Debunking myths effectively

Karl Thyssen

December 19, 2019
“How do I lie with statistics?”
Supervisor: Prof. Dr Ullrich Köthe
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?
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

They’re all going against the wind.

filmed in 2004

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How Contrarians View Global Warming

Global Surface Temperature Change (°C)


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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...
ARE YOU COMING TO BED?

I CAN'T. THIS IS IMPORTANT.

WHAT?

SOMEONE IS WRONG ON THE INTERNET.
Overview

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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

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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

S. Lewandowsky, et al., 2012, *Psychological Science in the Public Interest*, 13(3) 106–131
Kowalski and Taylor (2009), Bedford (2010), Osborne (2010)
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

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

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


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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

Break down misinformed arguments and supply truth as simply as possible


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Why does debunking fail

Familiarity backfire effect

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

Marsh & Fazio, 2006, S. Lewandowsky, et al., 2012, Psychological Science in the Public Interest, 13(3) 106–131

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The overkill backfire effect

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

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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)
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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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Evaluation of a template for countering misinformation

Non-Empirically supported treatments

Empirically supported treatments


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"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
Bibliography

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