

Designing diversity-aware news recommender systems

Challenges and opportunities for recommenders that do more than serving a company's bottom line

by Nicolas Mattis



Who am I

- PhD candidate at VU in Communication Science since Sep 2020
- Project: Rethinking news algorithms
- Working between different academic disciplines
- Travel enthusiast





Presentation structure

- Why does news diversity matter
- How can we measure diversity in news?
- Recommenders as choice architecture
- Diversity-aware recommender design:
key takeaways



After this presentation

- you will have heard about different ideas on why and how news diversity matters for democracy
- you will have thought about how to implement different diversity metrics
- you will have a good overview over the interplay between user interfaces and choices



Why does news diversity matter

Looking at the interplay between democracy, media, and technology



News diversity and democracy

- News media as the fourth estate
- gatekeeping
- framing





Framing

What does this have to do with diversity?

- News media shapes public opinion/discourse and voting
- Issues are rarely one-sided
- Diverse perspectives -> better informed
- shared responsibility: citizens and the media

Do you actively seek out alternative viewpoints?

0	0	0	0	0
Nah, I can't be bothered	only when I am really invested in a topic	from time to time, just for fun/out of interest	Yes, quite regularly	Always - I am the perfect citizen



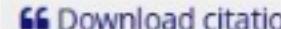
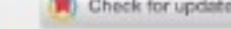
Diversifying news recommenders

- users appreciate serendipity
- the system needs some diversity to learn
- users don't always perceive differences in diversity
- diverse recommenders can facilitate tolerance (and maybe more)

**Benefits of Diverse News Recommendations for Democracy:
A User Study**

Lucien Heitz  , Juliane A. Lischka  , Alena Birrer  , Bibek Paudel  , Suzanne Tolmeijer  , Laura Laugwitz   & ...show all

Published online: 08 Feb 2022

 Download citation  <https://doi.org.vu-nl.idm.oclc.org/10.1080/21670811.2021.2021804> 

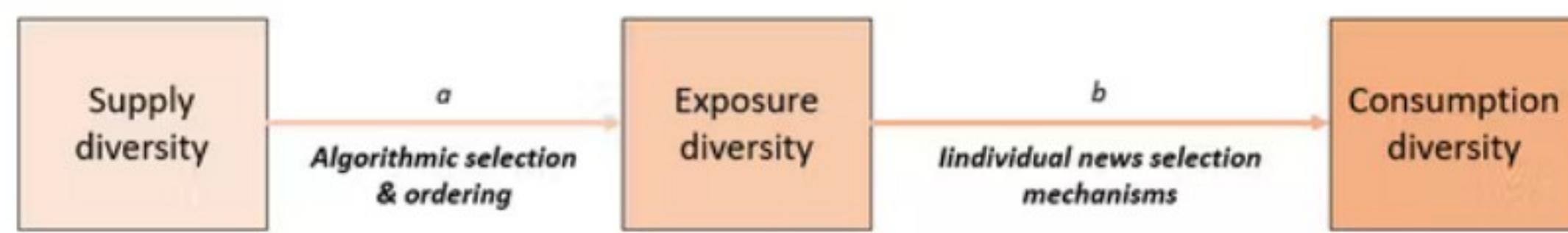


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How can we measure diversity in news?



Measuring diversity in news



- Levels: supply, exposure, or consumption
- Types: Topic, entity, viewpoint, structural
-

Measuring diversity in news



- Levels: supply, exposure, or consumption
- Types: Topic, entity, viewpoint, structural
- Methods: balance, variety, disparity/distance

Can we design a recommender system that serves democracy

A short exercise

<i>Recommender</i>	<i>Liberal</i>	<i>Participatory</i>	<i>Deliberative</i>	<i>Critical</i>
<i>User</i>	... is king	... should be activated	... should be given opportunities to deliberate	... should be 'triggered'
<i>Content</i>	Largely up to user choice	Inclusive, proportional, activating	Diverse, balanced, reflective	Marginal voices, provocative

Democratic news recommenders: normatively informed design (*Helberger, 2019*)



Democratic news recommenders - diversity metrics

(Vrijenhoek et al., 2021)

- **Calibration** (user preferences): e.g. will this user like a sports article?
- **Fragmentation** (overlap between story chains): e.g. how many other users will see this?
- **Affect** (inspire to take action): e.g. will this provoke thought/action of a user?
- **Representation** (balance of perspectives): e.g. are these recommendations multiperspective?
- **Alternative voices** (minorities): e.g. do these recommendations feature minority voices?

Think, pair, share

- Calibration (user preferences)
- Fragmentation (overlap between story chains)
- Affect (inspire to take action)
- Representation (balance of perspectives)
- Alternative voices (minorities)

Which metric is:

- 1) easiest to operationalise?
- 2) hardest to operationalise?
- 3) most important?
- 4) missing

think 1min -> discuss 1min -> answer
mentimeter



Which metric is easiest to operationalise?



Which metric is hardest to operationalise?



Which metric is most important?



Implementing Evaluation Metrics Based on Theories of Democracy in News

Comment Recommendation (Hackathon Report)

Myrthe Reuver, Nicolas Mattis

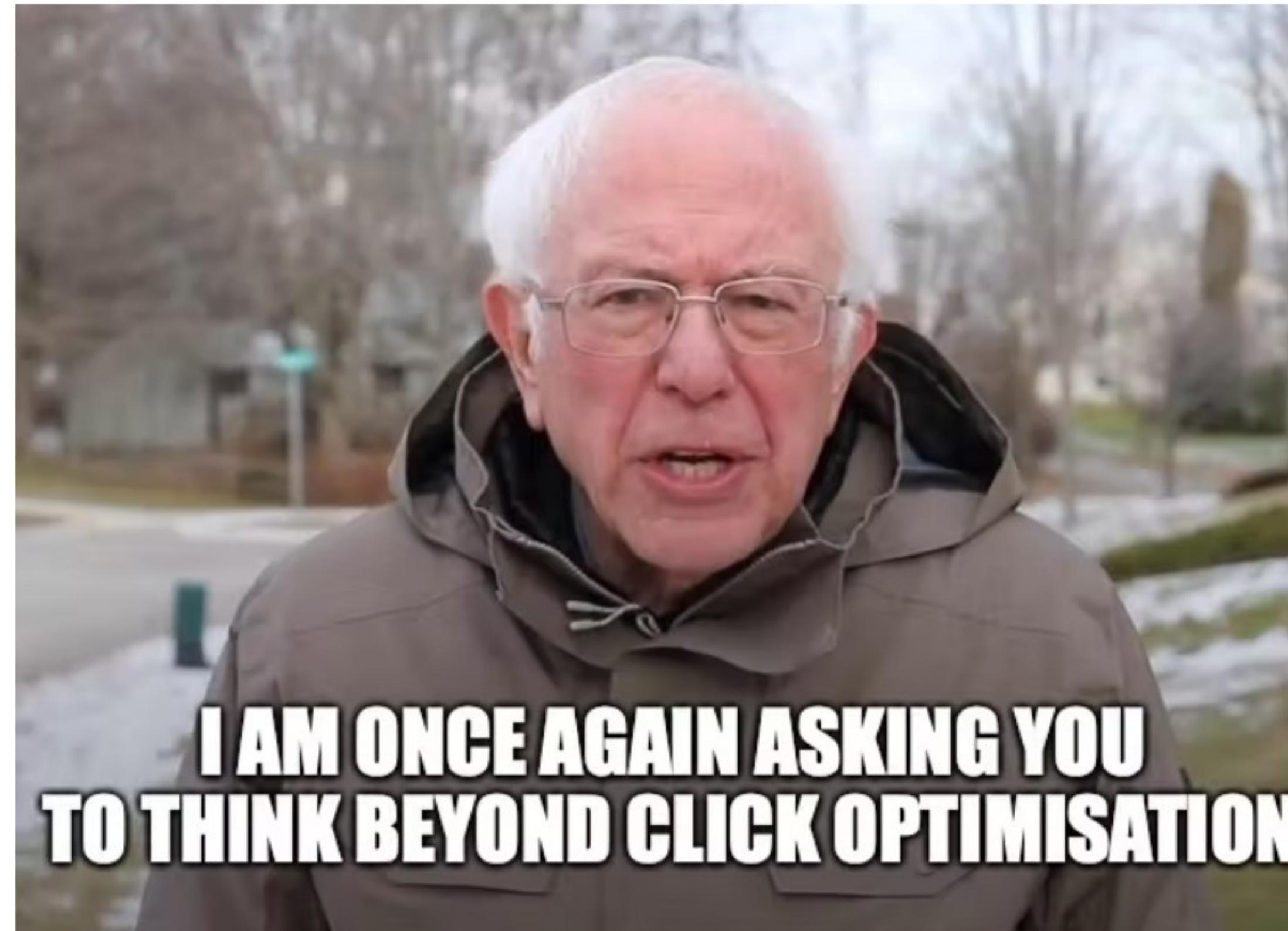
Recommendation	NYTimes Picks	Likes
Top 3	-0.083	-0.076
Top 5	-0.059	-0.053
Top 10	-0.041	-0.032
Mean all systems	-0.061	-0.053
all NYTimes Picks vs other comments	-0.039	X

Table 1: Results on the feb 2018 set. The left column shows the editorial picks, while the right column shows the recommendations based on user likes. Activation scores can range from [-1, 1], where a negative value denotes the recommender picks items less activating than in the general pool, while a positive value indicates the items are more activating.

Activation in NYT comment sections

- editorial recommendations vs. most liked vs. general
- Preference for less activating content
- Democratic implications?





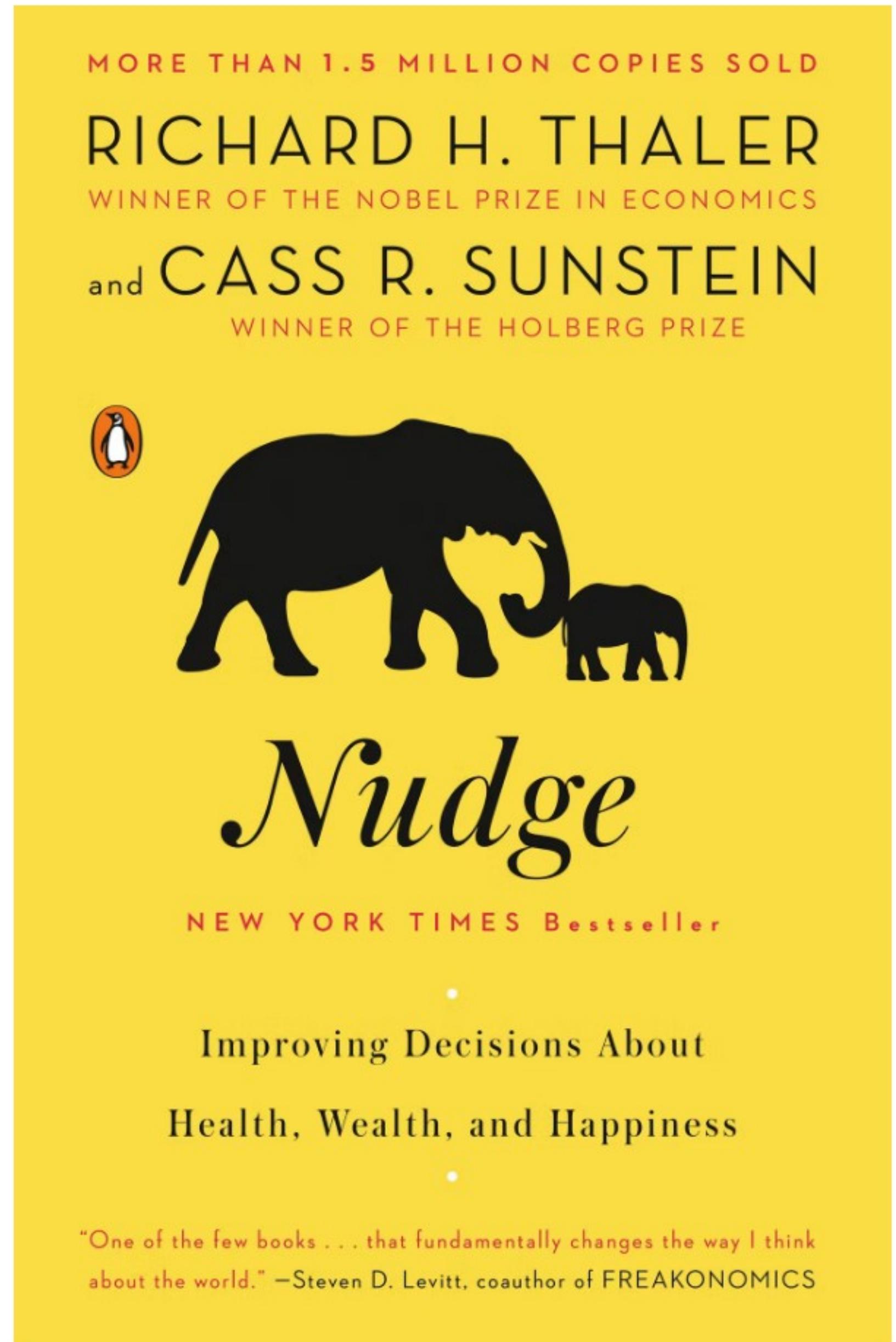
What else to optimise for

- Offering quality, not clickbait
- Building trust, loyal customers
- Long reads, background stories
- Democratic role of news
- Helping users to broaden their worldview

Recommenders as choice architectures

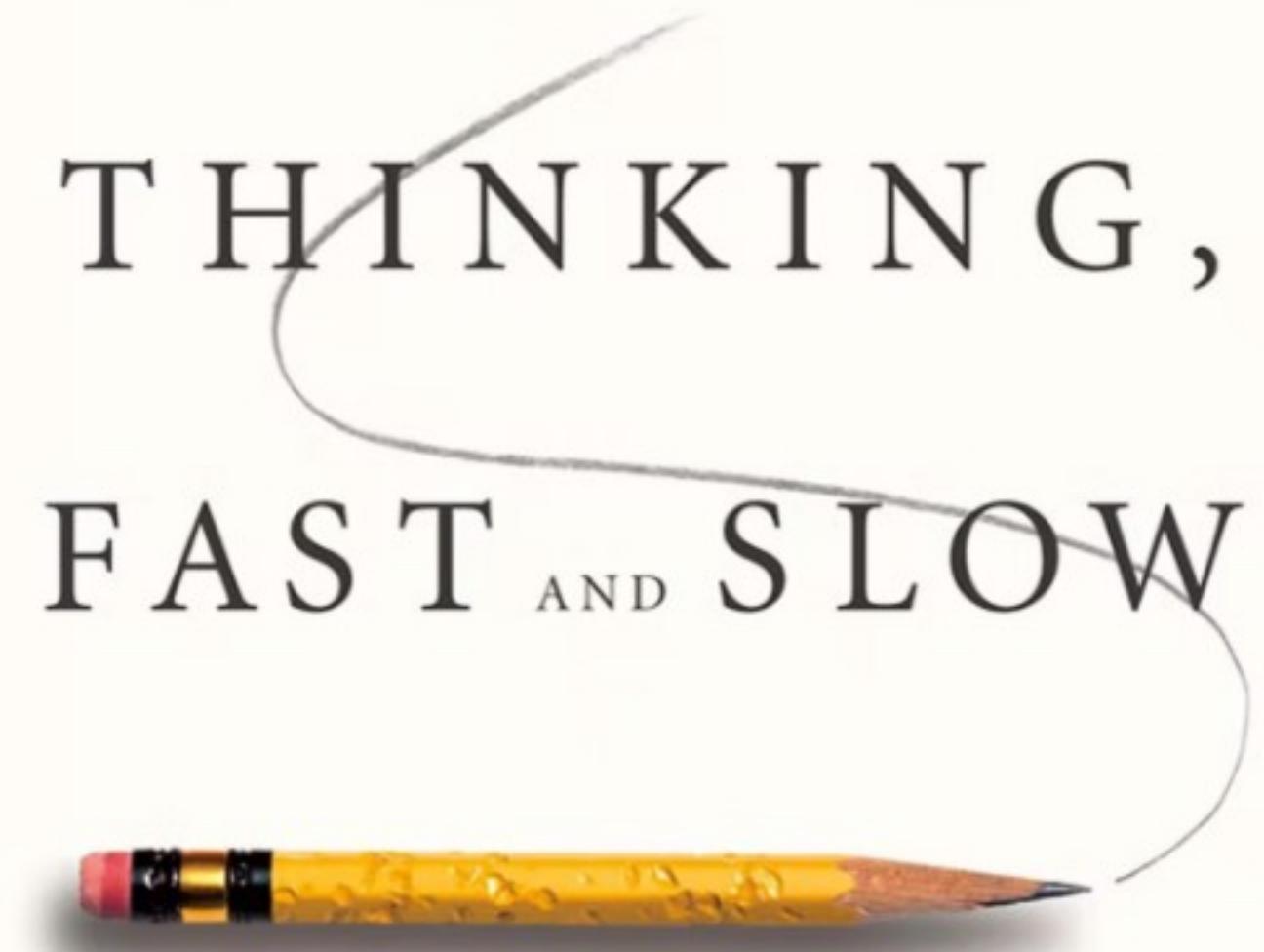
Looking at interface designs







THE NEW YORK TIMES BESTSELLER

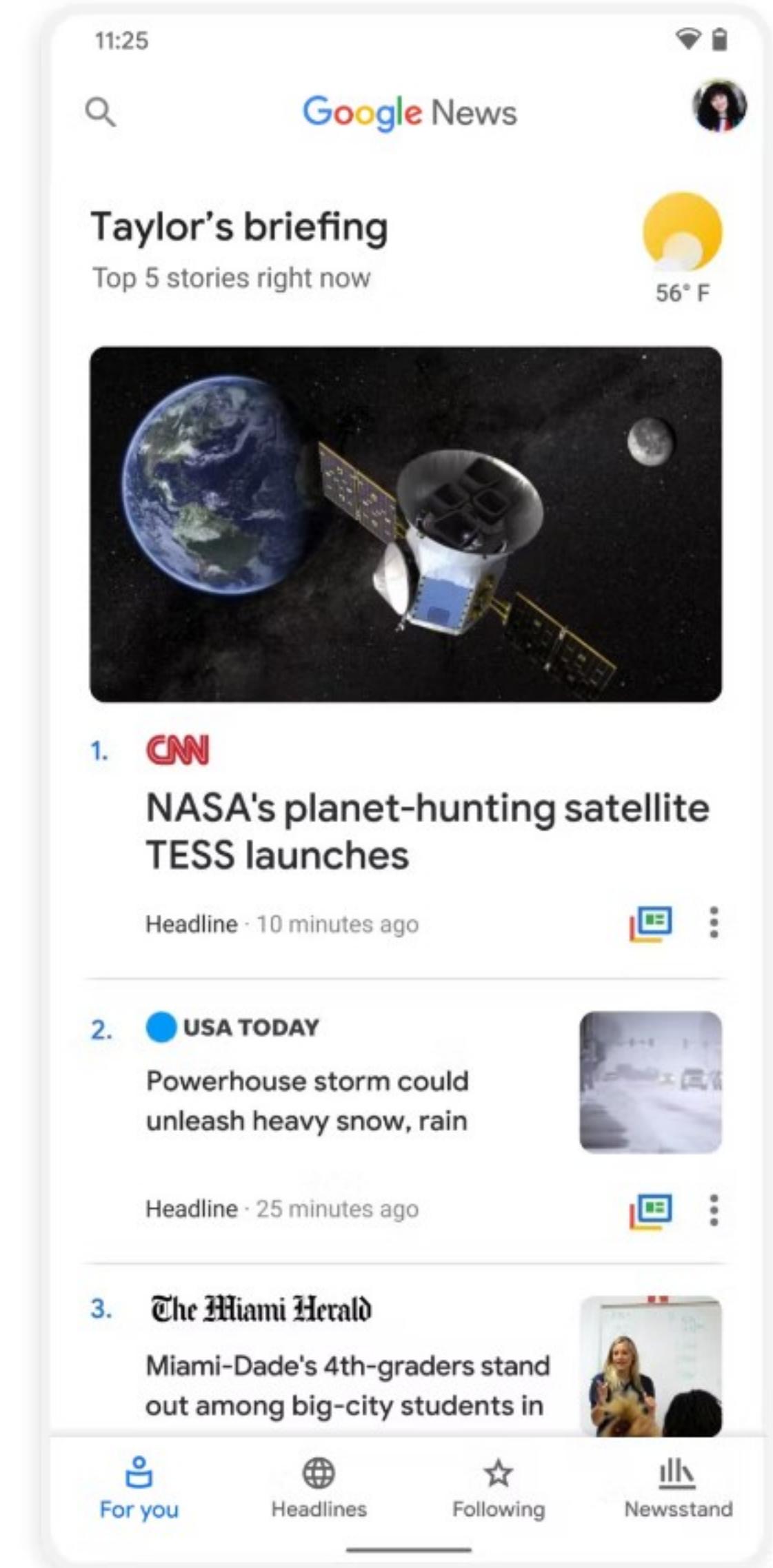


DANIEL
KAHNEMAN

WINNER OF THE NOBEL PRIZE IN ECONOMICS

"[A] masterpiece . . . This is one of the greatest and most engaging collections of insights into the human mind I have read." —WILLIAM EASTERLY, *Financial Times*





Decision cues

- Position
- Source cues
- Pictures
- Labels
- Explanations
- ...

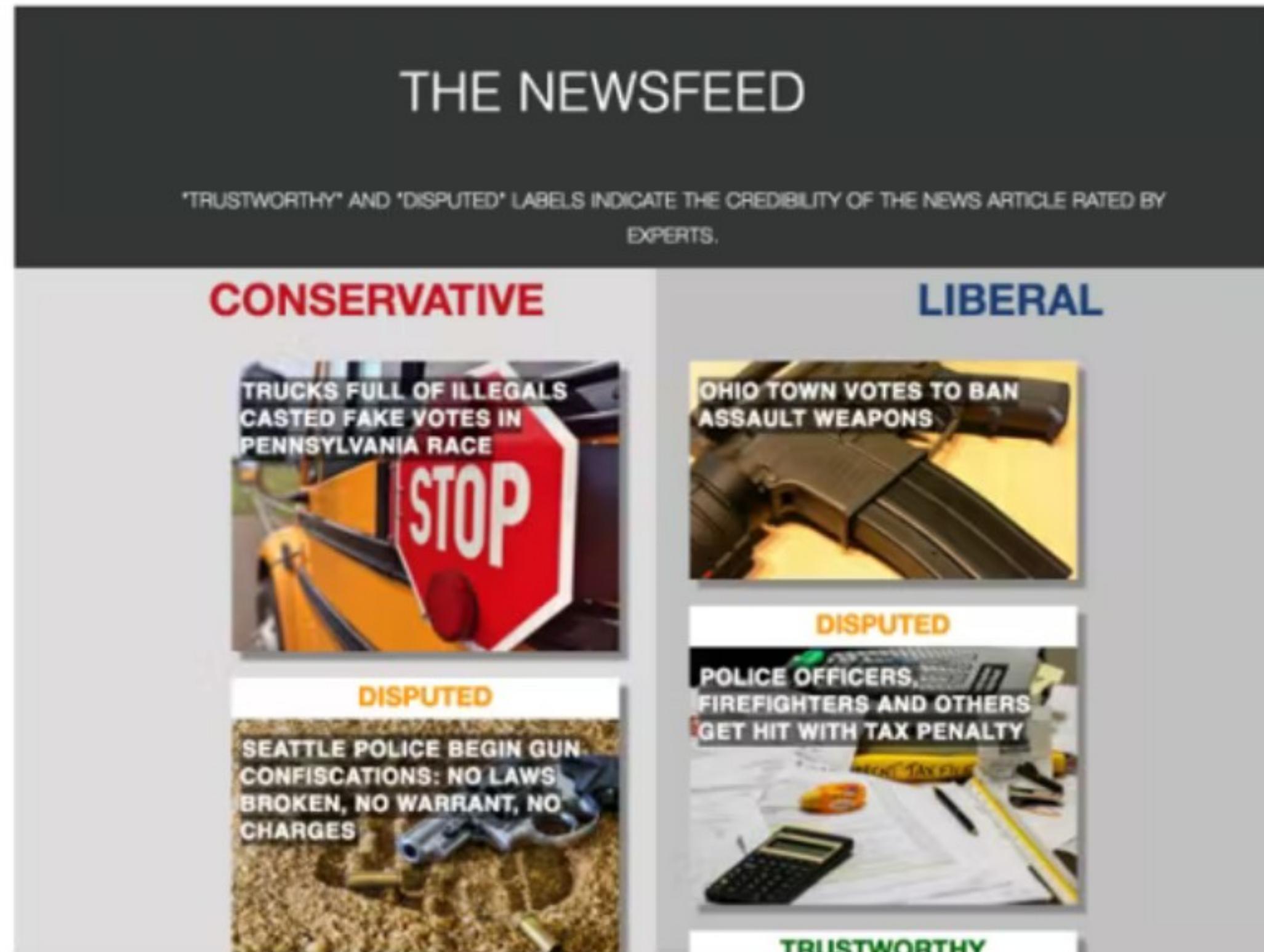


Positioning effects

Overall	0.31	0.21	0.14	0.17	0.13	0.1	0.1	0.09	0.08
D: Mobile	0.52	0.29	0.17	0.12	0.09	0.07	0.05	0.05	0.06
D: Tablet	0.33	0.2	0.14	0.18	0.15	0.1	0.09	0.09	0.07
D: PC	0.24	0.19	0.13	0.18	0.15	0.11	0.12	0.1	0.1

- obvious but powerful
- Determines what is seen
- affects perceived importance

Loecherbach et al. (2021)



Labels

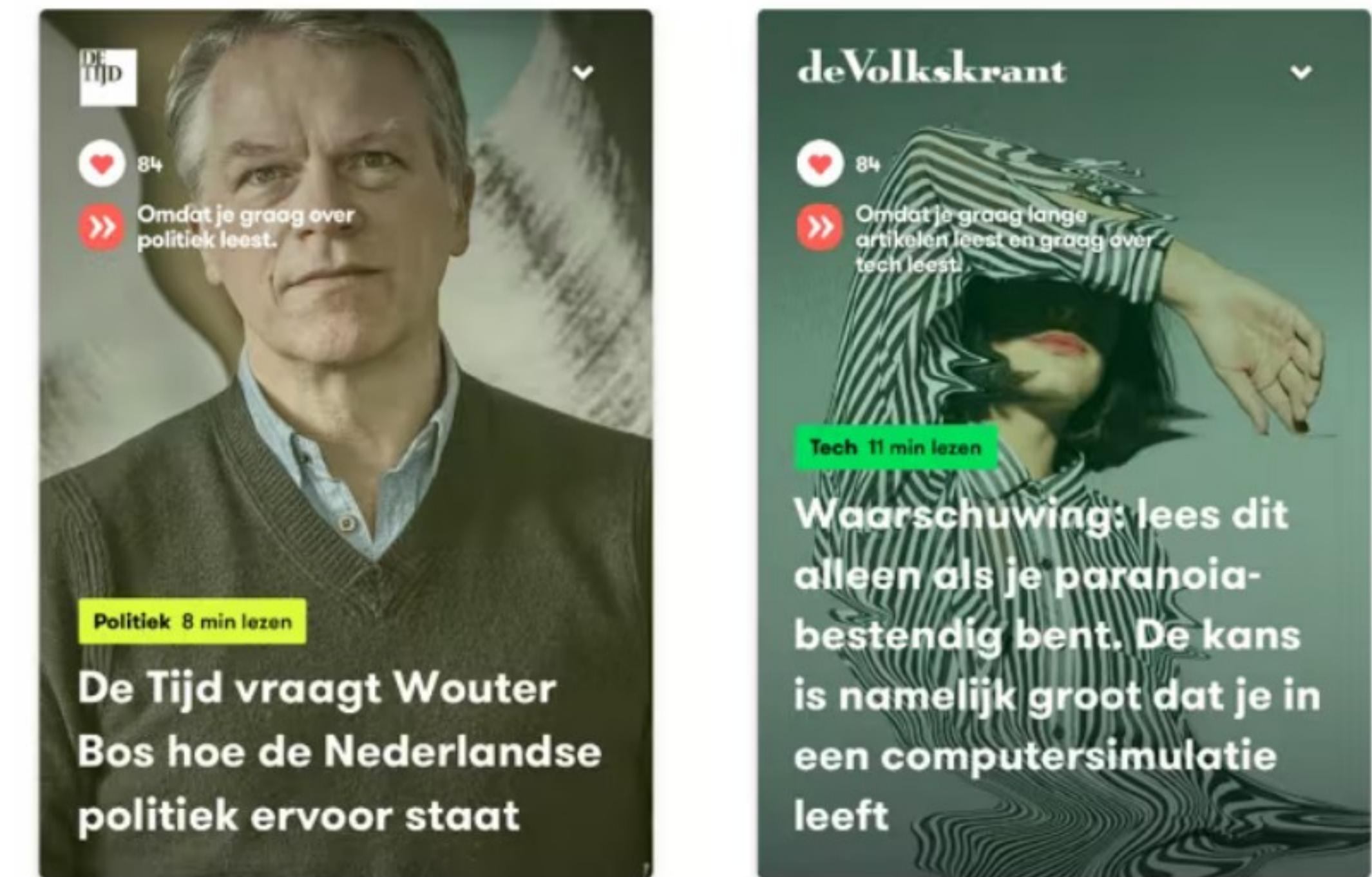
- Source
- Stance
- Credibility
- ...

(d) Interface D, With both Stance Labels and Credibility Labels

Gao et al. (2018)

Explanations

- why is this recommended
- increases transparency
- can foster trust in the system



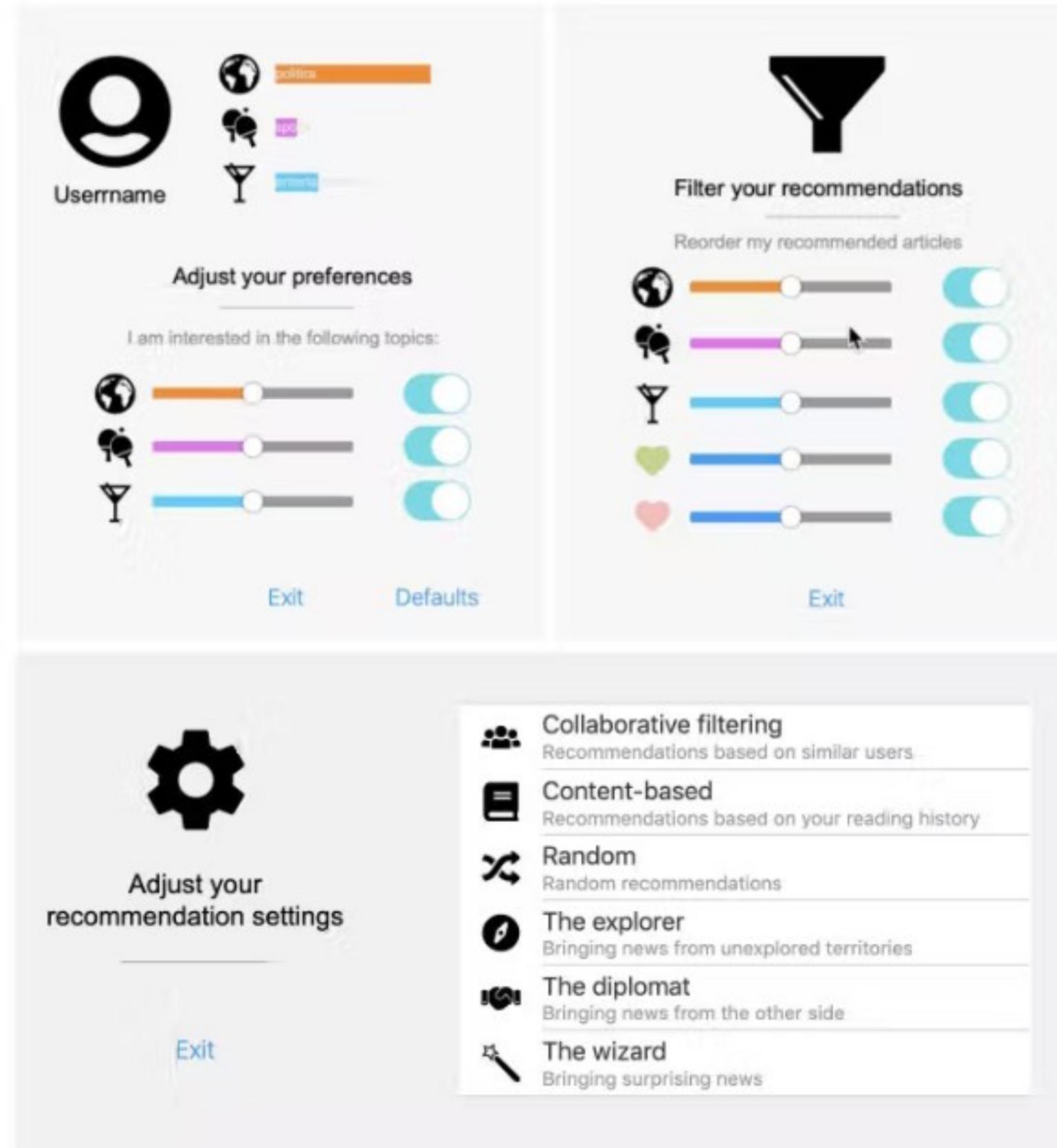
ter Hoeve et al. (2019)



Figure 1. Example feedback. Left: No articles (beginning of week), center: unbalanced, right: balanced.

Munson et al. (2013)



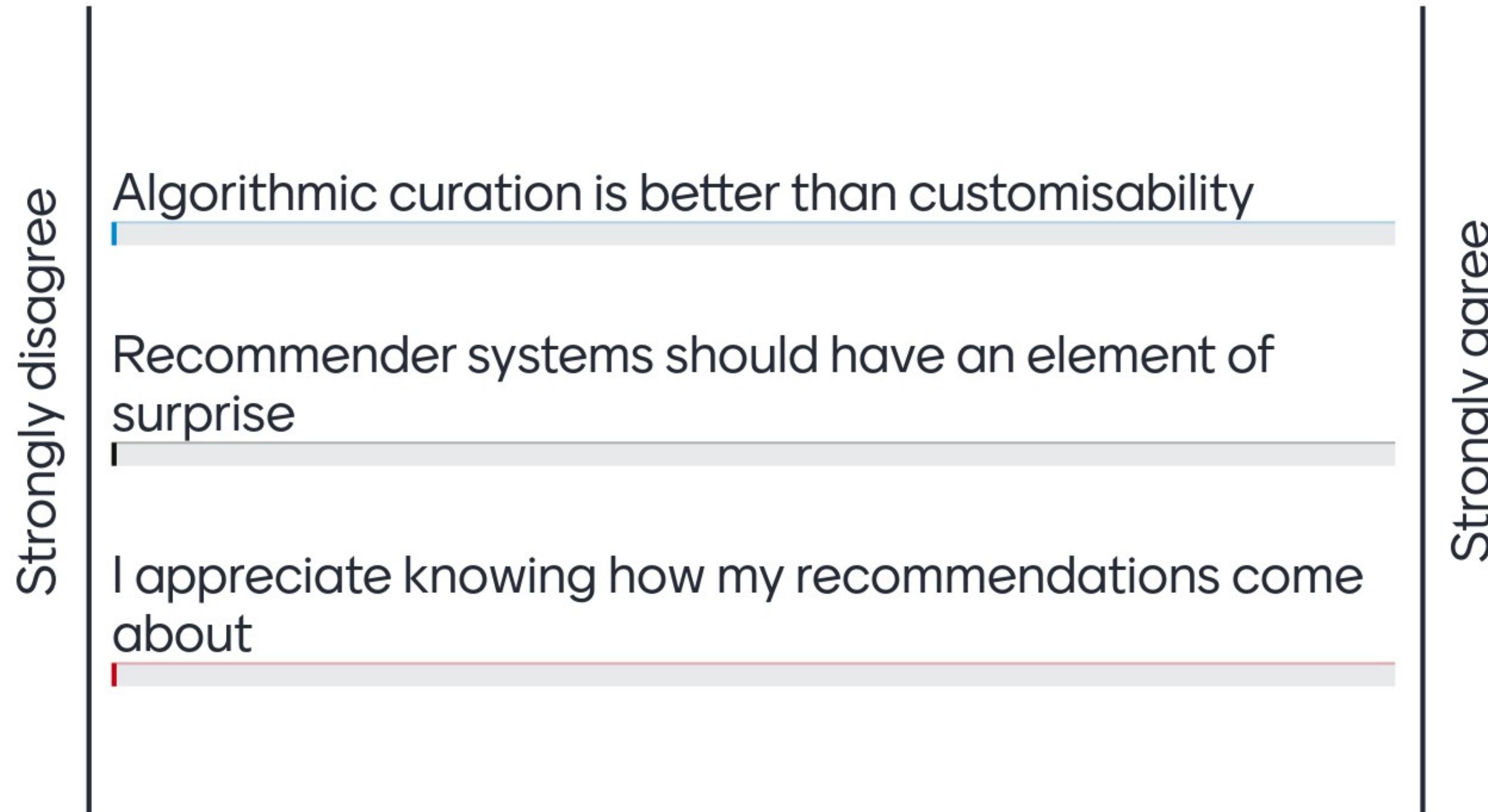


Customisation

- often desired, rarely used
- various forms
- self-actualisation



Do you agree?





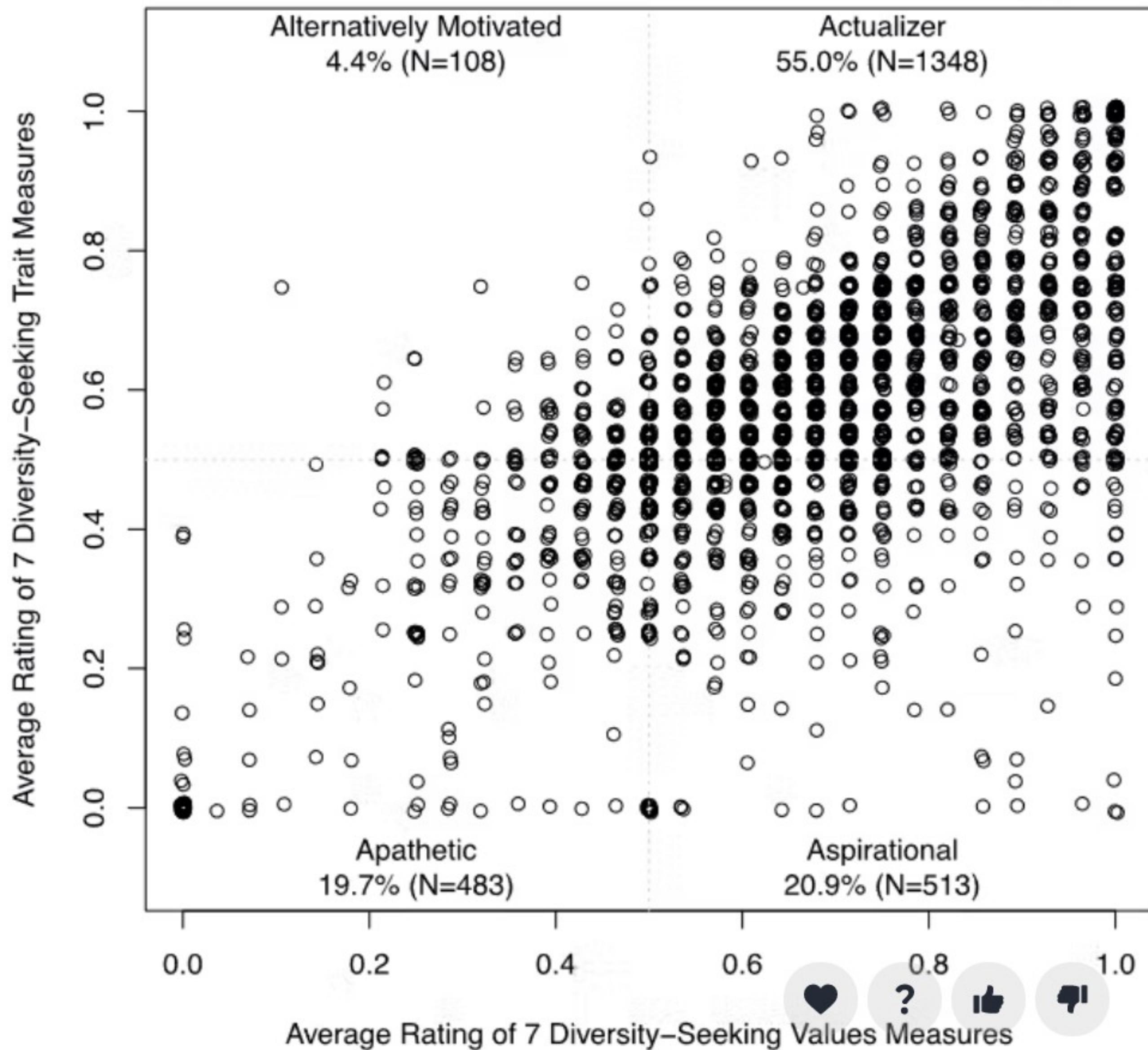
No nudge works for everyone

- Personal preferences
- Personality characteristics
- Context

Individual-level differences

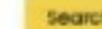
Diversity traits and values

Ratings of Diversity–Seeking Values vs. Traits



Home Mail Tumblr News Sports Finance Entertainment Lifestyle Answers Groups Mobile More ▾

YAHOO! Search Sign in   

 Symptoms of Psoriatic Arthritis 

OPEN-MINDED DEMOCRATS: WHY LISTENING TO OTHER PERSPECTIVES IS IMPORTANT

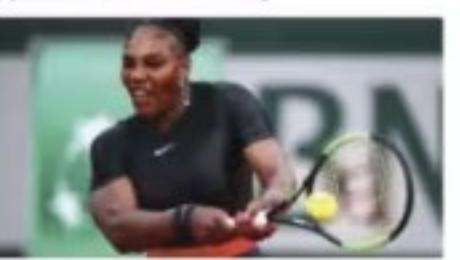
Yahoo News July 18, 2018

Despite all the partisan bickering, **Democrats are increasingly tolerant**. According to a new nationwide study by a prominent Democratic research organization, a **majority of Democrats indicated that they see themselves as open-minded**—willing to hear new ideas and arguments, even if they come from across the partisan aisle. The study finds that 74% would not mind having a neighbor who is a member of the opposing party, most say that talking about politics with people they disagree with is generally interesting and informative, and 80% prefer to read news stories that present diverse perspectives.

These results give cause for optimism regarding the state of the citizenry. According to political theorists, **ideal citizens should be willing to learn about multiple perspectives** and actively engage with those who hold opposing political views. *"Looking at and giving full attention to different viewpoints on political issues is crucial to good citizenship"*, says Joseph Mitchell, the author of the study. Openness to different views does not mean that people are abandoning their principles – it is simply necessary to become knowledgeable and form more informed opinions. **The high levels of open-mindedness among Democrats are promising**. Joseph Mitchell concludes *"It is through seeking diverse views and intellectually engaging with different political perspectives, can we build a stronger and better society. As a Democrat, I fully endorse open-mindedness."*

 SHOP NON-TRADITIONAL DESIGNS

Popular in the Community

 No women made the 2018 Forbes 100 highest-paid athletes list
Good Morning, America

 Zuck Shares "Bombshell" News Regarding Wife
The Today Show Sponsored

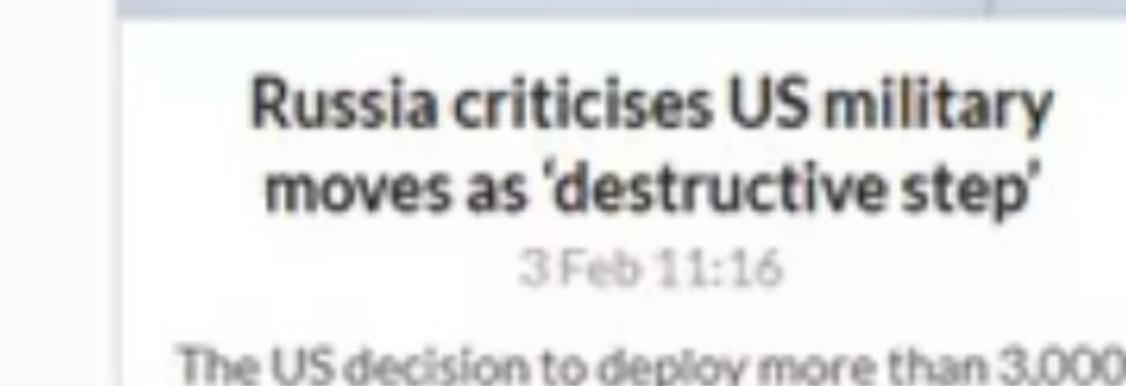
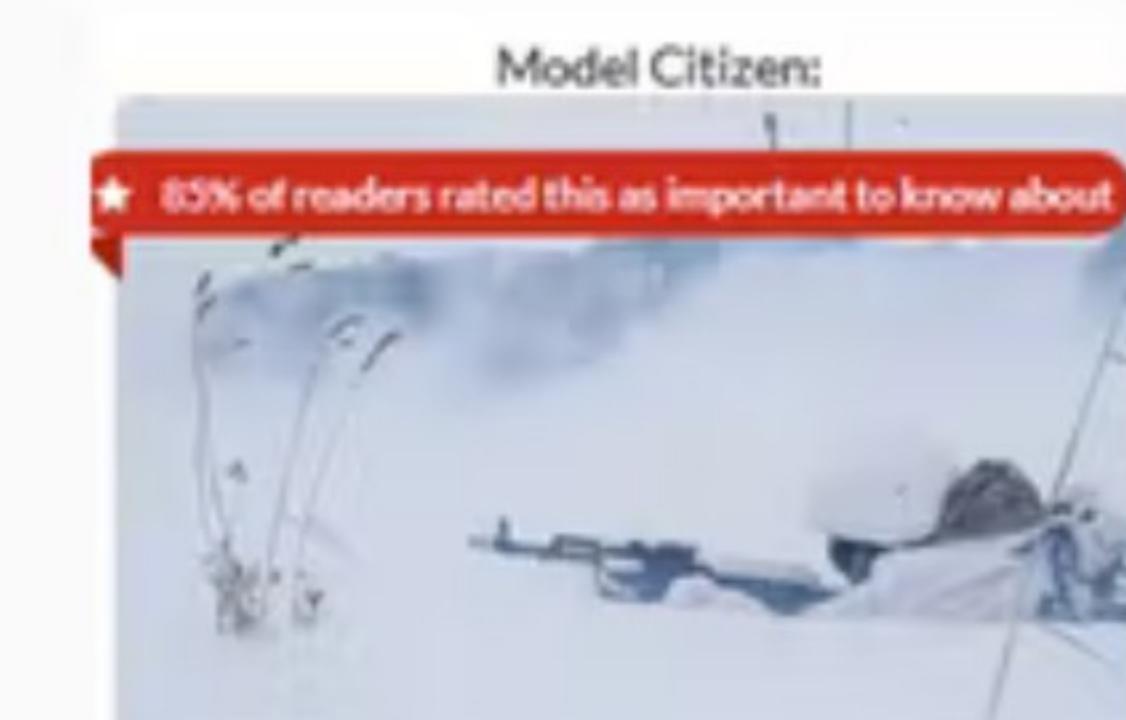
Individual-level differences

Social norms

Figure 3. Example of stimuli used in Study 2: The partisan ingroup open-mindedness prompt for democrats.



Upcoming experiment



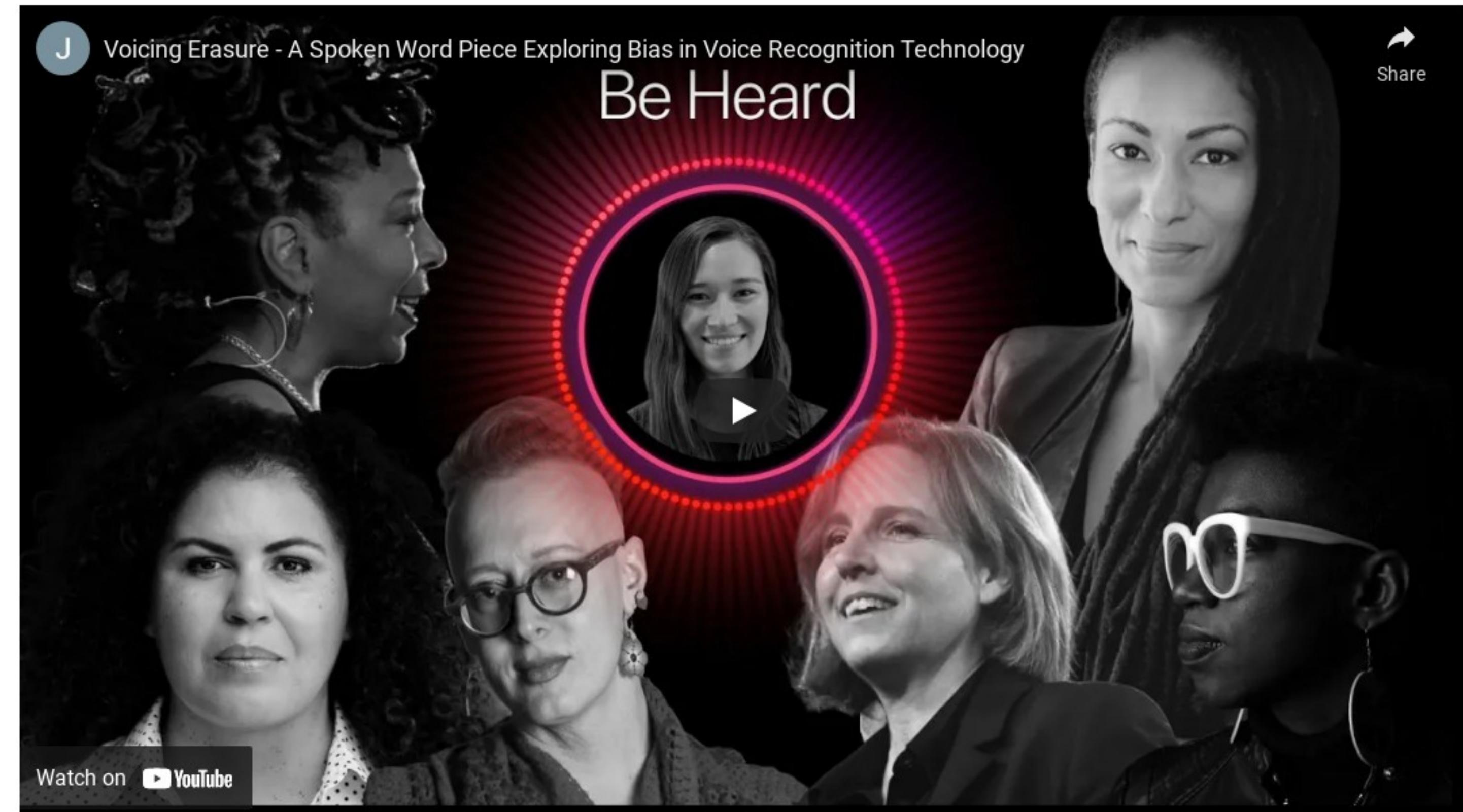


Paternalism

- How much nudging is justified?
- Who decides what people should read
- Transparency

Main Take-aways

- Important to look beyond recommendation accuracy
- News recommenders can do more than maximise engagement
- Every recommender is a choice architecture: design matters



Responsible recommender design: some food for thought



Any questions?

0 questions
0 upvotes

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