntist movement because of a longstanding preoccupation with territory. Given the historical inequities between English- and French-speaking people in Québec, and particularly given that “working the land” was exclusively assigned to the latter, the converging themes of nature-territory-inhabitants provide a meeting point for environmentalist and sovereigntist ideas (Labelle 2006:347). Finally, we note that Québec's economic and infrastructural situation may also play a role in reinforcing environmental values and narratives. While energy-intensive resource industries such as forestry and mining are still a large part of the province's economy, its renewable energy base (provided largely by hydroelectric dams) is for many a source of nationalist pride (Desbiens 2004).

Environmental ideas and values also play an important role in English-speaking Canada. To be clear, English-speaking Canada is not an homogenous category. Public opinion surveys (and electoral results) show that there are significant political differences among Atlantic, Central, and Western Canadian regions, as well as among urban, suburban, and rural regions (divisions that are also evident in French-speaking Canada — see Henderson 2004). Nevertheless, the case can be made for continuity within English-speaking Canada when it comes to environmental values. For instance, Angus (1997) argues that English Canadian identity has always been marked by particular anxieties about status and role — being intimately linked with, subjected to, and yet distinct from the two great imperial powers of the last two centuries (British and American). According to Angus, this has led to a particular but broadly writ cultural preoccupation with the dynamics between Self and Other, which in turn explains English Canada's relatively easy adoption of multiculturalism (the internal Other) and environmentalism (nature as the nonhuman Other) as core building blocks of nationalist identity (see also Mackey 2002:40). In a slightly different way, Shields (1991) suggests that ideas of wilderness, nature, and environmental protec-

tion have served as a means of unifying the diverse regions of English Canada that otherwise have different cultures and economic interests. The resonance of this narrative owes much to its flexibility, encompassing both environmentalist goals (i.e., a “green” self-image, particularly against the United States) and perceptions of nature-as-adversary that draw on colonial ideas about hardscrabble life on the pioneering frontier (see also Atwood 1972; Coates 1985).

Finally, recent survey research has shown that Canadians as a whole demonstrate “a moderate level of pro-environmental beliefs” as measured by adherence to the principles of the “New Ecological Paradigm” (NEP) (Huddart-Kennedy et al. 2009a:320). The NEP, first elaborated by Catton and Dunlap (1980), refers to emerging values that break from an exclusive focus on human interests (Human Exemptionalism Paradigm or HEP) to embrace a more ecologically sensitive worldview. Existing pan-Canadian studies on NEP values typically yield low standard deviations (e.g., Deng et al. 2006; Huddart-Kennedy et al. 2009a, 2009b), suggesting relative consistency in environmental values across regions.

Thus, while there is evidence to suggest that French-speaking Canadians are, on the whole, more environmentally conscious than their English-speaking compatriots, these are differences of degree and not of type. Assuming that the print media will reflect these tendencies, we advance the following hypotheses (H1a and H1b):

H1a: French-language coverage of climate change will focus more on environmental issues related to climate change than English-language media.

H1b: French-language coverage will favour the consensus view of anthropogenic climate change more than English-language coverage.

Both effects, however, are expected to be weak.

MEDIA CULTURES AND CLIMATE CHANGE COVERAGE

A second factor that may affect the presentation and narration of climate change issues are the differing media cultures in English- and French-speaking Canada. Remarkably little research has been done on this question, and most of it has focused on specific events (such as the 1995 Québec referendum on sovereignty — see Robinson 1998). However, significant work has been done comparing Continental French (France) and Anglo-American journalistic traditions and practices (e.g., Chalaby 1996; Benson and Saguy 2005; Neveu 2009). Generally speaking, this literature suggests that Anglo-American and French journalism differ on

several counts, some of which are stylistic and others more profoundly normative. In an historical overview, Chalaby (1996:313) argues that many of these differences can be traced back to the constraints faced by early journalists:

A new [journalistic] discourse was able to emerge more rapidly in [the] Anglo-American [world] because writers were unable to impose their literary values and norms upon journalists. In the United States and in England, the press grew independently from the literary field but this was not the case in France ... where French literary figures and celebrities have always been very involved in journalism.

Similarly, Neveu (2009:11) argues that the establishment of journalism as a separate literary form and occupation in Anglo-American society contributed to a professionalization of the field, which in turn prompted and fostered the development of strong codes of conduct and a predominantly descriptive style. In Anglo-American journalism, the norms of neutrality, objectivity, and detachment are particularly cherished in news reporting (cable news networks notwithstanding — see Boykoff and Boykoff 2004). Neveu also argues that North American news consumers helped establish a utilitarian streak in the Anglo-American press, particularly independent farmers and merchants who relied on pricing, market, and “shipping news” on a day-to-day basis (2009:11).

In contrast, early French journalism, much less structured, tended to combine information and editorial in the form of “commentaries,” wherein “the journalist analyses and comments on a topic from a specific moral or political point of view” (Chalaby 1996:315). Chalaby also notes that relative political stability in North America and England provided journalists with an easy means of demonstrating neutrality (by discussing both sides of an issue and quoting representatives from established political parties), while political pluralism, upheaval, and violence in France throughout the 19th century meant that newspapers and journalists frequently aligned themselves with movements and understood their work as “polemicizing and publicizing political ideas” (1996:319). While the importance of political ideologies has diminished in French journalism over time, many of the stylistic and normative differences remain (see Benson 2002; Rieffel and Watine 2002; Kuhn 2005; Benson and Hallin 2007; Esser 2008).

The extent to which these patterns replicate themselves in English- and French-language media in Canada remains unclear. Generally speaking, English-language news media in Canada tend to follow the Anglo-American model, but with a less formal approach to objectivity and neutrality (for instance, English-Canadian coverage of climate

change issues does not typically follow the “experts in conflict” narrative or point-counterpoint format frequently found in the United States — Young and Dugas, 2011; Boykoff and Boykoff 2004). The French-language print media in Canada appear to be somewhere in the middle of the two traditions. Case studies of Québec media have found parallels with the Continental French style, particularly that journalists are more deferential and less challenging of (nonpolitical) authorities, such as scientists and environmental groups, than is typical in Anglo-American media (Dumas and Gendron 1991; cf. Einsiedel and Coughlan 1993). Johansen et al. (2001:474) note that journalism professionalized rather late in francophone Québec — the first formal French language journalism program was established only in 1968 at Laval University — and thus argue that the window of entry for Anglo-American norms into francophone Québécois journalism has been relatively small. Interestingly, Charron (2002) arrives at the same conclusion from a different direction, arguing that francophone journalism was much more concerned with balance and neutrality during the immediate postwar period than today. According to this interpretation, from the 1970s onwards the younger group of newly professionalized journalists sought to differentiate themselves from the older generation and “make their mark” by “more openly attaching their subjectivity” to the stories they reported (pp. 84–85).

Finally, we note that although the differences between French and Anglo-American media cultures are widely recognized, there are substantial differences of opinion regarding how they affect the content of coverage. For instance, in a landmark study of climate change reporting in France and the United States, Brossard et al. (2004:359) argue that the commentary style of French journalism leads to less varied and diverse coverage than is typical in the United States. American norms of investigative journalism, which emphasize uncovering facts and pursuing leads, prompt reporters to seek out differing perspectives and opinions (some of which are far outside the political and scientific mainstream), both as a means of narrating the story and to sustain audience interest (2004:362). These sources have their own axes to grind, which means that American coverage is both wide-ranging and conflict-heavy (see Boykoff 2007). By comparison, French articles were less concerned with reporting competing claims or representing all perspectives on climate change, focusing instead on domestic and international political issues, such as the tense relations between the United States and the European Union on the climate file (Brossard et al. 2004:363–4).

These findings contrast with research by Benson (2009) and Benson and Hallin (2007), who argue that the French commentary style allows for a more independent and critical style of coverage. This is in part be-

cause journalists are less beholden to official sources and their formulaic talking points for material, and in part due to unique political-economic circumstances that apply in France but not in Canada, namely direct subsidies to smaller newspapers that, among other things, lessen dependence on advertisers who could conceivably influence coverage. Benson (2009:404) also argues that freedom from the need to base stories on official or organizational positions opens more room for “multiperspectivalness,” or the presence of a greater range and diversity of viewpoints, particularly from civil society, than in American media. These divergent findings make it difficult to confidently project a hypothesis regarding potential differences in English- and French-language coverage of climate change in Canada. Nevertheless, given that Brossard et al.’s research is specifically about climate change (Benson’s work focuses on politics and immigration), we will take their findings as the basis for H2. Our final hypothesis (H3), however, is consistent with both Brossard et al. and Benson’s findings that commentary style journalism tends to put a strong emphasis on political and social issues.

H2: English-language coverage of climate change will be more diverse in terms of voice and theme than French-language coverage.

H3: French-language coverage of climate change will be more concerned with moral and political dimensions of climate change issues than English-language coverage.

METHODS

The research reported in this article is part of a larger project entitled *Public Discourses on Climate Change in Canada*, which looks at multiple dimensions of the social and cultural life of climate change issues in this country. The data we consider here come from a content analysis of climate change coverage in eight major Canadian newspapers, six published in English (*The Calgary Herald*, *The Globe and Mail*, *The National Post*, *The New Brunswick Telegraph-Journal*, *The Toronto Star*, *The Vancouver Sun*) and two in French (*Le Devoir*, *La Presse*). Newspapers were selected with an eye to regional representation, circulation, and influence (so-called “newspapers of record”), although these criteria were constrained by the availability of electronic records.² Each newspaper was examined across a twelve month period, October 2007 to October 2008.

Individual newspaper items were selected for analysis using an electronic database (ProQuest) and the keywords “climate change” OR

2. For instance, *The Halifax Chronicle* is a regional newspaper of record, but was unavailable in electronic format at the time of study.

“global warming” OR “greenhouse effect” OR “greenhouse gas.”³ Each item was then read in order to exclude those that made only passing reference to climate change issues. Remaining articles (N=2,249) were subjected to content analysis using a coding schema designed to capture use of voice (quotation and paraphrasing of sources from various backgrounds), claims (regarding specific risks and benefits, impacts, motives), narrative devices (metaphors, parallels), and frames (such as green capitalism, political conflict, fatalism). The codes were determined partly with reference to similar studies conducted in Europe and the United States (e.g., Ungar, 1992; Wilkins 1993; Trumbo 1996; McComas and Shanahan 1999; Boykoff and Boykoff 2004; Carvalho 2007; Olausson 2009; Antilla 2010), but also inductively from a preliminary reading of approximately 250 articles in the sample. The strength of structured content coding is that it standardizes the articles and thus allows for statistical analysis of tendencies, variance, and associations. However, this method does have limitations, including an emphasis on denotative content (explicit) over connotative content (latent). Nevertheless, content coding is the best technique for performing large comparative analyses, and has been fruitfully applied to climate change issues by researchers in other contexts (e.g., Brossard et al. 2004; Antilla, 2005; Boykoff 2007; 2009; Smith and Joffe 2009). More qualitative critical discourse analysis was also performed on select media items, although these findings are not reported here (see DiFrancesco and Young 2011; Young forthcoming). The coding was performed by two research assistants. Intercoder reliability was tested using a Cohen’s kappa test on a subset of 100 articles, yielding an overall mean coefficient of 0.71, which is considered high for this conservative test (Lombard et al. 2002:593).

FINDINGS

Results from the content analysis show that English- and French-language coverage of climate change issues varies substantially across several key dimensions, but that support for the hypotheses is mixed. First, we will consider variations in the structure and general characteristics of media items (such as the type of articles, news pegs used, and the relative balance of newspaper coverage). Second, we will consider the question of voice or who is speaking in articles about climate change in the English and French media. Finally, we will examine similarities and differences in the substantive content of climate change coverage, in-

3. The keywords in French were “changement(s) climatique(s), réchauffement planétaire, gaz(es) à effet(s) de serre.”

cluding an investigation into the unique thematic combinations or “narrative packages” found in each group of newspapers.

General Characteristics of the Media Items

An overview of the population of articles for each newspaper is provided in Table 1. Here, we see that both English and French language newspapers took a substantial interest in climate change as a newsworthy topic during the study period (which encompassed the awarding of the shared Nobel Peace Prize to former US Vice-President Al Gore and members of the IPCC, as well as the 2008 federal election campaign in which the Liberal Party of Canada advanced its climate-focused Green Shift platform in a losing cause). While the English outlets averaged more items on climate change in this twelve month period (301 to 220), the French newspapers placed climate change articles in the front section more frequently (in 75% of cases compared with 61% for English outlets — figures not in tables). The French-language newspapers on average ran notably fewer editorials (52 to 91) and letters to the editor (3 to 40). These latter tendencies may have to do with adoption of the “commentary” style discussed previously, which may in turn eliminate the need to editorialize the issue. We will return to this point in our later discussion of findings.

Table 1. Type of Articles by Publication

	<i>News Item</i>	<i>Editorial</i>	<i>Letter to the Editor</i>	<i>Feature or Information Series</i>	<i>Total</i>
<i>Calgary Herald</i>	164	26	38	12	240
<i>Globe and Mail</i>	198	90	46	37	371
<i>National Post</i>	103	118	55	14	290
<i>New Brunswick Telegraph-Journal</i>	117	53	16	0	186
<i>Toronto Star</i>	167	150	49	6	372
<i>Vancouver Sun</i>	196	106	37	7	346
Total English	945	543	241	76	1805
<i>Le Devoir</i>	152	37	1	14	204
<i>La Presse</i>	141	67	5	27	236
Total French	293	104	6	41	444

Table 2 provides information regarding the use of news pegs. Environmental issues are notoriously difficult for journalists to cover, particularly slow-developing or “creeping problems” such as climate change that lack punctuated events (Boykoff 2007). Consequently, a key focus of the content analysis is the news peg that is used to establish the story. Generally speaking, even editorials and features peg their narra-

tives to an event, angle, or overarching theme that justifies the story's relevancy and draws readers in (Wilkins 1993). News pegs were determined by examining the title, subtitle, and first paragraph of the article to determine the initial emphasis of the item. Table 2 gives the ratio (percentage) of items using particular news pegs (statistically significant differences are noted; significance is measured using t-test comparison of means). Here, we see that English and French papers are similar in several respects. First, both groups use new discoveries or publications as an important window into climate change issues, while occurrences in the natural world and scientific events (such as meetings, conferences, and public statements) are rarely used (see Young and Dugas 2011 for a discussion of longitudinal changes on these variables). Both English and French media are also notable in their aversion to "conflict among experts" as the primary narrative vehicle in climate change coverage. This has been a major media trope in the United States (Boykoff and Boykoff, 2004; Demeritt, 2006; Boykoff, 2007), but our study is consistent with several others that have found that this narrative is rarely used in other media cultures (Olausson, 2009; Antilla 2010). This is not to imply that expert disagreements are absent in Canadian coverage (14% of English and 15% of French articles contain an identifiable "rebutter" voice that challenges the predominant argument or position in the piece), but that these disagreements are rarely used as *the reason* for writing the story.

Table 2. News Pegs (Ratios)

	<i>English Media</i>	<i>French Media</i>
New discovery or publication	0.19	0.21
Occurrence in natural world	0.02	0.01
Scientific event	0.03	0.02
Political event**	0.27	0.34
Conflict among experts	0.01	0.01
Suggested remedy**	0.18	0.29
Cultural product (film, book)*	0.03	0.01
Other**	0.11	0.02
No discernible peg**	0.16	0.09

* Variance is significant to <.05; **Variance is significant to <.01

Among the key differences is that proportionally more English-language articles appear without a discernible peg, although most non-pegged items are either editorials or short factual articles — both of which are more common in the English papers. The Anglophone press is also more likely to peg stories to "other" themes — including holiday travel, personal advice, and stock market analysis — which may indicate greater diversity of coverage (lending support to H2). The French media make greater proportional use of political events (such as policy debates, Question Period, and press conferences) and suggested remedies. We

note that these findings are consistent with H3, but set them aside for the moment, as they will be clarified when we consider issues of voice, or who is speaking about climate change through the media (see next section).

Next, we consider the overall balance of newspaper coverage. Articles were coded according to whether or not they privilege a particular position or perspective on climate change, for instance by presenting certain claims uncontested or by stating outright that one position is correct and the other incorrect or faulty. As we see in Table 3, the French-language media present a significantly higher proportion of articles that explicitly privilege claims about anthropogenic or human-induced climate change (which is the consensus view of the Intergovernmental Panel on Climate Change [IPCC]). On the other hand, the English media are much more likely to privilege “sceptic” or nonconsensus views on climate change, although such items represent a small fraction of total coverage (5%). These findings support H1a and H1b — that French-language coverage would be more attuned to environmental issues and favouring the consensus view on climate change than English-language reporting, but only as a matter of degree (albeit a large degree by this evidence). We also note that the modal category in both English and French coverage is “not discernable or not relevant,” which reflects the fact that most articles in both languages set the anthropogenic/sceptic debate aside when reporting on climate change issues. This finding is consistent with other studies that have found that while the science-based dispute remains high profile (looming large in the public mind), it is less dominant in day-to-day coverage of climate change than twenty years ago (Trumbo 1996; Olausson 2009; Young and Dugas 2011).

Table 3. Balance (Ratios)

	<i>English Media</i>	<i>French Media</i>
Privileges anthropogenic claims**	0.11	0.27
Equal consideration	0.01	0.00
Privileges “sceptic” claims**	0.05	0.01
Not discernable/not relevant**	0.84	0.73

**Variance is significant to $<.01$

Voice – Who is Speaking?

The sociology of journalism tells us that voice plays a critical role in formulating and presenting news items. In the Anglo-American media tradition, voice is frequently used as a means of constructing an image of balance or neutrality, where both sides are given the opportunity to say their piece, and it is then left to the reader to decide who has presented the better case (Dunwoody, 1999). As we have seen, however, neither

the English- nor the French-language outlets use quotations very frequently in this way when covering climate change issues. Instead, voice is primarily used to narrate the story. Climate change is an inordinately complex and multidimensional problem, and, as with many environmental issues, journalists rely on sources to *both* explain and interpret the problem for their audiences. This dual role grants significant power to sources, frequently allowing them to become what Hall et al. (1978) term “primary definers” of an article’s stance or tone (see also Anderson, 1993).

Table 4 gives the ratio of items that quote or paraphrase representatives of various groups at least once in the article text. These data confirm the importance of sources to the climate change issue, as 75% of all articles in both English and French contain at least one citation (articles containing no voices also tend to be shorter, averaging 476 words compared to 635). Table 4 shows important similarities across the English and French media. For instance, both frequently turn to environmental groups for commentary on climate change-related issues, but rarely to other reform-oriented groups such as labour unions and religious organizations. Think tanks are also less represented here than in the United States (see McCright and Dunlap 2003). There is substantial evidence of divergence, however. First, we note that voices from private business and industry associations appear significantly more frequently in the English media, which suggests that English coverage is more business friendly. Second, consistent with H3, we find that the French articles are

Table 4. Voice (Ratio of Articles Citing Individuals, by Role)

	<i>English Media</i>	<i>French Media</i>
Environmental group	0.19	0.22
Other reformist group	0.01	0.01
Business or industry association**	0.16	0.11
Think tank	0.06	0.04
University-affiliated expert**	0.20	0.09
Politician (all)**	0.29	0.36
Federal governing politician**	0.12	0.17
Federal opposition politician**	0.07	0.11
Provincial governing politician	0.12	0.10
Provincial opposition politician*	0.03	0.01
Municipal-level politician	0.04	0.02
Foreign politician**	0.05	0.11
Government employee (all levels)	0.14	0.12
International agency*	0.09	0.14
Citizen**	0.05	0.01
No voice in article	0.25	0.25
Diversity of voice index score*	1.52	1.36

* Variance is significant to <.05; **Variance is significant to <.01

significantly more likely to cite politicians, particularly those working at the federal level and those based in other countries. This is an important finding in part because English Canadians frequently assume that Québec is somewhat of an inward-looking province disengaged from federal politics due to the language divide and the sovereignty issue. These findings suggest the opposite. We also note that French articles are more likely to cite representatives of international agencies such as the United Nations and the IPCC.

Third, we see that university-affiliated experts are cited much more frequently in English-language coverage. This may be partially explained by the fact that much Canadian and international climate science is conducted predominantly in English, although we note that OURANOS, a major government- and university-sponsored research group on climate change issues, is based in Montreal and operates primarily in French. Another explanation is that science plays different roles in English- and French-language coverage. Several studies of media coverage of environmental problems (including climate change) have noted how scientific claims can paradoxically be used to establish larger narratives of uncertainty (e.g., Zehr 2000; Demeritt 2006). Essentially, when coverage dwells on or is dominated by scientific discussions, it frequently gives readers the impression that the issue is still in its formative stages — not well understood, requiring further research, far from consensus. Science can also be mobilized as a barrier to politics, as with the assertion that it is best to wait for definitive or “sound science” prior to enacting policy responses (Demeritt, 2006:468–9; McCright and Dunlap 2010). This means that the relative underrepresentation of university-affiliated voices in the French-language coverage may in fact reflect broader acceptance of the consensus position on anthropogenic climate change than in the English media.

The final line of Table 4 provides information on a “diversity of voice index” that we created following Benson (2009), achieved by summing the number of categories of voice (as opposed to the total number of speakers) that appear in each article, and then averaging them across all items. This measure shows that English language articles tend to contain a greater diversity of voices than French articles (1.52 to 1.36), even controlling for word count and type of article.⁴ This finding supports H2 (that English-language coverage will be more varied in terms of voice

4. Controls were introduced using a linear regression model. The voice diversity index was the dependent variable, and the independent variables were word count, English-language media (dummy), news item (dummy), editorial (dummy), and feature or information series (dummy). Standardized coefficients (Beta scores) indicate that news item has the greatest effect on diversity of voice (.429) followed by word count (.388) and language (.106).

and theme). As suggested earlier, the francophone tradition of “commentary” reporting and journalists as “auteurs” appears to leave a smaller space for outside voices, even on a complex issue such as climate change.

Issues, Frames, and Claims

Next we compare the substantive content of English- and French-language coverage of climate change issues. As mentioned, content coding and analysis sacrifices a certain degree of depth for comparative breadth. Nevertheless, content coding can be applied to “softer” or less manifest content, such as issues, frames, and claims provided that these are well-defined and that coding is performed with a high degree of intercoder reliability (Woodrum, 1984; Gamson and Modigliani, 1989). The prevalence of these narrative devices appearing in English- and French-language media are given in Table 5. The table is not exhaustive, but includes all codes where statistically significant differences were observed.⁵

Table 5. Prevalence of Key Narrative Devices

		<i>English Media</i>	<i>French Media</i>
Issues	Mention of ecological issues**	0.37	0.54
	Mention of economic issues	0.33	0.33
	Mention of health issues	0.07	0.08
	Mention of social/cultural issues**	0.12	0.05
Frames	Economic growth frame	0.18	0.21
	Green capitalism frame**	0.34	0.72
	Political conflict frame**	0.07	0.20
	Justice and equity frame**	0.04	0.10
	Moral obligation frame*	0.06	0.03
	Faith in innovation frame	0.08	0.07
	Fatalistic frame	0.02	0.02
	Frame diversity index score**	0.80	1.44
Claims	Mention of anthropogenic causation**	0.17	0.24
	Mention of non-anthropogenic causation	0.04	0.03
	Assertion of denial of the reality of climate change**	0.06	0.00
	Attribution of blame	0.17	0.15
	Accusation of bias**	0.27	0.33
	Call for government intervention*	0.09	0.13
	Call for urgent approach to mitigation*	0.19	0.23
	Mention of adaptation**	0.04	0.01
	Mention of victim*	0.15	0.11
	Mention of technological fix	0.11	0.10
	Mention of future**	0.24	0.13
	Appeal to Canadian nationalism**	0.04	0.01
Appeal to regional values	0.06	0.08	
Overall	Narrative complexity index score**	2.76	3.65

* Variance is significant to <.05; **Variance is significant to <.01

5. Please contact the first author for a copy of the complete coding instrument.

The first group of codes in Table 5 refer to the proportion of articles that contain mentions of ecological, economic, health, and social-cultural issues related to climate change. Mentions of issues are important because they ground the abstract notion of climate change in concrete problems. Immediately, we see that ecological themes are significantly more common in French-language coverage (appearing in 54% of items compared to 37% in the English press). This is strong evidence that environmental issues play a more central role in French-language reporting (lending support to H1a). While economic issues are mentioned in both English- and French-language media with equal regularity (in 33% of items), closer analysis reveals important differences in how these are portrayed. While English reporting tends to focus strongly on the economic risks of mitigating climate change (a conservative narrative that appears in 17% of all items), the French media tend to focus on either the economic benefits of mitigation (in 11% of all items) or the argument that current mitigation efforts are *too weak* to solve the problem (in 21% of all items — figures not in tables). As a counterpoint, we note that English-language media are significantly more likely to discuss social-cultural issues, such as the threat that climate change poses to livelihoods, traditions, or identities. These mentions are usually found in so-called “human interest” stories that quote ordinary citizens (see Table 4) — a common trope in Anglo-American media but largely absent from our sample of French-language coverage.

The second group of variables in Table 5 represent frames. Frames are strategic narrative devices that provide readers with an “interpretive package” for understanding an issue (Gamson and Modigliani 1989:1). By nature, frames are selective, downplaying certain aspects of an issue while emphasizing others. According to Entman (1993:52), frames are highly effective narrative tools because they bundle factual, moral, and prescriptive arguments into a coherent ready-made interpretation of the issue at hand. Frames were coded based on their underlying argument rather than their topic. For instance, while the economic growth frame and the green capitalism frame both have business issues as their key topic, the former makes a more conservative argument about the primacy of economic growth at all costs, while the latter is a more progressive narrative about private sector reforms and profit-making in response to climate change or climate change policy.

These findings show that French and English media make similar use of some frames (economic growth, faith in innovation, and fatalistic), but diverge strongly on others. The green capitalism frame, for instance, is common in both languages but pervasive in French coverage. Anecdotally, the popularity of this theme appears to stem from

journalists' affinity for the "Québec vert" narrative discussed previously (see Cardinal 2007), as well as the tradition in Québec of valourizing alternative socially conscious forms of capitalism (often termed "économie sociale" or "économie solidaire"). French articles are also more likely to use a political conflict frame, wherein climate change problems are directly attributed to political gridlock at the domestic and/or international level. Interestingly, English coverage is more likely to use what we term a moral obligation frame, which involves the argument that climate change ought to be addressed because it is wrong, while French coverage evokes a more complex justice and equity frame that suggests that climate change is caused by and/or needs to be addressed alongside social justice issues. For a broad measure of frame usage, we constructed a frame diversity index in the same manner as the voice diversity index found in Table 4. This shows that French articles typically contain significantly more frames per article (1.44) than English articles (0.80), which again holds when controlling for word count and type of article.⁶ This finding directly contradicts H2.

The third group of variables in Table 5 refer to specific claims. Here, we note that French-language items are significantly more likely to identify human activities as the cause of climate change, to contain explicit calls for government intervention, to advocate an urgent approach to mitigation, and to contain accusations of bias (the latter three being "political" themes). On the other hand, English-language items were more likely to contain outright denials of climate change, as are frequently found in US media (Boykoff and Boykoff 2004). They are also more likely to mention future projections and scenarios (a scientific theme), and to expressly identify victim(s) of climate change, perhaps due to the aforementioned tendency to human interest narratives.

Finally, Table 5 refers to a third index — that we term a "narrative complexity index" — that sums and averages all possible content codes relating to issues, frames, and claims. This is a broad index that provides a rough measure of the overall thematic richness of typical climate change coverage across the two groups. As with the frame diversity index, we see that French-language coverage scores significantly higher (3.65 codes/article) than English-language coverage (2.76 codes/article).⁷ This is yet another knock against H2, which was formulated on the expectation that French-language journalists would be more consistent in their narratives due to the "commentary" tradition, compared to

6. The Beta scores on statistically significant variables are: language (.262), word count (.188), editorial (.148), news item (.072).

7. The Beta scores on statistically significant variables are: word count (.276), language (.155), editorial (.111).

English-language reporters, whose coverage would be more varied (or scattered) based on the range of possible perspectives and issues linked to climate change. The evidence now clearly points to greater diversity of voice in the English reporting, but greater thematic diversity in the French coverage. There is, however, one final piece to add to this puzzle: while French articles are more thematically diverse *internally*, English coverage is more diverse *overall*. This finding is based on summing and then averaging the standard deviations on all codes in the narrative complexity index, giving an average of 0.261 for English items and 0.233 for French items. This measure is a way to look at the dispersion of content codes across the entire population of articles in each group, compensating for the fact that French coverage tends to cluster around several key issues, frames, and claims (specifically ecological issues, green capitalism, political conflict, accusations of bias, and calls for mitigation), while English-language coverage has fewer overtly dominant codes. Thus, it appears that English coverage is more diverse as a whole, but also that individual articles are more likely to compartmentalize climate change issues — to address them in thematic silos that consider a small number of related issues. French-language media, by contrast, appear more willing to reach across silos to present more complex (if less varied) narratives to readers.

Narrative Packaging of Climate Change Issues

Finally, we examine similarities and differences in the “narrative packaging” of climate change issues in the English- and French-language newspapers. By this, we refer to the tendency for different issues, claims, and frames to appear together (Gamson and Modigliani 1989; Young and Matthews 2010:172–9) and thus present recurring narrative combinations to readers. To investigate the occurrence of such packages, we applied a statistical measure of association (two-tailed phi test) to cross-tabulations of key content codes. We only classify the strongest associations ($p < .01$) as recurring narrative packages.

Table 6 presents significant narrative packages that are present in both the English- and French-language media. First, these findings show that there is a measure of narrative consistency in climate coverage across the language groups, as many themes are being “packaged” together in the same way. Second, they illustrate that narrative packages can be *thematically consistent* or *thematically variable* (earlier work by Gamson and Modigliani, 1989, focuses exclusively on thematically consistent packages). For instance, the tendency of a moral claim to appear with (1) a call for urgent mitigation measures, and (2) a mention of ecological risk

from climate change, presents a uniform or consistent thematic message. On the other hand, the tendency for an assertion of scientific consensus to be packaged with (1) an assertion of scientific uncertainty, and (2) a mention of ecological risk from climate change, is evidence of thematic variance within climate change stories. As we discussed earlier, Canadian media rarely set out to achieve perfect balance in their reporting on climate change issues. Nevertheless, both English- and French-language reporting tends to include an acknowledgement of claims about uncertainty alongside assertions of scientific consensus and corresponding ecological risk. In other words, when the latter two claims appear, they are frequently moderated or contested by claims of uncertainty.

Table 6. Strong Thematic Associations (“Narrative Packages”) Evident in both English and French-language Publications (Select)

<i>Theme</i>	<i>Appears with ...</i>
Assertion of scientific consensus	Assertion of scientific uncertainty Ecological risk from climate change
Moral claim	Call for urgent approach to mitigation Ecological risk from climate change
Green capitalism frame	Economic growth frame Political conflict frame Economic risk from mitigation
Economic growth frame	Presence of a political voice Economic risk from mitigation Economic benefit from mitigation
Accusation of bias	Green capitalism frame Political conflict frame Presence of a political voice

Measure of association on all variables significant to $<.01$ (phi test)

The only other thematically consistent package in Table 6 involves accusations of bias, which are strongly associated to political themes, including the presence of a political voice (either making an accusation or defending him or herself against one). In contrast, the narratives surrounding green capitalism and economic growth are more varied. For instance, green capitalism, which is a common frame that is supposedly progressive in meaning (referring to profit-making through environmental reform) frequently appears with claims about the economic risks or impacts of mitigation measures. We also note the link between green capitalism and political themes, which, along with the popularity of green capitalism mentions more generally (see Table 5), suggests that the notion of green capitalism is “user friendly” — in that it is frequently evoked by actors on all sides of climate change debates to reinforce their arguments.

Tables 7 and 8 provide information about narrative packages that *only* appear in English- and French-language coverage, respectively. By comparing these two tables, we get a sense of where English and French media diverge. One of the most significant divergences involves how science and expert knowledge are presented. Science and expertise are critical languages in climate change debates, given the complexity of the problem, its abstractness (relative to everyday lived experiences), and the role of models and projections in anticipating future impacts. In the English-language media, science and expertise appear to be presented in more self-contained or self-referential ways than in the French cover-

Table 7. Strong Thematic Associations (“Narrative Packages”) that Appear Uniquely in English-language Publications

<i>Theme</i>	<i>Appears with ...</i>
Assertion of scientific consensus	Expert knowledge claim (climatology)
Assertion of scientific uncertainty	Expert knowledge claim (any)
Accusation of bias	Accusation of bias
	Expert knowledge claim (any)
Attribution of blame	Assertion of denial
	Ecological risk from climate change
	Presence of environmentalist voice
Political conflict frame	Presence of political voice
Economic growth frame	Economic risk from mitigation
	Ecological risk from mitigation
	Ecological benefits of mitigation
	Presence of a political voice
	Presence of an industry voice

Measure of association on all variables significant to $<.01$ (phi test)

Table 8. Strong Thematic Associations (“Narrative Packages”) that Appear Uniquely in French-language Publications

<i>Theme</i>	<i>Appears with ...</i>
Assertion of scientific consensus	Mention of victim
Assertion of scientific uncertainty	Mention of anthropogenic causation
	Ecological risk from climate change
Moral claim	Expert knowledge (any)
	Use of crisis metaphor
	Mention of victim
Political conflict frame	Mention of victim
Green capitalism frame	Call for urgent mitigation
Economic growth frame	Call for urgent mitigation
	Expert knowledge claim (any)
	Economic risk from climate change
	Political conflict frame
	Justice and equity frame

Measure of association on all variables significant to $<.01$ (phi test)

age. For instance, assertions of scientific consensus in the English media tend to appear alongside expert claims about climatology (as well as the themes identified in Table 6). In contrast, the French media tend to present expert knowledge claims (of all kinds) in the context of an identifiable victim of climate change, such as an animal, landscape, population, or industry. Looking further down Table 8, we see that expert knowledge claims in the French-language media are also associated with moral claims about the impacts of climate change, as well as with the economic growth frame, where it is frequently bundled with discussions of political conflict and justice/equity. In the English media, the only time expert knowledge appears beyond discussions of scientific consensus or uncertainty is alongside accusations of bias. This is a consistent narrative in Anglo-American media coverage of environmental controversies generally, where advocates try to discredit the scientific claims of others by levying accusations of interestedness, bias, and predetermined results (McCright and Dunlap 2010; Young and Matthews 2010). It is notable that the French-language media do not appear to use this pervasive narrative, and instead focus on (presumably more expansive) intersections of science and morality.

DISCUSSION

Findings from the content analysis suggest that Canadian English- and French-language coverage of climate change converge and diverge across several dimensions. We begin with a discussion of the hypotheses that were formulated using existing research and literature on environmental values and media cultures. Overall, our analysis found strong support for H1a and H1b (that French-language coverage would focus more on environmental dimensions of climate change, and would favour the consensus view of the IPCC more than the English coverage). Findings presented in Table 5 demonstrated that French-language coverage is much more likely to explicitly mention an ecological issue when covering climate change (in 54% of items, compared to 37%), and to privilege claims about anthropogenic climate change (Table 3). We note, however, that these are differences of degree rather than kind. The English media also contain substantially more articles privileging the consensus view than the sceptic view, and regularly serve as a platform for environmental groups to express their views (Table 4). They are also more likely than the French-language media to focus on identifiable victims, “ordinary citizens,” and social-cultural dimensions of climate change issues. Each of these are means of “humanizing” climate change impacts and thus presenting pro-reform narratives (Smith and Joffe 2009).

The evidence regarding H2 is decidedly mixed. This hypothesis — that English-language coverage would be more varied in voice and theme — is based on expected differences in media cultures. As discussed previously, the Continental French and Anglo-American traditions are generally thought to differ, with the former adopting a “commentary-style” of reporting in which authors have a distinct presence in their texts, and the latter adopting ideals of professional detachment and practices such as using sources to narrate stories. This led us to expect that English-language coverage would be more varied — more open to influence by the wide range of events and actors who have something to say on climate change issues. Among the evidence supporting H2 is that English-language coverage is open to outright claims of denial of the reality of climate change (appearing in 5% of all items), which are completely absent from the French media (Table 5). English coverage also scored higher on the diversity of voice index (1.52 to 1.36), suggesting a greater reliance on sources. Evidence against H2 comes from the frame diversity index and the overall narrative complexity index, both of which indicate that French articles typically contain a greater diversity of themes. Finally, close analysis of the standard deviations on all content codes led us to conclude that English and French coverage is differently diverse — while English coverage may be more varied *as a whole*, French-language items tend to be more variable and nuanced *internally*.

This finding is potentially significant because climate change is an extraordinarily complex problem that resists easy answers. More expansively, prominent sociologists such as Beck (2009), Giddens (2009), and others (Hulme 2009; Jasanoff 2010; Swyngedouw 2010) have recently argued that climate change ought to play a more central role in social theory because it has broken free of the natural sciences and is forcing civil society to confront potentially transformative questions about progress, development, consumption, and democracy. In other words, complexity matters, and any serious attempt to address climate change will need to be multidimensional and reach across political, economic, and cultural spheres (Homer-Dixon 2007). In this sense, the French-language coverage, while less diverse overall, is better at relating climate change to the spheres of politics, business, and morality. As we saw in Table 2, French-language items are significantly more likely to use political events and suggested remedies as news pegs for climate change coverage. Table 5 also showed that issues of green capitalism and justice/equity are far more central to French coverage.

In contrast, the less complex English-language items suggest that climate change issues are more compartmentalized or considered in isola-

tion. Paradoxically, this compartmentalization may have to do with the role that science and expertise plays in the English-language media. As discussed earlier, English media cite university-affiliated experts more frequently (Table 4) and are more likely to package scientific themes together (such as consensus-uncertainty-bias — see Table 7). This contrasts with the French tendency of blending expert knowledge with other themes, notably the intersections of science-morality-politics-economy that are illustrated in Table 8. As argued by Demeritt (2006), conflicts over science or uncertainty frequently have the effect of preempting politics. Put another way, there is no point debating responses to climate change if the facts are still in doubt (McCright and Dunlap 2010). This may explain why science intersects with key political themes in the French media but not in the English coverage: in French journalism, the scientific debate is not permitted to overwhelm other dimensions of the issue. This leads us to conclude that French-language media are doing a better job *narrating* the complexity of climate change issues to audiences, even if the overall range of discussion is greater in the more “silo-like” items appearing in the English media.

Finally, our analysis uncovered substantial support for H3 — that the French-language coverage would be more concerned with moral and political dimensions of climate change. While the English media contained a particular moral narrative that was less frequent in the French media (focusing on victims), as discussed above, Table 8 showed that French coverage tends to weave moral themes into a broader range of discussions. With respect to politics, we found that government looms large in French-language coverage of climate change issues. Table 5 showed that French-language items were significantly more likely to contain a call for state intervention, an accusation of bias, and the political conflict frame. Moreover, the French media were far more likely to criticize existing mitigation attempts as being too weak — a narrative that was notably absent from the English media.

CONCLUSION

This article has sought to add to a growing body of literature that examines the cultural variability of climate change issues, in this case by looking at media discourse across the language divide in Canadian society. Our findings suggest that climate change is indeed being narrated differently to English- and French-speaking audiences in Canada. The complexity and multidimensionality of the climate change problem poses a significant challenge to journalists and editors trying to respon-

sibly report, interpret, and explain these issues to their readers. Our key conclusion is that English and French news organizations deal with this complexity differently. In our view, these differences are likely associated with the different environmental cultures and media cultures in English- and French-speaking Canada. Available evidence suggests that the province of Québec is the most pro-environmental in Canada, and that environmentalism has particular resonance for francophone Canadians. Even if these differences are sometimes exaggerated, the high degree of ecologically focused coverage in the French media suggests that journalists are attempting to reflect these values by, for instance, seeking out stories and sources that focus on this dimension of the climate change story. This leads to more focused and, in a sense, one-sided coverage compared to the English-language media that is happy to include claims of denial, scientific uncertainty, and pro-business narratives in climate change reporting. Differing media cultures appear to be equally significant. English Canadian media, with its grounding in the Anglo-American tradition, is open to covering the range of possible stories and angles on climate change but in relative isolation from one another (although we note that it does not artificially stage debates, as is common in US media). Put more crudely, it is more willing to follow the climate change story wherever it goes in a less critical fashion, even if it leads into suspect terrain. As Boykoff and Boykoff (2004) have noted, this approach is not without consequence, as the quest to cover “the whole story” frequently gives voice to characters and ideas of dubious quality and relevance. In contrast, the French commentary tradition is less open to outside voices, less diverse overall, but presents more thematically complex and nuanced articles that better address the expansive nature of the climate change problem. Two solitudes? Perhaps not, but there is substantial evidence of narrative break across the language divide. On the whole, the Francophone media are participating in the kinds of complex and multidimensional conversations about climate change that need to happen, while the English media appear more interested in reporting from the sidelines.

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