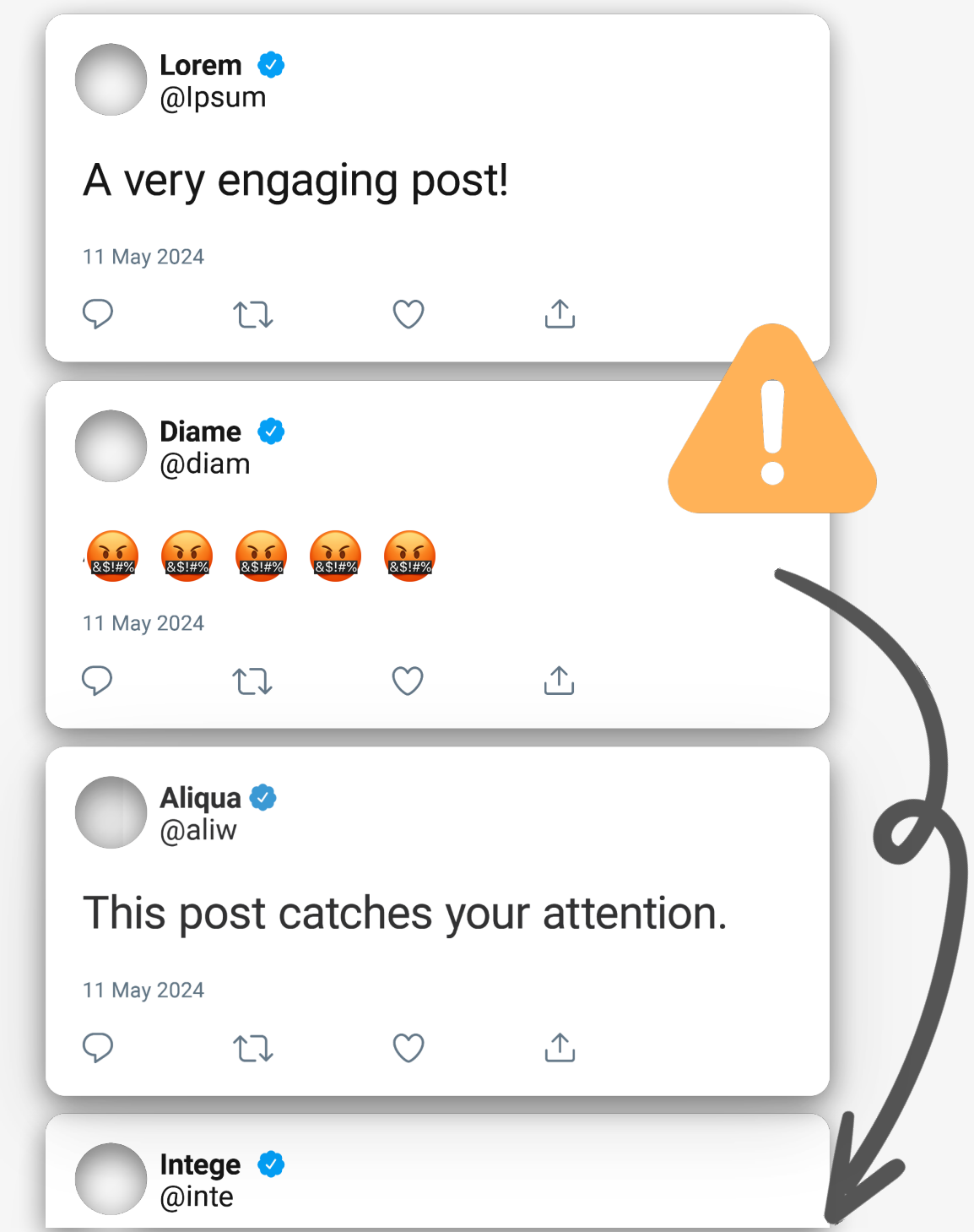


Social Media Feed Ranking Algorithms: Guide to Field Experiments

Martin Saveski
University of Washington

Tiziano Piccardi
Johns Hopkins University

IC2S2: International Conference on Computational Social Science
Burlington, Vermont
07/28/2026

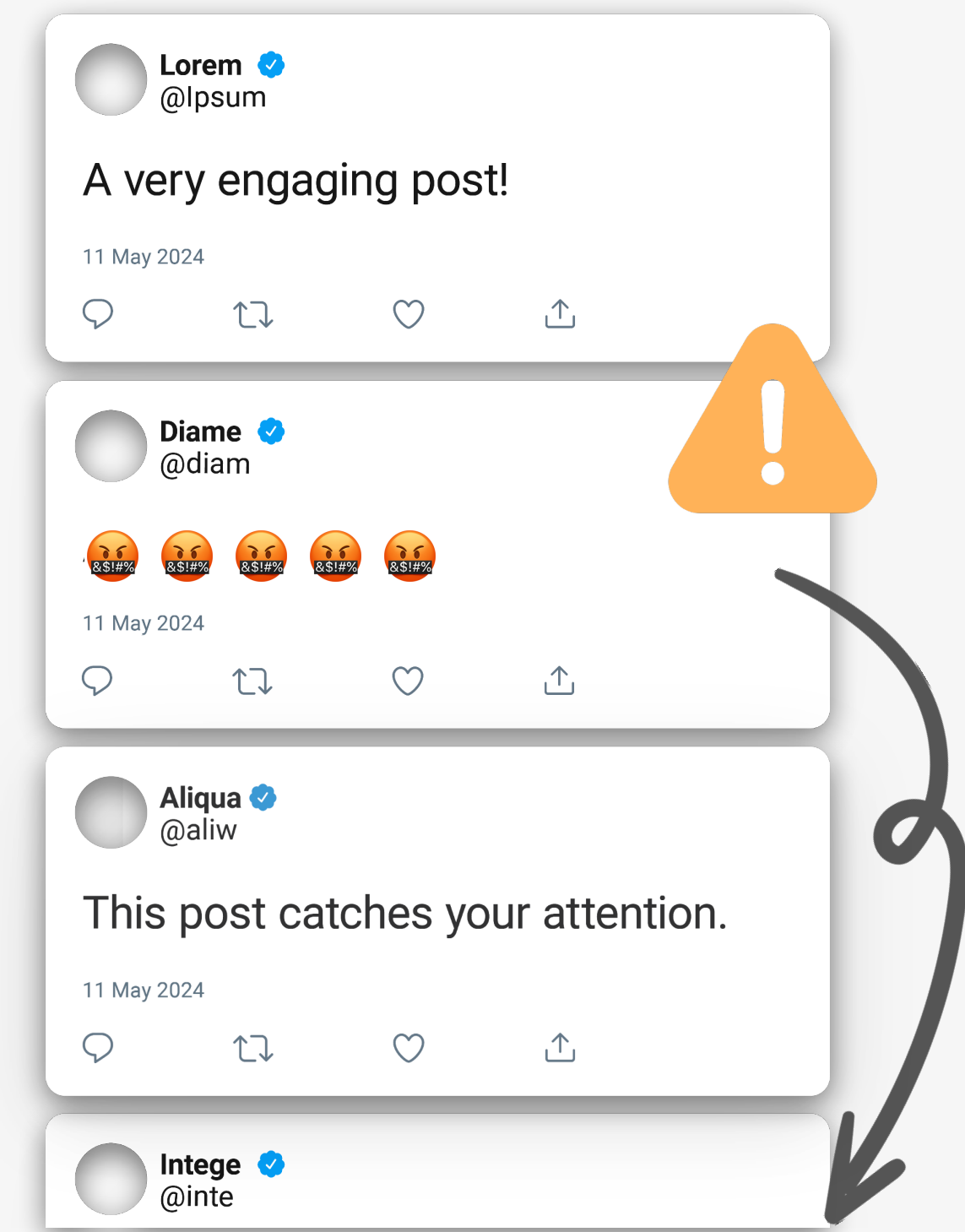


Plan for today

1. History & foundations (50 mins)
2. Feed experiments using middlewares (50 mins)
3. Hands-on tutorial (1 hour)
 - Modify feeds with a browser extension
 - Build your own BlueSky feed

Part 1: History & Foundations of Feed Ranking Algorithms

Martin Saveski



Algorithmic feeds in historical context

World Wide Web

- Invented in 1989 (37 years ago)

MySpace

- Created in 2003 (23 years ago)

Facebook

- Created in 2004 (22 years ago)
- Introduced the Like button in 2009 (17 years ago)
- Introduced an Algorithmic Feed in 2011 (15 years ago)

Twitter/X

- Created in 2006 (20 years ago)
- Introduced an Algorithmic Feed in 2016 (10 years ago)
- “See what’s happening — right now”

Before the feed

MySpace.com | Home

The Web ● MySpace ●

Search

Help | SignUp

myspace

Home | Browse | Search | Invite | Film | Mail | Blog | Favorites | Forum | Groups | Events | Videos | Music | Classifieds

Tom



":-)"
Male
30 years old
Santa Monica,
CALIFORNIA
United States

Last Login:
4/22/2006

View My: [Pics](#) | [Videos](#)

Contacting Tom

Send Message

Forward to Friend

Add to Friends

Add to Favorites

Instant Message

Block User

Add to Group

Rank User

MySpace URL:

Tom's Interests

General

Internet, Movies, Reading,
Dancing, Karaoke, Baseball,
Language. Culture. History of

Tom is in your extended network

Tom's Latest Blog Entry [[Subscribe to this Blog](#)]

MySpace Concert & Parties -Georgia, Orlando, Miami! ([view more](#))

In Stores Today - MySpace Records Vol. 1 ! ([view more](#))

MySpace Records - get more photos for your profile! ([view more](#))

October 29th - MySpace 2-Year Anniversary Concert! ([view more](#))

NIN, QOTSA, Acoustic and Punk Tours (!) ([view more](#))

[[View All Blog Entries](#)]

Tom's Blurbs

About me:

I'm here to help you with **MySpace**. Send me a message if you're confused by anything. **Before asking me a question, please check the FAQ to see if your question has already been answered.**

I may have been on your friend list when you signed up. If you don't want me to be, click "Edit Friends" and remove me!

Also, feel free to tell me what features you want to see on MySpace and if I think it's cool, we'll do it!

home search global social net invite faq logout



(This is you)

Harvard

quick search

go

My Profile [[edit](#)]

[My Groups](#)

[My Friends](#)

[My Messages](#)

[My Away Message](#)

[My Mobile Info](#)

[My Account](#)

[My Privacy](#)

Picture [[edit](#)]



Information [[edit](#)]

Account Info:

Name:

Member Since: February 9, 2004

Last Update: January 19, 2005

Basic Info:

Email:

Status: Student

Sex: Male

Year: 2005

Concentration:

Residence: Adams

Phone: 3-2060

Birthday:

Home State:

High School:

Extended Info:

Scrennname:

Looking For: Friendship
Dating

Interested In: Women

Relationship Status: Single

Political Views: Moderate

Facebook introduces the News Feed

September, 2006



Facebook introduces an algorithmic feed

September, 2011

The Facebook Blog



Interesting News, Any Time You Visit

by Mark Tonkelowitz on Tuesday, September 20, 2011 at 12:30pm

When you visit Facebook, you should see the things you're most interested in, like status updates from your family and closest friends. Last week, we announced improvements to [Friend Lists](#) and a new [Subscribe button](#) to help you see more of what you care about, and less of what you don't.

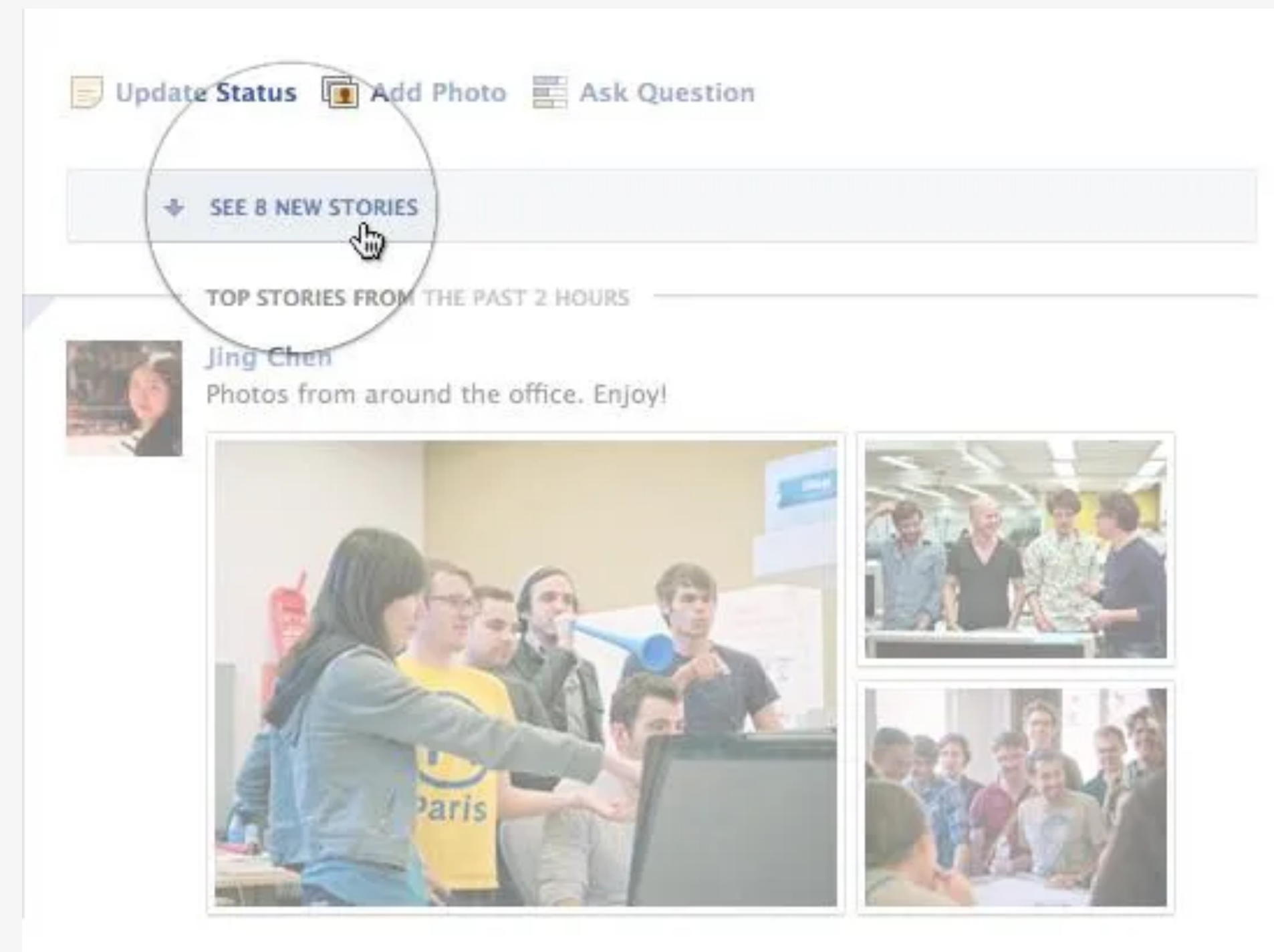
But it's not just the people you hear from that make your News Feed interesting. It also matters how much you visit Facebook. If you haven't returned in a week, you may want to see a summary of top stories first. If you've already visited several times that day, you probably care more about recent news.

Starting today, it will be easier to keep up with the people in your life no matter how frequently or infrequently you're on Facebook.

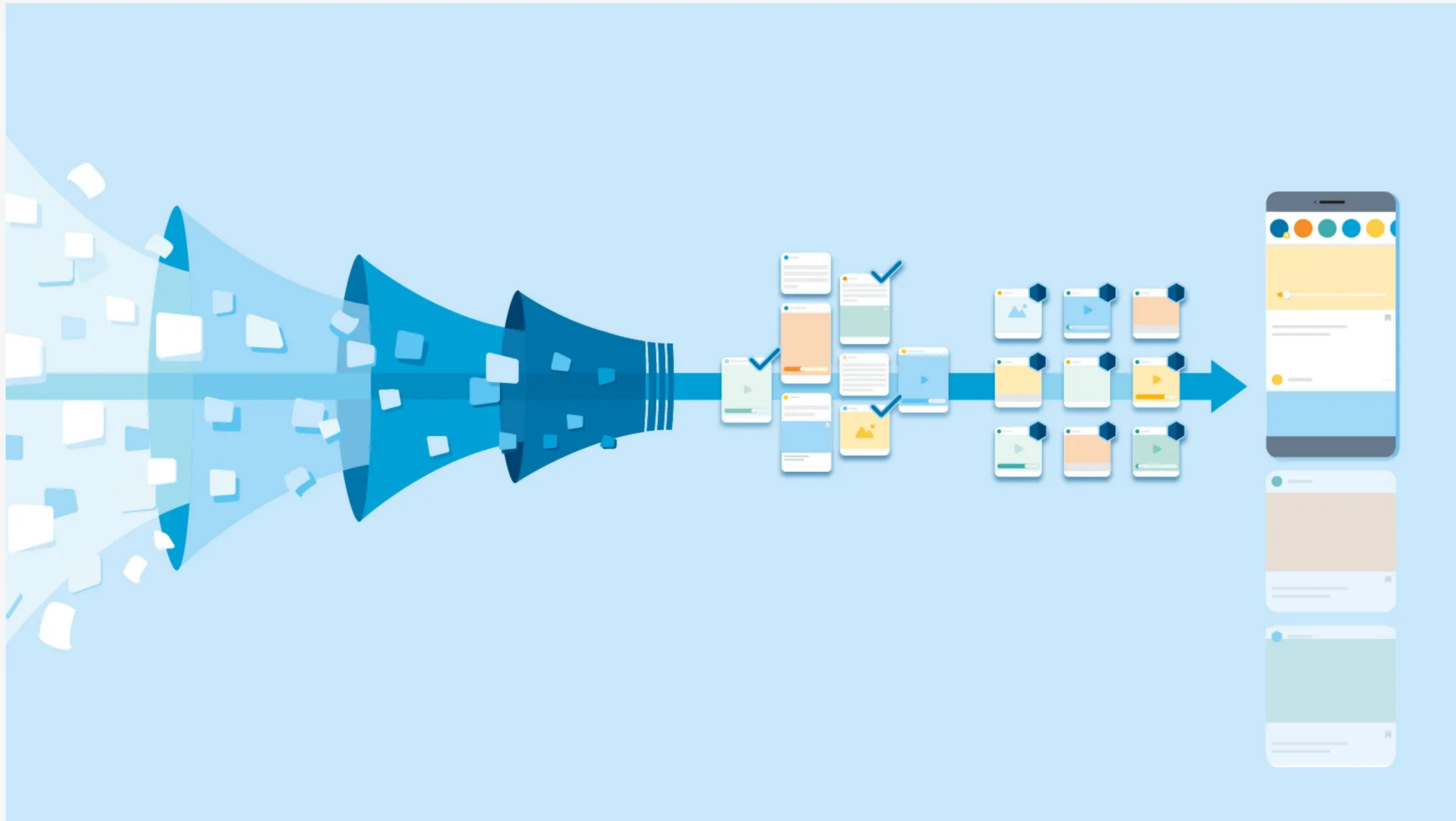
News Feed: See What Matters at the Top

When you pick up a newspaper after not reading it for a week, the front page quickly clues you into the most interesting stories. In the past, News Feed hasn't worked like that. Updates slide down in chronological order so it's tough to zero in on what matters most.

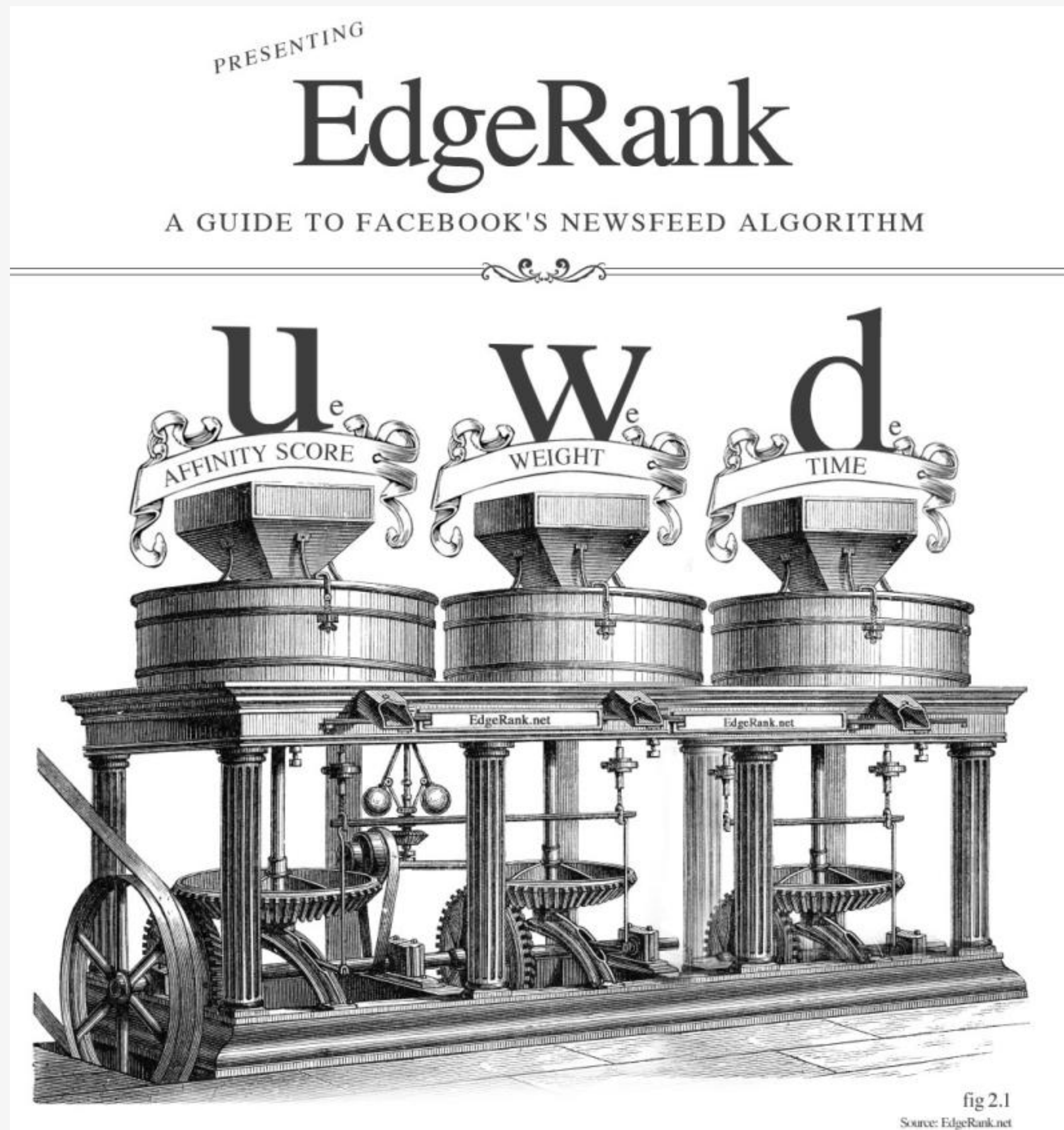
Now, News Feed will act more like your own personal newspaper. You won't have to worry about missing important stuff. All your news will be in a single stream with the most interesting stories featured at the top. If you haven't visited Facebook for a while, the first things you'll see are top photos and statuses posted while you've been away. They're marked with an easy-to-spot blue corner.



Goals of a feed algorithm



Facebook's first feed ranking algorithm (2011)



$$\text{score}(\text{user}, \text{item}) = \frac{\text{affinity}(\text{user}, \text{poster}) * \text{Weight}[\text{item.type}]}{\text{item.age}}$$

affinity(user, poster):

How much the user cares about the poster (manually crafted)

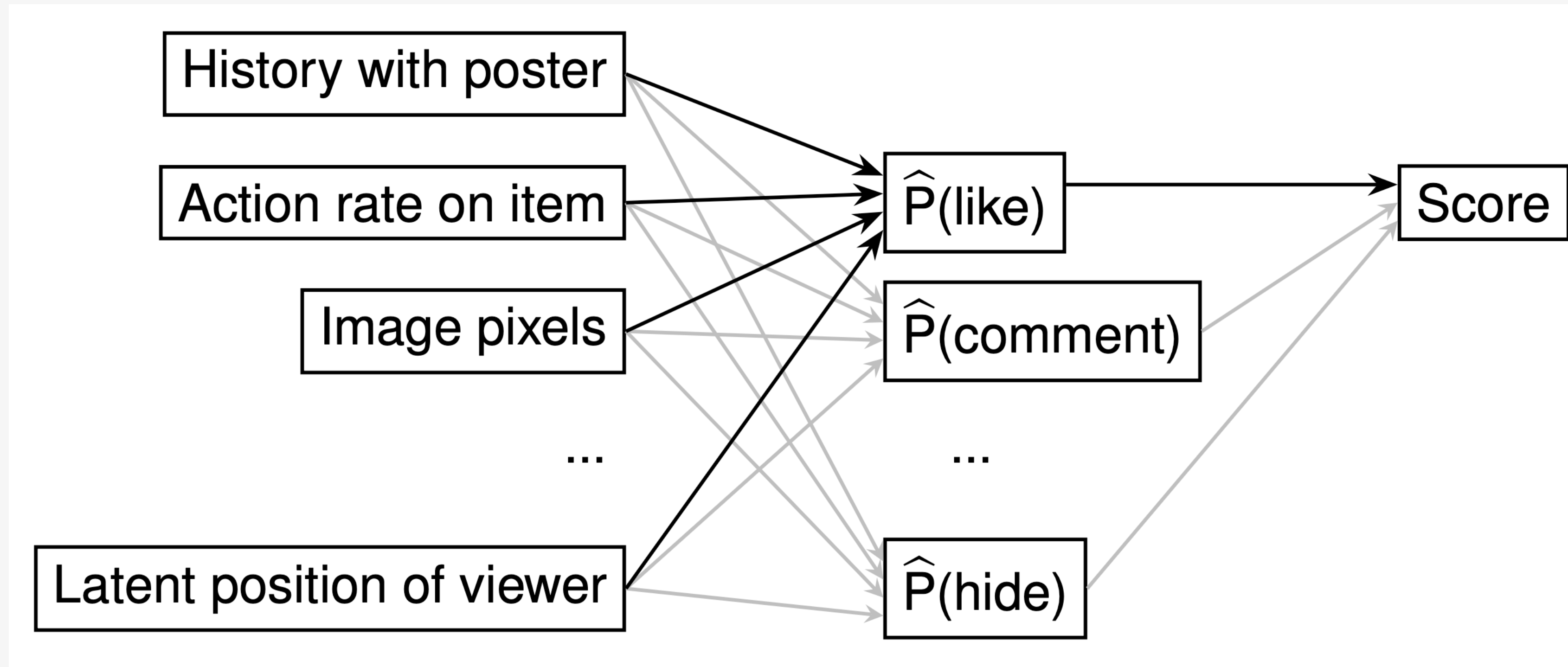
Weight[item.type]:

How engaging different type of content are

item.age:

Posts scores decay over time

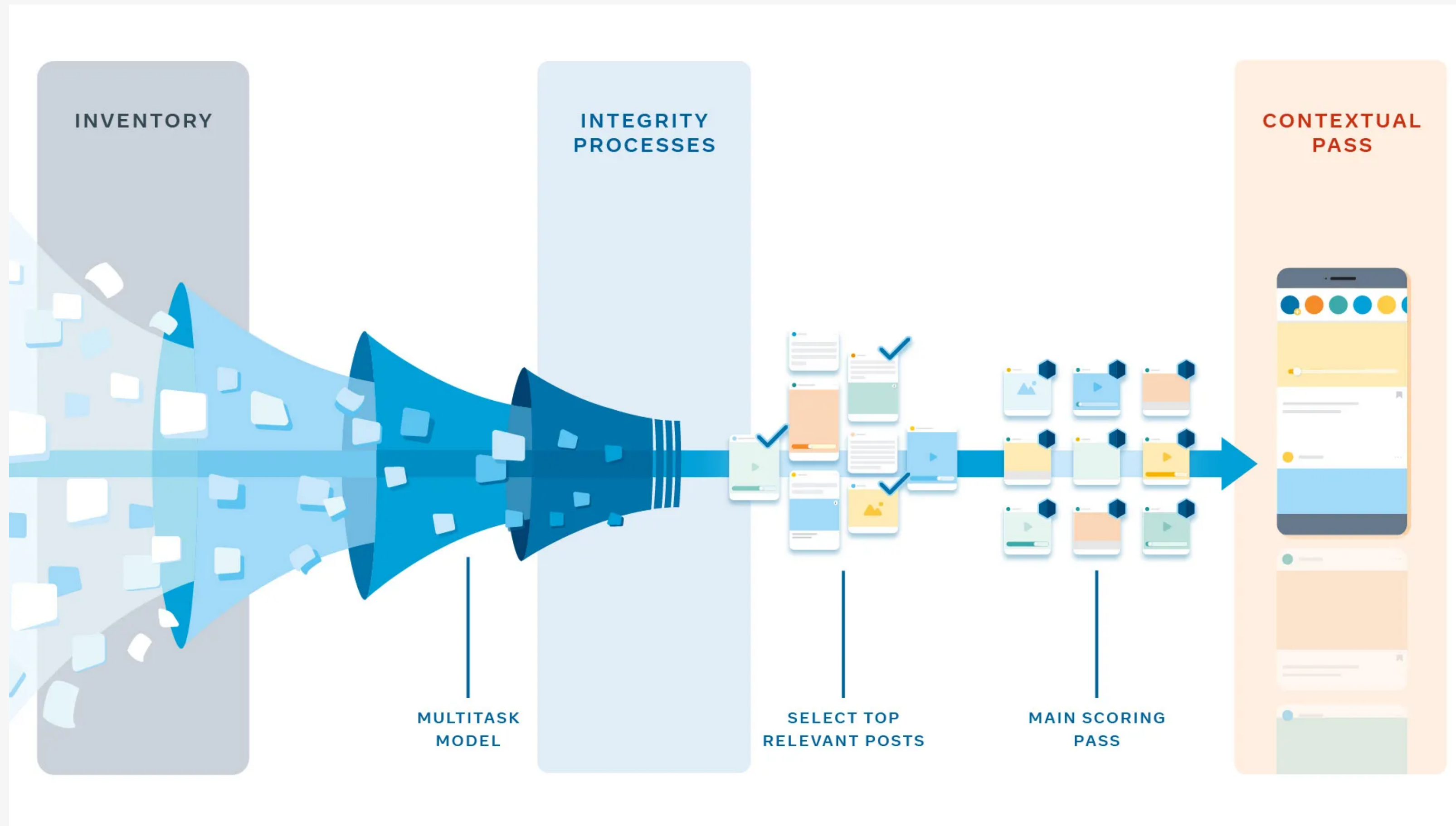
Modern feed ranking algorithms



Score =

$$w_{\text{like}} \times P(\text{like}) + \\ w_{\text{comment}} \times P(\text{comment}) + \\ \dots + \\ w_{\text{hide}} \times P(\text{hide})$$

Facebook's (recent) feed ranking algorithm



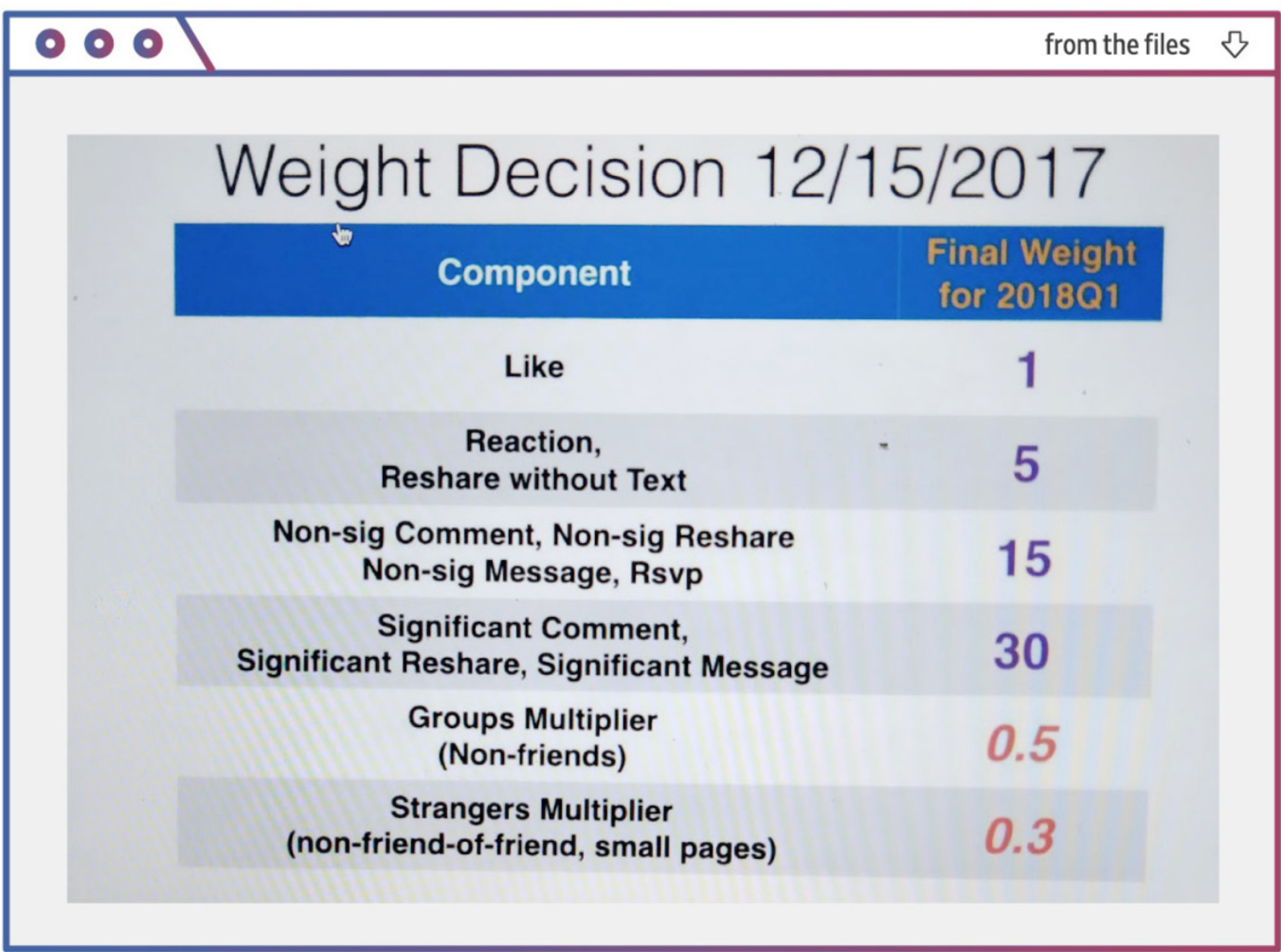
Facebook's (recent) feed ranking algorithm

100s of prediction models based on 1000s of signals

Four main categories of predictions:

1. Actions you'll take on the post
2. How you'll spend time viewing the post
3. Your interest in the post or person, Page or Group that shared the post
4. How others will interact with the post if you take a certain action, such as commenting or sharing a post

Facebook’s “Meaningful Social Interactions”



from the files

Component	Final Weight for 2018Q1
Like	1
Reaction, Reshare without Text	5
Non-sig Comment, Non-sig Reshare Non-sig Message, Rsvp	15
Significant Comment, Significant Reshare, Significant Message	30
Groups Multiplier (Non-friends)	0.5
Strangers Multiplier (non-friend-of-friend, small pages)	0.3

December 2017 internal Facebook memo titled “The story of deriving Meaningful Social Interactions metric weights” published by Wall Street Journal;
Borrowed from: Narayanan, “Understanding Social Media Recommendation Algorithms” (2023)

Twitter/X's “For You” algorithm, 2023

Candidate Sourcing

In-network posts (~50%)

- Recent posts by users you follow

Out-of-network posts (~50%)

- Posts users you follow recently engaged with
- Posts & users are similar to your interests

Ranking

Light Ranker

- Fast Logistic Regression model (faster)

Heavy Ranker

- ~48M parameter neural network (slower)

Both designed to predict engagement

Heuristics & Filters

- **Author Diversity:** Avoid too many consecutive posts from a single author.
- **Content Balance:** balance of In-Network and Out-of-Network posts
- **T&S Safety Filtering:** remove spam, violence, etc.

.....

Twitter/X's “For You” algorithm, 2026

Candidate Sourcing

In-network posts (~???)

- Recent posts by users you follow

Out-of-network posts (~???)

- Embedding-based retrieval model, considers all recent posts

Ranking

Phoenix Scorer

- Grok 1 based transformer model that predicts $p(\text{like, report, reply, etc})$

Weighted Scorer

- Combine predictions into a final relevance score

Heuristics & Filters

- **Author Diversity:** Avoid too many consecutive posts from a single author.
- **Content Balance:** balance of In-Network and Out-of-Network posts
- **T&S Safety Filtering:** remove spam, violence, etc.

....

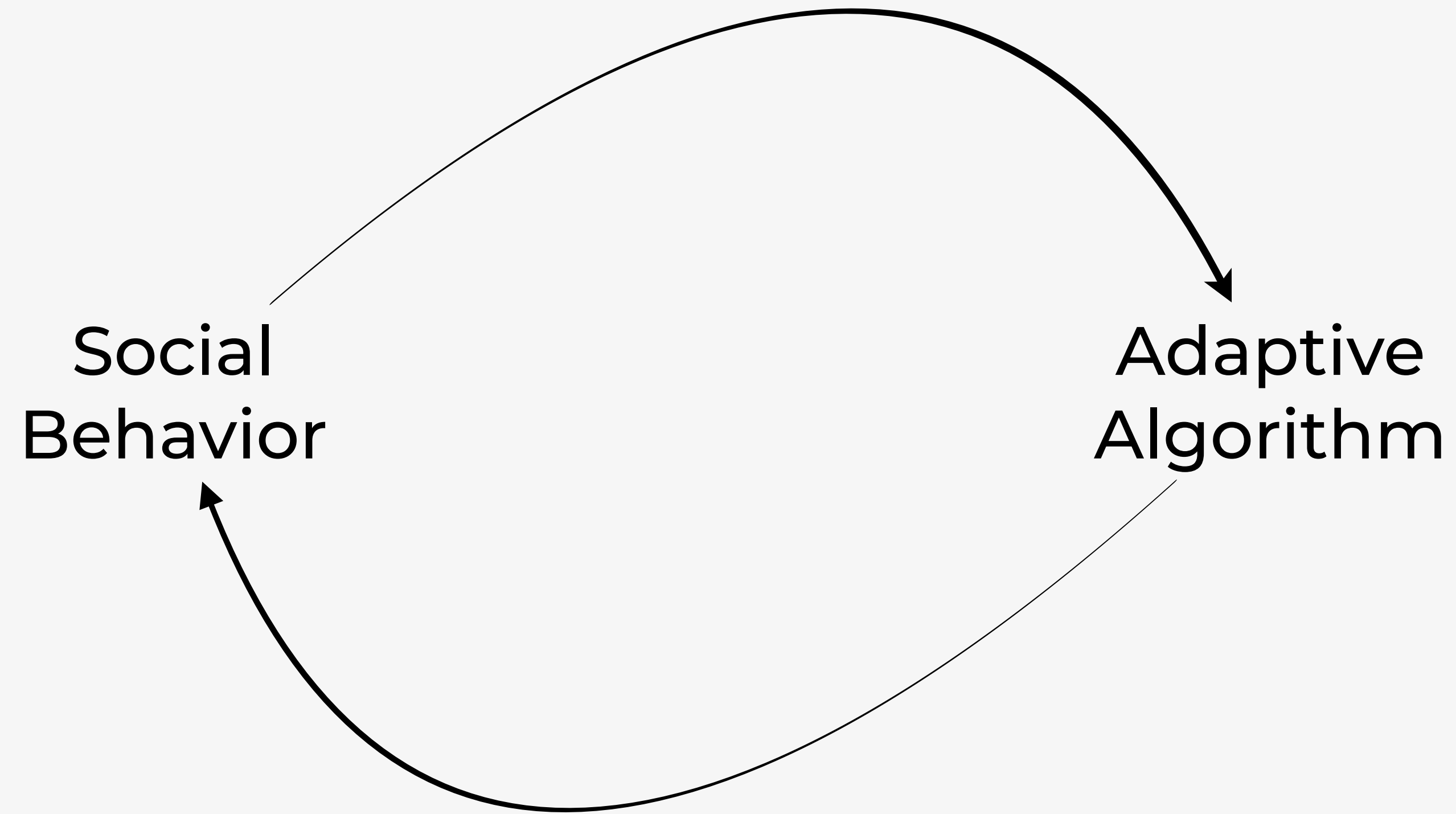
Twitter/X's “For You” algorithm: Weights

Type of engagement	2023 Weight
Probability the user will like the tweet	0.5
Probability the user will retweet the tweet	1.0
Probability the user replies to the tweet	13.5
Probability the user opens the tweet author profile and likes or replies to a tweet	12.0
Probability (for a video tweet) that the user will watch at least half of the video	0.005
Probability the user replies to the tweet and this reply is engaged by the tweet author	75.0
Probability the user will click into the conversation of this tweet and reply or like a tweet	11.0
Probability the user will click into the conversation and stay there for at least 2 minutes	10.0
Probability the user will react negatively (requesting “show less often” on the tweet or author, block or mute the tweet author)	-74.0
Probability the user will click report tweet	-369.0

Twitter/X’s “For You” algorithm: Weights

Type of engagement	2023 Weight	2026 Weight
Probability the user will like the tweet	0.5	???
Probability the user will retweet the tweet	1.0	???
Probability the user replies to the tweet	13.5	???
Probability the user opens the tweet author profile and likes or replies to a tweet	12.0	???
Probability (for a video tweet) that the user will watch at least half of the video	0.005	???
Probability the user replies to the tweet and this reply is engaged by the tweet author	75.0	???
Probability the user will click into the conversation of this tweet and reply or like a tweet	11.0	???
Probability the user will click into the conversation and stay there for at least 2 minutes	10.0	???
Probability the user will react negatively (requesting “show less often” on the tweet or author, block or mute the tweet author)	-74.0	???
Probability the user will click report tweet	-369.0	???

Complex feedback loop in feed algorithms



Are feed algorithms to blame?

Political
polarization

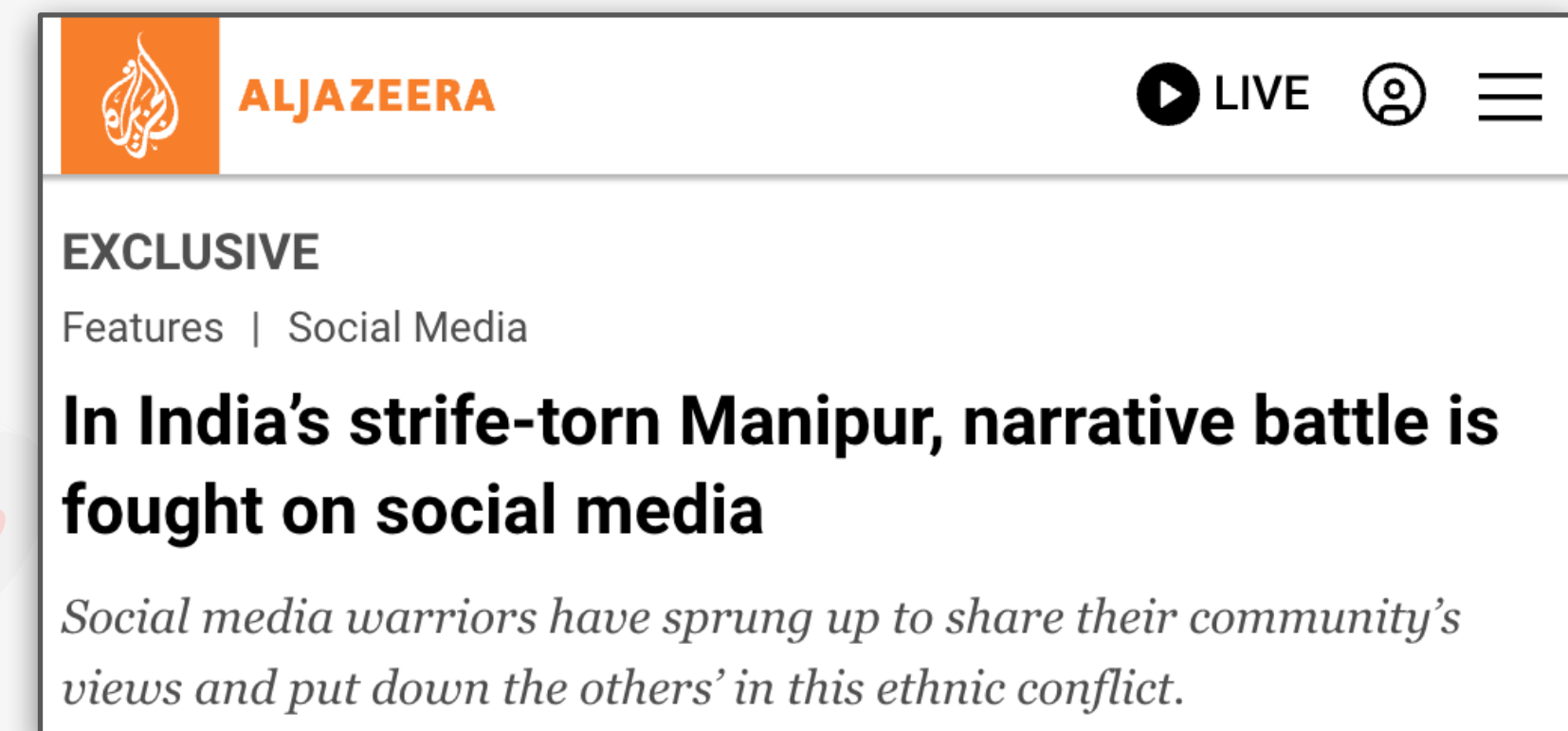
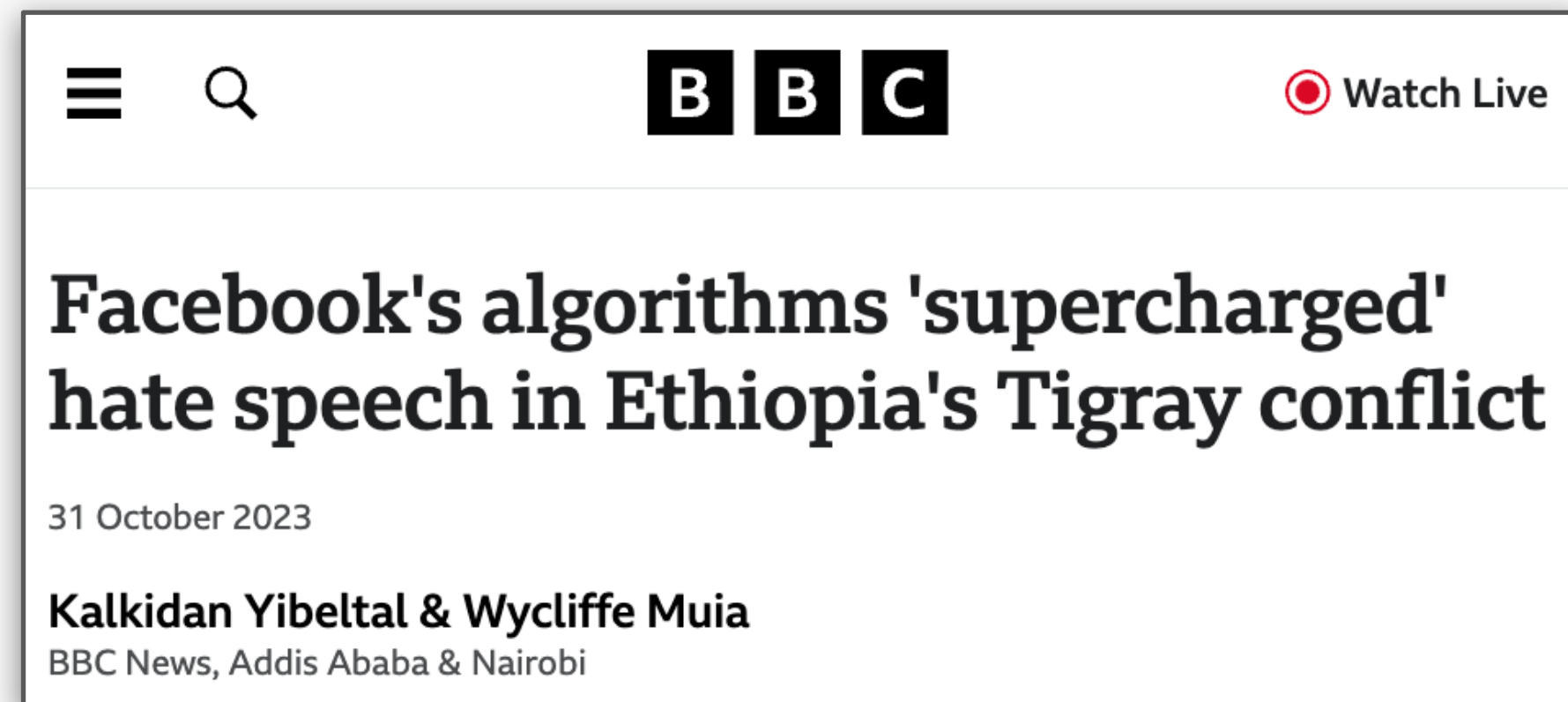
Misinformation

Mental
health risks

Online
harassment



Are feed algorithms to blame?



Mental
health risks

Online
harassment

Science: Special issue on social media and elections

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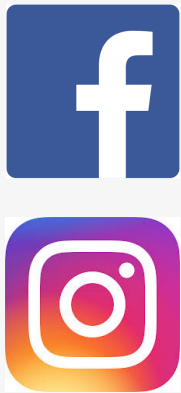
Studies find little impact of social media on polarization

BY KAI KUPFERSCHMIDT

Big collaboration between Meta and external researchers

<https://www.science.org/toc/science/381/6656>

Algorithmic vs. Chronological feeds



How do social media feed algorithms affect attitudes and behavior in an election campaign?

ANDREW M. GUESS , NEIL MALHOTRA , JENNIFER PAN , PABLO BARBERÁ , HUNT ALLCOTT, TAYLOR BROWN , ADRIANA CRESPO-TENORIO, DREW DIMMERY , DEEN FREELON , [...], AND JOSHUA A. TUCKER +19 authors [Authors Info & Affiliations](#)

SCIENCE • 27 Jul 2023 • Vol 381, Issue 6656 • pp. 398-404 • DOI: 10.1126/science.abp9364



The political effects of X’s feed algorithm

[Germain Gauthier](#), [Roland Hodler](#), [Philine Widmer](#) & [Ekaterina Zhuravskaya](#)

[Nature](#) 652, 416–423 (2026) | [Cite this article](#)

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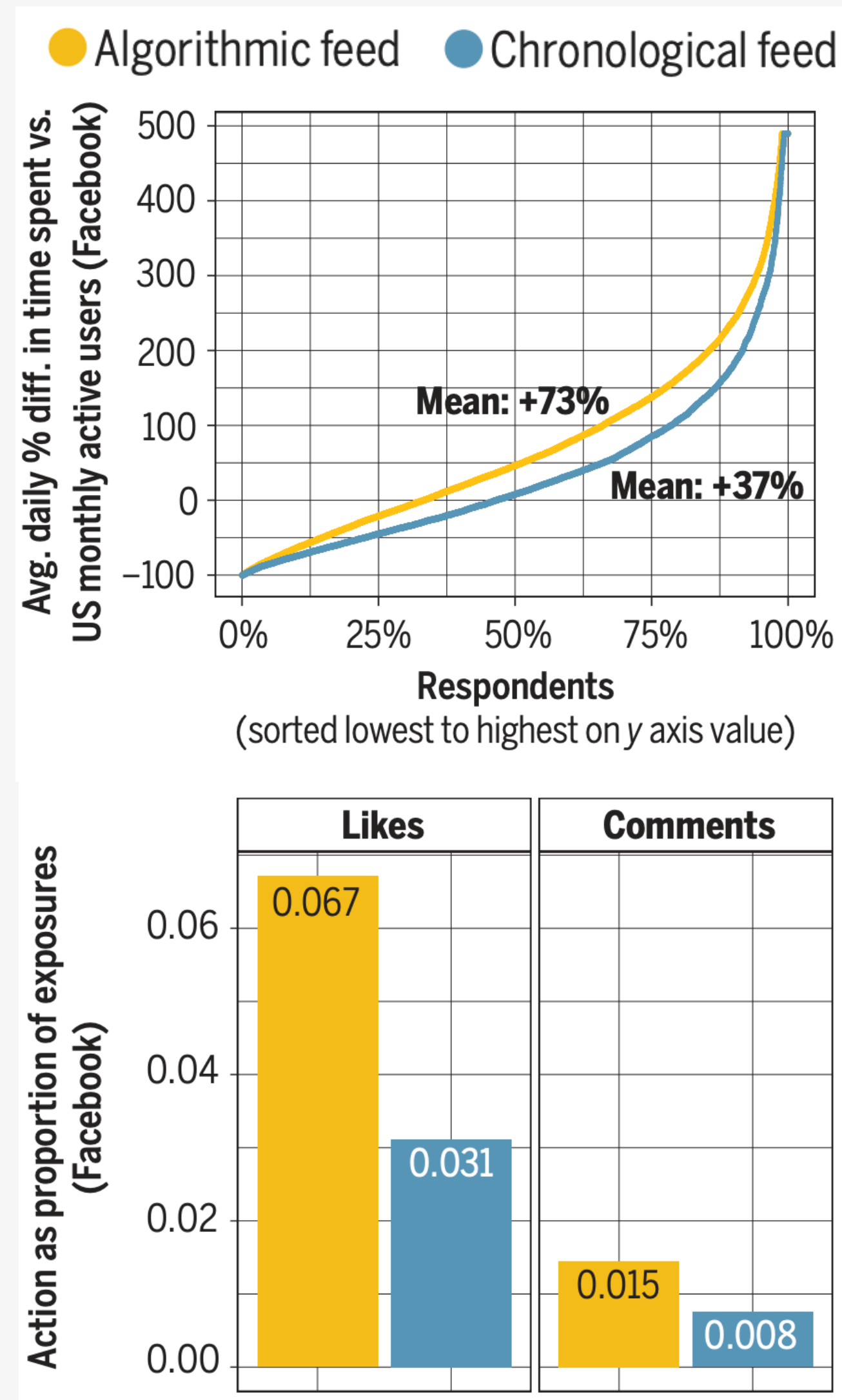
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Reranking partisan animosity in algorithmic social media feeds alters affective polarization

TIZIANO PICCARDI , MARTIN SAVESKI , CHENYAN JIA , JEFFREY HANCOCK , JEANNE L. TSAI , AND MICHAEL S. BERNSTEIN

SCIENCE • 27 Nov 2025 • Vol 390, Issue 6776 • DOI: 10.1126/science.adu5584

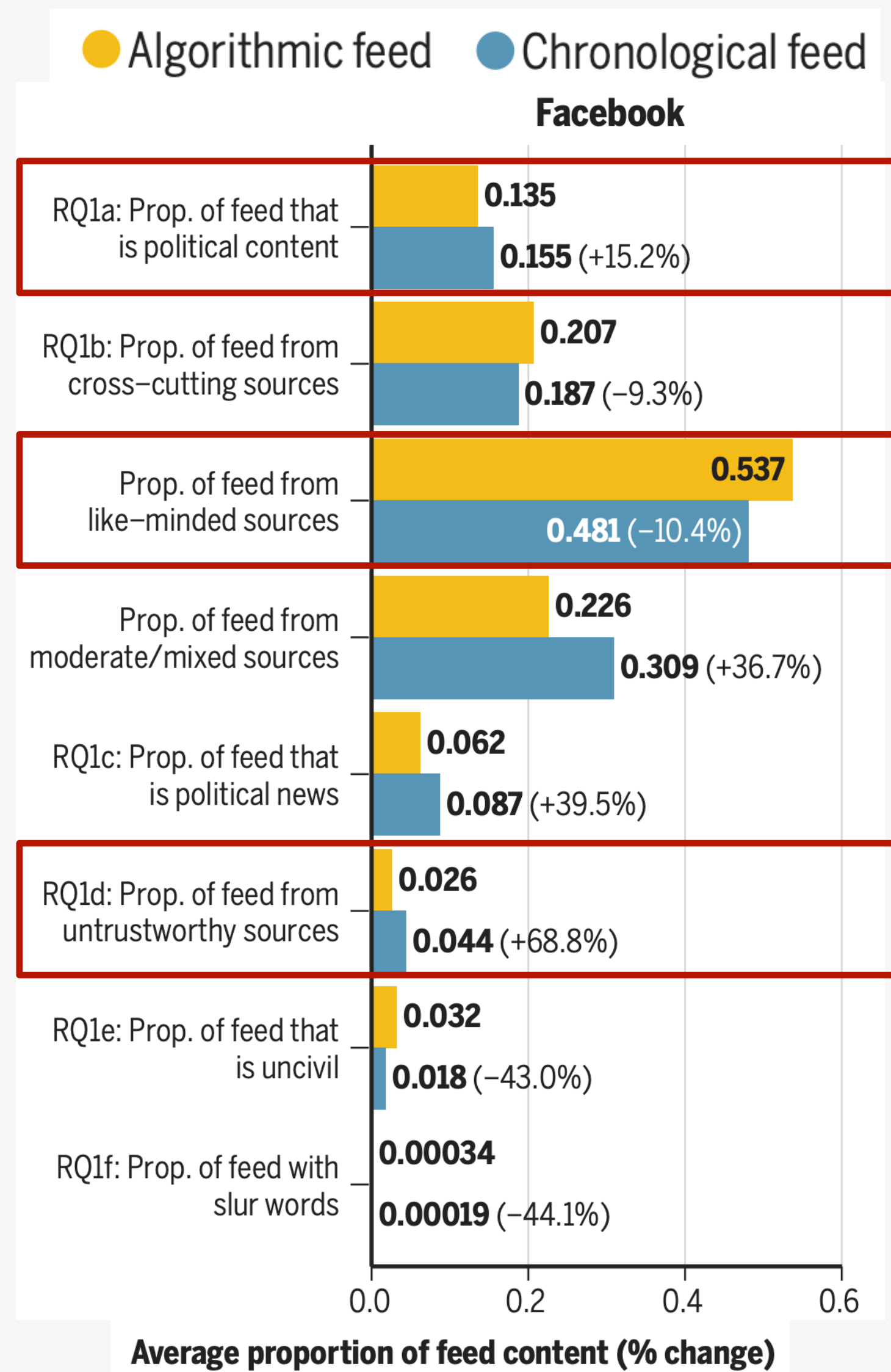
Algorithmic vs. chronological feed, Meta in 2020



Moving to chronological feed:

- Decreased time spent on the platform
- Decreased rate of likes and comments

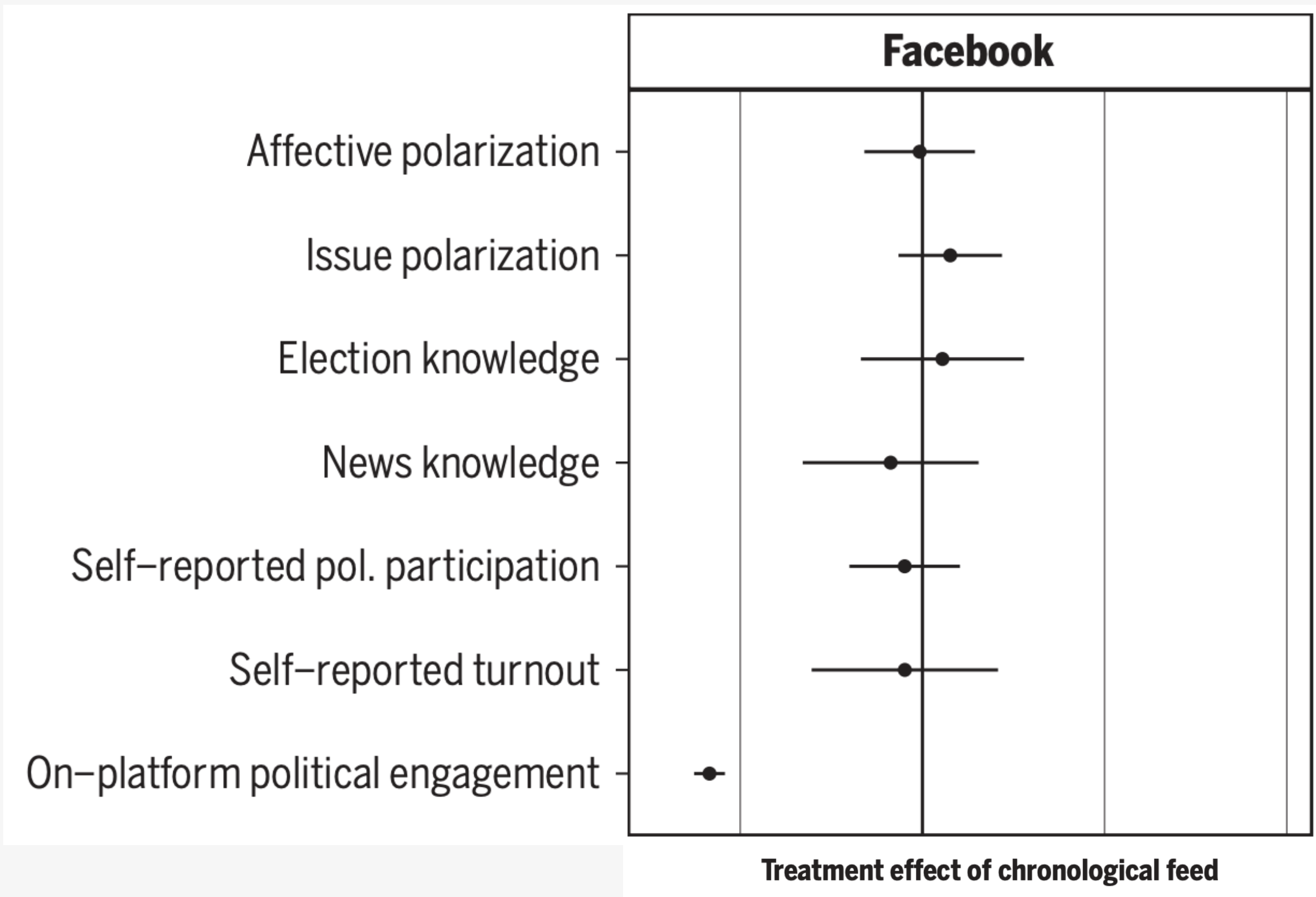
Algorithmic vs. chronological feed, Meta in 2020



Moving to chronological feed:

- ↑ exposure to political content
- ↓ exposure to like-minded sources
- ↑ exposure to untrustworthy content

Algorithmic vs. chronological feed, Meta in 2020

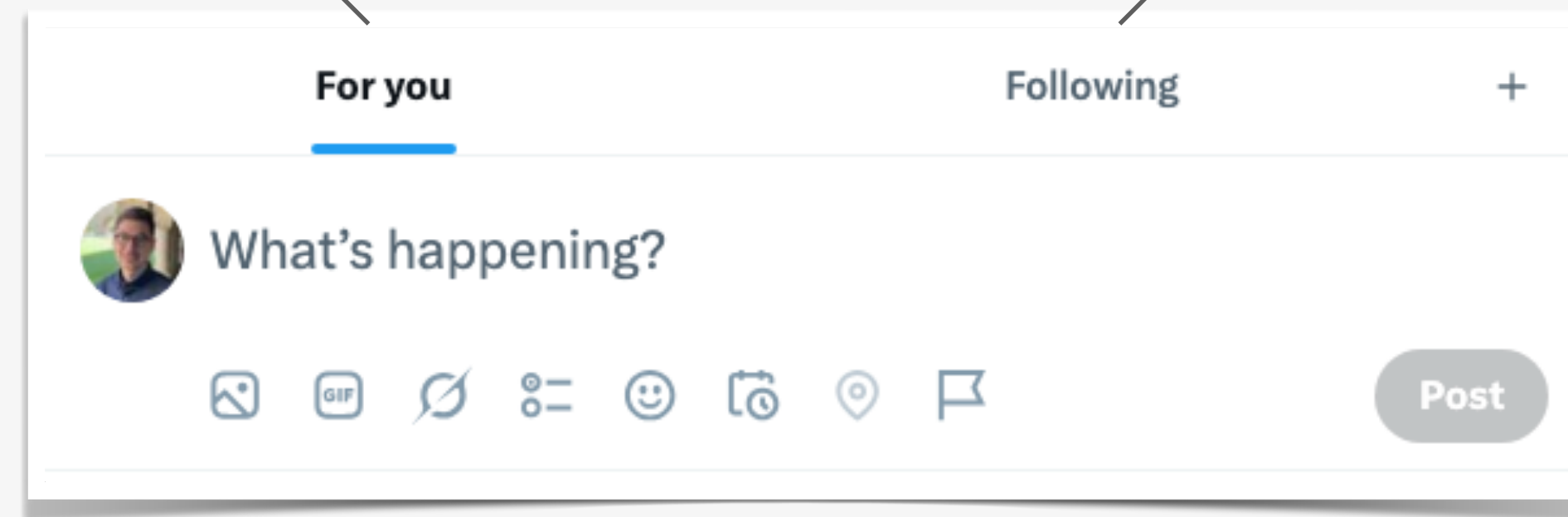


No significant changes on issue polarization, affective polarization, political knowledge, or other key attitudes during the 3-month study period

Algorithmic vs. chronological feed, X in 2023

Algorithmic
Feed

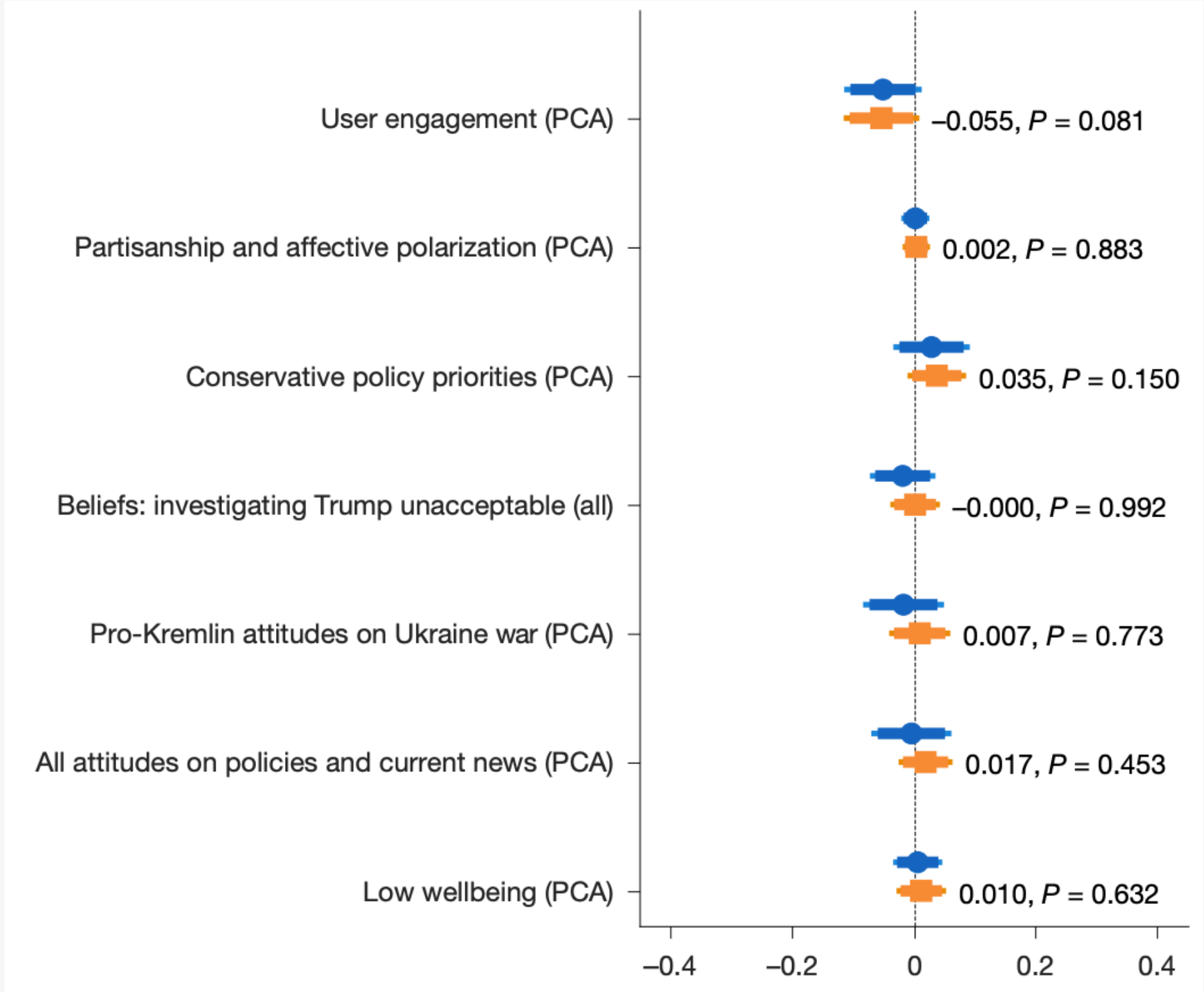
Chronological
Feed



Treatments: Algorithmic => Chronological
Chronological => Algorithmic

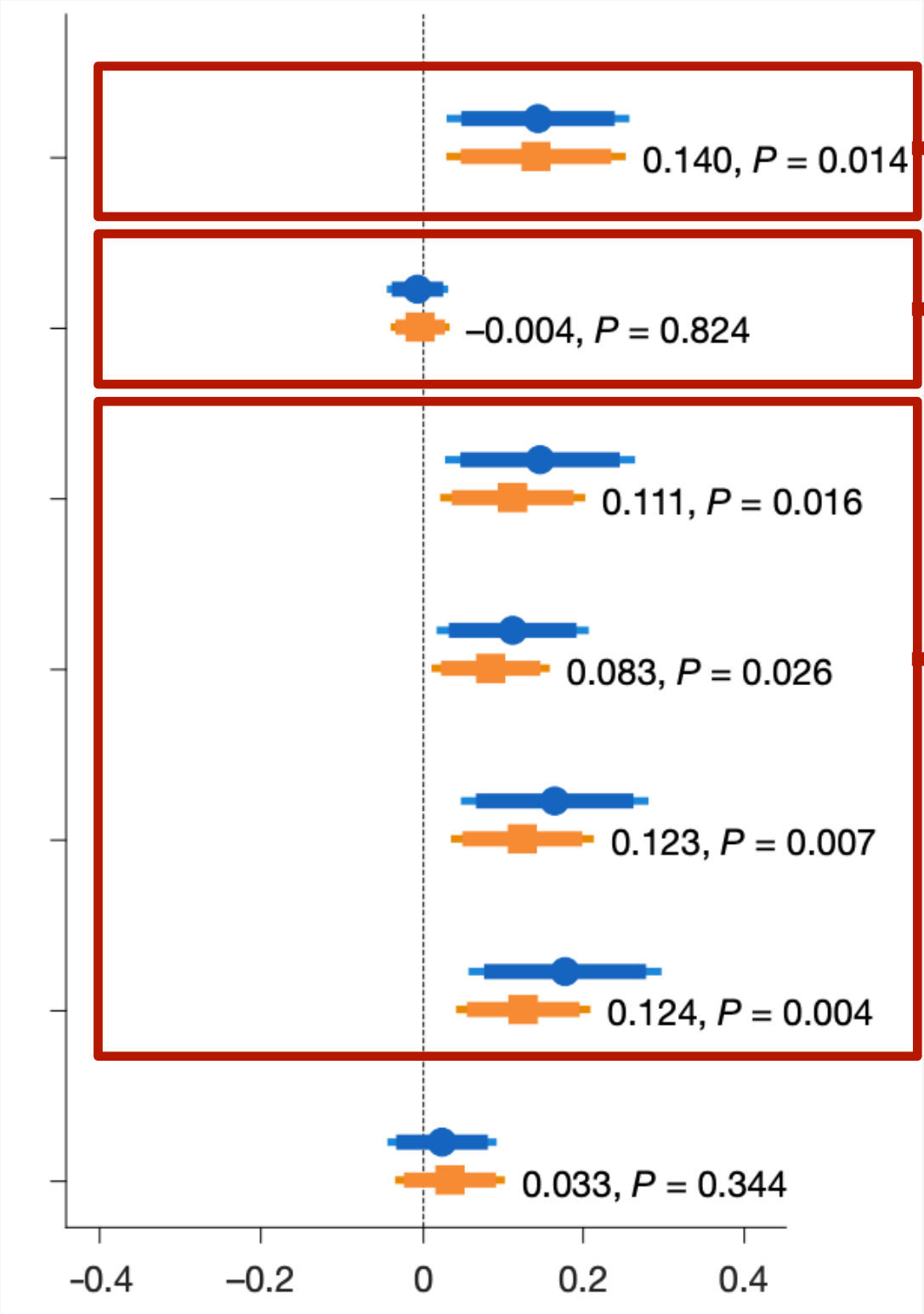
Algorithmic vs. chronological feed, X in 2023

Algorithmic
=>
Chronological



No effects

Chronological
=>
Algorithmic

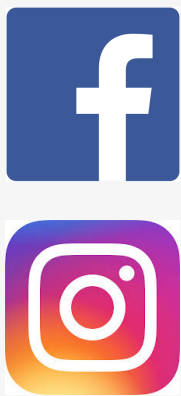


→ Increase in engagement

→ No change in polarization

→ More conservative attitudes

Algorithmic vs. Chronological feeds



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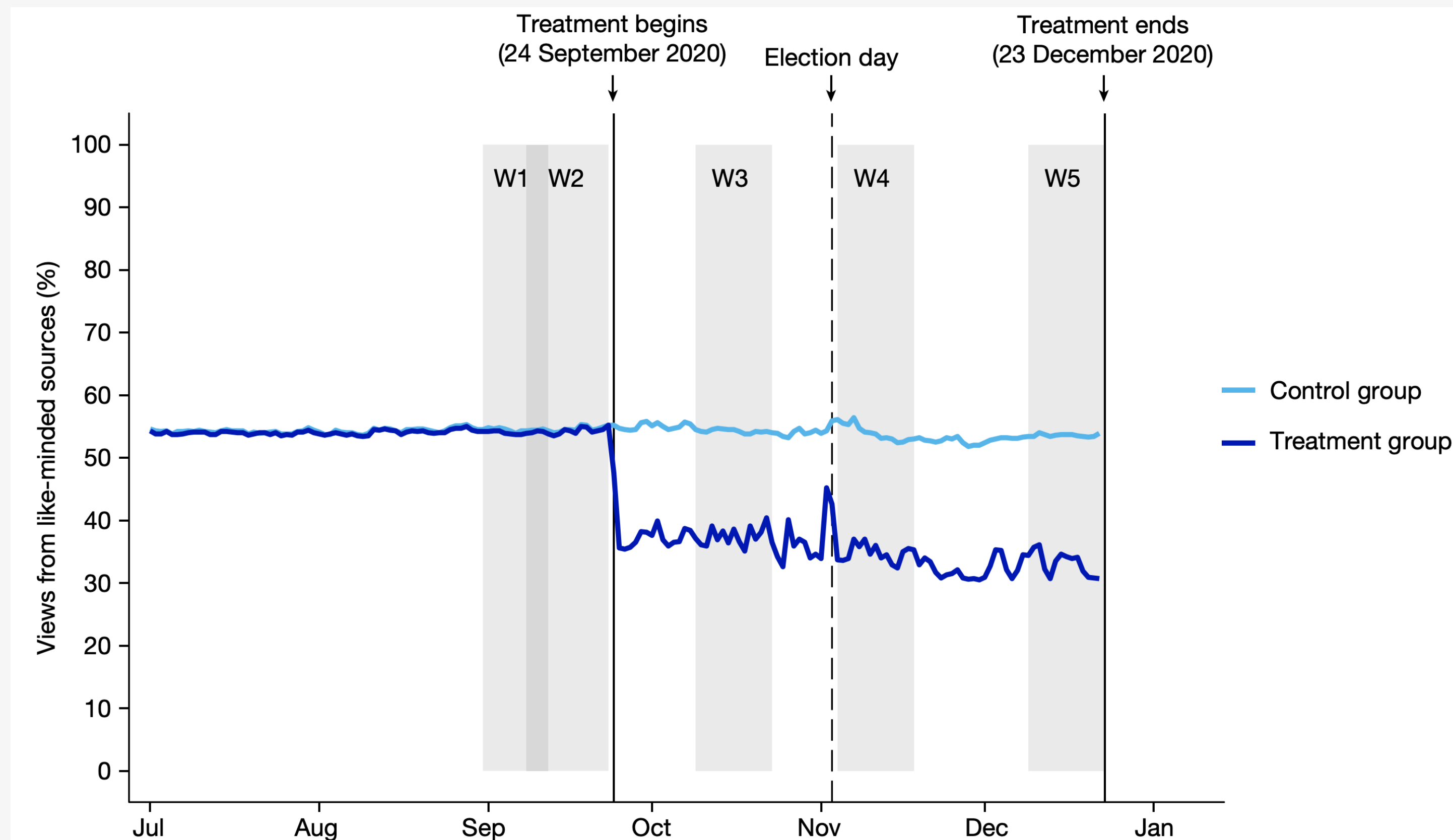
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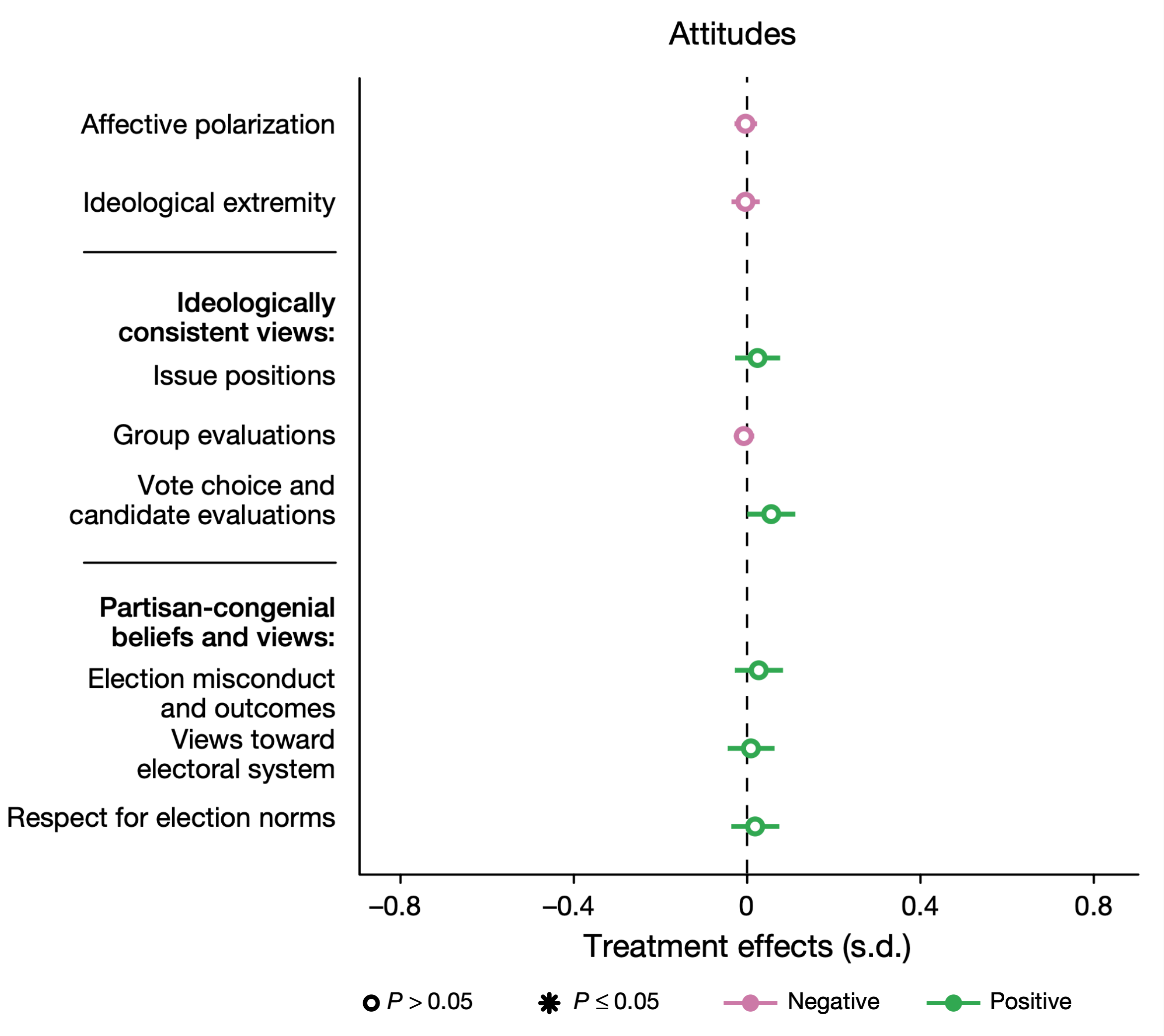
Reduced exposure to like-minded sources, Meta in 2020

“... content from ‘like-minded’ sources constitutes the **majority** of what people see on the platform, although political information and news represent only a **small fraction** of these exposures”



Field experiment on Facebook **reducing exposure** to content from like-minded sources (n=23k)

Reduced exposure to like-minded sources, Meta in 2020



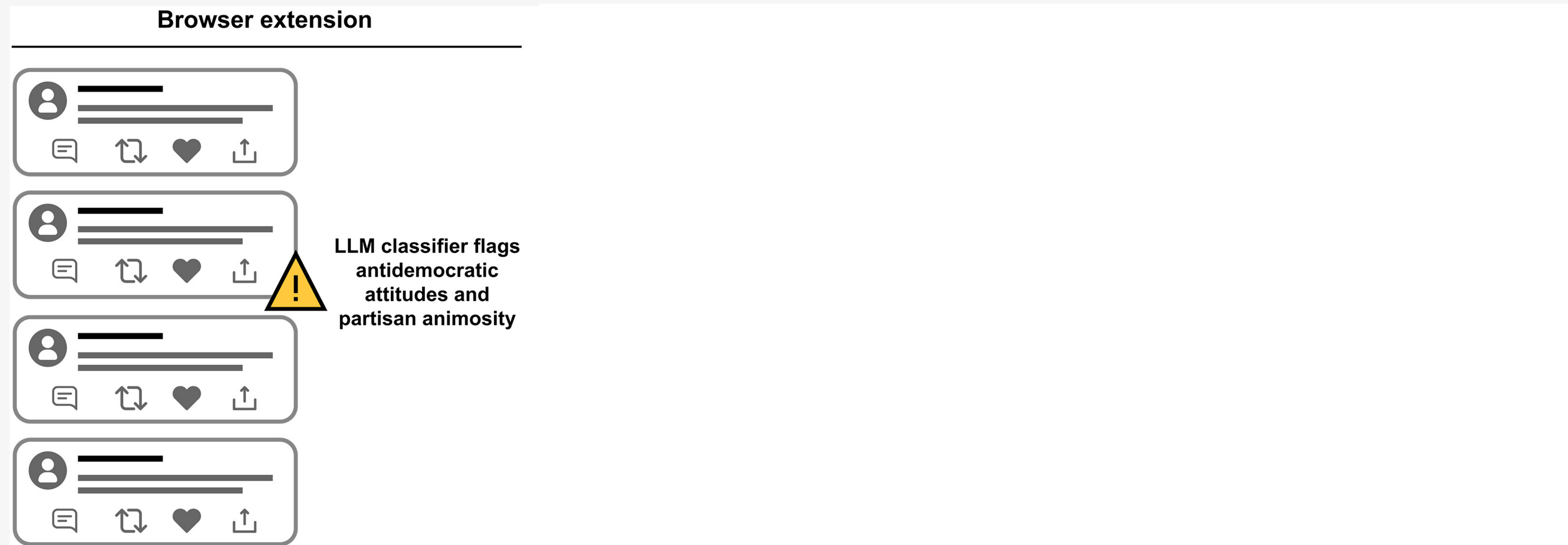
The intervention had **no measurable effects** on eight preregistered attitudinal measures

Reranking anti-democratic attitudes using LLMs, X in 2024

Key idea: Reranking content that is likely to polarize (anti-democratic attitudes and partisan animosity)

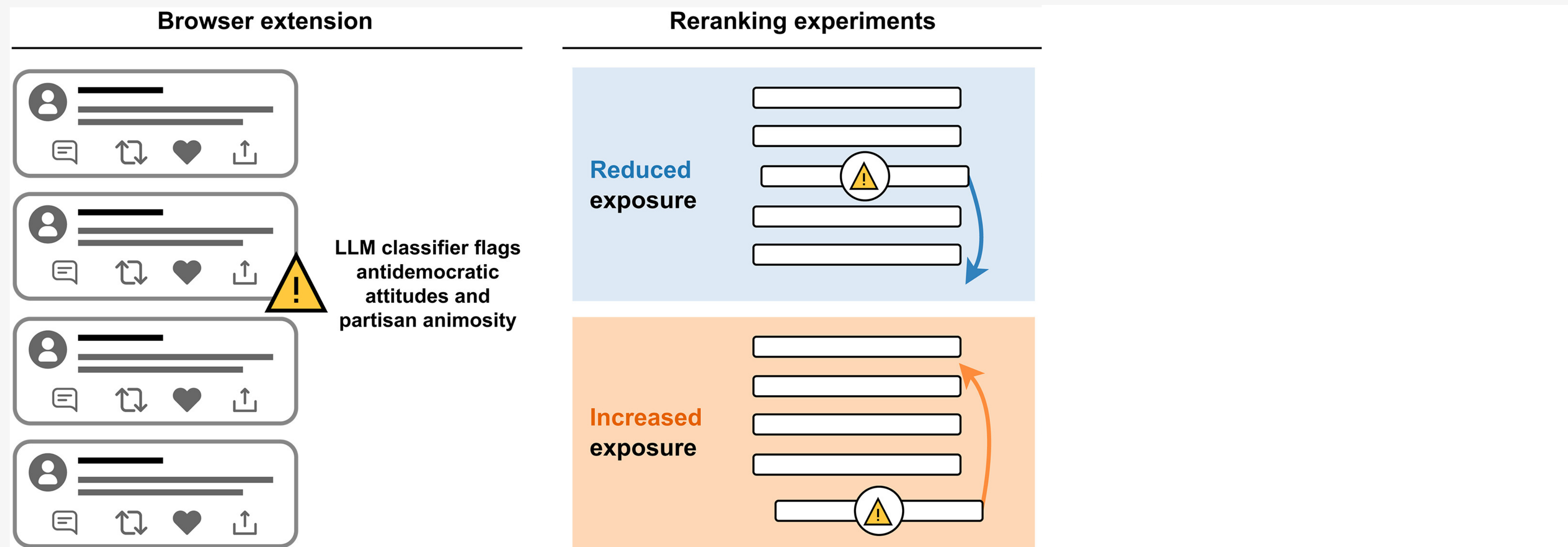
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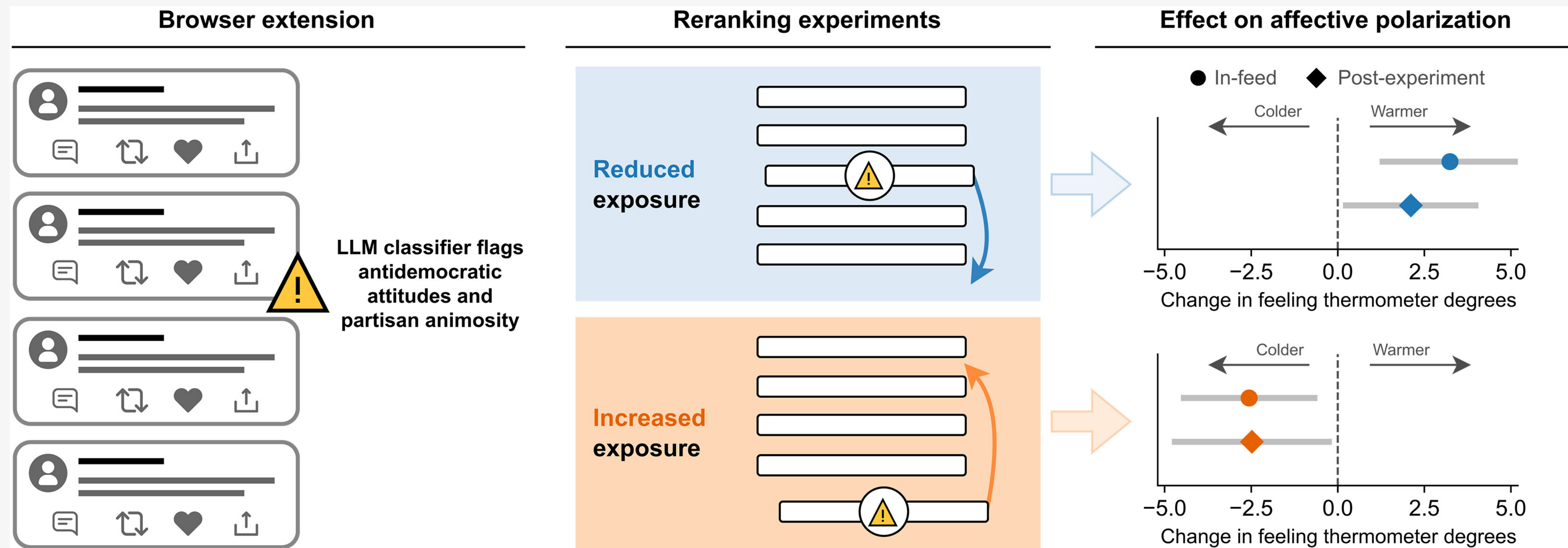
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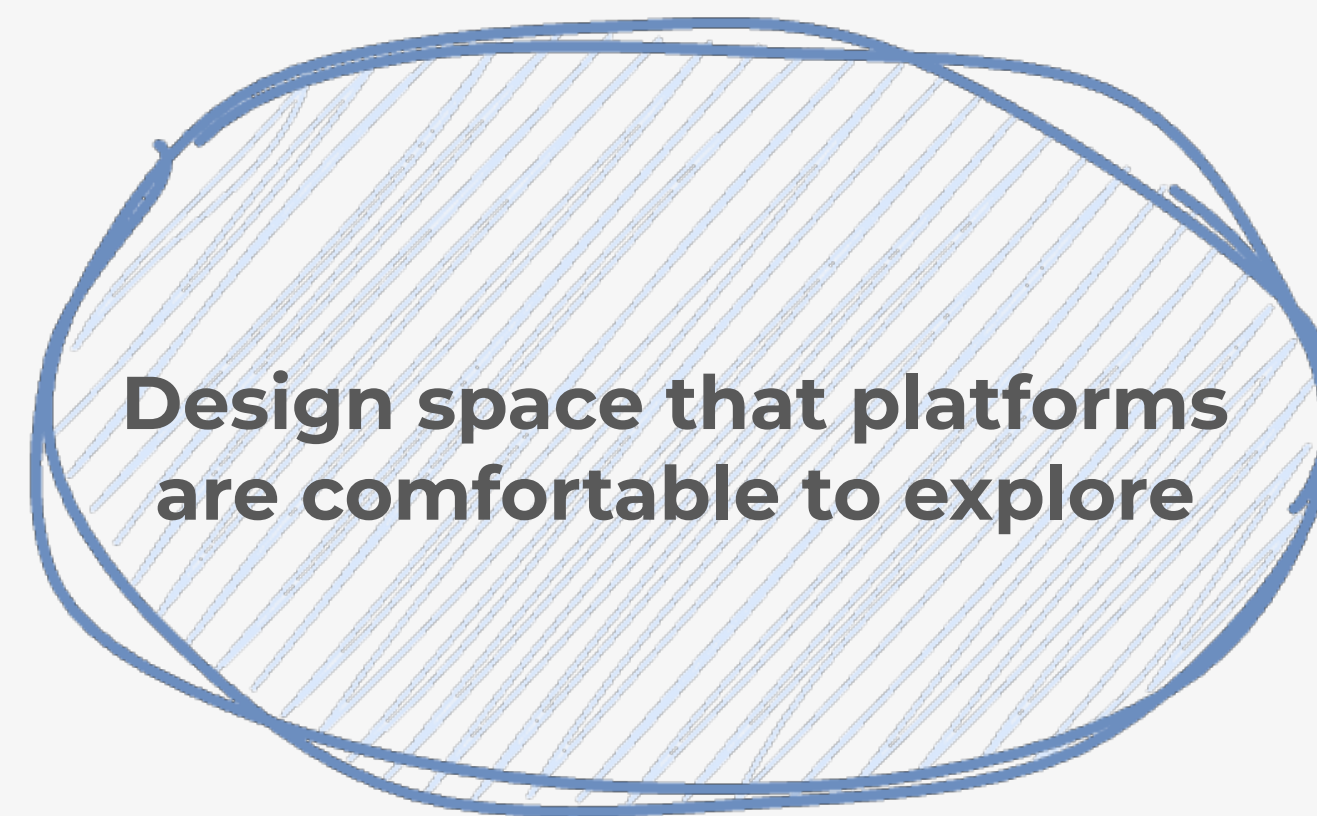
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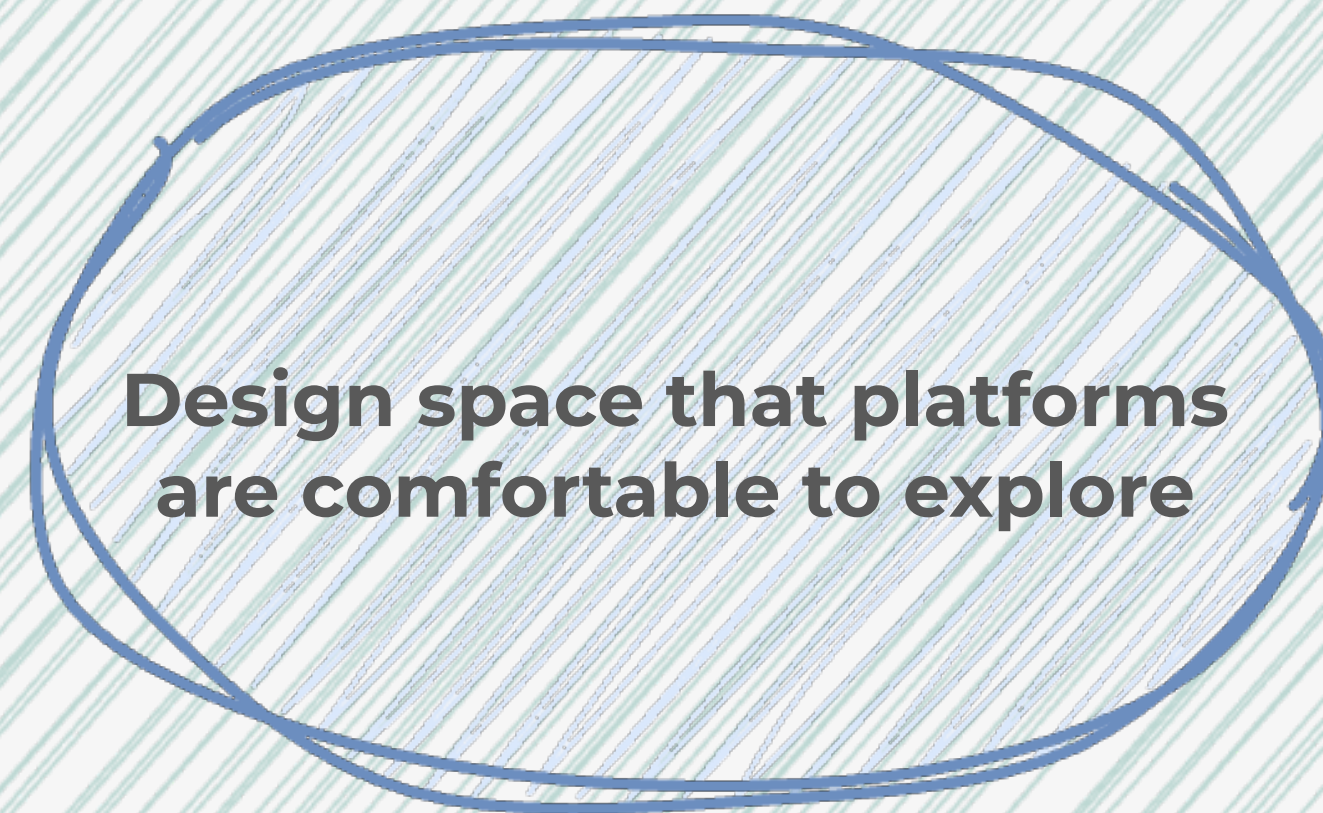


**Design space that platforms
are comfortable to explore**



**Design space that platforms
are comfortable to explore**

**The real design space
is much bigger!**



Design space that platforms
are comfortable to explore

**The real design space
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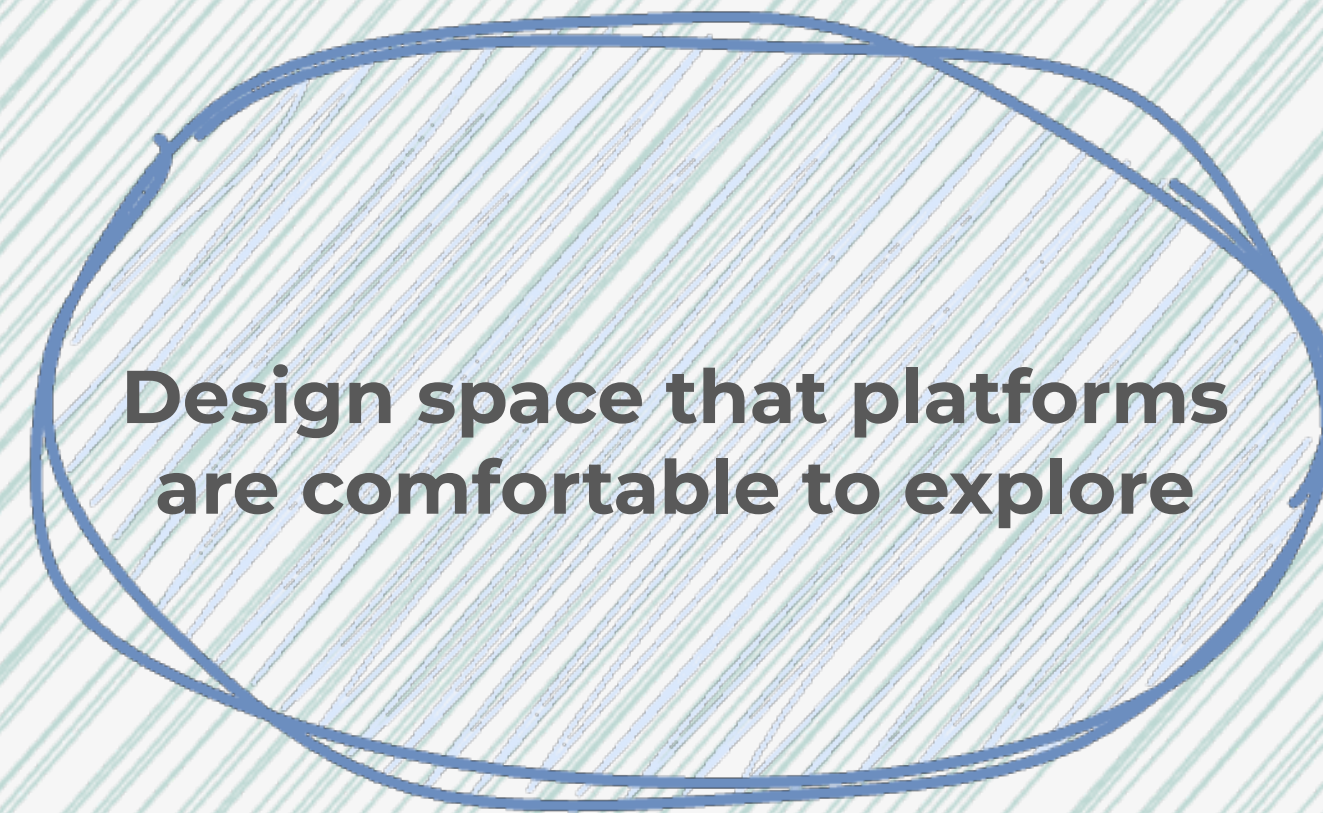
LLMs →

Opportunities for research

Researchers can...

Test bold ideas that platforms cannot try

Articulate new visions for how these platforms could operate



The real design space is much bigger!

Parting Thoughts

- Feed ranking algorithms have a lot of power: they control what we see and how we see it
- Feed ranking algorithms are a “recent” invention
- They are very malleable
- Lots of opportunities to make positive change!

“We shape our buildings; thereafter they shape us”

Winston Churchill

5-minute break

Next:
Feed experiments
using middlewares

