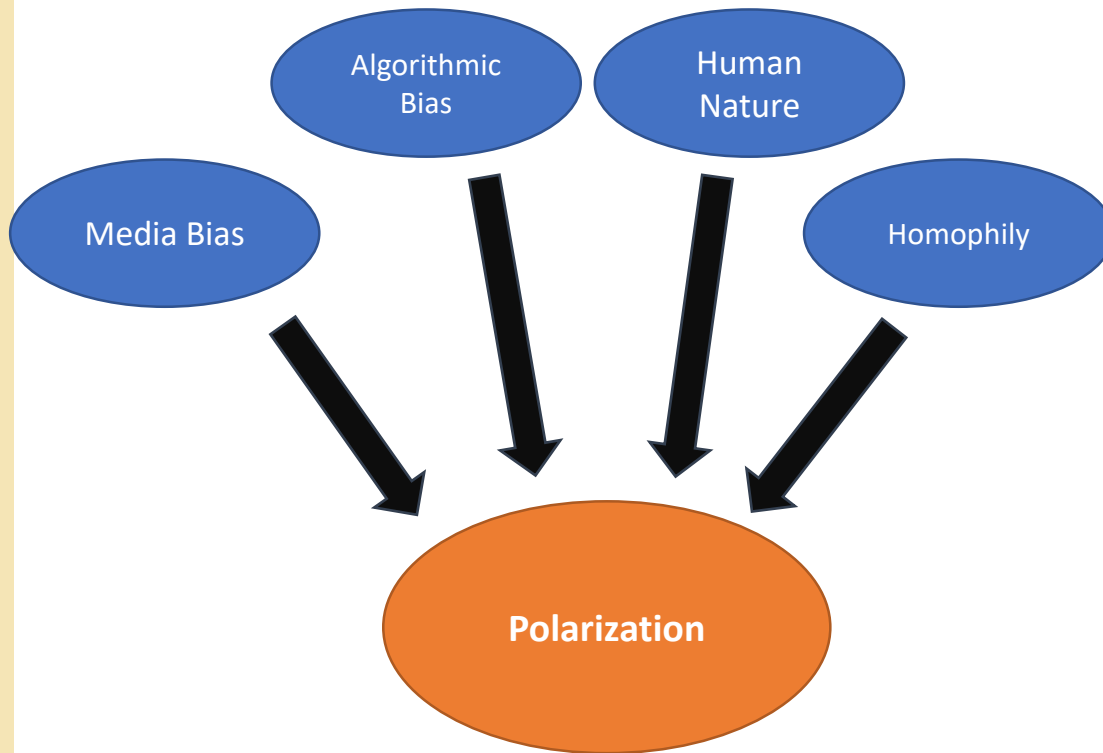


Down the Rabbit Hole – How Social Media Is Building a Better Conspiracy Theorist

By Ryan Butner

Corporate Engagement / Fusion Center

Humans: Primed for Misinformation

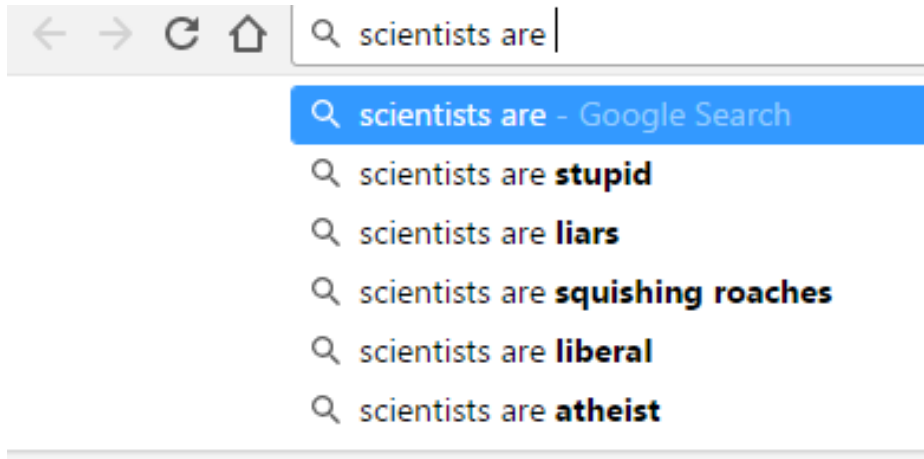


Social media amplifies our worst instincts:

- Social networks (Homophily)
- Information Overload/Echo Chambers/Filter Bubbles/Biased Assimilation
- Algorithm bubbles
- Media is incentivized for sensationalism to drive clicks
- You are more likely to believe “fake news” by virtue of being exposed to it once – even if you’re aware that it’s fake at the time.

So what could go wrong?

The Subtlety of Memetic Landscapes

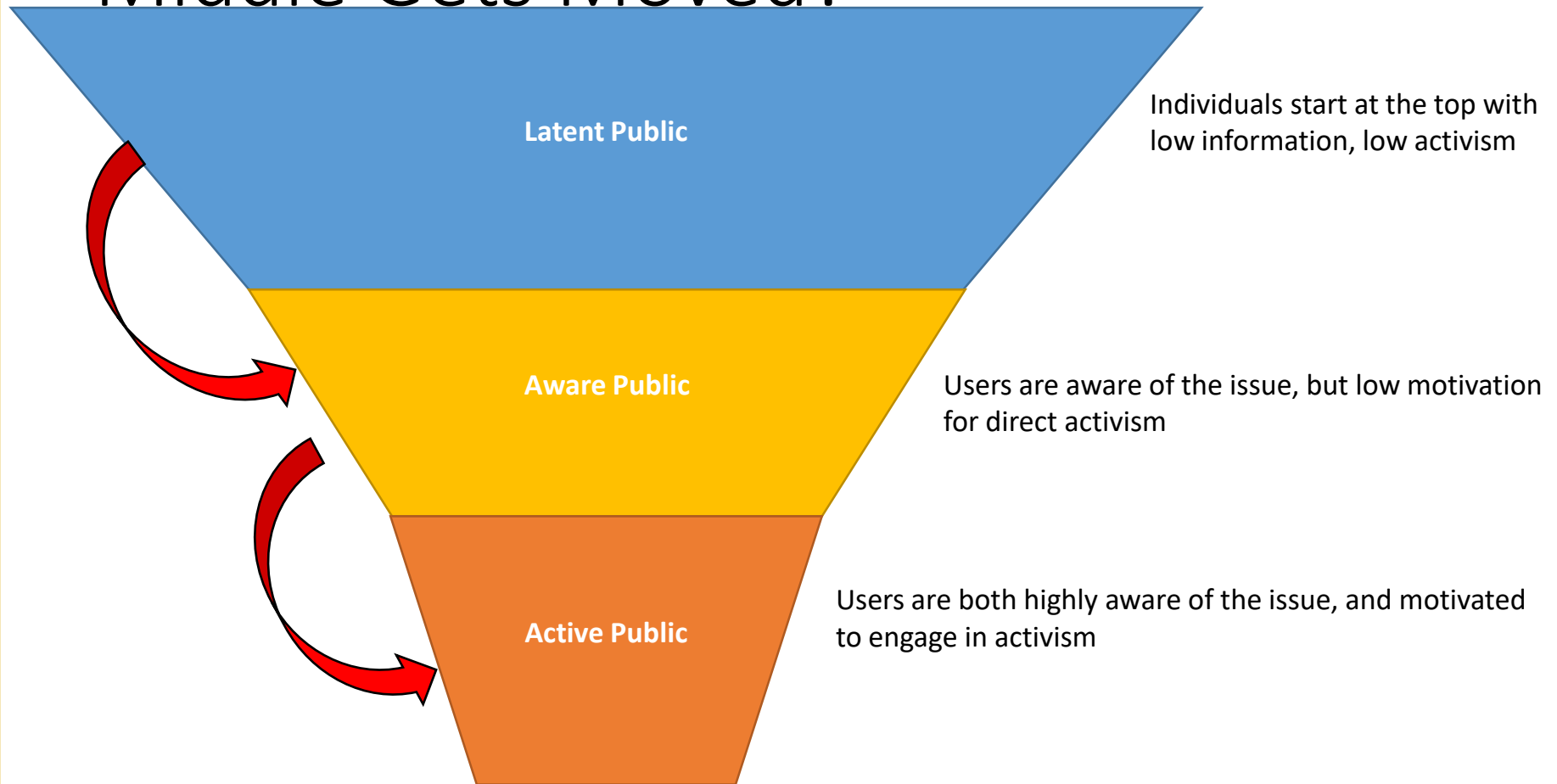


But all of those previous findings are really just a symptom of something else -

- This is less about communication and more about memetics – the competition of ideas.
- Activists have figured out how to out-compete science in this new environment.
- Regardless of the origins or basis of the story, the narrative (meme) that scientists and traditional media are not to be trusted is pervasive in this new media ecosystem.
- Knowledge isn't a conscious process, it's a feeling
- People look for ammunition, not information

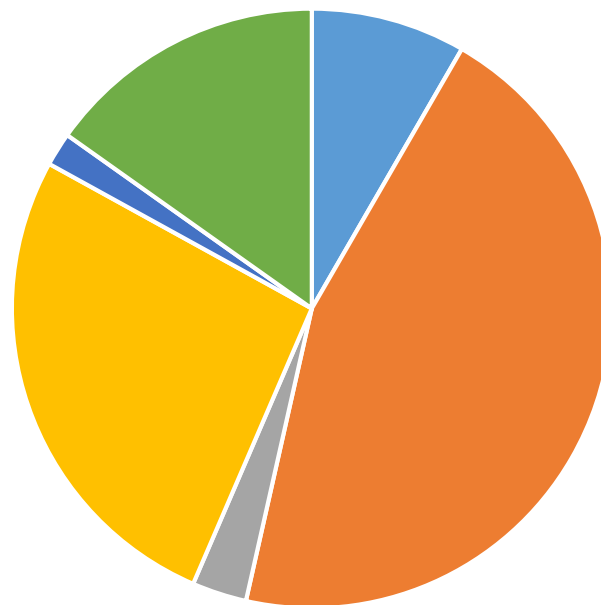
So how are alternative science groups telling their story better than science?

Conspiratorial Funnel: How the Middle Gets Moved?



How to Evaluate This? About the Study

March Against Monsanto: Posts by Type
2014-2017

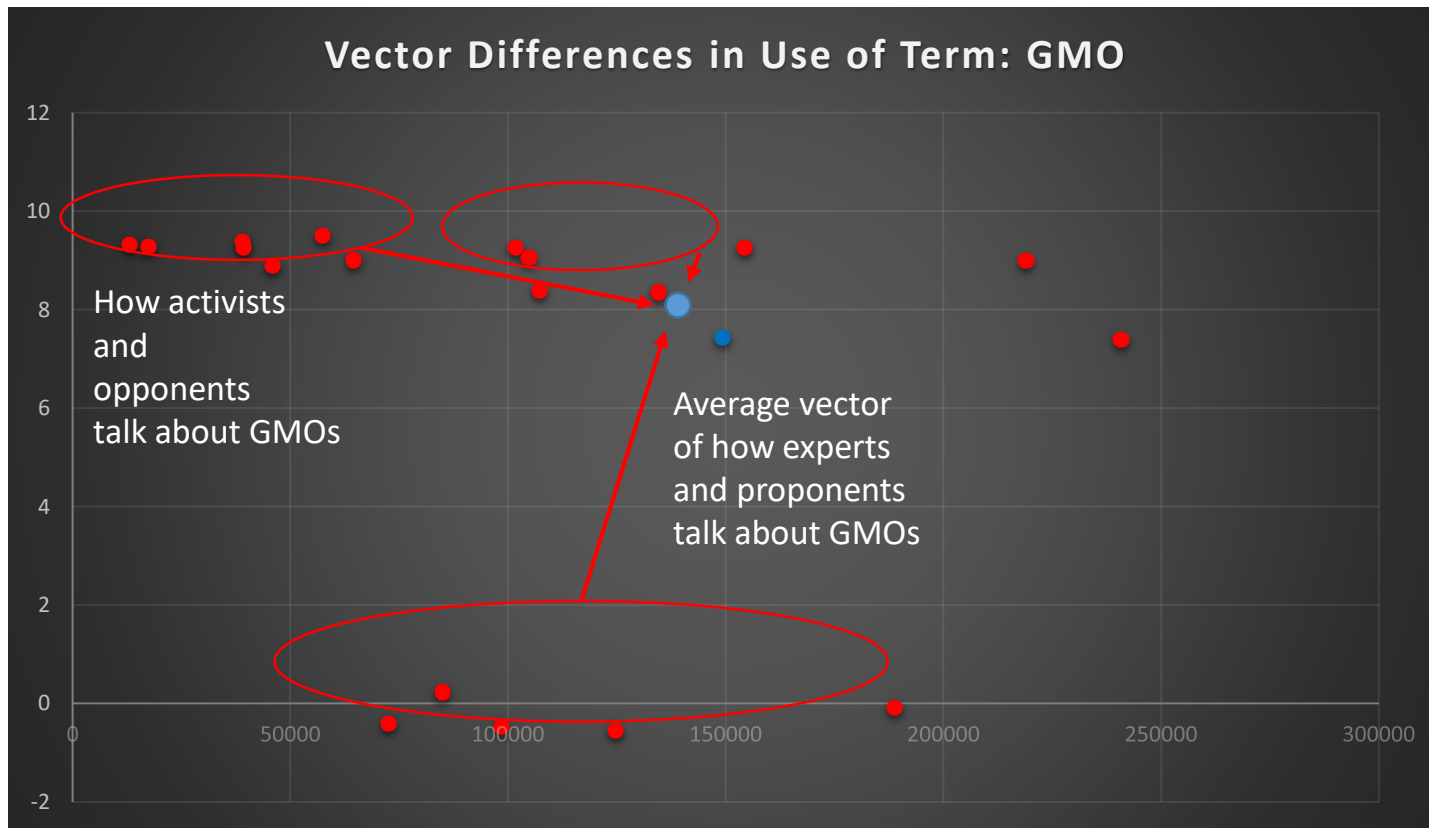


■ Alternative Medicine ■ GMO
■ Inspirational ■ Other
■ Anti-Vaccine ■ Wellness

- Examined 22 Anti-GMO groups and 12 Media outlet groups on Facebook across 3 years (2014 to 2017)
- Final data set contained 258,000 Group Posts
- Represented 6.5 million interactions from 1,131,491 unique users
- Posts were additionally processed with a rudimentary topic classifier to identify discussions that were about various topics:
 - GMOs and/or Monsanto
 - Anti-vaccine
 - Wellness/Health
 - Alternative Medicine
 - “Inspirational” posts of a pseudo-spiritual nature
 - Other topics (Politics, gossip, etc)

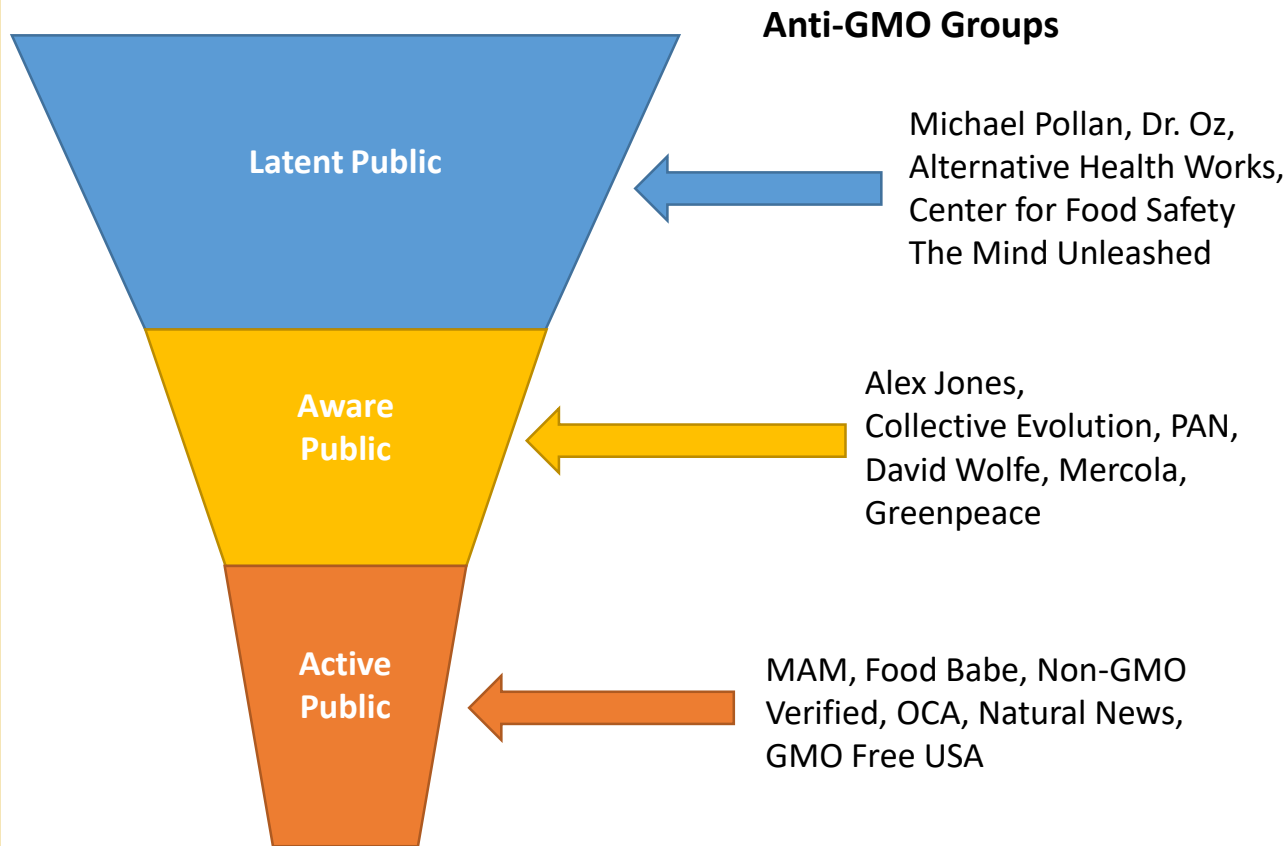
How Extreme Is a Group?

Measuring Vector Distances



- Measured the distance of each group's tokenized representation from a centroid of pro-GMO groups
- The further a group's vector from the centroid, the more difference in how they use the word.
- Calculate these distances for multiple words related to the GMO discussion, such as "label", "Monsanto", "glyphosate", etc.

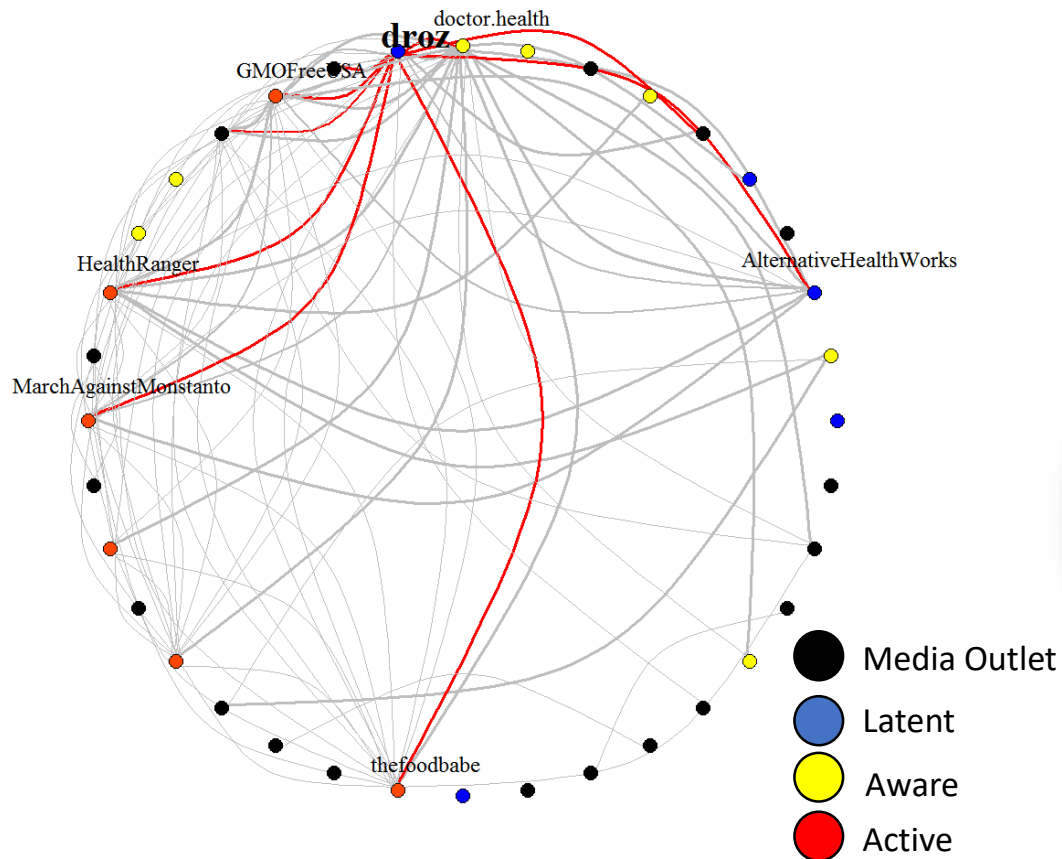
Rank Groups Based Upon Vector Distances



Note: This study reflects the views of a group's user-base far more than it does the page operator's due to the data collected.

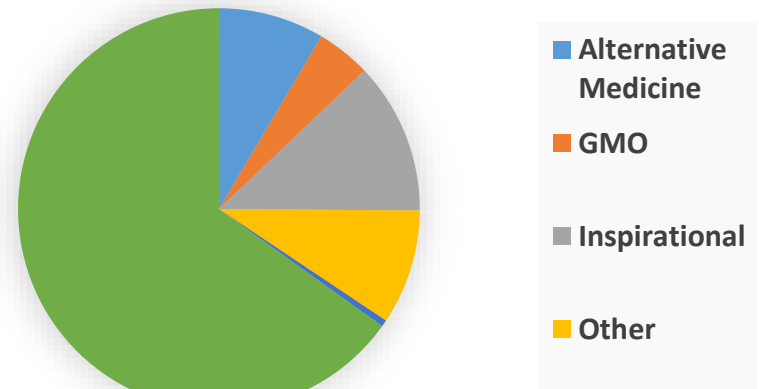
Normalization in Action: A Case Study

2014 to 2017 : Dr Oz Cross-Traffic

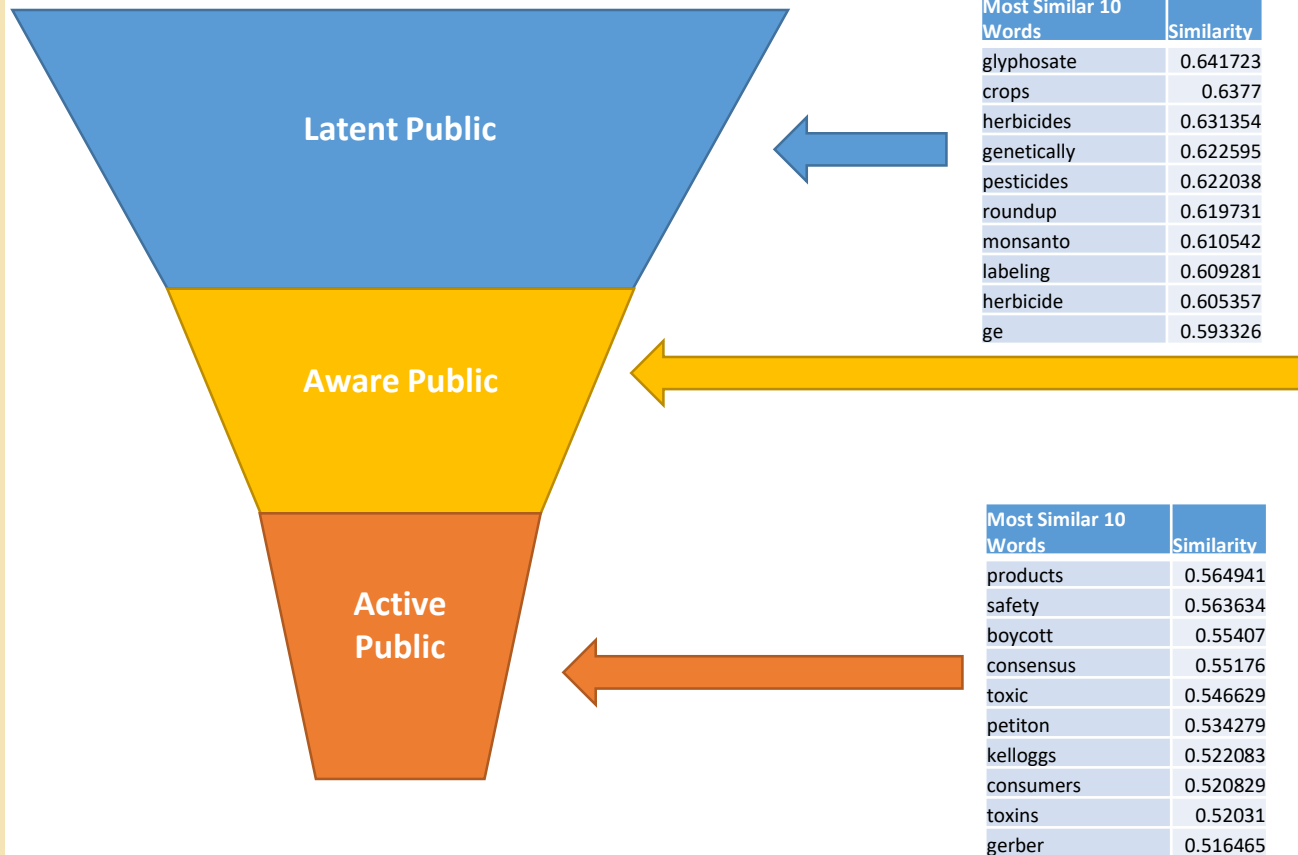


- Dr. Oz has high visibility to the general public
- His users most often later turned up on Mercola, Natural News, etc.
- Unlikely to be by design, but an emergent behavior due to shared memes of health and wellness.

Dr Oz: Story Types



Word Associations: A Window into a Tribe's Memetic Landscape



How do users at each level talk about “gm0s”?

Most Similar 10 Words	Similarity
glyphosate	0.553595
eliminate	0.522105
chemicals	0.511582
categorical	0.510359
ban	0.509769
associated	0.503881
harmful	0.501546
labelgm0s	0.498584
inundating	0.494856
herbecides	0.493311

Comparing Both Sides:

Pro-GMO Groups

A Science Enthusiast,
Tysonism,
Biology Babe



The Farmer's Daughter,
SciBabe,
Kavin Senapathy, Skeptibeard



"Do You Even Science, Bro",
Neil DeGrasse Tyson,
Kevin Folta, The Credible Hulk, The
Farmer's Life,
Bill Nye, March Against Myths



Anti-GMO Groups

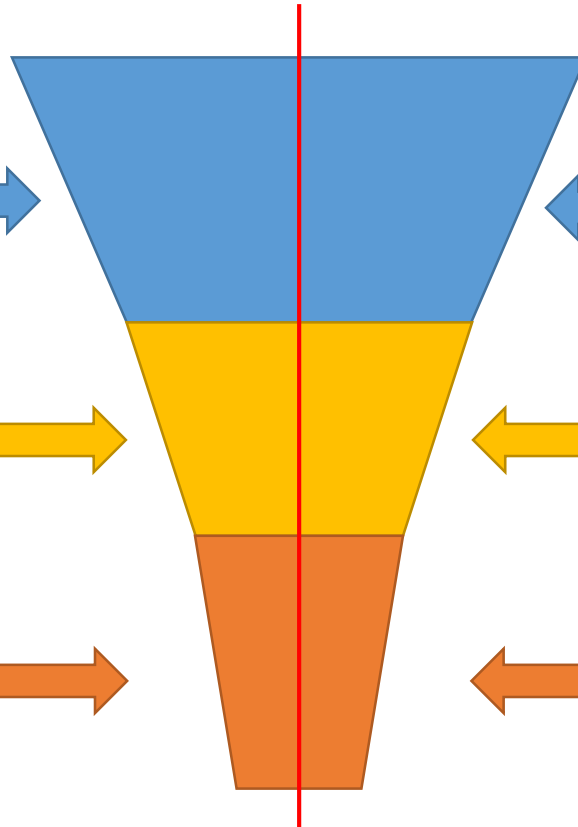
Michael Pollan, Dr. Oz,
Alternative Health Works,
Center for Food Safety
The Mind Unleashed



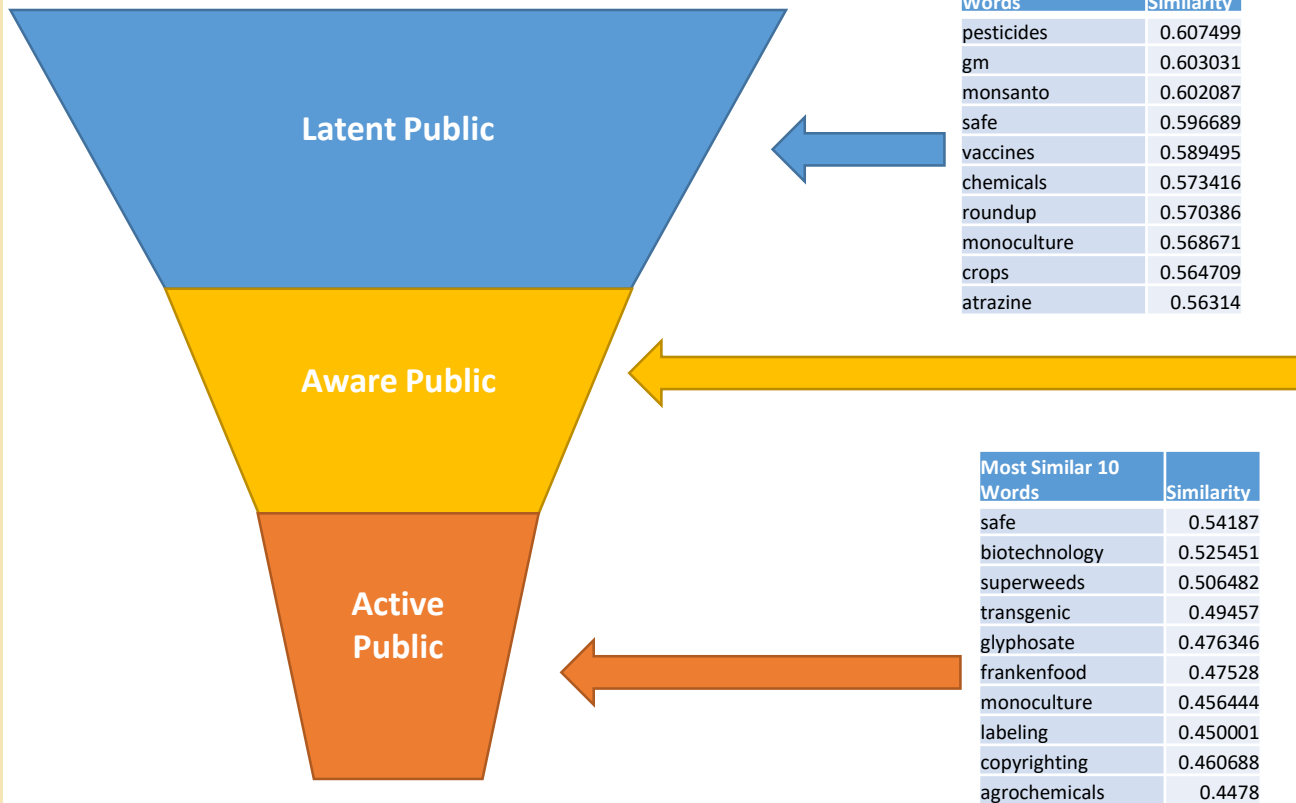
The Food Tank, Alex Jones,
Collective Evolution, PAN,
David Wolfe, Mercola
Greenpeace



MAM, Food Babe, Non-GMO
Verified, OCA, Natural News,
GMO Free USA



Word Associations: How the Blue Team Talks



Most Similar 10 Words	Similarity
pesticides	0.607499
gm	0.603031
monsanto	0.602087
safe	0.596689
vaccines	0.589495
chemicals	0.573416
roundup	0.570386
monoculture	0.568671
crops	0.564709
atrazine	0.56314

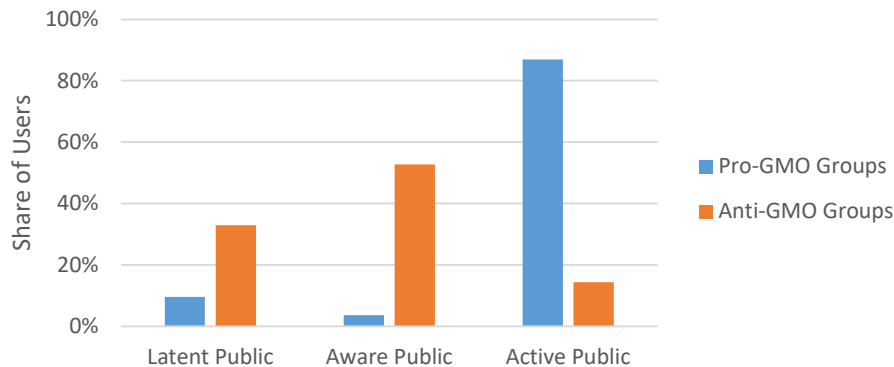
How do users at each level talk about “gm”s?”

Most Similar 10 Words	Similarity
ge	0.556796
biotech	0.548456
modified	0.520703
organics	0.51769
biotechnology	0.511887
frankenfoods	0.506112
pesticides	0.505877
labelling	0.501427
consumers	0.500102
transparency	0.498751

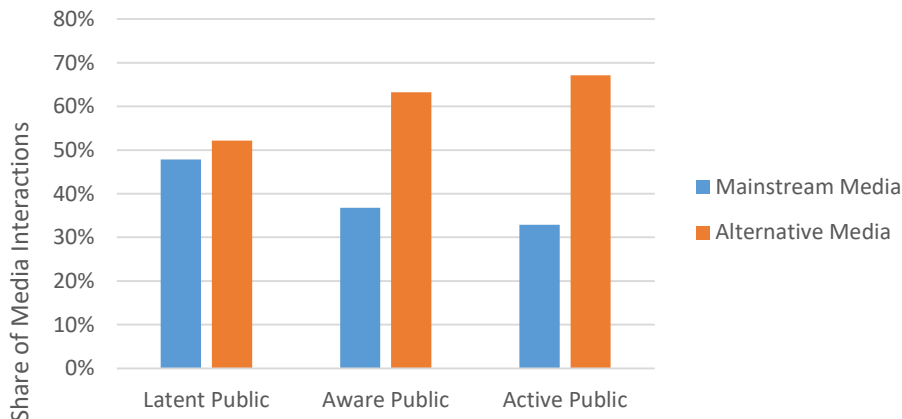
Most Similar 10 Words	Similarity
safe	0.54187
biotechnology	0.525451
superweeds	0.506482
transgenic	0.49457
glyphosate	0.476346
frankenfood	0.47528
monoculture	0.456444
labeling	0.450001
copyrighting	0.460688
agrochemicals	0.4478

Sci-Comm Achilles' Heel

Distribution of Followers: By Cohort



Media Interaction by Type

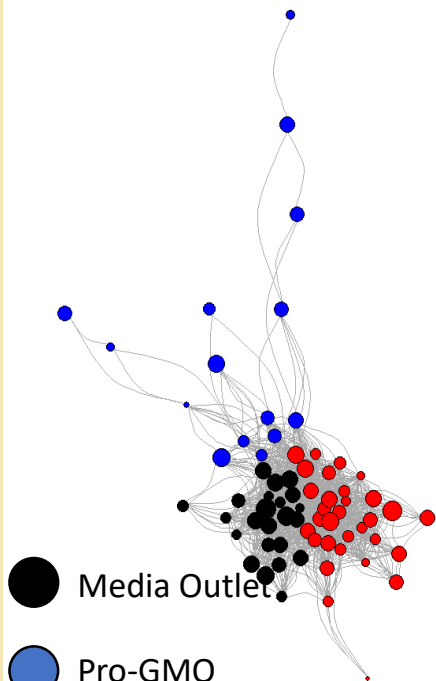


- The Anti-GMO information ecosystem has the majority of its users “upstream” from its active public (86%).
- Its message can get disseminated to many audiences, even those not necessarily engaged in the debate (yet).
- Conversely, sci-comm is the one preaching to the choir; and it has few channels to get its message in front of the latent (moveable) public.
- As we go further down the funnel, people become less likely to engage with mainstream media pages

You are more likely hear the Anti-GMO message, even if you’re not tuned in, but you likely won’t hear Pro-GMO voices unless you’re already engaged.

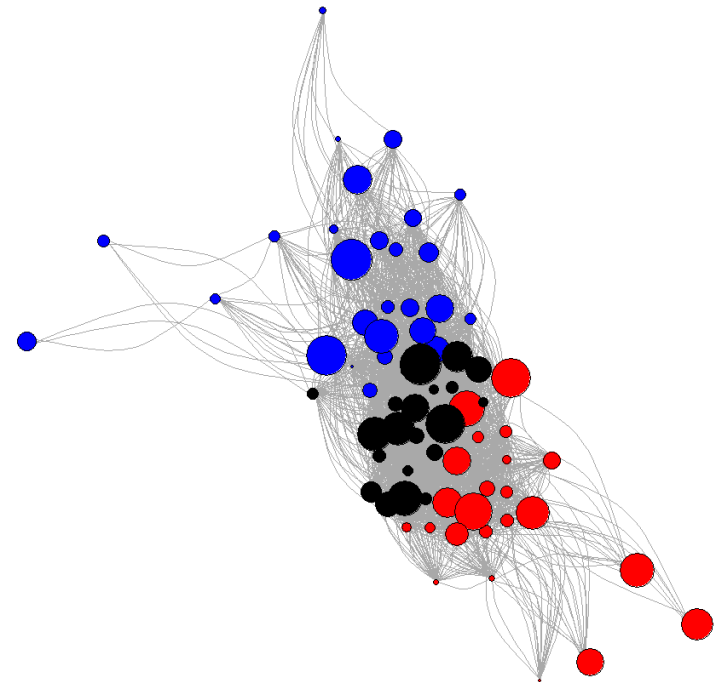
However, The Landscape is Changing

Mutual Users on Facebook: 2014



- Media Outlet
- Pro-GMO
- Anti-GMO

Mutual Users on Facebook: 2017



Conclusions

- Social media ecosystems gradually normalize alternative narratives about science among users through gradual exposure
- The general public has a high degree of exposure to alternative science groups and their messages (memes), pro-science groups are only now getting similar exposure as more scientists are getting out there themselves.
- **Scientists and science communicators need to be participating in this competition of ideas directly.**

Thank You!

Twitter: @

Email: @Monsanto.com