

Navigating climate science

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Science communicators should take more account of how people make judgments and decisions when faced with complex uncertain problems.

The idea that greenhouse gas emissions are warming Earth's atmosphere is one of the most certain concepts in natural science yet as the level of scientific certainty has grown, so has the level of public scepticism about it, note Dr. Ben Newell and Professor Andy Pitman.

"Despite the near total lack of evidence to the contrary, a significant portion of the public, journalists and politicians emphasize their serious doubts about the [science](#) of [global warming](#)," the two UNSW academics say in a new article arguing that science communicators should take more account of how people make judgments and decisions when faced with complex uncertain problems.

Their paper, titled "The Psychology of Global Warming: Improving the Fit between the Science and the Message", appears in the [Bulletin of the American Meteorological Society](#). Dr. Newell is a senior lecturer in the School of Psychology and Professor Pitman is co-director of the Climate Change Research Centre.

The pair explore the disconnect between the science and public understanding, and how to bridge that gap by understanding how we process information to make decisions.

It is well-established, for example, that losses and gains have a very different [psychological impact](#): the pleasure associated with receiving \$500 is less than the 'pain' felt at losing the same amount, so we tend to be more averse to losses than we are attracted by corresponding gains.

"Recent research indicates that some environmental outcomes are treated similarly to financial ones," they say. "So when describing actions to mitigate global warming, messages should focus on the potential to avoid large losses - such as high fuel or heating bills - than the corresponding gains, such as the savings accrued over time by installing solar hot water."

How humans interpret evidence, how they react to evidence and how they form views based on evidence is not based solely on the quality of the evidence. A growing body of psychological research suggests useful ways to tailor the message to common ways of thinking and feeling.

Information processing does not occur in an emotional vacuum, the authors note. Emotions contribute strongly to perception and understanding of evidence, such as the effect of increased CO₂. Using vivid images of global warming, such as shrinking glaciers and melting ice sheets engages emotional processing but should be done judiciously to avoid emotional numbing or a despair response: research suggests that

individuals have a "finite pool of worry".

A tendency to be swayed by biases in the external samples of information can also affect memory and judgment processes. For example, if the public read, or hear opinions from climate change skeptics about 50% of the time then this could lead to a bias in the perception of the balance of [evidence](#) in the minds of the public - that the science is only about 50% certain.

Numbers and units of measurement used to convey the statistics can also have a major impact on interpretation of the severity of the problem. The amount of carbon dioxide in the atmosphere seems tiny when it is expressed as 0.0384% by volume, or 390 parts per million - yet if it was collapsed into a single layer, it would be a substantial eight metres deep.

Provided by University of New South Wales

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