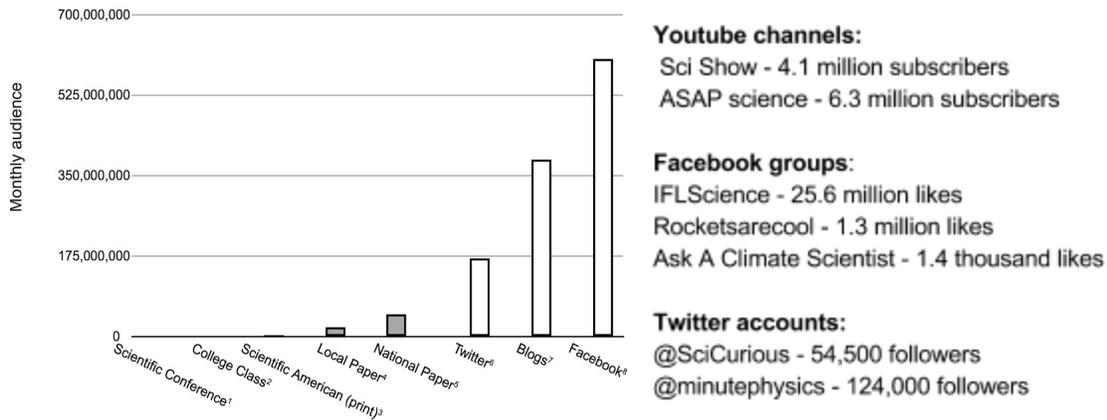
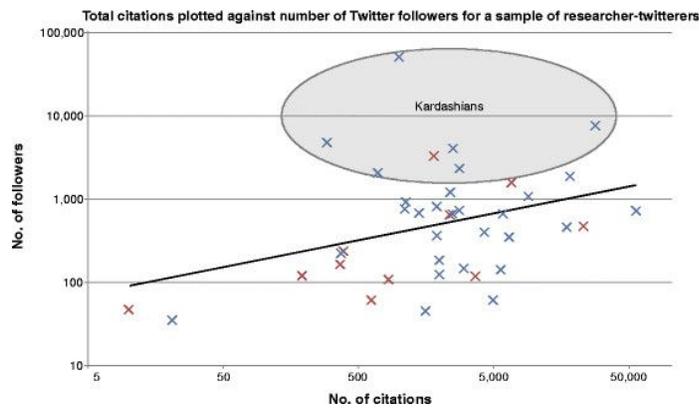


Social Media allows scientists to share their science with more people than ever



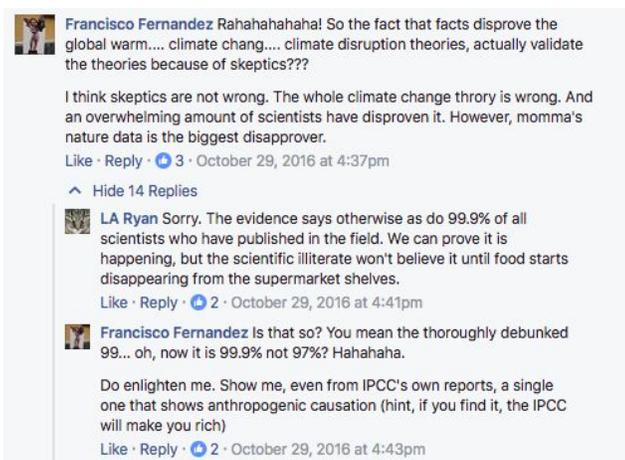
(Graph - Bik & Goldstein, 2013)

It allows us to root out misinformation right out the source, climbing down from our ivory towers. And scientists have noticed this



(Hall, 2014)

But social media can be difficult to navigate



And maybe in our post-facts world social media is an evil to be shunned, not embraced?

(Facebook thread in response to "Why Climate Skeptics are wrong", Facebook, 2016)

Sources

Papers

An Introduction to Social Media for Scientists (Bik & Goldstein, PLoS Biology, 2013)

The Kardashian index: a measure of discrepant social media profile for scientists (Hall, Genome Biology, 2014)

Study by Facebook (Science, 2015) - <http://science.sciencemag.org/content/348/6239/1130>

Study about Facebook (2016) - https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2795110

Anatomy of news consumption on Facebook (PNAS, 2017) - <http://www.pnas.org/content/114/12/3035>

Articles

Blame the Echo Chamber on Facebook. But Blame Yourself, Too - <https://www.wired.com/2016/11/facebook-echo-chamber/>

Scientists guide to social media

- <http://www.sciencemag.org/careers/features/2014/02/scientists-guide-social-media>

<https://theconversation.com/how-social-media-can-distort-and-misinform-when-communicating-science-59044> <https://www.bu.edu/research/articles/communicating-science-on-social-media/>

Confronting Stem Cell Hype (Science, 2016) -

<http://science.sciencemag.org/content/352/6287/776.full>

Taking facts out of context:

<https://briankoberlein.com/2015/07/27/a-failure-to-communicate/>

Source sheet 2: Trolls

Everyone knows social media is riddled with trolls but does anyone know how to confront them?

1. Do we know what a troll is?

“someone who posts nasty things online with the intent of provoking a reaction, usually emotional, from their targets”

Source: Constructively dealing with trolls in science communication - Aaron Huertas, Science Communication media

2. Is it always easy to distinguish trolling from criticism or different worldviews?

Here's a view responses pulled from science articles on the Daily Mail website. Spot the troll.

“So, more science evidence that we can learn from GODS creation - religion and science are almost the same thing #MakeUPray”

“Someone actually paid for people to come up with this utter twaddle?”

“Another study in stating the obvious!”

“MORE ANTI-male propaganda!!!! Zzzzzzz women are more violent than men”

2. Should we respond directly to trolls?

“scientists and science communicators often feel an urge to respond to trolls that would never occur to actors, musicians or other public figures who are targeted by them.”

Source: Constructively dealing with trolls in science communication - Aaron Huertas

“Among those who have experienced online harassment, 60% decided to ignore their most recent incident while 40% took steps to respond to it. Regardless of whether a user chose to ignore or respond to the harassment, people were generally satisfied with their outcome. Some 83% of those who ignored it and 75% of those who responded thought their decision was effective at making the situation better.”

Pew research study on trolls (Oct. 2014)

3. Are there creative ways to respond?

For Every Sexist Email She Gets, This College Student Will Write A Wikipedia Entry About A Woman Scientist

Emily Temple-Wood has written hundreds of articles about women in science.

By Dominique Mosbergen



For more stories you won't want to miss, subscribe to our **HuffPost Must Read** Newsletter.

SUBSCRIBE IN(FORMATION)
The reality of belief numbers. Learn more.
✉ **Newsletter**

The Contemplative Mammoth

ice age ecology, early career academia, and diversity in STEM

Let's feed the trolls...science!

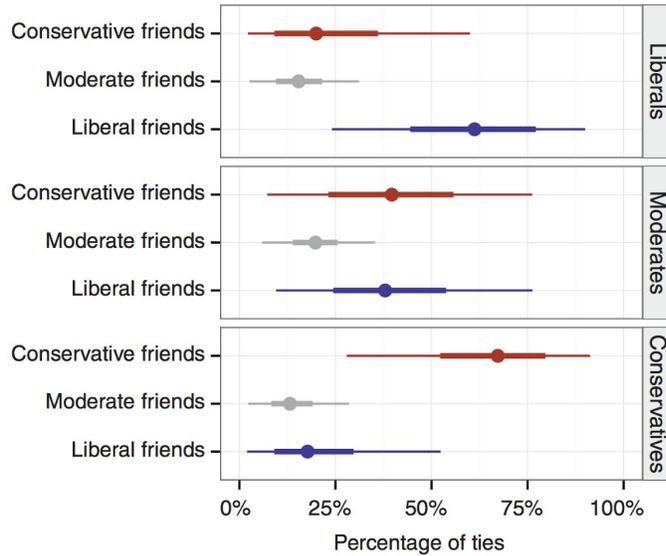
let's try something different. The next time someone trolls you, respond with a science fact– and ONLY a science fact (it can be anything, not necessarily related to what you're being trolled about). No insults, no rational debating, no sarcasm. You can use #TrollScienceFacts

Source Sheet 3: Echo chambers

Multiple studies, primarily based on Facebook, show online *echo chambers* clearly exist.

Echo chambers separate the population on general political views...

Fig. 2. Homophily in self-reported ideological affiliation. Proportion of links to friends of different ideological affiliations for liberal, moderate, and conservative users. Points indicate medians, thick lines indicate interquartile ranges, and thin lines represent 10th to 90th percentile ranges.



(Schmidt, et al., **Anatomy of news consumption on Facebook**, *PNAS*, 2016)

And they also exist for science:

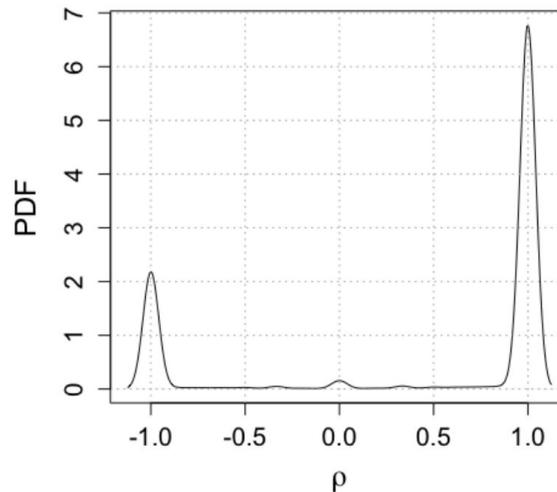
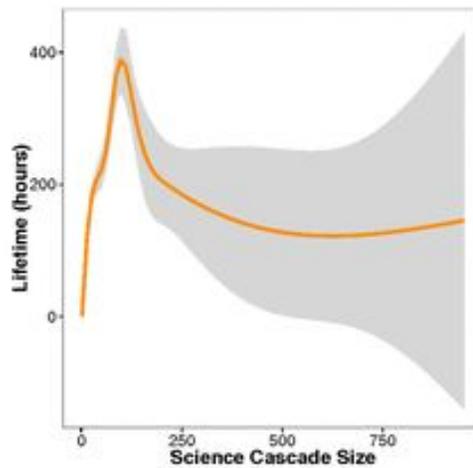
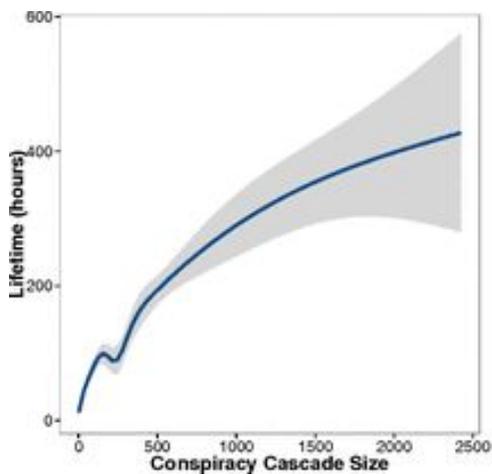


Figure 1: Users are polarized. The probability density function (PDF) of the frequency that a user has polarization ρ is remarkably concentrated in two peaks near the values $\rho = -1$ (science) and $\rho = 1$ (conspiracy), indicating that users are split into two distinct communities.

“We considered a user to be polarized in science or conspiracy narratives when 95% of his “likes” is on either conspiracy or science posts.”

(Quattrocio, Walter and Scala, Antonio and Sunstein, Cass R., **Echo Chambers on Facebook** (June 13, 2016). Available at SSRN: <https://ssrn.com/abstract=2795110>)

FB USA	TOTAL	SCIENCE	CONSPIRACY	DEBUNKING
Pages	478	83	330	66
Posts	679,948	262,815	369,420	47,780
Likes	603,332,826	453,966,494	145,388,117	3,986,922
Comments	30,828,705	22,093,692	8,304,644	429,204
Likers	52,172,855	39,854,663	19,386,131	702,122
Commentsers	9,790,906	7,223,473	3,166,726	118,996



Are these bubbles avoidable?

How should we react to and confront echo chambers as individuals and scientists?

Source sheet 4: Post-truth science

Social media is post-truth platform inappropriate for science communication

From the Wikipedia page on Post truth politics, social media section:

“Content is often judged based on how many views it gets, creating an atmosphere based on click bait that appeals to emotion instead of researched fact. Content that gets more views is continually filtered around different internet circles, regardless of its legitimacy...The internet also allows people to choose where they get their information, allowing them to reinforce their own opinions.”

Is social media a platform that promotes ‘views and likes’ as indicators of truth?

If so, do we simply have to accept this, or are there ways to tackle this, like the facebook ‘disputed’ tag?



Source sheet 5: Taking facts out of context

Taking facts out of context

Case: The “mini Ice Age” story:

“Thanks To Reduced Solar Activity, We Could Be Heading For A Mini Ice Age In 2030.” - IFL Science

“Mini Ice Age’ Not a Reason to Ignore Global Warming.” - IFL Science

“The earth is 15 years from a mini ice age that will cause bitterly cold winters during which rivers such as the Thames freeze over” - Telegraph (UK)

These headlines came after a peer-reviewed paper accompanied by a presentation that presented a model for the sun’s magnetic field and sunspots, predicting a 60% fall in sunspot numbers when extrapolated to the 2030s. However, the press release only said “solar activity will fall by 60 per cent during the 2030s”, without clarifying that solar activity referred to sunspots. Zharkova, the author herself, sent further mixed signals, saying that the “mini ice age” is a possibility although this was her statement only after the media coverage.

There was a strong backlash to the media hype which was followed by correction statements such as in the same Telegraph article:

“CORRECTION: An earlier version of this article inaccurately stated that scientists have predicted bitterly cold winters in the 2030s, “similar to freezing conditions of the late 17th century”. In fact, the research focused solely on solar activity, and did not made any prediction about its possible future climate effects. We are happy to make this clear.”

Case: Taking SSRIs during pregnancy.

In July 2011, a paper was published showing that taking SSRIs during pregnancy increases the risk of the child having autism by two-fold, and 3.8-fold if taken during the first trimester. Headlines such as “Maternal exposure to anti-depressant SSRIs linked to autism in children” (The Washington Post) appeared, sending mothers into panic, and even a TV ad encouraging a lawsuit against a drug manufacturer of SSRIs.

All despite the fact that a 2- or 3.8-fold effect is modest. (In context, being male increases risk of developing autism by 4-fold.)

Are cases such as these avoidable? Is it an inherent byproduct of the pace of online media?

Who should be responsible for ensuring complete and correct communication?

Scientists, journalists, blogs, readers, all of the above?

How can we promote science and scientist interaction without falling into the pitfalls of research findings and data being misunderstood?

Source information and commentary:

<https://theconversation.com/the-mini-ice-age-hoopla-is-a-giant-failure-of-science-communication-45037>

<https://briankoberlein.com/2015/07/27/a-failure-to-communicate/>

<http://www.psychiatrictimes.com/autism/autism-pregnancy-and-ssris-when-media-distorts-facts>

<https://theejbm.wordpress.com/2013/11/20/miscommunications-in-science-and-effects-on-the-public/>

Twitter propagation of rumors: Some rumors and conspiracies generate almost as much response as real stories.

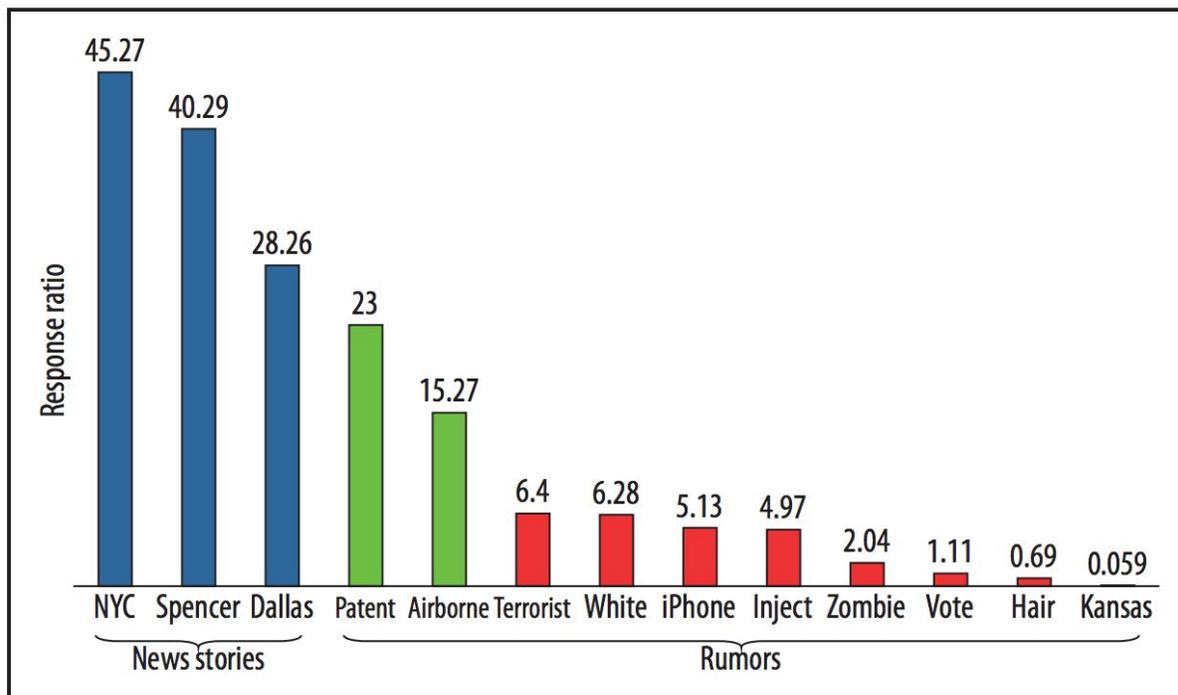


Figure 4. Response ratios for 3 news stories and 10 rumors related to Ebola.