We face structural barriers at the level of individual psychology, as summarized in an excellent section of Jacobs' *Governing for the Long Term* describing cognitive limits as they apply to policy making.[[1]](#footnote-1) People are impeded from acting on climate change because "abstract and spatially distant phenomena" fail to engage our emotions; because we often consider harm arising from unintentional actions blameless; because ego self-defence drives us to reject implied personal criticism; because we fail to respond appropriately to uncertainty; because we are split into political tribes, including some defined by hostility to environmentalism; and because we grant lesser moral standing to people outside our groups.[[2]](#footnote-2)[[3]](#footnote-3)[[4]](#footnote-4)[[5]](#footnote-5)[[6]](#footnote-6) Climate change, as a frightening but unintended consequence of actions which we may otherwise consider beneficial or benign, challenges the idea that the universe is morally ordered and just. Feygina et al. describe how people "rationalize 'the way things are' and, in so doing, deny environmental problems and resist meaningful attempts to create and implement a new, more sustainable status quo." [[7]](#footnote-7) We also inappropriately assume that climate change is akin to familiar problems where it is possible to try one approach for a short time and promptly see the resulting effects, rather than a "complex dynamical system with long delays, multiple positive feedbacks, and nonlinearities that may cause abrupt, costly, and irreversible regime changes." [[8]](#footnote-8)[[9]](#footnote-9) Even 84% of graduate students at MIT (70% of them from STEM fields) failed to grasp the dynamics between CO2 emitted today, its accumulation in the atmosphere, and what is needed to stabilize the climate.[[10]](#footnote-10)[[11]](#footnote-11) Among the greatest psychological barriers to action is a profound sense of entitlement: an expectation that life as people have come to expect it is the norm and should by default continue indefinitely. The central challenge from environmentalism is to this view, with growing awareness particularly since the 1960s that life as we know it in the rich world is not 'sustainable' and the concomitant question of if and how it could be made to be so. Even the invisibility of GHG pollution has been cited as a barrier to action, with Shue noting how "the invisible non-solid wastes that seem to be drifting off harmlessly into the sky and on into the endless universe" impedes people from understanding and confronting the consequences of fossil fuel use.[[12]](#footnote-12) While some climate-linked events may serve as focusing events which motivate policy makers, the impossibility of attributing specific adverse consequences to specific emissions limits the degree to which this can drive policy.[[13]](#footnote-13) Jacobs argues that: "the range of unfamiliar, complex, and spatially dispersed economic, health, and environmental consequences of pollution or climate change are far more difficult for most citizens to concretely imagine and are thus likely to play a modest role in their policy evaluations." [[14]](#footnote-14)[[15]](#footnote-15) This connects to the discussion of framing in chapter 6: if policy makers and the public have adopted a world view in which extreme weather is taken as demonstrative of climate change risks then rising numbers of heat waves, wildfires, and other extreme events may help motivate effective CO2 mitigation policies.[[16]](#footnote-16) Climate change is subject to a problem of shifting baselines which impair cognitive salience. Daniel Pauly coined the term in 1995 to describe how fisheries scientists are misled because as time passes they use recent experience as their baseline of comparison, thus missing long-term trends.[[17]](#footnote-17) In a way, climate change policy also involves another form of invisibility: if adverse consequences are avoided by limiting fossil fuel use and atmospheric CO2 accumulation then citizens and policy makers may not perceive or may question whether those losses would ever have occurred.[[18]](#footnote-18)

1. Jacobs, Alan M. Governing for the Long Term: Democracy and the Politics of Investment. Cambridge: Cambridge University Press, 2011. p. 30-42 [↑](#footnote-ref-1)
2. Markowitz, Ezra M. and Azim F. Shariff. “Climate Change and Moral Judgement”. In: Nature Climate Change 2.4 (2012), p. 243. url: https: //www.nature.com/articles/nclimate1378 (visited on 2019-12-29) p. 243-5 [↑](#footnote-ref-2)
3. Robert Gifford describes seven "dragons of inaction": "limited cognition about the problem, ideological worldviews that tend to preclude pro-environmental attitudes and behavior, comparisons with key other people, sunk costs and behavioral momentum, discredence toward experts and authorities, perceived risks of change, and positive but inadequate behavior change." Gifford, Robert. “The Dragons of Inaction: Psychological Barriers That Limit Climate Change Mitigation and Adaptation”. In: American Psychologist 66.4 (2011), p. 290. url: https://www.researchgate.net/ publication/254734365\_The\_Dragons\_of\_Inaction\_Psychological\_ Barriers\_That\_Limit\_Climate\_Change\_Mitigation\_and\_Adaptation (visited on 2019-12-29). [↑](#footnote-ref-3)
4. Levin et al. describe four key features of climate change as a "super wicked" problem: "time is running out; the central authority needed to address it is weak or non-existent; those who cause the problem also seek to create a solution; and hyperbolic discounting occurs that pushes responses irrationally into the future" “Playing it Forward: Path Dependency, Progressive Incrementalism, and the “Super Wicked” Problem of Global Climate Change”. In: International Studies Association 48th Annual Convention. Chicago, February. Citeseer. 2007. url: https://iopscience.iop.org/article/10. 1088/1755-1307/6/50/502002/meta (visited on 2019-12-29). p. 2 [↑](#footnote-ref-4)
5. Malin et al. found "partisan motivated cognition" in how Colorado residents viewed unconventional oil and gas production, with people's perceptions of its impact on their lives partly a function of their political identities. Malin, Stephanie A., Adam Mayer, James L. Crooks, Lisa McKenzie, Jennifer L. Peel, and John L. Adgate. “Putting on Partisan Glasses: Political Identity, Quality of Life, and Oil and Gas Production in Colorado”. In: Energy Policy 129 (2019), pp. 738–748. url: https:// www.sciencedirect.com/science/article/pii/S0301421519300503 (visited on 2020-07-30).

   Mayer found that Colorado conservatives misjudge the severity of existing regulation. Mayer, Adam. “Political Identity and Paradox in Oil and Gas Policy: A Study of Regulatory Exaggeration in Colorado, US”. In: Energy Policy 109 (2017), pp. 452–459. url: https://www.sciencedirect.com/ science/article/pii/S030142151730455X (visited on 2020-07-30). [↑](#footnote-ref-5)
6. For more on how climate change "fails to activate our moral intuitions" see: Bazerman, Max H. and Ann E. Tenbrunsel. Blind Spots: Why We Fail to Do What’s Right and What to Do About It. Princeton: Princeton University Press, 2011.

   Haidt, Jonathan. “The Emotional Dog and its Rational Tail: A Social Intu- itionist Approach to Moral Judgment”. In: Psychological Review 108.4 (2001), p. 814. url: https://www.ncbi.nlm.nih.gov/pubmed/ 11699120 (visited on 2019-12-29). [↑](#footnote-ref-6)
7. They describe how under system justification theory "our evaluations of social systems and institutions are influenced by epistemic needs to maintain a sense of certainty and stability, existential needs to feel safety and reassurance, and relational needs to affiliate with others who are part of the same social systems." They also describe "a destructive situation in which the psychological motivation to defend the socioeconomic system paradoxically leads people to ignore and therefore increase their vulnerability to events that threaten that system." Feygina, Irina, John T. Jost, and Rachel E. Goldsmith. “System Justification, the Denial of Global Warming, and the Possibility of ‘System-sanctioned Change’”. In: Personality and Social Psychology Bulletin 36.3 (2010), pp. 326–338. url: https://journals.sagepub.com/doi/abs/10.1177/0146167209351435 (visited on 2019-07-18). p. 327, 335 [↑](#footnote-ref-7)
8. Sterman describes how, unlike with processes where there are short lags between action and effect, with climate change: "there are substantial delays in every link of a long causal chain stretching from the implementation of emissions abatement policies to emissions reductions to changes in atmospheric GHG concentrations to surface warming to changes in ice sheets, sea level, agricultural productivity, extinction rates, and other impacts" and concludes: "Mitigating the risks therefore requires emissions reductions long before additional harm is evident."

   Sterman, John D. “Risk Communication on Climate: Mental Models and Mass Balance”. In: Science 322.5901 (2008), pp. 532–533. doi: 10. 1126/science.1162574. eprint: https://science.sciencemag. org/content/322/5901/532.full.pdf. url: https://science. sciencemag.org/content/322/5901/532. p. 532 [↑](#footnote-ref-8)
9. Of particular note, the ability of the ocean and terrestrial biospheres to absorb carbon may not remain constant, for instance as sea water warms and becomes increasingly saturated with CO2. Jaffe, Robert L. and Washington Taylor. The Physics of Energy. Cambridge: Cambridge University Press, 2018. p. 725 [↑](#footnote-ref-9)
10. Sterman, John D. “Risk Communication on Climate: Mental Models and Mass Balance”. In: Science 322.5901 (2008), pp. 532–533. doi: 10. 1126/science.1162574. eprint: https://science.sciencemag. org/content/322/5901/532.full.pdf. url: https://science. sciencemag.org/content/322/5901/532. p. 533 [↑](#footnote-ref-10)
11. In June 2011, The Economist's science and technology section published an explanatory article entitled: "Emissions slashed today won’t slow warming until mid-century" which noted: "greenhouse-gas emissions do not cause an instantaneous rise in global temperatures, and neither does cutting them result in instantaneous cooling. Instead, it will take decades for today’s policy efforts to result in measurable impacts on global temperature." Emissions Slashed Today Won’t Slow Warming Until Mid-century. 2020. url: https://www.economist.com/science-and-technology/2020/ 07/11/emissions-slashed-today-wont-slow-warming-until-mid- century (visited on 2020-07-15).

    It chiefly referenced: Samset, B.H., J.S. Fuglestvedt, and M.T. Lund. “Delayed Emergence of a Global Temperature Response After Emission Mitigation”. In: Nature Communications 11.1 (2020), pp. 1–10. url: https://www.nature. com/articles/s41467-020-17001-1.pdf (visited on 2020-07-15). [↑](#footnote-ref-11)
12. As an illustrative contrast, he provokes readers to consider someone who chooses to bury landmines on public trails which will only become active during some distant generation, where people may have different preferences and more wealth and technology. Shue, Henry. Climate Justice: Vulnerability and Protection. Oxford: Oxford University Press, 2014. p. 79, 162-3 [↑](#footnote-ref-12)
13. On focusing events, see: Kingdon, John W. Agendas, Alternatives, and Public Policies. Boston: Little, Brown, 1984.

    Jacobs, Alan M. Governing for the Long Term: Democracy and the Politics of Investment. Cambridge: Cambridge University Press, 2011. p. 264, 48

    Krosnick, Jon A., Allyson L. Holbrook, Laura Lowe, and Penny S. Visser. “The Origins and Consequences of Democratic Citizens’ Policy Agendas: a Study of Popular Concern About Global Warming”. In: Climatic Change 77.1-2 (2006), pp. 7–43. url: https://link.springer. com/content/pdf/10.1007/s10584-006-9068-8.pdf (visited on 2020-07-12).

    Oppenheimer, Michael and Alexander Todorov. “Global Warming: The Psychology of Long Term Risk”. In: Climatic Change 77.1-2 (2006), p. 1. url: https://search.proquest.com/docview/198502837 (visited on 2020-07-12). [↑](#footnote-ref-13)
14. Jacobs, Alan M. Governing for the Long Term: Democracy and the Politics of Investment. Cambridge: Cambridge University Press, 2011. p. 265 [↑](#footnote-ref-14)
15. Nicholls and Lowe note: "uncertainty pervades the issue of benefits of mitigation on the future magnitude of sea-level rise and other climate change, and the benefits in terms of avoided impacts." Nicholls, Robert J. and Jason A. Lowe. “Benefits of Mitigation of Climate Change for Coastal Areas”. In: Global Environmental Change 14.3 (2004), pp. 229–244. url: https://www.sciencedirect.com/ science/article/pii/S0959378004000445 (visited on 2020-07-12). [↑](#footnote-ref-15)
16. The Toronto Star's "Undeniable Climate Change" series is an example of a deliberate journalistic effort to cultivate such a world view, as is The Guardian's decision to systematically change the terminology they use in climate reporting. Undeniable: Canada’s Changing Climate. 2019. url: https://projects. thestar.com/climate-change-canada/ (visited on 2020-07-12).

    Ogilvie, Megan. What We Can Do Now. 2019. url: https://projects. thestar.com/climate-change-canada/what-you-can-do/ (visited on 2020-07-12).

    Why the Guardian is Changing the Language it Uses About the Environment. 2019. url: https://www.theguardian.com/environment/ 2019/may/17/why-the-guardian-is-changing-the-language-it- uses-about-the-environment (visited on 2019-07-06). [↑](#footnote-ref-16)
17. Shifting baselines have the opposite properties to events which Kingdon argues will focus attention on policy change, since they smear into the general tone of background conditions rather than standing out in contrast. Pauly, Daniel. “Anecdotes and the shifting baseline syndrome of fisheries”. In: Trends in Ecology & Evolution 10 (10 1995), p. 430.

    Hance, Jeremy. Proving the ‘Shifting Baselines’ Theory: How Humans Consistently Misperceive Nature. 2009. url: https://news.mongabay.com/ 2009/06/proving-the-shifting-baselines-theory-how-humans- consistently-misperceive-nature/ (visited on 2020-07-12).

    Jackson, Jeremy B.C., Karen E. Alexander, and Enric Sala, eds. Shifting Baselines: The Past and the Future of Ocean Fisheries. Washington D.C.: Island Press, 2011.

    Pauly, Daniel. Vanishing Fish: Shifting Baselines and the Future of Global Fisheries. Vancouver: Greystone Books, 2019. [↑](#footnote-ref-17)
18. See: Jacobs, Alan M. Governing for the Long Term: Democracy and the Politics of Investment. Cambridge: Cambridge University Press, 2011. p. 267 [↑](#footnote-ref-18)