

Dissecting Diversity – towards a conceptual framework for realizing diversity in recommendations

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Central questions

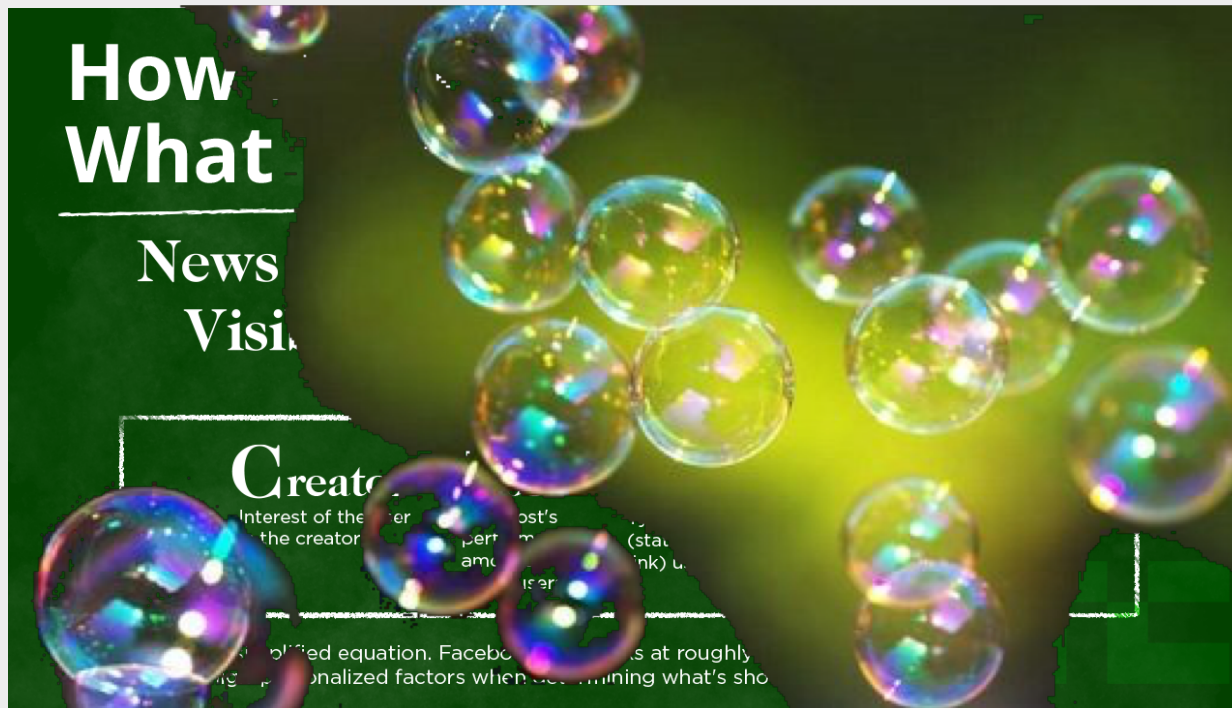
- What is **diversity**?
- Do people **encounter sufficiently diverse content** on platforms?
- How do **diverse recommendations** look like?



Why these questions matter

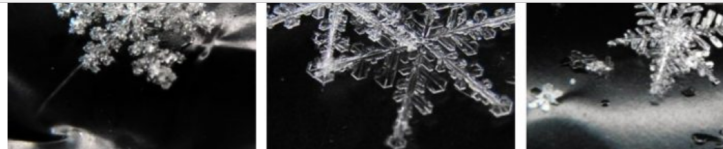


Facebook Newsfeed Recommender



(J. Constin, How Facebook Newsfeed works, Techcrunch, 9.09.2016)

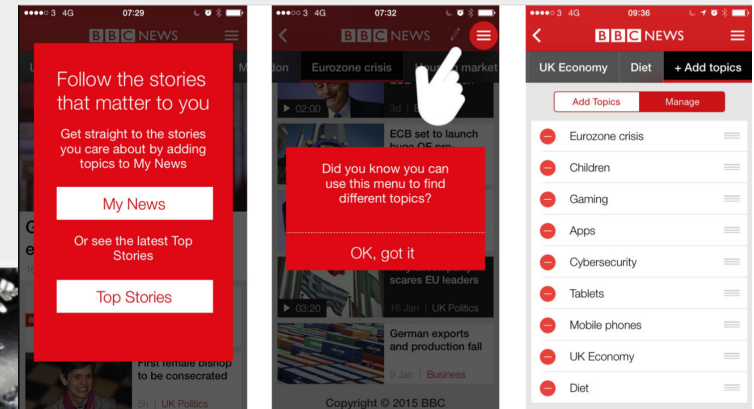
Personalised news platforms



All the news that's fit for you: The New York Times is experimenting with personalization to find new ways to expose readers to stories

"Instead of thinking about having stories compete for limited space on the homepage, we're trying to shift the conversation to a different understanding of our distribution."

By **RICARDO BILTON** @rbilton Sept. 28, 2017, 11:12 a.m.



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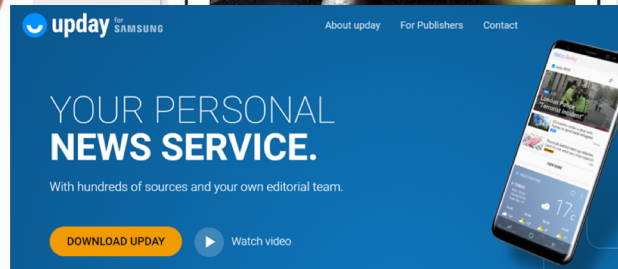
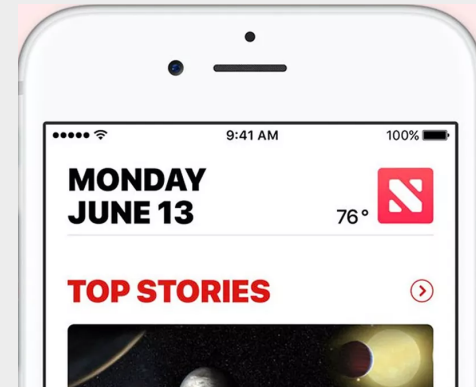
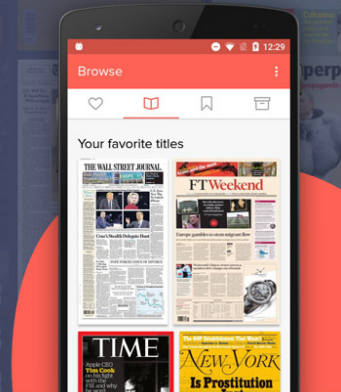
News aggregators for Mobile platforms



Discover the best journalism.

No paywalls, no ads, just stories you'll love.

» Blendle



And users appreciate algorithmic selection

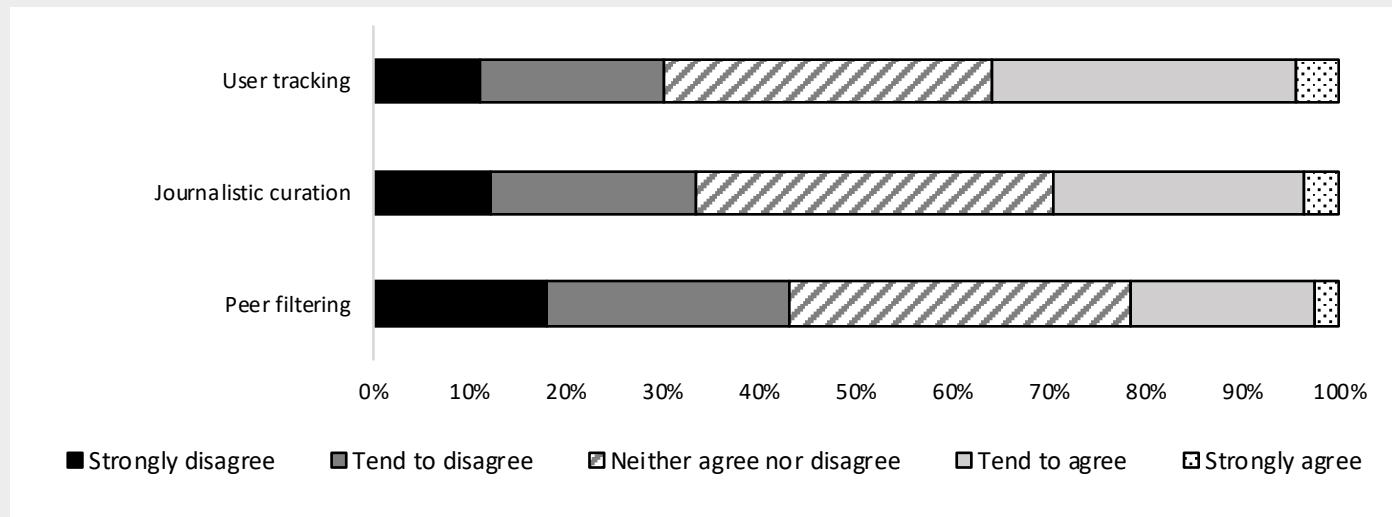


Figure: Belief that having news stories selected either automatically (on the basis of own past consumption ['user tracking'] or friends' news consumption ['peer filtering']) or by editors and journalists ('journalistic curation') is a good way to get news (n=53,314). (Thurman, Moeller, Trilling & Helberger, 2017)

But users are also concerned about diversity

Type	Concerned about missing out on important information	Concerned about missing out on challenging viewpoints	Concerned about privacy
Spain	70	67	54
UK	65	61	49
USA	60	59	49
Germany	44	42	46
Austria	43	44	51
Korea	42	38	45

Q10D_2016b_1/2/3. Please indicate your level of agreement with the following statements – I worry that more personalised news may mean that I miss out on important information/I worry that more personalised news may mean that I miss out on challenging viewpoints/I worry that more personalised news will mean my privacy is placed at greater risk.

Base: Total sample in each country

(Thurman, Moeller, Trilling & Helberger, 2017)

News recommenders: a threat to democracy?

“Increasing filtering mechanisms make it more likely for people to **only get news on subjects they are interested in**, and with the perspective they identify with. ... It will also tend to **create more insulated communities as isolated subsets** within the overall public sphere. ... Such developments undoubtedly have **a potentially negative impact on democracy.**”

Responsible news recommender design

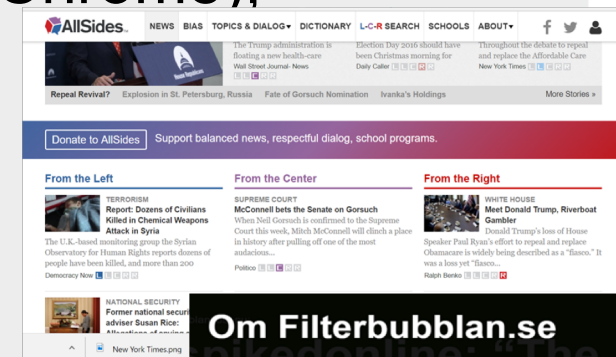
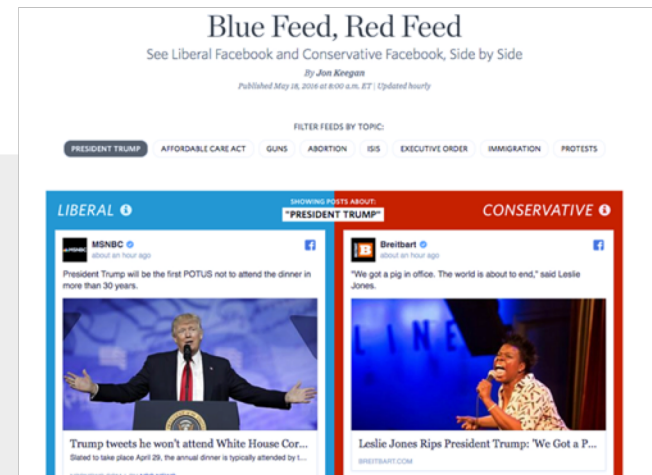
“Research has shown that ... in many situations, hearing the other side is desirable. We suggest that, equipped with this knowledge, software designers ought to **create tools that encourage and facilitate consumption of diverse news streams**, making users, and society, better off.” (Garrett & Resnick, 2011)

But.... what is diverse?



Diversity by design

Growing number of examples (many US based):
 Balancer; Considerati; Huffington Posts' Flipside;
 Read Across the Aisle; Wall Street Journals Red
 Feed, Blue Feed; Escape your Bubble (Chrome);
 Indivisible; New York Times;
 Filterbubblan; Blendle



Om Filterbubblan.se

Filterbubblan.se är en tjänst som låter dig se hur olika debatten låter i de tre ideologiska filterbubblor som präglar svensk inrikespolitik, från vänster till höger.



Understanding the impact of algorithmic filtering on diversity: a matter of red & blue?



“Diversity” from the computer science perspective

- “Diversity as the opposite of similarity” (Bradley & Smith, 2001)
- Since then: diversity typically defined as some measure of variance/similarity/distance/serendipity (Kunaver & Pozrl, 2016; Kaminskas & Bridge, 2016)
- Managing the trade-off between accuracy and diversity
- User perspective as alternative approach: novelty, unexpectedness, user satisfaction (Vargas, 2014a & b)

Diversity from the social science perspective: a concept with a mission

Diversity in news matters because it is **precondition** for a range of **values** we cherish in society (e.g. tolerance, informed citizenship, autonomy, deliberation)



Diversity & democratic theory



If and how algorithmic recommendations lead to more or less diversity very much depends on the democratic theoretical perspective one adopts.

Depending on the theoretical perspective, diversity can serve different goals or values, some of which might even contradict.

Depending on the perspective:

- Different values & objectives
- Different expectations for citizens
- Different roles for the media
- Different ideas of what counts as ‘ideal’ diversity
- Different implications for responsible news recommenders

(N. Helberger, K. Karppinen, L. d’Acunto, Exposure diversity as a design principle for recommender systems, Information, Communication & Society, 2017)

Representative liberal & competitive models of democracy



Or: market place of ideas



(Representative) liberal perspective

- **Values:** individual autonomy, freedom of expression, democratic will formation through elections
- **Role citizens:** minimal normative demands common citizen, focus on political elite and expert citizen (burglar alarm standard), ‘throw the rascals out’ (Strömbäck 2005)
- **Recommendation is diverse if:** responsive to demand users, focus on political news and presents political alternatives, broadly supported ideas get bigger share (proportionality)

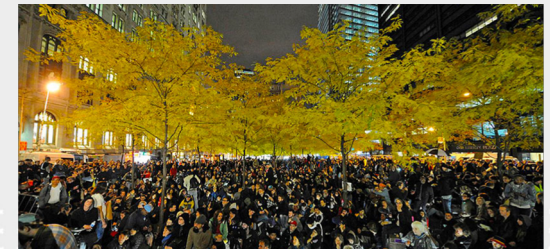


Models of participatory democracy



Participatory perspective

- **Values:** Active political participation, empowerment, equality, inclusiveness
- **Role citizen:** active, “[c]itizenship is not a spectator sport” (Putnam, 2002)
- **Recommendation is diverse if:** reflects the heterogenous society: all interests and perspectives are equally presented, + more attention for commentary, activism



Deliberative and discursive models



Deliberative perspective

- **Values:** focus shifts from voting to also the process: deliberation, tolerance, respect
- **Role citizens:** readiness to dialogue, politically interested and engaged, information omnivores
- **Recommendation is diverse if:** representation heterogeneous interests etc. beyond purely political, attention for grassroots, minorities, strong presence public service as 'social glue'



Radical and critical models



Critical perspective

- **Values:** popular inclusion, contestation of elites, attention for differences
- **Role citizens:** high normative expectations, active and critical, 'see' and acknowledge minorities, being different, questioning reigning elites & power structures
- **Recommendation is diverse:** if it nudges us to “experience otherness” (Gurevich, 1988, 1189), focus on minorities, radical and critical voices, every-day-life, filterbubbles can be a good thing



Re-thinking filterbubbles



When are recommendations diverse?

- **Liberal recommender:** **interest-driven diversity**

> informs about politics, shows political alternatives, *and for the rest gives people what they want*

- **Participatory recommender:** **representative diversity**

> maps diversity of ideas and opinions in society, responds to differences in information needs, styles and preferences

- **Deliberative recommender:** **challenging diversity**

> nudges to encounter different perspectives, serendipity, activates people to comment, share, engage, like, dislike

- **Critical recommender:** **provocative diversity**

- nudges people to encounter and acknowledge minority opinions, finding and engaging with like-minded

Recom- mendation 'flavour'	Participatory recommender	Liberal recommender	Deliberative recommender	Critical recommender
Optimising for....	Participation	Users' autonomy and self- development	Democratic discourse	Critical inclusiveness
Diverse exposure =	Inclusive representation of main different political/ideological viewpoints in society	Responsive to individual preference signals Adaptive to preference changes	Balanced content, commentary, discussion formats, background info	Minority voices Prominence for less popular content
	Focus on political content/news but also: non-news content (e.g. more participatory models)	Privacy-sensitive Little variance, in the sense of distance from personal preferences	Beyond politics Share of articles presenting various perspectives, diversity of emotions, range of different sources	Critical tone Content that is purposefully biased, provokes, exposes and challenges
	Background info, political advertising		Prominence PSM	
Beyond exposure	Accessible, multi- platform, heterogeneity of styles and tones, can be emotional, emphatic, mobilising	Active user curation of media offer, recommendation Sharing, likes, clicks, duration of engagement	Rational, inclusive, showing both sides, consensus seeking + invite comment/ participation	Heterogeneous, narratives, affective, emotional, provocative, figurative, shrill
Counter indication	Over-participation, fragmentation, fatigue	Conflict with editorial freedom, watchdog function	Backfire effects, indifference	Fragmentation, radicalisation

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Next step

SIDN project: Unlocking the potential of news recommenders for an open internet and empowered citizens. Runtime: 2018-2019.

Goal: To develop a **toolkit** that measures diversity and the preformance of recommender systems to deliver diversity.

Team: Sanne Vrijenhoek (AI), Judith Moeller (CommScience), Natali Helberger (media policy), Daan Odijk (Blendle & RTL)

In other words: We will develop



Tools to **measure**
diversity in large
quantities of
news



Tools to **map**
diversity in
personalised
recommendations



Tools to **evaluate**
and improve
diversity in news
recommendation
systems

Lessons we learn

- Diversity is about the right mix of metrics
- There is no optimal % of diversity
- Approaches to solving diversity questions differ between disciplines (vagueness as a comfort zone vs solving a computer science problem)
- As do ideas of what ‘sufficiently concrete metrics’ mean/where exactly more concretisation is needed (e.g. what is non-news content, how to identify topics)
- Both fields publish & present in separate worlds: need to identify common grounds & venues

Questions we still need to solve & would greatly appreciate your input

- How to translate (abstract) normative conceptions of diversity into concrete metrics & benchmarks?
- When “concretizing” diversity how can we do so in a way that is also useful for computer scientists?
- How can we visualise diversity best (user facing)?
- Which values/metrics to combine?
- Are certain types of diverse recommenders more likely to be build than others, and if so, why?
- What categories of metrics already exist, and:
- Are you aware of comparable projects we could learn from?

Conclusions

- Algorithmic recommendations and filtering can pose risks but also opportunities for diversity.
- Different recommendation logics can conform to different conceptions of diversity, and promote different values: autonomy, tolerance, deliberation, political participation, etc.
- Maybe what really matters is that we are exposed to diverse recommendation logics to realise the diverse values that we cherish in democratic societies.

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