

Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed
☐	☒ The exact sample size (<i>n</i>) for each experimental group/condition, given as a discrete number and unit of measurement
☐	☒ A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒ The statistical test(s) used AND whether they are one- or two-sided <i>Only common tests should be described solely by name; describe more complex techniques in the Methods section.</i>
☐	☒ A description of all covariates tested
☐	☒ A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒ A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☐	☒ For null hypothesis testing, the test statistic (e.g. <i>F</i> , <i>t</i> , <i>r</i>) with confidence intervals, effect sizes, degrees of freedom and <i>P</i> value noted <i>Give P values as exact values whenever suitable.</i>
☒	☐ For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐ For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☒	☐ Estimates of effect sizes (e.g. Cohen's <i>d</i> , Pearson's <i>r</i>), indicating how they were calculated

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection	For the survey data, no software was used by the researchers. We worked with the survey company YouGov. To collect the X data, we used a custom Chrome extension and Python 3.12.3.
Data analysis	We use Python 3.12.3, R4.3.3 (with the package grf version 2.4.0), and Stata 19 (with the package leebounds version 1.5). All Python and R packages used are open-source and available under their respective licenses. Stata 19 is a proprietary software from StataCorp LLC under a commercial license. The full list of packages used for each software is provided in the replication folder.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our [policy](#)

The replication data is available in the Figshare repository (<https://doi.org/10.6084/m9.figshare.28033772>). We notably provide all anonymized survey, newsfeeds,

and followings data from our experiment. To comply with IRB directives and respect the privacy of our respondents, we deleted all identifiable information. We notably deleted: respondents' X (formerly Twitter) handles, the text of the posts and the name of the accounts shown to them in the newsfeeds, and the lists of the accounts they followed. In addition to our own data collection, we used five external datasets: a dataset of all US cities, states, and counties (Source: <https://github.com/grammakov/USA-cities-and-states>); a dataset of news media bias (Source: R. E. Robertson, et al., Auditing partisan audience bias within Google Search. Proceedings of the ACM on Human-Computer Interaction 2 (CSCW), 148 (2018), doi:10.1145/3274417); a dataset containing the universe of posts by congressmen on X between January 2023 and July 2023 (Source: <https://alexlitel.github.io/congresstweets/>); a dataset containing the universe of X handles of news media outlets (Source: U. Matter, P. Widmer, Who Owns the Online Media?, Tech. rep., SSRN (2021).1484); and the ANES Social Media Study Dataset (Source: <https://electionstudies.org/data-center/2020-2022-social-media-study/>). These external datasets are also included in the replication repository.

Research involving human participants, their data, or biological material

Policy information about studies with [human participants or human data](#). See also policy information about [sex, gender \(identity/presentation\), and sexual orientation](#) and [race, ethnicity and racism](#).

Reporting on sex and gender

This study collected self-reported gender information through YouGov's survey panel (male, female, or prefer not to disclose). All respondents identified as either male or female. According to the summary statistics, approximately 52% of participants identified as male across both initial feed settings (50% for those initially on chronological feed and 53% for those on algorithmic feed). The study uses 'gender' rather than 'sex' as the data comes from self-reporting. No biological sex data was collected. Gender was included as a control variable in robustness checks but was not a primary focus of analysis. The study did not perform specific gender-based analyses of the algorithm's effects. We conducted our study independently of a social media platform, which means that our sample is smaller than what might otherwise have been possible, restricting our options to do heterogeneity analyses for reasons of statistical power (as described in the manuscript). The full dataset with individual-level gender information was collected with participant consent and is available in the repository, with appropriate privacy protections for identifiable information.

Reporting on race, ethnicity, or other socially relevant groupings

The study used several socially relevant variables: gender, race, education, and political partisanship, all of them self-reporting through the YouGov survey platform. For details on the gender information, see the previous question. For linear regressions, some variables were dichotomized: Race was collected with eight categories in the YouGov survey, but due to small sample sizes in individual non-white categories, was dichotomized by the researchers into 'White' (78% of participants) and 'Other' categories for statistical analysis. Education was collected on a six-point scale (from 'No High School' to 'Post-graduate'), which researchers dichotomized into '4-year college degree or above' versus 'below 4-year college degree'. This corresponds to a dichotomization along our sample's median. Political partisanship was self-identified as Democrat, Republican, Independent, or Other party. These demographic variables were not used as proxies for other social constructs. They were included as controls in robustness checks, but the main results presented in the paper also show specifications without demographic controls, relying solely on the experimental randomization. When examining treatment effect heterogeneity using LASSO, these variables were included to predict initial feed choice.

Population characteristics

The sample consisted of 4965 active, US-based, X users, of which approximately (up to rounding) 52% were males, 58% had a four-year college degree or more, 78% were white, 46% declared themselves as Democrats, 32% as Independents, and 21% as Republicans (percentages are rounded and may not sum to 100%). The average age in the sample was 50 years old.

Recruitment

Participants were recruited through the survey company YouGov, drawing from U.S.-based registered members of the YouGov panel. Of 13,265 panel members contacted, 3,434 were screened out as they were not active X users (defined as using X less than 'several times a month'). The study design only admitted participants who self-reported being active on X at least 'several times a month' and provided informed consent. Of the 9,831 eligible participants, 8,363 provided consent, and 6,043 completed the pre-treatment survey. The final sample consisted of 4,965 participants who completed both pre- and post-treatment surveys. Several potential sources of bias should be noted. First, the sample is limited to YouGov panel members who are active X users, which may not be representative of the general U.S. population or all X users. Second, there was attrition between surveys -- approximately 21.8% of pre-treatment respondents did not complete the post-treatment survey. However, attrition rates were similar across treatment groups (21.88% for chronological and 21.72% for algorithmic, $p = 0.87$), and Lee bounds analysis was conducted to assess the robustness of results to selective attrition.

Ethics oversight

We obtained ethical approval from the Ethics Committee of the University of St. Gallen, Switzerland.

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☒ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description

This study is a quantitative field experiment that randomized X (formerly Twitter) users to different feed settings (algorithmic vs.

Study description	chronological) for seven weeks in 2023. The study collected quantitative data through pre- and post-treatment surveys, computational analysis of feed content, and analysis of accounts followed by participants.
Research sample	The research sample consists of 4,965 active U.S.-based X users recruited through the YouGov survey panel. The sample demographics include: mean age of approximately 49 years (with standard deviation of about 15 years), 52% male, 78% white, and 58% with a college degree or higher. Prior to the experiment, 76% of participants used the algorithmic feed (X's default setting) and 24% used the chronological feed. The sample is not representative of the general U.S. population as it is limited to active X users (defined as using X at least 'several times a month'). However, this selection was necessary for the objective of understanding the effects of X's recommender algorithm on users' political attitudes.
Sampling strategy	The sample was recruited from YouGov's U.S. panel of respondents through rolling admission in July 2023. All panel members were contacted and screened for eligibility (being active on X at least 'several times a month'), resulting in 6,043 pre-treatment survey completions and 4,965 post-treatment survey completions. No formal sample size calculations were performed prior to data collection. The approximate sample size was given by our budget (we remunerated participants). The achieved sample size of nearly 5,000 participants provided sufficient statistical power to detect significant treatment effects, as demonstrated by the precise estimates reported in the study.
Data collection	Data were collected through these methods: online surveys administered through YouGov's platform at the beginning and end of the seven-week experiment period, including the option to run a custom Google Chrome extension that captured feed content from participants who opted to install it, and public X account data for participants who shared their handles. The study was conducted entirely online without direct interaction between researchers and participants. Treatment assignment (algorithmic vs. chronological feed) was randomized through the YouGov platform. The researchers were blind to individual participants' treatment assignments during data collection. Participants were informed about the general purpose of studying X's newsfeed but were not aware of specific hypotheses.
Timing	Pre-treatment survey data were collected on a rolling basis in July 2023. Post-treatment survey data were collected from the end of August through September 2023. The average duration between entering and leaving the study was seven weeks.
Data exclusions	Participants were recruited through the survey company YouGov, drawing from U.S.-based registered members of the YouGov panel. Of 13,265 panel members contacted, 3,434 were screened out as they were not active X users (defined as using X less than 'several times a month'). The study design only admitted participants who self-reported being active on X at least 'several times a month' and provided informed consent. No participants were excluded after.
Non-participation	Of the 9,831 eligible participants (see above), 8,363 provided consent, and 6,043 completed the pre-treatment survey. The final sample consisted of 4,965 participants who returned to also fill out the post-treatment survey. This corresponds to a 50.5% response rate.
Randomization	Participants were randomized into the algorithmic or chronological feed setting through a random generator on the YouGov survey platform.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☒	☐ Clinical data
☒	☐ Dual use research of concern
☒	☐ Plants

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Plants

Seed stocks

Not used.

Novel plant genotypes

Not used.

Authentication

Not used.