The politics of intersecting crises: The effect of the COVID-19 pandemic on climate policy preferences

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Abstract

Few contemporary crises have reshaped public policy as dramatically as the COVID-19 pandemic. In its shadow, policymakers have debated whether other pressing crises–including climate change–should be integrated into COVID-19 policy responses. Public support for such an approach is unclear: the COVID-19 crisis might eclipse public concern for other policy problems, or complementarities between COVID-19 and other issues could boost support for broad government interventions. In this research note, we use a conjoint experiment, panel study, and framing experiment to assess the substitutability or complementarity of COVID-19 and climate change among American and Canadian publics. We find no evidence that the COVID-19 crisis crowds out public concern about the climate crisis. Instead, we find that the publics in both countries prefer that their government integrate climate action into COVID-19 responses. We also find suggestive evidence that analogizing climate change with COVID-19 may sometimes increase concern about climate change.

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1   Introduction

In the shadow of the COVID-19 pandemic, policymakers have debated whether other pressing crises–including climate change–should be integrated into their COVID-19 responses. Is it politically feasible to integrate climate policies into pandemic recovery plans? Conventional wisdom suggests that the public may struggle to prioritize multiple crises simultaneously, particularly when they unfold across different time scales. However, public experience with one crisis could also increase comfort with the type of aggressive policy interventions necessary to manage other crises, especially where such interventions are complementary. The contemporary moment thus raises pressing questions about how public policy preferences and issue prioritization shift in the face of competing policy challenges. Have the health and economic emergencies triggered by the pandemic displaced public concern about climate change? Or has public experience with one crisis - the COVID-19 pandemic - increased support for climate action?

In this letter we draw from four new surveys of the Canadian and American publics to explore linkages (or lack thereof) in the public mind between COVID-19 and climate change. First, we use a conjoint experiment to examine whether the public supports integrating climate action into COVID-19 recovery packages. Next, we use a panel study to examine whether the pandemic has changed the extent to which the public views climate change as a worrying issue that the government should prioritize. We then use a framing experiment to explore whether communication about COVID-19 can shape the way the public thinks about climate change. Overall, we find that the COVID-19 crisis has not crowded out public support for climate action and, instead, has created political opportunities for integrated policy responses that include climate change mitigation.

2   The politics of intersecting crises

How does the public respond to simultaneous crises? From one perspective, new crises compete within the public's "finite pool of worry" (Weber, 2006) and can crowd out concerns about other policy challenges. For example, short-term economic needs are often viewed as displacing longer-term environmental concerns (Inglehart, 1977; Elliott et al., 1997). Indeed, several studies have linked the 2008-2009 Great Recession with a downturn in climate policy support (Kahn and Kotchen, 2011; Scruggs and Benegal, 2012; Shum, 2012). In this view, simultaneous crises act as substitutes in the public mind.

Alternatively, a new crisis may open a window of opportunity for addressing pre-existing issues (Kingdon and Thurber, 1984). Prior to the pandemic, the American public supported linking climate policy with social and economic policy (Bergquist et al., 2020) and might likewise support an integrated approach to COVID-19 and climate change. Responses to a new crisis might also normalize broad-scale governmental interventions. For example, the scale of COVID-19 stimulus spending could re-calibrate expectations about appropriate government interventions in the economy. In this view, simultaneous crises could complement each other in the public mind.

Finally, public attitudes about simultaneous policy challenges could remain independent, with public opinion about longstanding crises unaffected by the emergence of new problems. For example, scholars have revisited the link between economic downturns and climate concerns and failed to find evidence that economic distress reduces support for climate action (Mildenberger and Leiserowitz, 2017; Bakaki and Bernauer, 2018). Similarly, in the context of COVID-19, efforts to frame the pandemic as a "trial run" for climate policymaking did not influence public attitudes (Ecker et al., 2020).

Despite the possibility that COVID-19 has shifted political incentives in other policy areas, scholars have not yet explored these linkages. Instead, most political analyses of COVID-19 have focused on support for pandemic-related policies and/or the impact of the pandemic on support for incumbent governments. Thus, the pandemic has increased support for incumbent politicians across the globe (Leininger and Schaub, Leininger and Schaub; Yam et al., 2020), without reshaping the public's ideological positioning (Bol et al., 2021). In some countries, surveys show increased support for technocracy and expert-driven rulemaking (Amat et al.,

2020), and higher levels of trust in institutions and individuals (Esaiasson et al., 2020; Schraff, 2020; Devine et al., 2020). However, these "rally-around-the-flag" effects declined over time in many countries (Johansson et al., 2021). Similarly, early studies in the US found little evidence of partisan polarization around COVID attitudes (Gadarian et al., 2021; Myers, 2021), but political polarization increased as the pandemic wore on (Grossman et al., 2020; Allcott et al., 2020). In contrast to the United States, Canada has continued to see robust cross-party consensus about pandemic response measures (Merkley et al., 2020).

Likewise, recent studies of public attitudes about climate change have focused narrowly on how drivers such as elite cues (Guntermann and Lachapelle, 2020; Merkley and Stecula, 2020; Lee et al., 2021) and social norms (Bechtel et al., 2019; Mildenberger and Tingley, 2019) influence beliefs about climate change and support for policy to address it. Scholars have not explored how other issues on the political agenda might shape public attitudes about climate change.

Two recent studies have compared public willingness to accept the same policies when proposed as responses to either COVID-19 *or* climate change. The public is more supportive of nationally coordinated responses (Amat et al., 2020) and air travel restrictions (Kallbekken and Sælen, 2021) when they are associated with COVID-19 rather than climate change. These findings suggest that the public views different policy instruments as more appropriate in some contexts rather than others, but they do not tell us whether exposure to intersecting crises influences how the public thinks about the crises or policies to address them. In practice, some governments have linked COVID and climate change, by incorporating green stimulus into their coronavirus relief plans. However, only 2 percent of pandemic recovery dollars are expected to spur positive environmental impacts (OECD, 2020), and we lack an understanding of political incentives to link COVID response and climate policy.

3 Methods

Our analysis leverages four datasets: two collected during the early months of the COVID-19 pandemic, and two from mid-2021, over a year after pandemic-related restrictions began in the United States and Canada.

First, we leverage data from the Canadian Climate Opinion Panel (CCOP). The CCOP was a custom five-wave public opinion panel survey administered on-line between February 2019 and May 2020 to a sample drawn from the Leger 360 platform. Complete information on the CCOP is provided as Online A.1. Second, we fielded a national survey of the American public simultaneously with the May 2020 wave 5 of the CCOP. US respondents were recruited by Qualtrics between May 15 and May 20 (n=1049) and quota sampled by race, age and gender. Third, in April 2021, we fielded a second national survey of Americans, this time using the Lucid Theorem service (n=1,695). Again, respondents were quota sampled by race, age and gender. Fourth, in June 2021, we fielded a national survey of Canadians, also using Lucid. Canadian respondents were quota sampled on language, age, and gender (n=1,058). We then merged local COVID prevalence data into all four datasets, using data from provincial health authorities in Canada and a non-partisan repository of health data in the United States. We provide full details about the surveys and COVID-19 prevalence data in Online A.2.

We use these surveys to explore the relationship between climate change and COVID-19 in three ways. Our primary focus explores whether public support for climate policy increases or decreases support for government responses to the COVID-19 pandemic. We explore this topic using a conjoint survey experiment embedded in the 2021 Canadian and US surveys. Conjoint experiments capture the dynamics of multi-dimensional decision-making and show how different choice dimensions vary in relative importance (Hainmueller et al., 2014; Bansak et al., 2016). Respondents are asked to choose between two choice bundles that contain randomly varying combinations of policy elements. The researcher can then estimate Average Marginal Component-Specific Effects (AMCEs) for each policy element (Hainmueller et al., 2014). The AMCE shows how much a given policy element increases or decreases public support for the policy package, holding all other elements constant.

In our conjoint experiment, respondents were asked to evaluate three randomly generated pairs of policy packages, which varied with respect to five dimensions: climate action, infrastruc-

ture, individual support, business support, and costs. Full details about the policy elements are included in Online B.1. We focus particular attention on the implications of bundling climate policies into COVID-19 response packages. These elements are contained within the climate action and infrastructure dimensions.

We conduct the analysis at the level of the policy package. Our dependent variable is a binary indicator for whether each policy bundle was preferred (Y=1) or not preferred (Y=0). We then use a linear probability model to calculate the AMCE for each policy element. We incorporate a fixed effect to control for the order in which the policy bundles were presented. We use the model:

$$Y_i = \alpha + \beta Individual_p + \gamma Business_p + \eta Climate_p + \zeta Infrastructure_p + \lambda Cost_p + \epsilon_p \quad (1)$$

Y indicates whether policy package p was selected, and ϵ is an error term. The remaining variables indicate the levels for each policy attribute. We cluster standard errors at the respondent level.

This conjoint experiment reveals whether the American and Canadian publics prefer that COVID-19 response packages integrate policy to address climate change, but it does not tell us whether or how the pandemic has changed views of climate change and climate policy. To assess this question, we extend the conjoint experiment with two supplemental analyses. First, we evaluate the effect of COVID incidence on climate concern by evaluating within-subject changes in Canadian climate policy preferences between the December 2019 and April 2020 waves of the Canadian Climate Opinion Panel. Details on question wording are provided in Online B.2. We analyze this panel data using a (two-way, fixed effects) OLS model of the form,

$$\text{Concern}_{it} = \gamma_i + \omega_t + \alpha \ \text{COVIDincidence}_{it} + \eta_{it},$$

where Concern_{it} is one of our two measures of climate concern i in survey wave t, γ_i are individual respondent fixed effects, ω_t are survey wave fixed effects, and η_{it} is the error term. The key parameter of interest is α, the coefficient on $\text{COVIDincidence}_{it}$.

Second, in all four surveys, we tested whether framing the climate crisis as similar to the COVID pandemic might increase public climate concern or prioritization of climate change. This framing experiment randomly assigned survey respondents to read one of three vignettes that either discussed the COVID-19 pandemic alone, or highlighted similarities between COVID-19 and the climate crisis. Respondents in both the Canadian and the US samples received the same set of experimental vignettes. Details on these experimental vignettes are provided in Online B.3.

4 Results

Our conjoint-experimental results show that Americans and Canadians support an approach to COVID relief that incorporates climate policy (Figure 1). Including green infrastructure spending increases support for a coronavirus relief package. Further, in both countries, support for clean energy and clean transportation boosts support more than fossil fuel infrastructure investments. In Canada, clean energy investments boost support more than roads, bridges, and tunnels, whereas we cannot distinguish between the increased support associated with clean energy and traditional infrastructure in the United States. All tested climate policy measures boost support for the overall package. Conditioning business support on pollution reductions boosts support by the greatest amount in both countries, and this effect is statistically significantly greater than the boost in support associated with excluding fossil fuel companies from receiving assistance.

Climate change is conditioned by a high degree of partisan polarization in both the United States and Canada (Lachapelle et al., 2012; Mildenberger et al., 2017) However, these results are stable when disaggregated by partisan sub-groups in the US and ideological sub-groups in Canada (Figure 2). In the US sample, the boost in support for packages that include clean transportation or retraining for fossil fuel workers, or that exclude fossil fuel companies from receiving assistance, is driven by Democrats. Still, we do not find evidence that including

Figure 1: How social, economic, and climate programs shape support for bundled COVID-19 response packages in Canada and the United States
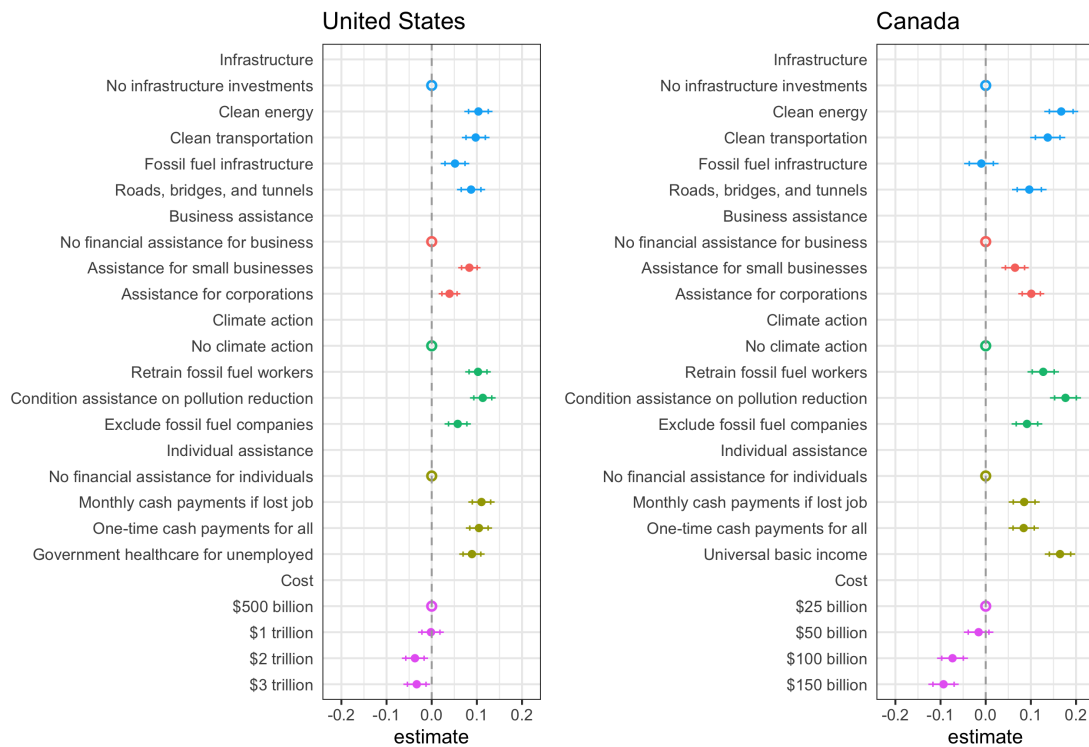
The figure shows average effects of each policy element (colored by policy dimension) on support for the COVID-19 policy bundle in the United States (left panel) and Canada (right panel). Point estimates are average marginal component effects (AMCEs) with 95% confidence intervals for each policy level. Hash marks show 83% confidence intervals, to aid visual inspection of significant differences in effect sizes (Payton et al., 2003; Bolsen and Thornton, 2014). Each AMCE estimates how inclusion of the listed program affects support for the bundled COVID-19 package. Each element is compared against a base category for each policy dimension, denoted by a dot on the 0 intercept.

these elements causes a decline in support among Republicans. Similarly, among Canadians the boost in support associated with clean energy is driven by left-leaning voters, and the boost in support associated with fossil fuel infrastructure is driven by right-leaning voters, but we do not see a decline in support among other groups when packages include these policies. Overall, while including some climate policy elements elicits more enthusiastic support among particular segments of the population in both countries, we do not find evidence that climate policy reduces support among any group.

Figure 2: Conjoint results by partisan or ideological sub-groups
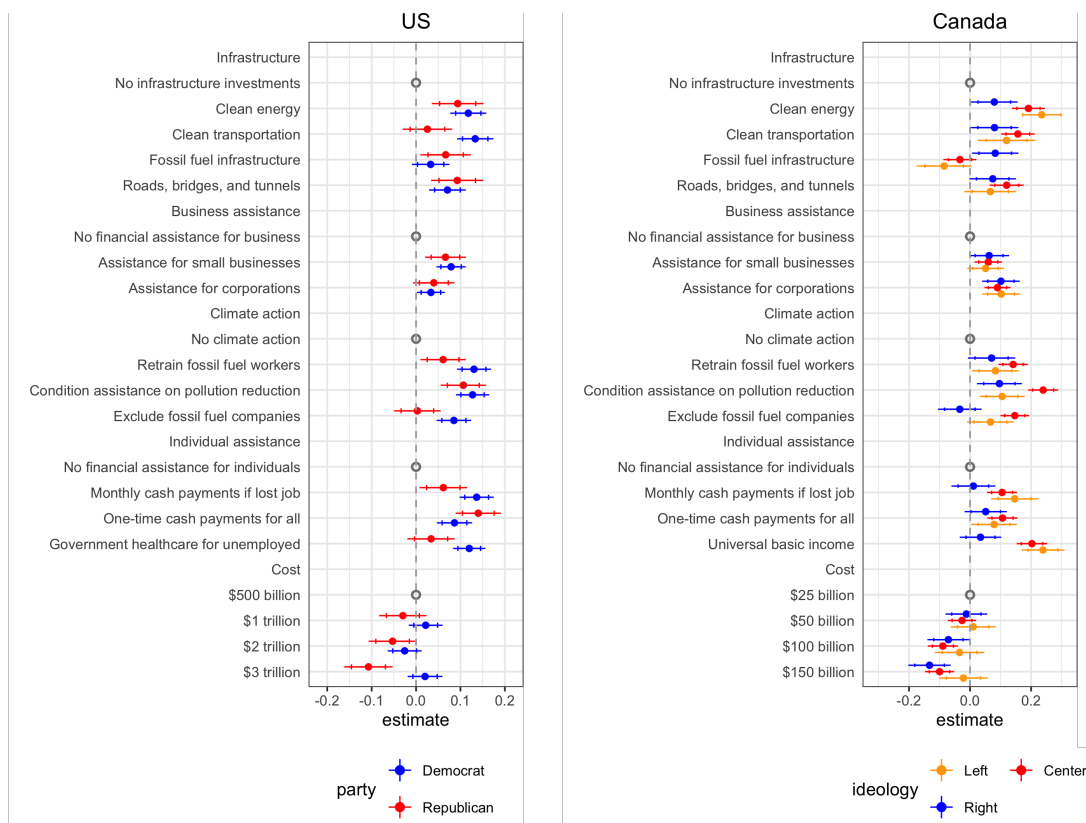
The figures show how the average effect of each policy element varies between Democrats and Republicans (US) and self-reported conservatives, centrists, and liberals (Canada). AMCEs are shown in red for Republicans and conservatives, orange for centrists, and blue for Democrats and liberals. Point estimates are average marginal component effects (AMCEs) with 95% confidence intervals for each policy level. Hash marks show 83% confidence intervals, to aid visual inspection of significant differences in effect sizes (Payton et al., 2003; Bolsen and Thornton, 2014). Each AMCE estimates how inclusion of the listed program affects support for the bundled COVID-19 package. Each element is compared against a base category for each policy dimension, denoted by a dot on the 0 intercept.

These conjoint results suggest that the COVID-19 crisis created a policymaking window for climate action via public spending. The public prefers that governments take simultaneous action to manage intersecting crises. However, these results could mask a decline in issue prioritization. We explore whether COVID reduced concern about climate change using the Canadian Climate Opinion Panel. In our two-way fixed effects model, we find no evidence that COVID-19 reduced either the salience of climate change for Canadians or their support for climate policy. The results reported in in Table 1, Column 1, show no significant effect of local COVID-19 prevalence on the importance Canadians assign to the issue of climate change. Results are similar for a range

of other issues reported in Online B.2. Column 2 of Table 1 shows the results for a model of the effect of local COVID-19 prevalence on support for carbon pricing. Carbon pricing is the most high-profile climate policy in Canada. As with issue importance, we find no statistically significant effects. We thus find no evidence that COVID-19 crowded climate change out of a "finite pool of worry" for Canadians.

Table 1: Results of two-way fixed effects models, showing no statistically significant effect of COVID-19 prevalence at the local level on (1) the importance Canadians assign to climate change and (2) support for carbon pricing. Local COVID-19 prevalence is measured as the percent of the local population that had contracted COVID-19 (cumulative through May 18, 2020). Issue importance is measured on a five-point scale (1:5). Support for carbon pricing is measured on a five-point scale (1:5)

	Dependent variable:	
	Importance of clim. chg.	Support for carbon pricing
COVID-19 prevalence (pct.)	0.043	−0.070
	(0.094)	(0.203)
Respondent fixed effects	Yes	Yes
Wave fixed effects	Yes	Yes
Waves	2	2
Observations	834	505

Note: *p<0.05; **p<0.01; ***p<0.001
Robust standard errors are reported, clustered at the respondent level.

These results still leave open the question of how the public might respond to media or political communications that link the two crises. Thus, we also explore whether support for climate policy might be enhanced when respondents receive messages about parallels between the COVID-19 pandemic and the climate crisis. We find only suggestive evidence that this is the case. Figure 3 shows that the direction of the effect of framing climate change as analogous to COVID-19 is in the expected direction in most cases, but the effect of the treatment is small in magnitude and is not reliably statistically significant. This exploratory component of our study merits replication with a larger sample. In the Online Appendix we include Tables 3 and 4, which show the results in detail, as well as an analysis of whether we can differentiate the effects of the two versions of the framing treatments (Tables 5 and 6).

These results mirror the results from the panel analysis. COVID-19 does not crowd climate out of the public consciousness, but neither does its structural similarity to climate change dramatically increase public climate concern.

5   Conclusion

In this research note, we have assessed public support for integrated policy approaches that address COVID-19 and climate change simultaneously. We have also explored the attitudinal bases for the public's policy preferences, by asking whether exposure to or communication about the new COVID-19 crisis changes how the public thinks about climate change. We find no evidence that the COVID-19 pandemic reduced support for climate action by crowding climate change out of a finite pool of worry. Instead, COVID recovery packages that included climate action were more popular than those that did not. Moreover, we do not find evidence that exposure to COVID-19 reduced the importance of climate change in the public mind or support for climate policy. Likewise, we find inconclusive evidence that rhetorically linking the two crises can build support for climate action. The COVID-19 crisis has not crowded out public support for climate action and, instead, may create opportunities for integrated policy solutions.

Figure 3: Effect of framing climate change as analogous to COVID-19 on climate concern
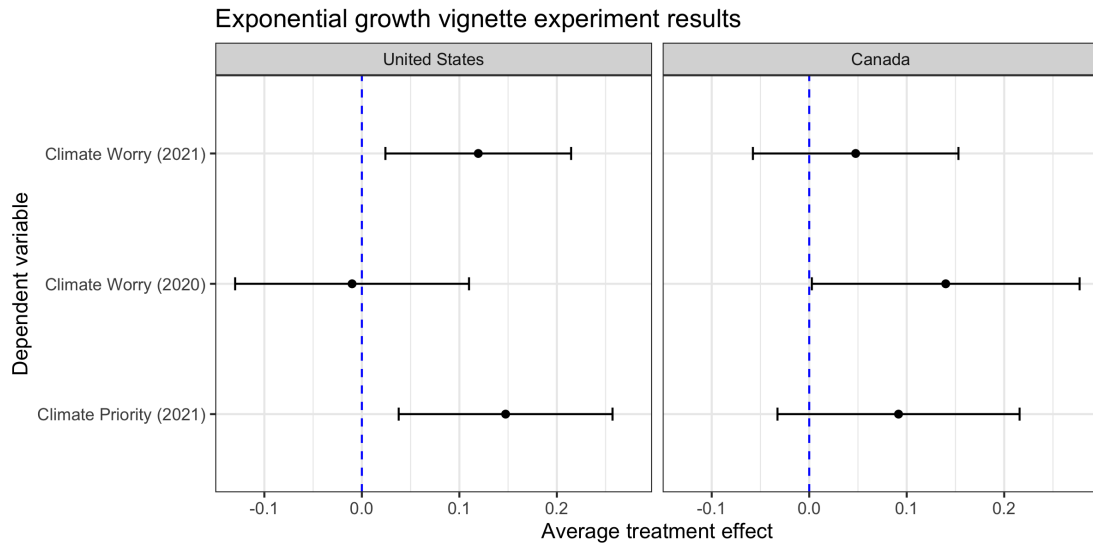
The figure shows the average treatment effect (with 95% confidence intervals) of framing climate change as analogous to the "exponential growth" of COVID-19. The vignette experiment was conducted four times, on two samples: the United States (May 2020 and Feb. 2021) and Canada (May 2020 and Jun. 2021). The dependent variables are: worry about climate change (all samples, measured on a four-point scale); and whether government should make climate change a priority (2021 samples only, measured on a four-point scale).

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A   Data

A.1   Canadian Climate Opinion Panel

The Canadian Climate Opinion Panel (CCOP) was a custom five-wave public opinion panel survey administered on-line between February 2019 and May 2020 to a sample drawn from the Leger 360 platform. This platform is a web-based pool of over 400,000 Canadians, 60 percent of which were recruited randomly via Random-Digit-Dialing (RDD). Panel respondents were drawn from five Canadian provinces (British Columbia, Alberta, Saskatchewan, Ontario and Quebec). The CCOP dataset has little systematic attrition and no survey design effects (Mildenberger, Lachapelle, Harrison and Stadelmann-Steffen, 2020).

The first four waves of the CCOP were conducted to study Canadian attitudes about federal climate policy. In May 2020, we collected a fifth panel wave in the early months of the COVID-19 pandemic by recontacting the 1,190 survey respondents who responded to the panel's fourth wave, conducted between 22 November and 16 December 2019. Fieldwork for the fifth wave was conducted between May 13 and May 28 2020. A total of 899 panelists completed the survey, delivered as a web-based questionnaire through the Leger 360 platform. This represented a 24% attrition rate between wave 4 and wave 5 of the CCOP. Panelists were given the option of responding in either English or French, with 147 panelists responding in French.

A.2   COVID prevalence data

Canadian COVID prevalence data was obtained from publicly available provincial government sources. All provinces report daily on COVID incidents, with local information reported regionally within the provinces. For the CCOP analysis, data were collected on May 19, 2020, for British Columbia's five health authorities, Alberta's five health zones, Saskatchewan's six health regions, Ontario's 34 public health units, and Quebec's 18 health regions. Local COVID prevalence is expressed in our dataset as the percentage of the population infected with COVID, up to and including May 18, 2020, to coincide with the CCOP's fifth wave. COVID prevalence in this sample ranges from 0% to 1.0880 %, with a median prevalence rate of 0.0431%. These data were then merged into the panel dataset based on the respondent's federal electoral district, which we matched with the provincial health regions.

COVID prevalence data are not available for the Canadian sample that was recruited on Lucid in 2021, because we were not able to obtain geographic identifiers below the province level for Lucid respondents.

For the United States sample, COVID prevalence data were obtained from the USAfacts.org resource, a publicly-available, non-partisan repository of data provided by US government agencies. COVID data is updated daily by USAfacts.org with county-level cumulative COVID case counts obtained from state-level public health agencies; where states do not report county-level data, USAfacts.org obtains county-level data from the Centers for Disease Control and county public health authorities. [1] COVID prevalence was then calculated as cases per 100 of population (or, percentage of population infected with COVID), up to and including May 16, 2020, to coincide with the timing of the US survey. COVID prevalence in this sample ranges from 0% to 3.718 %, with a median prevalence rate of 0.231%. These data were then merged with the US survey data, matched to the respondent's zipcode. Where a respondent's zipcode covered multiple counties, we calculated the mean COVID prevalence for the counties over which the zipcode spans.

B   Methods

B.1   Conjoint experiment

Respondents were given the prompt: "As you may have heard, politicians are currently considering various policies to address the COVID-19 pandemic's economic impacts. We are interested in your views on how the federal government should address this COVID-19 crisis. On each of the next few screens, you will be shown a pair of proposed policy programs that the government may consider. Please read the descriptions of the proposals carefully. Then, please indicate which proposal you would prefer the government to pursue." The policy packages varied with respect to climate action, infrastructure, individual support, business support, and costs.

Figure ?? provides an example of the conjoint choices for Experiment 1 as seen by one survey respondent.

B.2   Panel study

We measure climate concern using two questions in the CCOP. First, we analyze a measure of climate issue prioritization. In both waves, respondents were asked to indicate "How important or unimportant are each of the following issues to you personally?" We focus on the response "Climate change and the environment", which respondents evaluated on a five point scale from 'Extremely important' to 'Not at all important'. These results are presented in the main text. While our focus was on the impact of COVID-19 prevalence on climate change prioritization, we also assessed whether COVID-19 impacted Canadians' prioritization of other issues. Thus, we also included measures of salience on the following issues: jobs and the economy, health care,

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[1]Detailed information on USAfacts.org's methodology is available at `https://usafacts.org/articles/detailed-methodology-covid-19-data/`

Scenario 2

	Policy Package A	**Policy Package B**
Election Preparation	Every state must allow "vote-by-mail" for the November 2020 election	Every state must allow "vote-by-mail" for the November 2020 election
Individual Support	Expansion of unemployment benefits	Expansion of unemployment benefits
Loan Exclusions	No federal loans for Wall Street firms	No exclusions, all industries eligible for federal loans
Cost	$2 trillion	$2 trillion
Infrastructure Investments	Government investments in clean energy, like wind and solar	Government investments in clean energy, like wind and solar
Loans to Corporations	Government loans to corporations if 90% of workers keep their jobs	Government loans to corporations in exchange for company shares

Figure 4: Example of conjoint choice table as seen by survey respondents

education, climate change and the environment, taxes and government spending, affordability and cost living, and immigration. Results across this range of issues are presented in Table 2.

Second, we consider respondents' specific support for a carbon price, which has been a source of substantial political debate in Canada as a result of the federal government's imposition of its own tax if provinces do not meet federal conditions. Here, respondents in both waves were asked: "Based on what you know, how do you feel about putting a price or tax on fossil fuels like coal, oil and gas in order to reduce carbon emissions in Canada? This type of policy is often referred to as 'carbon pricing.' Responses were collected on a five-point Likert scale from "Strongly Oppose" to "Strongly support." Results are presented in the main text, in Table 1, column 2.

B.3 Framing experiment

In the first condition, *Control*, respondents received a vignette highlighting the exponential nature of COVID-19 spread.

Table 2: Results of two-way fixed effects models, showing no statistically significant effect of COVID-19 prevalence at the local level on the importance Canadians assign to the following issues: jobs and the economy; health care; education; climate change; taxes and government spending; affordability; immigration. Local COVID-19 prevalence is measured as the percent of the local population that had contracted COVID-19 (cumulative through May 18, 2020). Issue importance is measured on a five-point scale (1:5).

	Dependent variable: issue importance			
	Jobs & economy	Health care	Education	Climate change
COVID-19 prev. (pct.)	0.035	0.036	0.148	0.043
	(0.115)	(0.111)	(0.126)	(0.094)
Respondent FEs	Yes	Yes	Yes	Yes
Wave FEs	Yes	Yes	Yes	Yes
Waves	2	2	2	2
Observations	834	834	834	834
	Taxes & govt spending	Affordability	Immigration	
COVID-19 prev. (pct.)	-0.081	-0.103	0.054	
	(0.110)	(0.100)	(0.164)	
Respondent FEs	Yes	Yes	Yes	
Wave FEs	Yes	Yes	Yes	
Waves	2	2	2	
Observations	834	834	834	

Note: $^{*}p<0.05$; $^{**}p<0.01$; $^{***}p<0.001$
Robust standard errors are reported, clustered at the respondent level.

> *Control Condition:* When something grows slowly at first but then spreads much much faster it is called **"exponential growth."**
>
> The **new coronavirus** is an example of a problem that **grows exponentially**. The coronavirus spread slowly at first but then quickly sped up and overwhelmed health systems around the world. Some experts say that our experience with the new coronavirus has shown the risk of waiting to act on a problem that grows exponentially. If governments had acted sooner to contain the coronavirus, we might have been able to slow its growth and avoid the loss of many human lives and high economic costs.

In a second condition, *Climate text*, this vignette was extended to also describe the exponential growth of carbon pollution levels since the industrial revolution, and borrowing language from the COVID-19 pandemic response to suggest that we must collectively "flatten the climate curve."

> *Climate text:* When something grows slowly at first but then spreads much much faster it is called **"exponential growth."**
>
> The **new coronavirus** is an example of a problem that **grows exponentially**. The coronavirus spread slowly at first but then quickly sped up and overwhelmed health systems around the world. Some experts say that our experience with the new coronavirus has shown the risk of waiting to act on a problem that grows exponentially. If governments had acted sooner to contain the coronavirus, we might have been able to slow its growth and avoid the loss of many human lives and high economic costs.
>
> **Climate change** is another problem that **increases exponentially**. Levels of carbon pollution are rising exponentially. This will cause severe heat waves, major droughts, and flooding from rising seas and intense rainstorms. Experts believe the economic damages from these disasters could also increase exponentially.
>
> If governments take strong action now, we can slow the rate of carbon pollution and avoid the worst impacts of climate change, **"flattening the climate curve."** If we delay action, like some governments delayed action to contain the coronavirus, the costs of climate action will be higher and we won't be able to prevent the most severe and costly damages from climate change.

A third treatment arm, *Climate text + image*, used the same text as the Climate Text vignette, but supplemented this text with two images that provided a visual illustration of exponential growth in both the COVID and climate contexts. These images are presented as Figure 5

B.4   Vignette experiment

As a manipulation check, respondents were asked to identify the main topic of the text they just read, choosing between "Exponential growth," "Artificial intelligence," "Fashion," or "Nutrition." If they answered incorrectly, they were given text to read again, and given the same manipulation check. If they failed the manipulation check a second time, their responses were excluded from analysis.

After reading the vignettes, respondents were asked the following questions, which served as the dependent variables for the experiment. First, we measured respondents' level of worry about climate change with the question: "How worried are you about climate change?" Answer choices were "very worried," "somewhat worried," "not very worried," and "not at all worried." Next, we measured respondents' prioritization of climate change with the question: "Do you think that climate change should be a low, medium, high, or very high priority for the Prime Minister and Parliament?" (in Canada) or "Do you think that climate change should be a low, medium, high, or very high priority for the President and Congress?" (in the US). We analyze these responses by coding each variable as a four-point continuous scale.

In the analysis presented in the main text, we assess whether framing climate change as analogous to COVID-19 influences worry or prioritization about climate change. In this analysis we regress the dependent variables on an indicator for whether a respondent was shown either the *Climate text* or *Climate text + image* vignette. These results are shown in Figure 3 in the main text and Tables 3 and 4 below.

For the survey waves where we detected a significant effect for the bundled framing treatments, we also assess whether the two versions of the treatment have different effects on Canadians' and Americans' worry about or prioritization of climate change. We estimate the model:

$$Y_i = \beta_0 + \beta_1 T_i + \beta_2 T I_i + \epsilon_i \tag{2}$$

where Y_i is each respondents' answer to the worry or priority question, T_i is an indicator for whether a respondent received the *Climate text* treatment, and $T I_i$ is an indicator for whether a respondent received the *Climate text + image* treatment. Tables 5 and 6 show the results.

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Total confirmed COVID-19 deaths

Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.

Source: European CDC – Situation Update Worldwide – Last updated 22nd April, 11:30 (London time)

Historical carbon dioxide emissions from global fossil fuel combustion and industrial processes from 1758 to 2018 (in million metric tons)*

Sources
Global Carbon Project; Expert(s) (Gilfillan, et al.)
© Statista 2019

Additional Information:
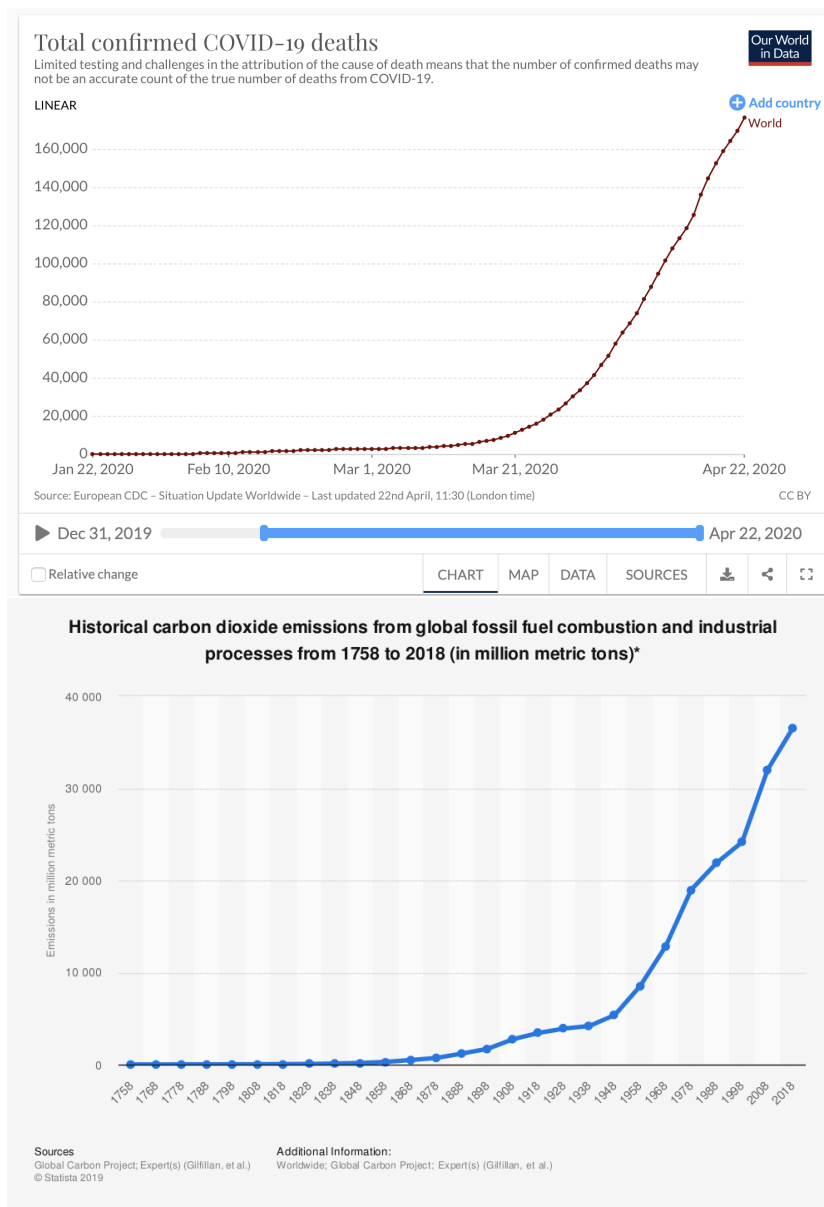Worldwide; Global Carbon Project; Expert(s) (Gilfillan, et al.)

Figure 5: Images used to supplement the Climate Condition vignette in a third framing experiment treatment arm

Table 3: Average treatment effects of analogizing climate change to the exponential growth of COVID-19 on respondents' level of worry about climate change.

	Dependent variable: Worry about climate change			
	Canada		United States	
	(May 2020)	(Jun. 2021)	(May 2020)	(Feb. 2021)
Average treatment effect	0.140*	0.048	−0.010	0.119*
	(0.070)	(0.054)	(0.061)	(0.049)
Control group mean	1.694	2.196	2.060	2.086
	(0.058)	(0.044)	(0.051)	(0.040)
Observations	892	1,040	1,049	1,609

Note: $^{*}p<0.05$; $^{**}p<0.01$; $^{***}p<0.001$
Robust standard errors in parentheses.

Table 4: Average treatment effects of analogizing climate change to the exponential growth of COVID-19 on respondents' belief that government should prioritize climate change.

	Dependent variable: Climate prioritization	
	(USA: Feb. '21)	(Can: Jun. '21)
Average treatment effect	0.147**	0.092
	(0.056)	(0.063)
Control group mean	1.865	1.933
	(0.047)	(0.052)
Observations	1,611	1,040

Note: $^{*}p<0.05$; $^{**}p<0.01$; $^{***}p<0.001$
Robust standard errors in parentheses.

We use an F test to determine whether the *Climate text* and *Climate text + image* treatments have different effects on respondents' worry or prioritization of climate change. We cannot conclude that the effects of the two treatments are different for either dependent variable ($p = 0.45, 0.892, 0.91$ for the *climate worry* dependent variable in Feb. 2021 (US), May 2020 (Canada), and *climate priority* dependent variable in Feb. 2021 (US)). Instead, we conclude that the treatments are jointly significant in these cases (as indicated by the analyses presented in the main text).

Table 5: Average treatment effects of analogizing climate change to the exponential growth of COVID-19 on respondents' level of worry about climate change. ATEs are presented for both the text-only treatment and a treatment that included images added to the text showing graphical representations of exponential growth. We present results in this table for the survey waves in which we find significant treatment effects.

	US Feb. 2021	Canada May 2020
Intercept	2.09***	1.69***
	(0.04)	(0.06)
Text only trt. effect	0.10	0.15
	(0.06)	(0.08)
Text + image trt. effect	0.14*	0.13
	(0.05)	(0.08)
Observations	1609	892

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Robust standard errors in parentheses.

Table 6: Average treatment effects of analogizing climate change to the exponential growth of COVID-19 on respondents' belief that government should make climate change a priority. ATEs are presented for both the text-only treatment and a treatment that included images added to the text showing graphical representations of exponential growth. We present results in this table for the survey wave in which we found significant effects.

	US Jun. 2021
Intercept	1.86***
	(0.05)
Text only trt. effect	0.15*
	(0.06)
Text + image trt. effect	0.14*
	(0.06)
Observations	1611

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Robust standard errors in parentheses.