Journal of Environmental Psychology 70 (2020) 101464

Contents lists available at ScienceDirect

Journal of Environmental Psychology

journal homepage: www.elsevier.com/locate/jep

Using the COVID-19 economic crisis to frame climate change as a secondary issue reduces mitigation support

ARTICLE INFO

Handling Editor: Sander van der Linden
Keywords
Climate change communication
COVID-19
Mitigation support
Framing
Climate action

ABSTRACT

The COVID-19 pandemic has understandably dominated public discourse, crowding out other important issues such as climate change. Currently, if climate change enters the arena of public debate, it primarily does so in direct relation to the pandemic. In two experiments, we investigated (1) whether portraying the response to the COVID-19 threat as a "trial run" for future climate action would increase climate-change concern and mitigation support, and (2) whether portraying climate change as a concern that needs to take a "back seat" while focus lies on economic recovery would decrease climate-change concern and mitigation support. We found no support for the effectiveness of a trial-run frame in either experiment. In Experiment 1, we found that a back-seat frame reduced participants' support for mitigative action. In Experiment 2, the back-seat framing reduced both climate-change concern and mitigation support; a combined inoculation and refutation was able to offset the drop in climate concern but not the reduction in mitigation support.

The COVID-19 pandemic has recently dominated public discourse, crowding out other important topics, including climate change, from traditional and social media (Cinelli et al., 2020). While understandable, this is concerning, as experts assume that the challenges associated with climate change will dwarf the challenges associated with COVID-19, and the impacts of the pandemic on the climate—while positive in the short-term—have the potential to be negative long-term (Dow & Downing, 2016; Hepburn, O'Callaghan, Stern, Stiglitz, & Zenghelis, 2020; Hook & Wisniewska, 2020; Taskinsoy, 2020; Worland, 2020).

During this time, when climate change emerged as a topic of discourse, it did so mainly in relation to the pandemic. Much of this coverage was framed in one of two ways: (1) In an attempt to bring climate change back into the public eye, climate-change communicators have presented the success of behaviour change in response to the coronavirus threat as a template for climate action (e.g., Galbraith & Otto, 2020; Yim & Kassam, 2020). In this frame, COVID-19 is portrayed as a "trial run" for future climate-change-related challenges. (2) By contrast, various commentators have used the economic crisis triggered by COVID-19 to argue that governments' focus needs to be on economic factors, and post-pandemic economic recovery, such that climate action needs to take a "back seat" (e.g., Temple, 2020). Some of these comments have even promoted enhanced burning of fossil fuels to kick-start the economy once pandemic-related restrictions are eased (e.g., Foley, 2020). Given the expert consensus that urgent mitigative action is required to avert the worst consequences of climate change (IPCC, 2018), we were concerned by the potential impacts of the latter type of framing.

We posed two questions: (1) Might a "trial-run" frame enhance climate-change concerns and mitigation support, which may have been temporarily depressed due to the pandemic?[1]; (2) might a "back-seat" frame reduce climate-change concerns and mitigation support?

1. Materials and methods

We ran two experiments. Pre-registrations and materials are available at the Open Science Framework (OSF; https://osf.io/42965/).[2] Ethics approval was granted by the University of Western Australia's Human Research Ethics Office. We developed two opinion articles of approx. 225 words each. One was titled "Our Response to the COVID-19 Crisis Will Help Us Tackle Climate Change"; it argued that "the current crisis shows that we can respond to a challenge" and that "climate change needs to remain at the top of our agenda." The other was titled "The COVID-19 Economic Crisis Is Not the Time to Worry About Climate Change"; it argued that we need to "use more resources in 2021 to jump-start the economy" so "climate change will have to take a back seat." In Experiment 1, participants were randomly provided with either article (trial-run and back-seat conditions TR and BS), or no article (control condition C).

Experiment 2 was a direct replication, but added a back-seat-inoculation/refutation (BS-IR) condition designed to counteract the

[1] The Supplement (https://osf.io/42965/) reports an analysis comparing data from 2019 to 2020, suggesting that climate-change concern did *not* generally decline during COVID-19.

[2] We note that an additional study was carried out initially, which was considered a failed experiment (see Supplement for details). It had three additional conditions (two featuring a rebuttal of the article, and one featuring an additional fear appeal to counteract the back-seat article). This study was also pre-registered but yielded no significant results. Pre-registration, materials, and results are available at the OSF. The two experiments presented here used improved instructions, a gist-memory question to exclude participants who did not sufficiently engage with the materials, and a different recruitment platform (Prolific) that is known for high-quality data (see Peer, Brandimarte, Samat, & Acquisti, 2017).

https://doi.org/10.1016/j.jenvp.2020.101464
Received 27 May 2020; Received in revised form 29 June 2020; Accepted 29 June 2020
Available online 2 July 2020

back-seat framing. It used an inoculation message highlighting that authors of opinion pieces can have a hidden agenda and sometimes use flawed logic (e.g., a false dichotomy) in order to manipulate readers (Cook, Ellerton, & Kinkead, 2018; Cook, Lewandowsky, & Ecker, 2017; van der Linden, Leiserowitz, Rosenthal, & Maibach, 2017), as well as a refutation providing the gist of the trial-run article (Benegal & Scruggs, 2018; Lewandowsky, Stritzke, Freund, Oberauer, & Krueger, 2013; Paynter et al., 2019).

The two dependent measures were climate-change concern and support for climate-change mitigation; each was measured with seven items and scaled to a continuous 0–1 scale. Pre-treatment covariate measures comprised political orientation (three items), climate-change belief (three items), and COVID-19 concern (five items).

Participants were adult U.S. residents recruited via "representative" Prolific samples.[3] For Experiment 1, sampling was based on an a-priori power analysis (Faul, Erdfelder, Lang, & Buchner, 2007) conducted for the earlier, failed experiment; this had suggested a minimum sample size of 576 participants (96 per condition) to detect an effect of $f = 0.15$ between groups ($\alpha = 0.05$; $1 - \beta = 0.8$). Based on the outcome of the failed experiment, and to ensure sufficient power post-exclusions, for Experiment 1 it was decided to test a minimum of 580 participants (200 per experimental condition; 180 in control condition; see pre-registration for details). For Experiment 2, analysis focusing on two conditions and the effect size observed in Experiment 1 ($f = 0.144$) suggested a minimum sample size of 190 participants per condition. Based on additional considerations (see pre-registration), it was decided to test a minimum of 880 participants (230 in condition BS-IR; 220 in TR and BS; 210 in control).

In Experiment 1, we obtained 589 complete data sets; after applying pre-registered exclusion criteria, final sample size was $N = 560$ ($n_C = 178$, $n_{TR} = 192$, $n_{BS} = 190$; 266 males, 289 females, 5 of undisclosed or non-binary gender; age range: 18–78 years; $M_{age} = 45.79$, $SD = 15.79$). In Experiment 2, we obtained 884 complete data sets; after applying pre-registered exclusion criteria, final sample size was $N = 803$ ($n_C = 207$, $n_{TR} = 191$, $n_{BS} = 197$, $n_{BS\text{-}IR} = 208$; 385 males, 407 females, 11 of undisclosed or non-binary gender; age range: 18–80 years; $M_{age} = 33.03$, $SD = 12.16$).

Table 1
Planned contrasts in Experiments 1 and 2.

dV/Hypothesis	Experiment 1			Experiment 2		
	$F(1,554)$	p	η_p^2	$F(1,796)$	p	η_p^2
Climate-change concern						
Control < Trial-run	**< 1**			**<1**		
Control > Back-seat	**3.61**	**.058**	**.006**	**5.34**	**.021**	**.007**
Control > Back-seat-IR	–	–		<1		
Back-seat < Back-seat-IR	–	–		5.02	.025	.006
Mitigation support						
Control < Trial-run	**< 1**			2.62	.106	.003
Control > Back-seat	**7.28**	**.007**	**.013**	**9.15**	**.003**	**.011**
Control > Back-seat-IR	–	–		4.10	.043	.005
Back-seat < Back-seat-IR	–	–		1.05	.305	.001

Note. IR, inoculation/refutation; primary hypotheses (as per pre-registrations) in bold.

2. Results

All data and a summary of additional analyses are available at the OSF. Results were comparable across Experiments 1 and 2 and will thus be reported together. A one-way ANCOVA on climate-change concern yielded $F(2,554) = 2.71$; $\eta_p^2 = 0.010$; $p = .067$ in Experiment 1 (see Fig. 1A), and $F(3,796) = 2.30$; $\eta_p^2 = 0.009$; $p = .076$ in Experiment 2 (see Fig. 1B). All covariate effects were significant in both experiments, $F(1,554) \geq 26.88$; $\eta_p^2 \geq 0.046$; $p < .001$, in Experiment 1, and $F(1,796) \geq 57.44$; $\eta_p^2 \geq 0.067$; $p < .001$, in Experiment 2. Planned contrasts are presented in Table 1.

The analogous ANCOVA on mitigation support yielded $F(2,554) = 4.45$; $\eta_p^2 = 0.016$; $p = .012$ in Experiment 1 (see Fig. 1A), and $F(3,796) = 3.17$; $\eta_p^2 = 0.012$; $p = .024$ in Experiment 2 (see Fig. 1B). All covariate effects were significant, $F(1,554) \geq 21.70$; $\eta_p^2 \geq 0.038$; $p < .001$ in Experiment 1, and $F(1,796) \geq 49.46$; $\eta_p^2 \geq 0.058$; $p < .001$, in Experiment 2. Planned contrasts are presented in Table 1.

Deviating from pre-registrations, we re-ran analyses without covariates to test for suppression effects (i.e., control-variable-induced increases in effect sizes; see Lenz & Sahn, 2020); these analyses are provided in the Supplement for sake of transparency. We note here that

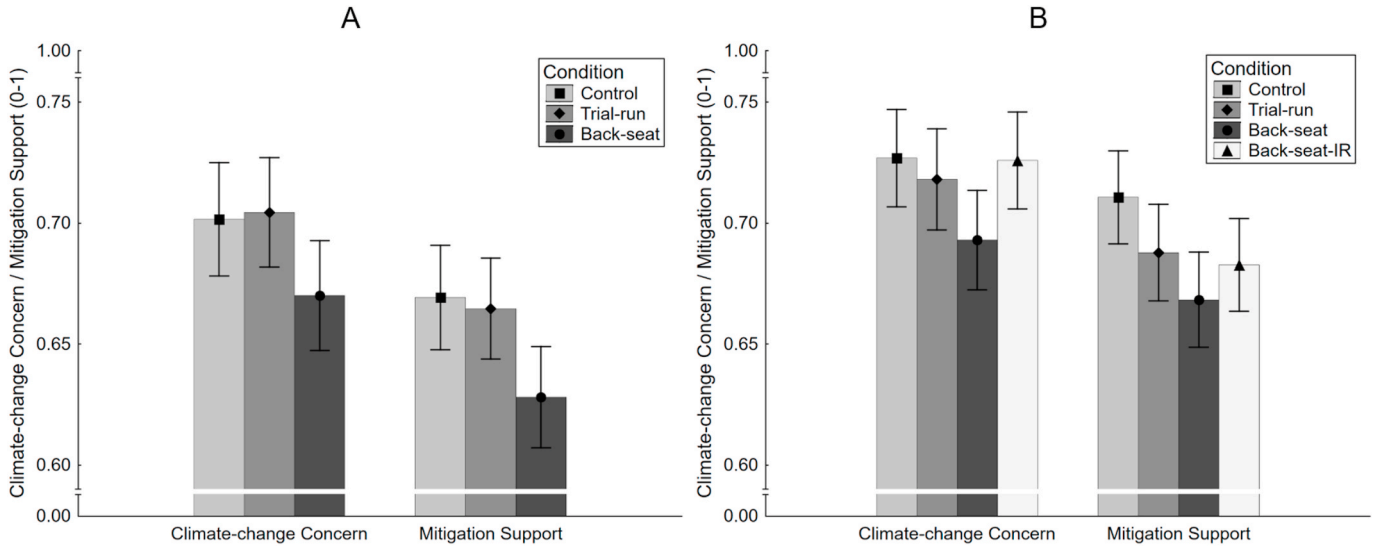

Fig. 1. Least-square Means and Confidence Intervals across conditions in Experiments 1 (panel A) and 2 (panel B).

[3] Prolific (www.prolific.co) uses age, gender, and race criteria to construct samples, but note that these are not truly representative.

the effect of the back-seat framing on mitigation support remained significant in Experiment 1 (and in a conjoint analysis across experiments). The only effect to remain significant in Experiment 2 was the contrast of back-seat and back-seat-inoculation/refutation conditions in the climate-change concern analysis. However, we argue that there is a plausible explanation for the suppression: political orientation and climate beliefs will be much better predictors of climate-change concern and mitigation support than our subtle experimental manipulation—in fact, this is the precise reason the covariates were included and pre-registered a priori. Therefore, in our case, inclusion of covariates arguably improved precision.

3. Conclusions

We can draw two conclusions: (1) We can provide no support for portraying COVID-19 as a "trial run" for future climate action, as there was no evidence that a trial-run frame had any impact on our dependent measures. We note that this does not provide strong evidence *against* the use of such a frame, either. (2) By contrast, arguing that the pandemic justifies at least temporarily dismissing climate change as a secondary concern, while prioritising economic recovery, seemingly resonated with participants. While evidence for an impact on climate-change concern was mixed, an article using such "back-seat" framing significantly reduced support for mitigative action in both experiments. We acknowledge that the observed effects were small; however, they may be larger with repeated exposure to back-seat framing. Being aware of this effect will hopefully facilitate countermeasures, including inoculations and debunking of arguably misleading claims that climate action can take a back seat while policy focus turns to economic recovery. In Experiment 2, such countermeasures jointly offset the "back-seat effect," at least for climate-change concern. We also acknowledge the limitation that our covariate measures made political identity salient, so further exploration of this issue by future research is encouraged.

Data availability statement

All data are permanently and freely available at https://osf.io/42965/.

Author contributions

UE: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Visualization; Writing - original draft

LB: Conceptualization; Methodology; Validation; Writing - original draft; Writing - review & editing

JC: Conceptualization; Methodology; Visualization; Writing - review & editing

MH: Conceptualization; Methodology; Writing - review & editing

TK: Conceptualization; Methodology; Writing - review & editing

SL: Conceptualization; Funding acquisition; Methodology; Writing - review & editing

Declaration of competing interest

Ullrich Ecker receives funding from the Australian Research Council (ARC); Stephan Lewandowsky consults for, and collaborates with, the Joint Research Center of the European Commission. He receives funding from the ARC, the ESRC (via CREST), and the Volkswagen Foundation. All other authors declare no competing interests.

Acknowledgements

This work was supported by an Australian Research Council grant (DP160103596) awarded to UE and SL. The funder had no role in study design or collection, analysis and interpretation of data. We thank Charles Hanich for research assistance.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jenvp.2020.101464.

References

Benegal, S. D., & Scruggs, L. A. (2018). Correcting misinformation about climate change: The impact of partisanship in an experimental setting. *Climatic Change, 148*, 61–80. https://doi.org/10.1007/s10584-018-2192-4.

Cinelli, M., Quattrociocchi, W., Galeazzi, A., Valensise, C. M., Brugnoli, E., Schmidt, A. L., & Scala, A. (2020). *The COVID-19 social media infodemic*. https://arxiv.org/abs/2003.05004.

Cook, J., Ellerton, P., & Kinkead, D. (2018). Deconstructing climate misinformation to identify reasoning errors. *Environmental Research Letters, 13*, Article 024018. https://doi.org/10.1088/1748-9326/aaa49f.

Cook, J., Lewandowsky, S., & Ecker, U. K. H. (2017). Neutralizing misinformation through inoculation: Exposing misleading argumentation techniques reduces their influence. *PloS One, 12*, Article e0175799. https://doi.org/10.1371/journal.pone.0175799.

Dow, K., & Downing, T. E. (2016). *The Atlas of climate change: Mapping the world's greatest challenge*. Berkeley: University of California Press.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175–191. https://doi.org/10.3758/BF03193146.

Foley, M. (2020, April 21). Gas to fire economic recovery and capitalise on cheap oil prices. https://www.smh.com.au/politics/federal/gas-to-fire-economic-recovery-and-capitalise-on-cheap-oil-prices-20200421-p54lw8.html.

Galbraith, E., & Otto, R. (2020, March 20). Coronavirus response proves the world can act on climate change. https://theconversation.com/coronavirus-response-proves-the-world-can-act-on-climate-change-133999.Hepburn et al., 2020 Hepburn, C., O'Callaghan, B., Stern, N., Stiglitz, J., & Zenghelis, D. (2020). Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change? *Smith School Working Paper 20-02;forthcoming in Oxford Review of Economic Policy*. https://www.inet.ox.ac.uk/files/Hepburn-et-al-2020-Will-COVID-19-fiscal-recovery-packages-accelerate-or-retard-progress-on-climate-change-EMBARGOED-5-MAY-2020.pdf.

Hook, L., & Wisniewska, A. (April 14 2020). *How coronavirus stalled climate change momentum*. https://www.ft.com/content/052923d2-78c2-11ea-af44-daa3def9ae03.

Ipcc. (2018). In V. Masson-Delmotte, P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P. R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan , R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, & T. Waterfield (Eds.), *Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming of 1.5°C Above Pre-industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty*. https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_Low_Res.pdf.

Lenz, G., & Sahn, A. (2020). *Achieving statistical significance with control variables and without transparency*. https://doi.org/10.31222/osf.io/s42ba.

Lewandowsky, S., Stritzke, W. G. K., Freund, A. M., Oberauer, K., & Krueger, J. I. (2013). Misinformation, disinformation, and violent conflict: From Iraq and the "War on Terror" to future threats to peace. *American Psychologist, 68*, 487–501. https://doi.org/10.1037/a0034515.

Paynter, J. M., Luskin-Saxby, S., Keen, D., Fordyce, K., Frost, G., Imms, C., et al. (2019). Evaluation of a template for countering misinformation: Real-world autism treatment myth debunking. *PloS One, 14*, Article e0210746. https://doi.org/10.1371/journal.pone.0210746.

Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology, 70*, 153–163. https://doi.org/10.1016/j.jesp.2017.01.006.

Taskinsoy, J. (2020). *No brainer, tackle climate change by 2030 or await the doomsday by 2100*. https://doi.org/10.2139/ssrn.3532709.

Temple, J. (2020, March 24). We need economic relief now. Climate policy can come later. https://www.technologyreview.com/2020/03/24/950341/coronavirus-economic-stimulus-climate-policy-clean-energy-covid19/.

van der Linden, S., Leiserowitz, A., Rosenthal, S., & Maibach, E. (2017). *Global Challenges, 1*, 1600008. https://doi.org/10.1002/gch2.201600008.

Worland, J. (2020, March 10). How coronavirus could set back the fight against climate change. https://time.com/5795150/coronavirus-climate-change/.

Yim, N., & Kassam, N. (2020, May 11). Can COVID-19 response be a model for climate action?. https://www.lowyinstitute.org/the-interpreter/prospects-climate-change-action-post-covid-19-world.

Ullrich K.H. Ecker[a,*], Lucy H. Butler[a], John Cook[b], Mark J. Hurlstone[a,c], Tim Kurz[a,d], Stephan Lewandowsky[e,a]

[a] *School of Psychological Science, University of Western Australia, 35 Stirling Hwy, Perth, 6009, Australia*

[b] *Center for Climate Change Communication, George Mason University, 4400 University Drive, Fairfax, VA, 22030, USA*
[c] *Department of Psychology, Lancaster University, Bailrigg, Lancaster LA1 4YW, UK*
[d] *Department of Psychology, University of Bath, 10 West, Claverton Down, Bath BA2 7AY, UK*
[e] *School of Psychological Science, University of Bristol, 12a Priory Rd, Bristol, BS8 1TU, UK*

[*] Corresponding author.
E-mail addresses: ullrich.ecker@uwa.edu.au (U.K.H. Ecker), 21984487@student.uwa.edu.au (L.H. Butler), jcook20@gmu.edu (J. Cook), mark.hurlstone@uwa.edu.au (M.J. Hurlstone), tim.kurz@uwa.edu.au (T. Kurz), stephan.lewandowsky@bristol.ac.uk (S. Lewandowsky).