



Debunking myths effectively

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“How do I lie with statistics?”

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Overview

1. **Some of the most popular modern myths**
2. How *not* to debunk a myth
3. Why does debunking fail
4. A template for debunking misinformation

1. What are some of the most popular modern myths?



What is your immediate reaction?

How do you feel if someone approaches you in an attempt to convince you of the truth of these myths?

How do you convince them otherwise?



The
FLAT EARTH
SOCIETY

On November 9th, 2018, 500
“flat-Earthers” assembled in
North Carolina for the first
annual Flat Earth International
Conference.



New Zealand, Britain, Italy,
Brazil have had similar
conferences in 2019





20% of Americans believe in alien abduction

UFO capital Bonnybridge on flightpath

BBC

TO THE STARS...
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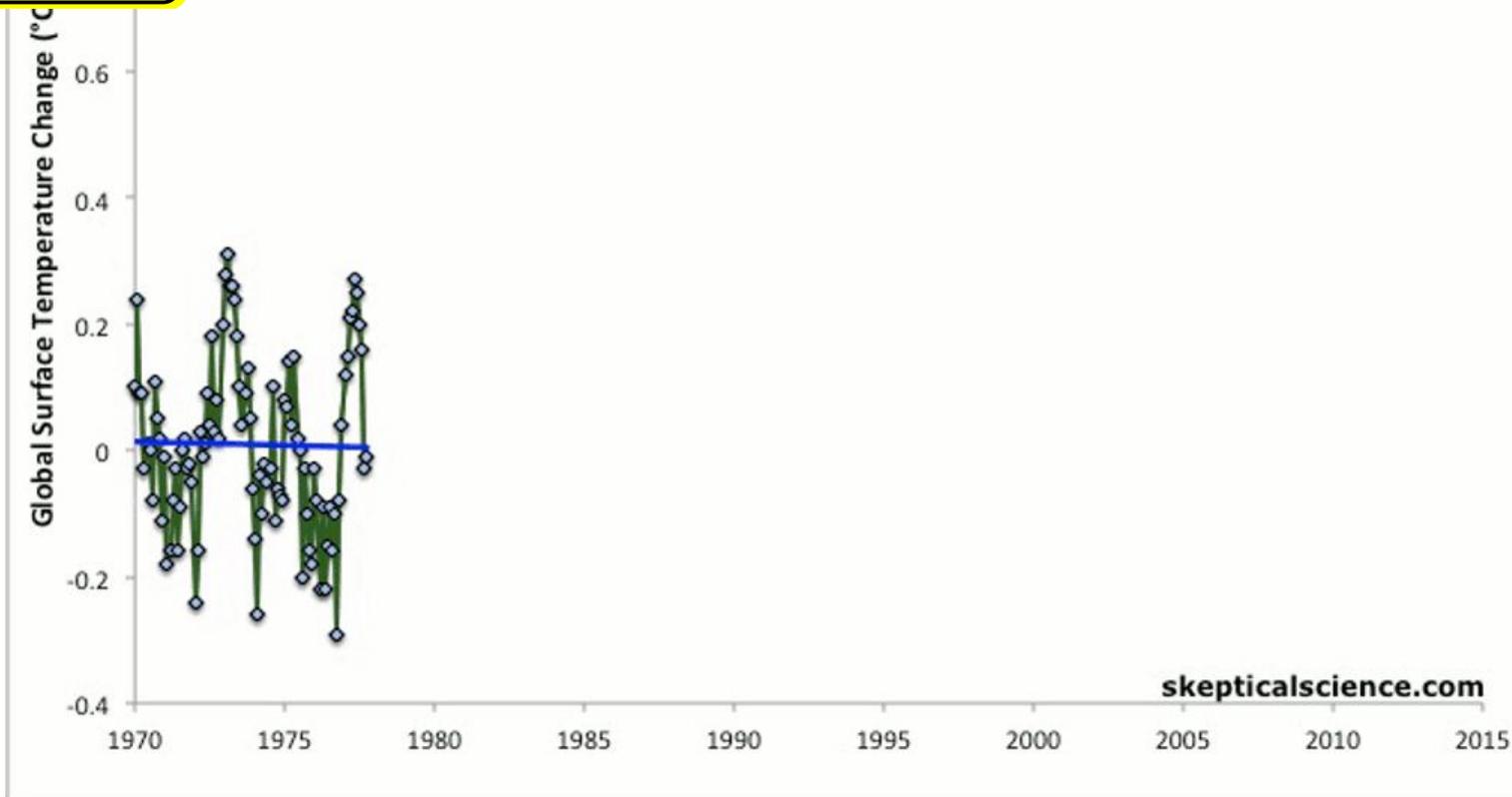
They're all going against the wind.

SUBSCRIBE

filmed in 2004



How Contrarians View Global Warming



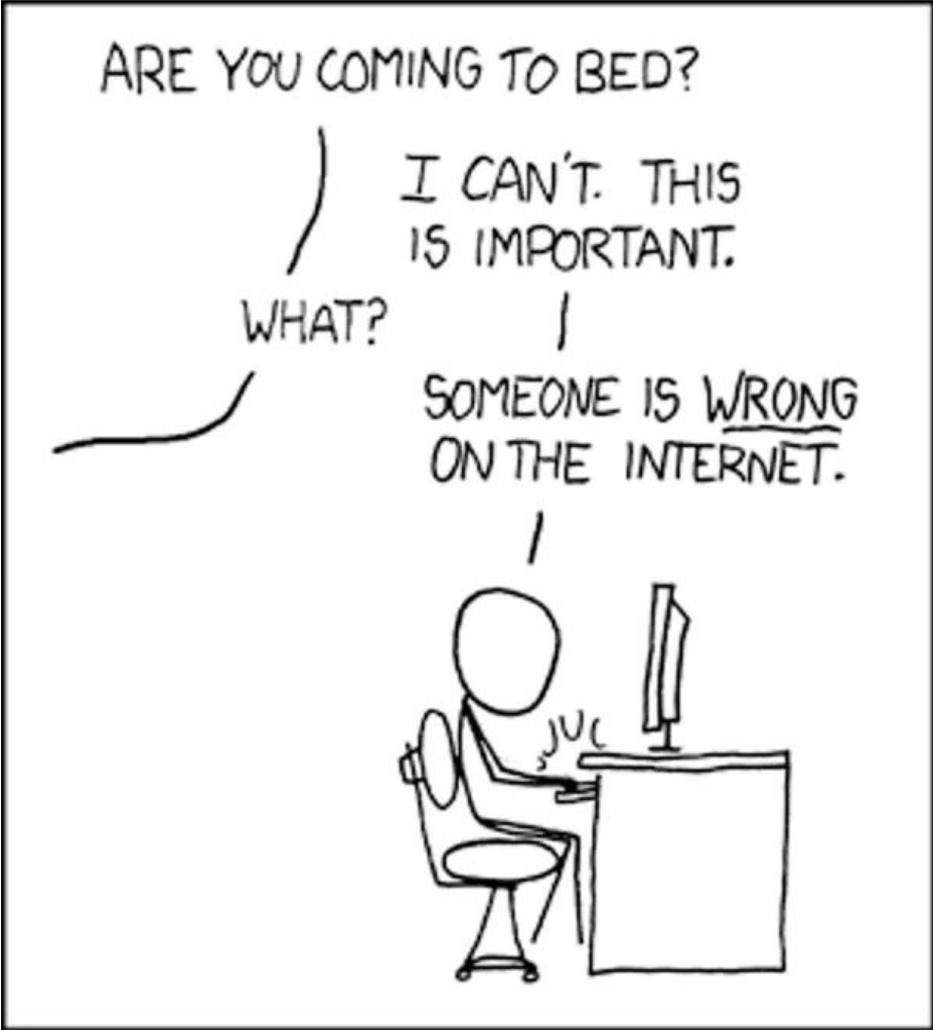


How does something like this even happen?

Andrew Wakefield published paper linking MMR and autism - '98

Unreproducible, retracted and sued.

Vaccination Hesitancy in top 10 threats to global health by WHO (above HIV/AIDS). More on this in later talk...





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Naive approach to debunking a myth



- Explain the facts
- Explain the core falsehoods of the myth
- Explain the fallacies associated with the “evidence”
- Explain any dangers belief in this myth might present
- Present scientific studies as evidence

How *not* to debunk a myth



“A qualitative study into why vaccination messages fail”

4 sub-groups for 4 different varieties in “debunking”

1. Autism-correction - citing studies
2. Disease risk - explaining the diseases
3. Disease narrative - story of measles
4. Disease images

How *not* to debunk a myth



1. (Autism correction) Information was said to be one-sided (no papers detailing dangers of vaccination)
Was trying too hard to convince them
2. (Disease risk) Oversimplistic
Clear bias towards vaccination as no discussion of dangers of vaccines
3. (Story of disease case) One example proves nothing
4. (Disease images) Emotional blackmail
The source of the pictures is dubious

How *not* to debunk a myth - What can we learn?



Clearly the approach has to be more personal and less aggressive

Information has to be from a trustworthy source

More detail, perhaps graphic is required

Less partisan, more inclusion in the setting

Why we resist debunking - Lewandowsky



Often lack of understanding of the mechanisms of learning

Accepted information becomes part of a worldview

The knock-on effect of changing “knowledge” can be difficult to fully understand

How do we learn *new* information - Lewandowsky



The least informed have the highest confidence in their false beliefs

Information relayed in conversation comes with a “guarantee of relevance”

To disbelieve: High degree of attention, strong implausibility of the message, or high levels of distrust at the time the message is received

How do we learn information - Lewandowsky



1. Is this information compatible with other things I believe to be true?
2. Is this information internally coherent? - do the pieces form a plausible story?
3. Does it come from a (in)credible source? - news sources...?
4. Do other people believe it? - herd mentality, crowd wisdom, peer pressure, Christopher Browning: *Ordinary Men: Reserve Police Battalion 101*



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Why does debunking fail

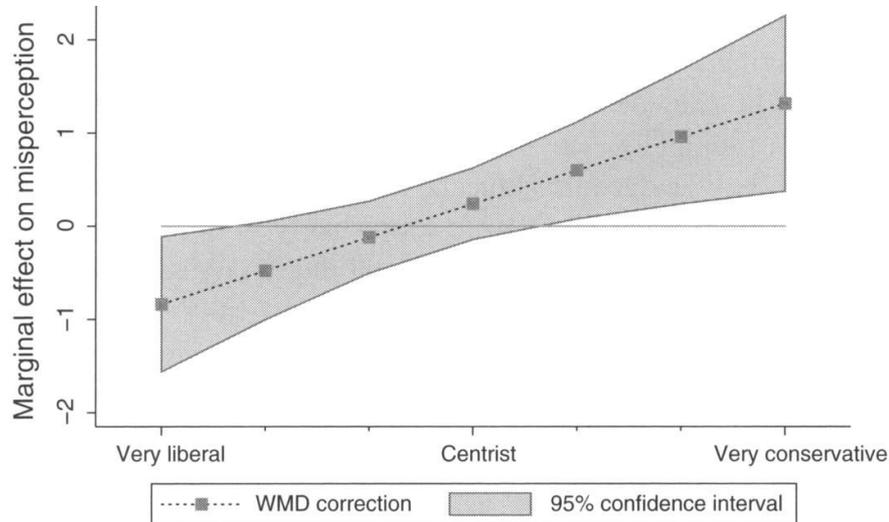


Myth	Correction
Iraq possessed WMD's which was grounds for Bush's Iraq war	The Duelfer report which documents lack of Iraqi WMD stockpile
Bush's Tax cuts generate so much extra growth the Government's tax revenue rises	Graphs showing steep decline in Governmental revenue after cuts
Bush banned all stem cell research	Explanation of the lack of restrictions on private research institutions

Why does debunking fail



WMD correction effect



Hypothesis: the correction will be increasingly ineffective as subjects become more conservative

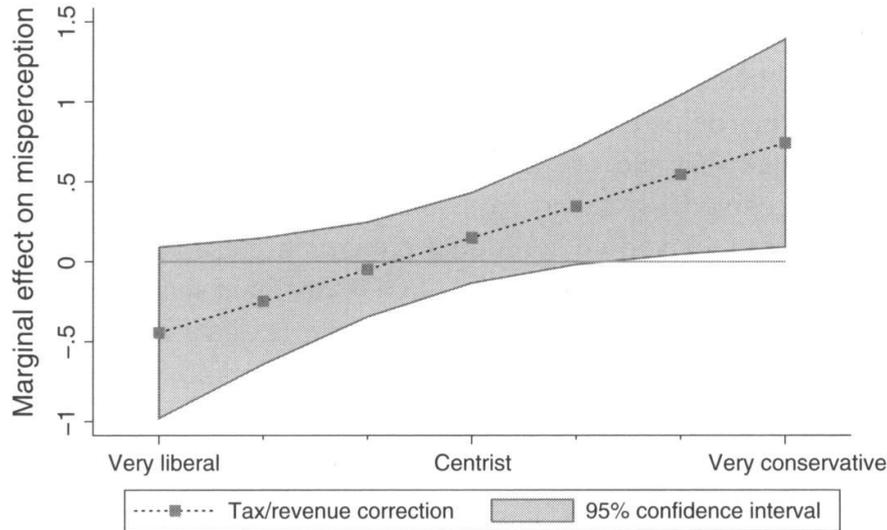
“Neutral” news source

Clearly debunking backfires

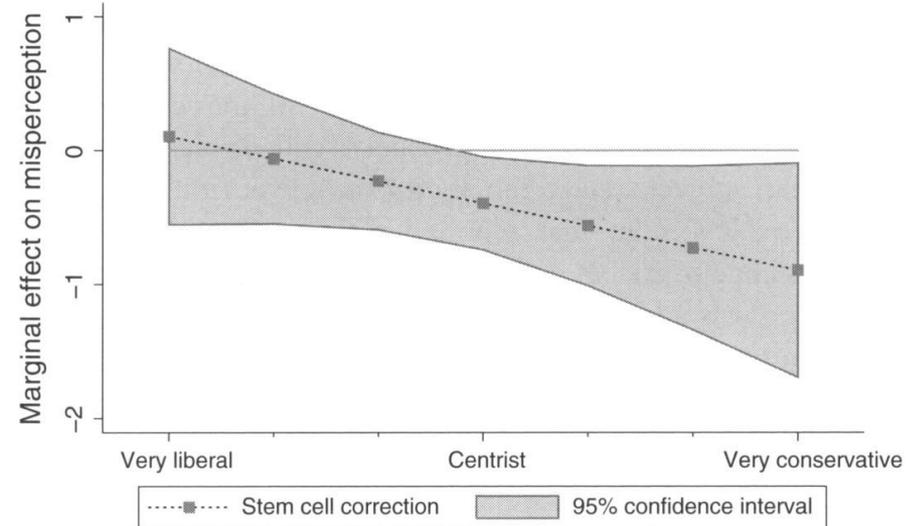
Why does debunking fail



Tax vs. revenue correction effect



Stem cell ban correction effect



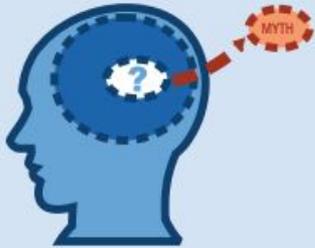
Why does debunking fail



The continued influence effect

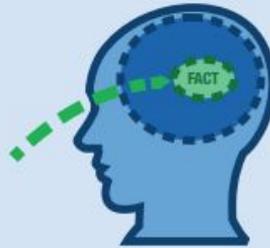
Continued Influence Effect

Despite a retraction, people continue to rely on misinformation



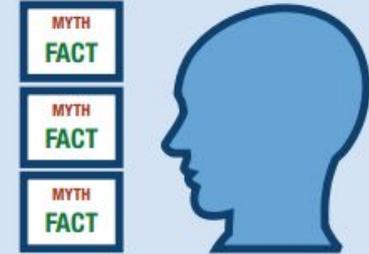
Alternative Account

Alternative explanation fills gap left by retracting misinformation



Repeated Retraction

Strengthen retraction through repetition (without reinforcing myth)



Break down misinformed arguments and supply truth as simply as possible

Kowalski and Taylor (2009), S. Lewandowsky, et al., 2012, *Psychological Science in the Public Interest*, 13(3), 106–131

19 Dec, "How do I lie with statistics?"

Karl Thyssen: Debunking myths effectively

Why does debunking fail



Familiarity backfire effect

Familiarity Backfire Effect

Repeating the myth increases familiarity, reinforcing it



Emphasis on Facts

Avoid repetition of the myth; reinforce the correct facts instead



Preexposure Warning

Warn upfront that misleading information is coming



Explain the ongoing effects of misinformation rather than just generally mention that misinformation may be present

Why does debunking fail



The overkill backfire effect

Overkill Backfire Effect

Simple myths are more cognitively attractive than complicated refutations



Simple, Brief Rebuttal

Use fewer arguments in refuting the myth — less is more



Foster Healthy Skepticism

Skepticism about information source reduces influence of misinformation



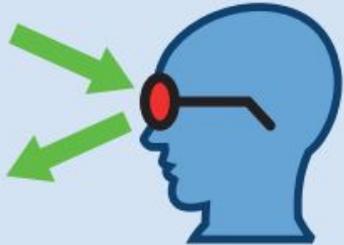
Why does debunking fail



The worldview backfire effect

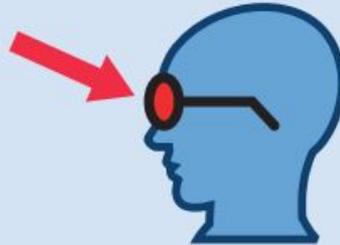
Worldview Backfire Effect

Evidence that threatens worldview can strengthen initially held beliefs



Affirm Worldview

Frame evidence in worldview-affirming manner by endorsing values of audience



Affirm Identity

Self-affirmation of personal values increases receptivity to evidence





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A template for debunking misinformation



- Bullshit warning - pre-exposure warning
- Source credibility - trustworthiness vs. expertise
- Self-affirmation - affirm identity
- Social norming - familiarity and inclusion
- Graphical representation - understandability
- Alternative information - substitute fiction with fact
- Salience of core corrective message - memorability
- Regular follow-up - repeated retractions

Evaluation of a template for countering misinformation



Study to debunk non-empirically tested treatments for Autism

86 Professionals in 2 groups, test and control:

3 empirically supported treatments, empirical evidence

3 non-empirically supported treatments, anecdotal evidence

E.g.:“A small number of people on the spectrum who start communicating using FC [facilitated communication] go on to use typing without help. It would be helpful to know more about these people and how they became independent. . .”

Evaluation of a template for countering misinformation



1. Explain the importance of evidence based practice and establishing source credibility
2. Self-affirmation segment - professional values and commitment
3. Explanation of why people might want to believe it (social norming)

A template for debunking misinformation



- Bullshit warning - pre-exposure warning
- Source credibility - trustworthiness vs. expertise ✓
- Self-affirmation - affirm identity ✓
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Evaluation of a template for countering misinformation

4. Warning of misinformation, document labelled “Myth”



5. Presentation of high quality research (including graphical representation) - introduction of alternative (tested) treatments

6. Repeat core message, emphasise alternative

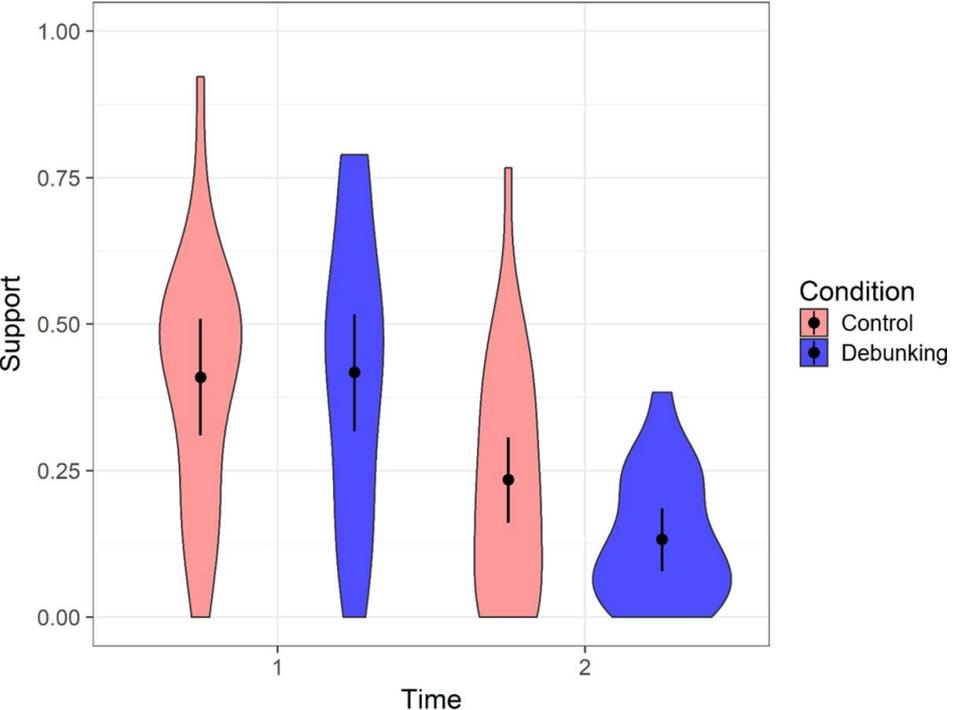
A template for debunking misinformation



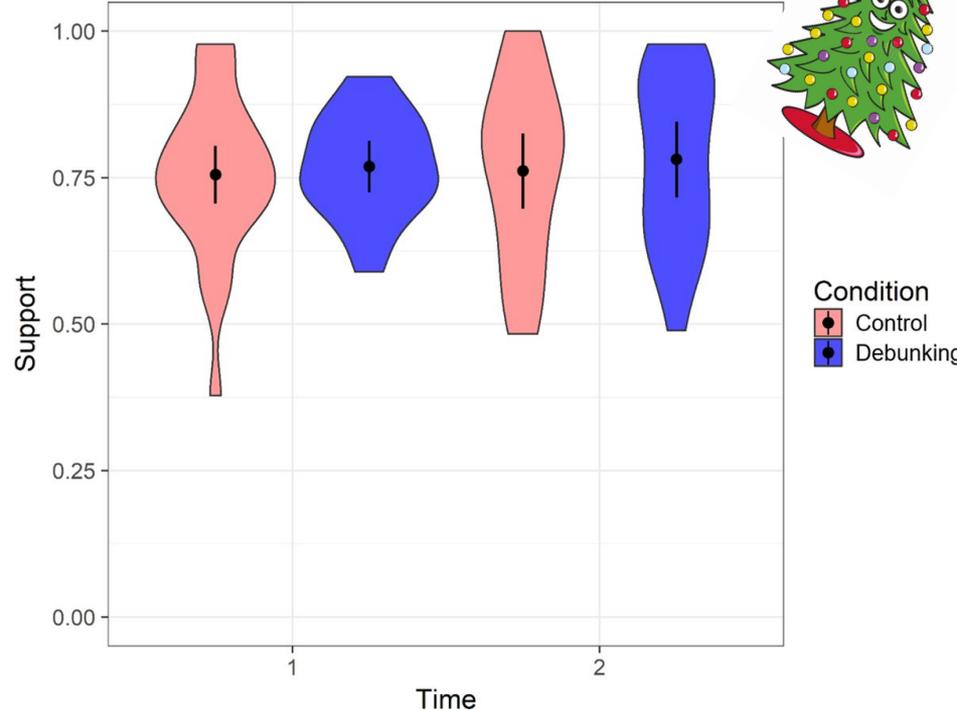
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- Source credibility - trustworthiness vs. expertise ✓
- Self-affirmation - affirm identity ✓
- Social norming - familiarity and inclusion ✓
- Graphical representation - understandability ✓
- Alternative information - substitute fiction with fact ✓
- Salience of core corrective message - memorability ✓
- Regular follow-up - repeated retractions ✓

Evaluation of a template for countering misinformation

Non-Empirically supported treatments



Empirically supported treatments





"It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so."

-Mark Twain

“The best defence against bullshit is vigilance. So if you smell something, say something.”

-Jon Stewart

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**OUR PLANET IS
GLOBAL WARMING AT
7,409,177,820,267,687
KITTEN
SNEEZES
PER SECOND**



Thank you for your attention!



Credible source: John Cook of the University of Queensland Global Change Institute said in a presentation in 2013. Photograph: John Cook at Skeptical Science/fanpop.com