Why Misinformation Exists & How to Properly Debunk Myths

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Why Misinformation Exists

Best estimate of human portion of modern climate change is 110%

Aerosols (pollution) offsetting some warming
Why Misinformation Exists

• Human-caused climate change is settled fact
• No legitimate scientific debate about the cause of climate change
• So why are Americans not completely on board?
Why Misinformation Exists

Industry-backed Campaign:

- Washington has more than six climate lobbyists for every member of Congress.
Why Misinformation Exists

Industry-backed Campaign:

The Organization of Denial: Conservative Think Tanks and Environmental Scepticism, Jacques, Dunlap & Freeman (2008):

"Thus, the notion that environmental skeptics are unbiased analysts exposing the myths and scare tactics ... is a charade, as skeptics are supported by politically powerful conservative think tanks CTTs funded by wealthy foundations and corporations."

Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming (Oreskes & Conway, 2011)

Smoke, Mirrors & Hot Air - How ExxonMobil Uses Big Tobacco's Tactics to Manufacture Uncertainty on Climate Science (Union of Concerned Scientists, 2007)
Why Misinformation Exists

Journalism & Mass Media - False Balance & Bad Reporting:


• Majority (52.65%) of coverage in the US prestige press gave "roughly equal attention" to the view that humans were contributing to global warming, and the other view that exclusively natural fluctuations could explain the earth’s temperature increase. This despite the fact that there was an overwhelming consensus that humans were the primary drivers of global warming. The authors concluded:

"This supports the hypothesis that journalistic balance can often lead to a form of informational bias."

• Max Boykoff (2008):

“Coverage of some areas of climate change is improving…but an overall trend of inadequate coverage by the mass media persists."
Why Misinformation Exists

Journalism & Mass Media - False Balance & Bad Reporting:

CNN Coverage of Climate Science
- Accurate: 70%
- Misleading: 30%

Fox News Channel Coverage of Climate Science
- Accurate: 28%
- Misleading: 72%

MSNBC Coverage of Climate Science
- Accurate: 92%
- Misleading: 8%

In 2013, 30 CNN segments referencing climate science were entirely accurate while 13 contained misleading statements.

In 2013, 14 Fox News segments referencing climate science were entirely accurate while 36 contained misleading statements.

In 2013, 121 MSNBC segments referencing climate science were entirely accurate while 11 contained misleading statements.

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Huertas A., Kriegsman R. *Science or Spin: Assessing the Accuracy of Cable News Coverage of Climate Science 2013* ucsusa.org/scienceorspin
Why Misinformation Exists

Journalism & Mass Media:

• The real science is primarily represented in peer-reviewed science journals but these scientific journals are typically not accessible to the general public and can be highly mathematical.

• Climate change misinformation is primarily published on Web pages, blogs, television shows, radio, and other forms of mass media, all of which are much more accessible to the general public than scientific journals.

Misinformation is reaching more people than the real science.
Why Misinformation Exists

Cultural World-View: (It is NOT about the science!)

In their 2013 national survey titled *GOP Deeply Divided Over Climate Change*, The Pew Center for the People & the Press show that only 24% of Republicans believe that global warming is being caused by humans compared to 66% of Democrats. With increased education Democrats are more on board with the science but for Republicans it is only slightly improved.

The good news: increased understanding across the board!
Why Misinformation Exists

Cultural World-View: (It is NOT about the science!)

Hierarchical Worldview - believe that rights, duties, goods, and offices should be distributed differentially and on the basis of clearly defined and stable social characteristics (e.g., gender, wealth, lineage, ethnicity). (Conservative ideology)

Egalitarian Worldview - believe that rights, duties, goods, and offices should be distributed equally and without regard to such characteristics. (Liberal ideology)

Communitarian Worldview - believe that societal interests should take precedence over individual ones and that society should bear the responsibility for securing the conditions of individual flourishing. (Liberal ideology)

Individualistic Worldview - believe that individuals should secure the conditions of their own flourishing without collective interference or assistance. (Conservative/Libertarian ideology)
Why Misinformation Exists

Cultural World-View: (It is NOT about the science!)

Perceptions of Scientific Agreement on Climate Change

Experts agree
Egalitarian Communitarian

Experts disagree or are divided
Hierarchical Individualist

Why Misinformation Exists

Cultural World-View: (Message Effect)

Kahan, et al. (2007) in their study *The Second National Risk and Culture Study: Making Sense of - and Making Progress In - The American Culture War of Fact* conclude:

"Individuals’ expectations about the policy solution to global warming strongly influences their willingness to credit information about climate change. When told the solution to global warming is increased antipollution measures, persons of individualistic and hierarchic worldviews become less willing to credit information suggesting that global warming exists, is caused by humans, and poses significant societal dangers. Persons with such outlooks are more willing to credit the same information when told the solution to global warming is increased reliance on nuclear power generation."

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<tr>
<th>Science Accepted</th>
<th>Science Not Accepted</th>
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Cultural World-View: (Message Effect)

Individualists and hierarchs who received the “antipollution” version of the news report were even more skeptical about these facts than were hierarchs and individualists in a control group that received no newspaper story—and thus no information relating to the scientific report that made these findings.

Individuals subconsciously resist factual information that threatens their defining values.
Why Misinformation Exists

Cultural World-View: (Messenger Effect)

HPV Vaccinations: Pro & Con (Kahan et al., 2010)

“Some public health experts favor universal vaccination of American girls (at or before age 12) to protect them from catching human papillomavirus (HPV). Other public health experts oppose such a program.”

No Argument: “We’d like to know what you think” and immediately requested to respond to the risk-benefit items.

Unattributed Argument: “Here are what two opposing policy experts say” and read a pro vs. con set of arguments

Culturally Identifiable Advocate: “Here are what two opposing policy experts say. Each advocate is on the faculty of a major university and has written numerous books on public policy.”
Why Misinformation Exists

Cultural World-View: (Messenger Effect)

HPV Vaccinations: Pro & Con (Kahan et al., 2010)

“Here are what two opposing policy experts say. Each advocate is on the faculty of a major university and has written numerous books on public policy.”

Books:
- The Immigrant Invasion: Threatening the American Way of Life
- The War on American Manhood
- Selfishness Is Not a Vice: Individual Freedom and the Public Good
- Why Big Government Doesn’t Work

Hierarchist

Individualist

Communitarian

Egalitarian

Books:
- The Crisis of Authority: The Assault on Traditional Values in America
- How “Women’s Liberation” Hurts Women - and Men and Children, too
- Community First: Fighting Selfishness in American Society
- The Limits of Individual Rights

Books:
- Against Race and Sex Discrimination, For Individual Freedom
- A Free Market Defense of Workplace Equality
- Respect for Individual Choice: the Cornerstone of a Free and Equal Society
- Stop Treating Us Like Infants: Why Government Shouldn’t Tell Adults What to Do

Books:
- Three Social Evils: Sexism, Racism, and Homophobia
- Raising Children: Avoiding Sexual Stereotypes
- People Before Profit: Fixing Corporate America
- Society as Family: One for All and All for One
Cultural World-View: (Messenger Effect)
HPV Vaccinations: Pro & Con (Kahan et al., 2010)

“...it is clear that argument exposure significantly increases risk concern as subjects’ worldviews become simultaneously more hierarchical and individualistic.”

“...the polarizing effect of information was highly sensitive to the cultural identity of the advocates making pro- and con-arguments. The results of this part of the experiment suggest that polarization grows where culturally diverse subjects see the argument they are disposed to accept being made by the advocate whose values they share, and the argument they are predisposed to reject being made by the advocate whose values they repudiate. In contrast, when subjects see the argument they are disposed to reject being made by the advocate whose values they share, and the argument they are predisposed to accept being made by the advocate whose values they repudiate, polarization shrinks to the point of disappearing.”

Next three slides from public presentation to college students
WHY YOU MATTER

Facts from the Professor?  
Facts from Peer Group?

• Research shows that the MESSAGE is trusted when the MESSENGER is from the same peer group
HOW YOU SHOULD ENGAGE

- Use examples that relate to audience world-view
- Always make it personal – humans trump Nature
HOW YOU SHOULD ENGAGE

• Not just 98% scientists and 100% science academies

• Military, health officials, insurers agree

• Three groups above are not tree-hugging liberals!
How to Debunk Misinformation


Debunking myths can reinforce the myth in peoples' minds. Avoid:
- The Familiarity Backfire Effect
- The Overkill Backfire Effect
- The Worldview Backfire Effect (We have been talking about this)

Successful debunking: **Providing an alternative explanation.**

1. Refutation must **focus on core facts** rather than the myth to avoid the misinformation becoming more familiar.
2. Any mention of a **myth should be preceded by explicit warnings** to notify the reader that the upcoming information is false.
3. Finally, the refutation should **include an alternative explanation** that accounts for important qualities in the original misinformation.
How to Debunk Misinformation

The Familiarity Backfire Effect

Example of debunking a climate myth

Sun and climate are going in opposite directions

Over the last few decades of global warming, the sun has shown a slight cooling trend. Sun and climate are going in opposite directions. This has led a number of scientists to independently conclude that the sun cannot be the cause of recent global warming.

One of the most common and persistent climate myths is that the sun is the cause of global warming.

This myth cherry picks the data - showing past periods when sun and climate move together but ignoring the last few decades when the two diverge.

Core fact emphasised in headline

Core facts reinforced in initial text

Myth

Explaining how the myth misleads (alternative explanation, see Page 5)
How to Debunk Misinformation

The Familiarity Backfire Effect

**MYTH** “The flu isn’t a serious disease.”

**FACTS** Influenza (flu) is a serious disease of the nose, throat, and lungs, and it can lead to pneumonia. Each year about 200,000 people in the U.S. are hospitalized and about 36,000 people die because of the flu. Most who die are 65 years and older. But small children less than 2 years old are as likely as those over 65 to have to go to the hospital because of the flu.

**MYTH** “The flu shot can cause the flu.”

**FACTS** The flu shot cannot cause the flu. Some people get a little soreness or redness where they get the shot. It goes away in a day or two. Serious problems from the flu shot are very rare.

**MYTH** “The flu shot does not work.”

**FACTS** Most of the time the flu shot will prevent the flu. In scientific studies, the effectiveness of the flu shot has ranged from 70% to 90% when there is a good match between circulating viruses and those in the vaccine. Getting the vaccine is your best protection against this disease.

**MYTH** “The side effects are worse than the flu.”

**FACTS** The worst side effect you’re likely to get from a shot is a sore arm. The nasal mist flu vaccine might cause nasal congestion, runny nose, sore throat and cough. The risk of a severe allergic reaction is less than 1 in 4 million.

Guess what happened?
Make your alternative viewpoints fewer and more easily to come to mind. In business this is called the “sticky factor”. We all remember commercials such as “Where’s the Beef?” and the Energizer Bunny “Keeps going, and going, and going...” See Made to Stick for ways to make your message more memorable.
How to Debunk Misinformation

The Overkill Backfire Effect

ARE YOU COMING TO BED?

I CAN'T. THIS IS IMPORTANT.

WHAT?

SOMEONE IS WRONG ON THE INTERNET.

Matt Cutts (2008)

Information Deficit Model does NOT work! K.I.S.S. does.
How to Debunk Misinformation

Filling the Gap with an Alternative Explanation

Removing a myth leaves a gap

Replace with alternative narrative

MYTH

FACT
How to Debunk Misinformation
Putting All Strategies in Play


Two examples of how I used these strategies on live radio:

Conservative radio interview #1

Conservative radio interview #2
How to Debunk Misinformation

Student Examples

**Junior College Students Put Climate Science Zombies Back Underground Thanks to Skeptical Science**

Three student term papers using effective refutation techniques

Also featured in *Journal of Geoscience Education* paper:

References

Center for Public Integrity (2009). The global climate change lobby. Available at: http://www.publicintegrity.org/investigations/global_climate_change_lobby/


