1 Know Your Audience

WHAT IS A MENTAL MODEL?

A ***mental model*** represents a person's thought process for how something works (i.e., a person's understanding of the surrounding world). Mental models, which are based on often-incomplete facts, past experiences, and even intuitive perceptions, help shape actions and behavior, influence what people pay attention to in complicated situations, and define how people approach and solve problems.[3] Perhaps most important to climate change communicators, mental models serve as the framework into which people fit new information.[4]

People usually have some relevant knowledge and beliefs that help them interpret new information in order to reach conclusions. When hearing about risk, people often refer to known related phenomena and associations from their past to decide if they find the risk threatening or manageable. But sometimes a mental model serves as a filter, resulting in selective knowledge "uptake," i.e., people seek out or absorb only the information that matches their mental model, confirming what they already believe about an issue. This poses a potential stumbling block for climate change communicators.

MENTAL MODELS AND THE CONFIRMATION BIAS

A ***confirmation bias*** makes people look for information that is consistent with what they already think, want, or feel, leading them to avoid, dismiss, or forget information that will require them to change their minds and, quite possibly, their behavior. People often exhibit a strong preference for their existing mental models about climate change, making them susceptible to confirmation biases that lead them to misinterpret scientific data, as shown by the example below.

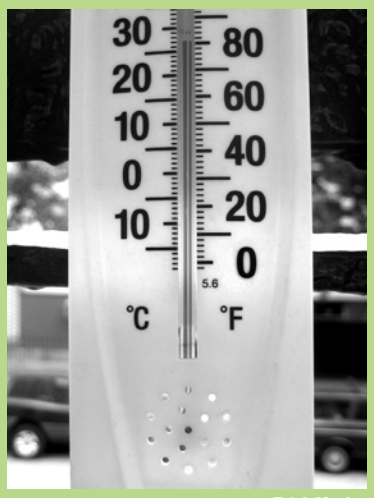
HOW TO IDENTIFY AND UPDATE MENTAL MODELS ABOUT CLIMATE CHANGE

The good news is that mental models are not static—people will update them by correcting misinformation, inserting new building blocks, and/or making new connections with existing knowledge. But for a presentation of new climate change information to succeed, communicators should first do their best to discover what climate change misconceptions the audience may have in its mental models. Communicators can then disconnect the erroneous climate change information from other parts of the model and replace it with new facts. The example on page 5 explores a common misconception that climate change communicators run into and how to counter it.

EXAMPLE

The Confirmation Bias and Climate Change

Both believers and skeptics find it tempting to over-interpret short-term hot or cold swings in temperature as evidence for or against climate change. Such confirmation bias in action can lead people who believe that climate change equals warmer temperatures to pay greater attention to supportive data, interpreting a heat wave in the Great Lakes region, for example, as evidence that their mental model is correct. Skeptics of climate change might pay more attention to news that announces close-to-normal levels of polar sea ice, a momentary finding but one that fits their mental model and enables them to disregard the more scientifically relevant trend of dramatic loss of sea ice in the Arctic and "debunk" climate change.[5] Both sides will either ignore facts that contradict their mental model of climate change or interpret them as exceptions to the rule.



Erich Nagler

Dr. Gavin Schmidt of NASA's Goddard Institute for Space Studies discussed the phenomenon of trying to fit new information into people's existing beliefs about climate change, providing communicators with great advice. As he explained to the *New York Times,* "there is this desire to explain everything that we see in terms of something you think you understand, whether that's the next ice age coming or climate change…When I get called by CNN to comment on a big summer storm or a drought or something, I give the same answer I give a guy who asks about a blizzard. 'It's all in the long-term trends. Weather isn't going to go away because of climate change.'"[6]

EXAMPLE

A Common Mental Model about the Ozone Layer and Greenhouse Gases

CRED researcher and director of the Yale Project on Climate Change Anthony Leiserowitz finds that people often confuse the hole in the ozone layer with climate change.[7] This is happening, in part and ironically, due to a science communication victory. Scientists and the media effectively and extensively covered the threat posed by the growing ozone hole, eventually resulting in international political action to phase out the main contributor, chlorofluorocarbons or CFCs.

But now many people conflate their mental model of the ozone layer with how the atmosphere works, in particular with how greenhouse gases accumulate in the atmosphere. Dr. Leiserowitz has found it leads to some interesting misconceptions that require updating, such as: If there is a "hole" in the ozone layer, and there is a global "greenhouse" effect, then there must be a "hole" in the "greenhouse." Some Americans thus reason that this "hole" either allows more solar radiation into the biosphere—warming the planet—or, alternatively, allows heat to escape—cooling the planet.

Although logical, such reasoning has unfortunately led to construction of an inaccurate mental model about the causes of climate change that, in turn, causes many Americans to support inappropriate solutions, such as believing that the best way to solve global warming is to ban aerosol spray cans.[8] Climate change communicators should try to identify this commonly mistaken mental model and replace it with correct information.