

**Issue Responsiveness in Canadian Politics: Are Parties  
Responsive to the Public Salience of Climate Change in the  
Question Period?**

Supplementary Material

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## I Choice and Validation of the Number of Topics

Diagnostic Values by Number of Topics

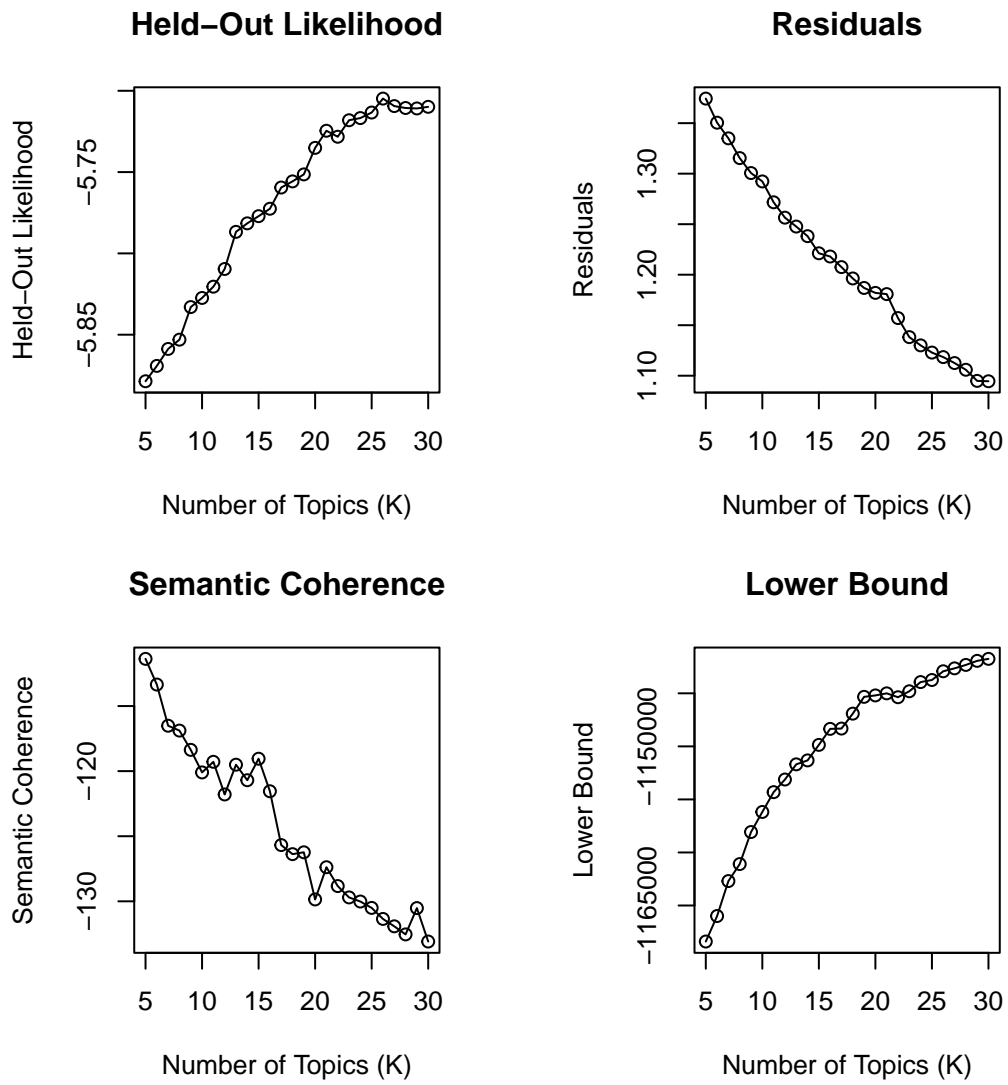


Figure S1: Diagnostic Values by Number of Topics

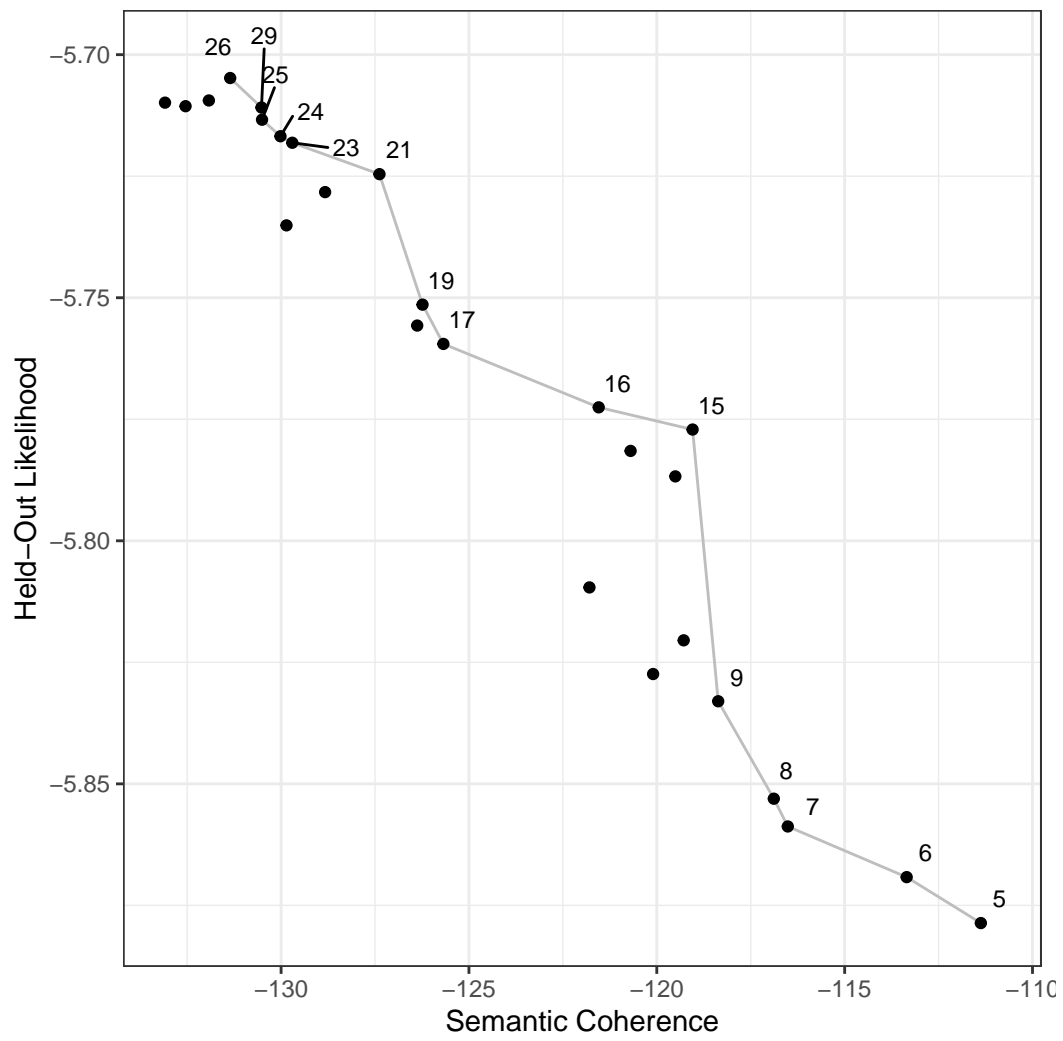


Figure S2: Relationship between Held-Out Likelihood and Semantic Coherence

Table S1: Words Representative of the Estimated Topics

COVID-19 / Health Care	health, vaccin, care, manag, crisi, pandem, suppli, drug, deliv, territori, transfer, medic, provinc, emerg, addit, system, product, failur, receiv, quickli
National Defense / Veterans Affairs	veteran, affair, militari, forc, defenc, servic, mission, arm, afghanistan, serv, foreign, honour, war, centr, equip, staff, oper, maintain, deserv, nation
Budget / Taxes	tax, cost, pai, carbon, busi, credit, taxpay, corpor, increas, save, rais, consum, deficit, revenu, bank, financ, billion, budget, balanc, price
Democratic Institutions / Investigations / RCMP	elect, senat, committe, court, answer, appoint, polic, campaign, question, rcmp, leader, alleg, justic, legal, common, stori, expens, simpl, parliament, debat
Foreign Policy / Immigration / Refugees	secur, world, border, intern, immigr, refuge, unit, agenc, china, food, concern, threat, organ, situat, alli, countri, citizen, human, engag, american
Criminal Justice / Culture / Official Languages / Human Rights	offici, women, colleagu, bill, legisl, languag, protect, right, victim, proud, introduc, posit, act, statu, discuss, issu, equal, cultur, commit, human
Economic Growth / Industry / Job Creation	creat, econom, job, sector, economi, growth, industri, lost, manufactur, opportun, creation, grow, innov, market, region, focus, export, plan, thousand, busi
Auditor General / Public Procurement / Treasury Board	board, farmer, contract, report, public, presid, decis, truth, auditor, releas, review, agricultur, transpar, media, treasuri, inform, depart, independ, fire, hide
Climate Change / Environment	chang, climat, environ, emiss, fight, target, clean, reduc, action, greenhous, plan, real, oil, pollut, effect, energi, approach, solut, price, reduct
Employment / Labor	worker, employ, wait, employe, insur, labour, lose, pension, union, fix, leav, peopl, week, paid, extend, program, disabl, post, train, month
Education / Research / Youth	fund, million, program, student, research, cut, school, budget, dollar, strategi, billion, educ, invest, aborigin, hundr, scienc, summer, announc, monei, init
Intergovernmental Affairs	agreement, deal, negoti, feder, british, provinc, provinci, sign, trade, premier, quebec, columbia, free, ontario, respect, jurisdict, met, regul, oppos, reach
Families / Middle Class / Seniors	famili, child, vote, children, middl, class, senior, poverti, benefit, help, choic, invest, lower, middleclass, hard, singl, rate, join, incom, live
Natural Resources / Infrastructure	consult, indigen, project, commun, coast, transport, resourc, infrastructur, pipelin, northern, municip, safeti, build, water, assess, move, nation, citi, natur, toronto
Ethics	commission, rule, ethic, person, law, conflict, matter, trust, recommend, friend, follow, polit, respons, advic, financ, investig, accept, break, violat, account

Table S2: Documents from the “Climate Change / Environment” Topic

1	Mr. Speaker, I agree with the Government of Québec’s declaration. However, the measures in Québec’s plan will not reduce air pollution enough. We need a strict national regulatory framework that goes beyond Kyoto targets. The clean air act will enable us, for the first time, to implement integrated regulation of air pollution and greenhouse gases.
2	Mr. Speaker, climate change is real and the cost of inaction is enormous. It is disappointing that while climate change is having a real impact on the health and well-being of Canadians, the Conservatives still do not have a plan to protect our environment. If they do not have a plan on climate change, they do not have a plan for the economy or for the future. Can the Parliamentary Secretary to the Minister of Environment please advise this House of the actions our government is taking to fight climate change?
3	Mr. Speaker, the targets for the economy are clear. According to our plans, greenhouse gas emissions must be reduced by 20% by 2020. In the meantime, in the regulatory system proposed and detailed by the Minister of the Environment, it is clear that we are calling for efforts to be made in terms of carbon sequestration, specifically for the oil sands. These are special measures for that sector to help us achieve our results.
4	Mr. Speaker, I agree that those who are trying to sabotage the plan to deal with greenhouse gases should be condemned. It is the Bloc members and the Liberals who should be condemned. This party is a party of action. We have tabled the clean air act and those parties want to stop Canada from moving forward on reducing greenhouse gas emissions. They need to stop their sabotage. They need to get on side with reducing greenhouse gas emissions.
5	Mr. Speaker, the vast majority of Canadians want a real plan to reduce greenhouse gas emissions, not a con job. Canada can and should be a leader on this issue. We should be about renewable energy, about eliminating subsidies that reward pollution, about pushing for energy efficiency, about being leaders in green technology. The government’s plan does just the opposite, and no one believes Conservatives take climate change seriously. As the world heads to the Cancun climate conference, will the government be a laughing stock, once again?
6	Mr. Speaker, our government is committed to working with our international partners to address climate change. We have contributed \$1.2 billion to developing countries so that they can reduce emissions and adapt to changes. We are also a founding member of an international coalition taking action to reduce pollutants like black carbon. I look forward to meeting with my international counterparts to continue to take action in addressing climate change.
7	Mr. Speaker, there is no question that the world must take action. Here in Canada, we are showing true leadership with our plan for absolute targets to reduce greenhouse gas emissions by 20% by 2020. Perhaps the NDP leader should read today’s La Presse. André Pratte wrote that the Prime Minister’s attitude is “perfectly reasonable.” He said that the Prime Minister “is right: everyone, including the United States, has to sign on to the post-Kyoto strategy.” We are taking action.
8	Mr. Speaker, I have good news for the member for Skeena–Bulkley Valley. The Conservative government finally has begun to get rid of the tax subsidies given to the oil sands by our friends opposite in the Liberal Party. We are taking real action to reduce greenhouse gas emissions by an absolute 20%. That will put Canada in a leadership position. We will do more in the next 12 years than virtually any country in the world. While we may not have the full support and enthusiasm of the member for Skeena–Bulkley Valley, we have the full support of the Liberal Party of Canada.
9	Mr. Speaker, I think the Prime Minister himself does not believe his own distortions. He knows very well that in June 2005 the prime minister at the time came forward with a plan for greenhouse gas reductions seven times more than what he wants. He knows very well that a full year was wasted when he killed the plan and the billions of dollars in greenhouse gas reductions. There are a lot of programs that he really just took parts of, and in changing the names, he is trying to fool the Canadian people. Will he show this kind of awful behavior at the G-8 meeting? Will he try to fool the world after he tried to fool Canadians?
10	Mr. Speaker, we are playing a leadership role on the international stage. We have helped more than 65 developing countries to reduce emissions and adapt to climate change. We are doing our part by contributing to the Green Climate Fund. We are a founding member and major financial contributor to the Climate and Clean Air Coalition. We are also addressing short-lived climate pollutants under the chairmanship of the Arctic Council. We will continue to protect our environment while keeping our economy strong.

## 2 Causal Estimates of Substitution Effects

In our previous analysis, we investigated how variations in the public salience of climate change influenced the level of attention given by political parties to this issue during the Question Period. Now, we shift our focus towards understanding the effect of changes in the public salience of climate change on the attention political parties dedicate to other policy matters during their Question Period interventions. This analysis serves as a placebo test, allowing us to assess whether our quasi-experimental treatment influences an outcome that is different from our outcome of interest. In general, we do not anticipate a significant or consistent effect of the public salience of climate change on the proportion of Question Period interventions related to other policy issues. Nonetheless, these findings could provide insights into some of the strategies employed by political parties to redirect attention towards more favorable topics when climate change gains greater prominence.

Formally, our aim is to estimate the parameter  $\beta_i^j$  in the following regression model:

$$\log \left( \frac{Y_{it}^j}{1 - Y_{it} - Y_{it}^j} \right) = \alpha_i^j + \beta_i^j \log (X_t) + \varepsilon_{it}^j. \quad (\text{A1})$$

In this equation,  $Y_{it}^j$  represents the proportion of Question Period interventions made by party  $i$  on topic  $j$  during week  $t$ . The dependent variable is standardized, enabling us to measure the prominence of a specific topic relative to all other topics except climate change. Furthermore, this standardization accounts for fluctuations in the proportion of interventions related to climate change, allowing us to analyze the effect of changes in the public salience of climate change on the topic composition of interventions across all other topics.

Figure S3 presents the results from estimating Equation (A1) using the two-stage least squares method. The figure displays the point estimates on the  $x$ -axis along with their corresponding 95% confidence intervals. For reference, the final row of the figure shows the results from estimating Equation (1) and includes their respective 95% confidence intervals. A positive coefficient implies that a party is more likely to highlight a specific topic in their Question Period interventions when there are exogenous changes in the public salience of climate change. Conversely, a negative coefficient suggests that the party is less likely to address that topic in their interventions when there are exogenous shifts in the public salience of climate change.

In general, our analysis does not reveal a consistent or systematic effect of the public salience of climate change on the topics discussed during the Question Period. However, the results do suggest that both the Conservative and Liberal parties have engaged in certain strategies of obfuscation and strategic maneuvering, albeit to a limited

extent. Specifically, when the public salience of climate change increases, the Conservative Party noticeably amplifies its discussions on topics such as economic growth, job creation, and intergovernmental affairs in their Question Period interventions. On the other hand, the Liberal Party reduces its emphasis on infrastructure and natural resources within Question Period interventions in response to a surge in the public salience of climate change. Finally, our findings suggest that following shifts in the public salience of climate change, the Liberal Party places greater emphasis on national defense while diminishing the prominence of foreign policy in their Question Period interventions.

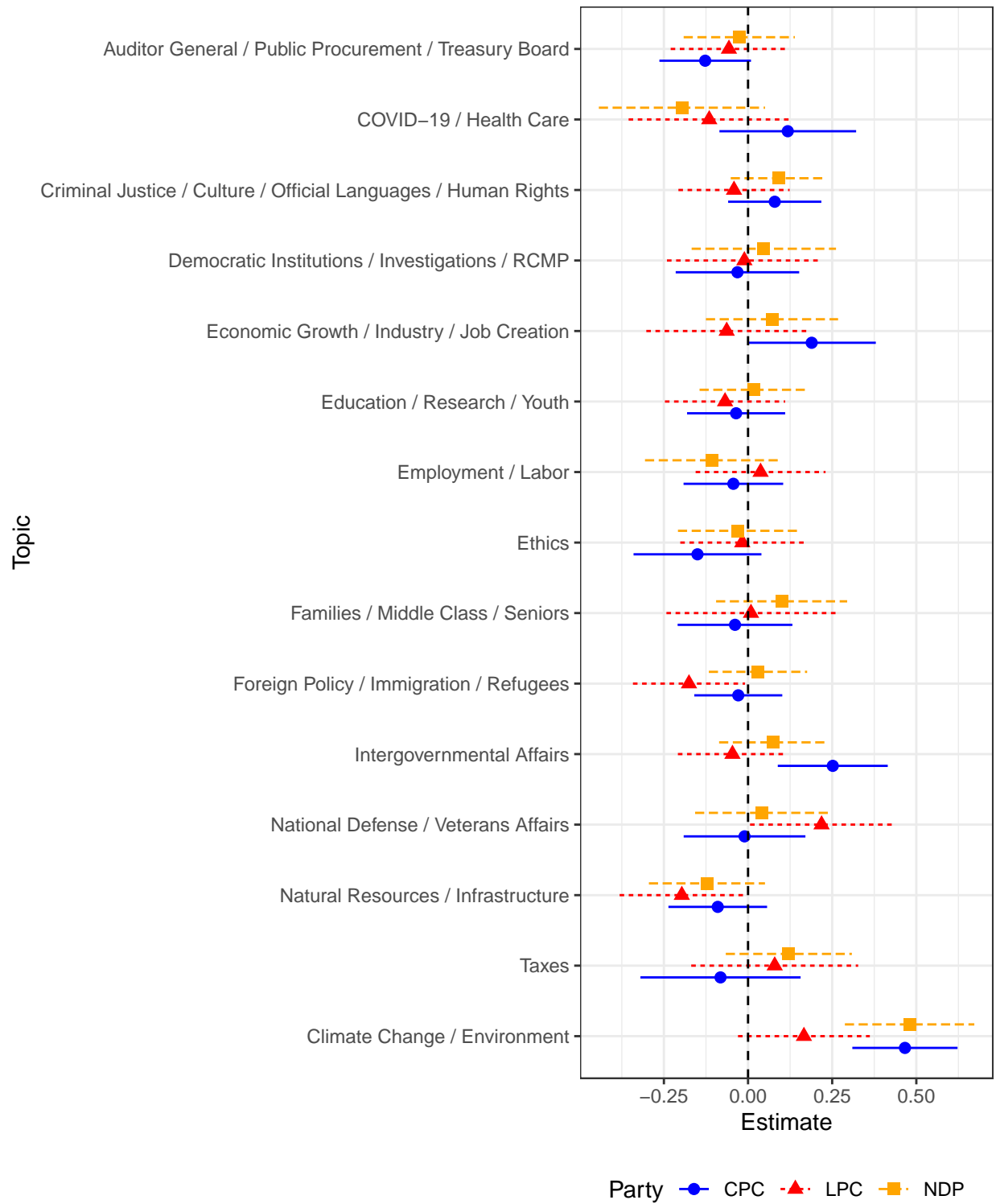


Figure S3: Causal Estimates of Substitution Effects



### 3 Geographic Heterogeneity in Issue Responsiveness

In our previous analysis, we have focused on how political parties respond to the national public salience of climate change. This choice was based on the premise that parties should reflect the concerns of the general public. However, we acknowledge that the public is not a homogeneous entity, and different groups can exert varying levels of influence on the decision-making processes of political parties. In support of this notion, Penner, Blidook, and Soroka (2006) argue that political representation during the Question Period is “particularized,” meaning that parties tend to represent the interests of specific sub-populations.

In general, the opinions and preferences of a party’s supporters are likely to carry more weight in shaping its decision-making. These supporters may be concentrated in specific regions of the country. Additionally, members of a party’s caucus represent geographic areas known as ridings and may face pressure to address the unique concerns and interests of their constituents. Consequently, we posit that parties may exhibit varying degrees of responsiveness to changes in the public salience of climate change across different provinces.

We acknowledge that our previous analysis, which relied on a national measure of public salience, might not adequately capture regional variations in the salience of climate change. Given Canada’s vast size and geographical diversity, the impacts of climate change can be experienced differently and at different times across various regions. Consequently, there may exist significant regional disparities in the degree of salience attributed to climate change. To account for these regional disparities, we incorporated into our analysis measures of the provincial public salience of climate change obtained from Google Trends.

The relationship between the public salience of climate change in Canada and its ten provinces is depicted in Figure S4. The vertical axis represents the national public salience of climate change, while the horizontal axis represents the public salience of climate change in each province. Our analysis reveals a positive correlation between the public salience of climate change at the provincial and national levels. The strength of this correlation is primarily influenced by the size of each province, with larger provinces exhibiting a higher correlation between their public salience of climate change and the national level.

Next, we conduct an analysis to evaluate the extent to which political parties seem to prioritize certain constituencies over others. Specifically, we employ a regression model that takes into account the levels of public salience regarding climate change at both the national and provincial levels.

Estimating issue responsiveness poses a significant challenge due to simultaneous causality. The public’s perception of priorities is not only influenced by political parties’ attention to policy issues but also has an impact on

the level of attention parties allocate to those issues. For instance, supporters of the Conservative Party may not prioritize climate change because the party itself does not address it. Conversely, the Conservative Party may not focus on climate change because its supporters do not consider it a crucial issue. To address these challenges, we have previously developed a research approach that allows us to causally identify parties' responsiveness to the national public salience of climate change. However, this methodology does not allow us to causally identify parties' responsiveness to specific sub-populations. Therefore, our analysis primarily focuses on examining whether there is a residual correlation between the prevalence of climate change discussions in Question Period and its public salience at the provincial level.

The estimation results are presented in Tables S3 and S4. The available evidence suggests that there is limited support for the notion that parties respond differently to the public salience of climate change across provinces. When accounting for the national public salience of climate change, we observed no significant residual relationship between the public's level of concern about climate change in the provinces and the frequency of climate change discussions in Question Period, except in a few specific cases. Before 2015, both the Conservatives and Liberals in Alberta displayed a negative residual correlation. This indicates that, holding all other factors constant, these parties addressed climate change less frequently in their Question Period interventions when the issue was more prominent in the province. Similarly, negative residual correlations were observed for the Liberals in New Brunswick prior to 2015, as well as for the Liberals in Manitoba and Nova Scotia after 2015. However, it is crucial to note that these residual correlations are of minor magnitude and could be considered "false positives." Therefore, overall, the findings suggest little substantial evidence to support the notion that parties exhibit differential responsiveness to the public salience of climate change across provinces.

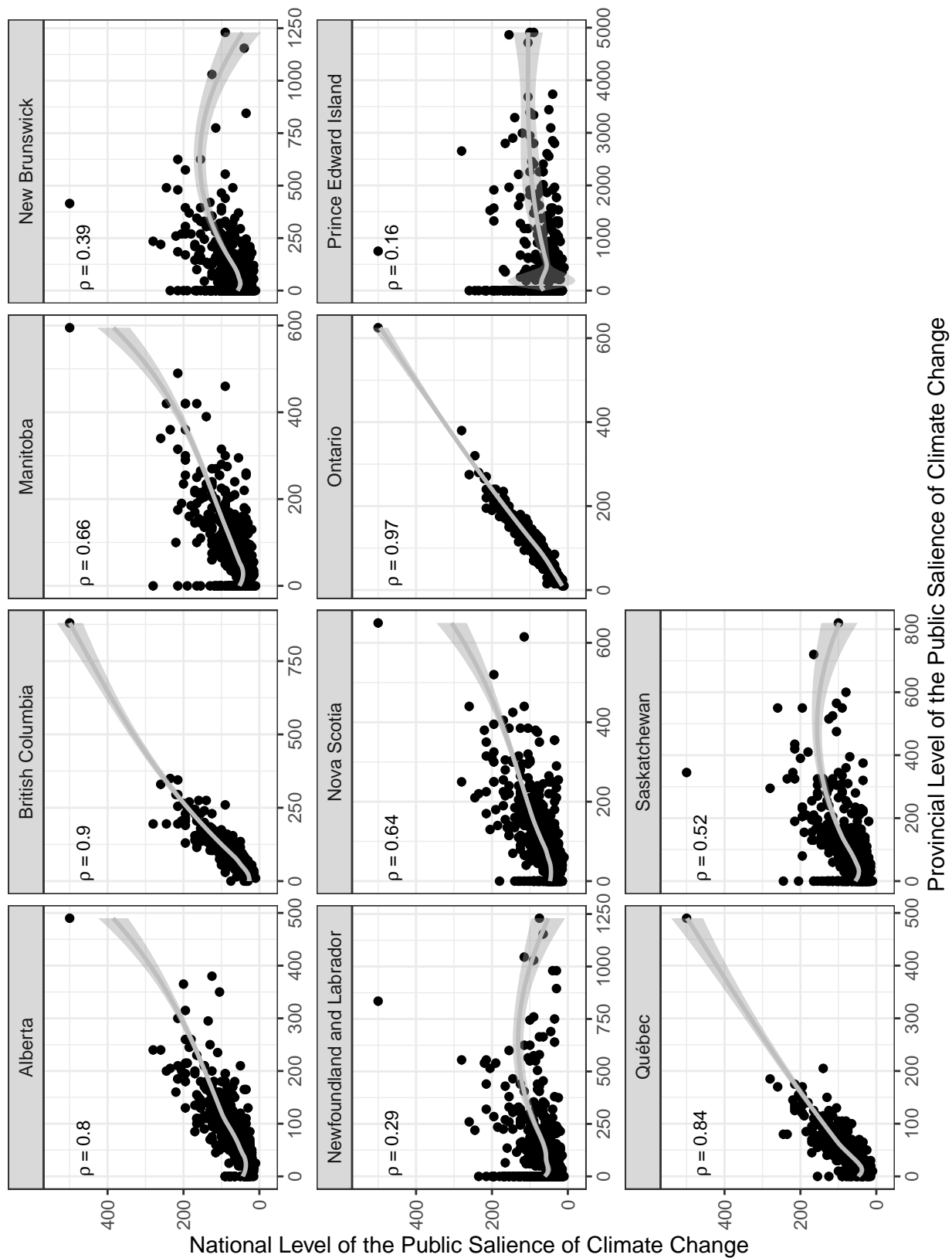


Figure S4: Relationship between the National and Provincial Levels of the Public Salience of Climate Change

Table S3: Regional Heterogeneity in Issue Responsiveness

	CPC		LPC		NDP	
	(1)	(2)	(3)	(4)	(5)	(6)
National	0.400*** (0.048)	0.498*** (0.145)	0.282*** (0.062)	0.062 (0.187)	0.355*** (0.056)	0.454** (0.189)
Alberta		-0.014*** (0.005)		-0.012** (0.006)		-0.006 (0.007)
British Columbia		0.059 (0.062)		0.156* (0.080)		0.117 (0.086)
Manitoba		-0.001 (0.002)		-0.001 (0.002)		0.001 (0.002)
New Brunswick		-0.001 (0.001)		-0.004*** (0.001)		-0.0004 (0.002)
Newfoundland and Labrador		-0.002 (0.001)		0.001 (0.001)		-0.001 (0.002)
Nova Scotia		0.001 (0.002)		-0.001 (0.002)		0.001 (0.002)
Ontario		-0.153 (0.125)		0.105 (0.161)		-0.241 (0.167)
Prince Edward Island		-0.001 (0.001)		-0.0001 (0.001)		0.0004 (0.002)
Québec		-0.001 (0.004)		0.001 (0.006)		-0.006 (0.006)
Saskatchewan		0.001 (0.001)		0.004** (0.002)		0.001 (0.002)

Note:

\*p&lt;0.1; \*\*p&lt;0.05; \*\*\*p&lt;0.01

Table S4: Regional Heterogeneity in Issue Responsiveness

	CPC		LPC	
	(1)	(2)	(3)	(4)
<b>Before 2015</b>				
National	0.428*** (0.050)	0.376** (0.177)	0.319*** (0.066)	0.128 (0.239)
Alberta		-0.014*** (0.005)		-0.015** (0.007)
British Columbia		0.072 (0.075)		0.125 (0.102)
Manitoba		-0.001 (0.002)		-0.0003 (0.003)
New Brunswick		-0.0001 (0.001)		-0.005** (0.002)
Newfoundland and Labrador		-0.002 (0.001)		0.001 (0.002)
Nova Scotia		0.001 (0.002)		-0.0002 (0.003)
Ontario		-0.012 (0.153)		0.109 (0.207)
Prince Edward Island		-0.001 (0.001)		0.001 (0.002)
Québec		-0.001 (0.005)		-0.001 (0.006)
Saskatchewan		0.001 (0.002)		0.003 (0.002)
<b>After 2015</b>				
National	0.127 (0.101)	-0.370 (0.445)	0.229* (0.121)	0.560 (0.437)
Alberta		0.025 (0.099)		0.190* (0.096)
British Columbia		0.164 (0.131)		-0.004 (0.129)
Manitoba		0.0003 (0.004)		-0.009** (0.003)
New Brunswick		-0.002 (0.002)		-0.005** (0.002)
Newfoundland and Labrador		-0.001 (0.002)		0.001 (0.002)
Nova Scotia		0.004 (0.003)		-0.008** (0.003)
Ontario		0.168 (0.283)		-0.266 (0.279)
Prince Edward Island		-0.0003 (0.002)		-0.002 (0.002)
Québec		0.095 (0.080)		-0.124 (0.080)
Saskatchewan	12	0.004 (0.003)		-0.002 (0.003)

Note:

\* p&lt;0.1; \*\* p&lt;0.05; \*\*\* p&lt;0.01