

1 Title: Can citizen pressure influence politicians' communication about
2 climate change? Results from a field experiment
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27 Abstract

28 Urgent reductions in greenhouse gas emissions depend on governments implementing and enforcing
29 rigorous climate policy. Individuals in democracies seeking to persuade government officials to reduce
30 greenhouse gas emissions can take steps such as voting, protesting and contacting officials directly, but
31 it is unclear how effective each of these actions is in changing the behavior of elected officials. Here we
32 take advantage of the public nature of social media to evaluate the actual efficacy of climate campaign
33 emails using an original, real-world experiment where 335 Members of Canadian Parliament were asked
34 by constituents to post a pro-climate message to their Twitter account. Only one Member of Parliament
35 posted the exact text suggested by the campaign. After scraping and coding 18776 tweets, we first find
36 no evidence that a public health messaging frame is more effective than a standard environmental
37 frame in eliciting pro-climate posts. Furthermore, we find only a marginally significant relationship
38 between volume of constituent contact and increased pro-climate tweeting from Members of
39 Parliament. Follow-up interviews with political staffers suggest that analog alternatives may be more
40 effective than campaign emails in some cases. Interview findings also reveal that some offices receive
41 low levels of constituent communication on climate change, indicating that increased pressure from
42 constituents could still be consequential.

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47 Introduction

48 The combined emissions targets of national governments are insufficient to avoid dangerous levels of
49 planetary warming as defined by the Paris Climate Agreement (Rogelj et al., 2016). Partially in response
50 to this lack of ambition, over one million people around the world attended protests in March of 2019
51 with the intent of pressuring government officials into greater action on climate change (Wahlström et
52 al., 2019). Despite increasing political mobilization, when asked to describe what they see as the most
53 effective way for individuals to reduce greenhouse gas emissions, a recent study found that members of
54 the public favor consumer actions like reducing personal vehicle usage over political actions like voting
55 (Wynes et al., 2020). Interestingly, political advocacy is often a necessary condition for enabling
56 consumer action, since structural barriers may prevent widespread consumer change (Ockwell et al.,
57 2009). And while consumers can seek out a broad literature on the most effective steps they can take to
58 reduce greenhouse gas emissions (Gardner and Stern, 2008; Lacroix, 2018; Wynes and Nicholas, 2017),
59 beyond some evidence that voting is a high-impact climate action (Wynes et al., 2021), there is little
60 research to inform the decisions of an individual hoping to use political action to mitigate climate
61 change (Han and Barnett-Loro, 2018).

62 It is difficult to compare the effectiveness of different political actions and different consumer actions,
63 but it may at least be possible to create a hierarchy whereby an individual could identify the political
64 actions that are most meaningful at effecting change. A survey of European Members of Parliament, for
65 instance, suggested that politicians viewed voting as highly effective, writing letters or emails to elected
66 officials as moderately effective and online discussions as less effective ways to influence political
67 decision making (Hooghe and Marien, 2012). But these approximate rankings may not hold in other
68 jurisdictions or remain consistent across multiple issues. A sudden influx of constituent communications

69 on a new issue, for example, might cause greater response from officials than the same volume of
70 communication on an issue that officials are already addressing.

71 A degree of dissonance between the policies being enacted by officials and the opinions expressed by
72 constituents can be explained by the “spiral of silence” on climate change. Since climate mitigation
73 measures only become effective when a sufficient number of actors participate, governments and
74 individuals who perceive a large proportion of their peers as unmotivated may be less willing to take on
75 the individualized costs associated with climate action (Mildenberger and Tingley, 2017a). According to
76 this theory on the role of “secondary beliefs” (beliefs about what others believe), climate action is then
77 at least partially reliant on individuals signaling that they are willing to act on climate, and other
78 individuals correctly interpreting those signals.

79 Unfortunately, individuals not only underestimate public concern for climate change in other nations
80 (Taddicken et al., 2019), they also tend to underestimate concern for climate change among their own
81 peers, causing them to self-silence (Geiger and Swim, 2016). Furthermore, both citizens and political
82 elites underestimate public support for carbon regulation (Hertel-Fernandez et al., 2019; Mildenberger
83 and Tingley, 2017b), which depresses support for further action. Additional research in the United States
84 has found that the misperceptions of political elites may be partly driven by disproportionate contact
85 from Republican constituents, who are more likely to be opposed to climate action (Broockman and
86 Skovron, 2018). Such misperceptions have also proven difficult to correct, as officials are unwilling to
87 revise their estimates of constituent preference even in the face of strong public polling data (Kalla and
88 Porter, 2019). In the UK, research suggests that silence from constituents on climate change discourages
89 Members of Parliament from acting on climate change, since they do not believe that doing so would be
90 representing the needs of their electorate (Willis, 2018). As there is broad evidence that citizen concern
91 for climate change is partially driven by cues from elites (Brulle et al., 2012; Carmichael and Brulle, 2017;
92 Merkley and Stecula, 2020; Rinscheid et al., 2020), there is value in either group jumpstarting a feedback

93 loop where increased expressions of concern by elites or the public amplifies concern and action in the
94 other group.

95 Many environmental activists currently rely on online campaigns through social media and email to
96 recruit members of the public to pressure elected officials. Prior to widespread use of digital
97 communication, legislators could discern which messages came from constituents based on their
98 address or the area code of their phone number, but emails and social media communications largely
99 mask the location of the sender. Emails and social media have also lowered the cost of communication,
100 such that issues which constituents are not very passionate about can still generate a high volume of
101 online correspondence (Cluverius, 2017). Thus a large volume of communication no longer signals
102 salience, and legislators may rely less on these signals to inform their choices (Cluverius, 2017;
103 McDonald, 2019).

104 The presence of dishonest communication strategies may exacerbate the lack of trust displayed by
105 legislators. Astroturfing, the act of falsely imitating grassroots organizing (McNutt and Boland, 2007),
106 includes dishonest mass communication campaigns from interest groups. Interest groups might make
107 use of members' contact information without their permission or contact legislators who are not in the
108 same jurisdiction as the members. Legislators who become aware of such tactics may then devalue
109 future communications with similar characteristics, even if they are sent by constituents in good faith.

110 Given indicators of change in the way that legislators interpret signals from their constituents, it is
111 important for grassroots organizations and concerned citizens to know how their outreach is now
112 received. Past research has demonstrated the variable ways in which officials react to correspondence
113 from their constituents. A study in the United States made use of emails from fictitious citizens to show
114 that politicians are less responsive to minorities (Butler and Broockman, 2011), and an experiment
115 featuring letters from actual individuals found that politicians are more responsive to service requests

116 than to policy requests (Butler et al., 2012). In the UK, elected officials provided higher quality responses
117 to information rich letters than to information poor letters from citizen interest groups (Richardson and
118 John, 2012). The results of this research suggest that even within a single type of action, such as writing
119 a letter, changes to authorship or format can alter the effectiveness of that political action.

120 The Canadian political system offers an interesting case to examine mass communication campaigns on
121 climate change. Support for climate change policies is higher in Canada than in the United States, with
122 broad (though heterogenous) support for carbon pricing across the nation (Mildenberger et al., 2016).
123 Canada is a parliamentary democracy; the national House of Commons is composed of 338 Members of
124 Parliament (MPs), each representing constituents residing in their electoral district (or riding). The four
125 major federal parties have varying levels of ambition on climate policies and targets, with only a fringe
126 party formed in 2018 openly denying the existence of human-caused climate change. In the months
127 leading up to the most recent federal election, climate change became a priority issue for Canadian
128 voters (Bricker, 2019). Still, it is not clear that Canadian politicians have come to terms with this shift in
129 preference of the electorate. Canadian climate policies are projected to fall short of Canada's own target
130 set out in its Nationally Determined Contribution to the Paris Agreement, for instance (Environment and
131 Climate Change Canada, 2020).

132 An ideal experiment to evaluate the efficacy of a political campaign would be to test whether members
133 of a legislature who receive a greater volume of constituent correspondence are more likely to vote or
134 write new motions in line with stated constituent preferences. However, legislative voting usually
135 conforms to party lines (Nokken, 2000). In Canada, for example, even a successful campaign might only
136 sway one or two MP votes out of 338, and therefore go undetected by statistical tests. Surveys of
137 legislators can instead be used to elicit the legislator's opinions on what they believe is effective in
138 changing their political decisions (Cluverius, 2017; Hooghe and Marien, 2012), but results from these
139 investigations may be subject to social desirability bias (Nederhof, 1985). For instance, a legislator may

140 feel compelled to incorrectly report that they value constituent preference above party mandate in
141 order to conform to public expectations. Survey techniques such as asking a participant for the
142 perceived opinions of their peers, and randomized response or list experiment can be used to reduce
143 social desirability bias, though they have limitations (Glynn, 2013). Additionally, surveys of elected
144 officials often feature low response rates (Docherty, 2001; Hertel-Fernandez et al., 2019), which would
145 preclude the use of list experiments for a small (generally <500) population like members of a
146 Parliament or Congress (though not necessarily their staff). A real-world experiment designed to avoid
147 social desirability bias or response bias is necessary to assess the responsiveness of legislators to
148 constituent communications.

149 Given the difficulty of directly linking constituent communications on climate change to political
150 decisions, Twitter offers a useful alternative forum for conducting such an experiment. By asking
151 legislators to post a specific tweet, we can detect a fingerprint of our intervention that is more definitive
152 than statistical changes in vote counts. While tweets are less impactful than legislation, studies suggest
153 that politicians can use Twitter to influence their followers on a range of meaningful indicators, including
154 voting intentions (Colliander et al., 2017) and vaccine hesitancy (Hornsey et al., 2020). With the
155 increased willingness of media outlets to embed Twitter posts from politicians in their stories (Bane,
156 2019; Dumitrescu and Ross, 2020), and the potential for political parties (Seethaler and Melischek, 2019)
157 and campaigns (Kreiss, 2014) to drive media cycles from Twitter, these posts should not be viewed as
158 purely performative.

159 In this paper, we present the findings of an innovative field experiment testing the efficacy of online
160 political participation. We partner with a non-partisan organization to run a real-world campaign where
161 constituents asked their MPs to tweet about climate change. We then monitor the MPs' Twitter
162 accounts to evaluate the effectiveness of the communication campaign, thereby measuring the
163 responsiveness of MPs to outreach from their constituents on the high-salience issue of climate change.

164 First, we analyze the effectiveness of communicating using different frames on pro-climate tweeting.
165 There is some evidence that framing climate communications in terms of their public health effects can
166 lead to greater support for climate change mitigation (Kotcher et al., 2018; Maibach et al., 2010; Myers
167 et al., 2012). Since framing might influence the decision to participate, we included a public health frame
168 and a more typical environmental frame as a control. Then we look at the effect of email
169 communication in general on changes in the rate of pro-climate tweeting compared to before the
170 experiment took place.

171 We follow this experiment with interviews of political staff in MP offices to solidify our understanding of
172 the efficacy of these campaigns, staffer management of constituent correspondence, and MP Twitter
173 behaviour. This serves the double purpose of exploring ways to encourage political elites to send
174 stronger cues on climate change and of better understanding how climate activists can best engage with
175 their elected representatives.

176 Methods

177 Study Design

178 To run the experiment, we partnered with Evidence for Democracy, a non-partisan, non-for-profit
179 organization that promotes the use of evidence-based decision-making in Canadian government.
180 Evidence for Democracy was founded by co-organizers of the “Death of Evidence” protests of 2012,
181 initiated in response to research funding cuts and the closure of research stations (Chartrand, 2012).
182 Both the current staff and board of directors are largely composed of researchers and academics.
183 Membership is concentrated in Ontario, British Columbia and Quebec with a large segment of
184 supporters consisting of academics, public servants, government researchers, and retired scientists. At
185 the time of the campaign, approximately 6580 individuals followed Evidence for Democracy on
186 Facebook, 5600 on Twitter and 250 on Instagram. In addition to running educational and research

187 programs, Evidence for Democracy raises awareness of scientific and policy-based issues in Canada and
188 encourages members of the public to engage directly with policymakers.

189 Members of Evidence for Democracy were contacted by the organization using the organization listserv
190 and an additional post made on Evidence for Democracy's Facebook page to recruit participation for the
191 campaign. The initial email was sent to 15556 members on May 4, 2019, with a follow-up reminder sent
192 five days later to 15335 recipients. Participating members were notified that the campaign was part of a
193 study being conducted with researchers at the University of British Columbia. We assisted Evidence for
194 Democracy in designing the text of a campaign email that asked Canadian MPs to post messages on
195 their official Twitter accounts encouraging action on climate change. We then designed two different
196 suggested tweets that MPs could post so as to reduce the cost of participation. One tweet represented a
197 public health framing and the other an environmental framing. This also allowed us to extend the
198 research on framing by testing on an important new population: elected officials. Both the campaign
199 email and the tweets were available in English and French, Canada's two official languages (see Online
200 Resource 1 for full text of the emails).

201 Public Health Tweet: Science tells us that climate change poses a significant public health threat,
202 from increased asthma & heat stroke to the spread of disease due to extreme weather. Thanks to all
203 the youth who voiced their concern #Fridays4Future #MarchforScience

204 Environmental Tweet: Science tells us that climate change stands to dramatically alter Canada's
205 ecosystems, putting our cherished landscapes and iconic wildlife species at risk. Thanks to all the
206 youth who voiced their concern #Fridays4Future #MarchforScience

207 The campaign was timed to coincide with the March for Climate rallies which were happening around
208 Canada in early May of 2019. Prior to the experiment, we used block randomization according to
209 political party to assign each member of Parliament to one of two conditions. Randomization was

210 conducted with the R package randomizr (Coppock, 2019). All MPs received the same email, but half
211 were given the public health tweet as an example of a tweet they might wish to send out and half were
212 given the environmental tweet. When members of Evidence for Democracy followed a link to
213 participate, they entered their postal code and were automatically given the version of the campaign
214 email containing the tweet that was assigned to their Member of Parliament. In this way a Member of
215 Parliament only received emails containing the example of the public health tweet or the example of the
216 environmental tweet, but not both.

217 Data collection and analysis

218 When the campaign concluded we scraped tweets using the rtweet package from R (Kearney, 2019),
219 starting 7 days before the start of the campaign to act as a control, and 10 days after the first day of the
220 campaign to test the campaign's efficacy. Two MPs did not have twitter accounts at the time of the
221 campaign, and because the campaign was conducted just prior to some byelections, three seats were
222 not filled. In total we scraped 18776 tweets from 333 MPs.

223 While collecting results it became clear that there was insufficient Twitter participation from MPs to
224 decisively evaluate which frame was more effective in persuading an MP to adopt and tweet out the
225 suggested text. We therefore focused our analysis on whether receiving emails from constituents was a
226 predictor of increased pro-climate tweets. We first evaluated the efficacy of the campaign emails by
227 searching for the exact wording suggested in the example tweets included in the campaign emails. It is
228 possible however that an MP would still be motivated by receiving an email to tweet about climate
229 change, but to choose their own distinct wording (this is especially true given that MPs prefer to
230 maintain a consistent social media narrative). We filtered the 18776 tweets by using a series of English
231 and French keywords which included: "global warm*", "climat*", "ghg", "greenhouse gas*", "effet de
232 serre", "fossil", "carbon", "emit", "emett", "emis*", and "pipeline", thereby creating a subset of the

233 data with 1723 relevant tweets (“pipeline” was included as the proposed expansion of the Trans-
234 Mountain pipeline has become emblematic of the larger political conflict surrounding the carbon-
235 intensive oil and gas industry). Two raters then went through the reduced set of tweets and coded them
236 as either “pro-climate”, “anti-climate” or “neutral”. Full instructions for coding are available in Online
237 Resource 2. Once all relevant tweets were coded, the two raters identified codes that were not agreed
238 upon and discussed the coding until a consensus was achieved. The initial agreement was satisfactory (κ
239 =0.848).

240 To test for a relationship between message framing (or number of campaign emails) and Twitter activity
241 we ran a zero-inflated negative binomial regression with number of pro-climate tweets in the
242 experimental period as the outcome variable. Zero-inflated negative binomial models are appropriate
243 for fitting overdispersed count data with excess zeroes (Hua et al., 2014). In our sample, these zero
244 values can be expected from two sources: structural zeros from legislators who never post pro-climate
245 tweets for ideological reasons, and sampling zeros from legislators who may occasionally post pro-
246 climate messages, but happen to not do so during the course of the experiment. We controlled for
247 confounding variables including the likelihood of being re-elected on the rationale that politicians are
248 more responsive to constituents when they are likely to face a competitive election in the near future
249 (McAlexander and Urpelainen, 2020). To estimate likelihood of re-election, we used seat projections for
250 each electoral district taken from 338canada.com on September 22, one month before the election,
251 which categorized the lean of each district on a seven-point scale. Some MPs were randomized to a
252 certain treatment (e.g. public health frame) but did not receive that treatment because no constituents
253 in their riding sent them an email. To include these missing values or “non-compliers” and preserve the
254 original balance from randomization we used intention to treat (ITT) analysis (Gupta, 2011). Therefore,
255 in our analysis, every subject who was randomized is included according to their randomization
256 assignment. Zero-inflated models were run in the pscl package in R (Zeileis et al., 2008).

257 Interviews

258 To triangulate the findings from our Twitter experiment, we conducted semi-structured interviews with
259 staffers in the MP offices. We reached out to every MP by email, debriefing them on the experiment,
260 and asking if a member of their office would be willing to answer interview questions. Through the
261 interviews we sought to answer four research questions:

262 1) Are MP offices more responsive to larger volumes of communication from constituents?

263 2) Are MP offices more responsive to certain forms of communication (e.g. personalized emails versus
264 campaign emails)?

265 3) How do MP offices manage social media accounts?

266 4) Do MP offices receive a higher volume of constituent communication on climate change than on
267 other issues?

268

269 Because political staffers act as gatekeepers, determining which messages are shown to an MP as well
270 as often managing an MP's social media accounts, we judged it more useful to speak with staffers than
271 with MPs. This increased the likelihood of conducting more interviews, while offering the possibility of
272 contributing to a sparse literature on the role of legislative aides as actors in the political process
273 (Hertel-Fernandez et al., 2019).

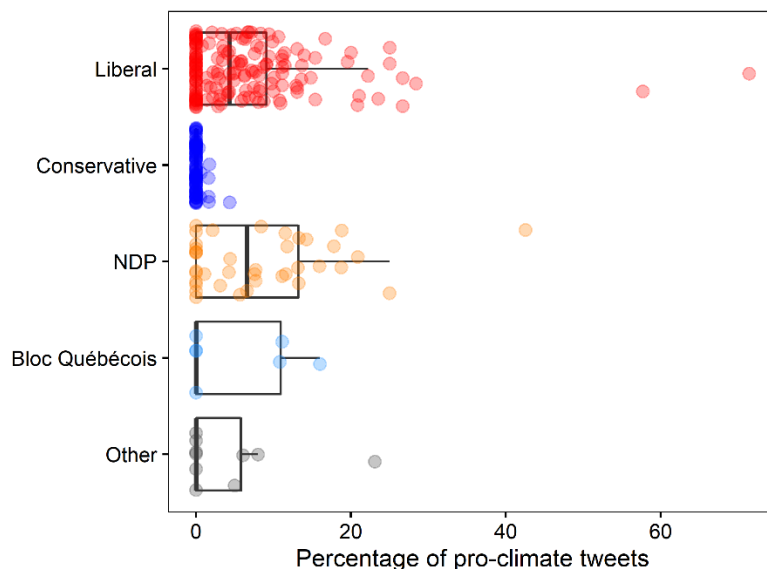
274 To staffers who responded, we provided letters of consent (see Online Resource 3), and in order to save
275 time for ostensibly busy staffers, obtained consent orally. We contacted those who did not respond
276 initially up to two additional times with reminder messages. The interviews lasted ten to fifteen
277 minutes. We transcribed interviews and then conducted thematic analysis according to a matrix based
278 method to identify emerging trends (Bryman, 2008). Interviewees agreed to participate on conditions of

279 anonymity, so some identifying details have been removed from the text. We received approval for all
280 methods from the University of British Columbia’s Behavioural Research Ethics Board.

281 Results

282 Experimental findings

283 We collected a total of 18776 tweets for analysis. Of these, 1723 were flagged as potentially relevant to
284 climate change based on our keyword search. We then coded each of those 1723 tweets as “pro-
285 climate” (in favour of greater awareness or action on climate change) or “anti-climate” (dismissive of the
286 existence, seriousness or need for action on climate change). 1327 tweets were coded as pro-climate
287 with substantial differences in the fraction of pro-climate tweets by MPs in the various parties (Figure 1).
288 26 tweets were coded as anti-climate. 16 of the 26 anti-climate tweets were from MP Maxime Bernier,
289 of the People’s Party of Canada, while the remaining 10 were posted by six MPs from the Conservative
290 Party of Canada.

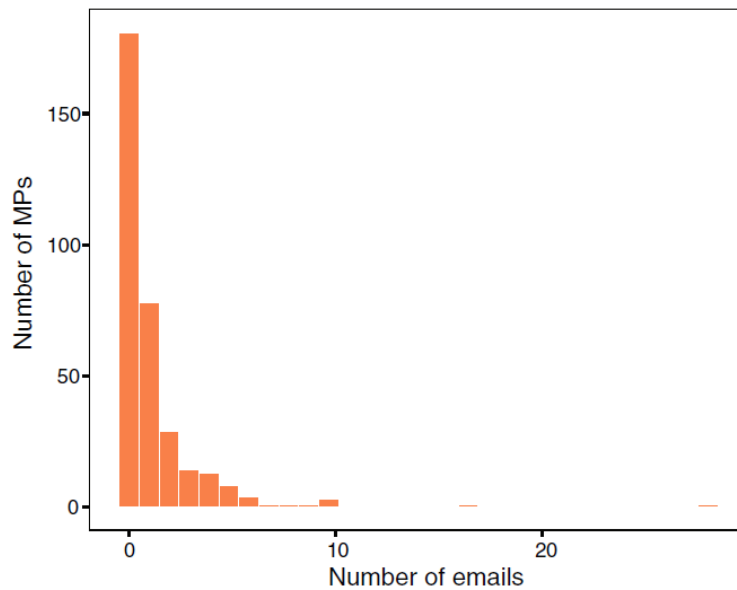


291

292 **Fig. 1** Boxplot showing the percentage of all of an MP’s tweets which were coded as “pro-climate” for
293 each Canadian Member of Parliament, grouped by major political party.

294 During the email campaign, a total of 392 campaign emails were sent to Members of Parliament (see
295 Table 1 for breakdown including randomization outcomes). Note that this excludes emails from
296 constituents residing in the three ridings which were waiting on the results of a byelection. Even still,
297 other campaigns run by Evidence for Democracy have resulted in greater rates of participation. Emails
298 sent to MPs were not evenly distributed (Figure 2). 181 MPs received no emails, while one MP received
299 28. Of these, only one MP, a Liberal Party member who received four emails from constituents, tweeted
300 out the actual suggested text provided in the campaign emails.

301



302

303 **Fig. 2** Histogram showing the distribution of number of emails received by Members of Parliament
304 during the campaign

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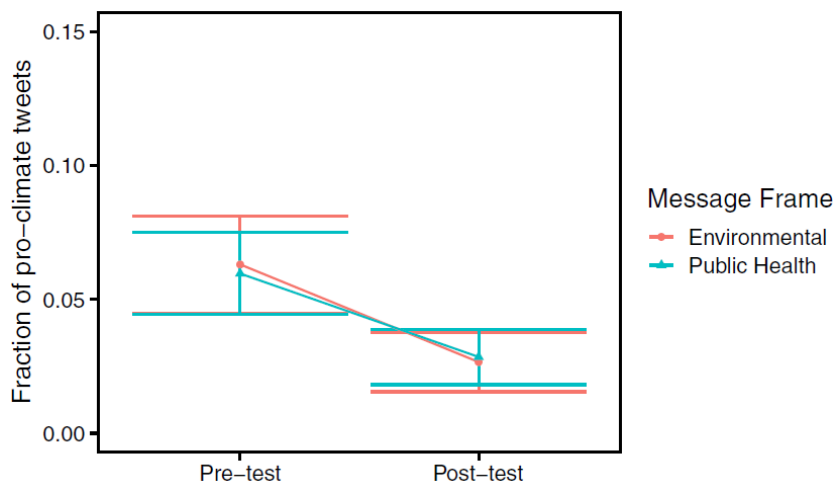
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Table 1: Composition of Canadian Members of Parliament at the time of the experiment

| Party | Members of Parliament | Female | Male | Tweets during analysis period | MPs receiving environment frame | MPs receiving public-health frame | Total emails received |
|----------------|-----------------------|--------|------|-------------------------------|---------------------------------|-----------------------------------|-----------------------|
| Liberal | 177 | 50 | 127 | 10308 | 46 | 43 | 267 |
| Conservative | 97 | 18 | 79 | 4160 | 17 | 22 | 66 |
| NDP | 41 | 17 | 24 | 2218 | 12 | 7 | 48 |
| Bloc Québécois | 10 | 2 | 8 | 145 | 2 | 1 | 4 |
| Other | 10 | 4 | 6 | 1945 | 2 | 2 | 7 |
| Total | 335 | 91 | 244 | 18776 | 79 | 75 | 392 |

308

309 Although only one MP tweeted out the exact text suggested in the campaign email, it is possible that
 310 MPs receiving the constituent email would still feel pressured to write a different post about climate
 311 change which fit their office’s narrative more closely (see the Interview Findings). We first evaluate
 312 whether MPs in the health communication frame increased their pro-climate tweeting more than those
 313 in the pro-environmental frame. There was a downward trend in the rate of pro-climate tweeting from
 314 the pre-experiment to post-experiment periods, but there was no difference between MPs who
 315 received an environmental frame and those who received a public health frame (Figure 3).



316

317 **Fig. 3** Error bars shows the 95% confidence interval of the mean fraction of tweets which were coded as
 318 pro-climate in the pre-experiment and post-experiment periods.

319 Because we could not control which members of Evidence for Democracy sent emails to their
 320 representatives, there was an uneven number of messages to MPs from the two groups: 221 emails
 321 with the environmental framing went out to 79 MPs, while 171 emails with the public health framing
 322 went out to 75 MPs. Still, this did not amount to a statistically significant difference in the mean number
 323 of emails received by MPs in the two groups ($t=1.11$, 95% CI [-0.227,0.810], $p=.27$). We ran a zero-
 324 inflated negative binomial model to control for the number of opportunities an MP had to make a pro-
 325 climate tweet (the number of tweets in the experimental period), the number of emails received and
 326 other potential confounders. We failed to find evidence for a difference in the number of pro-climate
 327 tweets between the two messaging groups (Table 2).

Table 2: Results from the zero-inflated negative binomial ITT model predicting pro-climate tweeting

| | Coefficient | Standard Error | p-value |
|--------------------------------|-------------|----------------|---------|
| Counts portion of the model | | | |
| Email frame (public health) | 0.028 | 0.206 | .890 |
| Pre-trial pro-climate tweeting | 2.277 | 0.954 | .017 |
| Number of emails | 0.054 | 0.030 | .069 |
| Party (Conservative) | -4.514 | 0.800 | <0.001 |
| (Liberal) | -1.917 | 0.618 | .002 |
| (NDP) | -0.979 | 0.655 | .135 |
| (Other) | -1.905 | 0.767 | .013 |
| District Competitiveness | -0.095 | 0.070 | .171 |
| Constant | -1.288 | 0.695 | .064 |
| Logistic portion of the model | | | |
| Pre-trial pro-climate tweeting | -22.550 | 49.651 | .650 |
| Tweets in experimental period | -0.190 | 0.120 | .112 |
| Constant | 2.441 | 1.336 | .068 |

Note: N=335, Log Likelihood=-304.047, Pre-trial pro-climate tweeting is fraction of pre-trial tweets coded as pro-climate, District competitiveness is from 0-6 where 6 is a safe district

328

329 The regression model also shows whether receiving constituent contact, regardless of message frame,
 330 increased pro-climate tweeting generally. In a successful campaign we might expect that MPs who

331 received more emails would be more likely to increase the number of pro-climate tweets than those
332 who did not. But, in the zero-inflated negative binomial regression the number of emails received by an
333 MP was only a marginally significant predictor of the number of pro-climate tweets posted in the
334 experimental period. The effect of a single additional email was estimated at 1.055 (=exp(0.054),
335 p=.069). If this is a true effect it would mean that, other variables held constant, an MP receiving an
336 additional email would be expected to post 5.5% more pro-climate tweets (see Online Resource 4 for
337 details).

338

339 Interview findings

340 We conducted interviews with 12 MP staffers from 11 MP offices. Provinces represented included
341 British Columbia (5 MP offices), Ontario (3), Saskatchewan (1), Alberta (1) and Manitoba (1). Staffers
342 worked for MP offices from the Liberal Party of Canada (8), the New Democratic Party (2), the
343 Conservative Party of Canada (1) and one office not belonging to the top four political parties. We
344 specifically sought out staffers who were responsible for managing constituent communication and or
345 managing the MP's social media accounts.

346 Volume of communication

347 We began the interview by asking staffers if there was a threshold number of communications required
348 from constituents to raise an issue with the MP. There was no consensus on how MP offices act in this
349 regard. Only two staffers described an actual volume of constituent communications that would prompt
350 them to involve their MP, and even then, the responses were more qualitative than quantitative:

351 Definitely if we receive more than two calls in a day about a topic, we would be letting him know ...
352 that's pretty unusual for us to receive more than two calls in a day about a specific topic

353 ...there isn't actually a codified threshold but we typically get little tricklings in of like five
354 correspondence ... As soon as we start to see we'll get thirty now on this one, then we go something
355 is up ... if you get six thousand - okay there's a bot.

356 These responses suggest that a high volume of emails is not always necessary to at least reach the MP
357 and may be detrimental if the campaign suspects astroturfing or other types of foul play such as
358 automated emails (bots).

359 Two staffers said the process was issue dependent, with more weight given to issues that are relevant to
360 the riding association or the MP's office. Three staffers said they observe trends in communication and
361 use those to inform the MP of which issues are becoming more salient for their constituents, "usually
362 there's an issue that becomes popular and we get a lot of e-mails on that specifically and then that's the
363 one we send over to him". Two staffers noted that the type of communication helped them determine if
364 the message was worth sending to their MP, with less weight given to campaign emails. One
365 interviewee said, "if an e-mail is a campaign, so if it's something we're getting repeatedly, our support
366 staff at the Liberal research bureau will create a party response to the issue. So it doesn't necessarily
367 need to be brought up to [name of MP], because there's already party lines provided."

368 This raises the complication that a letter can be effective either because it is actually seen by an MP and
369 therefore has the chance to persuade them, or because it is added to a tally that informs the decisions
370 of the MP or the party apparatus: "when it comes to e-mails we do keep track and ... gauge whether or
371 not they're pro or they're anti for an issue". Another staffer noted that they "keep tallies on who calls in
372 ... who e-mails in about what, and all the offices do that, and [staff at the political party] keep track of
373 it." In this way, it is possible for constituent contact to bypass individual MPs and directly inform policy
374 changes at the party level.

375 Without prompting, five staffers also noted that they prioritized communications from constituents. This
376 took the form of responding to constituent communications first, only responding to constituents, or
377 preferentially alerting their MP of communications that came from within the district. One staffer noted
378 that while constituent communications are prioritized, some additional weight is given to messages that
379 at least come from near the district since there were few other representatives from the same party in
380 that region.

381 Form of communication

382 Ten of the twelve staffers were able to comment on which type of communication was given more
383 weight in decision-making. All staffers agreed that campaign emails (or form emails) were given either
384 equal or lesser treatment compared to personalized emails, hand-written letters or phone calls. Five
385 staffers described a hierarchy with campaign emails on the bottom. For instance, one mentioned that
386 when they received personalized messages they tried to set up a phone call with the constituent while
387 another described how hand-written letters receive personal responses from the MP. Both of these
388 staffers observed that campaign emails only receive generic responses in their office.

389 Other staffers were very explicit in describing a hierarchy, saying for instance that “Hand-written letters
390 are certainly more impactful than emails and form emails” while another noted that if a message comes
391 through the MP’s website it “definitely weigh(s) more heavily than a blanket campaign letter”. One MP
392 went so far as to identify four levels of impact with a personalized hand-written letter being the most
393 impactful, followed by a form letter that is mailed, then a personalized email, and finally campaign
394 emails. They went on to say “a hundred e-mails about one issue ... like each person has written their
395 own e-mail, that will make us think about it. But a hundred [hand-written] letters would really give you
396 pause to think about what’s going on, and to try to figure out how you respond.”

397 Still, this was not a unanimous belief: two staffers maintained that all communications were treated
398 equally while a third claimed that campaign emails had lower weight for the MPs, but equal weight
399 when sending numbers to the political party apparatus. Two other staffers did not rank campaign emails
400 as being less impactful but believed that the process of responding to a hand-written letter endowed it
401 with more meaning,

402 When a letter comes in, someone has to physically open it and read it. An e-mail comes in and you
403 get blasted with it... don't want to say we don't read them, we read all those, maybe really quickly ...
404 and then go to the next one.

405 Managing social media

406 In order to understand the process whereby a staffer would evaluate and potentially acquiesce to a
407 constituent request for a social media post, we asked interviewees to describe how their office handles
408 the MP's Twitter communication. Staffer responses indicated substantial differences between offices.
409 Four offices described their MP as maintaining control over their own Twitter account. In two of these
410 cases the staffer indicated that the MP personally reviewed every item of constituent correspondence,
411 making for a straight path between a constituent request for a Twitter post, like in this study, and the
412 fulfilment of that request. In four cases the MP co-managed the Twitter account with the same staff
413 member who managed correspondence. In three offices the staffers who received constituent
414 communication were not necessarily the same as those who helped to manage the MP's social media
415 account. In those offices there would need to be coordination in order for a social media request from
416 constituents to be carried out.

417 Two interviewees recalled receiving the constituent request from the experiment. One described
418 maintaining a general policy of not tweeting the suggestions of constituents due to the abundance of
419 requests, many of which were viewed as irrelevant: "...we don't really tweet things on suggestion of

420 constituents, as a general policy. Because, A) you get too many requests. B) A lot of requests are
421 inappropriate or irrelevant. And C) It's outside the tone of [M.P.'s name] general social media presence."
422 The other staffer noted the difficulties of matching the suggested text with their MP's desired narrative
423 as well as the problematic timing of the particular request: "I do remember that ... by the time it made
424 its way to me it was sort of a late Thursday night and we had a jam-packed Friday schedule which is why
425 we didn't move forward with it. And if I recall correctly as well, the message that was being asked ...
426 wasn't an easy fit with his typical narrative on the issue."

427 Is communication on climate change saturated?

428 Interviewees were asked, "Compared to other issues, do you feel like you receive a lot of
429 correspondence from constituents about climate change?" Responses to this question were mixed.
430 Three interviewees said that they received a below average amount of communication on this issue, for
431 instance, "We don't have a whole lot of personal people writing in their personal thoughts of climate
432 change. We get a lot of form letters that somebody's found a website that automatically sends an e-mail
433 to their MP". Another staffer perceived a gap between how much climate communication the staffer
434 expected to receive and what is actually received: "It's unfortunate, it surprises me how little activism
435 there is on climate change, like [MP name] is the [name of position], and still we get very little letters
436 and things here about that." Another interviewee described the volume of communication on climate
437 change as average, but added that "whenever my boss is out in the community it's one of the first things
438 that comes up. I don't feel it correlates to the amount of letters and e-mails we receive in regards to
439 climate change. I would have expected it to be more, so I would say we get an average amount, when I
440 feel we should be getting a higher amount."

441 Seven offices believed the amount of communication on climate change was above average. Several of
442 these staffers noted that the MP's portfolio or the composition of their ridings might explain this focus.

443 One staffer mentioned that “Climate change and water management is a very big issue where [they are]
444 from” while another said that “Climate change is always a big topic and, I think especially going into
445 flood and forest fire season in [name of province], I think is something that’s gonna ramp up even
446 further.”

447 Some interviewees identified the difficulty of drawing boundaries around the issue, as climate change
448 can exacerbate natural resource problems or be taken into consideration when approving new fossil fuel
449 infrastructure like pipelines. One interviewee noted that because their constituency is in Alberta, which
450 has a heavy oil and gas industry presence, they receive correspondence with “a bit more balance on the
451 environment issues”, indicating that not all communication on the issue of climate change consists of a
452 pro-climate message. Two interviewees also observed that climate can be more or less represented in
453 constituent communication depending on current events and media focus.

454 Discussion

455 Mass communication campaign emails are a primary tool of contemporary climate action, even though
456 researchers believe that their efficacy may be declining (Cluverius, 2017). While some climate
457 organizations may track the success of interventions like campaign emails or phone calls, their data is
458 not generally available to the public. Everyday citizens would therefore benefit from understanding
459 which political actions merit their effort. If, for instance, campaign emails are largely discarded by
460 political staffers without even being read, then climate activists should not waste resources on those
461 interventions. But this study points to a middle-ground: The statistical results and interviews suggest
462 that it is possible for campaign emails to influence MPs' public support for climate action, but that it is
463 not realistic to expect MPs to share exact language provided by constituents (due to party message
464 discipline), and that the effect of campaign emails is marginal, and likely lower than that of old-
465 fashioned letters or in-person communication.

466 The empirical insights provided by this experiment add to a field that is largely speculative. Only one MP
467 fulfilled the constituent request to post a pro-climate tweet and we found no statistical difference in the
468 frequency of pro-climate tweets between those who received an environmental versus a public health
469 frame. We also found only a marginal statistical difference in the frequency of pro-climate tweets of
470 those who received messages compared to those who did not¹. This positive effect of the constituent
471 communication may be unique to experimental design and the sample and would need to be confirmed
472 by further research.

473 The overall lack of MP response to the constituent requests in the experiment remains notable given the
474 low-cost, symbolic nature of the requested action: posting a pro-climate message on Twitter. Campaigns
475 regularly seek for more substantial action from elected officials, like requesting a vote against party
476 lines. The request in this study demands a much lower level of persuasion by the constituents. Some
477 MPs manage both their own social media and review all constituent correspondence, while in some
478 other cases the staffers who manage MPs' Twitter accounts are often the same staffers who deal with
479 messages from constituents. In such cases the obstacles to participation are low since fulfilling the
480 request does not even require communication between multiple actors. Furthermore, it is common for
481 MPs to tweet more than ten times per day, so a single tweet on the topic of climate change would not
482 necessitate a large shift in messaging strategy. An alternative interpretation is that a social media
483 request may seem less important in the eyes of the MP offices than constituent requests to vote a
484 certain way on legislation. The perceived stakes associated with the campaign request may matter in
485 addition to how easily the request can be satisfied.

¹At the suggestion of a reviewer, a reasonable way to interpret the data is using a one-tailed p-value (given the clear directional hypothesis we stated earlier in the paper). When viewed this way, this means that each additional email translated into a 5.5% increase in pro-climate tweets.

486 MPs from the Conservative Party may have also been hesitant to send a signal that is at odds with the
487 messaging strategy of their party, but they are an exception. Their reticence does not explain why only
488 one of the 115 MPs from other parties who received emails from their constituents was willing to post
489 the suggested message on Twitter. Our use of an experiment instead of surveys to determine the
490 responsiveness of elected officials avoids the response bias and social desirability bias that would
491 weaken the findings of a similar investigation performed with surveys alone. This method of
492 investigation does however necessitate certain tradeoffs. First, studies on political elites are
493 understandably restricted to a small sample size (we analyzed 335 MPs for this experiment). Similarly,
494 performing a realistic experiment required us to partner with an actual organization, in this case
495 Evidence for Democracy. We chose a non-partisan organization with the intent of reducing the tendency
496 for right-leaning MPs to dismiss the persuasive communication outright. But given the partisan divide on
497 some science-policy issues in Canada (Lachapelle et al., 2012), Evidence for Democracy and its
498 membership may not be viewed by MPs as non-partisan (Liberals received over twice as many emails
499 per MP as Conservatives). Evidence for Democracy also has a smaller membership than other
500 organizations, and the fact that the campaign centered on social media posts instead of more
501 galvanizing topics in Canadian politics resulted in only 392 emails going out to MPs. This is not
502 necessarily a flaw since more communications are not necessarily more effective, but it does limit the
503 generalizability of our results to smaller campaigns. Additionally, the campaign was timed to coincide
504 with the Fridays for Future and the March for Science marches. Possibly due to this timing, MPs posted
505 more pro-climate tweets per day in the control period, and by the time campaign communications had
506 been relayed to them they may have been disinclined to tweet on the subject again. Finally, there may
507 be potential confounders that our regression failed to take into account. As an example, members of
508 Evidence for Democracy who sent emails may live in communities with higher concern for climate
509 change and be served by representatives who would be more willing to tweet about climate change

510 when prompted. We tried to control for this first by using Party and number of pro-climate tweets in the
511 pre-experiment period as predictor variables, but other, unconsidered confounders may still be present.
512 While the use of a field experiment increases the study's external validity, the effort required to conduct
513 a single experiment of this type mean that we were only able to test a single intervention (with two
514 types of messaging frames). Emails could have been designed to be more or less persuasive or be sent
515 from email addresses that carry more or less weight with legislators and so forth. Rather than assuming
516 that these particular campaign emails are widely representative, one could instead view the experiment
517 as a confirmation of the interview findings: MP offices do read messages, but only a certain combination
518 of volume, content and timing will prompt offices to act on constituent requests.

519 Theories of Representation

520 The level of responsiveness shown by MPs in the experiment speaks to the models of representation
521 favored by Canadian officials. MPs may think of their representative role as “promissory” (fulfilling
522 election promises), “anticipatory” (attempting to please future voters), “gyroscopic” (acting as a trustee
523 with internal motivations), or “surrogate” (representing non-constituents) (Mansbridge, 2003). Because
524 climate legislation creates benefits that are spread across the globe and across generations, but
525 concentrates costs, elected officials may struggle to act in promissory or anticipatory fashion while
526 supporting ambitious climate legislation (Willis, 2018). How Canadian MPs view their role as
527 representatives can therefore be critical to how they legislate on climate change. In interviews, MP
528 staffers described a focus on constituents at the expense of those not in their riding (which shows a
529 tendency towards the anticipatory or promissory models). Experiments like this one can also shed light
530 on the models of representation favored by legislators, with greater responsiveness to constituent
531 requests indicating that legislators are aligning themselves with future voters.

532

533 Implications of the study

534 Integrated together, the experiment and interviews provide evidence about the general effectiveness of
535 individual political actions. If campaign emails sent within six months of an election are unable to
536 persuade MP offices to make a token statement on social media, then they are unlikely to achieve larger
537 changes such as persuading an elected official voting against party lines. Such vote shifts also represent
538 a rather ineffective way of influencing national politics: the Canadian political system is even less
539 amenable to dissenting votes than other Westminster-style parliaments, and parties incentivize
540 conformity by denying promotions and coveted committee positions to dissenters (Malloy, 2003). The
541 interviews suggest that the greater political impact of communication from constituents, whether via
542 campaign emails or more individually persuasive hand-written letters, may be on party or governing
543 strategy rather than a vote in the legislature. Though follow-up research is needed to understand if all
544 parties operate in the same way, one interviewee described how every office in their party delivers
545 tallies of constituent communication to the central party.

546 This influence is evident in internal party negotiations about climate and energy policy decisions. For
547 example, in Canada, MPs of the governing party (ostensibly informed by the preferences of their
548 constituents) meet with the Prime Minister in weekly sessions where they have the opportunity to
549 influence the government's agenda (Malloy, 2004). The debate within the Liberal cabinet over whether
550 to approve the Teck Frontier oilsands project serves as a recent example, with members of cabinet
551 taking sides largely based on the preferences of their constituents (Leblanc and Walsh, 2020). This
552 highlights some regional differences in the power of individual voters, where constituents represented
553 by members of the governing party have greater influence over national decision-making. But,
554 constituencies of other parties still command some leverage, especially in situations where the
555 governing party retains only a plurality of seats in the legislature (as is the case for the current minority
556 government in Canada). In such cases the governing party tends to be especially sensitive to public

557 opinion and criticisms levelled by the opposition parties (Bourgault, 2011). Furthermore, there is
558 evidence that representatives in party-centered systems may work to change the views of fellow party
559 members when those views are in opposition with the preferences communicated by constituents
560 (Öhberg and Naurin, 2016). While persuading individual MPs or political parties through emails might
561 not generate change that can be experimentally observed, there is evidence that such efforts are still
562 worthwhile.

563 Regarding the hypothesis that public health messages can be more persuasive than environmental
564 messages, we view the findings of this study as equivocal. Interviewees referred to the importance of
565 message discipline, which suggests that Twitter may be a difficult forum to conduct an experiment on
566 message framing in particular. That being said, a similar experiment using more personalized messages
567 and run on a larger group of legislators may have elicited a detectable difference between messaging
568 frames.

569 [Future research needs](#)

570 This research points to a variety of avenues for future research on the effectiveness of different political
571 actions in addressing climate change. Results from the interviews suggest that campaign emails may be
572 more effective at informing party decisions than decisions of individual MPs. It is possible that
573 campaigns targeting a small number of swing votes on climate legislation would do better to use
574 personalized emails, phone calls and hand-written letters, whereas efforts to change the priorities of
575 party leadership could still rely on generic campaign emails. More generally, there is a need to
576 understand how different forms and volumes of communication about climate change are viewed by
577 subnational elected officials, and by officials in other governing systems. For instance, officials with a
578 smaller number of constituents, like city councilors, may be considerably more responsive than national
579 officials.

580 As political science makes greater use of field experiments, responsiveness can be measured by social
581 media posts, whether an official sends a reply to constituent outreach (Butler et al., 2012), the quality of
582 that reply (Richardson and John, 2012), the willingness to meet with a constituent (Kalla and Porter,
583 2019), and the willingness to co-sponsor new legislation or change a vote on tabled legislation.
584 Additional experiments that match these dependent variables with different forms of persuasion (phone
585 calls, petitions, and perhaps even protests) can provide insight into how citizens best engage with their
586 representatives.

587 Our experiment tried to make use of secondary beliefs to encourage climate action first by elites and
588 then by their followers, but campaigns could use other strategies that capitalize on secondary beliefs.
589 For example, research might test a normative appeal about how many other people are contacting their
590 elected officials as a way to increase the number of members that send emails to their legislators. In an
591 experiment similar to ours, a message to legislators could include public opinion information to signal to
592 legislators that their constituents would like them to act more on climate change.

593 Finally, there are multiple ways to incorporate advocacy group expertise into research. One approach is
594 to engage in academic-practitioner collaborations that treat the practitioners as a full partner in
595 experimental research from conceptualization to execution (Levine, 2020, 2021). Our study represents
596 an instance of this kind of collaboration. However, another useful model is to partner with advocacy
597 groups to document and synthesize their existing expertise and use that to inform theory and future
598 research (for example, see Han et al. (2017) and Sherman et al. (2020)). Both forms of research are
599 valuable to increasing the societal impact of research on climate change communication, and
600 organizations like Climate Access, Climate Outreach, research4impact, and The Climate Advocacy Lab
601 could help to facilitate such collaborations.

602 Recommendations

603 Interviews with campaign staffers showed that elected officials are not so saturated with
604 communication on climate change that additional outreach from constituents would be ignored. And if
605 there is still value for campaigners and individuals in reaching out to their representatives, then it is
606 worthwhile to know the most effective ways of doing so.

607 While mass campaign emails remain more effective than no action at all, organizations seeking to
608 maximize their impact on the political decision-making process with respect to climate change should
609 consider diversifying methods of contact. Phone banks, letter-writing parties, and personalized emails all
610 have the potential to be more persuasive on a per-communication basis than campaign emails.
611 Campaigners often seek to intervene in political decisions that arise suddenly, in which case online
612 communications have an obvious advantage over hand-written letters or postcard campaigns, but
613 phone calls would still be timely and possibly more effective. Personalized emails or letters also require
614 more effort and may result in a lower volume of communication, but there could be diminishing returns
615 to high volumes of repetitive communication if elected officials and their staff fail to see these as sincere
616 efforts at outreach. Alternatively, recruiting activists to make more phone calls may generate its own set
617 of obstacles, such as unwillingness on the part of socially anxious individuals to participate (Reid and
618 Reid, 2007). In the short term, if large, organized protests are curtailed by increased social distancing (as
619 a legacy of the COVID-19 pandemic), it will be especially important for members of the climate
620 movement to understand how to better persuade elected officials using other means.

621 Climate campaigners have a unique opportunity during climate strikes and other protests to recruit
622 mobilized individuals to contact their representatives. A survey of protestors attending the Fridays for
623 Future rallies in 13 cities found that of the largest age group, teenagers, only 10% had ever contacted a
624 government official (Wahlström et al., 2019). Each gathering features a large captive audience, who,

625 though engaged in protesting, could be maximizing their impact by also writing short, hand-written
626 letters to their MPs, or leaving a phone message at their MPs office. Based on our experimental results
627 and the interviews conducted with MP staffers, these interventions are expected to be more effective
628 than campaign emails. Organizing group communication at a protest would ensure that multiple
629 interventions not only occur at the same time, but also coincide with increased media attention. This
630 would signal the kind of trend that MP staffers described as sufficient justification to notify their
631 Member of Parliament, and is consistent with expert belief that the attention of political actors is
632 influenced by recent events (Jones and Baumgartner, 2005). In addition to generating necessary
633 pressure on politicians to act on climate change, organizing group communications of this sort would
634 also better educate members of the public on how to communicate with their representatives, allowing
635 for lasting civic engagement.

636

637

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