



Liberty and the pursuit of science denial

Stephan Lewandowsky^{1,2}

Any strategy to mitigate climate change will have economic and political implications that are incompatible with libertarian ideals of free markets. These political implications have created an environment of rhetorical adversity in which disinformation is systematically disseminated by a variety of politically and economically motivated actors who seek to delay or defang climate policies. I review the strategies of climate denial and how they fit within an historical arc ranging from denial of the adverse health effects of tobacco to the denial of facts and policies involving the COVID-19 pandemic. I review communicative countermeasures and conclude by pointing to the necessity to examine whether science denial is a necessary implication of libertarianism or whether it can be reframed to become an ally in climate mitigation and public-health policies.

Addresses

¹ School of Psychological Science and Cabot Institute, University of Bristol, 12a Priory Road, Bristol BS8 1TU, United Kingdom

² University of Western Australia, Australia

Corresponding author:

Lewandowsky, Stephan (stephan.lewandowsky@bristol.ac.uk)

URL: <http://www.cogsciwa.com>.

Current Opinion in Behavioral Sciences 2021, 42:xx-yy

This review comes from a themed issue on **Human response to climate change**

Edited by **Sander van-der-Linden** and **Elke Weber**

<https://doi.org/10.1016/j.cobeha.2021.02.024>

2352-1546/© 2021 Elsevier Ltd. All rights reserved.

Tobacco smoke is bad for your health, COVID-19 is a dangerous disease caused by an airborne virus, and greenhouse gas emissions from the burning of fossil fuels alter our planet's climate with adverse consequences. None of these facts are disputed within the relevant scientific communities, and their impact is readily discernible. Population-level mortality rates from lung cancer track smoking rates [1], COVID-19 infections decline in response to social-distancing measures [2], and the impacts of climate change track the observed increase in global temperatures and confirm the warnings issued by climate scientists decades ago.

The pervasive scientific evidence has, however, failed to keep influential political and economic actors from

seeking to undermine tobacco control measures, climate-change mitigation policies, and now also public-health measures to control the COVID-19 pandemic. Almost without exception, those actors are adherents of libertarianism and operate within an ecosystem of conservative and free-market 'think tanks' and 'institutes' that engage in the denial of any science that, if taken seriously, entails the need to infringe on 'liberty' through regulations or policy. The links between the tobacco industry's efforts to question medical research and decades of climate denial are well known, both at an institutional level and the use of a common 'playbook' [3,4]. Here I first review the consequences and strategies of organized climate denial before pivoting to the emergence of links between those political efforts and opposition to public-health measures to address the COVID-19 pandemic. I then examine how the challenges posed by disinformation can be met, concluding with pointers towards a necessary future in-depth examination of whether denial of inconvenient science is a necessary attribute of libertarianism, or whether it can be reformed or reframed to become an ally in the pursuit of climate mitigation and public health.

Organized climate denial

Climate science versus partisans

The public in many countries remain partially unconvinced that climate change presents a risk or is caused by the use of fossil fuels. In the U.S., the share of people who accept that climate change is happening has been hovering around 70% between 2016 and 2020 [5]. When these aggregate statistics are analyzed further, a pervasive polarization along party lines emerges. Although Republican and Democrat voters showed similar concern about climate change in the 1990s, by 2016, only 40% of Republicans worried about climate change, compared to 84% of Democrats [6]. This political polarization has been evident in countless surveys in the U.S. and around the world, including in Australia [7], the United Kingdom [8], and in 56 nations around the world [9].

The reasons for the polarization can be traced back to elite cues. During the 25 years from 1990 to 2015, messages from Democratic elites — which are supportive of climate science — became increasingly vocal whereas Republican elites talked less about climate change and sent more mixed messages [10]. These elite cues, amplified by the media, are a primary determinant of public concern about climate change [11]. The media also give undue prominence to press releases from large corporations arguing against climate mitigation while ignoring messages from organizations with scientific expertise [12].

Climate science versus disinformation

Opposition to climate science typically claims the mantle of ‘skepticism’, sometimes even claiming to defend ‘sound science’ against the alleged ‘politicization’ of mainstream climate science. When those contrarian claims are examined they do not withstand scrutiny. So-called ‘skeptical’ arguments have been shown to be flawed methodologically [13] as well as being illogical [14,15]. In particular, contrarian argumentation has been shown to be frequently incoherent, for example when it is simultaneously argued that (a) global temperature cannot be reliably measured but (b) it has been cooling for 10 years [15]. Blind expert tests (i.e. statistical experts adjudicating claims about data that are not identified as relating to climate change) have also revealed contrarian interpretations to be misleading and unsuitable for policy advice [16,17].

There is no doubt that disinformation about climate change is disseminated in an organized manner, using tools ranging from the publication of ‘skeptical’ books funded through conservative think tanks [18,19], to ostensibly philanthropic institutions [20], and \$2 billion spent on lobbying Congress about climate change legislation [21] with the money mainly being expended on legislators with an anti-environmental track record [22]. The fossil fuel industry was aware of climate change and its consequences in the 1960s [23]. Between 1977 and 2014, more than 80% of internal documents and peer-reviewed articles produced by Exxon-Mobil acknowledged the reality of human-caused climate change, whereas only 12% of public-facing ‘advertorials’ did [24]. Exxon-Mobil has also been identified as the funder of some of the most central actors in a network of 164 ‘skeptical’ organizations [25].

Disinformation versus the public

Climate disinformation, leveraged through media coverage, has discernible effects on public attitudes. A long-standing journalistic norm is the assumption that there are two sides to an issue. Accordingly, U.S. mainstream media and TV gave contrarian voices equal coverage with climate scientists for a long time [26,27]. False-balance coverage constitutes one of the most insidious, albeit sometimes inadvertent, forms of climate misinformation. False-balance media coverage demonstrably reduces the public’s understanding of the strength of scientific evidence [28] and reduces the public’s perception of the scientific consensus [29].

Although the situation has gradually improved, with the media generally no longer presenting pervasive false balance [30], the few contrarian scientists are disproportionately visible in the media [31]. In addition, basic facts about climate change lack prominence in coverage. For example, the New York Times rarely mentions the mechanics of the greenhouse effect [32]. In addition,

social media continue to foreground anti-scientific viewpoints. On YouTube, the majority of videos about climate change are anti-scientific [33] and YouTube’s recommender system drives millions of people to watch climate disinformation every day [34].

Misinformation demonstrably undermines the public’s knowledge and acceptance of climate change. At a theoretical level, modeling has shown that even fairly subtle biases [35] and just a few evidence-resistant agents [36] are sufficient to prevent a network of rational agents from accepting the best available scientific knowledge. There is empirical evidence to back up the modeling. A few misleading numbers often used by ‘skeptics’ are sufficient to lower self-reported acceptance of climate change [37]. Misinformation can also ‘cancel out’ accurate information, thus preventing people from being informed accurately [38,29,39]. On social media, comments on blog posts have been shown to alter people’s own attitudes and the perception of others’ attitudes [40,41].

Disinformation has been shown to be particularly damaging when it seeks to undermine a scientific consensus. A petition that purports to show that 31 000 scientists disagree with the scientific consensus (virtually all signatories have marginal scientific credentials at best) has been identified as particularly damaging [38]. The most frequently shared climate article on social media in 2016 featured this misleading petition [42].

From tobacco to climate change to COVID-19

Misleading petitions and other means to create chimerical scientific dissent are a favored tool in the denialist’s arsenal. The tobacco industry pioneered the ‘fake experts’ technique to feign a lack of scientific consensus (e.g. by presenting an actor in a lab coat proclaiming cigarettes to be harmless), and recent events show that the petitions did not stop with tobacco and climate change. The COVID-19 pandemic that turned the world upside down in early 2020 also triggered an ‘infodemic’ of misinformation [43,44] and conspiracy theories, for example the claim that 5G broadband installations were responsible for the virus-borne disease, which led to the destruction of telecommunications installations in the U.K. [45,46]. Other misinformation targeted behavioral public-health measures such as lockdowns [45] or mask wearing [47]. Although much of the misinformation surrounding COVID-19 is difficult to attribute directly to political actors, in some cases there are striking similarities between climate-denial operatives and COVID-related disinformers.

Both groups consider state-sponsored measures with great suspicion, sometimes opining that there is a ‘Deep State’ [48] or ‘cartel’ [49] conspiring against citizens to increase taxes and limit their liberties, often ostensibly for the benefit of foreign states. There are also organizational

links between people who question COVID-19 public-health measures and climate deniers. One such connection involves the American Institute for Economic Research (AIER), a libertarian free-market think-tank that has a history of bogus argumentation about climate change (e.g. by denying the scientific consensus), and which has recently engaged in similarly bogus argumentation about COVID-19 [50]. A central component of the AIER's activities is their sponsorship of the 'Great Barrington Declaration', whose signatories (many of whom have no scientific credentials) advocate a 'herd immunity' strategy by letting the pandemic spread through the population while seeking to protect those who are most vulnerable. This position has been vociferously opposed by the majority of experts [51,52]. Support for the Declaration has instead been found among bots on social media which according to the Federation of American Scientists' Disinformation Research Group 'indicates the conversation is manipulated and inorganic in comparison to the scientific consensus-based conversation opposing herd immunity theories' [53]. As with climate change, COVID-19 disinformation has been shown to be amplified by right-leaning media in a quantitative analysis [54].

It is unsurprising therefore that, in replication of the public-opinion dynamics of climate change, the American public has become increasingly polarized along partisan lines on COVID-19 [55], with tragic outcomes. Partisanship has been found to be predictive of mobility as gaged from smartphone geotracking data, with U.S. counties that voted for Donald Trump in the 2016 presidential election exhibiting 14% less physical distancing in early 2020 than counties who voted for Hillary Clinton. The reduced compliance with pandemic control measures eventually translated into higher COVID-19 infection and fatality growth rates in pro-Trump counties [56]. Surveys of the public yield similar conclusions [57].

The COVID-19 pandemic thus condensed into a single year the ideological mechanics and consequences that have been unfolding across many decades in climate denial. The vastly accelerated time scale and the availability of unambiguously measurable consequences — illness and death — can serve as an illustration and warning of the consequences that may arise from climate denial in the future.

How to respond?

The communicators' toolbox

Much research has focused on how communicators can respond in a fraught and adversarial environment, as for example reviewed by [58**,59**,60**]. Briefly: First, there is evidence that knowledge matters. Providing a causal explanation of the greenhouse effect in 35 words increases people's acceptance of the science and orients them towards mitigative action [37]. Second, alignment of messages with an individual's cultural frame of reference

are easier to understand [61] and have greater impact. For example, messages emphasizing free-market based solutions to climate change, increase acceptance of climate science among conservatives [62]. Third, numerous studies have leveraged the existing scientific consensus as a communication tool. Highlighting the 97% consensus among climate scientists increases acceptance of climate science and/or policy support [63–65]. Fourth, people can be protected against disinformation through 'inoculation'; that is, warning people how they might be misled by climate deniers [66,67]. Finally, other interventions enhance literacy more generally, for example by providing guidelines about how to evaluate news online [68].

The effectiveness of that toolbox is, however, limited by the political context in which it can be applied. Sociologist Robert Brulle once noted, 'the barriers to action on climate change are based in the distribution of social power in the economic, political, and cultural spheres. Introducing new messages or information into an otherwise unchanged socioeconomic system will accomplish little' [69, p. 185]. This recognition is crucial because it clarifies that overcoming climate denial and facilitating climate mitigation is not simply a matter of improving communication but of political change. Effecting this political change, in turn, requires a better understanding of the ideology that is currently at the heart of most organized science denial, from tobacco to climate to COVID-19, namely libertarianism.

Libertarianism versus science

The role of libertarian attitudes in the rejection of science has been established across many domains [70]. It is less clear whether this is a necessary consequence of a worldview that rests on a 'preference for minimal government, plus voluntary association, the primacy of individual autonomy and of course the maximization of individual freedom' [71, p. 288]. On the one hand, several libertarian perspectives exist in support of mandatory vaccinations [72] and climate mitigation [73,74]. Libertarian arguments for climate mitigation are usually anchored in property rights, focused on the idea that people whose property is adversely affected by climate change (e.g. island nations being inundated by sea level rise) can seek protection or relief from polluters [74]. On this optimistic view, 'libertarian theory calls for ecosystem protection; and ... ecosystem protection can be accomplished most effectively when undertaken in a manner that is consistent with libertarian principles' [75, p. 26].

On the other hand, to date even market-based approaches to climate mitigation, such as carbon trading, have attracted opposition from libertarian think tanks, mainly based on the notion that cap-and-trade carbon markets are not 'natural' [49]. Libertarian opposition to market-based solutions is also fueled by the view that the alignment of scientific findings with the interests of some large firms

with stakes in renewable energy represents a ‘regulatory cartel’ [49]. Moreover, recent results suggest that the very norms of the scientific enterprise, such as the ideas that knowledge is universal, belongs to everyone, and should not be subjugated to anyone’s commercial or political interests, are in conflict with libertarian attitudes [76]. That intrinsic conflict, in turn, helps explain libertarian opposition to scientific findings [76].

At present, it is unclear how those two competing strands of libertarian thought and action will ultimately play out. After decades of worldview-motivated denial of issues ranging from tobacco to COVID-19, simple extrapolation would expect this track record to continue.

Conflict of interest statement

Nothing declared.

Acknowledgment

The author was supported by a Humboldt Award from the Humboldt Foundation in Germany during part of this work.

References and recommended reading

Papers of particular interest, published within the period of review, have been highlighted as:

- of special interest
 - of outstanding interest
1. Peto R, Darby S, Deo H, Silcocks P, Whitley E, Doll R: **Smoking, smoking cessation, and lung cancer in the UK since 1950: combination of national statistics with two case-control studies.** *Br Med J* 2000, **321**:323-329.
 2. Haug N, Geyrhofer L, Londei A, Dervic E, Desvars-Larrive A, Loreto V, Pinior B, Thurner S, Klimek P: **Ranking the Effectiveness of Worldwide COVID-19 Government Interventions.** *Nat Hum Behav* 2020, **4**:1303-1312.
 3. Nilsson M, Beaglehole R, Sauerborn R: **Climate policy: lessons from tobacco control.** *Lancet* 2009, **374**:1955-1956.
 4. Oreskes N, Conway EM: *Merchants of Doubt*. London, UK: Bloomsbury Publishing; 2010.
 5. Leiserowitz A, Maibach E, Rosenthal S, Kotcher J, Bergquist P, Ballew M, Goldberg M, Gustafson A, Wang X: *Climate Change in the American Mind: April 2020. Technical Report*. New Haven, CT: Yale University and George Mason University; 2020.
 6. Egan PJ, Mullin M: **Climate change: US public opinion.** *Annu Rev Polit Sci* 2017, **20**:209-227.
 7. Cook J, Lewandowsky S: **Rational irrationality: modeling climate change belief polarization using Bayesian networks.** *Top Cogn Sci* 2016, **8**:160-179.
 8. Capstick SB, Pidgeon NF: **What is climate change scepticism? Examination of the concept using a mixed methods study of the UK public.** *Glob Environ Change* 2014, **24**:389-401.
 9. Hornsey MJ, Harris EA, Bain PG, Fielding KS: **Meta-analyses of the determinants and outcomes of belief in climate change.** *Nat Clim Change* 2016.
 10. Merkley E, Stecula DA: **Party elites or manufactured doubt? The informational context of climate change polarization.** *Sci Commun* 2018, **40**:258-274.
 11. Carmichael JT, Brulle RJ: **Elite cues, media coverage, and public concern: an integrated path analysis of public opinion on climate change, 2001–2013.** *Environ Polit* 2017, **26**:232-252.
 12. Wetts R: **In climate news, statements from large businesses and opponents of climate action receive heightened visibility.** *Proc Natl Acad Sci U S A* 2020.
 13. Benestad RE, Nuccitelli D, Lewandowsky S, Hayhoe K, Hygen H, van Dorland R, Cook J: **Learning from mistakes in climate research.** *Theoret Appl Climatol* 2016, **126**:699-703.
 14. Cook J, Ellerton P, Kinkead D: **Deconstructing climate misinformation to identify reasoning errors.** *Environ Res Lett* 2018, **13**:024018.
 15. Lewandowsky S, Cook J, Lloyd E: **The ‘Alice in Wonderland’ mechanics of the rejection of (climate) science: simulating coherence by conspiracism.** *Synthese* 2016, **195**:175-196.
 16. Lewandowsky S, Risbey JS, Oreskes N: **The “pause” in global warming: turning a routine fluctuation into a problem for science.** *Bull Am Meteorol Soc* 2016, **97**:723-733.
 17. Lewandowsky S, Ballard T, Oberauer K, Benestad R: **A blind expert test of contrarian claims about climate data.** *Glob Environ Change* 2016, **39**:91-97.
 18. Dunlap RE, Jacques PJ: **Climate change denial books and conservative think tanks: exploring the connection.** *Am Behav Sci* 2013, **57**:1-33.
 19. Jacques PJ, Dunlap RE, Freeman M: **The organisation of denial: conservative think tanks and environmental scepticism.** *Environ Polit* 2008, **17**:349-385.
 20. Farrell J: **The growth of climate change misinformation in US philanthropy: evidence from natural language processing.** *Environ Res Lett* 2019, **14**:034013.
 21. Brulle RJ: **The climate lobby: a sectoral analysis of lobbying spending on climate change in the USA, 2000 to 2016.** *Clim Change* 2018.
 22. Goldberg MH, Marlon JR, Wang X, van der Linden S, Leiserowitz A: **Oil and gas companies invest in legislators that vote against the environment.** *Proc Natl Acad Sci U S A* 2020, **117**:5111-5112.
 23. Franta B: **Early oil industry knowledge of CO₂ and global warming.** *Nat Clim Change* 2018, **8**:1024-1025.
 24. Supran G, Oreskes N: **Assessing ExxonMobil’s climate change communications (1977–2014).** *Environ Res Lett* 2017, **12**:084019.
 25. Farrell J: **Network structure and influence of the climate change counter-movement.** *Nat Clim Change* 2015, **6**:370-374.
 26. Boykoff MT, Boykoff JM: **Balance as bias: global warming and the US prestige press.** *Glob Environ Change* 2004, **14**:125-136.
 27. Boykoff MT: **Lost in translation? United States television news coverage of anthropogenic climate change, 1995–2004.** *Clim Change* 2008, **86**.
 28. Koehler DJ: **Can journalistic “false balance” distort public perception of consensus in expert opinion?** *J Exp Psychol: Appl* 2016, **22**:24-38.
 29. Cook J, Lewandowsky S, Ecker UKH: **Neutralizing misinformation through inoculation: exposing misleading argumentation techniques reduces their influence.** *PLOS ONE* 2017, **12**:e0175799.
 30. Brüggemann M, Engesser S: **Beyond false balance: how interpretive journalism shapes media coverage of climate change.** *Glob Environ Change* 2017, **42**:58-67.
 31. Petersen AM, Vincent EM, Westerling AL: **Discrepancy in scientific authority and media visibility of climate change scientists and contrarians.** *Nat Commun* 2019, **10**.
 32. Romps DM, Retzinger JP: **Climate news articles lack basic climate science.** *Environ Res Commun* 2019, **1**:081002.
 33. Allgaier J: **Science and environmental communication on YouTube: strategically distorted communications in online videos on climate change and climate engineering.** *Front Commun* 2019, **4**:36.
 34. AVAAZ: *Why is YouTube Broadcasting Climate Misinformation to Millions?* 2020.

35. Weatherall JO, O'Connor C, Bruner JP: **How to beat science and influence people: policy-makers and propaganda in epistemic networks.** *Br J Philos Sci* 2018.
36. Lewandowsky S, Pilditch TD, Madsen JK, Oreskes N, Risbey JS: **Influence and seepage: an evidence-resistant minority can affect public opinion and scientific belief formation.** *Cognition* 2019, **188**:124-139.
37. Ranney MA, Clark D: **Climate change conceptual change: scientific information can transform attitudes.** *Top Cogn Sci* 2016, **8**:49-75.
38. van der Linden S, Leiserowitz A, Rosenthal S, Maibach E: **Inoculating the public against misinformation about climate change.** *Glob Challenges* 2017, **1**:1600008.
39. McCright AM, Charters M, Dentzman K, Dietz T: **Examining the effectiveness of climate change frames in the face of a climate change denial counter-frame.** *Top Cogn Sci* 2016, **8**:76-97.
40. Hinnant A, Subramanian R, Young R: **User comments on climate stories: impacts of anecdotal vs. scientific evidence.** *Clim Change* 2016, **138**:411-424.
41. Lewandowsky S, Cook J, Fay N, Gignac GE: **Science by social media: attitudes towards climate change are mediated by perceived social consensus.** *Memory Cogn* 2019, **47**:1445-1456.
42. Readfearn G: *Revealed: Most Popular Climate Story on Social Media Told Half a Million People the Science Was A Hoax.* 2016.
43. Enders AM, Uscinski JE, Klofstad C, Stoler J: **The different forms of COVID-19 misinformation and their consequences.** *Harv Kennedy School Misinform Rev* 2020, **1**
- An analysis of misinformation surrounding COVID-19. This is interesting to compare to misinformation concerning climate change.
44. Roozenbeek J, Schneider CR, Dryhurst S, Kerr J, Freeman ALJ, Recchia G, van der Bles AM, van der Linden S: **Susceptibility to misinformation about COVID-19 around the world.** *R Soc Open Sci* 2020, **7**:201199.
45. Bruns A, Harrington S, Hurcombe E: **'Corona? 5G? or both?': the dynamics of COVID-19/5G conspiracy theories on Facebook.** *Media Int Aust* 2020, **177**:12-29.
46. Jolley D, Paterson JL: **Pylons ablaze: examining the role of 5G COVID-19 conspiracy beliefs and support for violence.** *Br J Soc Psychol* 2020, **59**:628-640.
47. Hornik R, Kikut A, Jesch E, Woko C, Siegel L, Kim K: **Association of COVID-19 misinformation with face mask wearing and social distancing in a nationally representative US sample.** *Health Commun* 2021, **36**:6-14.
48. Lahut J: *Dr. Anthony Fauci Did a Facepalm After Trump Mentioned the 'Deep State Department' in a Wild Coronavirus Briefing.* 2020.
49. Bohr J: **The 'climatism' cartel: why climate change deniers oppose market-based mitigation policy.** *Environ Polit* 2016, **25**:812-830.
50. Ward B: *Organisers of Anti-Lockdown Declaration Have Track Record of Promoting Denial of Health and Environmental Risks.* 2020.
51. Alwan NA, Burgess RA, Ashworth S, Beale R, Bhadelia N, Bogaert D, Dowd J, Eckerle I, Goldman LR, Greenhalgh T, Gurdasani D, Hamdy A, Hanage WP, Hodcroft EB, Hyde Z, Kellam P, Kelly-Irving M, Krammer F, Lipsitch M, McNally A, McKee M, Nouri A, Pimenta D, Priesemann V, Rutter H, Silver J, Sridhar D, Swanton C, Walensky RP, Yamey G, Ziauddeen H: **Scientific consensus on the COVID-19 pandemic: we need to act now.** *Lancet* 2020, **396**:e71-e72.
52. McKee M, Stuckler D: **Scientific divisions on COVID-19: not what they might seem.** *BMJ* 2020:m4024.
53. Federation of American Scientists: *Social Media Conversations in Support of Herd Immunity Are Driven by Bots.* 2020.
54. Motta M, Stecula D, Farhart C: **How right-leaning media coverage of COVID-19 facilitated the spread of misinformation in the early stages of the pandemic in the U.S.** *Can J Polit Sci/Revue canadienne de science politique* 2020, **53**:335-342.
55. Clinton J, Cohen J, Lapinski J, Trussler M: **Partisan pandemic: how partisanship and public health concerns affect individuals' social mobility during COVID-19.** *Sci Adv* 2020.
56. Gollwitzer A, Martel C, Brady WJ, Pärnamets P, Freedman IG, Knowles ED, Van Bavel JJ: **Partisan differences in physical distancing are linked to health outcomes during the COVID-19 pandemic.** *Nat Hum Behav* 2020, **4**:1186-1197.
57. Latkin CA, Dayton L, Moran M, Strickland JC, Collins K: **Behavioral and psychosocial factors associated with COVID-19 skepticism in the United States.** *Curr Psychol* 2021.
58. Farrell J, McConnell K, Brulle R: **Evidence-based strategies to combat scientific misinformation.** *Nat Clim Change* 2019, **9**:191-195
- Review of measures to counter disinformation about climate change.
59. Lewandowsky S: **Climate change, disinformation, and how to combat it.** *Annu Rev Public Health* 2021
- Detailed review of the role of disinformation in climate change, and how it can be rebutted.
60. Treen KMd'I, Williams HTP, O'Neill SJ: **Online misinformation about climate change.** *WIREs Clim Change* 2020
- Detailed review of misinformation online about climate change and how to address it.
61. Jones MD, Song G: **Making sense of climate change: how story frames shape cognition.** *Polit Psychol* 2014, **35**:447-476.
62. Dixon G, Hmielowski J, Ma Y: **Improving climate change acceptance among U.S. Conservatives through value-based message targeting.** *Sci Commun* 2017.
63. Deryugina T, Shurchkov O: **The effect of information provision on public consensus about climate change.** *PLOS ONE* 2016, **11**:e0151469.
64. Lewandowsky S, Gignac GE, Vaughan S: **The pivotal role of perceived scientific consensus in acceptance of science.** *Nat Clim Change* 2013, **3**:399-404.
65. van der Linden S, Leiserowitz A, Maibach E: **Scientific agreement can neutralize politicization of facts.** *Nat Hum Behav* 2018, **2**:2-3.
66. van der Linden S, Maibach E, Cook J, Leiserowitz A, Lewandowsky S: **Inoculating against misinformation.** *Science* 2017, **358**:1141-1142.
67. Vraga EK, Kim SC, Cook J, Bode L: **Testing the effectiveness of correction placement and type on instagram.** *Int J Press/Polit* 2020, **25**:632-652.
68. Lutzke L, Drummond C, Slovic P, Árvai J: **Priming critical thinking: simple interventions limit the influence of fake news about climate change on Facebook.** *Glob Environ Change* 2019, **58**:101964.
69. Brulle RJ, Carmichael J, Jenkins JC: **Shifting public opinion on climate change: an empirical assessment of factors influencing concern over climate change in the U.S., 2002-2010.** *Clim Change* 2012, **114**:169-188.
70. Lewandowsky S, Oberauer K: **Motivated rejection of science.** *Curr Direct Psychol Sci* 2016, **25**:217-222.
71. Wissenburg M: **The concept of nature in libertarianism.** *Ethics Policy Environ* 2019, **22**:287-302.
72. Brennan J: **A libertarian case for mandatory vaccination.** *J Med Ethics* 2018, **44**:37-43.
73. Dawson G: **Free markets, property rights and climate change: how to privatize climate policy.** *Libertarian Papers* 2011, **3**.
74. Adler JH: **Taking property rights seriously: the case of climate change.** *Soc Philos Policy* 2009, **26**:296-316.
75. Pardy B: **Environmental law and the paradox of ecological citizenship: the case for environmental libertarianism.** *Environ J* 2005, **33**:25-36.
76. Lewandowsky S, Oberauer K: *Worldview-Motivated Rejection of Science and the Norms of Science.* 2021.