

Optimism bias and climate change

Geoffrey Beattie explains why climate change messages are not getting through



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How to avoid talking about climate change

Conversations with strangers on buses can be very awkward. It was probably the open notebook that attracted his attention. He kept glancing over at it, surreptitiously at first, and then with longer glances as if he wanted to be seen. The pure white page of the notebook had just two words on it. 'CLIMATE CHANGE!' in big bold pencil. He tutted on his third glance at the page and then started to speak abruptly. 'Well, that's nonsense for a start,' he said. He pointed to the snow

on the street. It was only a fine dusting but it was enough. 'So that's global warming for you,' he said and looked at me to join him in some communal condemnation of this great hoax. 'You don't believe in that rubbish, do you?' His look was accusatory, it demanded an answer. But what was the point in replying?

It seems that climate change like politics, religion and death has entered the domain of topics that are not discussed in polite conversation. There is just too much disagreement that cannot be bridged by polite words.

It wouldn't have felt right talking about the difference between the weather and the climate to that man on the bus, or even trying to empathise with the fact that 'global warming' can be a highly misleading term for many. Some have suggested instead 'climate chaos', which captures better what we are witnessing in terms of more frequent extreme and unpredictable weather patterns. It was also probably not the best time to point out that there is a remarkable scientific consensus on climate change – 'remarkable' because it is rare to see this degree of scientific agreement on anything. Sometimes it's better to stay silent.

Although the role of human activity in the causation of climate change is both 'clear' (and 'growing'), evidence for large-scale behavioural adaptation on the part of the public appears absent.¹ Indeed, there seems to be a monumental disconnect between the scientific evidence for climate change and public perception and action. Research in the UK, for example, suggests that we pay little visual attention to carbon footprint information on products – other features, like price, value, brand etc., are much more immediately salient,² and a 2013 survey by Yale University found that only 63 per cent of Americans 'believe that global warming is happening'. Inter-

1. G. Beattie and L. McGuire, *The Psychology of Climate Change* (Routledge, 2018).

2. G. Beattie, 'How effective is carbon labelling for the consumer?', *Nature Climate Change*, 2 (2012), 214–217.

estingly, this figure had been higher (72 per cent) back in 2008 before the effects of the economic crisis were fully felt. So why is there such a divide in opinions between scientists and the public, and between different sections of the population? Are some people just not seeing the evidence, and if not why?

The psychology of climate change denial

There are some very well-known climate change deniers. Take Donald Trump, for example, distinctive in many ways, not least in terms of underlying personality. One trait may be particularly relevant here – he is an extreme optimist, a core trait for successful entrepreneurs who need to be resilient enough to bounce back after financial setbacks, including bankruptcy in Donald Trump's case.³ Trump declared that he would cancel the Paris Climate Agreement within 100 days of taking office; he signed an executive order in March 2017 which reversed the Clean Power Plan that required states to regulate power plants; he described anthropogenic climate change as 'fake news' and 'fictional'. But in 2017, the Fourth National Climate Assessment Report was also published,⁴ 'the authoritative assessment of the science of climate change' with a focus on the *United States*. Trump had tweeted 'Record low temperatures and massive amounts of snow. Where the hell is GLOBAL WARMING?' 'Right here, right now', was the answer from the Fourth National Climate Assessment Report. This report read 'Global annually averaged surface air temperature has increased by about 1.8° F (1.0° C) over the last 115 years (1901–2016). This period is now the warmest in the history of modern civilization.'

Optimism bias

So why do people, like Donald Trump, not get the message about climate change? Could it be because optimism links to 'optimism bias', where people overestimate the likelihood of positive events happening to them and underestimate the likelihood of negative events. According to Tali Sharot,⁵ around 80 per cent of people suffer from some form of optimism bias in different aspects of their lives – apparently believing that their marriages will work (it's only *other* marriages that fail, they say), their start-up businesses will succeed, and that they will have a long and fulfilling life compared to everyone else. This sort of unrealistic optimism would seem to be somewhat pervasive, affecting not just our personal relationships but also our attitudes to finance, work and health. For example, adolescent smokers are two and a half times more likely than non-smokers to

doubt that they themselves would ever die from smoking even if they smoked for 30 or 40 years. When it comes to smoking or climate change this optimism bias could (and can) have deadly consequences.

Optimism bias appears to be associated with specific cognitive biases in processing relevant information. One study in behavioural neuroscience used Functional Magnetic Resonance Imaging (fMRI) to measure brain activity as participants estimated their probability of experiencing a range of negative life events, including things like Alzheimer's and burglary.⁶ After each individual trial, participants were then presented with the average probability of that event occurring to someone like them. The researchers found that their participants were significantly more likely to change their estimate *only* if the new information was better than they had originally anticipated. This bias was reflected in their fMRI data in that optimism was related to a reduced level of neural coding of more negative than anticipated information about the future in the critical region of the frontal cortex (right inferior prefrontal gyrus). They also found that those participants highest in dispositional optimism were significantly worse at tracking this new *negative* information in this region, compared to those who were lower in dispositional optimism. In other words, the optimism bias derives partly from a failure to learn systematically from new undesirable information and this bias was most pronounced with those highest in dispositional optimism.

Optimism may be highly advantageous for the individual because it reduces stress and anxiety about the future, and optimists consequently have better immune functioning. Belief in a positive future also encourages individuals (in *some* domains) to behave in ways that can actually contribute to this positive future, thus becoming a self-fulfilling prophecy. Although underestimating future negative life events can reduce our stress level and add to our longevity, sometimes negative events do need to be considered, otherwise we may be discounting serious risks.

Optimism bias has been found across a range of environmental issues.⁷ A large 18-nation survey demonstrated that individuals believe that across a number of issues they are safer than others living elsewhere and that they are safer than future generations – in other words, they show both a spatial and a temporal bias. Some argue that optimism bias may help explain why we don't do anything about the threat of climate change. It's not personal, it won't affect us, it's others that need worry.

3. F.G. Crane and E.C. Crane, 'Dispositional optimism and entrepreneurial success', *The Psychologist-Manager Journal*, 10 (2007), 13–25.

4. D.J. Wuebbles et al., *Climate Science Special Report: Fourth National Climate Assessment, Volume I* (US Global Change Research Program, Washington DC, 2017).

5. T. Sharot, *Why We're Wired to Look on the Bright Side* (Constable & Robinson, 2012).

6. *Ibid.*

7. R. Gifford et al., 'Temporal pessimism and spatial optimism in environmental assessments: An 18-nation survey', *Journal of Environmental Psychology*, 29 (2009), 1–12.

Figure 1. An individual scan path of (a) an optimist and (b) a non-optimist, as they read a climate change article.

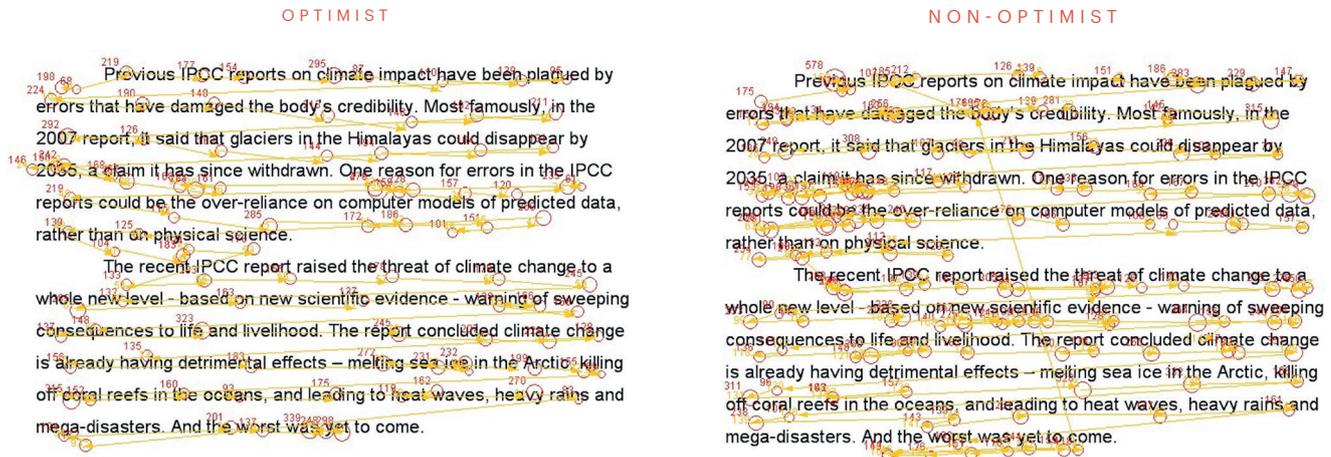
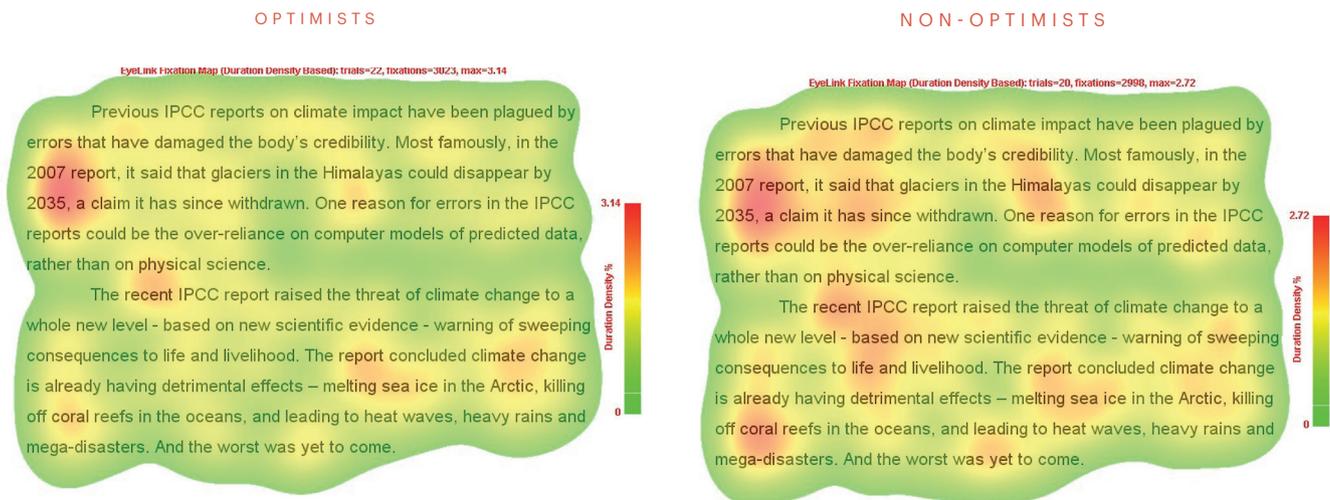


Figure 2. A hotspot analysis of eye gaze fixations of a group of (a) optimists and (b) non-optimists reading climate change articles. Greater intensity represents longer fixation durations at specific locations.



Optimism bias and visual attention to climate change messages

However, we took a somewhat different perspective here, by recognising that optimism bias is a form of biased cognition – the *product* of various psychological processes (rather than a process *per se*). So we attempted to determine what processes could potentially contribute to this. There were a few basic questions to begin with. How does optimism *bias* link to dispositional optimism, which is an underlying dimension of personality? Many assume that they are one and the same thing, but conceivably optimism bias could be strongly or weakly associated with underlying dispositional optimism across different domains. And how do optimists maintain their rosy outlook? What mechanisms underpin it? Optimism is characterised by a reduced level of neural coding of undesirable information, but could there be something even more basic than

that? Do optimists quite literally look on the bright side? Do they have an unconscious, automatic attentional bias to positive rather than negative information?

So in this new research funded by the British Academy/Leverhulme Small Research Grants scheme, we analysed the moment-to-moment gaze fixations of optimists and non-optimists reading climate change articles.⁸ These articles were ‘balanced’ – they contained arguments both *for* climate change (outlining the scientific evidence with the negative consequence spelt out) and *against* climate change (casting doubt on the evidence, and therefore more positive in tone). Figure 1 shows the results for one optimist and one non-optimist. The circles represent individual gaze fixations on words, with larger circles representing longer fixation durations. Lines between circles represent saccadic eye movement behaviour.

8. G. Beattie, M. Marselle, L. McGuire and D. Litchfield, ‘Staying over-optimistic about the future: Uncovering attentional biases to climate change messages’, *Semiotica*, 218 (2017), 21–64.

The overall results were very revealing. There was no significant relationship between dispositional optimism and *number* of individual gaze fixations on the climate change articles, but there was a significant negative correlation between optimism level and average fixation *duration* to arguments *for* climate change only. For optimists, fixation durations were significantly shorter to 'for' arguments than to 'against' arguments, for non-optimists there was no significant difference. Figure 2 shows that, in addition, higher levels of dispositional optimism were associated with less time overall spent attending to the content of the climate change articles irrespective of argument ('for' or 'against').

When asked to summarise what they had read, the majority of *non-optimists* framed their recall in terms of the arguments 'for' climate change ('this article is about global warming and how 95% of it is due to human activity'); *optimists*, on the other hand, tended to frame it as a debate between two opposing positions ('it's about climate change, about trying to understand what's happening with the weather and there are different points of view'). Additional research with another set of participants revealed that optimists have a stronger optimism bias when it comes to estimating the probability of climate change affecting them personally. Non-optimists (in the lowest third on dispositional optimism) were twice as likely to think that they would personally be affected by climate change, across a range of questions, than optimists in the top third.

It seems, therefore, that optimists spend less time fixating on arguments *for* climate change than non-optimists, they frame the recall of the overall articles differently to non-optimists, and they feel less personally threatened by climate change. Optimism, as we have seen, may have very positive effects on our lives, because underestimating the likelihood of future negative events can reduce our levels of stress and anxiety about the future and add to our longevity. Many people, it seems, have developed unconscious cognitive strategies rooted

in basic brain functioning that allows them to remain optimistic despite evidence to the contrary. The problem, however, is that some events really do need to be considered with great urgency, and optimism bias can have very significant negative consequences particularly regarding the discounting of serious risk. Climate change is clearly one such risk.

Implications

So what implications are there from this research? Firstly, we can't assume that people attend to messages about climate change in identical ways. The underlying messages may not get through because of an inherent cognitive bias designed to sustain positive mood, which is particularly prevalent in optimists. It may well not be enough simply to publicise the scientific evidence about climate change without framing it in a more optimistic way to highlight the positive aspects of mitigation strategies. A more positive overall frame about possible solutions should increase both feelings of self-efficacy and visual attention to the underlying message.

Secondly, for the past few decades, we have been striving to train people to be more optimistic because of its health benefits (with this great cultural emphasis on 'the power of positive thinking'). Some have argued that we have produced a profound socio-psychological change, especially in Western societies, with unrealistic expectations about the future.⁹ They have also argued that it has actually 'undermined preparedness' to deal with real threats like global terrorism, financial bubbles, or climate change, with the public having 'no ability or inclination to imagine the worst'. Optimism can be a very positive thing, but perhaps it has its limits; over-optimism could potentially be very damaging. Maybe, it is time, therefore, to re-evaluate this over-arching desire for promoting positive thinking in all aspects of life. Sometimes we might need some constructive realism instead. This might be especially true when it comes to climate change. ■

9. B. Ehrenreich, *Smile or Die: How Positive Thinking Fooled America and the World* (Granta, 2010).