

The truth is out there – so how do you debunk a myth?

6 February 2014, by John Cook



The truth is out there. Credit: Flickr/J

Debunking myths requires an understanding of the psychological research into misinformation. But getting your refutation out in front of lots of eyeballs is a whole other matter.

Here, I look at two contrasting case studies in debunking climate myths.

If you don't do it right, you run the risk of actually reinforcing the myth. Fortunately, there are a number of steps you can take to avoid any potential backfire effects.

Facts vs myths

First and foremost, you need to emphasise the key facts you wish to communicate rather than the myth. Otherwise, you risk making people more familiar with the myth than with the correct facts.

That doesn't mean avoid mentioning the myth altogether. You have to activate it in people's minds before they can label it as wrong.

Secondly, you need to replace the myth with an alternate narrative. This is usually an explanation of why the myth is wrong or how it came about. Essentially, debunking is creating a gap in people's

minds (removing the myth) then filling that gap (with the correct explanation).

If you had to boil down all the [psychological research](#) into six words then it can be [summed up](#) as follows:

fight sticky ideas with stickier ideas.

Myths are persistent, stubborn and memorable. To dislodge a myth, you need to counter it with an even more compelling, memorable fact.

The skeptical plan

With that principle in mind, the [Skeptical Science](#) team set out to debunk two climate myths in 2013. We were guided by cognitive psychology as we constructed our rebuttals.

In both cases, we sought a different path to our usual social media practice of immediate blogging, tweeting and Facebook and looked for something that would have a long-term impact.

Case Study 1: Communicating the [scientific consensus](#) on climate change

We decided to tackle arguably the most destructive climate myth of all, that there is [no scientific consensus](#) about human-caused [global warming](#).

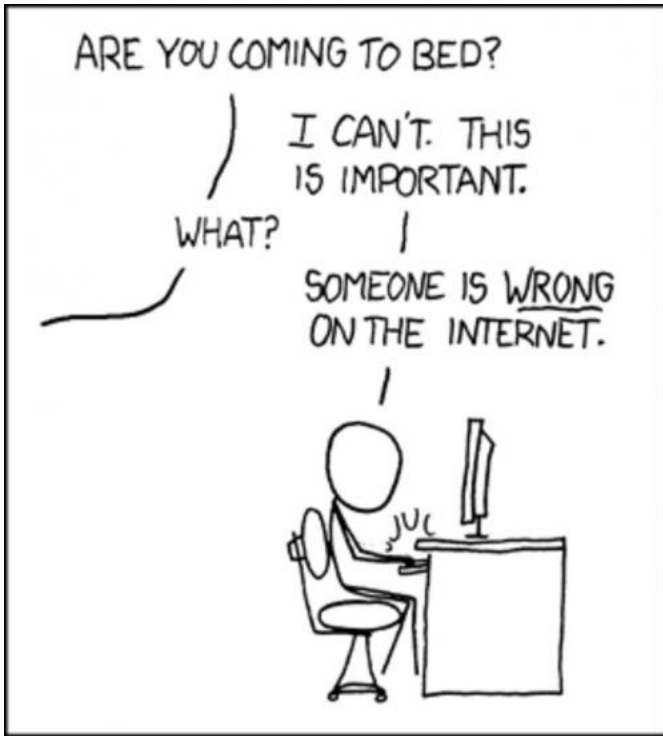
This misconception has grave consequences for society. When the public think that scientists don't agree on human-caused global warming, they're [less likely to support](#) policies to mitigate climate change.

We decided to increase awareness of the scientific consensus with a three-pronged approach:

1. scholarly research
2. mainstream media coverage
3. social media outreach.

The Skeptical Science team spent about a year doing the scholarly research - reading the abstracts of 12,000 climate papers published from 1991 to 2011. We identified around 4000 abstracts stating a position on human-caused global warming and among those papers, more than 97% endorsed the consensus.

The media message



Duty calls. Credit: xkcd.com

When our research was [published](#) in the peer-reviewed journal *Environmental Research Letters*, the University of Queensland and the universities of my co-authors issued [media releases](#) describing our work.

The release was constructed with the psychology of misinformation in mind. The emphasis was on the key fact we wished to communicate: 97% agreement among relevant climate papers.

But we also activated the misconception by mentioning survey data finding low public

perception of scientific agreement.

The result was media coverage [all over the world](#), including many non-English speaking countries.

At the same time, we launched [The Consensus Project](#) website that explained the results of our paper with clear, simple animations. We released a series of shareable [infographics](#), making it easy for people to share our results on social media.

Our goal was for the message of scientific consensus to push beyond people already engaged with the climate issue, and raise awareness among people who had no idea that there was 97% agreement among climate scientists.

Obama hears the message

We achieved this goal beyond our expectations when President Obama [tweeted our research](#) to 31-million followers.



Obama tweet on 97 per cent. Credit: Twitter

His tweet was retweeted over 2,500 times. Several weeks after the tweet, Obama gave a [landmark speech](#) on [climate change](#) in which he acknowledged the 97% consensus.

This exercise taught us that while social media is the future, old media isn't dead yet. And perhaps the sum of the two are greater than their individual parts.

Case Study 2: Communicating our planet's heat

build-up

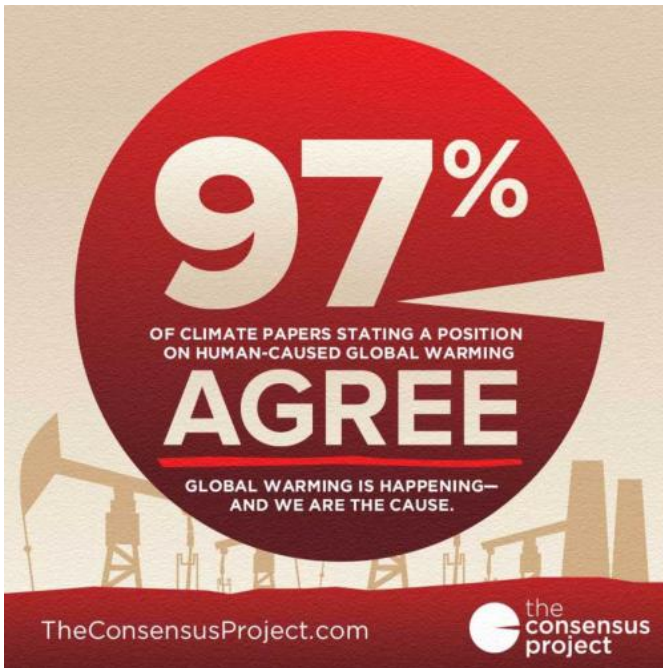
The second myth we tackled was the mistaken belief that [global warming has stopped](#). This myth has many variants, such as "global warming stopped 15, 16 or 17 years ago" (the time period varies) or "no statistically significant warming since 1998".

Typically, scientists respond to the "no warming" myth using statistical explanations that go over the heads of most people. How do you debunk this myth in a compelling, memorable way?

Global warming is a build up in heat. Greenhouse gases are trapping heat which is building up in our oceans, warming the land and air and melting ice. When scientists add up all the energy accumulating in our climate system, they find the heat build-up hasn't slowed since 1998.

The greenhouse effect continues to blaze away. It turns out the laws of physics didn't go on hiatus 16 years ago.

Creating a metaphor



Consensus on human caused global warming. Credit: Skeptical Science

To communicate this, we used a metaphor. We toyed with many metaphor ideas but found none able to conceptualise the heat build-up in a stickier manner more than this:

Since 1998, our planet has been building up heat at a rate of 4 Hiroshima A-bombs per second.

We released a website with an [animated ticker](#) widget to show how much heat our planet is building up each second. The widget, which can be freely embeded on other websites, also includes a number of other metrics such as the amount of energy in hurricane Sandy, an earthquake and a million lightning bolts.

Unlike traditional social media campaigns that flare brightly then quickly fade away, the widget steadily and incrementally increases the number of people it reaches.

Since it was released in November it has been embedded in a [number of blogs](#). The figures continue to grow with latest showing it used by more than 80 blogs and viewed more than 2-million times.

We knew the Hiroshima metaphor would be controversial but several factors influenced our decision to use it. One was that distinguished climate scientist [James Hansen](#) had been using the [metaphor for years](#).

Another was an [article](#) by the Bulletin of Atomic Scientists, a prestigious journal founded in the 1950s to warn of the dangers of nuclear weapons. The Bulletin endorsed the use of the Hiroshima metaphor as a compelling way to communicate the reality of global warming.

But ultimately, the cognitive science told us this was the most compelling way to refute the "hiatus" myth.

As expected, the widget provoked a strong reaction, predominantly from those already dismissive of climate science (and keen to prop up the "global warming stopped in 1998" [myth](#)).

A less explosive metaphor

I put the challenge out there to come up with a better metaphor to conceptualise the amount of heat that our planet is accumulating. No viable alternatives have come forward.

However, at the American Geophysical Union Fall Meeting in December, I proposed a tongue-in-cheek metaphor that I thought may get away with offending no one: [kitten sneezes!](#)

Two communication outreaches by [Skeptical Science](#) in 2013 took wildly different approaches but with the same goal. One adopted a top-down approach, attempting to reach the public through scholarly research and mainstream media. The other took a bottom-up approach, raising awareness through a widget embedded on a wide range of blogs.

Both were based on the [psychological research into debunking](#). Both were conceived as slow burn communication, with both achieving long-term impact.

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