Contents

S1 Overall Project Description

S1.1 Meta-Academic Collaboration Overview

This paper is part of the *U.S. 2020 Facebook and Instagram Election Study* (FIES), a broader set of experimental and observational studies that occurred as a result of a collaboration between academics and Meta. FIES was designed to address three intertwined concerns related to scientific understanding of the impact of social media on democratic processes. First, in the aftermath of the 2016 US elections, there was a widely recognized need to understand the impact of social media platforms on US elections. Second, research conducted solely by employees of these same platforms can encounter skepticism from the mass public and policy community. At the same time, outside independent researchers not employed by the platforms faced legal and fiduciary challenges in securing access to the data and research pipelines to conduct the types of necessary rigorous scientific analyses to answer questions about the impact of social media platforms on elections.

The *US 2020 Facebook and Instagram Election Study* is an attempted solution to this bundle of challenges. The project represents a novel form of collaboration between a team of researchers at Meta and a set of external researchers. The costs associated with the research (e.g., participant fees, recruitment, data collection, etc.) were paid by Meta. The academic team members received no form of financial compensation (e.g., support for student assistants, course buyouts, research funds) from Meta for their participation in the project.

Professors Natalie Jomini Stroud of the University of Texas at Austin and Joshua A. Tucker of New York University, at the time Chairs of the North American Regional (Stroud) and Electoral Integrity (Tucker) Social Science One Advisory Committees, selected and co-chaired a team of 15 additional external academic researchers (that is, researchers not employed by Meta); as part of the agreement, Meta did not have veto power over the academics selected for the team. Although there were many qualified researchers who could have been involved, the original members of the academic team for this project were selected based on their prior involvement with Social Science One and their expertise in social media and politics. Additional academic researchers (i.e., individuals who are not affiliated with Meta) were brought on as needed, including after paper pre-analyses plans were filed, based on their substantive and methodological expertise.

Chad Kiewiet de Jonge was the Meta research manager who oversaw day-to-day management of the research project at Meta. Annie Franco and Winter Mason co-led the Meta research team, which grew to include 16 researchers, 2 data engineers, 1 data scientist, and 3 interns working on various parts of the overall project.

Once assembled, the team of academics met beginning in March of 2020 to first brainstorm research ideas within the project's mandate of studying Facebook and Instagram's impact in the context of the 2020 elections and then to develop ideas for specific paper proposals. Concurrently, the team of Meta researchers began working with the academic team to provide feedback on research proposals, including the feasibility of possible designs and procedures for collecting the necessary data. As a result of this process, four general areas of inquiry were selected to form the scope of project: (1) dis/mis/information, knowledge, and (mis)perceptions; (2) political polarization; (3) political participation, both online and offline, and including vote choice and turnout; and (4) attitudes and beliefs about democratic norms and the legitimacy of democratic institutions.

The next step in the project involved identifying specific paper topics within these general scope

conditions. Based on their research interests, a subset of academic researchers served as "lead authors with final control rights" of each paper and were given control rights over final versions of the pre-analysis plans and papers.[S1] Both the academic researchers and the Meta researchers worked together to design the pre-analysis plans.[S2] The lead authors with final control rights for this paper are Jennifer Pan, Young Mie Kim, and Yiqing Xu.

Data collection was carried out by Meta and NORC, an independent survey research organization at the University of Chicago.[S3] Meta recruited most participants and collected on-platform data, while NORC carried out all surveys associated with the project, collected and appended all supplemental data outside of the Facebook/Instagram on-platform data, and recruited additional survey panelists (see Section S2.3.3 for details). The academic research team did not contact any human subjects as part of the research efforts. In the rare cases where members of the academic team – who had been publicly announced – were messaged by study participants, the messages were passed to NORC to respond.

At the data preparation stage, the Meta team produced, and the academics reviewed and approved, pipeline code used to produce the data tables needed for this project from raw platform data (e.g., number of followers) and data created for other internal Meta purposes (e.g., predictions of ideology of US Facebook users) that were employed in the analysis. The Meta researchers and, in some instances, the academics, carried out the initial analyses as detailed in the pre-analysis plan and as deemed necessary by the full research team for mutually agreed upon research-relevant analyses.

At the data analysis stage, the academics' role was to contribute to and monitor the results of data analyses, including: reviewing and writing code; inspecting de-identified samples or aggregated outputs; and conducting analyses within Meta's secure data-sharing Researcher Platform using data that has been stripped of any individually-identifying information.

Drafts of papers were written by the academic research team members, with feedback from the Meta academic researchers but with final decision-making resting with the specified lead authors with final control rights.

A full description of the roles and responsibilities of the academic research team, the Meta researchers, and NORC can be found at the Open Science Foundation.[S4] A public FAQ answering common questions about the U.S. 2020 Facebook & Instagram Election Study is available here: https://medium.com/@2020_election_research_project/266d30cbe95b.

S1.2 Research Transparency and Integrity

One of the primary goals in designing the project was to build in transparency concerning the research process given the constraints under which we were operating. With this in mind, five conventions were adopted to guide the research process.

First, none of the academic researchers nor their institutions received financial compensation

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[S1]By *control rights*, we mean that in the event of disagreements between members of the research team, the lead authors with control rights would have the final say in resolving these disagreements.

[S2]Pre-analysis plans were registered at the Open Science Foundation at https://doi.org/10.17605/OSF.IO/D7QES.

[S3]NORC was selected following a competitive bidding process involving other online survey research firms. To be clear, employees of NORC who implemented the data collection process were not members of the academic research team. More details about NORC can be found at: https://www.norc.org/Pages/default.aspx.

[S4]https://osf.io/upkns/

(e.g., support for student assistants, course buyouts, research funds) from Meta for their participation in the project.

Second, the analyses for all the papers resulting from the project, including this one, were pre-registered at the Open Science Foundation. The pre-registrations were embargoed while the research was being carried out, but are being made available to reviewers and will be publicly released at time of publication.

Third, for every paper, a set of core authors with control rights over the final content of the paper were specified in the pre-analysis plan. These core authors consist only of academic researchers (i.e., not employees of Meta).

Fourth, Meta publicly agreed that there would be no pre-publication approval of papers for publication on the basis of their findings. At the time the PAPs were proposed – but before any data analysis was conducted – Meta conducted legal, privacy, and feasibility reviews of the studies. Meta was entitled to review papers prior to publication, but could only request changes to protect confidential or personally identifiable information or to abide by their existing legal obligations.[S5] For this paper, Meta privacy and legal requested that we make text revisions in order to clarify Meta's policies on disabling and deleting accounts.

Fifth, we appointed a rapporteur for the project – Professor Michael Wagner of the University of Wisconsin, Madison – who was neither a paid employee of Meta nor a member of the academic research team. The rapporteur was given access to academic and Meta researchers, allowed to join project-related meetings, and had access to project documents. The rapporteur will not be a co-author on any of the papers resulting from the study, but the expectation is that the rapporteur will publish both academic and popular press articles assessing the research process itself.

Finally, Meta plans to make de-identified datasets from each published study conducted under this initiative and designed in collaboration with the academic team available to the broader research community, so that others can reproduce the analyses and conduct further election studies, at https://socialmediaarchive.org/.

S1.2.1 Author Declarations Below we list declarations from the academic author team. For consistency, we use the following key:

[S5]https://about.fb.com/news/2020/08/research-impact-of-facebook-and-instagram-on-us-election/.

a	Current employee (Meta)
b	Past employee (Meta)
c	Own individual stocks (Meta)
d	Paid consulting work (Meta)
e	Direct research funding from Meta (grant to you as PI or Co-PI)
f	Received an honorarium/fee (from Meta) for attending or hosting an event/serving as outside expert
g	Attended a Meta event where food, travel, or lodging was paid for by the company
h	Current employee (at a related company: Twitter, TikTok, Google/YouTube)
i	Past employee (at a related company)
j	Own individual stocks (at a related company)
k	Paid consulting work (at a related company)
l	Direct Research Funding from a related company (grant to you as PI or Co-PI)
m	Received an honorarium/fee (from a related company) for attending or hosting an event/serving as outside expert
n	Attended an event (at a related company) where food, travel, or lodging was paid for by the company

Hunt Allcott: Microsoft employee; none of the above. Ruth E. Appel: g, i. Deen Freelon: g. Matthew Gentzkow: f, g, m, n. Sandra González-Bailón: g, l. Andrew Guess: e, g. Shanto Iyengar: e, g. Young Mie Kim: g. David Lazer: g, n. Neil Malhotra: g, n. Brendan Nyhan: e, g, n. Jennifer Pan: e, f, g. Jaime Settle: c, e, g, j. Natalie Jomini Stroud: d, e, g, l, n. Emily Thorson: g. Rebekah Tromble: e, g, l. Joshua A. Tucker: e, f, g, n. Magdalena Wojcieszak: e, g, n. Yiqing Xu: c.

S1.2.2 Additional Disclosures

- Ancillary support (e.g., research assistants, course buyouts, etc.) was sourced by academics from the Democracy Fund, the Guggenheim Foundation, the John S. and James L. Knight Foundation, the Charles Koch Foundation, the Hewlett Foundation, Hopewell Fund, the Alfred P. Sloan Foundation, the University of Texas at Austin, New York University, Stanford University, the Stanford Institute for Economic Policy Research, the University of Wisconsin-Madison.

- Hunt Allcott received compensation from another source for consulting on a matter related to Meta's business. H.A. was an employee of Microsoft Research until December 2022.

- Matthew Gentzkow received compensation from Compass Lexecon for advice on a project for which Meta was the client. He has been a paid consultant for Amazon and done economic consulting for Analysis Group for clients including Google. He has received compensation as a member of the Toulouse Network for Information Technology, a research group funded in part by Microsoft.

- Brendan Nyhan has served as a member of the Misinformation Interventions Working Group at Meta since 2022. Meta has donated the honorarium he would receive for participating in this group to Doctors Without Borders on his behalf.

- Jennifer Pan served as a member of Meta's News Integrity Circle from fall 2020 to fall 2022. She received an honorarium for participating in the fall 2020 and spring 2021 session; the honorarium she would have received for participating was donated to Reporters without Borders for the fall 2021, spring 2022, and fall 2022 sessions.

- Natalie Jomini Stroud provided consultant services to Facebook in 2018–2019 on a prior research project; she was paid before the current project began.

- Joshua A. Tucker received a fee from Facebook to compensate him for administrative time spent in organizing a 1-day conference for approximately 30 academic researchers and a dozen Facebook product managers and data scientists that was held at NYU in the summer of 2017 to discuss research related to civic engagement; his fee was paid before the current project began. He is currently a Kroll Institute Fellow and Senior Advisor at Kroll.

S1.3 Ethical Considerations

Researchers involved in the project considered a number of ethical concerns related to the research and designed the studies to minimize potential harms to the respondents involved in them, as well as any broader social harms.

The study reported here involved analyzing data about 1) the accounts (e.g., Facebook users, Pages, groups, Instagram accounts) of CIB and FMO networks (see Section S2.1); 2) aggregated data from adult Facebook and Instagram users based in the US (see Section S2.2); and 3) individual-level participant data from Facebook and Instagram users age 18 and over who agreed to participate in a study of social media and politics (see Section S2.3). Academic researchers outside of Meta could only access de-identified data when conducting analyses.

Meta sought review from and was granted approval to conduct the experimental studies by the NORC Institutional Review Board (Protocol number 20.08.10, Project number 8870). Academic collaborators worked with their respective university IRB's to ensure compliance with Human Subjects Research regulations in their authorship of papers, including analysis of aggregated, de-identified data collected by Meta and NORC.

Meta retained the services of *Ethical Resolve*, a data ethics firm that was consulted by both Meta and academic researchers at various stages of the project prior to implementation of the research to evaluate whether it met long-running traditions of research ethics as well as emerging norms and best practices for conducting digital research.[S6]

S2 Materials and Methods

In this section, we begin by defining terms (Section S2.0.1). We then introduce classifiers and categorization methods that are applied to the data, including those from Meta (Section S2.0.2) and those from elsewhere (Section S2.0.3). Next, we introduce the three main types of data we utilize in this study: 1) data related to deceptive online networks (Section S2.1), and 2) aggregated platform data of users who were exposed to/engaged with network content (Section S2.2), 3) individual-level participant data that comprises survey and platform data from a consenting participant sample.

[S6]https://ethicalresolve.com/

S2.0.1 Definitions of Terms and Metrics

- Active users: Adult U.S.-based Facebook and Instagram users who were active for at least one day between June 26, 2020 and February 15, 2021 (the study period).

- VPV (view): "validated viewport view" represents a view on content. On Facebook, this is counted whenever the post renders in the visible portion of a user's web browser or mobile device for more than 250 milliseconds. On Instagram, this is counted whenever a single pixel is displayed on the screen for any period of time. We use the term VPV interchangeably with "views" throughout this paper.

- Ad impression: As noted in the Meta Business Help Center (https://www.facebook.com/business/help/785455638255832?id=354406972049255), "for ad impressions displayed in Facebook Feed and RHC, across both desktop and mobile platforms (primarily iOS and Android mobile web and mobile applications or native environments), an ad impression is counted the instant any part of the ad appears on screen (i.e., greater than zero pixel and greater than zero second)."

- Account type: In this paper, we refer to accounts as users, Pages, and groups on Facebook. Note that only Facebook users and Facebook Pages can create posts. On Instagram, accounts include Instagram users, who can create posts. We assume a user account corresponds to one individual. We cannot identify whether one user holds multiple accounts (including across the two platforms), so the number of unique individuals who are affected based on our data may be lower than the user numbers we report.

- Network account: An account on Facebook or Instagram identified by Meta as affiliated with a deceptive online network; also referred to as network-affiliated account.

- Non-network account: Any Facebook or Instagram account not identified by Meta as affiliated with a deceptive online network; also referred to as an account unaffiliated with the networks.

- Content source: On Facebook, content source refers to the Facebook user, Facebook Page or Facebook group where content was encountered. For example, a post made by a Facebook user to a Facebook group would have 'Facebook group' as content source. On Instagram, the only available source is Instagram user.

- Source of exposure: This refers to whether viewers saw content directly from network accounts or indirectly via non-network accounts. In rare cases, for some networks, there may be views from non-network accounts but no views from network accounts (this occurs if the network account posted content before the study period).

- Surface: "Surface" is used to denote an interface on Facebook and Instagram such as the Feed, Groups Tab, News Tab, user profiles; Stories on Facebook; and Stories, Explorer, Profile, and hashtags on Instagram.

- Original post: Original posts refer to content produced by users and Pages (not reshared).

- Facebook reshared post: On Facebook, reshared posts are produced by someone other than the user or the Page (e.g., by a friend, a group, a Page) and then shared by the user. Reshares of ads are considered organic posts, rather than ads. We do not count reshares to direct messages.

- Instagram reshared post: On Instagram, reshared posts are posts produced by someone other than the user and then shared by the user onto their Story surface. We do not count reshares to direct messages.

- Organic post: Includes original and reshared posts.

- Boosted post: As noted in the Meta Business Help Center (https://www.facebook.com/business/help/317083072148603), "A boosted post is a post to your Page's timeline that you can apply money to in order to boost it to an audience of your choosing. This is the simplest way to advertise on Facebook. Boosted posts differ from ads on Facebook because they are not created in Meta Ads Manager and don't have all of the same customization features." Once a post is boosted, it is no longer counted as organic.

- Engagement metrics: In addition to reshares, we consider the following types of engagement: clicks, reactions (including likes), and comments for Facebook; and likes and comments for Instagram.

  - Clicks (Facebook active users): Clicks are counted once per post and per day if a user clicked on any component of a post. This includes clicks on external URLs, clicks to "See More" and expand the text of a post, clicks on the post author's name, click to enlarge a picture, clicks to reshare, as well as clicks to add a like, reaction, comment, or any other type of engagement with the post. This data is only available for Facebook.

  - Reactions (Facebook active users): Reactions on Facebook measure whether a user added a reaction to a post. For active users, reactions include 'support', 'wow', 'anger', 'love', 'haha', 'sorry', and 'like'.

  - Reactions (Facebook Participants): Reactions on Facebook measure whether a participant added a reaction to a post. For participants, we include 'like' separately from other reactions. Thus, for participants reactions include 'support', 'wow', 'anger', 'love', 'haha', and 'sorry'.

  - Reactions (Instagram active users): Reactions on Instagram measure whether a user added a 'like' to a post.

  - Comments: Comments measure each distinct comment that a user adds to a post.

- Production metrics: Our metrics of content production refer to the count of network content (see section S2.1 for a detailed definition of networks). All types of posts are considered here (text posts, posts with links, image posts, photo albums, etc.). For Instagram, this includes all new image or video posts on active users' profiles. For both platforms, content data was only available if that content had been viewed by at least one US user during the June 26, 2020 to February 15, 2021 study period. Thus, counts exclude all posts by networks that were not viewed by any users in the US during this time.

- Network content: On Facebook, network content includes 1) original posts by network accounts, 2) reshares by network accounts, and 3) reshares of original network posts by non-network accounts. Note that (3) includes reshares by any user (US and non-US, adults and minors) that were seen by a US user during the study period. On Instagram, due to differences in reshare functionality, network content includes only original posts by network-affiliated accounts. Also referred to as network posts. Note that other forms of content that networks create, such as comments, are not included.

- Original post by network-affiliated account/original network post: Post that a network account created.

- Reshare by network account: A post that a network account reshared, whether or not it was originally created by a network account.

- Reshare of original network post by non-network account: A post that was originally created by a network account and that an account unaffiliated with a network reshared; includes reshare of reshares of network original posts, but excludes reshares of a network reshares of a non-network original post.

- Direct network content: On Facebook, direct network content includes 1) original posts by network accounts, and 2) reshares by network accounts; direct network content is a subset of network content that does not include reshares of original network posts by non-network accounts; also referred to as direct network posts.

- Indirect network content: On Facebook, indirect network content includes reshares of original network posts by non-network accounts; indirect network content is a subset of network content that does not include direct network content; also referred to as indirect network posts.

- Political candidate mentions: We include counts of mentions of political candidates in the content tables. This data is based on a regular expression search for the last name of each of the candidates, along with kamala, senator harris, and sen. harris for Kamala Harris. We include the following candidates: Joe Biden, Donald Trump, Kamala Harris and Mike Pence.

- Advertisement (ad): We include data based on the advertisements created by network accounts during the study period. Our advertisement tables include only advertisements, whereas our content tables include boosted posts. Note that a reshare of an advertisement is logged as an organic post, rather than an advertisement, so is not included in the ads data but is included in network content. For advertisements, we are able to create variables based on their text and thus have counts of political candidate mentions, but do not have counts based on classifiers. Ads for Facebook and Instagram are combined. We analyze ads separately because they occur relatively infrequently on average, and because, as noted above, ad data is not structured in the same ways as post data.

S2.0.2 Meta Classifiers and Categorization Methods Our analysis relies on classifiers and categorization methods to characterize either content or sources. The following classifiers, concepts, and categorization methods were either developed at Meta or are defined under Facebook

and Instagram's platform policies.

Classifiers

- Language classifier: we use Meta's standard language classifier to identify language.

- Civic classifier

  – **Definition:** This classifier predicts whether a given post is related to politics (government, elections, politicians, activism, etc.) or social issues (major issues that affect a large group of people, such as the economy, inequality, racism, education, immigration, human rights, the environment, etc.).

  – **Usage:**

    * We use the classifications for Facebook posts of any type (links, photos, videos, text) and Instagram posts (photos or videos) and comments that were created, seen or engaged with by US users during the US 2020 FIES.

    * We use the classifications for both English- and Spanish-language content. Note that this means if a network posts solely in a language other than English or Spanish, none of its posts would be classified as civic.

  – **Related content categories:**

    * Political memes: For purposes of the US 2020 FIES, we heuristically define political memes as images containing text categorized as civic.

  – **Performance:**

    * Based on a sample of approximately 10k labeled posts, the classifier has 83% precision and 82% recall on English-language Facebook content.

    * Based on a sample of approximately 17k labeled posts, the classifier has 81% precision and 85% recall on Spanish-language Facebook content.

    * Based on a sample of approximately 51k labeled posts, the classifier has 94% precision and 78% recall on English-language Instagram content.

    * Based on a sample of approximately 74k labeled posts, the classifier has 80% precision and 60% recall on Spanish-language Instagram content.

- COVID-19 classifier

  – **Definition:** This classifier predicts whether a given post is related to COVID-19, i.e. health concepts related to the virus, policy or public health guidance or the economic impact of the virus, as well as people's reactions to the situation.

  – **Usage:**

    * We use the classifier predictions for Facebook posts (any post type: links, photos, videos, text) and Instagram posts (photos or videos) that were created, seen or engaged with by US users during the US 2020 FIES.

    * We use the predictions for both English- and Spanish-language content.

– **Performance:**

  * Based on a sample of approximately 30k labeled posts, 94% precision and 94% recall for English-language Facebook posts.
  * Based on a sample of approximately 31k labeled posts, 94% precision and 95% recall for Spanish-language Facebook posts.
  * Based on a sample of approximately 57k labeled posts, 86% precision and 80% recall on English-language Instagram posts.
  * Based on a sample of approximately 58k labeled posts, 88% precision and 80% recall for Spanish-language Instagram posts.

• US ideology classifier

  – **Definition:** This classifier predicts adult US active Facebook users' political ideology. For this study, we use 3-class ideology classification.

  – **Methodology**

    * The classifier is trained to predict the self-reported ideology of adult US monthly active Facebook users based on their demographics, preferred language, location, and engagement with content, Pages, and groups. It outputs a numeric score ranging from 0 (indicating a user is predicted to be liberal) to 1 (indicating a user is predicted to be conservative).
    * The classifier has high coverage—it is able to place up to 95% of adult US monthly active Facebook users on this numeric scale. The classifier also has high week-over-week stability—on average, the weekly scores for individual users have a correlation of 0.96.
    * To categorize adult US monthly active Facebook users into distinct ideological groups, the continuous ideology scores must be discretized. The thresholds used in each study may vary depending on the lead authors' preferences regarding precision and recall tradeoffs, and/or the need for consistency with the thresholds applied to Page and group audience ideology scores described in the "Related entity categories" section below. In most cases, however, the user-level scores are discretized as follows:
      · 3-class ideology: Users with a score less than or equal to 0.40 are categorized as liberal. Those with a score greater than or equal to 0.60 are categorized as conservative. The remaining users with a score between 0.40 and 0.60 are categorized as moderate.

  – **Related entity categories:**

    * Entity audience ideology scores
      · We use the user-level ideology scores to generate similar ideology scores for Pages, groups, and web domains. We do so by computing a measure of the ideological composition of their audience: the average predicted ideology of Facebook users engaging with these entities in the last 28 days from the modal takedown date (or, if the account was removed earlier, then from the latest available date).

· This approach places Pages, groups, and web domains on the same 0-1 numeric ideology scale as users. As such, we use the same thresholds for categorizing these entities into ideological groups as those specified above.

– **Usage:**

* We use the ideological classifications of US monthly active Facebook users 18 years or older who were active during the US 2020 FIES.

* We use the audience ideology classifications for all Pages, groups, and domains producing content that US active Facebook users saw or interacted with during the US 2020 FIES.

* We use the audience ideology classifications for Pages and groups that belonged to the networks in the study.

– **Performance:** We evaluated how well the user-level inferences performed at predicting self-reported ideology by comparing our classifications to the survey responses of US 2020 FIES panelists. Precision and recall for each ideological group are as follows:

* Three-class classification
  · Self-reported Liberals: 62% precision and 77% recall
  · Self-reported Moderates: 53% precision and 30% recall
  · Self-reported Conservatives: 59% precision and 74% recall

– We note that the reason precision is lower across all groups and recall is lowest for self-reported moderates in the three-class classification task is that the model tends to predict self-reported moderates to actually be left- or right-leaning. This is consistent with external research finding self-reported moderates often have non-centrist ideological positions on various issues [4].

– We also evaluated how well the audience ideology measure might approximate the ideological affiliation of the entities themselves, if one exists. We compared the audience ideology scores we computed for the official Facebook Pages of US Members of Congress to a widely-used external measure of those Congress members' ideology derived from their legislative voting history, DW-NOMINATE [21], finding a 0.96 correlation (N = 409).

– Further evaluations of the ideology classifier can be found in the Supplementary Information of [31]

• News classifier

– **Definition:** This binary classifier predicts whether content is about current events, timely information, and follows journalistic standards such as citing sources and having a byline. See https://www.facebook.com/business/help/224099772719228 for additional information.

– **Usage:**

* We use the classifier predictions for Facebook posts with a link or video that were created, seen or engaged with by US active users during US 2020 FIES.

* We use the predictions for both English- and Spanish-language content.

   – **Performance:**

     * Classification thresholds were chosen to yield 80% recall.

     * Based on a sample of approximately 52k labeled links, precision at this threshold is 90% for US English-language news links.

     * Based on a sample of approximately 36k labeled links, precision at this threshold is 42% for US Spanish-language news links.

- Local news classifier

   – **Definition:** This classifier predicts whether a domain is a local news source based on the geographic concentration of its audience and whether a non-trivial proportion of its content is classified as either Civic or News based on predictions from the corresponding classifiers described above. See also https://www.facebook.com/journalismproject/facebook-research-news-deserts.

   – **Usage:** We use the domain-level categorizations, in combination with domain-level classifications in [17] (see S2.0.3 below), to identify local news sources.

   – **Performance** (of internal domain-level categorizations):

     * Precision: 86%

     * Recall: 92%

- Topic classifier

   – **Definition:** This classifier aims to classify content along 26 different broad topics, including Politics and Social Issues (combined in the Civic classifier described above):

     * Full list of topics:

       · Animals & Pets
       · Books & Literature
       · Business,Finance & Economics
       · Crime & Tragedy
       · Education & Learning
       · Fashion & Style
       · Children & Parenting
       · Fitness & Workouts
       · Food & Drink
       · Games, Puzzles & Play
       · Health & Medical
       · History & Philosophy
       · Holidays & Celebrations
       · Home & Garden
       · Music & Audio

- · Performing Arts
- · Politics
- · Relationships, Friends & Family
- · Religion & Spirituality
- · Science & Tech
- · Social Issues
- · Sports
- · Travel & Leisure Activities
- · TV & Movies
- · Vehicles & Transportation
- · Visual Arts, Architecture & Crafts
  - **Usage:**
    - ∗ We use the classifications for text, video, photo, and link posts that appeared in Facebook News Feed and were created, seen or engaged with by US active users during the US 2020 FIES.
    - ∗ We use the predictions for both English- and Spanish-language content.
    - ∗ Posts can be classified as multiple topics.
  - **Performance:**
    - ∗ Classification thresholds were chosen to yield 80% precision.
    - ∗ The recall across all topics at this threshold is 89% in English and 86% in Spanish.
    - ∗ The recall for individual topics at this threshold ranges from 49% to 99%, with a median value of 87%.

Non-classifier-based Content or Entity Categories

- Facebook and Instagram content takedown categories
  Posts taken down due to the post or account of the poster violating one or more of the Facebook and Instagram enforcement policies below. Note that if a post taken down for these reasons is reshared, the reshare may or may not share the same label depending on a variety of factors.

  - [Violence & Incitement](#)
  - [Misinformation (including harmful health misinformation)](#)
  - [Dangerous Individuals & Organizations](#)
  - [Coordinating Harm](#)
    - ∗ Voter suppression and fraud
    - ∗ Other types of Coordinating Harm
  - [Bullying and Harassment](#)
  - [Spam](#)
    - ∗ Engagement abuse

* Content spam
* Inflating distribution
  – [Hate Speech]

- Misinformation

  Misinformation refers to content that is directly rated "false" by one of Meta's independent fact-checking partners, or posts containing text, images or videos that are matched to such content using matching algorithms. See https://www.facebook.com/business/help/341102040382165 for a detailed description of how this rating category is defined.

  Meta's third-party fact-checking partners are certified by the nonpartisan International Fact-Checking Network. A full list of these partners is available at https://ifcncodeofprinciples.poynter.org/signatories. In the US, this list includes organizations such as Snopes, Reuters, The Washington Post, Fact Checker, FactCheck.org and PolitiFact. All fact-checks are publicly available on the websites of these organizations and can be reviewed by any external source for accuracy.

- Misinformation Repeat Offenders

  A misinformation 'strike' for the Misinformation Repeat Offender (MRO) program as of late 2020 was incurred on a post containing at least one piece of content that was rated "False" or "Altered" by one of Meta's independent fact-checking partners.

  On Facebook, Pages and (sub)domains with two or more strikes in a 90 day period were classified as MRO. Facebook groups with three or more misinformation strikes in a 90 day period were classified as MRO.

  On Instagram, an account was classified as MRO if it has created two or more posts that were rated "False" or "Altered" by a third-party fact checker in the past 90 days. An account could also be classified as MRO if it created three or more posts that were matched to content rated "False" or "Altered".

- Untrustworthy Sources

  – **Definition**: For purposes of this research project, we define untrustworthy sources based on the number of misinformation "strikes" they have accrued under Meta's Misinformation Repeat Offender Policy, where a strike may be counted when an entity produces content that is rated false or altered by one of Meta's independent fact-checking partners. On Facebook, we define untrustworthy sources to encompass Pages, groups, and domains that have accrued two or more misinformation strikes since the MRO program began on Facebook in 2018 (i.e., "lifetime" strikes). On Instagram, we define untrustworthy sources to encompass any public account with two or more strikes from content directly rated false or altered, or three or more strikes from content either directly rated false or altered or matching content rated false or altered since the MRO program began on Instagram in 2020.

  – **Operationalization**: Due to data retention limitations, we can only estimate the number of strikes accrued by an entity using the number of pieces of content that received a false or altered rating by one of Meta's fact-checking partners. Pages or groups that

have posted such content at least twice, or domains with two or more URLs rated as false by a third-party fact-checker are considered untrustworthy sources. In practice, the actual number of strikes an entity accrues does not necessarily equal the number of individual pieces of content that are fact-checked as false or altered (see Meta's Transparency Center for more details). The operationalization of how we determine whether a source is considered untrustworthy in this dataset is therefore more expansive than was originally pre-registered for this project and will necessarily overestimate exposure to untrustworthy sources. We exclude from this list of domains other social media platforms, hosting sites, and URL shorteners, even if they may host URLs that have been fact-checked as false.

- Potentially false content

  - **Definition**: For the purposes of this study we combine misinformation and untrustworthy sources to define content as 'potentially false'. A potentially false piece of content is one that is (i) rated as misinformation, or (ii) categorized as from a Misinformation Repeat Offender (MRO), or (iii) categorized as from an untrustworthy source. Note that when content from (ii) and (iii) are reshared, they may no longer be considered "potentially false" if the resharing account does not fall into (ii) or (iii).

- Hashtags

  - Hashtags were extracted from the text of the post accompanying an image or video on Instagram.

  - In the analysis scripts for this paper, we cleaned hashtags, which were already in lower case, as follows: We removed emoticons and trailing underscores. This allowed to unify counts for entries that only differ in the use of emoticons, while keeping the encodings for different languages and alphabets (e.g., English, Russian, Arabic) in tact.

  - If same hashtag is contained twice in a post, it will only be counted once.

S2.0.3 Other Classifiers and Categorization Methods   The following classifiers and categorization methods were either proposed by the academic team or adapted from published academic research. In the case of methods proposed by or co-developed with the academic team, a thorough performance evaluation by the US 2020 FIES academic and Meta researchers was not conducted due to time constraints in applying the methods to content or entities within Facebook's and Instagram's data retention periods. Instead, we relied on existing performance metrics when available (referenced below in regard to each classifier). In addition, when possible, the US 2020 FIES academic and Meta researchers did hand-label a small set of examples, and rough performance estimates based on these samples are included below.

- Content with slur words classifier

  - **Definition:** This classification method is adapted from [33], which identifies content containing at least one term sourced from Hatebase and the Racial Slur Database and attempts to reduce false positives introduced by the inclusion of terms with ambiguous

meaning. [33]'s classification method labels content as falling within any of eight different categories (listed below), as well as a joint category ("content with slur words") that encompasses all of them.

- ∗ List of categories:
  - · anti-Asian
  - · anti-Black
  - · anti-Immigrant
  - · anti-Muslim
  - · anti-Semitic
  - · anti-Latinx
  - · homophobic
  - · misogynistic

– This categorization method aims to capture content that could be perceived as hateful but need not violate Facebook's and Instagram's Community Standards or may not be captured by Meta's existing automated systems.

– **Methodology:** The method developed by [33] consists of a dictionary method that was augmented using machine learning methods in order to reduce the false positive rate. First, it identifies any post or comment that contains at least one term associated with each of the eight categories described above, based on a list compiled by and sourced from Hatebase and the Racial Slur Database. Second, it applies a text-based classifier trained on a random sample of tweets to attempt to reduce false positives from terms that have multiple meanings, not all of which may be considered a slur. For instance, a benign use of "sneakers", as opposed to its usage as an anti-Black slur.

– We note two limitations of this method, both of which are common to slur-based approaches to hate speech classification. First, the classification method only detects an inherently limited set of slurs. A great deal of hateful content is more nuanced, subtle, and/or complex, making it hard to automatically classify in any instance, but especially hard to do so using the detection of slurs [3]. Second, in selecting this classification method, we chose to err on the side of false positives (recall) as opposed to false negatives (precision). As a result, some of the content classified as containing one or more slur words may capture ingroup discourse and banter (e.g., use of the n-word among Black communities and use of "bitch'" among women), neither of which the false positive filter is designed to filter out. We therefore describe it here as "content with slur words" (a deviation from our preregistration). In general, we acknowledge that a slur-based approach may miss important context and produce both false positives and false negatives [35].

– **How it was Used:**
  - ∗ We apply the externally trained classification method to generate predictions for Facebook posts and comments, as well as Instagram captions and comments, that were created, seen or engaged with by US users during the US 2020 FIES.
  - ∗ This classification method was applied to English-language content only.

- For posts, the classification method is applied to the text of the post, the text contained in attached images, and a transcription of any attached videos.

- For comments, the classification method is applied to the text of the comment only.

- For reshared posts, a post is classified as containing one or more slur words if the original post or the reshared post (including the text that was added to the reshared post) was classified as containing one or more slur words.

- **Performance:**

  * [33] estimate this classification method has 94% accuracy, 95% precision, and 90% recall for content with a slur.

  * In a sample of posts seen by US adult monthly active users during the platform intervention period, over 90% of content predicted to contain a slur word using this method falls under the "misogynistic" subcategory.

- Incivility classifier

  - **Definition:** The classifier aims to capture uncivil content, defined as: "Features of discussion that convey an unnecessarily disrespectful tone toward the discussion forum's participants or its topics, which is including but not limited to:

    * (1) Name-calling, mean-spirited or disparaging words directed at a person or group of people.

    * (2) Aspersion, mean-spirited or disparaging words directed at an idea, plan, policy, or behavior.

    * (3) Vulgarity, using profanity or language that would not be considered proper in professional discourse.

    * (4) Pejorative speech, disparaging remarks about the way in which a person communicates."

  - This approach follows the definitions from [6]. Note that uncivil language as defined here may not necessarily be threatening or harmful and could be used to emphasize opinions, for example [32].

  - **Methodology:** The classifier is a regularized logistic regression, using unigrams as features, trained on two datasets:

    * A random sample of 5,000 Reddit comments, collected by [7], annotated by three undergraduate students (inter-coder agreement = 91%)

    * A random sample of 4,000 tweets, annotated by crowd workers (intercoder agreement > 80%), along with a synthetic set of 16,000 tweets labeled by the Google Perspective API, collected by [34].

    * The training dataset was complemented with 5 million labels generated using DistillBERT to improve its performance.

  - We applied the externally trained classifier to the Facebook and Instagram content categories described above, using text-based features (posts, captions, and comments) and OCR'd text from images (for posts only).

- For reshared posts, a post is classified as uncivil if the original post was classified as uncivil or if the reshared post was classified as uncivil.

- **Usage:**

  * We use the externally trained classifier to generate predictions for Facebook posts and comments, as well as Instagram captions and comments, that were created, seen or engaged with by US users during the US 2020 FIES.
  * This classifier was applied to English-language content only.

- **Performance:**

  * Predictions from this model were estimated by [7] to have 85% precision and 72% recall on the Reddit dataset (computed on a test set not used for training) and 89% precision and 70% recall on the Twitter dataset.
  * Based on human annotations conducted by the Meta research team and validated by a subset of the academic researchers on the US 2020 FIES comprising a random sample of 100 Facebook public posts, 100 Facebook public comments, and 100 Instagram public comments, we estimate that the classifiers have:
  * Facebook comments: 86% precision
  * Facebook posts: 83% precision
  * Instagram comments: 75% precision

- Based on a set of synthetic examples available in [20] from African-American Vernacular English, compared to their Modern Standard English variation, we found that the classifier yields similar predictions, which we take as evidence of adequate calibration.

- Voter suppression classifier

  - This classifier was collaboratively developed between Meta and academic researchers, and aims to capture a broader class of content than that falling under Facebook's definition of voter interference.

  - **Definition:** This classifier captures content related to three different types of potential voter suppression:

    * Deception, e.g. inaccurate information about the time, place, and manner of voting
    * Demobilization and calls to boycott the election
    * Voter intimidation and threats or attempts to organize violence at polling places

  - **Methodology:** Voter suppression posts are identified using three methods:

    * A set of regular expressions that capture frequent text patterns related to these categories
    * Posts that were removed by Facebook for violating the policy against voter interference
    * A Naive Bayes classifier trained on a 90-day sample of posts that were removed from Facebook for violating Meta's policy against voter interference, with negative examples consisting of posts classified as civic and posts containing terms mentioned in voting interference posts but not removed for violating the policy.

- **Usage:**
  * We use the classifier to generate predictions for Facebook and Instagram posts that were created, seen or engaged with by US users during the US 2020 research project study periods.
  * This classifier was applied to English-language content only
- **Performance:** Based on manual labeling of a sample of 4k non-deleted Facebook and Instagram posts conducted in December 2022, where posts removed under the voter interference policy were considered true positives, we estimate this method has:
  * Precision (Facebook): 83%
  * Recall (Facebook): 97%
  * Precision (Instagram): 96%
  * Recall (Instagram): 90%

- Local News Classifier

  - **Definition:** Local news domains gathered from [17].
  - **Methodology:** Per [17]:
    * "Local" news must be based in a US state, city or town (e.g. have a reference to a particular area either in the title, e.g., SF Chronicle, Oregon News, or in its home page description, e.g., 'Serving the Bay Area Community'). Would not have been available nation-wide in pre-digital times.
    * Sources: Alexa, ERP EXPO, most tweeted by politicians, USNPL, officialusa.com
  - **Usage:** We use the domain-level categorizations, in combination with domain-level classifications described in S2.0.2, to identify local news sources.

- **Performance:** All domains classified as local news were reviewed by human coders in [17] to ensure that the domains matched the definition for local news above.

S2.1 Data on Deceptive Online Networks

S2.1.1 Network Inclusion Criteria Deceptive online networks are operationalized as networks Facebook (now Meta) disabled between June 26, 2020 and November 3, 2021 (one year after election day) that targeted US users during the study period (June 26, 2020 and February 15, 2021). Networks include those disabled under the Coordinated Inauthentic Behavior (CIB) protocol, which consisted of influence operations, whether domestic or foreign in origin, that attempted to manipulate or corrupt public debate for a strategic goal.

CIB networks included, for example, a network from Russia that ran a small number of fake accounts posing as editors of a progressive-leaning news outlet and recruited authentic journalists to write political content (https://about.fb.com/news/2020/09/august-2020-cib-report/), and a network from the United States that used fake accounts to post partisan replies to American news outlets and public figures (https://about.fb.com/news/2020/10/removing-coordinated-inauthentic-behavior-september

Network also include those disabled under the Inauthentic Behavior (IB) protocol. These consisted of financially motivated operations (FMO) that were identified by an informal, internal Meta

taskforce as networks using inauthentic accounts to post content on American political themes—usually to drive users towards off-platform websites where the operators could monetize users' clicks. FMO networks included, for example, a cluster of Canada-based accounts spreading sensationalist content from domains whose names were meant to look like legitimate news sites or to look like legitimate sites related to former President Trump, but in fact were ad farm websites, and a cluster of U.S.-based accounts posting links to ad farm websites, as well as political conspiracy memes related to then presidential candidate Biden to drive page engagement and build an audience. Typically, these FMO networks copied the majority of their content from US media outlets and influential figures.

The academic team asked Meta for additional details about network identification, including how Meta knows which accounts are part of a network. The full response the academic team received is copied verbatim (text not edited by academic authors) in the following sections on Identification, Behavioral Characteristics, and Scope).

Identification

Meta takes action against Coordinated Inauthentic Behavior (CIB) networks and Financially-Motivated Operations (FMO) on the basis of the violating behaviors they display, not the content they post.

Meta detects CIB using a range of technical and behavioral indicators that help them determine whether a group of accounts, Facebook Pages, and/or Facebook Groups are operating on Meta platforms in a coordinated fashion (for instance, many fake accounts being operated from a central location [23] or by geographically dispersed groups who appear to be centrally provisioned with internet access and content directions [29]), and are centrally relying on fake accounts to mislead Meta and people using its services about who is behind the operation and what they are doing [10] for the purpose of manipulating or corrupting public debate for a strategic goal. In some cases, Meta also relies on insights from industry peers, law enforcement, researchers and the open-source community to identify such networks. Detection and investigation methods cover both Facebook and Instagram, and historically Meta has disrupted CIB networks that primarily focused on Facebook [28, 29], networks that primarily focused on Instagram [22, 27], and networks that operated substantially across both [24, 30].

Methods for detecting financially-motivated operations also rely on technical and behavioral indicators, as FMOs fall under Meta's Inauthentic Behavior (IB) policy. IB, as detailed in Meta's Community Standards, is an effort to mislead people or Facebook about the popularity of content, the purpose of a community (i.e. Groups, Pages, Events) or the identity of the people behind it. It is primarily centered around amplifying and increasing the distribution of content, and is often (but not exclusively) financially motivated.

Behavioral Characteristics

IB operators typically focus on quantity rather than the quality of engagement. For example, they may use large numbers of low-sophistication fake accounts to mass-post or like their content — be it commercial, social or political. They often use tactics similar to other large-scale online activities, like spam.

This behavior pattern distinguishes IB from Coordinated Inauthentic Behavior (CIB) where operators invest in mimicking human social activity as closely as possible. CIB might involve an elaborate fictitious journalist persona or a Middle-East-focused think tank managing multiple online accounts and websites to support their cover story, while trying to build trust with their targets and promote particular narratives. IB operators, on the other hand, can sometimes involve

the use of fake accounts, but there is typically little attempt to obfuscate their identity from Meta and only the most superficial attempts to construct a false identity.

Scope

The Coordinated Inauthentic Behavior networks analyzed in this study are those among all CIB networks detected by Meta that were identified by investigators as having US-focused activity during the study period, including networks where US users were a very small fraction of the audiences exposed to network content, such as a China-origin CIB network [11] which primarily focused on maritime security in the Asia-Pacific region [2], but included a small proportion of US-focused activity.

The financially-motivated operations analyzed in this study are those identified in 2020 by a cross-functional team as engaging in Inauthentic Behavior for monetization purposes, and producing political content that was reaching US audiences. Other forms of financially-motivated inauthentic behavior may have been enforced on through Meta's automated enforcement mechanisms, but are not included in the study.

Although Meta cannot guarantee every CIB or FMO network has been detected due to the inherent uncertainty in detection of adversarial actors, the data Meta provided to the academic authors includes all CIB and FMO cases that meet the criteria described above and that – as specified in the study pre-analysis plan – were removed between June 26, 2020 and November 3, 2021.

To give an idea of where CIB networks that include US audiences among their targets fit into the global context of total CIB activity, as of the end of 2022 [26], Meta has disrupted over 200 CIB networks around the world, originating in 68 countries, operating in at least 42 languages and targeting audiences in over 100 different countries. The United States was the most targeted country, targeted by 34 operations, followed by Ukraine targeted by 20 CIB networks, and the United Kingdom targeted by 16 operations. Notably, Meta often saw these covert networks focus on more than one country at a time. For example, one network from Iran disrupted in April 2020 [9] targeted 18 countries on four continents.

S2.1.2 Network Data Preparation   The study includes data on the characteristics of network accounts (Facebook and Instagram users, Facebook Pages, and Facebook groups), network content, and network ads from the study period of June 26, 2020 to February 15, 2021.[S7] Network accounts included any attributed to the network and removed, regardless of the time of removal. Counts of network accounts may differ from other reports if accounts were removed prior to or after the period examined for the reports.

This data is aggregated at the network level, meaning for each network we have both count data (for example, the number of accounts in each network, the number of posts produced on a day, etc.) and statistics describing the distributions of the variables of interest (generally 5th percentile (p5), mean, median, standard deviation and 95th percentile (p95)). Code to collect and process the data from Meta servers was written by Meta researchers and then reviewed by at least one member of the academic research team. The academic researchers only had access to code that was implemented within Meta specifically for this project. While the use of this data is permissible under Meta's Data Policy, care was nevertheless taken to ensure that user privacy was protected. These procedures included the following:

[S7]This means that while we may include a network identified by Meta up to November 3, 2021, we only analyze data for the networks during the study period, which centers around the 2020 elections.

- First, all requests were reviewed by Meta Legal and Privacy to ensure that no individual-level or identifying data were shared with the academic research team.

- Second, techniques were used to reduce the risk of any individually identifying data being shared. For tables related to network accounts and network content, data was aggregated at the network level.

All non-integer numeric variables in this study's replication data contain double-precision floating-point numbers and are therefore subject to floating point error. Given double-precision floating point numbers have 15.95 decimal digits of precision, and differences smaller than 1e-17 are within their margin of error, we have rounded the results of all computations involving variables of this data type to the 15th decimal digit.

S2.1.3   Missing Data   We do not have 100% of the data for all networks because in some cases, the accounts in the networks were deleted as part of Meta's takedown, and in accordance with Meta policies, the data associated with accounts in the networks were not retained. Once an account is deleted it is no longer possible to tie any data to that particular account after 90 days.[S8]

For 46 of the 49 CIB and FMO networks falling within the scope of this study, data was preserved because the data associated with most or all of the assets was able to be retained in accordance with Meta's policies after disabling the assets. The assets associated with the remaining 3 networks were mostly or fully deleted (see Table S1).

[S8]See https://www.facebook.com/legal/terms/plain_text_terms.

Table S1: Network-affiliated account overview and data missingness

| | Removed network-affiliated accounts | | | | |
Network ID	FB users	FB Pages	FB groups	IG users	Percent of network-affiliated accounts with data
1	54	50	0	4	99.07
2	35	3	0	89	100.00
3	303	187	44	31	99.12
4	13	2	0	0	100.00
5	165	13	10	7	100.00
6	5	1	1	3	100.00
7	23	7	0	3	100.00
8	276	36	18	35	98.90
9	206	55	0	77	99.41
10	0	2	0	22	95.83
11	12	6	0	10	100.00
12	12	0	0	0	100.00
13	67	0	0	248	99.68
14	8	8	4	0	100.00
15	366	0	10	4	98.95
16	7	1	14	8	96.67
17	66	57	1	9	89.47
18	14	4	0	0	5.56
19	7	13	11	0	100.00
20	12	1	3	2	100.00
21	13	0	0	0	100.00
22	3	2	0	3	100.00
23	2	5	3	2	33.33
24	20	0	0	0	100.00
25	8	0	0	0	87.50
26	10	0	0	0	100.00
27	6	1	0	0	100.00
28	7	12	0	3	100.00
29	676	0	0	0	99.11
30	203	0	0	0	100.00
31	11	0	0	0	100.00
32	6	1	2	2	100.00
33	4	10	0	13	100.00
34	5	6	2	0	100.00
35	154	0	12	0	98.80
36	45	10	0	0	96.36
37	1	0	1	0	100.00
38	12	0	0	0	100.00
39	13	0	0	0	100.00
40	10	7	0	15	100.00
41	22	0	1	0	100.00
42	28	0	0	0	100.00
43	1	6	1	4	58.33
44	39	12	2	0	100.00
45	4	2	0	14	100.00
46	9	11	0	5	88.00
47	32	0	5	0	100.00
48	11	26	35	0	97.22
49	228	128	2	0	1.12

Note: FB refers to Facebook, IG to Instagram. See Definitions of Terms and Metrics for a detailed definition of account types.

Based on case notes, we can qualitatively characterize these 3 networks as follows:

- Network 18, which was taken down on 09/18/2020, was a cluster of Canada-based accounts spreading sensationalist content from domains whose names were meant to look like legitimate news sites or to look like legitimate sites related to former President Trump, but in fact were ad farm websites. The network consisted of 4 Facebook Pages and 14 Facebook user accounts.

- Network 23, which was taken down on 10/09/2020, was a cluster of U.S.-based accounts posting links to ad farm websites, as well as political conspiracy memes related to President Biden to drive page engagement and build an audience. The network consisted of 2 Facebook user accounts, 5 Facebook Pages, 3 Facebook groups and 2 Instagram user accounts.

- Network 49, which was taken down on 01/06/2021, was a cluster of Bangladesh-based accounts creating Facebook events that linked to alleged live streams of a second Trump inauguration. The links would send users to affiliate sites on which they were prompted to pay for a streaming service that did not appear to exist. The network consisted of 228 Facebook user accounts, 128 Facebook Pages and 2 Facebook groups.

S2.1.4 Network Country Attribution The country attributions for these networks come solely from Meta investigative teams, based on various location signals available to them. According to Meta, the predictions may differ based on several factors, which could include the sophistication of the actor, their attempts to obfuscate their location, and the investigative need to know the actor's location.

S2.1.5 Network Data Coding

- Account characteristic metrics

  - Characteristics of network accounts (like age, gender, location etc.) are from the date closest to the modal takedown date for each network for which data was available. Because takedowns occurred in a staggered fashion, some accounts were already disabled on the modal takedown date, and so data had to be acquired from earlier periods.

  - For Facebook users, we predicted a primary location based on that user's information and activity on Facebook, including the city information reported on their Facebook profile as well as other device and connection information, if available. For Instagram users, we predicted a primary location based on that user's connection information such as IP address.

  - Age is derived from the date of birth of the user, as specified on the platform.

  - Gender is derived from the stated gender on the user profile.

- Network metrics

  - For networks with Facebook users, we provide networks metrics on their engagements with other network user accounts. Engagement data includes likes, reactions, comments, direct posts, mentions, direct messages, group messages, tags, and reshares during the June 26, 2020 to February 15, 2021 study period.

- The metrics are defined as follows and generated by the iGraph package in R. See more detailed descriptions at https://igraph.org/:

  * Edges (size): The number of edges in the graph between vertices, which are network-affiliated user accounts. Vertices are connected by an edge if they engaged with one another in any manner noted above.

  * Density: The ratio of the number of edges to possible edges.

  * Distance: The average of the shortest path between all vertices in the graph.

  * Reciprocity: The proportion of mutual connections between vertices.

  * Transitivity: The probability that the adjacent vertices of a vertex are connected.

  * Degree: For a vertex, the number of adjacent edges.

  * Strength: The sum of the weights of adjacent edges for each vertex.

  * Closeness: The number of steps required to access every other vertex, for a given vertex.

  * Betweenness: The number of smallest paths going through a vertex.

S2.1.6 CIB Network Descriptions CIB network descriptions can be found in Table S2. Note that many networks targeted countries other than the U.S., but are included here if they at least partially targeted US users.

Table S2: Links to published reports about CIB networks

ID	Name in common usage	Link to report with detailed network information	# in report
1	Roger Stone and associates	https://about.fb.com/news/2020/07/removing-political-coordinated-inauthentic-behavior/	4
2	Romania	https://about.fb.com/news/2020/08/july-2020-cib-report/	1
3	Truthmedia	https://about.fb.com/news/2020/08/july-2020-cib-report/	2
4	Russia IRA ("PeaceData")	https://about.fb.com/news/2020/09/august-2020-cib-report/	1
5	China ("Naval Gazing")	https://about.fb.com/news/2020/09/removing-coordinated-inauthentic-behavior-china-philippines/	1
6	Russia IRA ("United World International")	https://about.fb.com/news/2020/09/removing-coordinated-inauthentic-behavior-russia/	2
7	Russian intelligence ("Strategic Culture")	https://about.fb.com/news/2020/09/removing-coordinated-inauthentic-behavior-russia/	3
8	Russian military / GRU	https://about.fb.com/news/2020/09/removing-coordinated-inauthentic-behavior-russia/	1
9	Rally Forge	https://about.fb.com/wp-content/uploads/2020/11/October-2020-CIB-Report.pdf	11
10	Mexico / Venezuela	https://about.fb.com/news/2020/10/removing-coordinated-inauthentic-behavior-mexico-iran-myanmar/	1
11	Iran Eurovision	https://about.fb.com/news/2020/10/removing-coordinated-inauthentic-behavior-mexico-iran-myanmar/	2
12	Iran typo-squatting domains	https://about.fb.com/wp-content/uploads/2021/01/December-2020-CIB-Report-.pdf	1
13	Fazze	https://about.fb.com/news/2021/08/july-2021-coordinated-inauthentic-behavior-report/	2

S2.1.7 Available FMO Network Descriptions While CIB takedowns are made public and accompanied by reports, FMO takedowns are not. Here, we provide qualitative descriptions of a subset of the FMO networks. This subset consists of networks that reached the largest number of viewers. The academic team asked Meta for descriptions of all FMO networks. Meta did not provide descriptions for all FMO networks because they did not have the resources in their investigative teams to conduct post-hoc investigations of all FMO networks.

- Network 15, which was taken down on July 28, 2020, and originated in Italy, consisted of 366 Facebook users, 10 groups and 4 Instagram users. The network posted links to ad-laden websites that featured articles on political topics copied from American outlets. The sources of the copied articles included outlets such as Patriot Journal, Fox News, Conservative Daily Brief and MAGA conservative.

- Network 17, which was taken down on September 9, 2020, and originated in Armenia, consisted of 66 Facebook users, 57 Pages, 1 group and 9 Instagram users. The network primarily focused on Ukraine, but also targeted audiences in the US. The network posted links to ad-laden websites with English-language and non-English-language content, including civic content. The English-language content included articles copied from outlets such as Business Insider.

- Network 19, which was taken down on September 30, 2020, and originated in North Macedonia, consisted of 7 Facebook users, 13 Pages and 11 groups. This network created fake accounts posing as Americans, as well as Pages and groups focused on US civic issues. They used these to post links to off-platform websites that featured articles on political topics copied from American outlets. The sources of the copied articles included outlets such as VOA News, Forbes, and Fox News.

- Network 27, which was taken down on October 20, 2020, and originated in Kosovo, consisted of 6 Facebook users and 1 Page. The Page was a compromised comedy Page which, after being compromised, was used to post non-civic memes and links to off-platform websites that featured content copied from Fox News. User comments on these posts pointed out the Page had been hacked.

- Network 29, which was taken down on October 20, 2020, and originated in Pakistan, consisted of 676 Facebook users. The network posted links to an off-platform website, which included copied articles from a number of other news sources.

- Network 34, which was taken down on October 28, 2020, and originated in Kosovo, consisted of 5 Facebook users, 6 Pages and 2 groups. This network used a fake account posing as an American to admin Pages and post links towards an ad-laden website that featured articles copied from American outlets. The sources of the copied articles included outlets such as America Now.

- Network 35, which was taken down on October 29, 2020, and originated in North Macedonia, consisted of 154 Facebook users and 12 groups. The network was a cluster of inauthentic accounts posting links to ad-laden websites that featured articles on political topics copied from American outlets. The sources of the copied articles included outlets such as the LA Post, The Washington Times, and The Federalist, among others.

- Network 36, which was taken down on October 29, 2020, and originated in North Macedonia, consisted of 45 Facebook users and 10 Pages. The network posted links to ad-laden websites which included articles copied from other news sources. The sources of the copied articles included outlets such as Fox News and the Daily Mail.

S2.2 Aggregated Platform Data

Aggregated platform data includes data on adult U.S.-based Facebook and Instagram users who were active for at least one day between June 26, 2020 and February 15, 2021 (the study period). The data includes the creation of, exposure to, and engagement with network content by active users during the study period (hereafter this data is referred to as 'active user data'). Active user data did not include users from Puerto Rico and other U.S. territories that have their own ISO code and are hence not included in how Meta filtered U.S. users. Facebook and Instagram user accounts that were in any of the CIB or FMO networks were excluded from the active user population. Specifically, these data include:

- Total engager/engagement actions data: total number of Facebook and Instagram users who viewed and engaged with network content during the study period, and total number of engagement actions taken by such users during the same period (see Section S2.2.1 for data collection period details; see Section S2.0.1 for network content definition).

- Engagement data: Aggregated statistics on Facebook and Instagram user engagement with network content, including for various population subgroups (see Section S2.2.2); network content is defined as above (see Section S2.0.1) and includes ads created by network (does not include any reshares by network of ads not created by network, does not include reshares by network of network ads, does not include reshares by users not affiliated with a network of network ads).

- Diffusion data: Diffusion of network content at tree level on Facebook; diffusion trees can only be started by original posts by network accounts (excludes reshares by network-affiliated accounts where original post was not made by any network-affiliated account); includes reshares seen by US users of any age (where account posting reshare can be of any age or location).

- Ad diffusion data: Diffusion of network ads at the tree level on Facebook and Instagram combined; Includes ad reshares on Facebook seen by US users of any age, regardless of where the resharer is a US user or not.

For this study, data on the characteristics of active users was collected on the date closest to the modal takedown date for networks for which data was available. The academic research team did not have access to individual-level active user data. Rather, active user data were shared with the academic team in a summarized, aggregate form. Code to collect and process the data from Meta servers was written by Meta researchers and then reviewed by at least one member of the academic research team. The academic researchers only had access to code that was implemented within Meta specifically for this project. While the use of this active user data is permissible under Meta's Data Policy, care was nevertheless taken to ensure that user privacy was protected. These procedures included the following:

- First, all requests were reviewed by Meta Legal and Privacy to ensure that no individual-level or identifying data were shared with the academic research team.

- Second, techniques were used to reduce the risk of any individually identifying data being shared. As noted before, all active user data was shared in a summarized, aggregate form. In these tables, only rows with 100 or more potentially contributing users are included.

We note the following unanticipated data gaps:

- The Instagram engagement (e.g., likes, comments, etc.) datasets used in the study were accidentally not preserved for the period prior to July 17, 2020. To ensure consistency across metrics, we reduce the period of aggregation for all metrics on the Instagram sample to between 2020-07-17 and 2021-02-15.

- Due to an error in the processing of the data, exposure logs on Instagram were missing for October 8, 9, 10, 11, and 13. Thus, our measures of exposure and production on Instagram exclude these five days.

- Given the discrepancy between factors such as devices used to access Facebook or how content is displayed across Facebook surfaces, there may be slight inaccuracies in the number of content views and engagement reported. However, because these differences shouldn't vary meaningfully from day to day, we expect that any such potential discrepancy should be effectively consistent across the study period and across different types of users. We note that for some users, engagement counts are higher than VPV counts due to logging errors.

All non-integer numeric variables in this study's replication data contain double-precision floating-point numbers and are therefore subject to floating point error. Given double-precision floating point numbers have 15.95 decimal digits of precision, and differences smaller than 1e-17 are within their margin of error, we have rounded the results of all computations involving variables of this data type to the 15th decimal digit.

S2.2.1 Data Collection Periods Study period: For Facebook, these metrics are based on computing the total count for the data collection period (2020-06-26 until 2021-02-15). For Instagram, metrics are aggregated between 2020-07-17 and 2021-02-15 due to an unanticipated data gap.

S2.2.2 Aggregated Platform Data Coding

- Breakdowns for aggregated platform data: Along with data on the full sample of active users, we also provide breakdowns of exposure and engagement based on the following subgroups of active users:

  - High news exposure: Users who were in the top 20% of news viewers during the study period among the active user population. News content is based on the News classifier, see S2.0.2. This data is only available for Facebook.

  - High exposure to content from untrustworthy sources: Users who were in the top 20% of viewers of content from untrustworthy sources during the study period among the active user population. For the definition of untrustworthy sources see S2.0.2. This data is only available for Facebook.

– High political ads exposure: Users who were in the top 20% of viewers of political ads during the study period among the active user population. This data is only available for Facebook.

– High political interest: Users who were in the top 20% of engagement with political content (based on Civic classifier) during the study period among the active user population. Civic engagement is defined as the number of actions taken on civic posts (likes, comments and reshares) divided by the number of VPVs of civic content, as defined by the Civic classifier (see S2.0.2). This data is only available for Facebook.

– Tenure: Terciles of active users' number of days since registering on the platform.

– Time spent on platform: Quartiles of active users based on their time spent on the platform during the study period. The metric of time spent on Facebook is based on Meta's internal measures of the amount of time that each person actively engages with the app or website. This metric includes time spent on all surfaces for both platforms.

– Gender: Stated gender by the user. Data may be missing for some users.

– Age: Stated age by the user. This data is only available for Facebook.

– Battleground state: Whether the user is inferred to reside in a battleground state. Following the two most recent Electoral College Ratings by the Cook Political Report prior to August 2020, we defined as battleground states those whose complete electoral geography was considered in the "Toss Up", "Lean Democrat", or "Lean Republican" in at least one of the reports. "Toss Up" states included: Arizona, Georgia, Maine, North Carolina; "Lean Democrat" or "Lean Republican" states included: Florida, Michigan, Minnesota, New Hampshire, Pennsylvania, Wisconsin, Iowa, Ohio, and Texas. Nebraska was excluded because only one of three congressional districts was identified as a battleground district. For Facebook users, we predicted a primary location based on that user's information and activity on Facebook, including the city information reported on their Facebook profile as well as other device and connection information, if available. For Instagram users, we predicted a primary location based on that user's connection information such as IP address.

– Groups in: Terciles of active users' count of memberships in Facebook groups.

– Groups administered: Binary measure of whether active users administered Facebook groups.

– Number of friends: Terciles of active users' count of friends on Facebook.

– Pages followed: Terciles of active users' count of Facebook Pages followed.

– Pages administered: Binary measure of whether active users administered Facebook Pages.

– Ideology: Whether the user was classified as conservative, moderate, or liberal. See S2.0.2 for the definition of the ideology classifier.

– Population density: Terciles based on the population density of the Congressional district in which the user was inferred to reside. For Facebook users, we predicted a

primary location based on that user's information and activity on Facebook, including the city information reported on their Facebook profile as well as other device and connection information, if available. For Instagram users, we predicted a primary location based on that user's connection information such as IP address.

– Congressional district: Inferred Congressional district of user. For Facebook users, we predicted a primary location based on that user's information and activity on Facebook, including the city information reported on their Facebook profile as well as other device and connection information, if available. For Instagram users, we predicted a primary location based on that user's connection information such as IP address.

– Swing district: Whether the user is inferred to reside in a Congressional swing district, based on the Cook Political Report. For Facebook users, we predicted a primary location based on that user's information and activity on Facebook, including the city information reported on their Facebook profile as well as other device and connection information, if available. For Instagram users, we predicted a primary location based on that user's connection information such as IP address.

– Census geographic division: Inferred location of User in U.S. Census Bureau Geographic Divisions. For Facebook users, we predicted a primary location based on that user's information and activity on Facebook, including the city information reported on their Facebook profile as well as other device and connection information, if available. For Instagram users, we predicted a primary location based on that user's connection information such as IP address.

– Number of posts composed by user (Facebook): Terciles of posts created by active users during study period. Posts include original posts and, for Facebook only, reshares.

– Number of posts composed by user (Instagram): Binary measure of whether active users created posts during the study period.

– Majority non-Hispanic/non-Latino White Congressional district: Whether the user was inferred to reside in a Congressional district that was majority non-Hispanic/non-Latino White. That is, this variable indicates whether a user is inferred to reside in a Congressional district where more than 50% of the population are White and not Hispanic/Latino according to the U.S. Census Bureau 2020 Census Redistricting Data (Public Law 94-171). For Facebook users, we predicted a primary location based on that user's information and activity on Facebook, including the city information reported on their Facebook profile as well as other device and connection information, if available. For Instagram users, we predicted a primary location based on that user's connection information such as IP address.

– Following: Terciles of active users' count of accounts they were following. This data is only available for Instagram.

– Followers: Terciles of active users' count of followers. This data is only available for Instagram.

• Information cascades: Our metrics are based on information cascades generated by all the posts published on Facebook (publicly or privately) by network accounts during our study

period that were seen by US users. We do not create data on information cascades for Instagram because reshares can only be made from original posts to stories. We reconstruct those information cascades in the form of network trees. Tree data structures are hierarchical networks with a root node (i.e., the original post) and nested layers of resharing activity—if the post is reshared. Nodes are posts published on Facebook and edges indicate resharing behavior. Reshares eligible to be included in these trees were all reshares seen by a US user during the study period, including reshares by network accounts. The minimum size of these trees or cascades is 0 (which corresponds to a scenario in which the original post is not reshared by anybody, or when the original post was made before the study period). To classify the creator type of the tree, whether the tree is potentially false, the promotion method of the tree, mentions of political candidates, and takedown categories, we take the classification of the root node. For all other classifiers, the tree is classified according to the median classification of all of the nodes in the tree. We include separate information cascades data for organic posts made by network accounts, and advertisements made by network accounts.

- Based on these cascades, we present aggregate summary statistics of four measures generated from the cascades at the network level.
  * Cascade size (post): number of reshares that contributed to the reshare cascade of a given original post by a network account over time.
  * Cascade size (ad): number of reshares that contributed to the reshare cascade of a given ad by a network account over time.
  * Cascade depth (post): number of reshare hops from the original post by a network account, where a hop is a reshare by a new unique user.
  * Cascade depth (ad): number of reshare hops from the ad by a network account, where a hop is a reshare by a new unique user.
  * Cascade maximum breadth (post): maximum number of users who contributed a reshare to the reshare cascade of a given original post by a network account at any depth.
  * Maximum cascade beadth (ad): maximum number of users who contributed a reshare to the reshare cascade of a given ad by a network account at a any depth.
  * Structural virality (post): average distance between all pairs of nodes in the reshare tree (where a node can be the original post by a network account or any reshare in this post's reshare cascade). See [12] for a technical description of the measure.
  * Structural virality (ad): average distance between all pairs of nodes in the reshare tree (where a node can be the ad by a network account or any reshare in this ad's reshare cascade).
- Ghost branches: our data encompasses all posts that were seen by all adult U.S.-based active Facebook users. This means that posting and resharing activity not seen by U.S. users does not appear in our data. To counter this, we decided to create "ghost branches" to replace them using an imputation approach that connects them to the node with depth immediately above the missing node. This is only relevant for the calculation of structural virality.

S2.2.3 Aggregated Platform Data for Subpopulations To facilitate baseline comparison between those exposed to deceptive online networks and the general Facebook user population, we include aggregated data on the distribution of subpopulations of active users (as defined in this paper) on Facebook, including:

- Age: proportion of active users age 18-29, 30-44, 45-64, and 65+

- Gender: proportion of female and male active users

- Ideology: proportion of active users who are conservative, moderate, and liberal

- Location of active users in a battleground state: proportion of active users in battleground states

- Location of active users in a swing district: proportion of active users in swing districts

- Location of active users in a census geographic division: proportion of active users based on census geographic divisions

- Location of active users in a majority non-Hispanic/non-Latino White Congressional district: proportion of active users in majority non-Hispanic/non-Latino White Congressional district

- Group of active users based on whether they administered any Facebook groups: proportion of active users who administered any Facebook groups

- Group of active users based on whether they administered any Facebook Pages: proportion of active users who administered any Facebook Pages

- Tercile of active users based on their number of Facebook group membership

- Tercile of active users based on their number of Facebook friends

- Tercile of active users based on their number of Facebook Pages followed

- Tercile of population density of the Congressional district in which active users are located

- Tercile of active users based on their number of posts created during the study period

- Tercile of active users based on their tenure on platform (days their account existed)

- Quartile of active users based on their time spent on the platform during the study period

- Congressional district: proportion of active users by congressional district

Data on subpopulation proportions taken at the date of the earliest network takedown during the study period.

S2.3 Individual-Level Participant Data

Individual-level participant data refers to a combination of survey responses and behavioral platform data for consenting research participants on Facebook.

Individuals' survey responses stem from five waves of surveys collected as follows:

- Wave 1: A subsample of Facebook-recruited respondents were invited to the survey on August 31, 2020 in a soft-launch. The remainder of sampled Facebook-recruited respondents were invited to the survey on September 1. The recruitment of the sample continued until Saturday, September 12. The wave included the recruitment and consent processes and a short survey.

- Wave 2: The field period for Wave 2 started on September 8 and continued through September 23. The wave included a baseline survey.

- Wave 3: The field period for Wave 3 started on October 9 and continued through October 23.

- Wave 4: The field period for Wave 4 started on November 4 at 12:05 am Central Time and continued through November 18.

- Wave 5: The field period for Wave 5 started on December 9 and continued through December 23. The survey started approximately one week later than the original schedule due to obtaining approvals for updated informed consent language.

These consenting participants were recruited for a number of on-platform intervention experiments as well as a deactivation study (for overall timeline, see Figure S1).
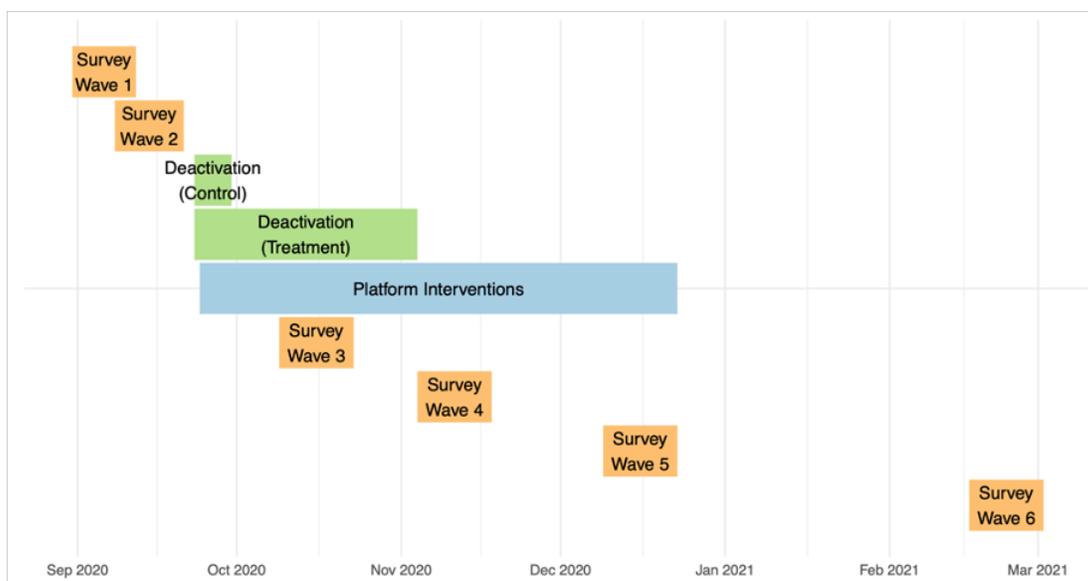
Figure S1: Survey timeline

Note that consenting participants were randomly assigned to different experimental interventions (see Section S4.6) as well as control groups. For analyses using individual-level participant

data which do not control for individual-level covariates, we restrict the analyses to the control group. Individual-level participant data is not representative of the population of users.

S2.3.1 Variables We group variables by data type (survey vs. platform behavioral data) and by analysis they mainly pertain to.

Variables in the individual-level participant data include the following survey data primarily used for our downstream analysis in Section S3 (for questionnaires with matching variable names, see https://socialmediaarchive.org/record/42/files/NORC_Survey_Questionnaires.pdf):

- Demographics: survey-based variables include male (where GENDER takes the value of 1); age (AGE_V2 brackets of 18-29, 30-44, 45-64, 65+); education (EDUC5); race and ethnicity (white non-hispanic, black non-hispanic, hispanic, asian-american and pacific islander, multi-racial from RACETHNICITY); income (INCOME_TERCILE); urban and rural (URBAN_RURAL_W1); swing state (BATTLEGROUND_BLOCK).

- Political ideology: party identification including Democrat and Republican ((PID_W1); Democrat and Republican leaners (PIDLEAN_W1); strong Democrats and Republicans (PIDSTRENGTH_D_W1, PIDSTRENGTH_R_W1); and ideology on a five point scale (IDEO1_W1).

- Voting history and intention: 2016 turnout (VOTE16_W1); 2016 presidential vote choice (CAND16_W1); 2020 vote intention (VOTE_LIKELY_W2); 2020 voter registration (REG_W2); 2020 likely vote choice (VOTE_PREELEC_W2); presidential approval in 2020 (APPROVAL_W2).

- Attitudes, capabilities and affect: feeling thermometer scores (FT_PEOPLEGROUPSA_W2, FT_PEOPLEGROUPSB_W2, FT_PEOPLEGROUPSC_W2, FT_PEOPLEGROUPSD_W2, FT_PEOPLEGROUPSE_W2, FT_PEOPLEGROUPSF_W2, FT_PEOPLEGROUPSG_W2, FT_PEOPLEGROUPSH_W2, FT_PEOPLEGROUPSI_W2, FT_PEOPLEGROUPSJ_W2); how smart people who support a particular party are (DEMSMART_W2; REPSMART_W2); responses to issue opinion questions on economy, perceptions of racial discrimination, and perceptions of gender discrimination (ECONOMY_W2, BLACKWHITE_ISSUEA_W2, BLACKWHITE_ISSUEB_W2, BLACKWHITE_ISSUEC_W2, BLACKWHITE_ISSUED_W2, SEXISM1_2A_W2, SEXISM1_2B_W2); epistemic political efficacy based on measures of respondents' confidence in their ability to find the truth about political issues (EPE1_W2) and figure out the facts behind most political disputes (EPE2_W2); political knowledge of which party has control of the house (KNOW_HOUSE_W2) and senate (KNOW_SENATE_W2) and which party is liberal and conservative (IDEOLOGY_GROUPB_W2, IDEOLOGY_GROUPC_W2); interest in politics (POLINT_W2); evaluation of democratic institutions such as whether elections are free from foreign interference and whether all adults have equal opportunity to vote (USDEMOC_TRAITA_W2, USDEMOC_TRAITB_W2, USDEMOC_TRAITC_W2, USDEMOC_TRAITD_W2, USDEMOC_TRAITE_W2, USDEMOC_TRAITF_W2); digital literacy based on respondents evaluation of own understanding with concepts such as wiki, hashtag, and selfie (DIGLITERACY_TERMA_W2, DIGLITERACY_TERMB_W2, DIGLITERACY_TERMC_W2, DIGLITERACY_TERMD_W2, DIGLITERACY_TERME_W2, DIGLITERACY_TERMF_W2, DIGLITERACY_TERMG_W2, DIGLITERACY_TERMH_W2); emotions during the past four weeks including feeling happy (EMOTA_W2), depressed (EMOTB_W2), and anxious (EMOTC_W2).

- Media trust and consumption: trust in various traditional media outlets: local news, national newspapers, national network TV news, Fox News, MSNBC, and CNN (INFOTRUST_SOURCEA_W2, INFOTRUST_SOURCEB_W2, INFOTRUST_SOURCEF_W2, INFOTRUST_SOURCEG_W2, INFOTRUST_SOURCEH_W2, INFOTRUST_SOURCEI_W2) and social media platforms: Facebook, Instagram, and Twitter (INFOTRUST_SOURCEC_W2, INFOTRUST_SOURCED_W2, INFOTRUST_SOURCEE_W2); daily sources of political information including national network TV, newspaper, online news, local TV, Facebook, Instagram, Twitter, YouTube, Fox News, MSNBC, CNN, talk radio, public radio, and family/friends (POLINFO_SOURCEA_W2, POLINFO_SOURCEB_W2, POLINFO_SOURCEC_W2, POLINFO_SOURCED_W2, POLINFO_SOURCEE_W2, POLINFO_SOURCEF_W2, POLINFO_SOURCEG_W2, POLINFO_SOURCEH_W2, POLINFO_SOURCEI_W2, POLINFO_SOURCEJ_W2, POLINFO_SOURCEK_W2, POLINFO_SOURCEL_W2, POLINFO_SOURCEM_W2, POLINFO_SOURCEN_W2)

- Political participation: self-reported participation where respondents reported whether they: (1) attended a protest or rally, (2) contributed money to a political candidate or organization, (3) signed an online petition, (4) tried to convince someone to vote (online or in-person), (5) wrote and posted political messages online, or (6) talked about politics with someone they know (POLPART_1_W2, POLPART_2_W2, POLPART_3_W2, POLPART_4_W2, POLPART_5_W2, POLPART_6_W2).

- Belief in the legitimacy of the election: we construct an index of various election-related beliefs and attitudes including belief in who won the 2020 presidential election, perceptions of election irregularities, confidence in election officials, and perceived accuracy of election results and mail-in voting (ELECTWIN_W5; IRREG2020A_W5; IRREG2020B_W5; MISINFOA_W5; MISINFOB_W5; MISINFOC_W5; MISINFOD_W5; MISINFOE_W5; CONFOFFICIALS_W5; COUNTACCURATE_W5; MAILACCURATE_W5).

- Factual discernment: we construct an index based on calculations of the difference between mean belief in four true claims (MISINFOI_W4; MISINFOB_W4; MISINFOJ_W4; MISINFOH_W4) and mean belief in seven false claims (MISINFOA_W4; MISINFOK_W4; MISINFOC_W4; MISINFOG_W4; MISINFOE_W4; MISINFOD_W4; MISINFOF_W4) that were circulating online at the time of the study. Perceived accuracy was measured on a four-point scale.

For our exploratory analysis of FIES experimental interventions (see Section S4.6), we use the following survey variables:

- Pre-treatment variables used in other FIES studies [14, 15, 31]: gender, age bracket, party identification, turnout in 2016, news consumption (via TV, cable, online, social media, newspapers), political interest, political participation, digital literacy

- Additional pre-treatment survey variables: whether participants have a collage degree, income tercile

In addition to their survey responses, participants' on-platform behavioral data, including metrics related to exposure to network content as well as political content more generally, engagement

metrics, and time spent was collected. The on platform behavior variables mainly used for our downstream analysis in Section S3 include:

- Platform behavior and FIES experimental intervention: count of all VPVs, count of cross-cutting VPVs,[S9] count of politics-related (civic) VPVs, count of news VPVs, count of views of content with likely slurs, count of uncivil content views, count of Page views, count of views of Pages considered untrustworthy sources, time spent on Facebook, enabling the constituent badge on Facebook, and donating to civic/political causes, engaging with political events, engaging with the Voter Information Center on Facebook, engaging with political figures on Facebook; count of reshares, reactions, likes, comments, clicks on political content; count of reshares, reactions, likes, comments and clicks overall; the experimental intervention study (chronological feed, no reshares, no political ads, no targeted political ads, less like-minded content, and less untrustworthy content) that the participant was randomized into. These variables were collected on Facebook for a period of 90 days prior to the initiation of experimental interventions (2020-06-26 to 2020-09-23 for behavioral data).

- Platform untrustworthy exposure: Platform untrustworthy exposure (for definition see Section S2.0.2) in the period of 90 days prior to experimental intervention initiation (2020-06-26 to 2020-09-23).

- Partisan news clicks (pre): We measure partisan news clicks by computing the absolute difference between the average domain audience ideology of political news domains that respondents clicked on feed and the mid-point of the domain audience ideology scale (0.50). When used as a control or pre variable, the data were collected in the period of 90 days prior to experimental intervention initiation (2020-06-26 to 2020-09-23).

- Partisan news clicks (post): When used as an outcome or post period measure, the data were collected 2020-11-04 to 2020-12-22.

- Network content views: We measure participants' views of networks from after Wave 2 until Wave 4 of the survey (2020-09-24 to 2020-11-03).

- Network content engagement: We measure participants' engagement with network content (the sum of clicks, reactions, comments, likes and reshares) from after Wave 2 until Wave 4 of the survey (2020-09-24 to 2020-11-03).

For our exploratory analysis of FIES experimental interventions (see Section S4.6), we use the following platform behavioral variables:

- Network content views: We measure participants' views of networks from after Wave 2 until Wave 4 of the survey (2020-09-24 to 2020-11-03).

- Network content engagement: We measure participants' engagement with network content (the sum of clicks, reactions, comments, likes and reshares) from after Wave 2 until Wave 4 of the survey (2020-09-24 to 2020-11-03).

[S9]For predicted liberal and conservative participants and sources (based on their audiences), content from a friend, Page or group is considered cross-cutting with respect to a participant whenever both the participant and source's predicted ideology categories do not match. Content from sources that are predicted to be neither liberal nor conservative (i.e., moderate users and entities with ideologically mixed audiences) is not considered cross-cutting.

- Total views: We measure participants' count of all VPVs from after Wave 2 until Wave 4 of the survey (2020-09-24 to 2020-11-03).

- Total engagement: We measure participants' engagement with any content (the sum of clicks, reactions, comments, likes and reshares) from after Wave 2 until Wave 4 of the survey (2020-09-24 to 2020-11-03).

- Additional pre-treatment platform variables: average daily time spent, social media activity tercile, Facebook friend count, civic content engagement, proportion of views in different categories (civic, civic news, cross-cutting, from untrustworthy sources, classified as uncivil, with likely slurs), partisan news clicks, posts by connections tercile and proportion of like-minded friends, block randomization group

For our analysis of the proportion of network views to political (civic) views, we use the following variables:

- Network content views: We measure participants' views of networks from after Wave 2 until Wave 4 of the survey (2020-09-24 to 2020-11-03).

- Political views: We measure the count of politics-related (civic) VPVs during the FIES experimental intervention treatment period (2020-09-24 to 2020-12-22).

- Total views: We measure participants' count of all VPVs from after Wave 2 until Wave 4 of the survey (2020-09-24 to 2020-11-03), and also during the FIES experimental intervention treatment period (2020-09-24 to 2020-12-22).

Indices are constructed using principal components analysis with varimax rotation, where items that do not load are excluded from the index [25].

For definitions of views (VPVs) and other behavioral variables, see Section S2.0.1.

S2.3.2 Sampling Consenting research participants were randomly assigned to different experimental interventions (which we refer to as "experimental interventions") that began on September 24, 2020 (after the completion of Wave 2) and ended halfway through the day on December 23, 2020. Participants were sampled to achieve specific sample targets across different stages of the study, which were in turn chosen to achieve desired minimum detectable effect sizes (MDEs) for experimental interventions across different subgroups among the set of respondents participating in the Wave 1 and Wave 2 surveys and Waves 4 or 5.

The sampling frames included all Facebook and Instagram monthly active U.S.-based users 18 years of age or older eligible to receive general surveys on a given platform (these represent a random set of users from the overall Facebook and Instagram populations) as of August 17, 2020.[S10] Participants were asked to confirm they were over 18 years of age and lived in the United States as part of the recruitment process. The Facebook sampling frame was trimmed by removing predicted fake accounts, employees, and advertisers. For Instagram, creators and business accounts also were removed. Finally, because the use of multiple accounts is common among Instagram

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[S10]For Meta's definition of monthly active user, see https://www.sec.gov/Archives/edgar/data/1326801/000132680123000013/meta-20221231.htm

users, the sampling frame was narrowed to include only a user's primary account (for users with multiple accounts, this is the oldest account).

The sampling frame was stratified along the following covariates: the number of days a user was active on a given platform (the number of days a user logged in to Facebook or Instagram in the 30 days on or before August 17, 2020, classified into three categories: 1-14 days, 15-29 days, and 30 days), a user's predicted census region (East, Midwest, South, West),[S11] whether the user is predicted to live in a battleground state,[S12] a user's predicted ideology (liberal, moderate, or conservative),[S13] and the census ethnic/racial composition in the zip code in which a user is predicted to live (percent of Hispanic residents and Black residents).[S14] For Instagram, the only variable not used for the stratification step was predicted ideology, as this classifier had not been developed for Instagram. The stratification of the sampling frame for these samples generated 621 and 207 population cells for Facebook and Instagram, respectively.

Having defined the sampling frames, sampling probabilities were computed to achieve specific sample distributions for the set of demographics encoded in the stratification step across each of the samples of interest. The sampling probabilities took into account (a) differential non-response across different demographics [S15] and (b) the desired sample size across the different studies.

The sample size is $N = 72,962$, with $N = 19,510$ participants randomized into the control group for the FIES platform interventions.

S2.3.3 Participant Recruitment and Consent

At the top of their Instagram or Facebook feed, randomly selected participants saw a recruitment message asking them if they would like to share their opinion as shown in Figure S2. Those clicking "Start Survey" were directed to a consent form. Participants gave their consent to participate in the on-platform experiments using an IRB-approved consent form, as follows:

Do You Want to Participate in a Research Study About the US Election in November?

Your participation in this research will help researchers at New York University, The University of Texas at Austin, and other academic institutions, as well as Facebook, under-

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[S11]The classification of states across each of the census regions is available here.

[S12]Following the two most recent Electoral College Ratings by the Cook Political Report prior to August, we defined as battleground states those whose complete electoral geography was considered in the "Toss Up", "Lean Democrat", or "Lean Republican" in at least one of the reports. "Toss Up" states included: Arizona, Georgia, Maine, North Carolina; "Lean Democrat" or "Lean Republican" states included: Florida, Michigan, Minnesota, New Hampshire, Pennsylvania, Wisconsin, Iowa, Ohio, and Texas. Nebraska was excluded because only one of three congressional districts was identified as a battleground district.

[S13]See the Classifiers appendix in Sections S2.0.2 for additional details on how ideology is predicted. For purposes of defining the sampling frame, liberal users have predicted ideology score below 0.35, conservative users have a predicted ideology score above 0.65; moderates have a predicted ideology score between 0.35 and 0.65. These thresholds were used for creating the sampling frame. Note that the thresholds we use to predict ideology for active users and network accounts in our data differ because of our focus on conservatives and liberal, instead of moderates.

[S14]Some fields had missing values (e.g., predicted ideology, state, and zip code). Individual values were imputed probabilistically using the distribution of demographics in the population. In general, the percent of missing values for a given demographic was quite small, never exceeding more than a few percentage points of the population.

[S15]Responses to Facebook surveys with a similar design were used to model differential response rates.

Figure S2: Image shown to recruit participants on FB or IG

stand more about how people's experience with Facebook and Instagram affects their opinions and behaviors on elections.

How it Works

Over the next four months, you'll be asked to fill out a short survey each month. This monthly survey will take about 15 minutes, for a total of 60 minutes over four months. Our partner, NORC at the University of Chicago, will administer this research.

During this time, your [Facebook/Instagram] experience may be different than what you're used to. For example, you might:

- See more or fewer ads in specific categories such as retail, entertainment, or politics

- See more or fewer posts in [News Feed / your feed] related to specific topics

- See more content from some [friends/connections] and less content from other [friends/connections]

- See more or less content about voting and elections

You'll be paid at least $30 for participating in this study and completing all four surveys, including $5 for each of the first two surveys and $10 for each of the final two surveys.

- You will receive your reward as an electronic gift card, delivered within 1 day of completing each survey

- You can only take each survey once

- If you do not complete the first survey, you will be removed from this study

If you choose to participate in this study, your survey responses will be linked with your Facebook and Instagram activity data from the 2020 calendar year.

Benefits, Alternatives, and Risks

There are no benefits to participating in this research, nor are there risks greater than those encountered in everyday life, including risks related to the loss of confidentiality. You can learn more about how we're keeping your information safe in the Data Collection and Your Privacy section below. You can choose not to participate in this study.

Data Collection and Your Privacy If You Choose to Participate in the Study

- NORC will join your survey responses to publicly available third-party data like if you've voted or made a political contribution, if this data is available

- Facebook will combine this data with your activity on Facebook and Instagram from the 2020 calendar year, collectively called Combined Data

- This Combined Data will only be used for research purposes and will not be used to show you ads

- This Combined Data will be shared with our academic partners and, if legally required, with the Institutional Review Board (IRB) that reviewed this study

- All access to this Combined Data will be monitored and logged

- Once this study is over, de-identified data (i.e. data where identifiers such as your name and other information that could reasonably be linked to you are removed) will be stored and shared for future research on elections, to validate the findings of this study, or if required by law for an IRB inquiry

You can decide to stop participating in this study at any time, for any reason, and without consequences. You may withdraw by visiting the study website hosted by our survey administrator, NORC at the University of Chicago, at 2020erp.norc.org

If you have any questions related to this research, you can email NORC at erpStudy@norc.org, or call toll-free at (866) 270-2602 between 9:00 AM - 10:00 PM ET.

If you are a research participant and have questions about your rights, or have concerns or complaints about this research, you can email the NORC Institutional Review Board (IRB) at surveyhelp@norc.org or call (866) 856 - 6672 between 9:00 AM and 10:00 PM ET. Please note that by contacting or providing information to NORC IRB, NORC IRB may obtain information about you, including any personal information that you share. Even though NORC IRB is affiliated with Facebook as this research study's IRB, Facebook's Data Policy does not apply to any information about you shared with NORC IRB when you initiate contact.

If you join this study, you affirm that you are at least 18 years of age and live in the United States. Once you join this study, you'll be sent off [Facebook/Instagram] to a site hosted by our study administrator, NORC, to complete a 5-minute enrollment form.

As noted in the study recruitment materials, participants were initially offered $5 for each of the first two surveys, and $10 for the final two surveys. Additional incentives were added as follows:

- Wave 2: FB/IG study participants were initially offered the cash equivalent of $5 for a post-completion reward. On September 20 a late respondent incentive of $10 was offered. Ten percent of the completions (17,997) received the $10 late respondent incentive.

- Wave 3: FB/IG study participants were initially offered the cash equivalent of $5 for a post-completion reward. Starting on October 16, an increased incentive of $10 was offered. Fifteen percent of the completions (20,613) received the $10 incentive.

- Wave 4: Those not in the deactivation groups were initially offered the cash equivalent of $10 as a post-completion survey reward. Starting on November 6, an incentive of $15 ($5 increase) was offered to the non-deactivation study participants, and on November 11 the incentive increased to $30. Panelists were also able to opt-out of receiving an incentive. Sixty-four percent of the completions (61,177) received the $10 incentive; 26% (24,566) received the $15 incentive; and 10% (9,800) received the $30 incentive.

- Wave 5: FB/IG study participants were offered differential incentives based on one or more participation factors. NORC offered respondents the following additional incentives based on their participation behavior:

    1. Participants linking their survey data with a valid Twitter handle were given an additional $5.

    2. Participants completing all prior survey waves and for whom their total incentive received (including Wave 5) was less than $40 were given additional incentive to bring the sum of survey incentives up to $40.

    3. Participants not completing the Wave 5 survey by December 15 were offered an additional $5.

Of all the respondents who completed the Wave 5 survey, 58% (76,248) received $20, 40% (53,133) received $25, 1% received $40 (1,384) and 1% received $50 (1,077).

S2.3.4   Re-identification Risk   For the individual-level data, the following variables were coarsened to minimize re-identification risks.

- INCOME (18 categories) to INCOME (3 categories: less than $49,999, $50,000 to $99,999, $100,000 or more); from Wave 1

- EDUCAT (14 categories) to EDUC5 (5 categories: less than high school, high school diploma, vocational degree / some college, college degree, graduate degree); from Wave 1

- HISPAN (8 categories), RACE_1 (15 categories) to RACETHNICITY (6 categories: White, non-Hispanic; Black, non-Hispanic; Other, non-Hispanic; Hispanic; 2+ non-Hispanic; Asian, non-Hispanic); from Wave 1

- ZIP (41,692 categories) to IS_SWING_STATE (2 categories based on Cook Political Report); see Wave 1

- ZIP (41,692 categories) to IS_SWING_CD (2 categories based on Cook Political Report); from Wave 1

- RELIGION (12 categories) to RELIGION (4 categories: Protestant, Roman Catholic, Mormon, Eastern or Greek Orthodox & not born-again; Protestant, Roman Catholic, Mormon, Eastern or Greek Orthodox & born-again; Jewish, Muslim, Buddhist, Hindu, Something else; Atheist, Agnostic, Nothing in particular); from Wave 5

S3 Downstream Analysis

As pre-registered, we examine the downstream consequences of deceptive online networks, specifically how exposure and engagement correlate with political outcomes at the individual level. To do so, we use individual-level participant data (see Section S2.3).

We acknowledge that, because we have limited knowledge about how the "treatments" in this specific downstream analysis (i.e., exposure to or engagement with the networks) are assigned, drawing causal conclusions using observational data under the unconfoundedness assumption is inherently challenging [18, 19]. Therefore, we conduct additional, pre-registered sensitivity analyses to gauge the credibility of the estimates and conclude that the estimates we obtained cannot be credibly interpreted as causal because they are highly susceptible to potential unobserved confounding.

We first outline the methods used to analyze how exposure and engagement correlate with political outcomes before presenting the results. See Section S8 for clarifications and deviations of this analysis.

S3.1 Methods

S3.1.1 Selection of Networks We select which networks to analyze by examining how many participants were exposed to each network after Wave 2 and before Wave 4 of the survey. We do this because if the network was removed prior to Wave 2, we would not have the required pre-exposure survey-based covariates. We set a threshold of 500 exposed participants after Wave 2 as the criteria for inclusion so that we are powered to detect, or rule out, moderately sized effects. Note that we pre-registered the threshold of 500 participants in our pre-analysis plan and initially planned to analyze networks reaching this threshold between Waves 2 and 3, 3 and 4, and 4 and 5. However, we deviated from this plan because the survey-based outcomes we examine are in Wave 4 and networks with higher reach were primarily active during Wave 3. Instead, we aggregate data between Wave 2 and 4 to maximize the number of exposures to networks (i.e., exposures to the network that occurred during the implementation of Wave 3 are now included, whereas those between Wave 4 and 5 are excluded, see SI Section S8.

Figure S3 shows the results of a prospective power analysis (conducted before we knew actual network reach in the participant data) that we rely on for guidance on the selection of networks for analysis. The figure shows that if we had 1,000 participants exposed, the minimum detectable effect (MDE) in an analysis of the effect of network exposure on the survey outcomes described below is 0.11 standard deviations of the outcome variable. If we had 2,000 participants exposed, the MDE is 0.08 standard deviations of the outcome variable. Based on this power analysis, we set the threshold to 500 participants so are powered to detect, or rule out, moderately sized effects.

Lowering the threshold would limit us to large effect sizes, which may be less substantively mean-ingful. Increasing the threshold would limit the number of networks we can analyze given likely lower rates of exposure. Two FMO networks operating on Facebook (FMO27 and FMO35) met these criteria, allowing us to estimate minimum detectable effects (MDEs) of 0.056 to 0.255 in the fully controlled models, which vary by outcome, exposure/engagement, and network analyzed. The maximum MDE for the fully controlled model is 0.13 for FMO27 and 0.26 for FMO35. Figure 4 in the main text shows the exact numbers of overall and treated participants for each analysis.
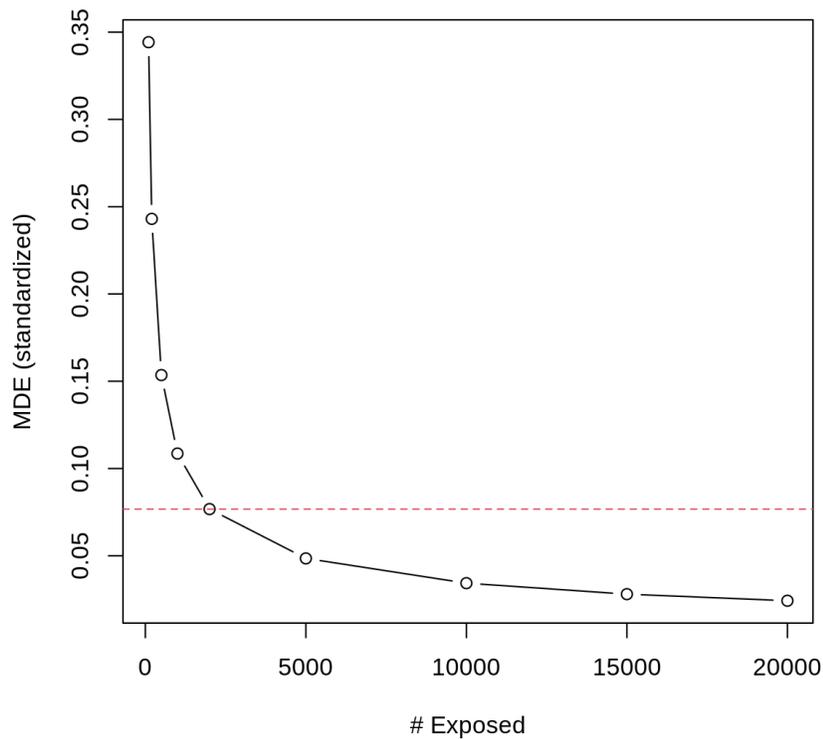
Figure S3: Standardized minimum detectable effect and exposure

S3.1.2 Exposure and Engagement   For networks that meet our inclusion criteria, we are inter-ested in how exposure to and engagement with deceptive online networks correlates with political outcomes. Exposure is measured as the number of VPVs of study participants to the network after Wave 2 and before Wave 4 (0 for those not exposed). Engagement is the number of clicks, likes, reactions, comments, and reshares by study participants with network content by survey wave (0 for those who did not engage, including those who were not exposed). Exposure and engagement are binarized (e.g., 1 for any exposure, 0 otherwise; 1 for any engagement, 0 otherwise) because discretized data require minimal functional form assumptions in estimation.

S3.1.3 Outcome Measures   As pre-registered, we focus on three political outcomes: belief in the legitimacy of the election, belief in misinformation, and partisan news clicks. We chose

these outcomes because they capture different aspects of politics (knowledge, attitudes, behavior) identified by prior research as areas potentially affected by deceptive political networks [1, 8, 13]. Furthermore, the outcomes are measured in different ways (survey-based responses, platform click data), and this diversity of outcome areas and measurement allows us to understand the scope of the relationship between exposure to network content and political outcomes.

The networks that met our inclusion criteria were both FMO networks. It is not the intention of deceptive financial networks to alter political knowledge, beliefs, or behaviors, but because these networks post political content, it is possible that exposure/engagement could be related to political outcomes, which we pre-registered before looking at any data about the networks other than whether they met the inclusion criteria. Regardless of the results, examining the association between political outcomes and FMO network exposure and engagement adds to our knowledge of deceptive financial networks and deceptive online networks more broadly.

Outcome variables include belief in the legitimacy of the election, factual discernment, and partisan news clicks, all measured post exposure to/engagement with deceptive networks and FIES experimental interventions (see Individual-Level Participant Data for details).

S3.1.4 Control variables   Control variables include demographics, political ideology, voting history and intention, attitudes, capabilities and affect, media trust and consumption, political participation, platform behavior and FIES experimental intervention, platform untrustworthy exposure, partisan news clicks, all measured prior to exposure to/engagement with deceptive networks and FIES experimental interventions (see Individual-Level Participant Data for details).

S3.1.5 Entropy Balancing   To gauge the correlations between users' exposure to, and engagement with, these networks and their subsequent attitudinal and behavioral outcomes, we employ entropy balancing [16], or *ebal*, to adjust for potential confounders. We preregistered entropy balancing as the primary method for this analysis rather than matching for three main reasons. First, because entropy balancing ensures exact covariate balance, it eliminates the iterative balance-checking process required by matching algorithms and reduces researcher discretion in selecting matching criteria [16]. Second, unlike matching, which often discards unmatched observations and significantly reduces sample size, entropy balancing retains all units (except for those with missing data) by reweighting observations to achieve exact covariate balance. Third, entropy balancing has desirable theoretical properties. It is doubly robust, meaning that if either the conditional expectation of the outcome Y or the propensity score is linear in the covariates X, entropy balancing remains consistent [37]. Under such conditions, it is also more efficient than matching.[S16]

We ensure that the variables for which we control for were measured before any potential exposure or engagement known to us occurred (before Wave 2). Note that participants may have been exposed to these or other networks prior to the study period, but that information is not known to us. We followed the application of *ebal* to reweight the control group units. This achieves a mean balance on the selected variables between users who were exposed to (or engaged with) these

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[S16]Matching is more advantageous than entropy balancing when $E[Y|X]$ is highly nonlinear in X, but when we included high-order terms of X to account for potential nonlinearities [36], these high-order terms turned out to be poor predictors of both $E[Y|X]$ and treatment assignment. Since higher-order terms did not predict $E[Y|X]$ and treatment assignment well, the algorithm implemented is standard entropy balancing and exact covariate balance is achieved in each case.

networks and those who were not. With the weights derived from this step, we conduct a weighted regression that includes the selected pre-exposure covariates as controls. It is important to note that while *ebal* is frequently used to estimate causal effects in observational studies, we refrain from interpreting our association findings as causal. This is because drawing such conclusions requires the unconfoundedness assumption that might be violated in our research setting. We use different combinations of variables to minimize the likelihood of obtaining statistically significant estimates merely by chance. We include pre-exposure attitudinal or behavioral measures, even if these exhibit significant missingness.

S3.2 Results

For the two FMOs that met our downstream analysis criteria, individual-level characteristics explain variations in exposure to/engagement with these networks and users' political attitudes, knowledge and behaviors, suggesting the observed associations between exposure/engagement and users' attitudes, knowledge and behaviors are likely spurious.

S3.2.1 Networks analyzed Two networks met our pre-registered inclusion criteria. FMO27 (6 Facebook user accounts and 1 Facebook Page), active on Facebook from the end of June to October 20, 2020 and originating from Kosovo, mainly used a compromised comedy Page to post memes and links to off-platform websites featuring content from Fox News. Network content, both direct and indirect, associated with FMO27 covered a range of topics, primarily children and parenting (63% of posts), food and drink (19.77% of posts), and some content related to crime and tragedy (10.47% of posts) and relationships, friends and family (9.24% of posts). This network's content was also related to news (11.83%) and politics (9.94%). Posts mentioned Trump (1,299 posts) nearly 4 times as often as Biden (338; see Table S43). A small portion of posts were related to COVID-19 (2.11%), and few contained potentially false content (0.05%), uncivil content (0.75%), or content with slur words (0.01%; see Table S44).

FMO35, active between late June and October 2020 and originating from North Macedonia, was a network of 154 Facebook users and 12 Facebook groups that posted links to ad-heavy websites featuring political topics copied from right-leaning outlets such as the *LA Post*, the *Washington Times*, and *The Federalist*. Network content, both direct and indirect, associated with FMO35 focused primarily on politics (47.76%), political memes (23.08%),[S17] and news (18.14%). Posts mentioned Trump (13,226 posts) over eight times as often as Biden (1,546) (see Table S43). A sizable share of posts (9.15%) was classified as potentially false. A small share of posts was classified as uncivil (2.72%), related to COVID-19 (1.81%), or content with slur words (0.06%) (see Table S44). Content from FMO35 also covered other topics, including children and parenting (27.16%), social issues (10.26%), TV and movies (7.67%) and crime and tragedy (5.93%; see Figure S31).

S3.2.2 Correlates with Attitudinal and Behavioral Outcomes For both FMO networks, without controlling for any individual-level characteristics, we observe that survey participants who were exposed to or engaged with the deceptive online networks tended to have less ability to discern true from false information, were less likely to believe in the legitimacy of the 2020 elections,

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[S17]Posts classified as political memes if they are images containing text categorized a political by the Civic classifier.

and were more likely to exhibit partisan news clicks (see Model 0 in the panels of Figure S4 and Table S3).

Table S3: Relationship between exposure to and engagement with FMO27 and FMO35 and political variables

Treatment	Dependent variable	Model	Estimate	Standardized estimate	p-value	CI Lower	CI Upper	N Treatment	N Control	MDE
Exposure to content from FMO27	Belief in legitimacy of the election	Model 0	-0.293	0.254	0.000	-0.332	-0.253	3,644	49,040	0.048
Exposure to content from FMO27	Belief in legitimacy of the election	Model 8	0.003	0.249	0.840	-0.022	0.027	2,028	27,070	0.065
Exposure to content from FMO27	Factual discernment	Model 0	-0.281	0.332	0.000	-0.309	-0.254	3,761	50,853	0.047
Exposure to content from FMO27	Factual discernment	Model 8	-0.022	0.355	0.109	-0.048	0.005	2,096	28,053	0.063
Exposure to content from FMO27	Partisan news clicks	Model 0	-0.008	0.095	0.000	-0.010	-0.005	4,924	59,185	0.042
Exposure to content from FMO27	Partisan news clicks	Model 8	0.002	0.100	0.067	0.000	0.004	2,748	33,609	0.056
Engagement with content from FMO27	Belief in legitimacy of the election	Model 0	-0.250	0.215	0.000	-0.332	-0.168	816	51,868	0.099
Engagement with content from FMO27	Belief in legitimacy of the election	Model 8	0.032	0.189	0.133	-0.010	0.074	466	28,632	0.131
Engagement with content from FMO27	Factual discernment	Model 0	-0.242	0.281	0.000	-0.301	-0.183	830	53,784	0.098
Engagement with content from FMO27	Factual discernment	Model 8	0.031	0.274	0.205	-0.017	0.080	469	29,680	0.130
Engagement with content from FMO27	Partisan news clicks	Model 0	-0.006	0.070	0.019	-0.010	-0.001	1,055	63,054	0.087
Engagement with content from FMO27	Partisan news clicks	Model 8	0.005	0.059	0.017	0.001	0.009	602	35,755	0.115
Exposure to content from FMO35	Belief in legitimacy of the election	Model 0	-1.177	1.023	0.000	-1.249	-1.104	1,038	51,646	0.088
Exposure to content from FMO35	Belief in legitimacy of the election	Model 8	-0.040	1.048	0.054	-0.081	0.001	627	28,471	0.113
Exposure to content from FMO35	Factual discernment	Model 0	-0.643	0.742	0.000	-0.696	-0.590	1,067	53,547	0.087
Exposure to content from FMO35	Factual discernment	Model 8	-0.048	0.767	0.056	-0.096	0.001	633	29,516	0.113
Exposure to content from FMO35	Partisan news clicks	Model 0	0.046	-0.529	0.000	0.041	0.051	1,515	62,594	0.073
Exposure to content from FMO35	Partisan news clicks	Model 8	0.000	-0.527	0.873	-0.004	0.005	904	35,453	0.094
Engagement with content from FMO35	Belief in legitimacy of the election	Model 0	-1.507	1.398	0.000	-1.652	-1.363	194	52,490	0.202
Engagement with content from FMO35	Belief in legitimacy of the election	Model 8	0.067	1.325	0.026	0.008	0.126	121	28,977	0.255
Engagement with content from FMO35	Factual discernment	Model 0	-0.856	1.008	0.000	-0.972	-0.740	202	54,412	0.197
Engagement with content from FMO35	Factual discernment	Model 8	-0.064	1.045	0.114	-0.142	0.015	128	30,021	0.248
Engagement with content from FMO35	Partisan news clicks	Model 0	0.064	-0.732	0.000	0.053	0.074	301	63,808	0.162
Engagement with content from FMO35	Partisan news clicks	Model 8	-0.007	-0.687	0.091	-0.014	0.001	189	36,168	0.204

Note: Standardized estimates were calculated as Cohen's d. The raw estimates are based on regressions using entropy balancing on observational data. Estimates, p-values, confidence interval bounds and post-hoc MDE rounded to 3 digits. Model 0 does not contain any control variables, while Model 8 controls for a range of survey and platform measures. The MDE column lists the minimum detectable effect size calculated post-hoc.

After we adjust for pre-exposure individual-level characteristics using entropy balancing [16],[S18] the previously strong associations between exposure or engagement and the three outcomes largely disappear for both networks. As Figure S4 shows, when participants' demographic covariates (gender, age, education, race, urban/rural, swing state, income) are incorporated (Model 1), associations between exposure or engagement and political knowledge, beliefs, and behaviors drastically decrease in size. When political ideology (party identification, ideology) is incorporated (Model 2), there is another large decrease in the size of the associations between exposure/engagement and all outcomes. After we incorporate voting patterns (Model 3: 2016 turnout, 2016 presidential vote choice, 2020 vote intention, 2020 likely vote choice, 2020 presidential approval) and attitudes, capabilities, and affect (Model 4: feeling thermometer, affective polarization, issue polarization, political efficacy, political knowledge, evaluations of US democracy, digital literacy, emotions), which are all reported pre-exposure, few associations remain statistically significant. This suggests that the previously estimated correlations between exposure/engagement and the outcome variables were highly likely driven by other factors, and cannot be interpreted as causal. The only estimates that remained statistically significant at the 5% level after all pre-exposure covariates were introduced were the association of engagement with FMO27 and more partisan news clicks (Figure S4 Panel 1C) and the association of engagement with FMO35 and diminished belief in the legitimacy of the election (Figure S4 Panel 2B), representing 2 out of 12 models (see Model 8 in Table S3).

S3.2.3 Sensitivity Analysis We conduct a sensitivity analysis to gauge the extent to which the estimated associations are robust to the inclusion of a potential confounder. This sensitivity

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[S18]We reweight participants who were not exposed to/engaged with network content to achieve mean balance in pre-exposure characteristics between those exposed/engaged and those who were not.
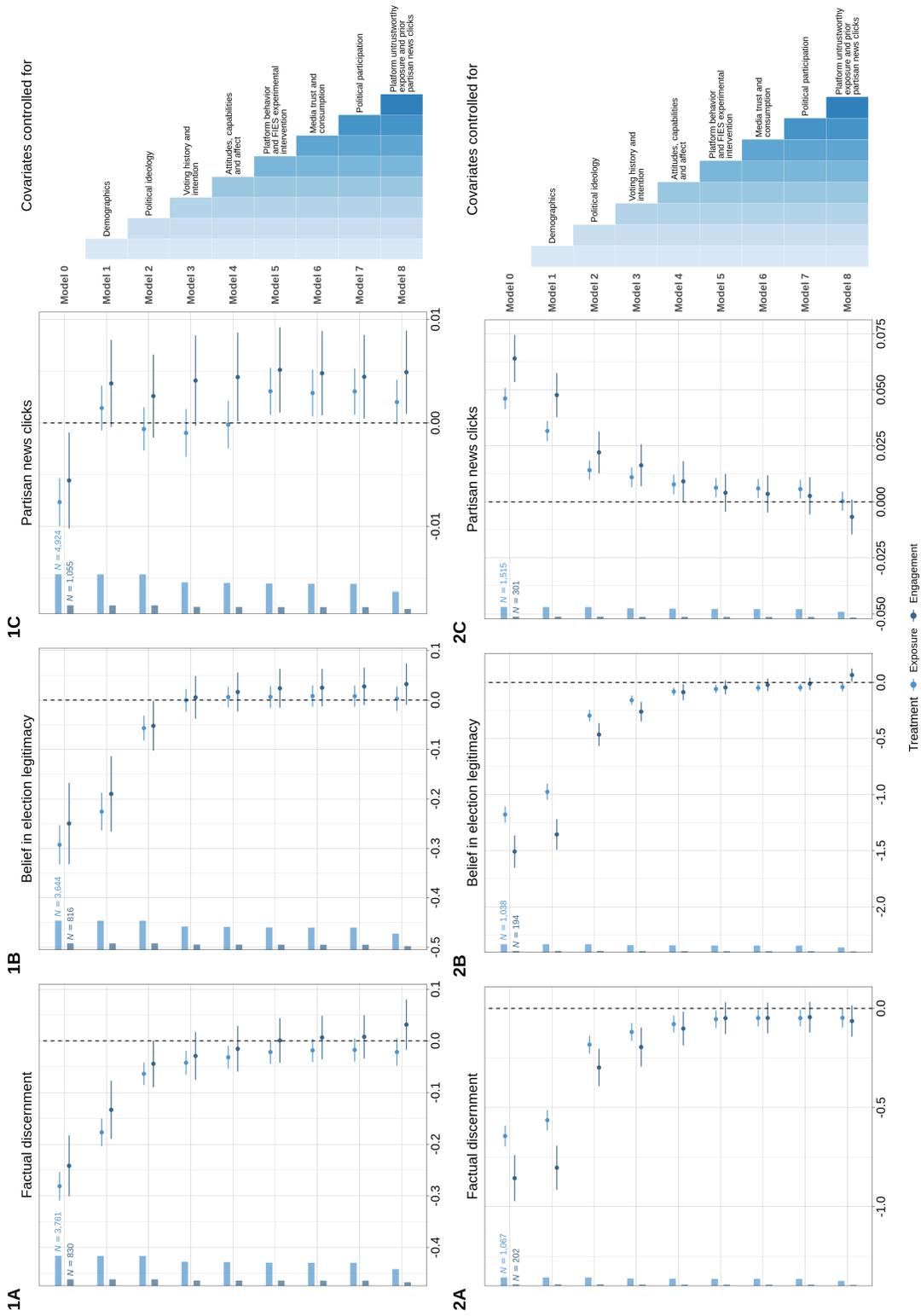
Figure S4: **Exposure to and engagement with network content and political outcomes.**

Note: Top panels refer to FMO27, bottom panels to FMO35. Panels 1A to 1C and 2A to 2C show coefficient estimates and the 95% confidence intervals based on Huber White robust standard errors (HC2) obtained by sequentially adding more pre-exposure covariates to the model and using entropy balancing to adjust for them. Each column shows a different outcome. The number of participants who were exposed to or engaged with deceptive network content are shown for each model in the form of bars on the left of the coefficient plots, the model at the very top also shows exact numbers for orientation.

analysis is required according to our pre-analysis plan because we intend to use it to safeguard against spurious findings when the estimates are statistically significant at the 5% level. Two of the estimated correlations remain statistically significant at the 5% level when available pre-exposure covariates are being controlled for. Therefore, we conduct the sensitivity analysis, which is a useful tool to understand the robustness of the observed relationship between exposure to, or engagement with, deceptive online networks. We modify the method proposed by [5] by replacing a simple regression analysis with the estimation strategy explained above. As in [5], our goal is to show the amount of confounding (in terms of both a potential confounder's partial correlation with the exposure/engagement and its partial correlation with the attitudinal or behavioral measures) needed to explain away the observed correlations and then benchmark it against existing covariates as if each of them were an omitted variable.

Figure S5 indicates whether an observed relationship between a "treatment" variable and an "outcome" variable is robust to the presence of an unmeasured potential confounder, whose levels of correlations with both treatment and outcome variables are benchmarked against observed covariates (triangles). The red line represent the threshold beyond which the amount of confounding would render the observed relationship statistically insignificant. The blue line represents the threshold beyond which the amount of confounding would reduce the observed relationship to zero. Figure S5 shows that the estimated correlations were, in both cases, highly sensitive to the presence of a potential confounder. When gauging the relationship between engagement with FMO27 and partisan news clicks, an unmeasured confounder—correlated with engagement and partisan news clicks at the same levels as prior partisan news clicks (which falls to the right of the red line)—would make the estimated coefficient statistically insignificant at the 5% level. For the relationship between engagement with FMO35 and belief in the legitimacy of the election, an unmeasured confounder—correlated with exposure and belief in the legitimacy of the election at the same levels as covariates such as prior trust in media (excluding social media) or being over the age of 65 (both falling to the right of the red line, along with other observed covariates)—would make the estimated coefficient statistically insignificant at the 5% level. This sensitivity analysis suggests that the observed associations between engagement and users' attitudes and behaviors are extremely sensitive to the inclusion of potential confounders and likely spurious.
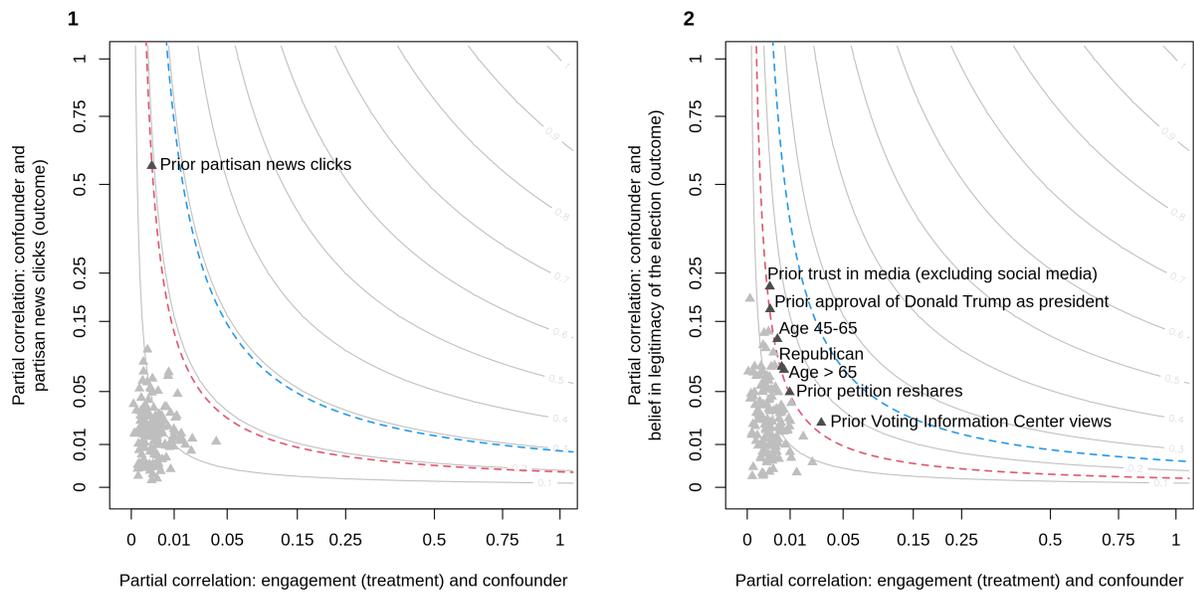
Figure S5: **Sensitivity analysis for correlational analyses.** Sensitivity analysis for engagement with FMO27 and partisan news clicks (Panel 1), and engagement with FMO35 and belief in the legitimacy of the election (Panel 2); red (blue) lines represent the threshold beyond which the amount of confounding would render the observed relationship statistically insignificant (zero).

S4   Additional Tables and Figures

In this section, we highlight additional descriptives of the characteristics, activities and reach of networks.

- Network activity

  - Table S4: Network characteristics overview
  - Figure S6: Number of posts with network content on Facebook by post type
  - Figure S7: Network activity over time by post type on Facebook and Instagram

- Network content

  - Figure S8: Overview of content that networks produced: percent of political content, and percent of top topics and hashtags
  - Table S5: Number of posts with network content on Facebook by Topic classifier (top 5 topics per network)
  - Table S6: Number of posts with network content on Instagram by hashtag (top 5 hashtags per network)
  - Table S7: Number of posts with network content on Facebook and Instagram by content takedown category and by network
  - Figure S9: Percent of candidate mentions among all candidate mentions of Trump, Pence, Biden and Harris in network content by candidate on Facebook and Instagram

- Network reach

  - Table S8: Number of active users exposed to or engaged with, and active users' total exposure to and engagement with network content on Facebook
  - Table S9: Number of active users exposed to or engaged with, and active users' total exposure to and engagement with network content on Instagram
  - Table S10: Overview of active users' exposure to and engagement with network content by network
  - Figure S10: Overlap between CIB and FMO network content viewers among active users on Facebook
  - Figure S11: Overlap between CIB and FMO network content viewers among active users on Instagram
  - Figure S12: Percent of active users' exposures to and engagement with network content by network on Facebook
  - Figure S13: Percent of active users' exposures to and engagement with network content by network on Instagram
  - Figure S14: Concentration of exposure and engagement with deceptive online network content on Facebook and Instagram

S4.1   Network activity

Table S4: Network characteristics overview

Network ID	Modal takedown date	Attributed countries of origin	Top language used FB	IG	Total posts FB (original and network reshare)	IG (original)	Total ads FB & IG
1	2020-07-08	United States	English		731	0	
2	2020-07-31	Romania	English	English	3,843	317	
3	2020-07-31	United States, Canada, Australia, New Zealand, Vietnam, Taiwan, Hong Kong, Indonesia, Germany, United Kingdom, Finland, France	Chinese		15,273	0	251
4	2020-08-31	Russia	English		434	0	2
5	2020-09-18	China	English		1,940	0	
6	2020-09-24	Russia	English	English	346	696	1
7	2020-09-24	Russia	Russian	Russian	1,759	697	
8	2020-09-24	Russia	English	English	1,500	354	
9	2020-10-08	United States	English	English	6,977	911	513
10	2020-10-27	Mexico, Venezuela		English	0	6,646	
11	2020-10-27	Iran	English	Farsi, Persian	3	11	
12	2020-11-16	Iran	English		183	0	
13	2021-07-30	Russia	Spanish	Hindi	2,597	5,853	
14	2020-07-14	Philippines			0	0	
15	2020-07-28	Italy	English	English	928	27	
16	2020-08-18	Albania	English		92	0	
17	2020-09-09	Armenia	Russian	Armenian	5,042	9	
18	2020-09-18	Canada	English		12	0	
19	2020-09-30	North Macedonia	English		63	0	
20	2020-09-30	North Macedonia	English	English	119	105	
21	2020-10-02	North Macedonia	Macedonian		3	0	
22	2020-10-07	North Macedonia	English	English	2	21	6
23	2020-10-09	United States	English		272	0	5
24	2020-10-13	Canada	English		1,001	0	
25	2020-10-16	North Macedonia	English		144	0	
26	2020-10-19	Bosnia and Herzegovina	English		11	0	
27	2020-10-20	Kosovo	English		771	0	
28	2020-10-20	Russia	Russian	English	63	29	157
29	2020-10-20	Pakistan	English		9,382	0	
30	2020-10-21	Bangladesh	Bengali		1,744	0	
31	2020-10-21	Pakistan	English		64	0	
32	2020-10-23	Pakistan	English		18	0	
33	2020-10-27	North Macedonia		English	6	21	10
34	2020-10-28	Kosovo	English		6,199	0	189
35	2020-10-29	North Macedonia	English		4,883	0	
36	2020-10-29	North Macedonia	English		958	0	53
37	2020-10-29	Pakistan			2	0	
38	2020-11-03	Pakistan	English		52	0	
39	2020-11-03	North Macedonia	English		176	0	
40	2020-11-03	Romania	English	English	855	468	6
41	2020-11-03	Algeria	English		232	0	
42	2020-11-04	India	English		288	0	
43	2020-11-04	India	English	English	4,274	219	
44	2020-11-05	Pakistan	English		3,334	0	
45	2020-11-05	North Macedonia	Macedonian	English	49	338	
46	2020-11-05	North Macedonia	English	English	866	132	2
47	2020-11-09	Bangladesh	English		2,128	0	
48	2020-11-12	Morocco	French		1,938	0	
49	2021-01-06	Bangladesh	English		172	0	

Note: FB refers to Facebook, IG to Instagram. Total posts in this table include original posts and reshares by network-affiliated accounts for Facebook, and only original posts by network-affiliated accounts for Instagram. Top language used refers to the most common language in direct network posts. See Definitions of Terms and Metrics for detailed definitions of original posts and reshares, see Network Country Attribution for more details on country attribution.

Figure S6: Number of posts with network content on Facebook by post type

Number of posts with network content on Facebook

Post type

- Reshare of network original post by account unaffiliated with network
- Reshare by network-affiliated account
- Network original post
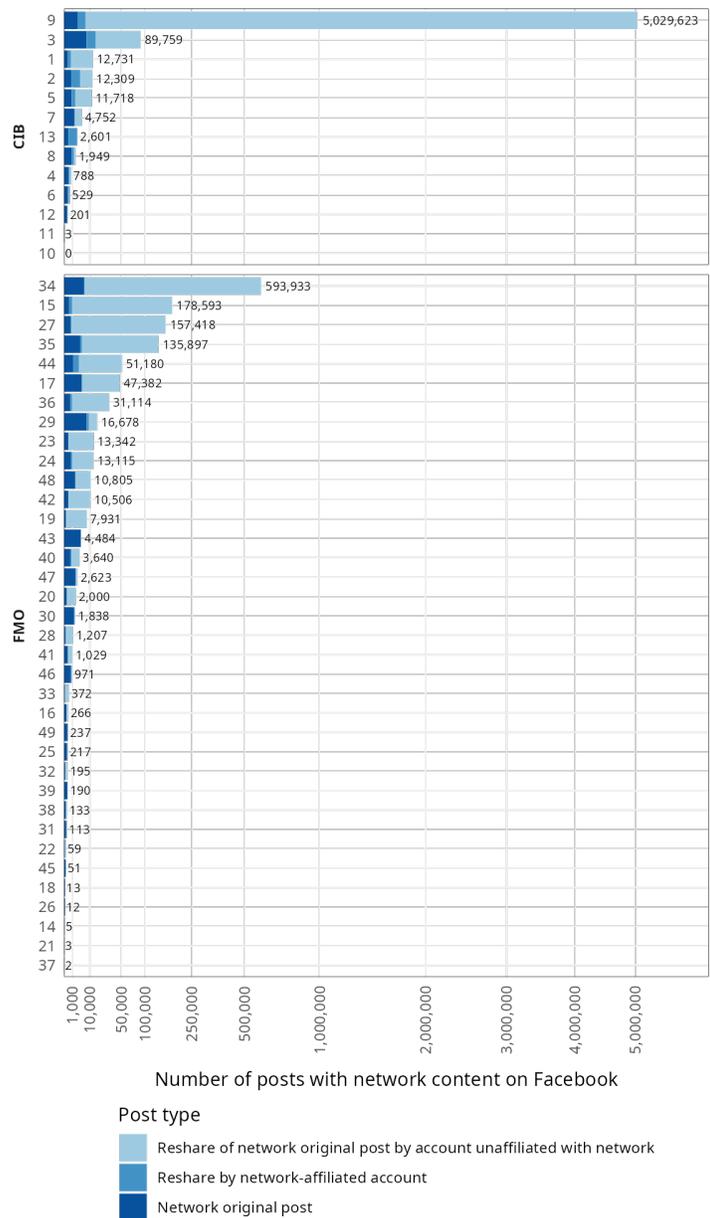
Note: See Definitions of Terms and Metrics for a detailed definition of network content.

Figure S7: Network activity over time by post type on Facebook and Instagram
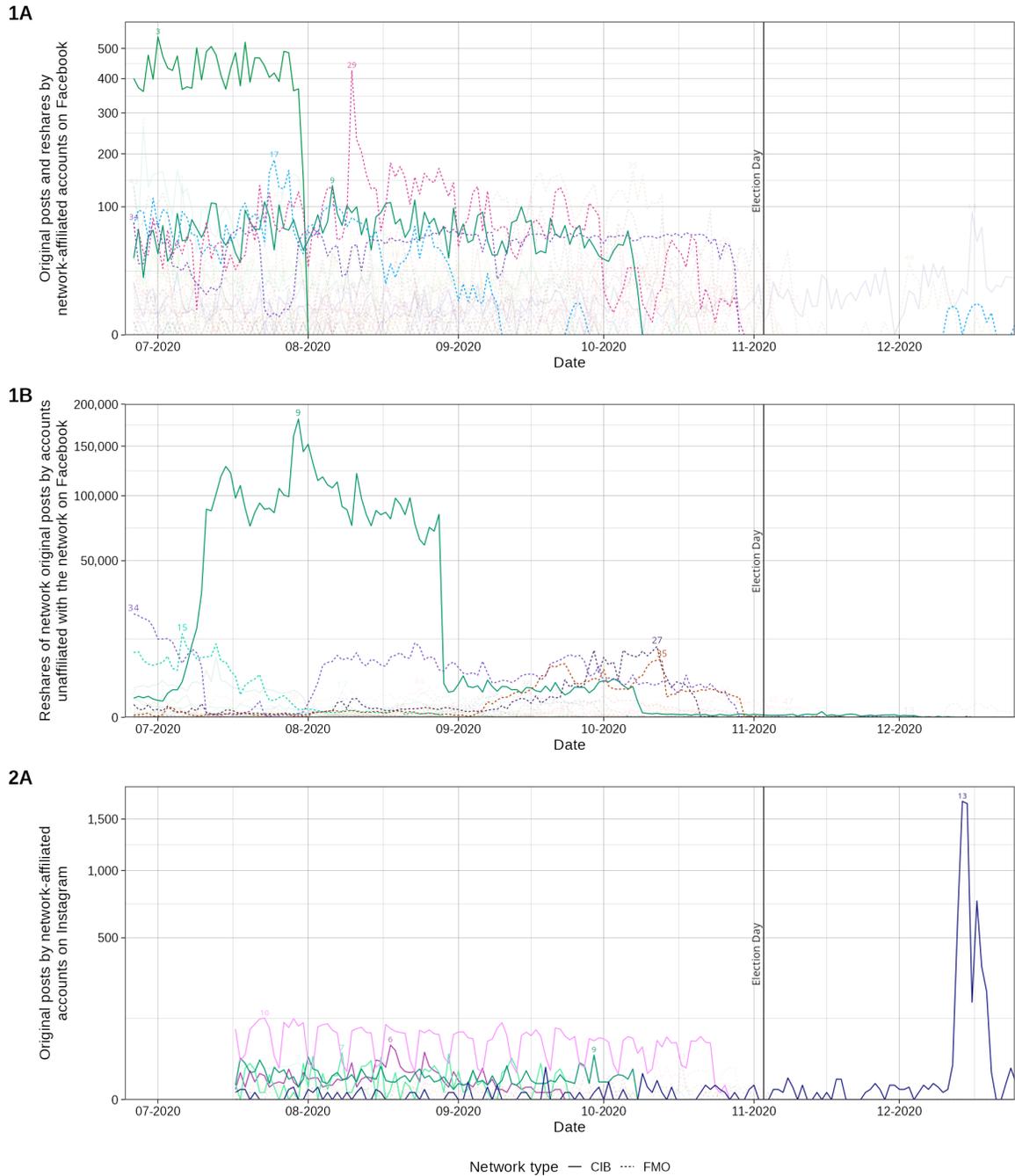
Note: In each panel, the top 5 networks in terms of total activity are shown in full colors, while the remaining networks are shown in opaque colors. See Definitions of Terms and Metrics for definitions of original posts and reshares.

S4.2 Network content

Figure S8: Overview of content that networks produced: percent of political content, and percent of top topics and hashtags
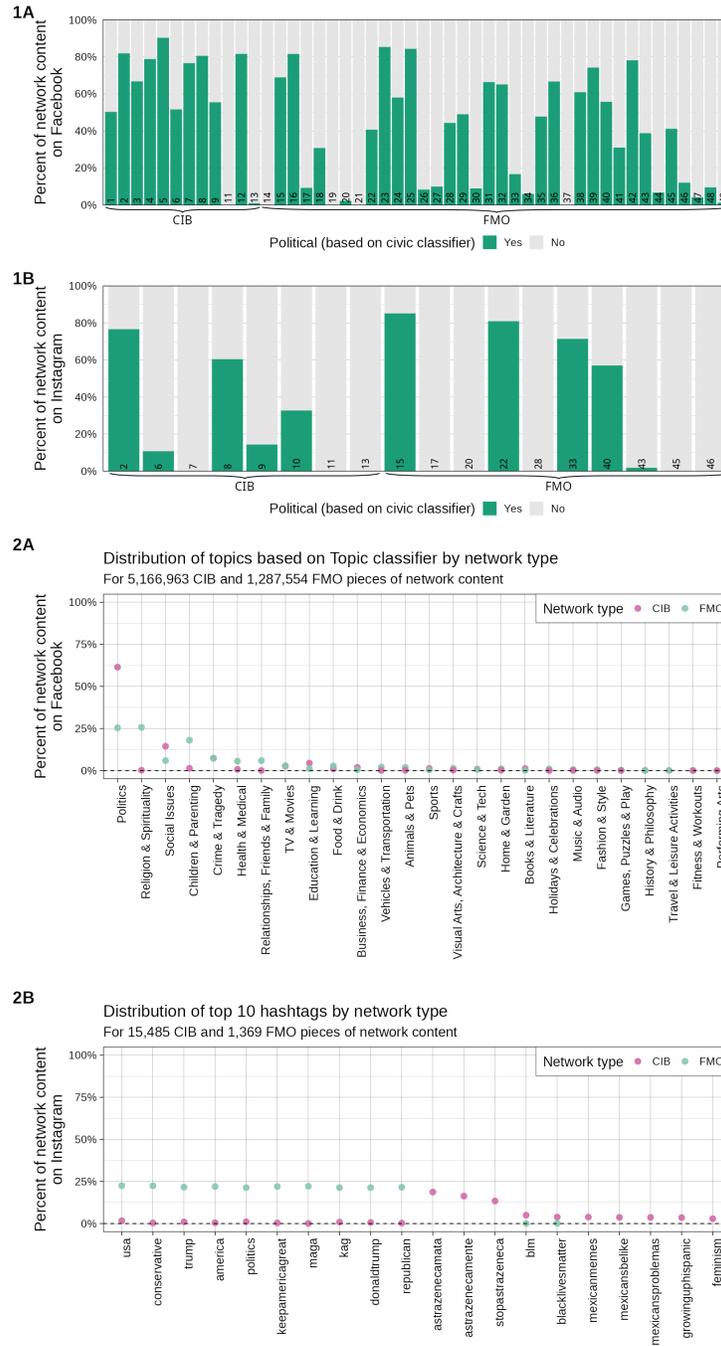
Note: See Definitions of Terms and Metrics for a definitions of network content and Meta Classifiers and Categorization Methods for more details on the Civic classifier, the Topic classifier and hashtags.

Table S5: Number of posts with network content on Facebook by Topic classifier (top 5 topics per network)

Network ID	Network type	Topic classifications (absolute frequency)
1	CIB	Politics (7,449), Crime & Tragedy (2,746), Social Issues (1,692), Health & Medical (1,403), Vehicles & Transportation (1,307)
2	CIB	Politics (10,895), Social Issues (1,064), Religion & Spirituality (611), Sports (248), Health & Medical (213)
3	CIB	Politics (54,176), Social Issues (27,776), Health & Medical (15,526), Crime & Tragedy (12,766), Education & Learning (7,518)
4	CIB	Politics (401), Social Issues (377), Crime & Tragedy (136), Health & Medical (134), Home & Garden (50)
5	CIB	Politics (10,413), Health & Medical (2,236), Social Issues (2,167), Vehicles & Transportation (775), Crime & Tragedy (373)
6	CIB	Politics (268), Crime & Tragedy (56), Social Issues (42), Books & Literature (29), Religion & Spirituality (29)
7	CIB	Politics (3,521), Crime & Tragedy (911), Social Issues (692), Health & Medical (308), Business, Finance & Economics (247)
8	CIB	Politics (1,259), Crime & Tragedy (765), Social Issues (444), Vehicles & Transportation (145), Health & Medical (113)
9	CIB	Politics (3,086,238), Social Issues (712,190), Crime & Tragedy (359,578), Education & Learning (219,660), TV & Movies (133,040)
12	CIB	Politics (150), Social Issues (49), Crime & Tragedy (35), Religion & Spirituality (4), Fashion & Style (2), Science & Tech (2)
13	CIB	Sports (599), TV & Movies (437), Relationships, Friends & Family (320), Vehicles & Transportation (298), Music & Audio (125)
14	FMO	Education & Learning (1), Music & Audio (1), Performing Arts (1)
15	FMO	Politics (146,897), Crime & Tragedy (17,831), Social Issues (16,146), TV & Movies (11,968), Religion & Spirituality (4,662)
16	FMO	Politics (223), Crime & Tragedy (20), Religion & Spirituality (15), Science & Tech (4), Games, Puzzles & Play (1)
17	FMO	Relationships, Friends & Family (7,765), Politics (3,640), Children & Parenting (3,503), TV & Movies (1,689), Books & Literature (1,261)
18	FMO	Politics (4), Crime & Tragedy (3), Fashion & Style (1), Relationships, Friends & Family (1), Science & Tech (1), Vehicles & Transportation (1)
19	FMO	Animals & Pets (7,548), Holidays & Celebrations (199), Travel & Leisure Activities (141), Crime & Tragedy (129), Home & Garden (125)
20	FMO	Animals & Pets (720), TV & Movies (369), Vehicles & Transportation (117), Politics (73), Social Issues (11)
22	FMO	Social Issues (19), Sports (6), Politics (5), Crime & Tragedy (2), TV & Movies (1), Vehicles & Transportation (1)
23	FMO	Politics (12,235), Social Issues (1,553), Crime & Tragedy (649), Vehicles & Transportation (341), Fashion & Style (325)
24	FMO	Politics (9,237), Crime & Tragedy (3,132), Social Issues (2,352), Holidays & Celebrations (554), Sports (549)
25	FMO	Politics (180), Social Issues (70), Crime & Tragedy (43), TV & Movies (37), Health & Medical (11)
26	FMO	Science & Tech (2), Business, Finance & Economics (1), Games, Puzzles & Play (1), Politics (1)
27	FMO	Children & Parenting (99,177), Food & Drink (31,124), Crime & Tragedy (16,482), Relationships, Friends & Family (14,544), Vehicles & Transportation (11,414)
28	FMO	Politics (534), Home & Garden (368), Business, Finance & Economics (318), Social Issues (35), Health & Medical (11)
29	FMO	Politics (8,790), TV & Movies (1,979), Health & Medical (1,350), Social Issues (1,049), Crime & Tragedy (942)
30	FMO	Relationships, Friends & Family (157), Music & Audio (108), Religion & Spirituality (102), Social Issues (92), Business, Finance & Economics (90)
31	FMO	Politics (86), Social Issues (17), TV & Movies (16), Crime & Tragedy (3), Sports (2)
32	FMO	Politics (126), Social Issues (15), Visual Arts, Architecture & Crafts (15), Science & Tech (8), Health & Medical (5)
33	FMO	TV & Movies (324), Social Issues (323), Animals & Pets (33), Politics (2), Sports (1)
34	FMO	Religion & Spirituality (306,950), Children & Parenting (88,267), Relationships, Friends & Family (48,596), Crime & Tragedy (43,767), Health & Medical (33,651)
35	FMO	Politics (76,485), Children & Parenting (36,912), Social Issues (13,939), TV & Movies (10,425), Crime & Tragedy (8,054)
36	FMO	Politics (23,730), Social Issues (2,960), Health & Medical (1,635), Crime & Tragedy (1,332), TV & Movies (1,291)
37	FMO	Visual Arts, Architecture & Crafts (1)
38	FMO	Politics (105), Social Issues (54), Crime & Tragedy (5), TV & Movies (4), Science & Tech (3), Travel & Leisure Activities (3), Visual Arts, Architecture & Crafts (3)
39	FMO	Politics (118), Social Issues (58), Health & Medical (33), Crime & Tragedy (26), TV & Movies (9)
40	FMO	Politics (2,164), Social Issues (1,010), Health & Medical (210), Crime & Tragedy (188), Children & Parenting (70)
41	FMO	Politics (363), TV & Movies (180), Fashion & Style (121), Children & Parenting (44), Visual Arts, Architecture & Crafts (38)
42	FMO	Politics (9,751), Social Issues (2,430), Crime & Tragedy (993), Holidays & Celebrations (357), Sports (273)
43	FMO	Politics (1,431), Social Issues (834), Crime & Tragedy (514), Health & Medical (377), TV & Movies (278)
44	FMO	Health & Medical (23,479), Religion & Spirituality (5,133), Politics (3,303), TV & Movies (2,527), Relationships, Friends & Family (1,703)
45	FMO	Politics (24), Social Issues (11), Food & Drink (3), Crime & Tragedy (2), Relationships, Friends & Family (2)
46	FMO	Health & Medical (101), Social Issues (88), Politics (66), Crime & Tragedy (65), Food & Drink (48)
47	FMO	Sports (300), Music & Audio (296), Visual Arts, Architecture & Crafts (143), Science & Tech (139), TV & Movies (116)
48	FMO	Food & Drink (2,818), Relationships, Friends & Family (1,789), Politics (1,140), Health & Medical (626), Sports (558)
49	FMO	Sports (42), Travel & Leisure Activities (2), Games, Puzzles & Play (1), Health & Medical (1), Music & Audio (1), Politics (1), TV & Movies (1)

Note: See Definitions of Terms and Metrics for a definition of network content and Meta Classifiers and Categorization Methods for more details on the Topic classifier.

Table S6: Number of posts with network content on Instagram by hashtag (top 5 hashtags per network)

Network ID	Network type	Hashtags (absolute frequency)
2	CIB	kag (127), donaldtrump (53), keepamericagreat (52), usa (52), conservative (50)
6	CIB	turkey (52), us (45), china (18), russia (18), france (17)
7	CIB	irchy_gypsymama (87), vasilisa (35), mskpit (32), travelwithkids (26), питерфм (20)
8	CIB	syria (299), today (219), war (217), aleppo (191), news (190)
9	CIB	hunting (127), huntingisconservation (127), proudamericanhunter (81), americanhunter (78), deerhunting (78), elkhunting (78), funnyhunting (78), huntervationist (78), huntforlife (78), huntingfacts (78), huntingislife (78), huntingmemes (78), huntingseason (78), outdoors (78), proudhunter (78)
10	CIB	blm (768), mexicanmemes (596), blacklivesmatter (595), mexicansbelike (570), mexicansproblemas (568)
11	CIB	شمیرادات (4), سوهانک (3), طهران (3), طهران_قدم (3), شمرون (2), طهران_قدیم (2), محله_سوهانک (2)
13	CIB	astrazenecamata (2901), astrazenecamente (2527), stopastrazeneca (2079), astrazenecakills (228), astrazenecalies (228)
15	FMO	trump2020 (1)
28	FMO	florida (15), floridalife (15), beach (13), floridaliving (13), california (11), nature (11), rocks (11)
33	FMO	cancelnetflixcuties (1)
40	FMO	conservative (307), maga (303), usa (303), america (301), keepamericagreat (301)
43	FMO	savagexfenty2020 (9), fenty (8), haveitalldaily (8), rihanna (8), savagexfenty (8)
45	FMO	dota2 (2), logodesigner (2), 22 (1), dota2indonesia (1), dota2wtf (1), steam (1)
46	FMO	coronanightlife (1), coworking (1), lifeisgood (1), tigerattitude (1)

Note: See Definitions of Terms and Metrics for a definition of network content and Meta Classifiers and Categorization Methods for more details on hashtags.

Table S7: Number of posts with network content on Facebook and Instagram by content takedown category and by network

Network ID	Network type	Content takedown categories on Facebook	Content takedown categories on Instagram
3	CIB	Content spam (283), Dangerous Individuals & Organizations (1), Misinformation (including harmful health misinformation) (1)	
4	CIB	Content spam (10), Hate Speech (1)	
5	CIB	Misinformation (including harmful health misinformation) (4), Hate Speech (2)	
6	CIB	Content spam (1)	
7	CIB	Hate Speech (1)	
9	CIB	Misinformation (including harmful health misinformation) (16), Content spam (15), Hate Speech (9), Violence & Incitement (5), Coordinating Harm (1), Dangerous Individuals & Organizations (1)	Misinformation and Harm Health (1)
12	CIB	Content spam (43)	
13	CIB		Engagement Abuse (344)
15	FMO	Content spam (23,321), Dangerous Individuals & Organizations (17), Hate Speech (4), Violence & Incitement (2)	
17	FMO	Content spam (1,018)	
18	FMO	Content spam (6)	
19	FMO	Content spam (1)	
23	FMO	Content spam (309), Misinformation (including harmful health misinformation) (4)	
24	FMO	Content spam (1,883), Hate Speech (6), Dangerous Individuals & Organizations (1)	
25	FMO	Content spam (15)	
27	FMO	Content spam (4,326)	
28	FMO	Content spam (288)	
29	FMO	Content spam (2,828), Misinformation (including harmful health misinformation) (3), Hate Speech (1)	
30	FMO	Content spam (10)	
31	FMO	Content spam (53)	
34	FMO	Content spam (10,680), Misinformation (including harmful health misinformation) (3)	
35	FMO	Content spam (9,331), Misinformation (including harmful health misinformation) (377), Hate Speech (3), Violence & Incitement (1)	
36	FMO	Content spam (30), Misinformation (including harmful health misinformation) (3), Bullying and Harassment (1)	
38	FMO	Content spam (27)	
39	FMO	Content spam (9)	
40	FMO	Misinformation (including harmful health misinformation) (1)	
41	FMO	Content spam (17)	
42	FMO	Content spam (200), Bullying and Harassment (1)	
44	FMO	Content spam (88), Hate Speech (1)	
45	FMO	Content spam (3)	
46	FMO	Content spam (1)	
47	FMO	Content spam (614)	
48	FMO	Content spam (606), Hate Speech (1)	

Note: See Definitions of Terms and Metrics for a definition of network content and Meta Classifiers and Categorization Methods for more details on content takedown categories

Figure S9: Percent of candidate mentions among all candidate mentions of Trump, Pence, Biden and Harris in network content by candidate on Facebook and Instagram
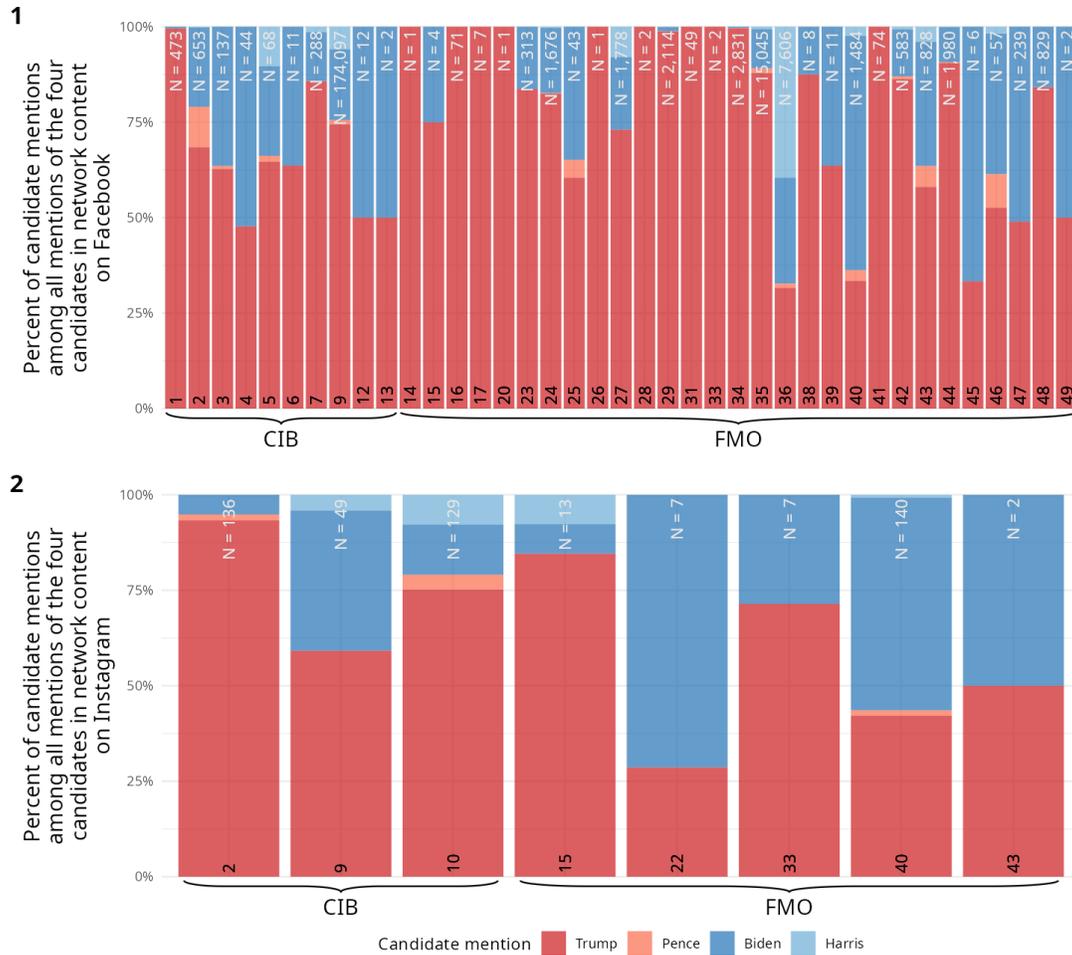
Note: See Definitions of Terms and Metrics for a definitions of network content and more details on candidate mentions.

S4.3   Network reach

Table S8: Number of active users exposed to or engaged with, and active users' total exposure to and engagement with network content on Facebook

Network type	Viewers	Clickers	Resharers	Views	Clicks	Reshares
CIB	15,305,161	4,412,302	1,691,761	55,870,634	6,148,881	4,967,135
FMO	27,695,164	3,490,107	521,402	119,369,610	6,821,529	963,792
CIB & FMO	36,788,238	7,474,595	2,084,173	175,240,244	12,970,410	5,930,927

Note: The total number of active users on Facebook was approximately 250 million. On Facebook, network content includes original posts and reshares by network-affiliated accounts, and reshares of network posts by accounts unaffiliated with the network. For reshares, only network original posts are considered. See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics.

Table S9: Number of active users exposed to or engaged with, and active users' total exposure to and engagement with network content on Instagram

Network type	Viewers	Resharers	Views	Reshares
CIB	2,944,266	9,625	69,296,390	12,167
FMO	34,570	365	356,399	798
CIB & FMO	2,977,009	9,989	69,652,789	12,965

Note: The total number of active users on Instagram was approximately 160 million. On Instagram, network content includes only original posts by network-affiliated accounts. See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics.

Table S10: Overview of active users' exposure to and engagement with network content by network

Network ID	Facebook				Instagram		
	Viewers	Views	Clicks	Reshares	Viewers	Views	Reshares
1	224,188	831,628	45,668	11,647	86	201	0
2	300,576	685,499	36,721	8,356	93,091	222,579	0
3	2,013,226	9,547,655	543,032	65,348	0	0	0
4	15,497	26,638	574	313			
5	136,487	459,230	32,767	1,995	0	0	0
6	1,539	8,161	247	12	278	1,910	0
7	29,709	170,169	8,734	1,357	29	8,095	0
8	1,766	10,315	249	56	220	4,459	0
9	13,372,847	44,114,171	5,480,541	4,878,049	31,419	370,456	225
10	0	0	0	0	2,823,231	68,606,961	11,942
11	2	3	0	0	1	2	0
12	2,621	4,873	115	1			
13	3,080	12,292	233	1	2,269	81,727	0
14	33	45	5	5			
15	3,272,849	12,414,208	1,233,129	170,801	17,852	177,868	0
16	28,214	104,996	993	1	1	25	0
17	183,920	603,403	24,045	3,005	7	19	0
18	429	2,233	194	1			
19	482,888	776,404	39,623	6,942			
20	312,816	615,009	28,505	1,715	13	805	0
21	7	11	0	0			
22	1,871	2,573	120	54	10,458	72,378	398
23	222,563	705,482	31,087	12,568	0	0	0
24	454,877	1,471,365	161,174	11,479			
25	33,082	921,495	75,555	70			
26	111	323	4	1			
27	10,462,923	40,314,108	2,090,490	144,244			
28	21,177	26,284	568	1,139	323	1,815	0
29	2,414,650	6,927,213	635,628	7,092			
30	111,131	168,269	9,202	26			
31	55,281	90,047	8,539	67			
32	3,010	4,840	192	96	4	17	0
33	10,248	13,709	510	349	10,485	72,752	398
34	9,650,461	35,606,667	1,377,003	393,104			
35	4,954,098	10,659,484	648,133	122,456			
36	1,592,153	2,977,054	125,094	28,405			
37	1	2	0	0			
38	3,022	4,789	463	73			
39	6,091	9,852	517	19			
40	35,185	95,127	4,659	2,420	596	8,311	1
41	359,562	1,000,215	29,758	734			
42	358,764	887,132	90,820	9,786			
43	5,793	15,813	363	111	5,261	19,463	1
44	630,562	2,236,041	161,885	44,268			
45	300	563	22	2	42	1,516	0
46	13,584	24,342	867	56	18	1,430	0
47	35,912	155,065	2,980	387			
48	199,278	515,969	39,238	2,256			
49	5,182	19,478	164	60			

Note: Network content that users can be exposed to or engage with differs by platform. On Facebook, network content includes original posts and reshares by network-affiliated accounts, and reshares of network posts by accounts unaffiliated with the network. On Instagram, network content includes only original posts by network-affiliated accounts. For reshares, only network original posts are considered. See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics.

Figure S10: Overlap between CIB and FMO network content viewers among active users on Facebook

FMO viewers

CIB viewers

21,483,077   6,212,087   9,093,074
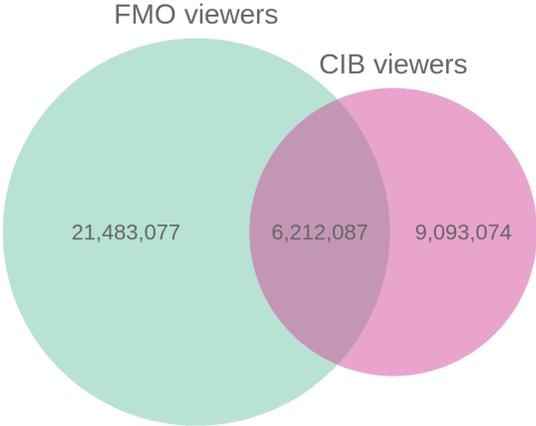
Note: See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics.

Figure S11: Overlap between CIB and FMO network content viewers among active users on Instagram

CIB viewers

FMO viewers

32,743

1,827

2,942,439
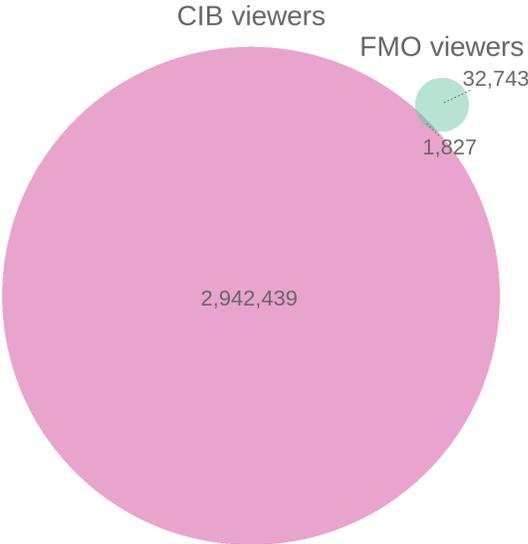
Note: See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics.

Figure S12: Percent of active users' exposures to and engagement with network content by network on Facebook

Figure S13: Percent of active users' exposures to and engagement with network content by network on Instagram

Note: See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics.

Figure S14: Concentration of exposure and engagement with deceptive online network content on Facebook and Instagram

Note: Concentration of active users' exposure and engagement with deceptive online network content on Facebook (Panel 1A) and Instagram (Panel 1B). Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics.

Figure S15: Active user exposure to and engagement with network content by time spent on Facebook

Note: Standardized means that before averaging across networks, the measure was standardized within network by dividing the mean for a specific subgroup by the overall mean. For example, the standardized views for the highest time spent quartile were calculated by dividing the average views for the highest time spent quartile subgroup by the average views overall for a given network. Any standardized value higher than 100% indicates that that group had higher than average engagement. As Panel 2C shows, the finding that active users who spend more time on platform view more network content is true in absolute terms, but the relationship is not consistent when controlling for the fact that those users see have more views in general. See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics.

Figure S16: Active user exposure to and engagement with network content by time spent on Instagram

Note: Standardized means that before averaging across networks, the measure was standardized within network by dividing the mean for a specific subgroup by the overall mean. For example, the standardized views for the highest time spent quartile were calculated by dividing the average views for the highest time spent quartile subgroup by the average views overall for a given network. Any standardized value higher than 100% indicates that that group had higher than average engagement. As Panel 2C shows, the finding that active users who spend more time on platform view more network content is true in absolute terms, but the relationship is not consistent when controlling for the fact that those users see have more views in general. Users with unknown time spent were omitted for the viewer share calculation, but count towards the total number of observations shown. Users who had no information on time spent were excluded from the calculation of standardized measures. See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics.

Figure S17: Viewers, average views and average reshares by network type and source of exposure on Facebook
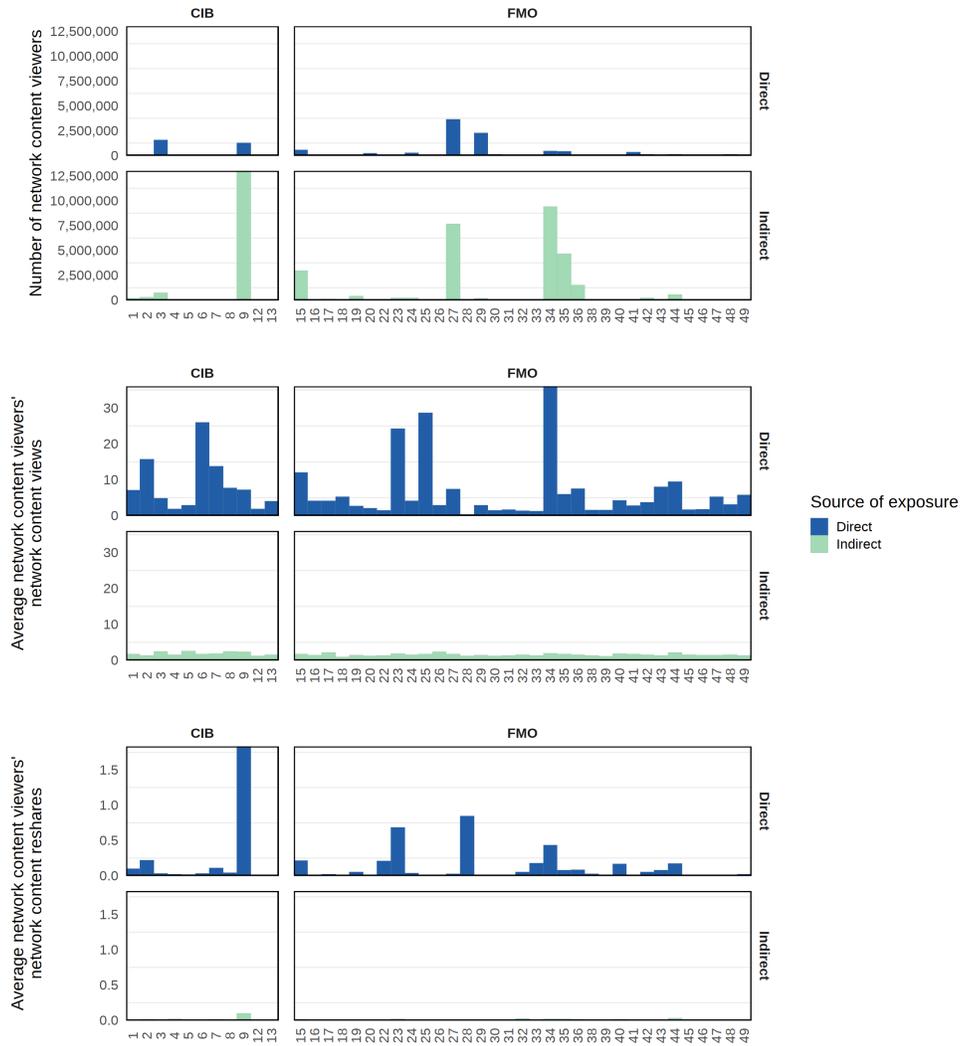
Note: For viewers, we show counts by network and source of exposure. For average views and reshares, we show the averages by network and source of exposure. The same viewer may have contributed to the viewer counts and averages for different networks if they saw multiple networks. The source of exposure is not necessarily unique, i.e. the same viewer may contribute to the direct and indirect source of exposure counts if they were exposed via both sources. We filter out viewers with unknown source of exposure. We filter out networks with less than 100 viewers. See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics.

Figure S18: Viewers, views and reshares by network type, source of exposure and subgroups on Facebook
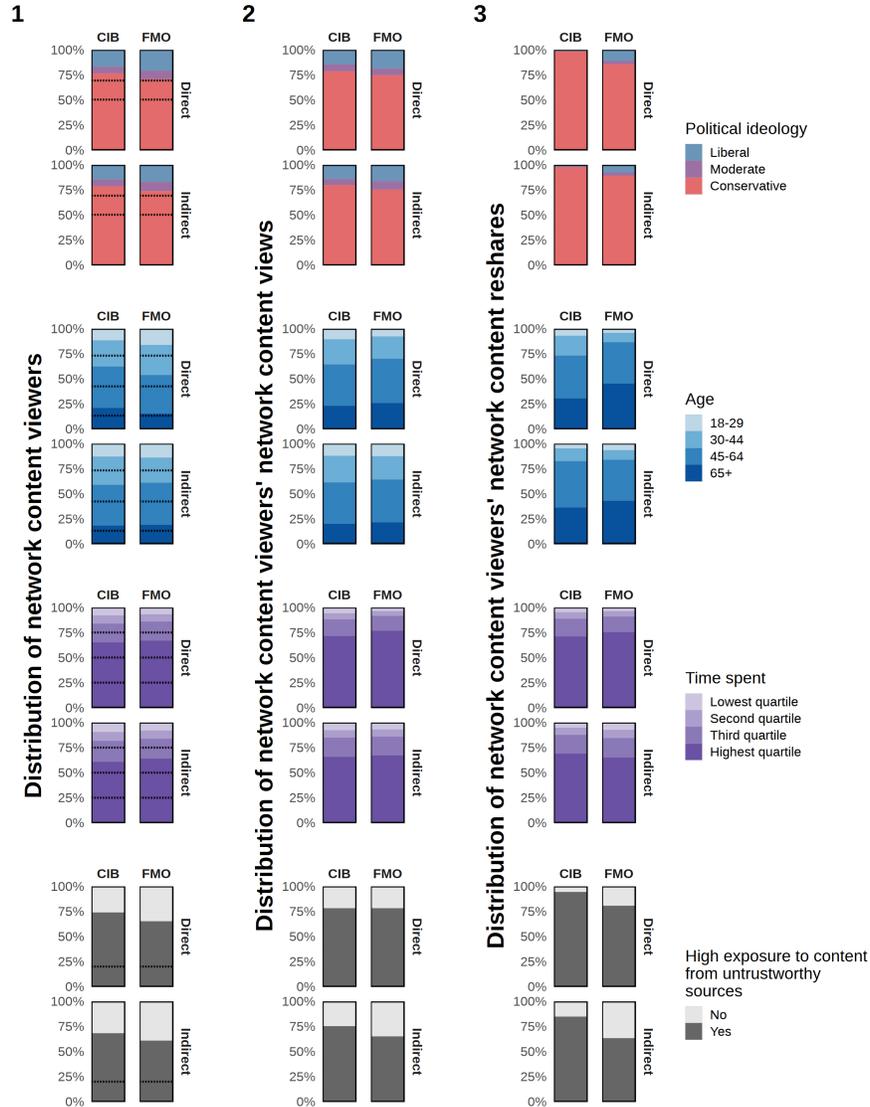
Note: Distribution of total viewers, views, and reshares by subgroup across all deceptive networks. For viewers, we have counts in the raw data. For views and reshares, we calculate counts by multiplying the averages by the number of users in a network-subgroup-source of exposure cell. We show counts aggregated across all networks. For viewer totals, this means viewers may be counted multiple times if they viewed multiple networks. For views and reshares, counting the same user multiple times is not an issue because we are interested in distribution of user characteristics for all views/reshares, and views/reshares are unique across networks even if they originate from the same users. The source of exposure is not necessarily unique, i.e. the same viewer may contribute to the direct and indirect source of exposure counts if they were exposed via both. We filter out viewers with unknown source of exposure. For viewers, we can compare the subgroup proportions to population proportions (indicated by black dotted lines), though population proportions are based on unique users and do not potentially count the same users multiple times. See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics. See Meta Classifiers and Categorization Methods for details on the political ideology classifier. See Aggregated Platform Data Coding for details on age, time spent and high untrustworthy exposure subgroups.

Figure S19: Viewers, views and reshares by network type, source of exposure, network and political ideology on Facebook

Note: Distribution of total viewers, views, and reshares by political ideology and by deceptive network. For viewers, we have counts in the raw data. For views and reshares, we calculate counts by multiplying the averages by the number of users in a network-subgroup-source of exposure cell. The same user may contribute to views and reshares for multiple networks, but since we show counts by network, this is not an issue. The source of exposure is not necessarily unique, i.e. the same viewer may contribute to the direct and indirect source of exposure counts if they were exposed via both. For viewers, we can compare the subgroup proportions to population proportions (indicated by black dotted lines). We filter out viewers with unknown source of exposure. We filter out networks with less than 100 viewers. See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics. See Meta Classifiers and Categorization Methods for details on the political ideology classifier.

Figure S20: Viewers, views and reshares by network type, source of exposure, network and age group on Facebook

Note: Distribution of total viewers, views, and reshares by political ideology and by deceptive network. For viewers, we have counts in the raw data. For views and reshares, we calculate counts by multiplying the averages by the number of users in a network-subgroup-source of exposure cell. The same user may contribute to views and reshares for multiple networks, but since we show counts by network, this is not an issue. The source of exposure is not necessarily unique, i.e. the same viewer may contribute to the direct and indirect source of exposure counts if they were exposed via both. For viewers, we can compare the subgroup proportions to population proportions (indicated by black dotted lines). We filter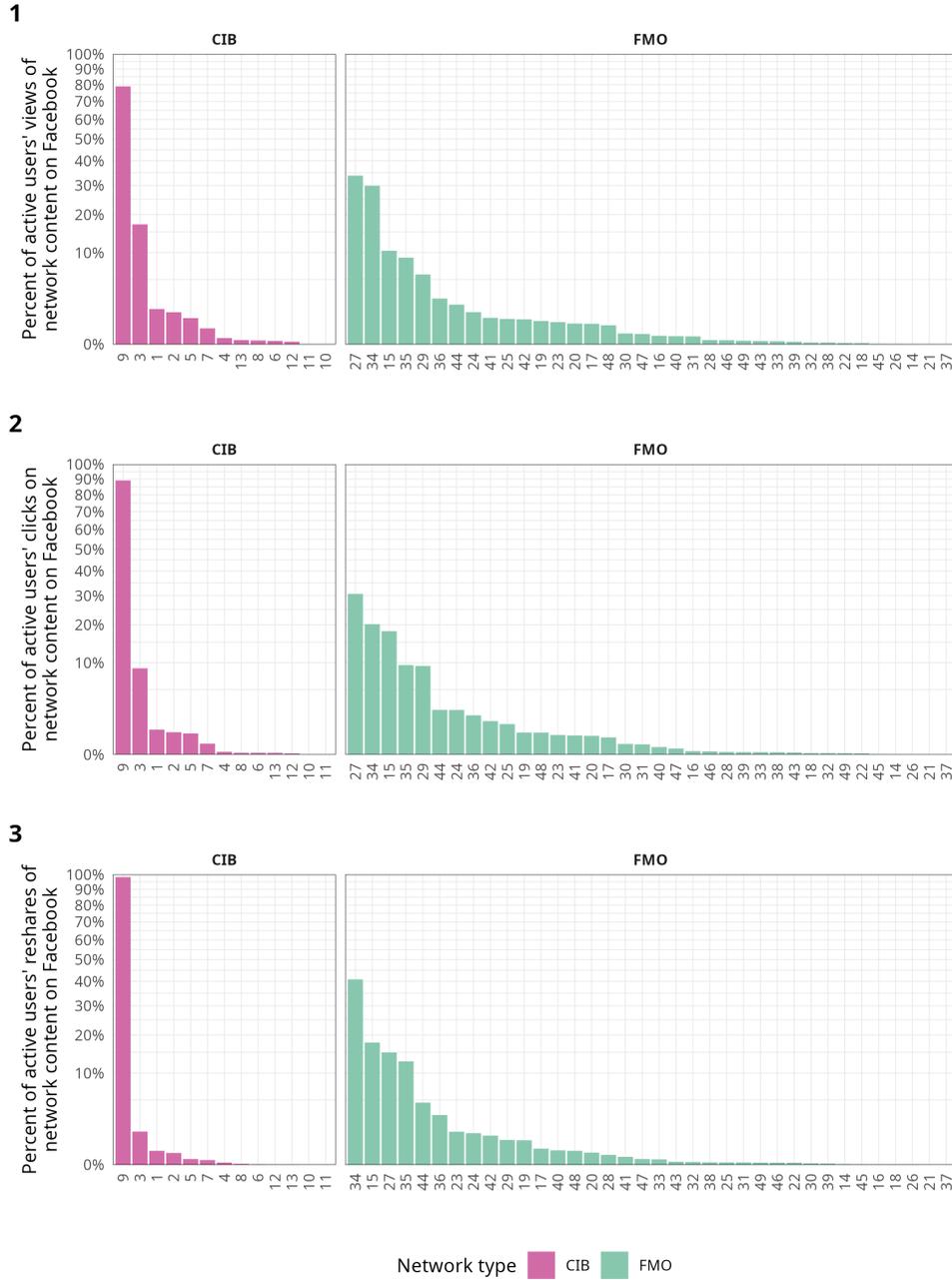 out viewers with unknown source of exposure. We filter out networks with less than 100 viewers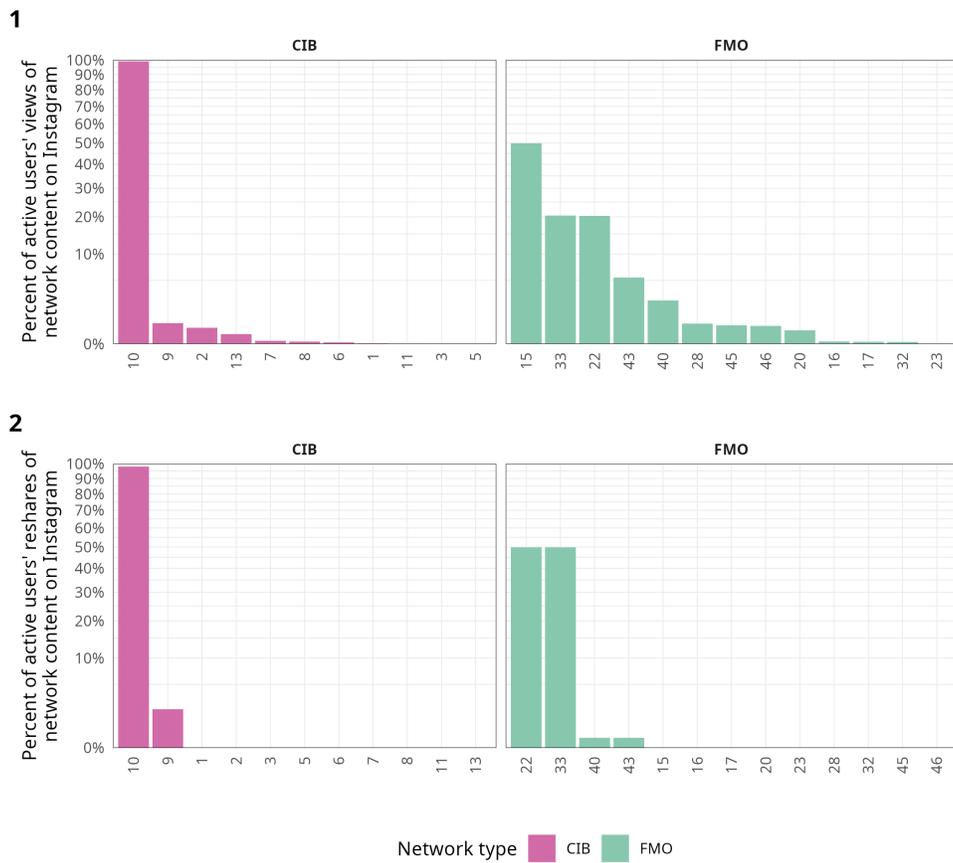. See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics. See Aggregated Platform Data Coding for details on age subgroups.

Figure S21: Viewers, views and reshares by network type, source of exposure, network and time spent on Facebook

Note: Distribution of total viewers, views, and reshares by political ideology and by deceptive network. For viewers, we have counts in the raw data. For views and reshares, we calculate counts by multiplying the averages by the number of users in a network-subgroup-source of exposure cell. The same user may contribute to views and reshares for multiple networks, but since we show counts by network, this is not an issue. The source of exposure is not necessarily unique, i.e. the same viewer may contribute to the direct and indirect source of exposure counts if they were exposed via both. For viewers, we can compare the subgroup proportions to population proportions (indicated by black dotted lines). We filter out viewers with unknown source of exposure. We filter out networks with less than 100 viewers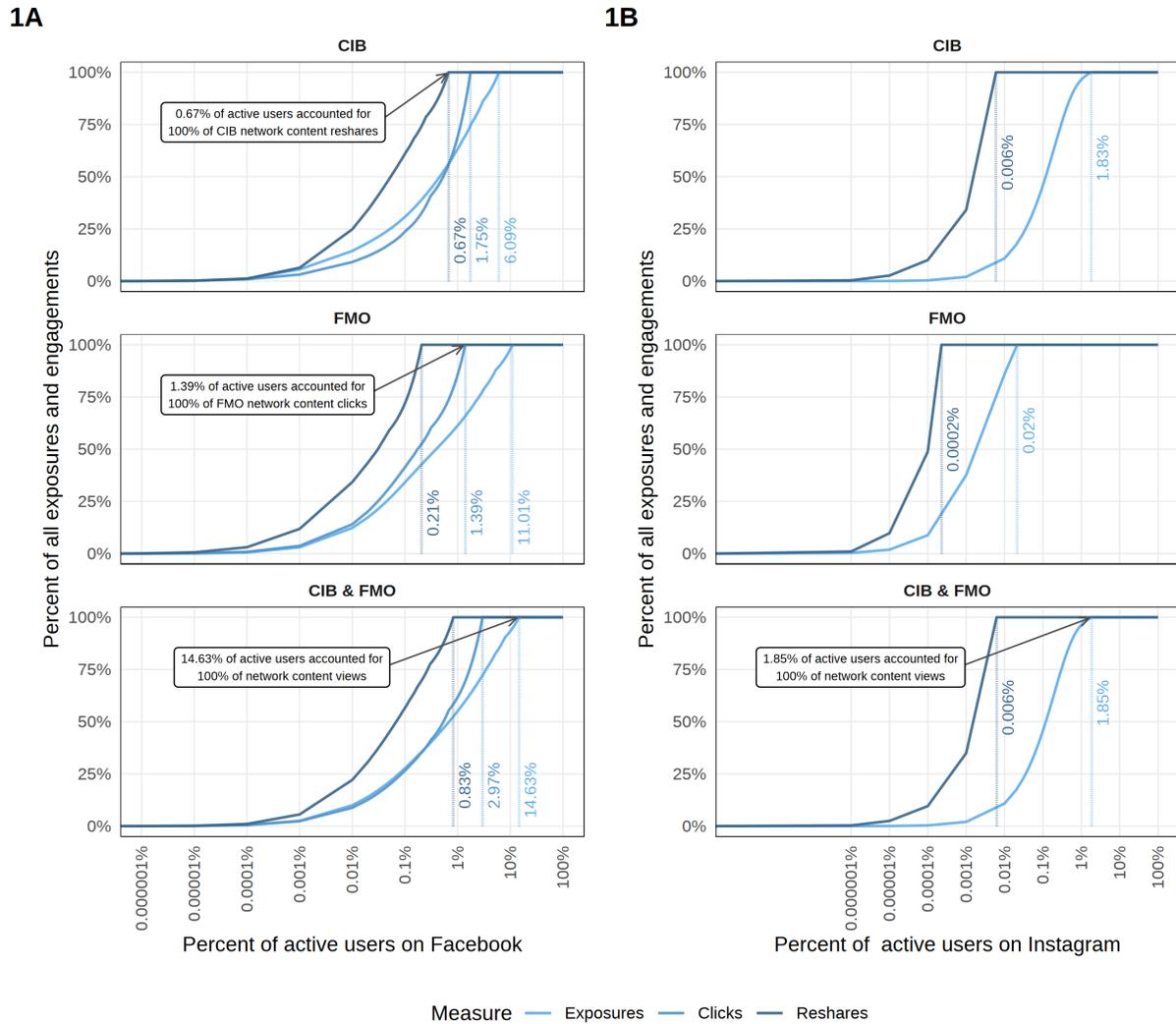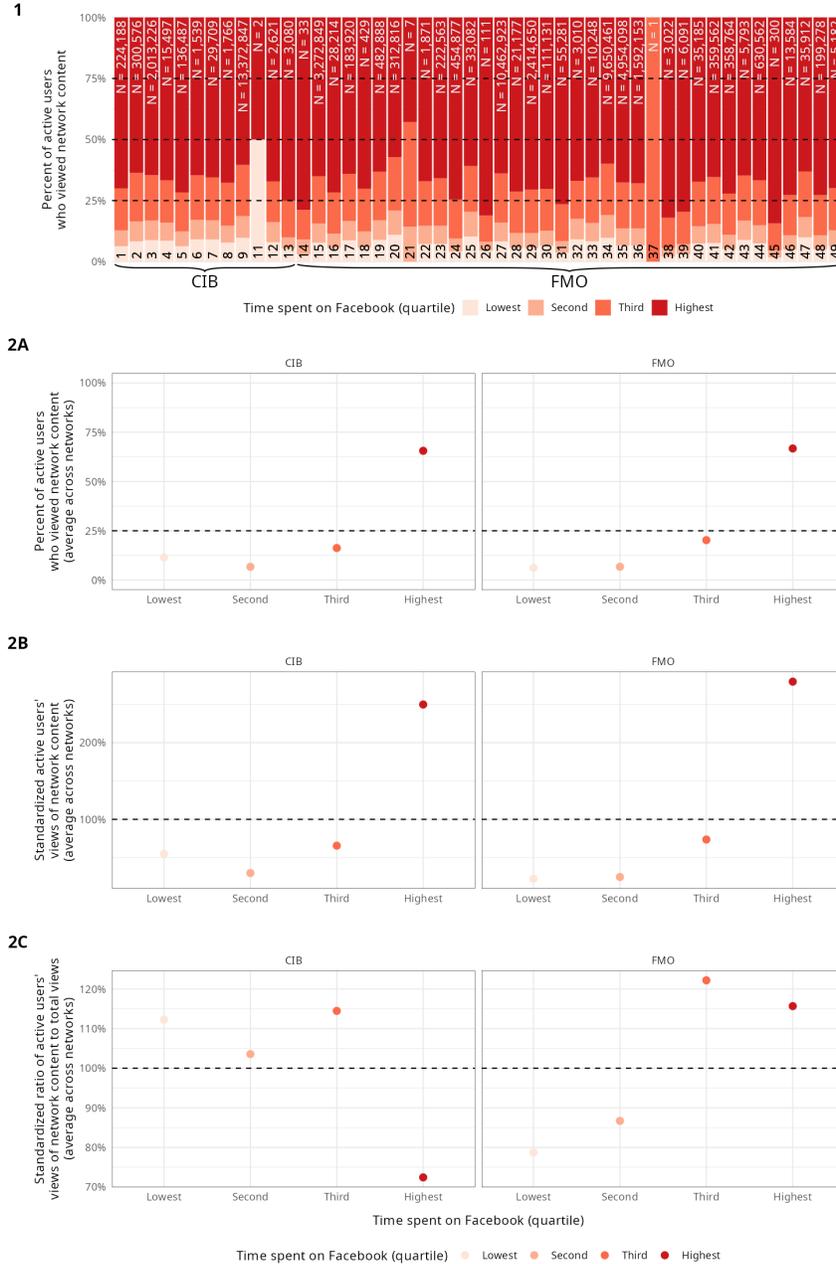. See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics. See Meta Classifiers and Categorization Methods for details on the political ideology classifier. See Aggregated Platform Data Coding for details on time spent subgroups.

Figure S22: Viewers, views and reshares by network type, source of exposure, network and high exposure to content from untrustworthy sources on Facebook

Note: Distribution of total viewers, views, and reshares by political ideology and by deceptive network. For viewers, we have counts in the raw data. For views and reshares, we calculate counts by multiplying the averages by the number of users in a network-subgroup-source of exposure cell. The same user may contribute to views and reshares for multiple networks, but since we show counts by network, this is not an issue. The source of exposure is not necessarily unique, i.e. the same viewer may contribute to the direct and indirect source of exposure counts if they were exposed via both. For viewers, we can compare the subgroup proportions to population proportions (indicated by black dotted lines). We filter out viewers with unknown source of exposure. We filter out networks with less than 100 viewers. See Definitions of Terms and Metrics for definitions of active users, network content and engagement metrics. See Meta Classifiers and Categorization Methods for details on the political ideology classifier. See Aggregated Platform Data Coding for details on high exposure to content from untrustworthy sources subgroups.

S4.4 Differences between direct and indirect network activity, content and engagement

Table S11: Top language differences between direct and indirect network posts on Facebook

Network ID	Top language in direct network posts	Top language in indirect network posts	Top language in network posts
3	Chinese	English	English
5	English	Tagalog	Tagalog
7	Russian	English	English
28	Russian	English	English
48	French	Arabic	Arabic

Note: Networks that are not shown have the same top language in direct and indirect posts. See Table S4 for the top language in direct network posts for all networks. See Definitions of Terms and Metrics for a definition network posts.

Figure S23: Distribution of topics based on Topic classifier on Facebook by network type and source of exposure

1 Distribution of topics based on Topic classifier by network type

For 35,586 CIB and 46,143 FMO pieces of network content
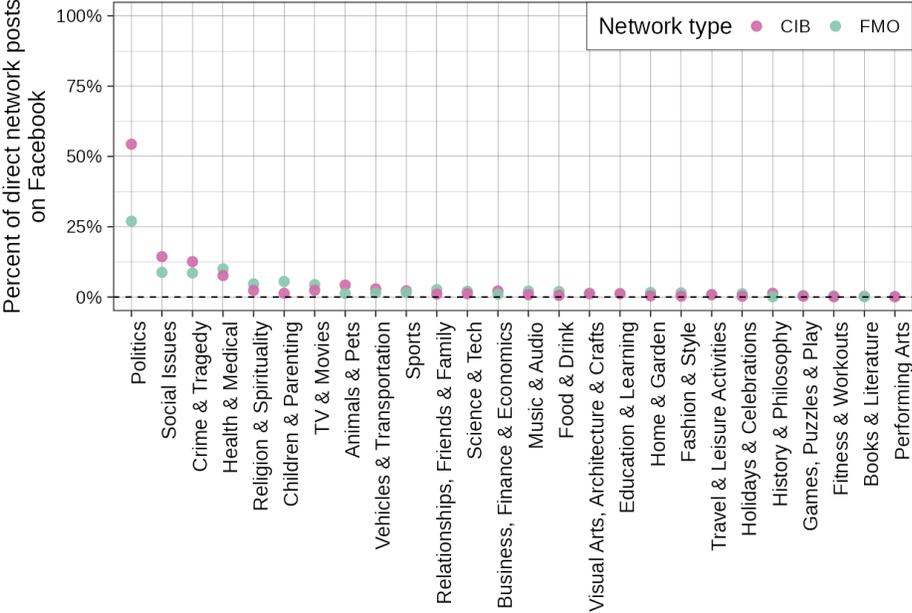
2 Distribution of topics based on Topic classifier by network type

For 5,131,377 CIB and 1,241,411 FMO pieces of network content
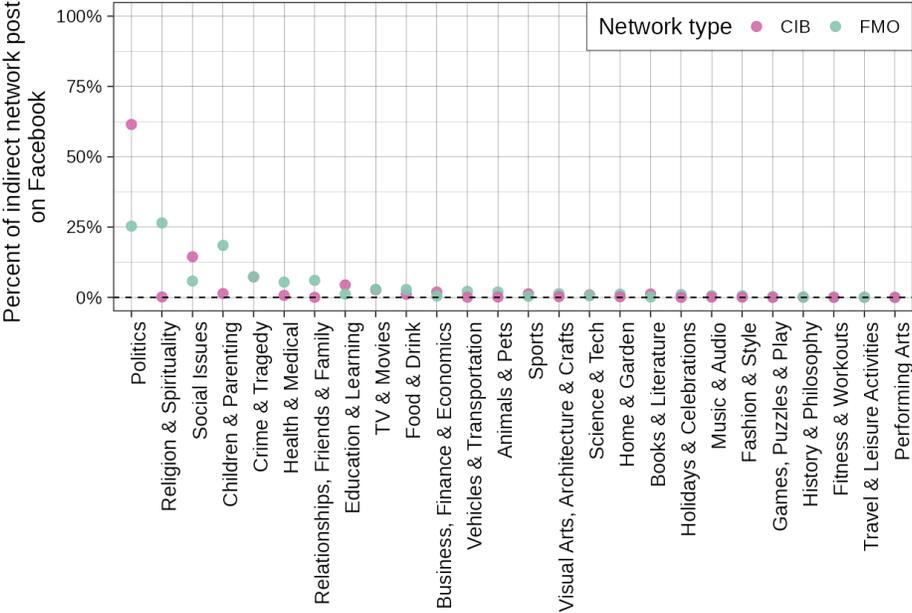
Note: See Definitions of Terms and Metrics for a definitions of network posts and Meta Classifiers and Categorization Methods for more details on the the Topic classifier.

Figure S24: Geographic characteristics of viewers of network content by how users are exposed to network content on Facebook
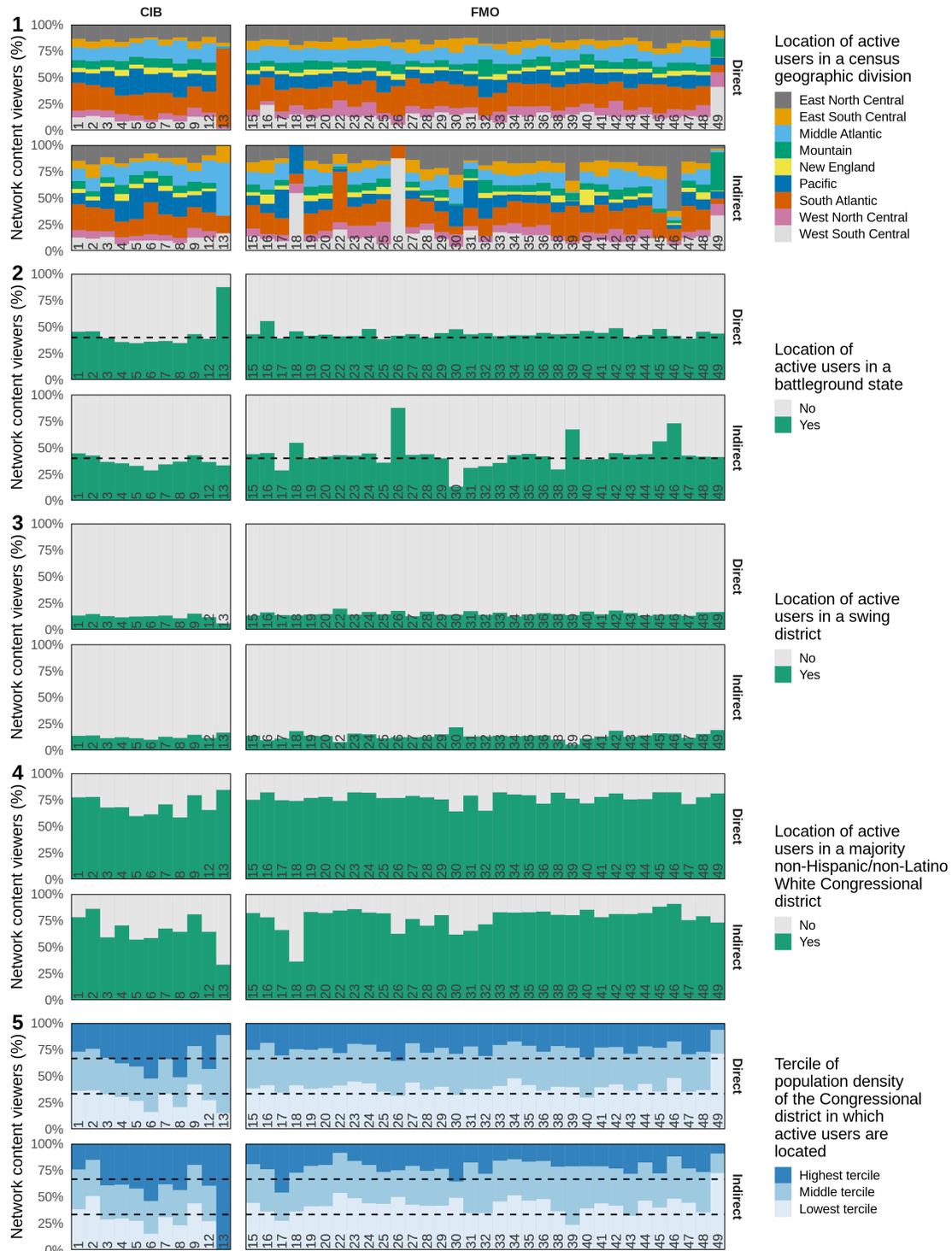
Note: Horizontal dashed lines correspond to how characteristics are distributed in the population of US adult active users in the study period. Networks CIB10, CIB11, FMO14, FMO21 and FMO37 excluded because they had less than 100 viewers. In each figure, viewers with an unknown source of exposure or missing values for the given category were omitted.

Figure S25: Connection characteristics of viewers of network content by how users are exposed to network content on Facebook
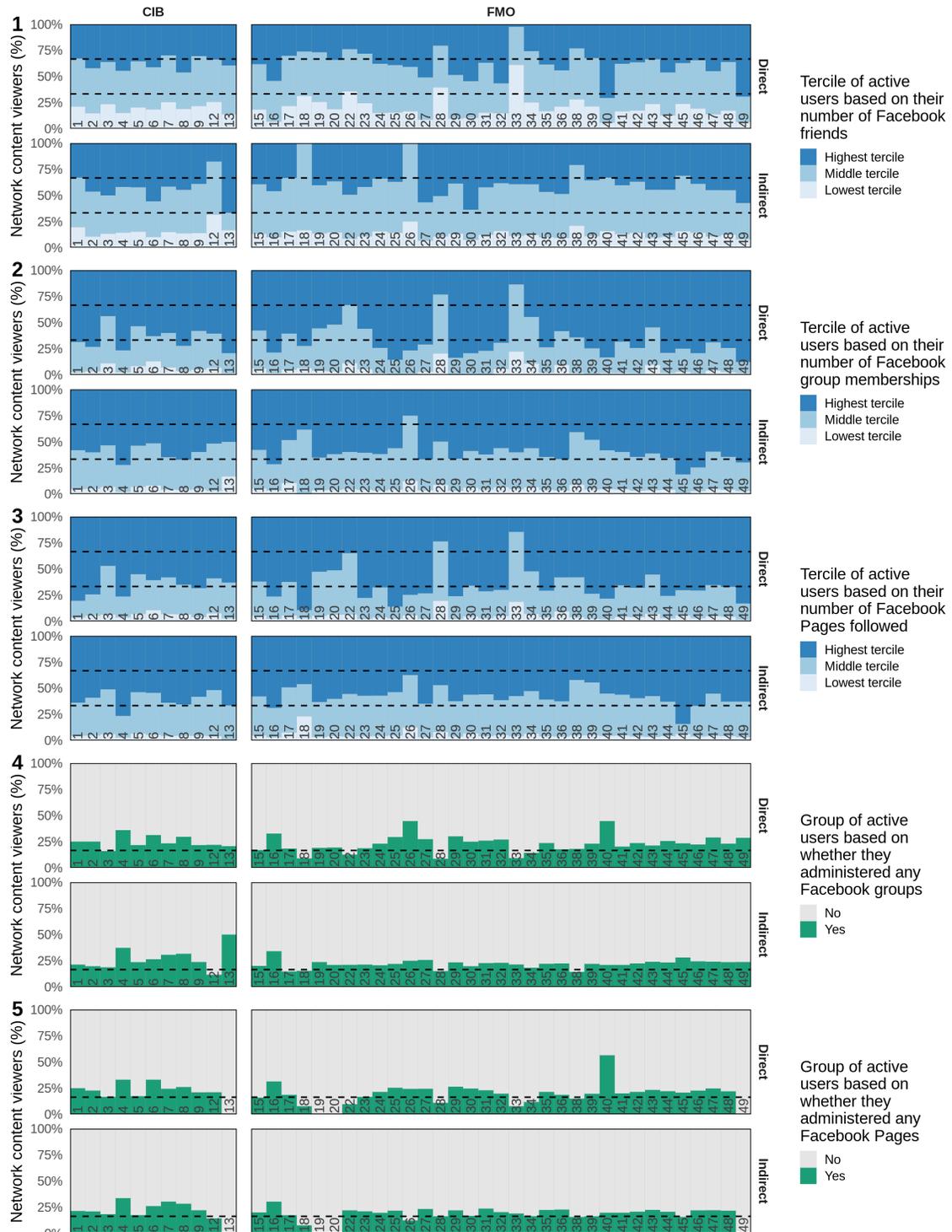
Note: Horizontal dashed lines correspond to how characteristics are distributed in the population of US adult active users in the study period. Networks CIB10, CIB11, FMO14, FMO21 and FMO37 excluded because they had less than 100 viewers. In each figure, viewers with an unknown source of exposure or missing values for the given category were omitted.

Figure S26: Social media activity characteristics of viewers of network content by how users are exposed to network content on Facebook
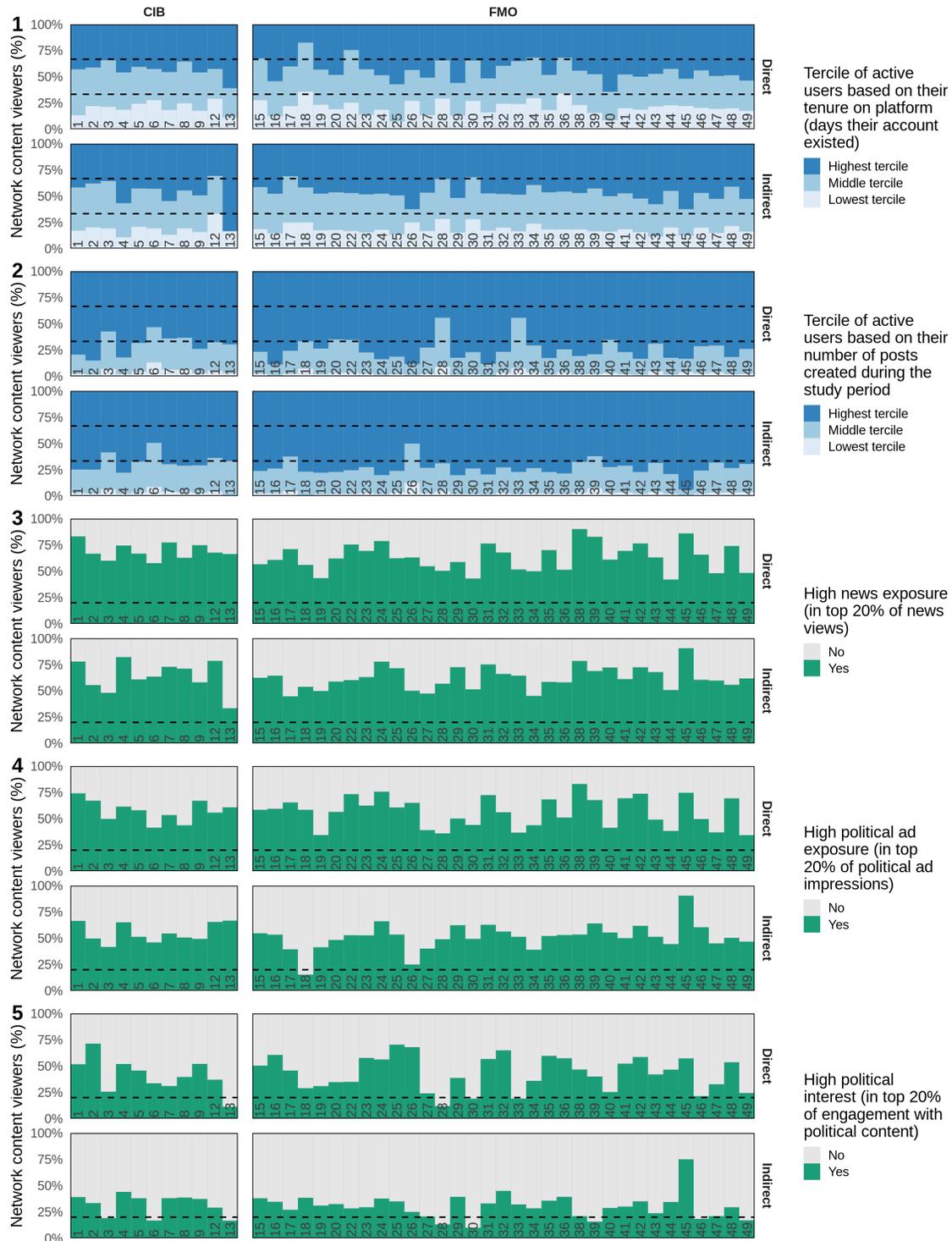
Note: Horizontal dashed lines correspond to how characteristics are distributed in the population of US adult active users in the study period. Networks CIB10, CIB11, FMO14, FMO21 and FMO37 excluded because they had less than 100 viewers. In each figure, viewers with an unknown source of exposure or missing values for the given category were omitted.

Table S12: Overview of active users' exposure to and engagement with network content on Facebook by network and source of exposure

Network ID	Network type	Viewers Exposed Directly	Viewers Exposed Indirectly	Average per viewer exposed directly			Average per viewer exposed indirectly		
				Views	Clicks	Reshares	Views	Clicks	Reshares
1	CIB	72,745	180,338	7.08787	0.32979	0.09855	1.68895	0.11705	0.00466
2	CIB	18,756	284,866	15.73525	1.03620	0.22116	1.34877	0.05933	0.01340
3	CIB	1,588,943	744,785	4.83241	0.27670	0.03425	2.45609	0.13574	0.01199
4	CIB	4,099	12,643	1.88851	0.04847	0.02254	1.48675	0.02950	0.01736
5	CIB	77,501	91,908	2.91894	0.18087	0.01577	2.51562	0.20265	0.00793
6	CIB	224	1,374	25.95111	0.60889	0.03111	1.68873	0.08000	0.00364
7	CIB	9,447	21,640	13.74383	0.71074	0.11144	1.80995	0.09056	0.01229
8	CIB	945	1,125	7.75052	0.13872	0.04451	2.50044	0.10168	0.01061
9	CIB	1,271,954	13,009,543	7.20644	0.18120	1.83283	2.30651	0.38822	0.09827
10	CIB								
11	CIB	2		1.50000	0.00000	0.00000			
12	CIB	2,450	267	1.84628	0.04514	0.00041	1.24719	0.01498	0.00000
13	CIB	3,076	6	3.98669	0.07530	0.00032	1.50000	0.16667	0.00000
14	FMO	0	33	0.00000	0.00000	0.33333	1.25000	0.13889	0.00000
15	FMO	587,541	2,964,874	12.03691	1.38323	0.21217	1.76519	0.13783	0.01367
16	FMO	21,803	6,615	4.17788	0.03361	0.00004	1.42089	0.03385	0.00000
17	FMO	92,487	102,963	4.15291	0.20608	0.02062	2.10093	0.04713	0.00711
18	FMO	416	13	5.31100	0.46411	0.00239	0.86667	0.00000	0.00000
19	FMO	61,262	427,501	2.72657	0.12944	0.05547	1.41164	0.07347	0.00804
20	FMO	249,328	64,379	2.08595	0.09587	0.00519	1.20600	0.05914	0.00367
21	FMO	7		1.57143	0.00000	0.00000			
22	FMO	135	1,738	1.49701	0.01198	0.20958	1.31764	0.06693	0.00794
23	FMO	12,146	215,593	24.20606	1.55281	0.68200	1.88314	0.05518	0.01914
24	FMO	275,361	208,397	4.17743	0.51007	0.03726	1.51061	0.09606	0.00560
25	FMO	32,121	967	28.61297	2.34971	0.00208	1.72934	0.01963	0.00310
26	FMO	103	8	2.89524	0.02857	0.00952	2.37500	0.12500	0.00000
27	FMO	3,637,708	7,654,095	7.38086	0.32910	0.02582	1.72231	0.11503	0.00570
28	FMO	220	20,962	0.36970	0.00833	0.84545	1.22826	0.02652	0.00095
29	FMO	2,262,807	192,216	2.93323	0.27135	0.00274	1.41893	0.10428	0.00447
30	FMO	110,563	594	1.50944	0.08274	0.00023	1.27227	0.03361	0.00168
31	FMO	54,253	1,038	1.62643	0.15493	0.00088	1.32757	0.08934	0.00384
32	FMO	137	2,881	1.34211	0.00000	0.05263	1.56940	0.06500	0.02268
33	FMO	1,213	9,035	1.27814	0.00000	0.17801	1.29600	0.05622	0.00562
34	FMO	467,164	9,398,804	36.03519	1.87329	0.43252	1.92434	0.04968	0.01767
35	FMO	439,005	4,676,342	5.97054	0.47190	0.08050	1.70595	0.09335	0.01830
36	FMO	88,040	1,525,984	7.51170	0.23262	0.08663	1.50238	0.06804	0.01343
37	FMO	1		2.00000	0.00000	0.00000			
38	FMO	2,716	306	1.57842	0.16115	0.02626	1.31046	0.04902	0.00000
39	FMO	5,871	222	1.61804	0.08617	0.00236	1.13216	0.02643	0.00000
40	FMO	11,848	23,728	4.19404	0.23215	0.16860	1.81211	0.07485	0.01359
41	FMO	350,103	11,174	2.79629	0.08266	0.00192	1.69848	0.06718	0.00544
42	FMO	140,644	232,368	3.69991	0.44543	0.05501	1.54891	0.11805	0.00845
43	FMO	1,028	4,779	8.02027	0.14274	0.08108	1.31686	0.04044	0.00313
44	FMO	107,762	545,391	9.48022	0.41697	0.17170	2.16713	0.21066	0.03135
45	FMO	299	32	1.71572	0.07023	0.00669	1.56250	0.03125	0.00000
46	FMO	11,570	2,325	1.81610	0.04546	0.00198	1.41116	0.14592	0.00773
47	FMO	26,217	10,822	5.25330	0.09454	0.01343	1.46230	0.04379	0.00277
48	FMO	125,709	75,859	3.13568	0.26370	0.01219	1.57539	0.07786	0.00403
49	FMO	2,744	2,462	5.79058	0.03924	0.02105	1.31671	0.02190	0.00041

Note: Different rates of engagement by those exposed directly or indirectly may be due to different engagement on the same content, or due to different content that is spread directly or indirectly and therefore receives different engagement. See Definitions of Terms and Metrics for definitions of network content, direct and indirect exposure, and engagement metrics.

S4.5 Correlation between reach and share of users reached via non-network accounts on Facebook

We calculate the Pearson correlation between cascade measures (average cascade depth, cascade size, cascade maximum breadth and structural virality) and the share of viewers who are exposed via network accounts (left-hand side of Figure S27) or network accounts (right-hand side of Figure S27). While the share of viewers exposed via network has a moderate to strong negative correlation with all of these cascade measures, the share of viewers exposed via non-network accounts has a moderate to strong positive correlation with those measures.

Figure S27: Correlation between cascade depth, size, maximum breadth and structural virality and the share of network viewers exposed via network or non-network accounts on Facebook
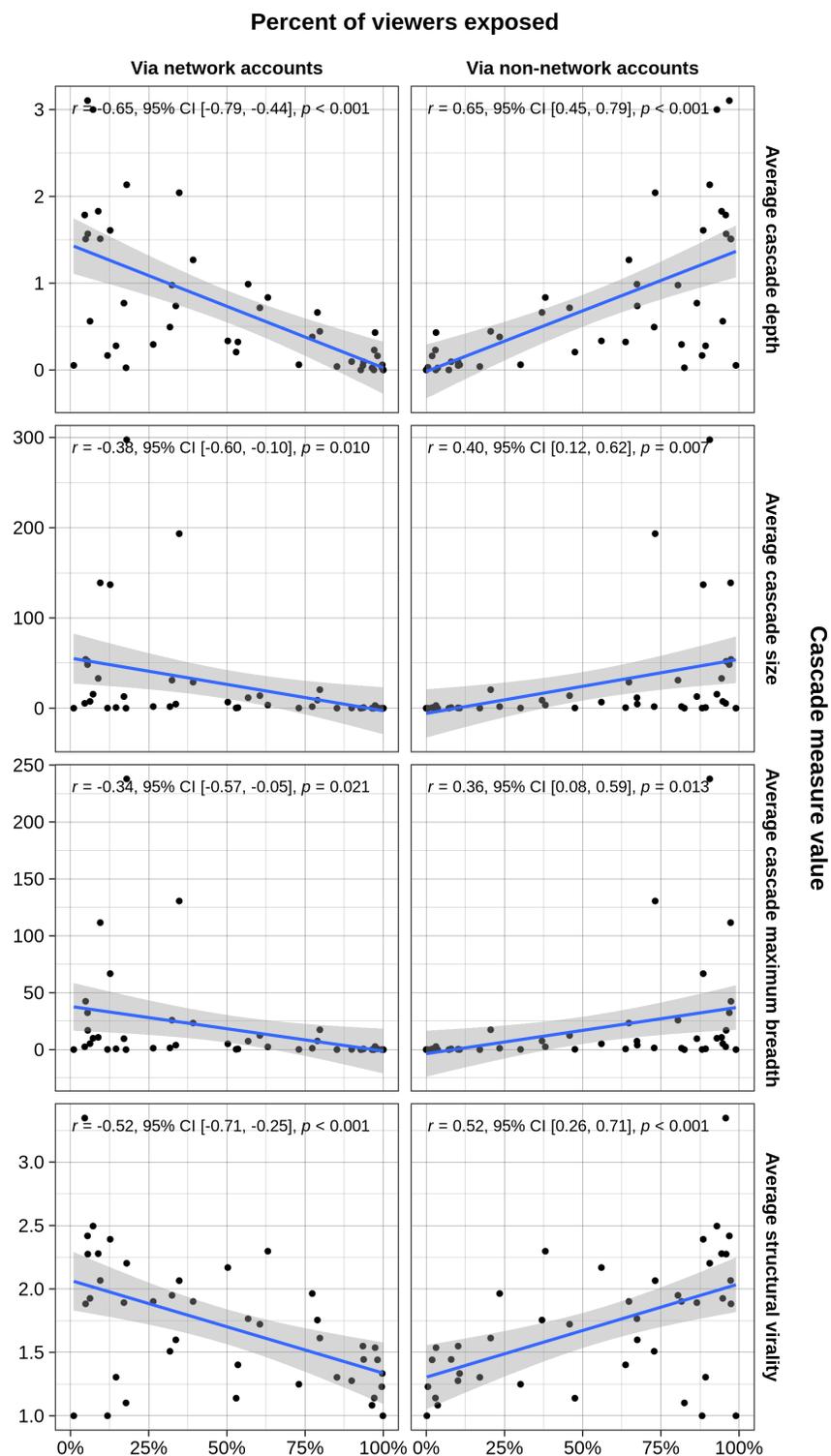
Note: Cascade data are only available for networks that had any original post by a network-affiliated account on Facebook. Missing values indicate that no original network post fell into a specific category. See Aggregated Platform Data Coding for more details on information cascade metrics.

S4.6 Experimental interventions

During the study period, experiments that were also part of the Facebook and Instagram Election Study took place on Facebook. In these experiments, consenting users were randomized to different types of Facebook feeds. We examine the effect of experimental treatment conditions on exposure to and engagement with deceptive online network content compared to the default feed ranking algorithm (control group) using replication data from published experiments [14, 15, 31], which also relies on individual-level participant data (see Section S2.3). This analysis was not pre-registered.

Following public replication code [14], we use a Lin regression setting with control variables selected via Lasso. We deviate from the replication code by adding additional potential control variables that are relevant to our setting: We also include whether a participant has a college degree, their income tercile, average daily time spent, social media activity tercile, Facebook friend count, civic content engagement, proportion of views in different categories (civic, civic news, cross-cutting, from untrustworthy sources, classified as uncivil, with likely slurs), partisan news clicks, posts by connections tercile and proportion of like-minded friends.

Balance checks suggest that treatment and control groups are relatively balanced for all treatments (see Tables S15, S16, S17).

We find that Facebook users who were randomized to an algorithm without reshared content [15] as well as users who were randomized to a reverse-chronological feed [14] were less likely to be exposed to and engaged with any network content (see Figure S28 and Tables S13 and S14).

For the binarized measures of exposure and engagement (see dependent variable "Any views of network content" and "Any engagement with network content" in Figure S28 and Tables S13 and S14), the effects are significant. While we show the standardized effect sizes in the regression plots and tables, we report the raw coefficients here for ease of interpretation. In the sample population, switching to chronological feed leads to an estimated decrease of participants with any network exposure by 3.35%, which amounts to a reduction of 28.2% in participants exposed at baseline. Similarly, switching to no reshares leads to an estimated decrease of participants with any network exposure by 3.85%, which amounts to a reduction of 32.3% in participants exposed in the sample population. In terms of engagement, switching to chronological feed leads to an estimated decrease of participants with any network engagement by 0.4%, which amounts to a reduction of 16.8% in participants engaged at baseline. Similarly, switching to no reshares leads to an estimated decrease of participants with any network engagement by 0.94%, which amounts to a reduction of 39.3% in participants engaged in the sample population.

However, these decreases in exposure and engagement seem to be at least partly driven by decreases in overall exposure to and engagement with any content. Both log-transformed views of network content and log-transformed views of any content decreased significantly for the no reshares and the reverse-chronological feed conditions, with the standardized effect sizes for network views being relatively larger than those for total views for the no reshares conditions, but relatively smaller for the reverse-chronological feed condition (see Figure S28 Panel A and Table S13; decrease in log-transformed total views for the no reshares condition only significant for SATE estimate). Both log-transformed engagements with network content and log-transformed total engagements decreased significantly for the no reshares and the reverse-chronological feed conditions, with the standardized effect sizes being larger for total engagements (see Figure S28 Panel B and Table S14). Analyzing network views/engagements as a proportion of total views/engagements,

we find that only one effect is statistically significant (see Figure S28 and Tables S13 and S14; the FDR-adjusted p-value is significant for PATE of proportion of network content engagements to total engagements in the no reshares treatment condition).

This may be because the number of consenting participants exposed to network content is very small and limited primarily to two FMO networks (FMO 27, FMO 35, see Figure S29). In fact, post-hoc MDE calculations show that we are not powered to detect effects on proportions of network views/engagements to total views/engagements (see MDE column in Tables S13 and S14 for minimum detectable effect sizes we calculated post-hoc).

Figure S28: Effect of experimental interventions on exposure to and engagement with deceptive online networks
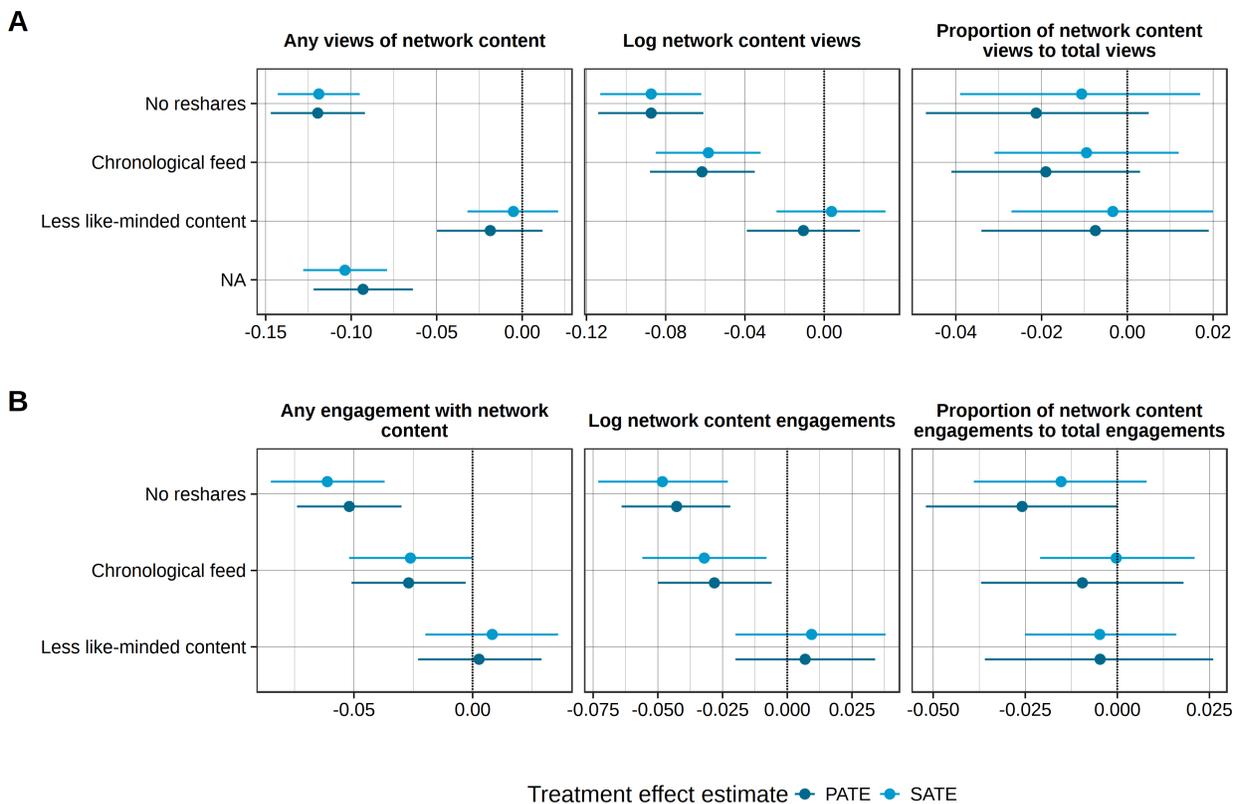
Note: Estimates are presented in standard deviations of the control group with 95% confidence intervals (not adjusted for multiple comparisons). The analyses for some models, including estimates for proportions, are underpowered based on a post-hoc MDE analysis. See Tables S13 and S14 for details and post-hoc MDE estimates.

Figure S29: Reach of deceptive online networks on Facebook in participant data
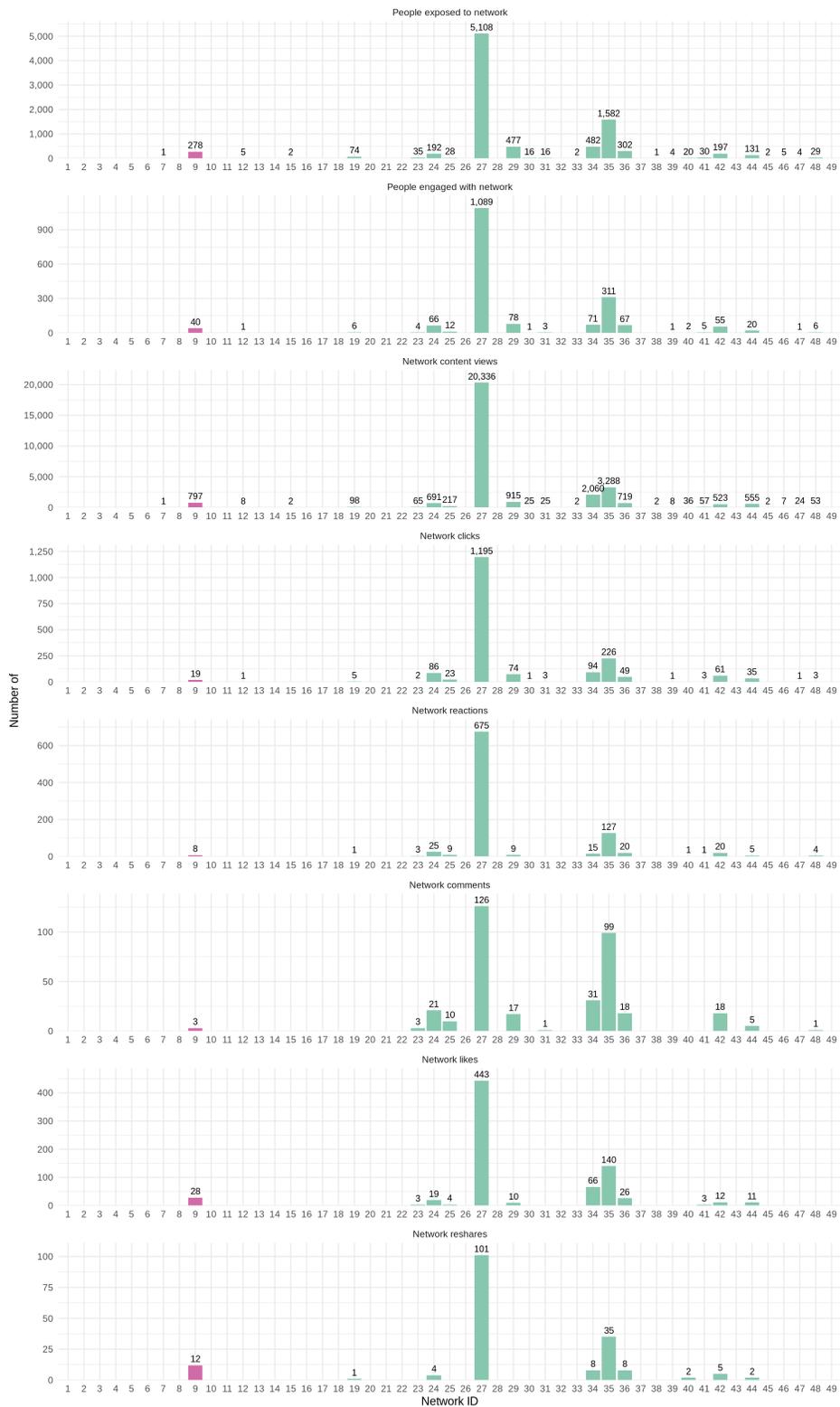
Note: Each row shows a different measure of reach of deceptive networks and how this reach is distributed across the 49 networks we analyzed.

Table S13: Effect of experimental interventions on exposure to deceptive online networks and total views

Dependent variable	Treatment	Effect type	Estimate	SE	SE type	p-value	FDR-adjusted p-value	N control	N treatment	MDE
Any views of network content	No reshares	PATE	-0.1196	0.01	HC2	0.00000	0.001	16,118	7,226	0.052
Any views of network content	No reshares	SATE	-0.1189	0.01	HC2	0.00000	0.001	16,118	7,226	0.037
Any views of network content	Chronological feed	PATE	-0.0931	0.01	HC2	0.00000	0.001	16,118	7,220	0.052
Any views of network content	Chronological feed	SATE	-0.1037	0.01	HC2	0.00000	0.001	16,118	7,220	0.037
Any views of network content	Less like-minded content	PATE	-0.0187	0.02	HC2	0.23486	0.176	16,118	7,212	0.054
Any views of network content	Less like-minded content	SATE	-0.0052	0.01	HC2	0.70404	0.418	16,118	7,212	0.038
Log network content views	No reshares	PATE	-0.0873	0.01	HC2	0.00000	0.001	16,118	7,226	0.054
Log network content views	No reshares	SATE	-0.0873	0.01	HC2	0.00000	0.001	16,118	7,226	0.038
Log network content views	Chronological feed	PATE	-0.0617	0.01	HC2	0.00001	0.001	16,118	7,220	0.054
Log network content views	Chronological feed	SATE	-0.0585	0.01	HC2	0.00001	0.001	16,118	7,220	0.038
Log network content views	Less like-minded content	PATE	-0.0105	0.01	HC2	0.46677	0.327	16,118	7,212	0.054
Log network content views	Less like-minded content	SATE	0.0037	0.01	HC2	0.78944	0.440	16,118	7,212	0.039
Log total views	No reshares	PATE	-0.0361	0.03	HC2	0.16582	0.132	16,118	7,226	0.053
Log total views	No reshares	SATE	-0.0468	0.01	HC2	0.00000	0.001	16,118	7,226	0.038
Log total views	Chronological feed	PATE	-0.0903	0.03	HC2	0.00076	0.002	16,118	7,220	0.053
Log total views	Chronological feed	SATE	-0.1112	0.01	HC2	0.00000	0.001	16,118	7,220	0.037
Log total views	Less like-minded content	PATE	-0.0356	0.03	HC2	0.20001	0.155	16,118	7,212	0.057
Log total views	Less like-minded content	SATE	-0.0248	0.01	HC2	0.01653	0.019	16,118	7,212	0.040
Proportion of network content views to total views	No reshares	PATE	-0.0213	0.01	HC2	0.11188	0.097	16,118	7,226	0.056
Proportion of network content views to total views	No reshares	SATE	-0.0107	0.01	HC2	0.45670	0.327	16,118	7,226	0.040
Proportion of network content views to total views	Chronological feed	PATE	-0.0190	0.01	HC2	0.09340	0.084	16,118	7,220	0.050
Proportion of network content views to total views	Chronological feed	SATE	-0.0095	0.01	HC2	0.37647	0.267	16,118	7,220	0.036
Proportion of network content views to total views	Less like-minded content	PATE	-0.0075	0.01	HC2	0.58657	0.362	16,118	7,212	0.052
Proportion of network content views to total views	Less like-minded content	SATE	-0.0034	0.01	HC2	0.77482	0.440	16,118	7,212	0.037

Note: Estimates are presented in standard deviations of the control group. The p-value column lists unadjusted p-values, while the FDR-adjusted p-value column lists p-values adjusted for multiple comparisons using false discovery rate (FDR) correction based on all models. The MDE column lists the minimum detectable effect size calculated post-hoc.

Table S14: Effect of experimental interventions on engagement with deceptive online networks and total engagements

Dependent variable	Treatment	Effect type	Estimate	SE	SE type	p-value	FDR-adjusted p-value	N control	N treatment	MDE
Any engagement with network content	No reshares	PATE	-0.0520	0.011	HC2	0.00000	0.001	16,118	7,226	0.053
Any engagement with network content	No reshares	SATE	-0.0612	0.012	HC2	0.00000	0.001	16,118	7,226	0.037
Any engagement with network content	Chronological feed	PATE	-0.0270	0.012	HC2	0.02829	0.030	16,118	7,220	0.055
Any engagement with network content	Chronological feed	SATE	-0.0262	0.013	HC2	0.04893	0.047	16,118	7,220	0.039
Any engagement with network content	Less like-minded content	PATE	0.0027	0.013	HC2	0.84015	0.440	16,118	7,212	0.056
Any engagement with network content	Less like-minded content	SATE	0.0082	0.014	HC2	0.56707	0.362	16,118	7,212	0.040
Log network content engagements	No reshares	PATE	-0.0427	0.011	HC2	0.00006	0.001	16,118	7,226	0.036
Log network content engagements	No reshares	SATE	-0.0482	0.013	HC2	0.00014	0.001	16,118	7,226	0.026
Log network content engagements	Chronological feed	PATE	-0.0282	0.011	HC2	0.01094	0.014	16,118	7,220	0.037
Log network content engagements	Chronological feed	SATE	-0.0321	0.012	HC2	0.00886	0.011	16,118	7,220	0.026
Log network content engagements	Less like-minded content	PATE	0.0069	0.014	HC2	0.61470	0.370	16,118	7,212	0.037
Log network content engagements	Less like-minded content	SATE	0.0094	0.015	HC2	0.52602	0.357	16,118	7,212	0.026
Log total engagements	No reshares	PATE	-0.0990	0.023	HC2	0.00002	0.001	16,118	7,226	0.036
Log total engagements	No reshares	SATE	-0.1180	0.009	HC2	0.00000	0.001	16,118	7,226	0.025
Log total engagements	Chronological feed	PATE	-0.4078	0.025	HC2	0.00000	0.001	16,118	7,220	0.039
Log total engagements	Chronological feed	SATE	-0.4511	0.009	HC2	0.00000	0.001	16,118	7,220	0.027
Log total engagements	Less like-minded content	PATE	-0.0723	0.025	HC1	0.00341	0.005	16,118	7,212	0.036
Log total engagements	Less like-minded content	SATE	-0.0603	0.009	HC1	0.00000	0.001	16,118	7,212	0.025
Proportion of network content engagements to total engagements	No reshares	PATE	-0.0259	0.013	HC2	0.04951	0.047	16,118	7,226	0.052
Proportion of network content engagements to total engagements	No reshares	SATE	-0.0153	0.012	HC2	0.20339	0.155	16,118	7,226	0.037
Proportion of network content engagements to total engagements	Chronological feed	PATE	-0.0095	0.014	HC2	0.49882	0.345	16,118	7,220	0.050
Proportion of network content engagements to total engagements	Chronological feed	SATE	-0.0003	0.011	HC2	0.97730	0.484	16,118	7,220	0.036
Proportion of network content engagements to total engagements	Less like-minded content	PATE	-0.0047	0.016	HC2	0.76833	0.440	16,118	7,212	0.050
Proportion of network content engagements to total engagements	Less like-minded content	SATE	-0.0048	0.011	HC2	0.64989	0.387	16,118	7,212	0.035

Note: Estimates are presented in standard deviations of the control group. The p-value column lists unadjusted p-values, while the FDR-adjusted p-value column lists p-values adjusted for multiple comparisons using false discovery rate (FDR) correction based on all models. The MDE column lists the minimum detectable effect size calculated post-hoc.

Table S15: Covariate balance for the chronological feed treatment

Variable	Chronological feed	Control	p-value	SMD
Number of observations	7220	16118		
In swing state (block randomization variable) = Yes (%)	2563 (35.5)	5665 (35.1)	0.614	0.007
Friend count tercile (block randomization variable) (mean (SD))	1.99 (0.81)	1.99 (0.81)	0.766	0.004
Race (block randomization variable) = White (%)	5293 (73.3)	11825 (73.4)	0.943	0.001
Party ID (block randomization variable (%)			0.868	0.008
... Democrat	3895 (53.9)	8722 (54.1)		
... Republican	2417 (33.5)	5409 (33.6)		
... Independent	908 (12.6)	1987 (12.3)		
Gender (%)			0.328	0.021
... Female	4161 (57.6)	9234 (57.3)		
... Male	2987 (41.4)	6751 (41.9)		
... Other	72 (1.0)	132 (0.8)		
Age (%)			0.667	0.018
... 18-29	1292 (17.9)	2903 (18.0)		
... 30-44	3129 (43.3)	6853 (42.5)		
... 45-65	2311 (32.0)	5271 (32.7)		
... >65	487 (6.7)	1091 (6.8)		
Race/ethnicity (%)			0.730	0.020
... Non-Hispanic white	5293 (73.3)	11825 (73.4)		
... Non-Hispanic Black, non-hispanic	485 (6.7)	1091 (6.8)		
... Hispanic	879 (12.2)	1895 (11.8)		
... Asian American and Pacific Islander	150 (2.1)	373 (2.3)		
... Other	413 (5.7)	932 (5.8)		
Has college degree (mean (SD))	0.49 (0.50)	0.51 (0.50)	0.012	0.036
Political ideology (mean (SD))	2.74 (1.16)	2.75 (1.16)	0.602	0.007
Income tercile [terciles coded 1, 2, 3] (mean (SD))	1.98 (0.81)	2.01 (0.81)	0.013	0.035
Party ID [from 1 = Strong Democrat to 7 = Strong Republican] (mean (SD))	3.52 (2.09)	3.52 (2.11)	0.961	0.001
Turnout in 2016 (mean (SD))	1.18 (0.39)	1.18 (0.38)	0.083	0.024
News consumption: network TV (mean (SD))	2.41 (1.18)	2.41 (1.18)	0.686	0.006
News consumption: cable (mean (SD))	1.91 (0.77)	1.91 (0.78)	0.506	0.009
News consumption: online websites (mean (SD))	3.18 (0.93)	3.17 (0.93)	0.702	0.005
News consumption: social media (mean (SD))	2.07 (0.65)	2.06 (0.64)	0.334	0.014
News consumption: newspapers (mean (SD))	1.46 (0.87)	1.47 (0.88)	0.419	0.011
Political interest (mean (SD))	3.85 (1.01)	3.86 (1.01)	0.563	0.008
Political participation (mean (SD))	2.34 (1.40)	2.35 (1.40)	0.455	0.011
Digital literacy index tercile [terciles coded 1, 2, 3] (mean (SD))	2.08 (0.90)	2.08 (0.90)	0.910	0.002
Facebook daily active time spent (mean (SD))	0.57 (0.93)	0.58 (0.92)	0.826	0.003
Social media activity tercile (%)			0.395	0.019
... Lowest tercile	2437 (33.8)	5415 (33.6)		
... Middle tercile	2377 (32.9)	5444 (33.8)		
... Highest tercile	2406 (33.3)	5259 (32.6)		
Facebook friends (mean (SD))	578.16 (672.71)	582.88 (681.56)	0.624	0.007
Civic content engagement (mean (SD))	0.02 (1.09)	0.00 (0.96)	0.263	0.015
Proportion of civic content views to all content views (mean (SD))	0.14 (0.10)	0.14 (0.10)	0.734	0.005
Proportion of civic news content views to all content views (mean (SD))	0.07 (0.07)	0.07 (0.07)	0.938	0.001
Proportion of cross-cutting content views to all content views (mean (SD))	0.21 (0.17)	0.21 (0.17)	0.557	0.008
Proportion of content views from untrustworthy sources to all content views (mean (SD))	0.03 (0.04)	0.03 (0.04)	0.192	0.019
Proportion of incivility content views to all content views (mean (SD))	0.04 (0.02)	0.04 (0.02)	0.095	0.024
Proportion of views of content with likely slurs to all content views (mean (SD))	0.00 (0.00)	0.00 (0.00)	0.942	0.001
Partisan news clicks (mean (SD))	0.20 (0.07)	0.20 (0.07)	0.877	0.002
Posts by connections tercile (%)			0.628	0.014
... Lowest tercile	2473 (34.3)	5566 (34.5)		
... Middle tercile	2437 (33.8)	5337 (33.1)		
... Highest tercile	2310 (32.0)	5215 (32.4)		
Proportion of likeminded to all Facebook friends quintile (%)			0.424	0.028
... Lowest quintile	1413 (19.6)	3121 (19.4)		
... Second quintile	1398 (19.4)	3278 (20.4)		
... Third quintile	1487 (20.6)	3206 (19.9)		
... Fourth quintile	1462 (20.3)	3231 (20.1)		
... Highest quintile	1446 (20.1)	3253 (20.2)		

Note: p-values result from a joint F-test for continuous variables and from a Chi-squared test for categorical variables.

Table S16: Covariate balance for the no reshares treatment

Variable	Control	No reshares	p-value	SMD
Number of observations	16118	7226		
In swing state (block randomization variable) = Yes (%)	5665 (35.1)	2534 (35.1)	0.918	0.002
Friend count tercile (block randomization variable) (mean (SD))	1.99 (0.81)	1.99 (0.81)	0.748	0.005
Race (block randomization variable) = White (%)	11825 (73.4)	5310 (73.5)	0.861	0.003
Party ID (block randomization variable (%)			0.867	0.008
... Democrat	8722 (54.1)	3883 (53.7)		
... Republican	5409 (33.6)	2445 (33.8)		
... Independent	1987 (12.3)	898 (12.4)		
Gender (%)			0.115	0.030
... Female	9234 (57.3)	4141 (57.3)		
... Male	6751 (41.9)	3044 (42.1)		
... Other	132 (0.8)	41 (0.6)		
Age (%)			0.388	0.025
... 18-29	2903 (18.0)	1239 (17.1)		
... 30-44	6853 (42.5)	3131 (43.3)		
... 45-65	5271 (32.7)	2356 (32.6)		
... >65	1091 (6.8)	499 (6.9)		
Race/ethnicity (%)			0.884	0.015
... Non-Hispanic white	11825 (73.4)	5310 (73.5)		
... Non-Hispanic Black, non-hispanic	1091 (6.8)	486 (6.7)		
... Hispanic	1895 (11.8)	867 (12.0)		
... Asian American and Pacific Islander	373 (2.3)	156 (2.2)		
... Other	932 (5.8)	403 (5.6)		
Has college degree (mean (SD))	0.51 (0.50)	0.50 (0.50)	0.054	0.027
Political ideology (mean (SD))	2.75 (1.16)	2.77 (1.17)	0.419	0.011
Income tercile [terciles coded 1, 2, 3] (mean (SD))	2.01 (0.81)	1.99 (0.81)	0.159	0.020
Party ID [from 1 = Strong Democrat to 7 = Strong Republican] (mean (SD))	3.52 (2.11)	3.54 (2.11)	0.561	0.008
Turnout in 2016 (mean (SD))	1.18 (0.38)	1.18 (0.39)	0.272	0.016
News consumption: network TV (mean (SD))	2.41 (1.18)	2.42 (1.18)	0.437	0.011
News consumption: cable (mean (SD))	1.91 (0.78)	1.92 (0.79)	0.303	0.015
News consumption: online websites (mean (SD))	3.17 (0.93)	3.17 (0.93)	0.732	0.005
News consumption: social media (mean (SD))	2.06 (0.64)	2.08 (0.65)	0.101	0.023
News consumption: newspapers (mean (SD))	1.47 (0.88)	1.49 (0.89)	0.094	0.024
Political interest (mean (SD))	3.86 (1.01)	3.86 (1.00)	0.946	0.001
Political participation (mean (SD))	2.35 (1.40)	2.32 (1.40)	0.167	0.020
Digital literacy index tercile [terciles coded 1, 2, 3] (mean (SD))	2.08 (0.90)	2.06 (0.90)	0.074	0.025
Facebook daily active time spent (mean (SD))	0.58 (0.92)	0.59 (0.95)	0.246	0.016
Social media activity tercile (%)			0.502	0.017
... Lowest tercile	5415 (33.6)	2414 (33.4)		
... Middle tercile	5444 (33.8)	2400 (33.2)		
... Highest tercile	5259 (32.6)	2412 (33.4)		
Facebook friends (mean (SD))	582.88 (681.56)	589.95 (699.55)	0.467	0.010
Civic content engagement (mean (SD))	0.00 (0.96)	0.02 (1.07)	0.225	0.017
Proportion of civic content views to all content views (mean (SD))	0.14 (0.10)	0.14 (0.10)	0.909	0.002
Proportion of civic news content views to all content views (mean (SD))	0.07 (0.07)	0.07 (0.07)	0.950	0.001
Proportion of cross-cutting content views to all content views (mean (SD))	0.21 (0.17)	0.20 (0.16)	0.064	0.026
Proportion of content views from untrustworthy sources to all content views (mean (SD))	0.03 (0.04)	0.03 (0.04)	0.292	0.015
Proportion of incivility content views to all content views (mean (SD))	0.04 (0.02)	0.04 (0.02)	0.174	0.019
Proportion of views of content with likely slurs to all content views (mean (SD))	0.00 (0.00)	0.00 (0.00)	0.272	0.016
Partisan news clicks (mean (SD))	0.20 (0.07)	0.20 (0.07)	0.007	0.039
Posts by connections tercile (%)			0.825	0.009
... Lowest tercile	5566 (34.5)	2475 (34.3)		
... Middle tercile	5337 (33.1)	2422 (33.5)		
... Highest tercile	5215 (32.4)	2329 (32.2)		
Proportion of likeminded to all Facebook friends quintile (%)			0.817	0.018
... Lowest quintile	3121 (19.4)	1418 (19.6)		
... Second quintile	3278 (20.4)	1426 (19.7)		
... Third quintile	3206 (19.9)	1442 (20.0)		
... Fourth quintile	3231 (20.1)	1445 (20.0)		
... Highest quintile	3253 (20.2)	1490 (20.6)		

Note: p-values result from a joint F-test for continuous variables and from a Chi-squared test for categorical variables.

Table S17: Covariate balance for the less like-minded content treatment

Variable	Control	Less like-minded content	p-value	SMD
Number of observations	16118	7212		
In swing state (block randomization variable) = Yes (%)	5665 (35.1)	2522 (35.0)	0.804	0.004
Friend count tercile (block randomization variable) (mean (SD))	1.99 (0.81)	2.00 (0.81)	0.855	0.003
Race (block randomization variable) = White (%)	11825 (73.4)	5274 (73.1)	0.717	0.005
Party ID (block randomization variable (%)			0.978	0.003
... Democrat	8722 (54.1)	3896 (54.0)		
... Republican	5409 (33.6)	2420 (33.6)		
... Independent	1987 (12.3)	896 (12.4)		
Gender (%)			0.799	0.010
... Female	9234 (57.3)	4136 (57.3)		
... Male	6751 (41.9)	3023 (41.9)		
... Other	132 (0.8)	53 (0.7)		
Age (%)			0.806	0.014
... 18-29	2903 (18.0)	1318 (18.3)		
... 30-44	6853 (42.5)	3092 (42.9)		
... 45-65	5271 (32.7)	2312 (32.1)		
... >65	1091 (6.8)	490 (6.8)		
Race/ethnicity (%)			0.370	0.029
... Non-Hispanic white	11825 (73.4)	5274 (73.1)		
... Non-Hispanic Black, non-hispanic	1091 (6.8)	476 (6.6)		
... Hispanic	1895 (11.8)	905 (12.6)		
... Asian American and Pacific Islander	373 (2.3)	150 (2.1)		
... Other	932 (5.8)	406 (5.6)		
Has college degree (mean (SD))	0.51 (0.50)	0.50 (0.50)	0.395	0.012
Political ideology (mean (SD))	2.75 (1.16)	2.76 (1.15)	0.763	0.004
Income tercile [terciles coded 1, 2, 3] (mean (SD))	2.01 (0.81)	1.97 (0.81)	0.007	0.038
Party ID [from 1 = Strong Democrat to 7 = Strong Republican] (mean (SD))	3.52 (2.11)	3.52 (2.10)	0.934	0.001
Turnout in 2016 (mean (SD))	1.18 (0.38)	1.19 (0.39)	0.068	0.026
News consumption: network TV (mean (SD))	2.41 (1.18)	2.40 (1.18)	0.567	0.008
News consumption: cable (mean (SD))	1.91 (0.78)	1.90 (0.78)	0.562	0.008
News consumption: online websites (mean (SD))	3.17 (0.93)	3.16 (0.93)	0.348	0.013
News consumption: social media (mean (SD))	2.06 (0.64)	2.08 (0.65)	0.153	0.020
News consumption: newspapers (mean (SD))	1.47 (0.88)	1.48 (0.87)	0.437	0.011
Political interest (mean (SD))	3.86 (1.01)	3.84 (1.02)	0.103	0.023
Political participation (mean (SD))	2.35 (1.40)	2.33 (1.41)	0.207	0.018
Digital literacy index tercile [terciles coded 1, 2, 3] (mean (SD))	2.08 (0.90)	2.09 (0.90)	0.507	0.009
Facebook daily active time spent (mean (SD))	0.58 (0.92)	0.57 (0.95)	0.530	0.009
Social media activity tercile (%)			0.064	0.033
... Lowest tercile	5415 (33.6)	2498 (34.6)		
... Middle tercile	5444 (33.8)	2325 (32.2)		
... Highest tercile	5259 (32.6)	2389 (33.1)		
Facebook friends (mean (SD))	582.88 (681.56)	567.88 (629.01)	0.112	0.023
Civic content engagement (mean (SD))	0.00 (0.96)	0.00 (1.02)	0.987	<0.001
Proportion of civic content views to all content views (mean (SD))	0.14 (0.10)	0.14 (0.10)	0.313	0.014
Proportion of civic news content views to all content views (mean (SD))	0.07 (0.07)	0.07 (0.07)	0.424	0.011
Proportion of cross-cutting content views to all content views (mean (SD))	0.21 (0.17)	0.21 (0.17)	0.585	0.008
Proportion of content views from untrustworthy sources to all content views (mean (SD))	0.03 (0.04)	0.03 (0.04)	0.217	0.018
Proportion of incivility content views to all content views (mean (SD))	0.04 (0.02)	0.04 (0.02)	0.497	0.010
Proportion of views of content with likely slurs to all content views (mean (SD))	0.00 (0.00)	0.00 (0.00)	0.838	0.003
Partisan news clicks (mean (SD))	0.20 (0.07)	0.20 (0.07)	0.814	0.003
Posts by connections tercile (%)			0.629	0.014
... Lowest tercile	5566 (34.5)	2472 (34.3)		
... Middle tercile	5337 (33.1)	2434 (33.7)		
... Highest tercile	5215 (32.4)	2306 (32.0)		
Proportion of likeminded to all Facebook friends quintile (%)			0.527	0.025
... Lowest quintile	3121 (19.4)	1427 (19.8)		
... Second quintile	3278 (20.4)	1471 (20.4)		
... Third quintile	3206 (19.9)	1386 (19.3)		
... Fourth quintile	3231 (20.1)	1491 (20.7)		
... Highest quintile	3253 (20.2)	1420 (19.7)		

Note: p-values result from a joint F-test for continuous variables and from a Chi-squared test for categorical variables.

S5 Results of Selected Pre-registered Analyses Referenced in the Main Text

S5.1 Distribution of user reshares of deceptive online network content on Facebook

Table S18: Summary statistics of number of active users' reshares of network original posts on Facebook

Network ID	Network type	p5	p50	p95	Avg	SD
1	CIB	0	0	0	0.000046318	0.019017
2	CIB	0	0	0	0.000033230	0.019476
3	CIB	0	0	0	0.000259874	0.094626
4	CIB	0	0	0	0.000001245	0.009064
5	CIB	0	0	0	0.000007934	0.005331
6	CIB	0	0	0	0.000000048	0.000268
7	CIB	0	0	0	0.000005396	0.007611
8	CIB	0	0	0	0.000000223	0.000702
9	CIB	0	0	0	0.019398905	0.652388
10	CIB	0	0	0	0.000000000	0.000000
11	CIB	0	0	0	0.000000000	0.000000
12	CIB	0	0	0	0.000000004	0.000063
13	CIB	0	0	0	0.000000004	0.000063
14	FMO	0	0	0	0.000000020	0.000141
15	FMO	0	0	0	0.000679237	0.074866
16	FMO	0	0	0	0.000000004	0.000063
17	FMO	0	0	0	0.000011950	0.007417
18	FMO	0	0	0	0.000000004	0.000063
19	FMO	0	0	0	0.000027607	0.006741
20	FMO	0	0	0	0.000006820	0.002981
21	FMO	0	0	0	0.000000000	0.000000
22	FMO	0	0	0	0.000000215	0.000512
23	FMO	0	0	0	0.000049980	0.027543
24	FMO	0	0	0	0.000045649	0.011074
25	FMO	0	0	0	0.000000278	0.001021
26	FMO	0	0	0	0.000000004	0.000063
27	FMO	0	0	0	0.000573626	0.053425
28	FMO	0	0	0	0.000004530	0.002347
29	FMO	0	0	0	0.000028203	0.006766
30	FMO	0	0	0	0.000000103	0.000322
31	FMO	0	0	0	0.000000266	0.000646
32	FMO	0	0	0	0.000000382	0.000793
33	FMO	0	0	0	0.000001388	0.001312
34	FMO	0	0	0	0.001563286	0.171190
35	FMO	0	0	0	0.000486980	0.039711
36	FMO	0	0	0	0.000112960	0.014463
37	FMO	0	0	0	0.000000000	0.000000
38	FMO	0	0	0	0.000000290	0.000568
39	FMO	0	0	0	0.000000076	0.000351
40	FMO	0	0	0	0.000009624	0.010938
41	FMO	0	0	0	0.000002919	0.003395
42	FMO	0	0	0	0.000038917	0.009202
43	FMO	0	0	0	0.000000441	0.001116
44	FMO	0	0	0	0.000176044	0.041604
45	FMO	0	0	0	0.000000008	0.000089
46	FMO	0	0	0	0.000000223	0.000772
47	FMO	0	0	0	0.000001539	0.001655
48	FMO	0	0	0	0.000008972	0.003504
49	FMO	0	0	0	0.000000239	0.000661

Note: See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S19: Summary statistics of number of active users' reshares of network original posts on Facebook by age group of active users

Network ID	Network type	Overall Median	Overall Mean	18-29 Median	18-29 Mean	30-44 Median	30-44 Mean	45-64 Median	45-64 Mean	65+ Median	65+ Mean
1	CIB	0	0.000046318	0	0.000010317	0	0.000026343	0	0.000070159	0	0.000118646
2	CIB	0	0.000033230	0	0.000004648	0	0.000007212	0	0.000046763	0	0.000126651
3	CIB	0	0.000259874	0	0.000050396	0	0.000149861	0	0.000451059	0	0.000548914
4	CIB	0	0.000001245	0	0.000000255	0	0.000000433	0	0.000002643	0	0.000002194
5	CIB	0	0.000007934	0	0.000001729	0	0.000002452	0	0.000012327	0	0.000024570
6	CIB	0	0.000000048	0	0.000000000	0	0.000000066	0	0.000000055	0	0.000000093
7	CIB	0	0.000005396	0	0.000000482	0	0.000001875	0	0.000008426	0	0.000017647
8	CIB	0	0.000000223	0	0.000000085	0	0.000000105	0	0.000000374	0	0.000000464
9	CIB	0	0.019398905	0	0.004149906	0	0.010892755	0	0.029833889	0	0.049391647
10	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000014	0	0.000000000
13	CIB	0	0.000000004	0	0.000000014	0	0.000000000	0	0.000000000	0	0.000000000
14	FMO	0	0.000000020	0	0.000000014	0	0.000000013	0	0.000000028	0	0.000000031
15	FMO	0	0.000679237	0	0.000071570	0	0.000111298	0	0.000924435	0	0.002795284
16	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000014	0	0.000000000
17	FMO	0	0.000011950	0	0.000003841	0	0.000009087	0	0.000016284	0	0.000026702
18	FMO	0	0.000000004	0	0.000000000	0	0.000000013	0	0.000000000	0	0.000000000
19	FMO	0	0.000027607	0	0.000005059	0	0.000008405	0	0.000045809	0	0.000081374
20	FMO	0	0.000006820	0	0.000001020	0	0.000002255	0	0.000010501	0	0.000022005
21	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.000000014	0	0.000000013	0	0.000000304	0	0.000000927
23	FMO	0	0.000049980	0	0.000005045	0	0.000009624	0	0.000066825	0	0.000205460
24	FMO	0	0.000045649	0	0.000002693	0	0.000009874	0	0.000078156	0	0.000151035
25	FMO	0	0.000000278	0	0.000000000	0	0.000000105	0	0.000000512	0	0.000000773
26	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000031
27	FMO	0	0.000573626	0	0.000355581	0	0.000396976	0	0.000762866	0	0.001042753
28	FMO	0	0.000004530	0	0.000001275	0	0.000004275	0	0.000005935	0	0.000009086
29	FMO	0	0.000028203	0	0.000001786	0	0.000005835	0	0.000044674	0	0.000101741
30	FMO	0	0.000000103	0	0.000000043	0	0.000000052	0	0.000000166	0	0.000000216
31	FMO	0	0.000000266	0	0.000000057	0	0.000000052	0	0.000000415	0	0.000000896
32	FMO	0	0.000000382	0	0.000000000	0	0.000000105	0	0.000000401	0	0.000001823
33	FMO	0	0.000001388	0	0.000000000	0	0.000000026	0	0.000002241	0	0.000005718
34	FMO	0	0.001563286	0	0.000175820	0	0.000317542	0	0.002097200	0	0.006332486
35	FMO	0	0.000486980	0	0.000060685	0	0.000142557	0	0.000789319	0	0.001553035
36	FMO	0	0.000112960	0	0.000011635	0	0.000027615	0	0.000191080	0	0.000360575
37	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.000000000	0	0.000000052	0	0.000000401	0	0.000001236
39	FMO	0	0.000000076	0	0.000000000	0	0.000000000	0	0.000000125	0	0.000000309
40	FMO	0	0.000009624	0	0.000000142	0	0.000000328	0	0.000011303	0	0.000048460
41	FMO	0	0.000002919	0	0.000000128	0	0.000000577	0	0.000002739	0	0.000014927
42	FMO	0	0.000038917	0	0.000003302	0	0.000010883	0	0.000067724	0	0.000118306
43	FMO	0	0.000000441	0	0.000000085	0	0.000000144	0	0.000001051	0	0.000000556
44	FMO	0	0.000176044	0	0.000027083	0	0.000135333	0	0.000332504	0	0.000247337
45	FMO	0	0.000000008	0	0.000000000	0	0.000000000	0	0.000000028	0	0.000000000
46	FMO	0	0.000000223	0	0.000000085	0	0.000000118	0	0.000000401	0	0.000000371
47	FMO	0	0.000001539	0	0.000000496	0	0.000000970	0	0.000002864	0	0.000002194
48	FMO	0	0.000008972	0	0.000007979	0	0.000002819	0	0.000011248	0	0.000020552
49	FMO	0	0.000000239	0	0.000000071	0	0.000000144	0	0.000000526	0	0.000000185

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S20: Summary statistics of number of active users' reshares of network original posts on Facebook by gender of active users

Network ID	Network type	Overall		Female		Male	
		Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.0000489395	0	0.000048467
2	CIB	0	0.000033230	0	0.0000295574	0	0.000040550
3	CIB	0	0.000259874	0	0.0002268077	0	0.000317135
4	CIB	0	0.000001245	0	0.0000005873	0	0.000002115
5	CIB	0	0.000007934	0	0.0000070639	0	0.000009552
6	CIB	0	0.000000048	0	0.0000000079	0	0.000000090
7	CIB	0	0.000005396	0	0.0000043892	0	0.000006986
8	CIB	0	0.000000223	0	0.0000001587	0	0.000000316
9	CIB	0	0.019398905	0	0.0129727338	0	0.028802300
10	CIB	0	0.000000000	0	0.0000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.0000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.0000000079	0	0.000000000
13	CIB	0	0.000000004	0	0.0000000000	0	0.000000009
14	FMO	0	0.000000020	0	0.0000000159	0	0.000000027
15	FMO	0	0.000679237	0	0.0007198224	0	0.000698038
16	FMO	0	0.000000004	0	0.0000000000	0	0.000000009
17	FMO	0	0.000011950	0	0.0000141755	0	0.000010510
18	FMO	0	0.000000000	0	0.0000000000	0	0.000000009
19	FMO	0	0.000027607	0	0.0000428836	0	0.000013583
20	FMO	0	0.000006820	0	0.0000066036	0	0.000007691
21	FMO	0	0.000000000	0	0.0000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.0000001826	0	0.000000280
23	FMO	0	0.000049980	0	0.0000295257	0	0.000078923
24	FMO	0	0.000045649	0	0.0000454236	0	0.000051224
25	FMO	0	0.000000278	0	0.0000001032	0	0.000000506
26	FMO	0	0.000000004	0	0.0000000079	0	0.000000000
27	FMO	0	0.000573626	0	0.0009842783	0	0.000175244
28	FMO	0	0.000004530	0	0.0000028891	0	0.000006859
29	FMO	0	0.000028203	0	0.0000257080	0	0.000034243
30	FMO	0	0.000000103	0	0.0000001508	0	0.000000063
31	FMO	0	0.000000266	0	0.0000002540	0	0.000000316
32	FMO	0	0.000000382	0	0.0000001508	0	0.000000687
33	FMO	0	0.000001388	0	0.0000014128	0	0.000001518
34	FMO	0	0.001563286	0	0.0020765806	0	0.001148878
35	FMO	0	0.000486980	0	0.0004080109	0	0.000636861
36	FMO	0	0.000112960	0	0.0000741318	0	0.000171133
37	FMO	0	0.000000000	0	0.0000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.0000002619	0	0.000000361
39	FMO	0	0.000000076	0	0.0000000635	0	0.000000099
40	FMO	0	0.000009624	0	0.0000097229	0	0.000010682
41	FMO	0	0.000002919	0	0.0000042939	0	0.000001663
42	FMO	0	0.000038917	0	0.0000376374	0	0.000045052
43	FMO	0	0.000000441	0	0.0000003413	0	0.000000615
44	FMO	0	0.000176044	0	0.0002933767	0	0.000062982
45	FMO	0	0.000000008	0	0.0000000079	0	0.000000009
46	FMO	0	0.000000223	0	0.0000004048	0	0.000000045
47	FMO	0	0.000001539	0	0.0000019604	0	0.000001265
48	FMO	0	0.000008972	0	0.0000103182	0	0.000008405
49	FMO	0	0.000000239	0	0.0000003413	0	0.000000136

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S21: Summary statistics of number of active users' reshares of network original posts on Facebook by location of active users in a census geographic division

Network ID	Network type	Overall		East North Central		East South Central		Middle Atlantic		Mountain		New England		Pacific		South Atlantic		West North Central		West South Central	
		Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.00004467	0	0.00004931	0	0.00003852	0	0.00005624	0	0.0000361	0	0.00003510	0	0.00005754	0	0.00004459	0	0.00004413
2	CIB	0	0.000033230	0	0.00003820	0	0.00006265	0	0.00003152	0	0.00002572	0	0.0000233	0	0.00001576	0	0.00004331	0	0.00003198	0	0.00003088
3	CIB	0	0.000259874	0	0.00014133	0	0.00014716	0	0.00031862	0	0.00021349	0	0.0001312	0	0.00063010	0	0.00017149	0	0.00018934	0	0.00020411
4	CIB	0	0.000001245	0	0.00000065	0	0.00000035	0	0.00000534	0	0.00000099	0	0.0000008	0	0.00000087	0	0.00000072	0	0.00000041	0	0.00000037
5	CIB	0	0.000007934	0	0.00000774	0	0.00000444	0	0.00000686	0	0.00001005	0	0.0000060	0	0.00001554	0	0.00000610	0	0.00000532	0	0.00000485
6	CIB	0	0.000000048	0	0.00000012	0	0.00000014	0	0.00000000	0	0.00000006	0	0.0000001	0	0.00000000	0	0.00000004	0	0.00000000	0	0.00000007
7	CIB	0	0.000005396	0	0.00000341	0	0.00000317	0	0.00000465	0	0.00000684	0	0.0000061	0	0.00000896	0	0.00000452	0	0.00000416	0	0.00000489
8	CIB	0	0.000000223	0	0.00000034	0	0.00000021	0	0.00000031	0	0.00000035	0	0.0000001	0	0.00000033	0	0.00000015	0	0.00000007	0	0.00000010
9	CIB	0	0.019398905	0	0.02258293	0	0.02463239	0	0.01485587	0	0.02659793	0	0.0142646	0	0.01444485	0	0.02018071	0	0.02504831	0	0.02006997
10	CIB	0	0.000000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.0000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000
11	CIB	0	0.000000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.0000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000
12	CIB	0	0.000000004	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.0000000	0	0.00000000	0	0.00000002	0	0.00000000	0	0.00000000
13	CIB	0	0.000000004	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.0000000	0	0.00000000	0	0.00000002	0	0.00000000	0	0.00000000
14	FMO	0	0.000000020	0	0.00000003	0	0.00000000	0	0.00000000	0	0.00000000	0	0.0000000	0	0.00000003	0	0.00000006	0	0.00000000	0	0.00000000
15	FMO	0	0.000679237	0	0.00076590	0	0.00094694	0	0.00066870	0	0.00079724	0	0.0005056	0	0.00042368	0	0.00080197	0	0.00067781	0	0.00065572
16	FMO	0	0.000000004	0	0.00000000	0	0.00000000	0	0.00000003	0	0.00000000	0	0.0000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000
17	FMO	0	0.000011950	0	0.00001139	0	0.00000917	0	0.00001626	0	0.00001368	0	0.0000068	0	0.00001698	0	0.00001075	0	0.00000941	0	0.00000964
18	FMO	0	0.000009004	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.0000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000003
19	FMO	0	0.000027607	0	0.00002808	0	0.00003210	0	0.00003597	0	0.00003414	0	0.0000337	0	0.00002456	0	0.00003048	0	0.00002918	0	0.00001955
20	FMO	0	0.000006820	0	0.00000823	0	0.00000748	0	0.00000762	0	0.00000742	0	0.0000071	0	0.00000530	0	0.00000750	0	0.00000791	0	0.00000600
21	FMO	0	0.000000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.0000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000
22	FMO	0	0.000000215	0	0.00000015	0	0.00000064	0	0.00000007	0	0.00000018	0	0.0000000	0	0.00000003	0	0.00000028	0	0.00000027	0	0.00000037
23	FMO	0	0.000049980	0	0.00006274	0	0.00004760	0	0.00005224	0	0.00006033	0	0.0000366	0	0.00003882	0	0.00004800	0	0.00006737	0	0.00004730
24	FMO	0	0.000045649	0	0.00005326	0	0.00005446	0	0.00004523	0	0.00004940	0	0.0000420	0	0.00003181	0	0.00004719	0	0.00007776	0	0.00003883
25	FMO	0	0.000000278	0	0.00000022	0	0.00000014	0	0.00000017	0	0.00000035	0	0.0000005	0	0.00000030	0	0.00000021	0	0.00000096	0	0.00000027
26	FMO	0	0.000000004	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.0000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000003
27	FMO	0	0.000573626	0	0.00054046	0	0.00116845	0	0.00039343	0	0.00040702	0	0.0003650	0	0.00028385	0	0.00088916	0	0.00046452	0	0.00076254
28	FMO	0	0.000004530	0	0.00000707	0	0.00000844	0	0.00000333	0	0.00000427	0	0.0000021	0	0.00000117	0	0.00000539	0	0.00000466	0	0.00000608
29	FMO	0	0.000028203	0	0.00004118	0	0.00002807	0	0.00002525	0	0.00003064	0	0.0000248	0	0.00002241	0	0.00002866	0	0.00002684	0	0.00002478
30	FMO	0	0.000000103	0	0.00000012	0	0.00000028	0	0.00000017	0	0.00000000	0	0.0000000	0	0.00000008	0	0.00000013	0	0.00000014	0	0.00000003
31	FMO	0	0.000000266	0	0.00000022	0	0.00000000	0	0.00000017	0	0.00000053	0	0.0000000	0	0.00000038	0	0.00000023	0	0.00000007	0	0.00000054
32	FMO	0	0.000000382	0	0.00000031	0	0.00000043	0	0.00000031	0	0.00000088	0	0.0000004	0	0.00000044	0	0.00000023	0	0.00000110	0	0.00000017
33	FMO	0	0.000001388	0	0.00000143	0	0.00000249	0	0.00000111	0	0.00000129	0	0.0000005	0	0.00000101	0	0.00000136	0	0.00000206	0	0.00000199
34	FMO	0	0.001563286	0	0.00198617	0	0.00326724	0	0.00115138	0	0.00147448	0	0.0008181	0	0.00065722	0	0.00177846	0	0.00231630	0	0.00203532
35	FMO	0	0.000486980	0	0.00054532	0	0.00079105	0	0.00039023	0	0.00050161	0	0.0002916	0	0.00026218	0	0.00062826	0	0.00053454	0	0.00059018
36	FMO	0	0.000112960	0	0.00011934	0	0.00015658	0	0.00009462	0	0.00013788	0	0.0000801	0	0.00006337	0	0.00013896	0	0.00014039	0	0.00013283
37	FMO	0	0.000000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.0000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000
38	FMO	0	0.000000290	0	0.00000037	0	0.00000043	0	0.00000031	0	0.00000018	0	0.0000002	0	0.00000011	0	0.00000038	0	0.00000034	0	0.00000034
39	FMO	0	0.000000076	0	0.00000006	0	0.00000021	0	0.00000000	0	0.00000018	0	0.0000000	0	0.00000014	0	0.00000002	0	0.00000000	0	0.00000014
40	FMO	0	0.000009624	0	0.00000792	0	0.00001669	0	0.00000698	0	0.00001291	0	0.0000085	0	0.00000493	0	0.00000877	0	0.00001227	0	0.00001104
41	FMO	0	0.000002919	0	0.00000214	0	0.00000668	0	0.00000195	0	0.00000467	0	0.0000016	0	0.00000207	0	0.00000356	0	0.00000240	0	0.00000334
42	FMO	0	0.000038917	0	0.00004554	0	0.00004176	0	0.00004891	0	0.00004049	0	0.0000263	0	0.00002158	0	0.00003845	0	0.00008144	0	0.00003119
43	FMO	0	0.000000441	0	0.00000050	0	0.00000085	0	0.00000066	0	0.00000029	0	0.0000003	0	0.00000057	0	0.00000051	0	0.00000014	0	0.00000017
44	FMO	0	0.000176044	0	0.00026962	0	0.00031473	0	0.00014607	0	0.00017471	0	0.0001707	0	0.00009491	0	0.00019585	0	0.00023363	0	0.00015198
45	FMO	0	0.000000008	0	0.00000000	0	0.00000007	0	0.00000000	0	0.00000000	0	0.0000000	0	0.00000000	0	0.00000000	0	0.00000000	0	0.00000000
46	FMO	0	0.000000223	0	0.00000068	0	0.00000021	0	0.00000003	0	0.00000012	0	0.0000001	0	0.00000033	0	0.00000028	0	0.00000000	0	0.00000003
47	FMO	0	0.000001539	0	0.00000134	0	0.00000220	0	0.00000073	0	0.00000105	0	0.0000012	0	0.00000153	0	0.00000188	0	0.00000144	0	0.00000196
48	FMO	0	0.000008972	0	0.00001212	0	0.00000980	0	0.00001164	0	0.00001028	0	0.0000091	0	0.00000591	0	0.00000853	0	0.00001083	0	0.00000773
49	FMO	0	0.000000239	0	0.00000003	0	0.00000007	0	0.00000007	0	0.00000129	0	0.0000001	0	0.00000016	0	0.00000008	0	0.00000028	0	0.00000064

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Figure S30: Average number of active users' reshares of network original posts on Facebook by location of active users in a Congressional district

Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 1 (CIB)
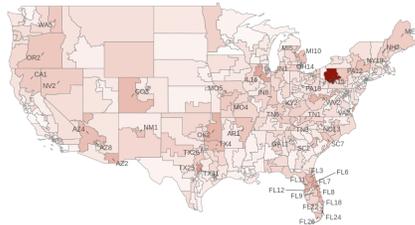
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 2 (CIB)
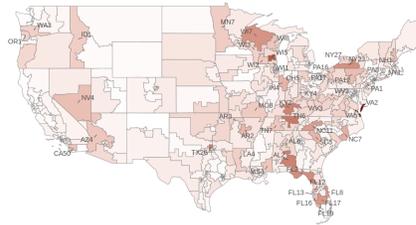
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 3 (CIB)

Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 4 (CIB)

Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 5 (CIB)

Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 6 (CIB)

Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 7 (CIB)

Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 8 (CIB)

Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 9 (CIB)

Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 12 (CIB)

Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 13 (CIB)

Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 14 (FMO)
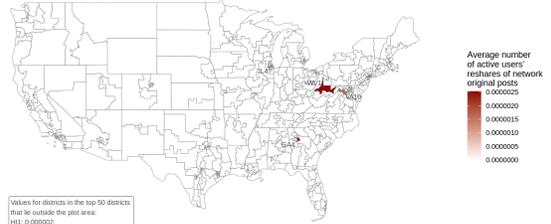
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 15 (FMO)
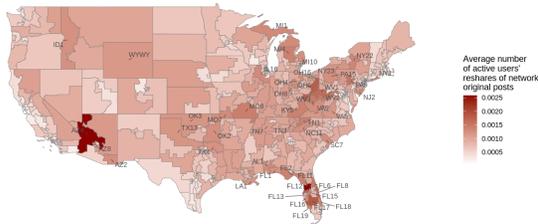
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 16 (FMO)
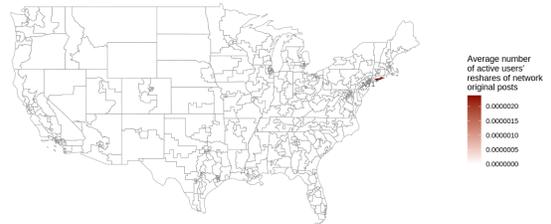
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 17 (FMO)
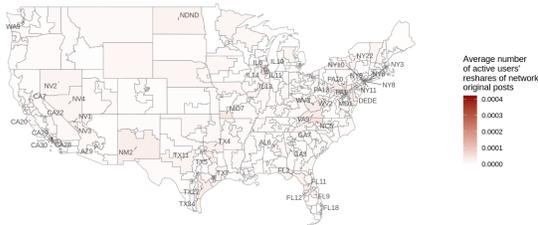
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 18 (FMO)

Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 19 (FMO)
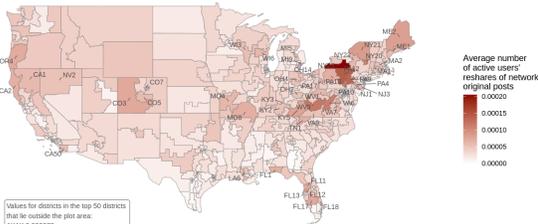
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 20 (FMO)
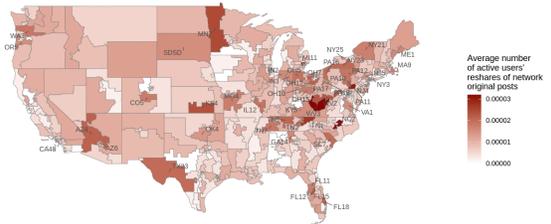
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 22 (FMO)
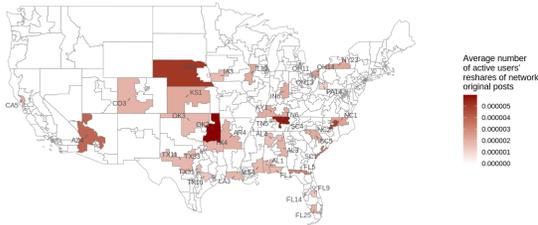
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 23 (FMO)
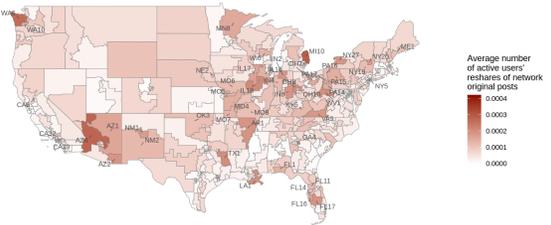
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 24 (FMO)
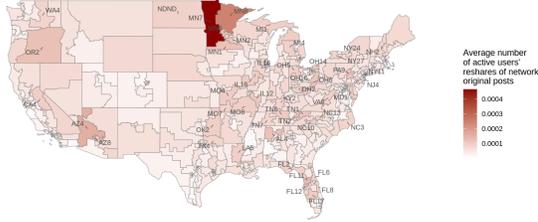
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 25 (FMO)
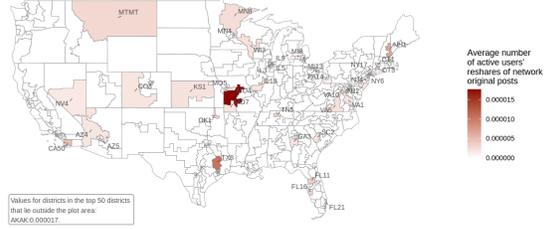
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 26 (FMO)
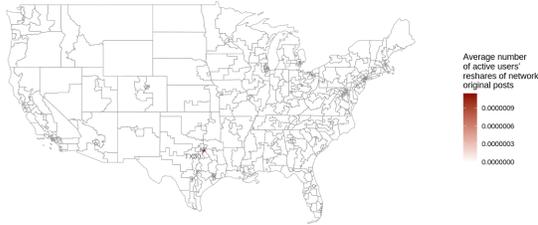
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 27 (FMO)
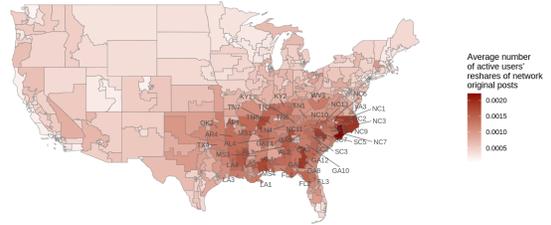
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 28 (FMO)
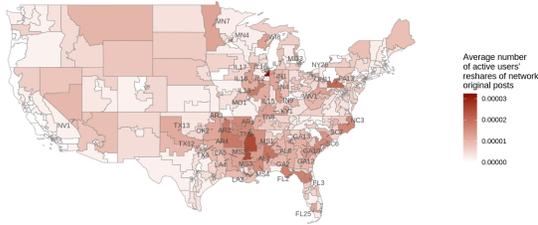
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 29 (FMO)
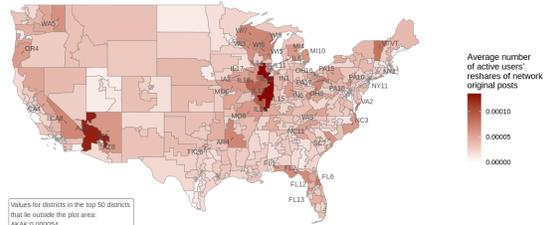
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 30 (FMO)
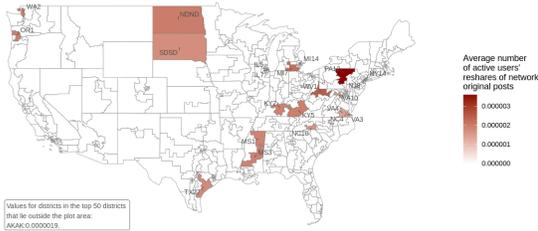
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 31 (FMO)
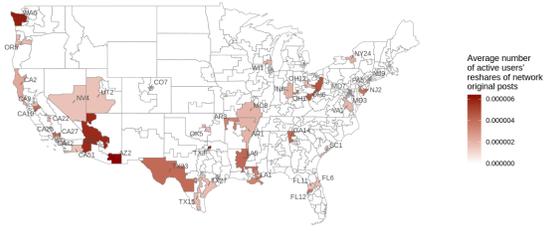
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 32 (FMO)
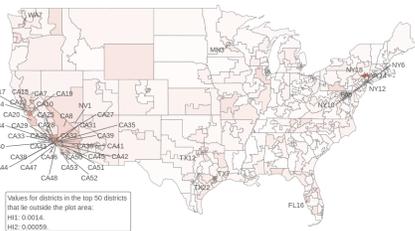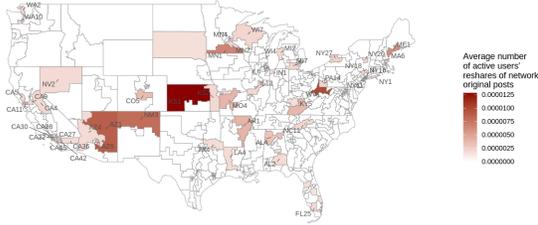
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 33 (FMO)
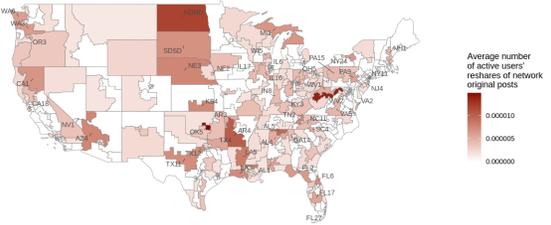
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 34 (FMO)
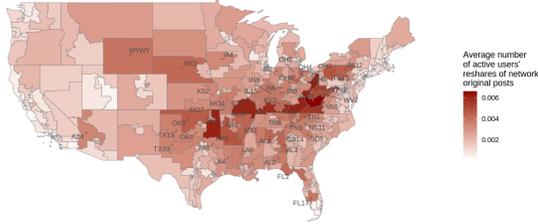
Average number of active users' reshares of network original posts by location of active users in a
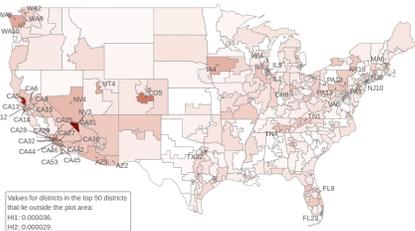Congressional district for network 35 (FMO)
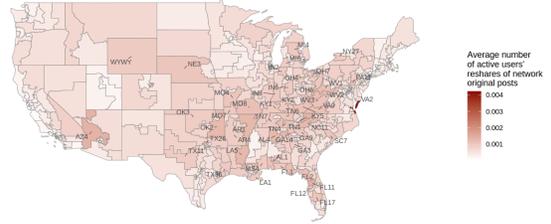
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 36 (FMO)
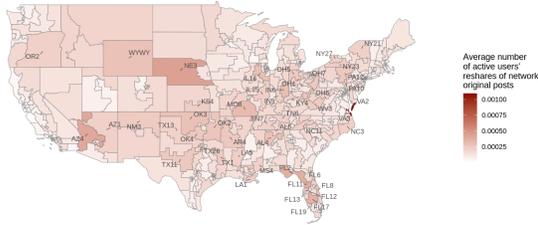
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 38 (FMO)
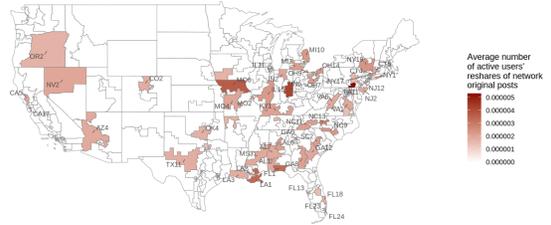
Average number of active users' reshares of network original posts by location of active users in a
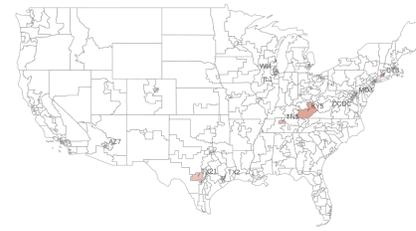Congressional district for network 39 (FMO)
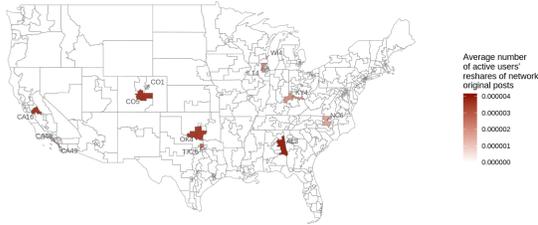
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 40 (FMO)
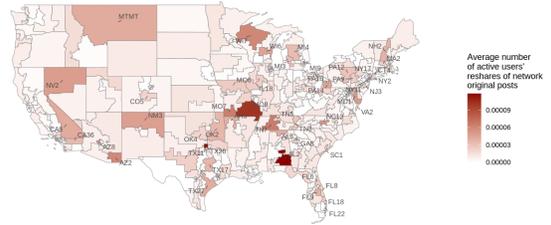
Average number of active users' reshares of network original posts by location of active users in a
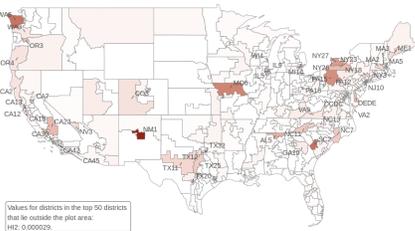Congressional district for network 41 (FMO)
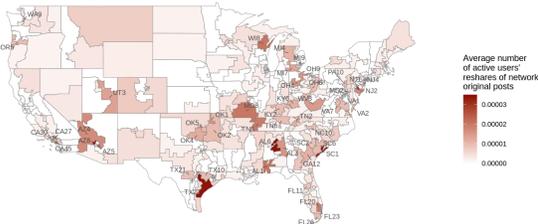
Average number of active users' reshares of network original posts by location of active users in a
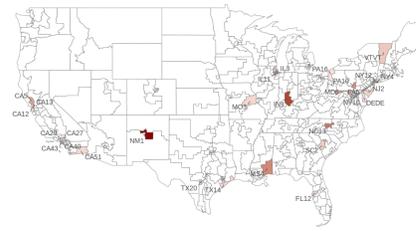Congressional district for network 42 (FMO)
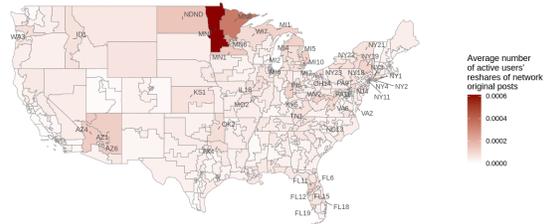
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 43 (FMO)
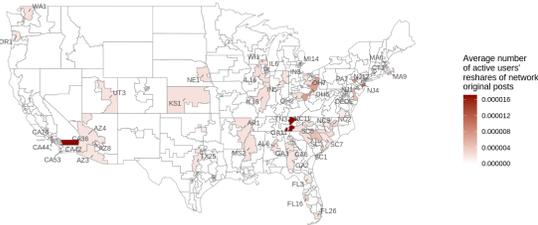
Average number of active users' reshares of network original posts by location of active users in a
Congressional district for network 44 (FMO)
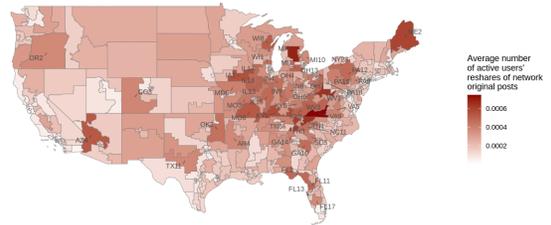
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 45 (FMO)

Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 46 (FMO)
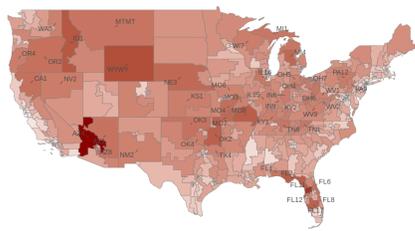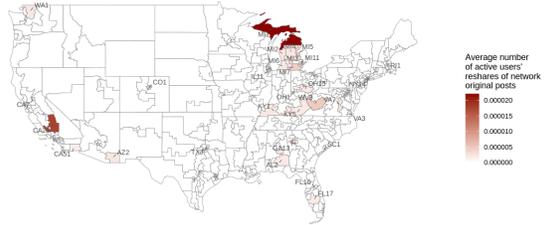
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 47 (FMO)
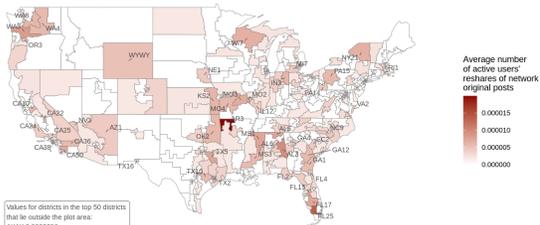
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 48 (FMO)
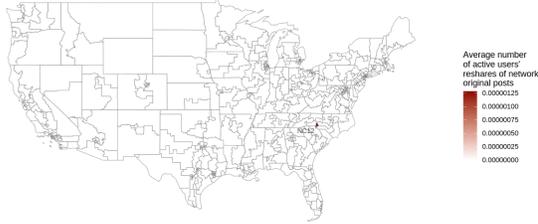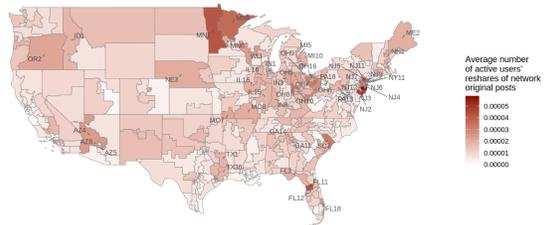
Average number of active users' reshares of network original posts by location of active users in a Congressional district for network 49 (FMO)
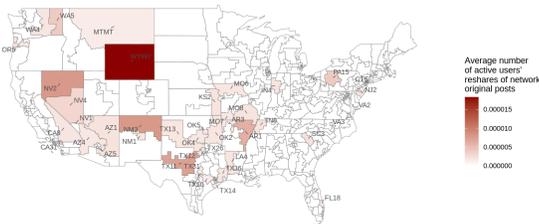
Note: No data shown because all values are 0 for networks: 10, 11, 21, 37. Up to top 50 Congressional districts are labeled. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S22: Summary statistics of number of active users' reshares of network original posts on Facebook by location of active users in a battleground state

Network ID	Network type	Overall		False		True	
		Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.0000413748	0	0.000052144
2	CIB	0	0.000033230	0	0.0000306888	0	0.000037487
3	CIB	0	0.000259874	0	0.0003160608	0	0.000185585
4	CIB	0	0.000001245	0	0.0000017005	0	0.000000574
5	CIB	0	0.000007934	0	0.0000090647	0	0.000006159
6	CIB	0	0.000000048	0	0.0000000432	0	0.000000065
7	CIB	0	0.000005396	0	0.0000061680	0	0.000003929
8	CIB	0	0.000000223	0	0.0000003170	0	0.000000097
9	CIB	0	0.019398905	0	0.0185314614	0	0.021487774
10	CIB	0	0.000000000	0	0.0000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.0000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.0000000000	0	0.000000011
13	CIB	0	0.000000004	0	0.0000000000	0	0.000000011
14	FMO	0	0.000000020	0	0.0000000288	0	0.000000011
15	FMO	0	0.000679237	0	0.0006384913	0	0.000763880
16	FMO	0	0.000000004	0	0.0000000072	0	0.000000000
17	FMO	0	0.000011950	0	0.0000141447	0	0.000009374
18	FMO	0	0.000000000	0	0.0000000000	0	0.000000011
19	FMO	0	0.000027607	0	0.0000285708	0	0.000029445
20	FMO	0	0.000006820	0	0.0000067518	0	0.000007556
21	FMO	0	0.000000000	0	0.0000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.0000001947	0	0.000000227
23	FMO	0	0.000049980	0	0.0000476350	0	0.000055171
24	FMO	0	0.000045649	0	0.0000421497	0	0.000053233
25	FMO	0	0.000000278	0	0.0000003248	0	0.000000249
26	FMO	0	0.000000004	0	0.0000000000	0	0.000000011
27	FMO	0	0.000573626	0	0.0005495503	0	0.000667697
28	FMO	0	0.000004530	0	0.0000044739	0	0.000005025
29	FMO	0	0.000028203	0	0.0000278628	0	0.000028981
30	FMO	0	0.000000103	0	0.0000001301	0	0.000000076
31	FMO	0	0.000000266	0	0.0000002602	0	0.000000292
32	FMO	0	0.000000382	0	0.0000004192	0	0.000000368
33	FMO	0	0.000001388	0	0.0000015551	0	0.000001245
34	FMO	0	0.001563286	0	0.0015788580	0	0.001739502
35	FMO	0	0.000486980	0	0.0004696105	0	0.000553919
36	FMO	0	0.000112960	0	0.0001102745	0	0.000125373
37	FMO	0	0.000000000	0	0.0000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.0000002821	0	0.000000325
39	FMO	0	0.000000076	0	0.0000001013	0	0.000000043
40	FMO	0	0.000009624	0	0.0000084933	0	0.000010025
41	FMO	0	0.000002919	0	0.0000029227	0	0.000003129
42	FMO	0	0.000038917	0	0.0000356589	0	0.000045643
43	FMO	0	0.000000441	0	0.0000005209	0	0.000000379
44	FMO	0	0.000176044	0	0.0001736934	0	0.000202397
45	FMO	0	0.000000008	0	0.0000000072	0	0.000000000
46	FMO	0	0.000000223	0	0.0000001736	0	0.000000336
47	FMO	0	0.000001539	0	0.0000014541	0	0.000001602
48	FMO	0	0.000008972	0	0.0000088480	0	0.000009928
49	FMO	0	0.000000239	0	0.0000003204	0	0.000000174

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S23: Summary statistics of number of active users' reshares of network original posts on Facebook by location of active users in a swing district

Network ID	Network type	Overall		False		True	
		Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.000045099	0	0.000049652
2	CIB	0	0.000033230	0	0.000032387	0	0.000040338
3	CIB	0	0.000259874	0	0.000270051	0	0.000222111
4	CIB	0	0.000001245	0	0.000001379	0	0.000000373
5	CIB	0	0.000007934	0	0.000008099	0	0.000006571
6	CIB	0	0.000000048	0	0.000000055	0	0.000000034
7	CIB	0	0.000005396	0	0.000005520	0	0.000003590
8	CIB	0	0.000000223	0	0.000000253	0	0.000000068
9	CIB	0	0.019398905	0	0.019326476	0	0.022354832
10	CIB	0	0.000000000	0	0.000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.000000005	0	0.000000000
13	CIB	0	0.000000004	0	0.000000005	0	0.000000000
14	FMO	0	0.000000020	0	0.000000025	0	0.000000000
15	FMO	0	0.000679237	0	0.000680838	0	0.000741794
16	FMO	0	0.000000004	0	0.000000005	0	0.000000000
17	FMO	0	0.000011950	0	0.000012489	0	0.000010533
18	FMO	0	0.000000004	0	0.000000005	0	0.000000000
19	FMO	0	0.000027607	0	0.000028741	0	0.000030146
20	FMO	0	0.000006820	0	0.000006862	0	0.000008517
21	FMO	0	0.000000000	0	0.000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.000000204	0	0.000000237
23	FMO	0	0.000049980	0	0.000050271	0	0.000053240
24	FMO	0	0.000045649	0	0.000045563	0	0.000053545
25	FMO	0	0.000000278	0	0.000000243	0	0.000000643
26	FMO	0	0.000000004	0	0.000000005	0	0.000000000
27	FMO	0	0.000573626	0	0.000603482	0	0.000551799
28	FMO	0	0.000004530	0	0.000004788	0	0.000004058
29	FMO	0	0.000028203	0	0.000027487	0	0.000033917
30	FMO	0	0.000000103	0	0.000000119	0	0.000000034
31	FMO	0	0.000000266	0	0.000000239	0	0.000000507
32	FMO	0	0.000000382	0	0.000000388	0	0.000000473
33	FMO	0	0.000001388	0	0.000001402	0	0.000001626
34	FMO	0	0.001563286	0	0.001652103	0	0.001582014
35	FMO	0	0.000486980	0	0.000489725	0	0.000596322
36	FMO	0	0.000112960	0	0.000112567	0	0.000141931
37	FMO	0	0.000000000	0	0.000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.000000313	0	0.000000203
39	FMO	0	0.000000076	0	0.000000080	0	0.000000068
40	FMO	0	0.000009624	0	0.000009195	0	0.000008511
41	FMO	0	0.000002919	0	0.000002961	0	0.000003310
42	FMO	0	0.000038917	0	0.000037283	0	0.000055796
43	FMO	0	0.000000441	0	0.000000498	0	0.000000236
44	FMO	0	0.000176044	0	0.000184130	0	0.000192449
45	FMO	0	0.000000008	0	0.000000005	0	0.000000000
46	FMO	0	0.000000223	0	0.000000239	0	0.000000236
47	FMO	0	0.000001539	0	0.000001483	0	0.000001723
48	FMO	0	0.000008972	0	0.000009046	0	0.000010875
49	FMO	0	0.000000239	0	0.000000266	0	0.000000234

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S24: Summary statistics of number of active users' reshares of network original posts on Facebook by tercile of population density of the Congressional district in which active users are located

Network ID	Network type	Overall		Lowest tercile		Middle tercile		Highest tercile	
		Median	Mean	Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.000052369	0	0.000049667	0	0.000036056
2	CIB	0	0.000033230	0	0.000046085	0	0.000039186	0	0.000016714
3	CIB	0	0.000259874	0	0.000178100	0	0.000229086	0	0.000373572
4	CIB	0	0.000001245	0	0.000000710	0	0.000000658	0	0.000002286
5	CIB	0	0.000007934	0	0.000006201	0	0.000007058	0	0.000010185
6	CIB	0	0.000000048	0	0.000000027	0	0.000000013	0	0.000000110
7	CIB	0	0.000005396	0	0.000005723	0	0.000004306	0	0.000005783
8	CIB	0	0.000000223	0	0.000000164	0	0.000000237	0	0.000000281
9	CIB	0	0.019398905	0	0.027734948	0	0.021829960	0	0.010534179
10	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
13	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
14	FMO	0	0.000000020	0	0.000000014	0	0.000000013	0	0.000000037
15	FMO	0	0.000679237	0	0.000913294	0	0.000783484	0	0.000398832
16	FMO	0	0.000000004	0	0.000000000	0	0.000000013	0	0.000000000
17	FMO	0	0.000011950	0	0.000010135	0	0.000010350	0	0.000015895
18	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
19	FMO	0	0.000027607	0	0.000037201	0	0.000032894	0	0.000017751
20	FMO	0	0.000006820	0	0.000008686	0	0.000008523	0	0.000004285
21	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.000000383	0	0.000000223	0	0.000000037
23	FMO	0	0.000049980	0	0.000069354	0	0.000054955	0	0.000029880
24	FMO	0	0.000045649	0	0.000061920	0	0.000051837	0	0.000027904
25	FMO	0	0.000000278	0	0.000000396	0	0.000000368	0	0.000000135
26	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
27	FMO	0	0.000573626	0	0.000783917	0	0.000675439	0	0.000355579
28	FMO	0	0.000004530	0	0.000006317	0	0.000004486	0	0.000003431
29	FMO	0	0.000028203	0	0.000037629	0	0.000030427	0	0.000018004
30	FMO	0	0.000000103	0	0.000000150	0	0.000000079	0	0.000000098
31	FMO	0	0.000000266	0	0.000000328	0	0.000000381	0	0.000000123
32	FMO	0	0.000000382	0	0.000000574	0	0.000000355	0	0.000000283
33	FMO	0	0.000001388	0	0.000002191	0	0.000001461	0	0.000000713
34	FMO	0	0.001563286	0	0.002666601	0	0.001701604	0	0.000664134
35	FMO	0	0.000486980	0	0.000701661	0	0.000590506	0	0.000244261
36	FMO	0	0.000112960	0	0.000162686	0	0.000135377	0	0.000056886
37	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.000000315	0	0.000000355	0	0.000000234
39	FMO	0	0.000000076	0	0.000000082	0	0.000000092	0	0.000000062
40	FMO	0	0.000009624	0	0.000013659	0	0.000009780	0	0.000004407
41	FMO	0	0.000002919	0	0.000003600	0	0.000003391	0	0.000002105
42	FMO	0	0.000038917	0	0.000051858	0	0.000043300	0	0.000025370
43	FMO	0	0.000000441	0	0.000000397	0	0.000000565	0	0.000000431
44	FMO	0	0.000176044	0	0.000278602	0	0.000202831	0	0.000084887
45	FMO	0	0.000000008	0	0.000000000	0	0.000000000	0	0.000000012
46	FMO	0	0.000000223	0	0.000000397	0	0.000000210	0	0.000000123
47	FMO	0	0.000001539	0	0.000001779	0	0.000001932	0	0.000000886
48	FMO	0	0.000008972	0	0.000011059	0	0.000010464	0	0.000006574
49	FMO	0	0.000000239	0	0.000000602	0	0.000000158	0	0.000000050

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S25: Summary statistics of number of active users' reshares of network original posts on Facebook by location of active users in a majority non-Hispanic/non-Latino White Congressional district

Network ID	Network type	Overall		False		True	
		Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318		0.000034818		0.0000513107
2	CIB	0	0.000033230		0.000016225		0.0000422701
3	CIB	0	0.000259874		0.000397980		0.0001951196
4	CIB	0	0.000001245		0.000002343		0.0000006889
5	CIB	0	0.000007934		0.000010774		0.0000064097
6	CIB	0	0.000000048		0.000000089		0.0000000328
7	CIB	0	0.000005396		0.000006508		0.0000046449
8	CIB	0	0.000000223		0.000000306		0.0000001903
9	CIB	0	0.019398905		0.011368652		0.0240095697
10	CIB	0	0.000000000		0.000000000		0.0000000000
11	CIB	0	0.000000000		0.000000000		0.0000000000
12	CIB	0	0.000000004		0.000000013		0.0000000000
13	CIB	0	0.000000004		0.000000013		0.0000000000
14	FMO	0	0.000000020		0.000000038		0.0000000131
15	FMO	0	0.000679237		0.000398668		0.0008376738
16	FMO	0	0.000000004		0.000000000		0.0000000066
17	FMO	0	0.000011950		0.000011971		0.0000123865
18	FMO	0	0.000000004		0.000000013		0.0000000000
19	FMO	0	0.000027607		0.000015281		0.0000359215
20	FMO	0	0.000006820		0.000004139		0.0000085884
21	FMO	0	0.000000000		0.000000000		0.0000000000
22	FMO	0	0.000000215		0.000000127		0.0000002496
23	FMO	0	0.000049980		0.000029688		0.0000614662
24	FMO	0	0.000045649		0.000025709		0.0000573291
25	FMO	0	0.000000278		0.000000038		0.0000004268
26	FMO	0	0.000000004		0.000000013		0.0000000000
27	FMO	0	0.000573626		0.000439480		0.0006780824
28	FMO	0	0.000004530		0.000004406		0.0000048437
29	FMO	0	0.000028203		0.000017801		0.0000337480
30	FMO	0	0.000000103		0.000000102		0.0000001117
31	FMO	0	0.000000266		0.000000268		0.0000002760
32	FMO	0	0.000000382		0.000000332		0.0000004338
33	FMO	0	0.000001388		0.000000664		0.0000018217
34	FMO	0	0.001563286		0.000826740		0.0020606902
35	FMO	0	0.000486980		0.000267668		0.0006249335
36	FMO	0	0.000112960		0.000061248		0.0001446818
37	FMO	0	0.000000000		0.000000000		0.0000000000
38	FMO	0	0.000000290		0.000000205		0.0000003483
39	FMO	0	0.000000076		0.000000038		0.0000000986
40	FMO	0	0.000009624		0.000004577		0.0000114487
41	FMO	0	0.000002919		0.000002148		0.0000034438
42	FMO	0	0.000038917		0.000020750		0.0000494290
43	FMO	0	0.000000441		0.000000358		0.0000005192
44	FMO	0	0.000176044		0.000088867		0.0002348291
45	FMO	0	0.000000008		0.000000000		0.0000000066
46	FMO	0	0.000000223		0.000000281		0.0000002169
47	FMO	0	0.000001539		0.000001253		0.0000016496
48	FMO	0	0.000008972		0.000006035		0.0000109492
49	FMO	0	0.000000239		0.000000168		0.0000003091

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S26: Summary statistics of number of active users' reshares of network original posts on Facebook by quartile of active users based on their time spent on the platform during the study period

Network ID	Network type	Overall		Lowest quartile		Second quartile		Third quartile		Highest quartile	
		Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.000007336	0	0.000012044	0	0.000025664	0	0.000140476
2	CIB	0	0.000033230	0	0.000008813	0	0.000013811	0	0.000026809	0	0.000083626
3	CIB	0	0.000259874	0	0.000032996	0	0.000054765	0	0.000136447	0	0.000816767
4	CIB	0	0.000001245	0	0.000000143	0	0.000000175	0	0.000000286	0	0.000004383
5	CIB	0	0.000007934	0	0.000000810	0	0.000001130	0	0.000004182	0	0.000025660
6	CIB	0	0.000000048	0	0.000000000	0	0.000000000	0	0.000000032	0	0.000000159
7	CIB	0	0.000005396	0	0.000001112	0	0.000000589	0	0.000002878	0	0.000017038
8	CIB	0	0.000000223	0	0.000000000	0	0.000000016	0	0.000000095	0	0.000000781
9	CIB	0	0.019398905	0	0.003755808	0	0.005030474	0	0.013812552	0	0.055092310
10	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000016
13	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000016
14	FMO	0	0.000000020	0	0.000000016	0	0.000000000	0	0.000000000	0	0.000000064
15	FMO	0	0.000679237	0	0.000138987	0	0.000183531	0	0.000485889	0	0.001911840
16	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000016
17	FMO	0	0.000011950	0	0.000002985	0	0.000003405	0	0.000007601	0	0.000033868
18	FMO	0	0.000000004	0	0.000000000	0	0.000000016	0	0.000000000	0	0.000000000
19	FMO	0	0.000027607	0	0.000005732	0	0.000007001	0	0.000019749	0	0.000078080
20	FMO	0	0.000006820	0	0.000001937	0	0.000002673	0	0.000005613	0	0.000017085
21	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.000000048	0	0.000000032	0	0.000000032	0	0.000000749
23	FMO	0	0.000049980	0	0.000005621	0	0.000010533	0	0.000030435	0	0.000153609
24	FMO	0	0.000045649	0	0.000003700	0	0.000005060	0	0.000019399	0	0.000154725
25	FMO	0	0.000000278	0	0.000000016	0	0.000000064	0	0.000000127	0	0.000000908
26	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000016	0	0.000000000
27	FMO	0	0.000573626	0	0.000072757	0	0.000099793	0	0.000318769	0	0.001806443
28	FMO	0	0.000004530	0	0.000000873	0	0.000001114	0	0.000003069	0	0.000013085
29	FMO	0	0.000028203	0	0.000003033	0	0.000005171	0	0.000016823	0	0.000087945
30	FMO	0	0.000000103	0	0.000000016	0	0.000000048	0	0.000000080	0	0.000000271
31	FMO	0	0.000000266	0	0.000000079	0	0.000000000	0	0.000000159	0	0.000000829
32	FMO	0	0.000000382	0	0.000000079	0	0.000000016	0	0.000000223	0	0.000001211
33	FMO	0	0.000001388	0	0.000000159	0	0.000000127	0	0.000001002	0	0.000004271
34	FMO	0	0.001563286	0	0.000447369	0	0.000513156	0	0.001197797	0	0.004101605
35	FMO	0	0.000486980	0	0.000076742	0	0.000107668	0	0.000305094	0	0.001461007
36	FMO	0	0.000112960	0	0.000021151	0	0.000028162	0	0.000076675	0	0.000326423
37	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.000000000	0	0.000000095	0	0.000000064	0	0.000001004
39	FMO	0	0.000000076	0	0.000000016	0	0.000000032	0	0.000000048	0	0.000000207
40	FMO	0	0.000009624	0	0.000004859	0	0.000005680	0	0.000006488	0	0.000021500
41	FMO	0	0.000002919	0	0.000000445	0	0.000000446	0	0.000001813	0	0.000008989
42	FMO	0	0.000038917	0	0.000003128	0	0.000005521	0	0.000019320	0	0.000127933
43	FMO	0	0.000000441	0	0.000000064	0	0.000000016	0	0.000000175	0	0.000001514
44	FMO	0	0.000176044	0	0.000031138	0	0.000038170	0	0.000103421	0	0.000532388
45	FMO	0	0.000000008	0	0.000000000	0	0.000000000	0	0.000000016	0	0.000000016
46	FMO	0	0.000000223	0	0.000000000	0	0.000000032	0	0.000000191	0	0.000000669
47	FMO	0	0.000001539	0	0.000000318	0	0.000000621	0	0.000001383	0	0.000003841
48	FMO	0	0.000008972	0	0.000001000	0	0.000001623	0	0.000005359	0	0.000027955
49	FMO	0	0.000000239	0	0.000000032	0	0.000000000	0	0.000000127	0	0.000000797

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S27: Summary statistics of number of active users' reshares of network original posts on Facebook by tercile of active users based on their number of Facebook friends

Network ID	Network type	Overall		Lowest tercile		Middle tercile		Highest tercile	
		Median	Mean	Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.000030466	0	0.000068021	0	0.000046983
2	CIB	0	0.000033230	0	0.000024281	0	0.000050570	0	0.000029036
3	CIB	0	0.000259874	0	0.000196368	0	0.000316132	0	0.000291811
4	CIB	0	0.000001245	0	0.000000444	0	0.000002748	0	0.000000730
5	CIB	0	0.000007934	0	0.000005285	0	0.000010904	0	0.000008392
6	CIB	0	0.000000048	0	0.000000000	0	0.000000076	0	0.000000074
7	CIB	0	0.000005396	0	0.000004638	0	0.000006117	0	0.000006226
8	CIB	0	0.000000223	0	0.000000025	0	0.000000190	0	0.000000470
9	CIB	0	0.019398905	0	0.017872468	0	0.030875019	0	0.012390785
10	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
13	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
14	FMO	0	0.000000020	0	0.000000025	0	0.000000025	0	0.000000012
15	FMO	0	0.000679237	0	0.000621966	0	0.001063239	0	0.000441671
16	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
17	FMO	0	0.000011950	0	0.000009733	0	0.000018984	0	0.000008565
18	FMO	0	0.000000004	0	0.000000000	0	0.000000013	0	0.000000000
19	FMO	0	0.000027607	0	0.000024378	0	0.000041415	0	0.000021635
20	FMO	0	0.000006820	0	0.000006608	0	0.000010116	0	0.000004663
21	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.000000241	0	0.000000304	0	0.000000136
23	FMO	0	0.000049980	0	0.000062584	0	0.000076191	0	0.000020018
24	FMO	0	0.000045649	0	0.000044382	0	0.000070787	0	0.000029496
25	FMO	0	0.000000278	0	0.000000191	0	0.000000468	0	0.000000222
26	FMO	0	0.000000004	0	0.000000013	0	0.000000000	0	0.000000000
27	FMO	0	0.000573626	0	0.000250217	0	0.000878862	0	0.000679578
28	FMO	0	0.000004530	0	0.000001489	0	0.000004757	0	0.000007799
29	FMO	0	0.000028203	0	0.000026401	0	0.000043437	0	0.000019189
30	FMO	0	0.000000103	0	0.000000140	0	0.000000076	0	0.000000111
31	FMO	0	0.000000266	0	0.000000178	0	0.000000380	0	0.000000284
32	FMO	0	0.000000382	0	0.000000229	0	0.000000531	0	0.000000444
33	FMO	0	0.000001388	0	0.000001784	0	0.000002087	0	0.000000542
34	FMO	0	0.001563286	0	0.001764024	0	0.002359503	0	0.000802112
35	FMO	0	0.000486980	0	0.000271380	0	0.000714536	0	0.000550066
36	FMO	0	0.000112960	0	0.000062450	0	0.000161618	0	0.000132003
37	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.000000332	0	0.000000493	0	0.000000099
39	FMO	0	0.000000076	0	0.000000064	0	0.000000089	0	0.000000086
40	FMO	0	0.000009624	0	0.000010330	0	0.000011508	0	0.000008598
41	FMO	0	0.000002919	0	0.000003137	0	0.000004388	0	0.000001725
42	FMO	0	0.000038917	0	0.000033248	0	0.000062372	0	0.000027655
43	FMO	0	0.000000441	0	0.000000293	0	0.000000556	0	0.000000542
44	FMO	0	0.000176044	0	0.000094171	0	0.000280396	0	0.000179972
45	FMO	0	0.000000008	0	0.000000000	0	0.000000025	0	0.000000000
46	FMO	0	0.000000223	0	0.000000204	0	0.000000291	0	0.000000209
47	FMO	0	0.000001539	0	0.000000727	0	0.000002428	0	0.000001700
48	FMO	0	0.000008972	0	0.000006533	0	0.000012551	0	0.000009141
49	FMO	0	0.000000239	0	0.000000077	0	0.000000189	0	0.000000477

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S28: Summary statistics of number of active users' reshares of network original posts on Facebook by tercile of active users based on their tenure on platform (days their account existed)

Network ID	Network type	Overall		Lowest tercile		Middle tercile		Highest tercile	
		Median	Mean	Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.000020997	0	0.000063748	0	0.000061978
2	CIB	0	0.000033230	0	0.000039862	0	0.000038388	0	0.000024292
3	CIB	0	0.000259874	0	0.000277087	0	0.000318316	0	0.000200728
4	CIB	0	0.000001245	0	0.000000434	0	0.000000760	0	0.000002801
5	CIB	0	0.000007934	0	0.000006924	0	0.000008660	0	0.000009022
6	CIB	0	0.000000048	0	0.000000050	0	0.000000000	0	0.000000101
7	CIB	0	0.000005396	0	0.000002526	0	0.000006752	0	0.000007748
8	CIB	0	0.000000223	0	0.000000213	0	0.000000150	0	0.000000330
9	CIB	0	0.019398905	0	0.014311072	0	0.023950863	0	0.022706256
10	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
13	CIB	0	0.000000004	0	0.000000014	0	0.000000000	0	0.000000000
14	FMO	0	0.000000020	0	0.000000024	0	0.000000035	0	0.000000000
15	FMO	0	0.000679237	0	0.000704043	0	0.000775699	0	0.000630106
16	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000013
17	FMO	0	0.000011950	0	0.000012027	0	0.000016077	0	0.000008935
18	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000013
19	FMO	0	0.000027607	0	0.000024760	0	0.000030283	0	0.000032239
20	FMO	0	0.000006820	0	0.000008320	0	0.000007429	0	0.000005577
21	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.000000251	0	0.000000253	0	0.000000175
23	FMO	0	0.000049980	0	0.000027444	0	0.000072870	0	0.000057797
24	FMO	0	0.000045649	0	0.000043056	0	0.000050735	0	0.000050431
25	FMO	0	0.000000278	0	0.000000038	0	0.000000485	0	0.000000358
26	FMO	0	0.000000004	0	0.000000000	0	0.000000013	0	0.000000000
27	FMO	0	0.000573626	0	0.000379643	0	0.000707035	0	0.000724180
28	FMO	0	0.000004530	0	0.000005275	0	0.000006084	0	0.000002852
29	FMO	0	0.000028203	0	0.000024736	0	0.000032176	0	0.000031849
30	FMO	0	0.000000103	0	0.000000227	0	0.000000090	0	0.000000012
31	FMO	0	0.000000266	0	0.000000215	0	0.000000346	0	0.000000282
32	FMO	0	0.000000382	0	0.000000518	0	0.000000308	0	0.000000380
33	FMO	0	0.000001388	0	0.000001417	0	0.000001765	0	0.000001219
34	FMO	0	0.001563286	0	0.002380514	0	0.001641270	0	0.000909814
35	FMO	0	0.000486980	0	0.000500450	0	0.000558651	0	0.000481709
36	FMO	0	0.000112960	0	0.000110345	0	0.000136672	0	0.000110469
37	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.000000330	0	0.000000337	0	0.000000254
39	FMO	0	0.000000076	0	0.000000038	0	0.000000104	0	0.000000097
40	FMO	0	0.000009624	0	0.000008902	0	0.000012401	0	0.000009185
41	FMO	0	0.000002919	0	0.000004438	0	0.000002656	0	0.000002154
42	FMO	0	0.000038917	0	0.000031829	0	0.000044396	0	0.000046559
43	FMO	0	0.000000441	0	0.000000469	0	0.000000350	0	0.000000568
44	FMO	0	0.000176044	0	0.000119898	0	0.000217545	0	0.000216821
45	FMO	0	0.000000008	0	0.000000000	0	0.000000013	0	0.000000012
46	FMO	0	0.000000223	0	0.000000203	0	0.000000260	0	0.000000241
47	FMO	0	0.000001539	0	0.000000889	0	0.000001640	0	0.000002297
48	FMO	0	0.000008972	0	0.000009503	0	0.000010556	0	0.000008284
49	FMO	0	0.000000239	0	0.000000130	0	0.000000177	0	0.000000420

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S29: Summary statistics of number of active users' reshares of network original posts on Facebook by tercile of active users based on their number of posts created during the study period

Network ID	Network type	Overall		Lowest tercile		Middle tercile		Highest tercile	
		Median	Mean	Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.000000000	0	0.000000873	0	0.000134900
2	CIB	0	0.000033230	0	0.000000012	0	0.000001089	0	0.000096320
3	CIB	0	0.000259874	0	0.000000256	0	0.000021320	0	0.000740643
4	CIB	0	0.000001245	0	0.000000000	0	0.000000000	0	0.000003648
5	CIB	0	0.000007934	0	0.000000000	0	0.000000371	0	0.000022891
6	CIB	0	0.000000048	0	0.000000000	0	0.000000000	0	0.000000140
7	CIB	0	0.000005396	0	0.000000000	0	0.000000084	0	0.000015735
8	CIB	0	0.000000223	0	0.000000000	0	0.000000012	0	0.000000641
9	CIB	0	0.019398905	0	0.000002047	0	0.000438469	0	0.056426516
10	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
13	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
14	FMO	0	0.000000020	0	0.000000000	0	0.000000000	0	0.000000058
15	FMO	0	0.000679237	0	0.000000073	0	0.000010648	0	0.001980311
16	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
17	FMO	0	0.000011950	0	0.000000000	0	0.000000921	0	0.000034127
18	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
19	FMO	0	0.000027607	0	0.000000000	0	0.000000933	0	0.000080003
20	FMO	0	0.000006820	0	0.000000012	0	0.000000598	0	0.000019395
21	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.000000000	0	0.000000012	0	0.000000618
23	FMO	0	0.000049980	0	0.000000000	0	0.000000574	0	0.000145926
24	FMO	0	0.000045649	0	0.000000000	0	0.000000311	0	0.000133489
25	FMO	0	0.000000278	0	0.000000000	0	0.000000000	0	0.000000816
26	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
27	FMO	0	0.000573626	0	0.000000049	0	0.000009033	0	0.001672375
28	FMO	0	0.000004530	0	0.000000012	0	0.000000383	0	0.000012891
29	FMO	0	0.000028203	0	0.000000000	0	0.000000227	0	0.000082439
30	FMO	0	0.000000103	0	0.000000000	0	0.000000012	0	0.000000291
31	FMO	0	0.000000266	0	0.000000000	0	0.000000000	0	0.000000781
32	FMO	0	0.000000382	0	0.000000000	0	0.000000012	0	0.000001107
33	FMO	0	0.000001388	0	0.000000000	0	0.000000012	0	0.000004056
34	FMO	0	0.001563286	0	0.000000707	0	0.000084169	0	0.004499113
35	FMO	0	0.000486980	0	0.000000049	0	0.000006844	0	0.001420560
36	FMO	0	0.000112960	0	0.000000012	0	0.000002118	0	0.000328997
37	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.000000000	0	0.000000000	0	0.000000851
39	FMO	0	0.000000076	0	0.000000000	0	0.000000012	0	0.000000210
40	FMO	0	0.000009624	0	0.000000000	0	0.000000120	0	0.000028090
41	FMO	0	0.000002919	0	0.000000000	0	0.000000024	0	0.000008532
42	FMO	0	0.000038917	0	0.000000000	0	0.000000431	0	0.000113640
43	FMO	0	0.000000441	0	0.000000000	0	0.000000024	0	0.000001270
44	FMO	0	0.000176044	0	0.000000012	0	0.000002752	0	0.000513269
45	FMO	0	0.000000008	0	0.000000000	0	0.000000000	0	0.000000023
46	FMO	0	0.000000223	0	0.000000000	0	0.000000000	0	0.000000653
47	FMO	0	0.000001539	0	0.000000000	0	0.000000239	0	0.000004278
48	FMO	0	0.000008972	0	0.000000012	0	0.000000191	0	0.000026096
49	FMO	0	0.000000239	0	0.000000000	0	0.000000000	0	0.000000699

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S30: Summary statistics of number of active users' reshares of network original posts on Facebook by tercile of active users based on their number of Facebook Pages followed

Network ID	Network type	Overall		Lowest tercile		Middle tercile		Highest tercile	
		Median	Mean	Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.000003973	0	0.000014471	0	0.000118365
2	CIB	0	0.000033230	0	0.000005187	0	0.000024024	0	0.000069162
3	CIB	0	0.000259874	0	0.000044435	0	0.000245834	0	0.000479730
4	CIB	0	0.000001245	0	0.000000049	0	0.000000213	0	0.000003411
5	CIB	0	0.000007934	0	0.000001214	0	0.000006278	0	0.000015998
6	CIB	0	0.000000048	0	0.000000000	0	0.000000035	0	0.000000105
7	CIB	0	0.000005396	0	0.000000772	0	0.000001868	0	0.000013314
8	CIB	0	0.000000223	0	0.000000012	0	0.000000024	0	0.000000621
9	CIB	0	0.019398905	0	0.002307224	0	0.015917673	0	0.039187810
10	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
13	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
14	FMO	0	0.000000020	0	0.000000000	0	0.000000012	0	0.000000047
15	FMO	0	0.000679237	0	0.000105606	0	0.000519689	0	0.001385734
16	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
17	FMO	0	0.000011950	0	0.000001974	0	0.000010310	0	0.000023113
18	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
19	FMO	0	0.000027607	0	0.000002477	0	0.000023930	0	0.000055274
20	FMO	0	0.000006820	0	0.000001189	0	0.000005805	0	0.000013209
21	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.000000049	0	0.000000296	0	0.000000293
23	FMO	0	0.000049980	0	0.000003740	0	0.000030172	0	0.000113817
24	FMO	0	0.000045649	0	0.000005665	0	0.000035800	0	0.000093635
25	FMO	0	0.000000278	0	0.000000000	0	0.000000024	0	0.000000797
26	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
27	FMO	0	0.000573626	0	0.000026411	0	0.000265673	0	0.001401990
28	FMO	0	0.000004530	0	0.000000552	0	0.000004268	0	0.000008591
29	FMO	0	0.000028203	0	0.000003727	0	0.000019638	0	0.000060091
30	FMO	0	0.000000103	0	0.000000037	0	0.000000142	0	0.000000129
31	FMO	0	0.000000266	0	0.000000025	0	0.000000189	0	0.000000574
32	FMO	0	0.000000382	0	0.000000012	0	0.000000331	0	0.000000785
33	FMO	0	0.000001388	0	0.000000135	0	0.000001454	0	0.000002520
34	FMO	0	0.001563286	0	0.000228157	0	0.001803115	0	0.002601778
35	FMO	0	0.000486980	0	0.000062361	0	0.000390973	0	0.000988047
36	FMO	0	0.000112960	0	0.000014039	0	0.000088731	0	0.000231538
37	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.000000074	0	0.000000273	0	0.000000512
39	FMO	0	0.000000076	0	0.000000025	0	0.000000024	0	0.000000175
40	FMO	0	0.000009624	0	0.000001819	0	0.000005312	0	0.000021237
41	FMO	0	0.000002919	0	0.000000479	0	0.000002591	0	0.000005551
42	FMO	0	0.000038917	0	0.000004313	0	0.000030707	0	0.000079722
43	FMO	0	0.000000441	0	0.000000012	0	0.000000297	0	0.000000989
44	FMO	0	0.000176044	0	0.000013002	0	0.000070113	0	0.000434160
45	FMO	0	0.000000008	0	0.000000000	0	0.000000000	0	0.000000023
46	FMO	0	0.000000223	0	0.000000012	0	0.000000178	0	0.000000465
47	FMO	0	0.000001539	0	0.000000295	0	0.000001165	0	0.000003084
48	FMO	0	0.000008972	0	0.000001069	0	0.000006073	0	0.000019293
49	FMO	0	0.000000239	0	0.000000000	0	0.000000084	0	0.000000614

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S31: Summary statistics of number of active users' reshares of network original posts on Facebook by tercile of active users based on their number of Facebook group memberships

Network ID	Network type	Overall		Lowest tercile		Middle tercile		Highest tercile	
		Median	Mean	Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.000003112	0	0.000033694	0	0.000102125
2	CIB	0	0.000033230	0	0.000006138	0	0.000031999	0	0.000061108
3	CIB	0	0.000259874	0	0.000069675	0	0.000287548	0	0.000416930
4	CIB	0	0.000001245	0	0.000000037	0	0.000000455	0	0.000003270
5	CIB	0	0.000007934	0	0.000001198	0	0.000007394	0	0.000015114
6	CIB	0	0.000000048	0	0.000000000	0	0.000000046	0	0.000000093
7	CIB	0	0.000005396	0	0.000000449	0	0.000003070	0	0.000012230
8	CIB	0	0.000000223	0	0.000000000	0	0.000000046	0	0.000000603
9	CIB	0	0.019398905	0	0.003070505	0	0.021584631	0	0.031963234
10	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000011
13	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000011
14	FMO	0	0.000000020	0	0.000000000	0	0.000000011	0	0.000000048
15	FMO	0	0.000679237	0	0.000090557	0	0.000705107	0	0.001228980
16	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
17	FMO	0	0.000011950	0	0.000002828	0	0.000013036	0	0.000019740
18	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000012
19	FMO	0	0.000027607	0	0.000002654	0	0.000025457	0	0.000052368
20	FMO	0	0.000006820	0	0.000001115	0	0.000008386	0	0.000010397
21	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.000000051	0	0.000000332	0	0.000000244
23	FMO	0	0.000049980	0	0.000012936	0	0.000063597	0	0.000069715
24	FMO	0	0.000045649	0	0.000002757	0	0.000035527	0	0.000094722
25	FMO	0	0.000000278	0	0.000000000	0	0.000000137	0	0.000000673
26	FMO	0	0.000000004	0	0.000000000	0	0.000000011	0	0.000000000
27	FMO	0	0.000573626	0	0.000044643	0	0.000384719	0	0.001243715
28	FMO	0	0.000004530	0	0.000000628	0	0.000004102	0	0.000008494
29	FMO	0	0.000028203	0	0.000001397	0	0.000022364	0	0.000058379
30	FMO	0	0.000000103	0	0.000000013	0	0.000000115	0	0.000000174
31	FMO	0	0.000000266	0	0.000000013	0	0.000000195	0	0.000000569
32	FMO	0	0.000000382	0	0.000000064	0	0.000000332	0	0.000000719
33	FMO	0	0.000001388	0	0.000000487	0	0.000002062	0	0.000001520
34	FMO	0	0.001563286	0	0.000608873	0	0.002264239	0	0.001717137
35	FMO	0	0.000486980	0	0.000057144	0	0.000427579	0	0.000936169
36	FMO	0	0.000112960	0	0.000015193	0	0.000099158	0	0.000215424
37	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.000000039	0	0.000000392	0	0.000000412
39	FMO	0	0.000000076	0	0.000000013	0	0.000000058	0	0.000000149
40	FMO	0	0.000009624	0	0.000001459	0	0.000009488	0	0.000016993
41	FMO	0	0.000002919	0	0.000000039	0	0.000003128	0	0.000005264
42	FMO	0	0.000038917	0	0.000002365	0	0.000030052	0	0.000080021
43	FMO	0	0.000000441	0	0.000000065	0	0.000000381	0	0.000000835
44	FMO	0	0.000176044	0	0.000011995	0	0.000095526	0	0.000400860
45	FMO	0	0.000000008	0	0.000000000	0	0.000000012	0	0.000000011
46	FMO	0	0.000000223	0	0.000000129	0	0.000000081	0	0.000000446
47	FMO	0	0.000001539	0	0.000000129	0	0.000001028	0	0.000003292
48	FMO	0	0.000008972	0	0.000000401	0	0.000006292	0	0.000019205
49	FMO	0	0.000000239	0	0.000000013	0	0.000000035	0	0.000000625

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S32: Summary statistics of number of active users' reshares of network original posts on Facebook by group of active users based on whether they administered any Facebook Pages

Network ID	Network type	Overall		False		True	
		Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.000041606	0	0.000072045
2	CIB	0	0.000033230	0	0.000034431	0	0.000026670
3	CIB	0	0.000259874	0	0.000249149	0	0.000318446
4	CIB	0	0.000001245	0	0.000000598	0	0.000004779
5	CIB	0	0.000007934	0	0.000007617	0	0.000009661
6	CIB	0	0.000000048	0	0.000000033	0	0.000000128
7	CIB	0	0.000005396	0	0.000004884	0	0.000008196
8	CIB	0	0.000000223	0	0.000000198	0	0.000000360
9	CIB	0	0.019398905	0	0.019371289	0	0.019549555
10	CIB	0	0.000000000	0	0.000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.000000005	0	0.000000000
13	CIB	0	0.000000004	0	0.000000004	0	0.000000000
14	FMO	0	0.000000020	0	0.000000019	0	0.000000026
15	FMO	0	0.000679237	0	0.000715654	0	0.000480367
16	FMO	0	0.000000004	0	0.000000000	0	0.000000026
17	FMO	0	0.000011950	0	0.000012191	0	0.000010637
18	FMO	0	0.000000004	0	0.000000005	0	0.000000000
19	FMO	0	0.000027607	0	0.000027695	0	0.000001189
20	FMO	0	0.000006820	0	0.000006843	0	0.000000000
21	FMO	0	0.000000000	0	0.000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.000000235	0	0.000000103
23	FMO	0	0.000049980	0	0.000053383	0	0.000031420
24	FMO	0	0.000045649	0	0.000046926	0	0.000038685
25	FMO	0	0.000000278	0	0.000000287	0	0.000000231
26	FMO	0	0.000000004	0	0.000000005	0	0.000000000
27	FMO	0	0.000573626	0	0.000539274	0	0.000760988
28	FMO	0	0.000004530	0	0.000004165	0	0.000006519
29	FMO	0	0.000028203	0	0.000028424	0	0.000027001
30	FMO	0	0.000000103	0	0.000000108	0	0.000000077
31	FMO	0	0.000000266	0	0.000000231	0	0.000000462
32	FMO	0	0.000000382	0	0.000000376	0	0.000000411
33	FMO	0	0.000001388	0	0.000001525	0	0.000000642
34	FMO	0	0.001563286	0	0.001730074	0	0.000653794
35	FMO	0	0.000486980	0	0.000491228	0	0.000463817
36	FMO	0	0.000112960	0	0.000114108	0	0.000106703
37	FMO	0	0.000000000	0	0.000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.000000301	0	0.000000231
39	FMO	0	0.000000076	0	0.000000075	0	0.000000077
40	FMO	0	0.000009624	0	0.000010349	0	0.000005671
41	FMO	0	0.000002919	0	0.000003101	0	0.000001924
42	FMO	0	0.000038917	0	0.000039329	0	0.000036668
43	FMO	0	0.000000441	0	0.000000405	0	0.000000641
44	FMO	0	0.000176044	0	0.000167148	0	0.000224549
45	FMO	0	0.000000008	0	0.000000005	0	0.000000026
46	FMO	0	0.000000223	0	0.000000245	0	0.000000103
47	FMO	0	0.000001539	0	0.000001346	0	0.000002592
48	FMO	0	0.000008972	0	0.000008796	0	0.000009930
49	FMO	0	0.000000239	0	0.000000239	0	0.000000000

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S33: Summary statistics of number of active users' reshares of network original posts on Facebook by group of active users based on whether they administered any Facebook groups

Network ID	Network type	Overall		False		True	
		Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.0000398150	0	0.000080660
2	CIB	0	0.000033230	0	0.0000343001	0	0.000027578
3	CIB	0	0.000259874	0	0.0002469731	0	0.000328011
4	CIB	0	0.000001245	0	0.0000005487	0	0.000004921
5	CIB	0	0.000007934	0	0.0000071798	0	0.000011915
6	CIB	0	0.000000048	0	0.0000000285	0	0.000000146
7	CIB	0	0.000005396	0	0.0000047534	0	0.000008689
8	CIB	0	0.000000223	0	0.0000001711	0	0.000000487
9	CIB	0	0.019398905	0	0.0190010213	0	0.021436291
10	CIB	0	0.000000000	0	0.0000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.0000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.0000000000	0	0.000000024
13	CIB	0	0.000000004	0	0.0000000048	0	0.000000000
14	FMO	0	0.000000020	0	0.0000000189	0	0.000000025
15	FMO	0	0.000679237	0	0.0006926476	0	0.000608411
16	FMO	0	0.000000004	0	0.0000000000	0	0.000000025
17	FMO	0	0.000011950	0	0.0000125102	0	0.000008993
18	FMO	0	0.000000000	0	0.0000000000	0	0.000000025
19	FMO	0	0.000027607	0	0.0000266001	0	0.000032762
20	FMO	0	0.000006820	0	0.0000070113	0	0.000005842
21	FMO	0	0.000000000	0	0.0000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.0000002139	0	0.000000219
23	FMO	0	0.000049980	0	0.0000522447	0	0.000038384
24	FMO	0	0.000045649	0	0.0000453618	0	0.000047122
25	FMO	0	0.000000278	0	0.0000002044	0	0.000000657
26	FMO	0	0.000000004	0	0.0000000048	0	0.000000000
27	FMO	0	0.000573626	0	0.0005100119	0	0.000899365
28	FMO	0	0.000004530	0	0.0000044920	0	0.000004722
29	FMO	0	0.000028203	0	0.0000277076	0	0.000030741
30	FMO	0	0.000000103	0	0.0000001093	0	0.000000073
31	FMO	0	0.000000266	0	0.0000002234	0	0.000000487
32	FMO	0	0.000000382	0	0.0000003945	0	0.000000316
33	FMO	0	0.000001388	0	0.0000014973	0	0.000000828
34	FMO	0	0.001563286	0	0.0016828767	0	0.000950917
35	FMO	0	0.000486980	0	0.0004791671	0	0.000526987
36	FMO	0	0.000112960	0	0.0001114864	0	0.000120508
37	FMO	0	0.000000000	0	0.0000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.0000002997	0	0.000000242
39	FMO	0	0.000000076	0	0.0000000856	0	0.000000024
40	FMO	0	0.000009624	0	0.0000095241	0	0.000010132
41	FMO	0	0.000002919	0	0.0000030685	0	0.000002157
42	FMO	0	0.000038917	0	0.0000378979	0	0.000044106
43	FMO	0	0.000000441	0	0.0000004091	0	0.000000606
44	FMO	0	0.000176044	0	0.0001540323	0	0.000288170
45	FMO	0	0.000000008	0	0.0000000048	0	0.000000024
46	FMO	0	0.000000223	0	0.0000002046	0	0.000000315
47	FMO	0	0.000001539	0	0.0000012036	0	0.000003247
48	FMO	0	0.000008972	0	0.0000087870	0	0.000009912
49	FMO	0	0.000000239	0	0.0000001762	0	0.000000555

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S34: Summary statistics of number of active users' reshares of network original posts on Facebook by predicted political ideology of active users (liberal, moderate, conservative)

Network ID	Network type	Overall		Liberal		Moderate		Conservative	
		Median	Mean	Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.000028927	0	0.000011466	0	0.000081371
2	CIB	0	0.000033230	0	0.000000873	0	0.000000858	0	0.000072425
3	CIB	0	0.000259874	0	0.000144605	0	0.000095396	0	0.000444429
4	CIB	0	0.000001245	0	0.000004230	0	0.000000167	0	0.000000144
5	CIB	0	0.000007934	0	0.000019669	0	0.000003146	0	0.000004136
6	CIB	0	0.000000048	0	0.000000104	0	0.000000024	0	0.000000036
7	CIB	0	0.000005396	0	0.000009480	0	0.000001597	0	0.000005611
8	CIB	0	0.000000223	0	0.000000458	0	0.000000000	0	0.000000216
9	CIB	0	0.019398905	0	0.000707734	0	0.000660405	0	0.042566641
10	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000009
13	CIB	0	0.000000004	0	0.000000000	0	0.000000022	0	0.000000000
14	FMO	0	0.000000020	0	0.000000015	0	0.000000000	0	0.000000036
15	FMO	0	0.000679237	0	0.000044943	0	0.000025887	0	0.001461204
16	FMO	0	0.000000004	0	0.000000015	0	0.000000000	0	0.000000000
17	FMO	0	0.000011950	0	0.000009243	0	0.000005554	0	0.000018495
18	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000009
19	FMO	0	0.000027607	0	0.000025215	0	0.000013730	0	0.000041522
20	FMO	0	0.000006820	0	0.000002721	0	0.000001311	0	0.000012893
21	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.000000000	0	0.000000000	0	0.000000477
23	FMO	0	0.000049980	0	0.000000370	0	0.000000524	0	0.000111932
24	FMO	0	0.000045649	0	0.000000222	0	0.000000262	0	0.000102437
25	FMO	0	0.000000278	0	0.000000000	0	0.000000000	0	0.000000629
26	FMO	0	0.000000004	0	0.000000000	0	0.000000000	0	0.000000009
27	FMO	0	0.000573626	0	0.000672418	0	0.000308833	0	0.000769004
28	FMO	0	0.000004530	0	0.000004570	0	0.000002765	0	0.000006213
29	FMO	0	0.000028203	0	0.000002440	0	0.000000477	0	0.000061078
30	FMO	0	0.000000103	0	0.000000177	0	0.000000048	0	0.000000099
31	FMO	0	0.000000266	0	0.000000104	0	0.000000024	0	0.000000530
32	FMO	0	0.000000382	0	0.000001390	0	0.000000024	0	0.000000009
33	FMO	0	0.000001388	0	0.000000074	0	0.000000048	0	0.000003066
34	FMO	0	0.001563286	0	0.000454002	0	0.000382847	0	0.003044932
35	FMO	0	0.000486980	0	0.000013857	0	0.000018068	0	0.001079373
36	FMO	0	0.000112960	0	0.000002337	0	0.000003361	0	0.000250523
37	FMO	0	0.000000000	0	0.000000000	0	0.000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.000000000	0	0.000000000	0	0.000000656
39	FMO	0	0.000000076	0	0.000000000	0	0.000000024	0	0.000000153
40	FMO	0	0.000009624	0	0.000000222	0	0.000000143	0	0.000021471
41	FMO	0	0.000002919	0	0.000000074	0	0.000000286	0	0.000006393
42	FMO	0	0.000038917	0	0.000000296	0	0.000000405	0	0.000087575
43	FMO	0	0.000000441	0	0.000000237	0	0.000000048	0	0.000000836
44	FMO	0	0.000176044	0	0.000127731	0	0.000096302	0	0.000280177
45	FMO	0	0.000000008	0	0.000000000	0	0.000000000	0	0.000000018
46	FMO	0	0.000000223	0	0.000000207	0	0.000000072	0	0.000000351
47	FMO	0	0.000001539	0	0.000001080	0	0.000000334	0	0.000002697
48	FMO	0	0.000008972	0	0.000006403	0	0.000003599	0	0.000014773
49	FMO	0	0.000000239	0	0.000000060	0	0.000000111	0	0.000000466

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S35: Summary statistics of number of active users' reshares of network original posts on Facebook by high political interest (whether active users were in the top 20% of engagement with political content (based on Civic classifier))

Network ID	Network type	Overall		False		True	
		Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.0000066936	0	0.00020869
2	CIB	0	0.000033230	0	0.0000039034	0	0.00015341
3	CIB	0	0.000259874	0	0.0000603017	0	0.00107770
4	CIB	0	0.000001245	0	0.0000000396	0	0.00000618
5	CIB	0	0.000007934	0	0.0000011428	0	0.00003576
6	CIB	0	0.000000148	0	0.0000000148	0	0.00000018
7	CIB	0	0.000005396	0	0.0000006135	0	0.00002500
8	CIB	0	0.000000223	0	0.0000000247	0	0.00000103
9	CIB	0	0.019398905	0	0.0027836432	0	0.08748632
10	CIB	0	0.000000000	0	0.0000000000	0	0.00000000
11	CIB	0	0.000000000	0	0.0000000000	0	0.00000000
12	CIB	0	0.000000004	0	0.0000000000	0	0.00000002
13	CIB	0	0.000000004	0	0.0000000000	0	0.00000002
14	FMO	0	0.000000020	0	0.0000000000	0	0.00000010
15	FMO	0	0.000679237	0	0.0000599158	0	0.00321714
16	FMO	0	0.000000004	0	0.0000000000	0	0.00000002
17	FMO	0	0.000011950	0	0.0000043882	0	0.00004294
18	FMO	0	0.000000004	0	0.0000000000	0	0.00000002
19	FMO	0	0.000027607	0	0.0000084845	0	0.00010597
20	FMO	0	0.000006820	0	0.0000014792	0	0.00002871
21	FMO	0	0.000000000	0	0.0000000000	0	0.00000000
22	FMO	0	0.000000215	0	0.0000000495	0	0.00000089
23	FMO	0	0.000049980	0	0.0000069162	0	0.00022645
24	FMO	0	0.000045649	0	0.0000038836	0	0.00021680
25	FMO	0	0.000000278	0	0.0000000198	0	0.00000134
26	FMO	0	0.000000004	0	0.0000000049	0	0.00000000
27	FMO	0	0.000573626	0	0.0001955933	0	0.00212276
28	FMO	0	0.000004530	0	0.0000022015	0	0.00001407
29	FMO	0	0.000028203	0	0.0000025181	0	0.00013346
30	FMO	0	0.000000103	0	0.0000000198	0	0.00000045
31	FMO	0	0.000000266	0	0.0000000396	0	0.00000120
32	FMO	0	0.000000382	0	0.0000000099	0	0.00000191
33	FMO	0	0.000001388	0	0.0000001929	0	0.00000628
34	FMO	0	0.001563286	0	0.0003965742	0	0.00634434
35	FMO	0	0.000486980	0	0.0000547311	0	0.00225829
36	FMO	0	0.000112960	0	0.0000118288	0	0.00052739
37	FMO	0	0.000000000	0	0.0000000000	0	0.00000000
38	FMO	0	0.000000290	0	0.0000000148	0	0.00000142
39	FMO	0	0.000000076	0	0.0000000198	0	0.00000030
40	FMO	0	0.000009624	0	0.0000003513	0	0.00004762
41	FMO	0	0.000002919	0	0.0000001286	0	0.00001435
42	FMO	0	0.000038917	0	0.0000037302	0	0.00018311
43	FMO	0	0.000000441	0	0.0000000841	0	0.00000191
44	FMO	0	0.000176044	0	0.0000639033	0	0.00063558
45	FMO	0	0.000000008	0	0.0000000000	0	0.00000004
46	FMO	0	0.000000223	0	0.0000001039	0	0.00000071
47	FMO	0	0.000001539	0	0.0000005541	0	0.00000558
48	FMO	0	0.000008972	0	0.0000021421	0	0.00003696
49	FMO	0	0.000000239	0	0.0000001385	0	0.00000065

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S36: Summary statistics of number of active users' reshares of network original posts on Facebook by high news exposure (whether active users were in the top 20% of news viewers)

Network ID	Network type	Overall		False		True	
		Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.0000171919	0	0.000185729
2	CIB	0	0.000033230	0	0.0000187400	0	0.000102587
3	CIB	0	0.000259874	0	0.0001067910	0	0.000992621
4	CIB	0	0.000001245	0	0.0000008558	0	0.000003107
5	CIB	0	0.000007934	0	0.0000032211	0	0.000030491
6	CIB	0	0.000000048	0	0.0000000144	0	0.000000207
7	CIB	0	0.000005396	0	0.0000009952	0	0.000026464
8	CIB	0	0.000000223	0	0.0000000240	0	0.000001174
9	CIB	0	0.019398905	0	0.0062756000	0	0.082214728
10	CIB	0	0.000000000	0	0.0000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.0000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.0000000000	0	0.000000023
13	CIB	0	0.000000004	0	0.0000000048	0	0.000000000
14	FMO	0	0.000000020	0	0.0000000048	0	0.000000092
15	FMO	0	0.000679237	0	0.0002375768	0	0.002793283
16	FMO	0	0.000000004	0	0.0000000000	0	0.000000023
17	FMO	0	0.000011950	0	0.0000073412	0	0.000034012
18	FMO	0	0.000000004	0	0.0000000048	0	0.000000000
19	FMO	0	0.000027607	0	0.0000196631	0	0.000065630
20	FMO	0	0.000006820	0	0.0000042115	0	0.000019307
21	FMO	0	0.000000000	0	0.0000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.0000000625	0	0.000000943
23	FMO	0	0.000049980	0	0.0000109228	0	0.000236931
24	FMO	0	0.000045649	0	0.0000075575	0	0.000227979
25	FMO	0	0.000000278	0	0.0000000962	0	0.000001151
26	FMO	0	0.000000004	0	0.0000000048	0	0.000000000
27	FMO	0	0.000573626	0	0.0003605406	0	0.001593578
28	FMO	0	0.000004530	0	0.0000031682	0	0.000011046
29	FMO	0	0.000028203	0	0.0000072450	0	0.000128522
30	FMO	0	0.000000103	0	0.0000000865	0	0.000000184
31	FMO	0	0.000000266	0	0.0000000865	0	0.000001128
32	FMO	0	0.000000382	0	0.0000001394	0	0.000001542
33	FMO	0	0.000001388	0	0.0000002692	0	0.000006743
34	FMO	0	0.001563286	0	0.0010241229	0	0.004144038
35	FMO	0	0.000486980	0	0.0002277404	0	0.001727852
36	FMO	0	0.000112960	0	0.0000582921	0	0.000374635
37	FMO	0	0.000000000	0	0.0000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.0000000529	0	0.000001427
39	FMO	0	0.000000076	0	0.0000000240	0	0.000000322
40	FMO	0	0.000009624	0	0.0000059181	0	0.000027361
41	FMO	0	0.000002919	0	0.0000013654	0	0.000010355
42	FMO	0	0.000038917	0	0.0000088508	0	0.000182830
43	FMO	0	0.000000441	0	0.0000001298	0	0.000001933
44	FMO	0	0.000176044	0	0.0001146082	0	0.000470111
45	FMO	0	0.000000008	0	0.0000000000	0	0.000000046
46	FMO	0	0.000000223	0	0.0000001538	0	0.000000552
47	FMO	0	0.000001539	0	0.0000008990	0	0.000004602
48	FMO	0	0.000008972	0	0.0000044951	0	0.000030399
49	FMO	0	0.000000239	0	0.0000001731	0	0.000000552

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S37: Summary statistics of number of active users' reshares of network original posts on Facebook by high political ads exposure (whether active users were in the top 20% of viewers of political ads)

Network ID	Network type	Overall		False		True	
		Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.0000201217	0	0.000190973
2	CIB	0	0.000033230	0	0.0000139546	0	0.000139670
3	CIB	0	0.000259874	0	0.0001305513	0	0.000974006
4	CIB	0	0.000001245	0	0.0000009770	0	0.000002723
5	CIB	0	0.000007934	0	0.0000039125	0	0.000030139
6	CIB	0	0.000000048	0	0.0000000141	0	0.000000233
7	CIB	0	0.000005396	0	0.0000034429	0	0.000016185
8	CIB	0	0.000000223	0	0.0000000752	0	0.000001037
9	CIB	0	0.019398905	0	0.0056453397	0	0.095347165
10	CIB	0	0.000000000	0	0.0000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.0000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.0000000000	0	0.000000026
13	CIB	0	0.000000004	0	0.0000000047	0	0.000000000
14	FMO	0	0.000000020	0	0.0000000047	0	0.000000104
15	FMO	0	0.000679237	0	0.0001940257	0	0.003358613
16	FMO	0	0.000000004	0	0.0000000000	0	0.000000026
17	FMO	0	0.000011950	0	0.0000064489	0	0.000042329
18	FMO	0	0.000000004	0	0.0000000047	0	0.000000000
19	FMO	0	0.000027607	0	0.0000194453	0	0.000072675
20	FMO	0	0.000006820	0	0.0000036307	0	0.000024433
21	FMO	0	0.000000000	0	0.0000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.0000000705	0	0.000001012
23	FMO	0	0.000049980	0	0.0000101501	0	0.000269925
24	FMO	0	0.000045649	0	0.0000085625	0	0.000250446
25	FMO	0	0.000000278	0	0.0000000376	0	0.000001608
26	FMO	0	0.000000004	0	0.0000000047	0	0.000000000
27	FMO	0	0.000573626	0	0.0003590713	0	0.001758414
28	FMO	0	0.000004530	0	0.0000026538	0	0.000014888
29	FMO	0	0.000028203	0	0.0000074540	0	0.000142782
30	FMO	0	0.000000103	0	0.0000000798	0	0.000000233
31	FMO	0	0.000000266	0	0.0000001127	0	0.000001115
32	FMO	0	0.000000382	0	0.0000001550	0	0.000001634
33	FMO	0	0.000001388	0	0.0000003570	0	0.000007081
34	FMO	0	0.001563286	0	0.0009005292	0	0.005223083
35	FMO	0	0.000486980	0	0.0001807615	0	0.002177942
36	FMO	0	0.000112960	0	0.0000460394	0	0.000482503
37	FMO	0	0.000000000	0	0.0000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.0000000611	0	0.000001556
39	FMO	0	0.000000076	0	0.0000000188	0	0.000000389
40	FMO	0	0.000009624	0	0.0000049553	0	0.000035404
41	FMO	0	0.000002919	0	0.0000008032	0	0.000014602
42	FMO	0	0.000038917	0	0.0000085437	0	0.000206639
43	FMO	0	0.000000441	0	0.0000001456	0	0.000002075
44	FMO	0	0.000176044	0	0.0001200583	0	0.000485200
45	FMO	0	0.000000008	0	0.0000000000	0	0.000000052
46	FMO	0	0.000000223	0	0.0000001503	0	0.000000622
47	FMO	0	0.000001539	0	0.0000008736	0	0.000005213
48	FMO	0	0.000008972	0	0.0000039501	0	0.000036701
49	FMO	0	0.000000239	0	0.0000001644	0	0.000000648

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

Table S38: Summary statistics of number of active users' reshares of network original posts on Facebook by high exposure to content from untrustworthy sources (whether active users were in the top 20% of viewers of content from untrustworthy sources)

Network ID	Network type	Overall		False		True	
		Median	Mean	Median	Mean	Median	Mean
1	CIB	0	0.000046318	0	0.0000111646	0	0.000216146
2	CIB	0	0.000033230	0	0.0000089471	0	0.000150544
3	CIB	0	0.000259874	0	0.0000871812	0	0.001094178
4	CIB	0	0.000001245	0	0.0000008400	0	0.000003200
5	CIB	0	0.000007934	0	0.0000019632	0	0.000036778
6	CIB	0	0.000000048	0	0.0000000192	0	0.000000186
7	CIB	0	0.000005396	0	0.0000009408	0	0.000026923
8	CIB	0	0.000000223	0	0.0000000096	0	0.000001252
9	CIB	0	0.019398905	0	0.0020951076	0	0.102995856
10	CIB	0	0.000000000	0	0.0000000000	0	0.000000000
11	CIB	0	0.000000000	0	0.0000000000	0	0.000000000
12	CIB	0	0.000000004	0	0.0000000000	0	0.000000023
13	CIB	0	0.000000004	0	0.0000000048	0	0.000000000
14	FMO	0	0.000000020	0	0.0000000096	0	0.000000070
15	FMO	0	0.000679237	0	0.0000947026	0	0.003503202
16	FMO	0	0.000000004	0	0.0000000000	0	0.000000023
17	FMO	0	0.000011950	0	0.0000053135	0	0.000044013
18	FMO	0	0.000000004	0	0.0000000000	0	0.000000023
19	FMO	0	0.000027607	0	0.0000140062	0	0.000093313
20	FMO	0	0.000006820	0	0.0000023712	0	0.000028314
21	FMO	0	0.000000000	0	0.0000000000	0	0.000000000
22	FMO	0	0.000000215	0	0.0000000288	0	0.000001113
23	FMO	0	0.000049980	0	0.0000032544	0	0.000275718
24	FMO	0	0.000045649	0	0.0000015648	0	0.000258628
25	FMO	0	0.000000278	0	0.0000000000	0	0.000001623
26	FMO	0	0.000000004	0	0.0000000000	0	0.000000023
27	FMO	0	0.000573626	0	0.0002565563	0	0.002105432
28	FMO	0	0.000004530	0	0.0000025344	0	0.000014169
29	FMO	0	0.000028203	0	0.0000019968	0	0.000154810
30	FMO	0	0.000000103	0	0.0000000768	0	0.000000232
31	FMO	0	0.000000266	0	0.0000000384	0	0.000001368
32	FMO	0	0.000000382	0	0.0000001344	0	0.000001577
33	FMO	0	0.000001388	0	0.0000001200	0	0.000007513
34	FMO	0	0.001563286	0	0.0006997772	0	0.005735014
35	FMO	0	0.000486980	0	0.0000995218	0	0.002358842
36	FMO	0	0.000112960	0	0.0000242541	0	0.000541512
37	FMO	0	0.000000000	0	0.0000000000	0	0.000000000
38	FMO	0	0.000000290	0	0.0000000144	0	0.000001623
39	FMO	0	0.000000076	0	0.0000000048	0	0.000000417
40	FMO	0	0.000009624	0	0.0000028848	0	0.000042181
41	FMO	0	0.000002919	0	0.0000004464	0	0.000014864
42	FMO	0	0.000038917	0	0.0000020160	0	0.000217189
43	FMO	0	0.000000441	0	0.0000000624	0	0.000002273
44	FMO	0	0.000176044	0	0.0000653943	0	0.000710607
45	FMO	0	0.000000008	0	0.0000000000	0	0.000000046
46	FMO	0	0.000000223	0	0.0000000816	0	0.000000904
47	FMO	0	0.000001539	0	0.0000006144	0	0.000006006
48	FMO	0	0.000008972	0	0.0000028320	0	0.000038633
49	FMO	0	0.000000239	0	0.0000000912	0	0.000000951

Note: The columns under the Overall header show the overall summary statistics not broken down by any subgroup for comparison. See Definitions of Terms and Metrics for definitions of active users, engagement metrics and network content, and Aggregated Platform Data Coding for more details on aggregate platform data for active users.

S5.2 Spread of deceptive online network content on Facebook

Table S39: Summary statistics of cascade depth (number of reshare hops from the original post by a network-affiliated account, where a hop is a reshare by a new unique user) on Facebook

Network ID	Network type	p5	p50	p95	Avg	SD
1	CIB	0	1	3	0.9775	1.19
2	CIB	0	0	3	0.5610	1.26
3	CIB	0	0	3	0.6620	1.06
4	CIB	0	0	2	0.2934	0.80
5	CIB	0	1	3	0.9881	1.16
6	CIB	0	0	2	0.2778	0.55
7	CIB	0	0	2	0.4937	0.77
8	CIB	0	0	2	0.3224	0.62
9	CIB	0	1	5	1.5111	2.19
11	CIB	0	0	0	0.0000	0.00
12	CIB	0	0	0	0.0507	0.30
13	CIB	0	0	0	0.0036	0.06
15	FMO	0	2	6	2.1342	2.61
16	FMO	0	0	3	0.3804	0.92
17	FMO	0	0	2	0.3343	1.14
18	FMO	0	0	0	0.0000	0.00
19	FMO	0	0	6	1.6087	2.77
20	FMO	0	0	2	0.4444	1.21
21	FMO	0	0	0	0.0000	
22	FMO	2	4	4	3.0000	1.41
23	FMO	1	2	8	3.1037	2.71
24	FMO	0	0	2	0.7158	0.92
25	FMO	0	0	1	0.2292	0.44
26	FMO	0	0	0	0.0000	0.00
27	FMO	0	1	6	2.0426	2.33
28	FMO	0	0	1	0.0526	0.23
29	FMO	0	0	1	0.0945	0.37
30	FMO	0	0	0	0.0303	0.21
31	FMO	0	0	1	0.1618	0.41
32	FMO	0	0	10	1.7857	2.97
33	FMO	0	0	1	0.1667	0.41
34	FMO	0	1	4	1.5085	1.93
35	FMO	0	1	6	1.8288	2.98
36	FMO	0	1	8	1.5682	3.21
38	FMO	0	0	1	0.0962	0.30
39	FMO	0	0	0	0.0230	0.15
40	FMO	0	1	2	0.7375	0.86
41	FMO	0	0	2	0.4306	0.70
42	FMO	0	1	3	1.2677	1.88
43	FMO	0	0	0	0.0255	0.20
44	FMO	0	0	3	0.7695	1.33
45	FMO	0	0	1	0.0588	0.24
46	FMO	0	0	0	0.0393	0.30
47	FMO	0	0	1	0.0607	0.28
48	FMO	0	0	3	0.8347	2.20
49	FMO	0	0	1	0.2059	0.42

Note: Cascade data are only available for networks that had any original post by a network-affiliated account on Facebook. Missing values indicate that no original network post fell into a specific category. See Aggregated Platform Data Coding for more details on information cascade metrics.

Table S40: Summary statistics of cascade size (number of reshares that contributed to the reshare cascade of a given original post by a network-affiliated account) on Facebook

Network ID	Network type	p5	p50	p95	Avg	SD
1	CIB	0	1	175	31.0405	77.88
2	CIB	0	0	48	7.5442	28.75
3	CIB	0	0	33	8.8940	81.63
4	CIB	0	0	10	1.8533	8.14
5	CIB	0	1	72	11.6394	50.07
6	CIB	0	0	2	0.7963	3.97
7	CIB	0	0	10	1.8074	4.65
8	CIB	0	0	4	0.6802	1.52
9	CIB	0	5	482	138.9044	984.19
11	CIB	0	0	0	0.0000	0.00
12	CIB	0	0	0	0.4348	3.28
13	CIB	0	0	0	0.0036	0.06
15	FMO	0	21	1,242	297.3899	560.78
16	FMO	0	0	14	1.7717	5.50
17	FMO	0	0	30	6.7594	42.39
18	FMO	0	0	0	0.0000	0.00
19	FMO	0	0	468	136.8913	485.90
20	FMO	0	0	54	20.5000	112.35
21	FMO	0	0	0	0.0000	
22	FMO	6	25	25	15.5000	13.44
23	FMO	1	25	178	48.3296	62.00
24	FMO	0	0	96	13.8967	36.31
25	FMO	0	0	2	0.3542	0.81
26	FMO	0	0	0	0.0000	0.00
27	FMO	0	22	837	193.3451	1,226.92
28	FMO	0	0	1	0.0526	0.23
29	FMO	0	0	1	0.7479	7.14
30	FMO	0	0	0	0.0434	0.38
31	FMO	0	0	4	0.6618	2.34
32	FMO	0	0	22	5.4286	8.33
33	FMO	0	0	1	0.1667	0.41
34	FMO	0	3	247	54.0809	213.18
35	FMO	0	3	88	33.0297	437.93
36	FMO	0	1	215	51.9773	298.34
38	FMO	0	0	2	0.2308	0.92
39	FMO	0	0	0	0.0287	0.20
40	FMO	0	1	16	4.5878	25.41
41	FMO	0	0	20	2.9904	8.75
42	FMO	0	3	152	28.8550	56.33
43	FMO	0	0	0	0.0417	0.91
44	FMO	0	0	67	12.9476	45.39
45	FMO	0	0	2	0.1176	0.48
46	FMO	0	0	0	0.0660	0.62
47	FMO	0	0	1	0.2029	2.85
48	FMO	0	0	19	3.5722	14.33
49	FMO	0	0	2	0.3176	0.82

Note: Cascade data are only available for networks that had any original post by a network-affiliated account on Facebook. Missing values indicate that no original network post fell into a specific category. See Aggregated Platform Data Coding for more details on information cascade metrics.

Table S41: Summary statistics of cascade maximum breadth (maximum number of users who contributed a reshare to the reshare cascade of a given original post by a network-affiliated account at a any depth) on Facebook

Network ID	Network type	p5	p50	p95	Avg	SD
1	CIB	0	1	127	25.8964	66.31
2	CIB	0	0	38	5.2818	15.53
3	CIB	0	0	27	7.6434	74.66
4	CIB	0	0	7	1.3012	5.81
5	CIB	0	1	42	7.4567	26.72
6	CIB	0	0	2	0.7222	3.60
7	CIB	0	0	8	1.5144	3.57
8	CIB	0	0	3	0.5942	1.24
9	CIB	0	5	418	111.5668	743.74
11	CIB	0	0	0	0.0000	0.00
12	CIB	0	0	0	0.4203	3.15
13	CIB	0	0	0	0.0036	0.06
15	FMO	0	20	1,012	237.8380	382.65
16	FMO	0	0	10	1.2174	3.46
17	FMO	0	0	25	5.1401	26.34
18	FMO	0	0	0	0.0000	0.00
19	FMO	0	0	258	66.7609	171.89
20	FMO	0	0	30	17.4722	101.61
21	FMO	0	0	0	0.0000	
22	FMO	5	15	15	10.0000	7.07
23	FMO	1	20	106	32.4222	33.39
24	FMO	0	0	82	12.4650	31.59
25	FMO	0	0	2	0.3472	0.78
26	FMO	0	0	0	0.0000	0.00
27	FMO	0	21	576	130.5756	660.29
28	FMO	0	0	1	0.0526	0.23
29	FMO	0	0	1	0.6560	5.85
30	FMO	0	0	0	0.0365	0.28
31	FMO	0	0	4	0.6471	2.24
32	FMO	0	0	10	2.5000	3.76
33	FMO	0	0	1	0.1667	0.41
34	FMO	0	3	191	42.4665	148.78
35	FMO	0	2	45	10.7976	39.49
36	FMO	0	1	87	16.9598	67.65
38	FMO	0	0	2	0.2308	0.92
39	FMO	0	0	0	0.0287	0.20
40	FMO	0	1	14	3.9741	21.99
41	FMO	0	0	19	2.7273	7.86
42	FMO	0	3	124	23.3680	42.74
43	FMO	0	0	0	0.0316	0.52
44	FMO	0	0	54	9.6535	32.59
45	FMO	0	0	2	0.1176	0.48
46	FMO	0	0	0	0.0535	0.49
47	FMO	0	0	1	0.1885	2.55
48	FMO	0	0	13	2.4537	10.08
49	FMO	0	0	2	0.3118	0.80

Note: Cascade data are only available for networks that had any original post by a network-affiliated account on Facebook. Missing values indicate that no original network post fell into a specific category. See Aggregated Platform Data Coding for more details on information cascade metrics.

Table S42: Summary statistics of structural virality (average distance between all pairs of nodes in the reshare tree (where a node can be the original post by a network-affiliated account or any reshare in this post's reshare cascade)) on Facebook

Network ID	Network type	p5	p50	p95	Avg	SD
1	CIB	1.0	2.0	2.5	1.9	0.42
2	CIB	1.0	2.0	3.2	1.9	0.75
3	CIB	1.0	1.7	2.9	1.8	0.65
4	CIB	1.0	1.9	3.2	1.9	0.66
5	CIB	1.0	1.7	3.1	1.8	0.70
6	CIB	1.0	1.3	2.1	1.3	0.38
7	CIB	1.0	1.3	2.4	1.5	0.50
8	CIB	1.0	1.3	2.1	1.4	0.38
9	CIB	1.0	2.0	3.0	2.1	0.87
11	CIB					
12	CIB	1.0	1.5	2.0	1.5	0.41
13	CIB	1.0	1.0	1.0	1.0	
15	FMO	1.3	2.1	3.0	2.2	0.91
16	FMO	1.0	1.9	3.0	2.0	0.62
17	FMO	1.0	2.1	3.8	2.2	1.08
18	FMO					
19	FMO	1.0	2.4	5.4	2.4	0.94
20	FMO	1.0	1.5	3.5	1.6	0.70
21	FMO					
22	FMO	1.9	3.1	3.1	2.5	0.84
23	FMO	1.3	2.2	4.1	2.4	0.92
24	FMO	1.0	1.8	2.3	1.7	0.44
25	FMO	1.0	1.0	1.7	1.1	0.23
26	FMO					
27	FMO	1.3	2.0	3.0	2.1	0.53
28	FMO	1.0	1.0	1.0	1.0	
29	FMO	1.0	1.3	2.2	1.4	0.44
30	FMO	1.0	1.0	2.3	1.2	0.52
31	FMO	1.0	1.5	2.0	1.4	0.35
32	FMO	1.0	4.0	6.8	3.3	2.06
33	FMO	1.0	1.0	1.0	1.0	
34	FMO	1.0	1.9	2.9	1.9	0.84
35	FMO	1.0	1.9	5.0	2.3	1.74
36	FMO	1.0	1.8	5.5	2.3	1.77
38	FMO	1.0	1.3	1.7	1.3	0.30
39	FMO	1.0	1.0	1.3	1.1	0.17
40	FMO	1.0	1.6	2.3	1.6	0.46
41	FMO	1.0	1.6	2.2	1.5	0.45
42	FMO	1.0	1.9	2.6	1.9	0.60
43	FMO	1.0	1.0	1.7	1.1	0.35
44	FMO	1.0	1.9	3.0	1.9	0.74
45	FMO	1.3	1.3	1.3	1.3	0.00
46	FMO	1.0	1.0	2.4	1.3	0.47
47	FMO	1.0	1.0	1.9	1.2	0.37
48	FMO	1.0	1.9	5.4	2.3	1.93
49	FMO	1.0	1.0	1.7	1.1	0.24

Note: Cascade data are only available for networks that had any original post by a network-affiliated account on Facebook. Missing values indicate that no original network post fell into a specific category. See Aggregated Platform Data Coding for more details on information cascade metrics.

S6 Results of Selected Pre-registered Analyses Referenced in the Supplementary Information

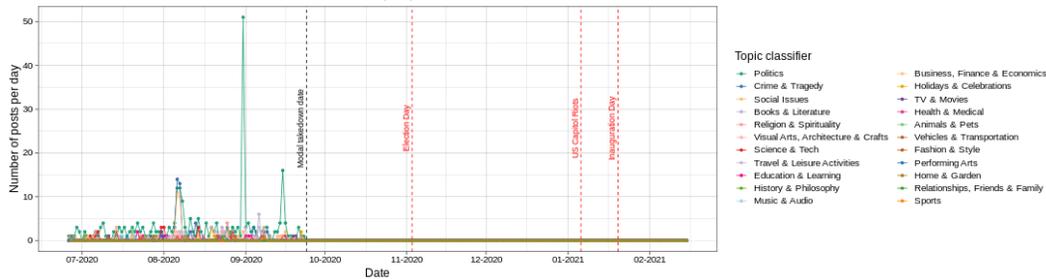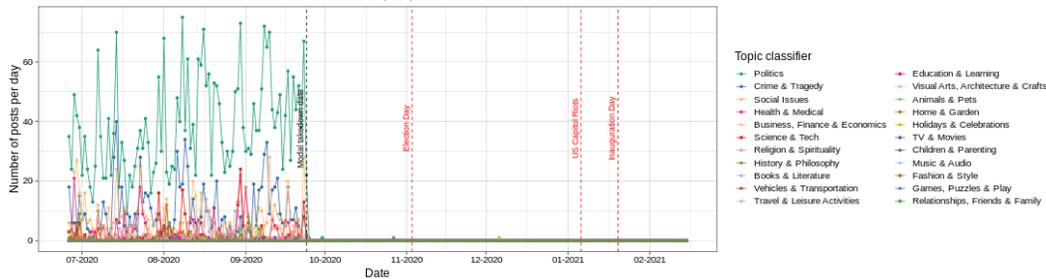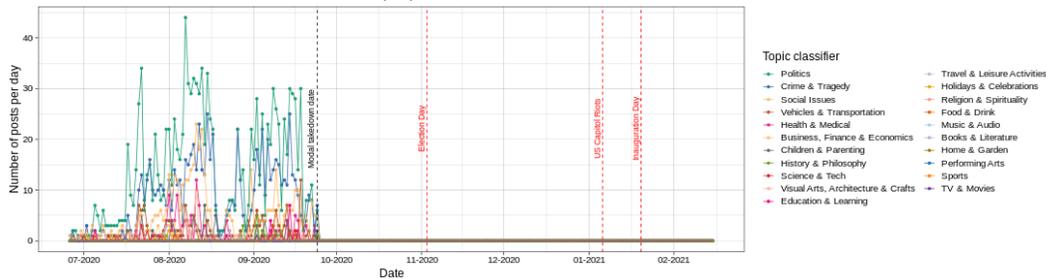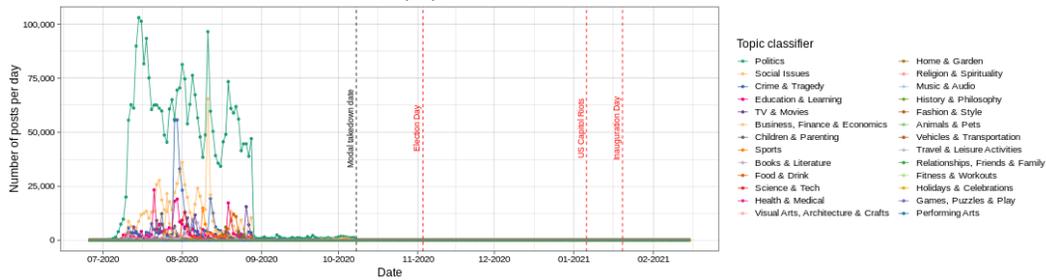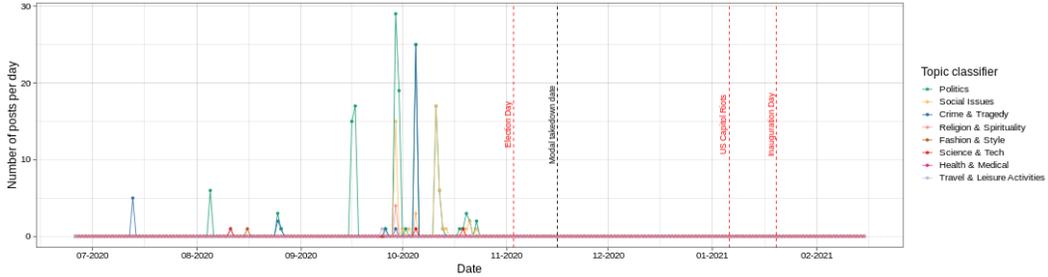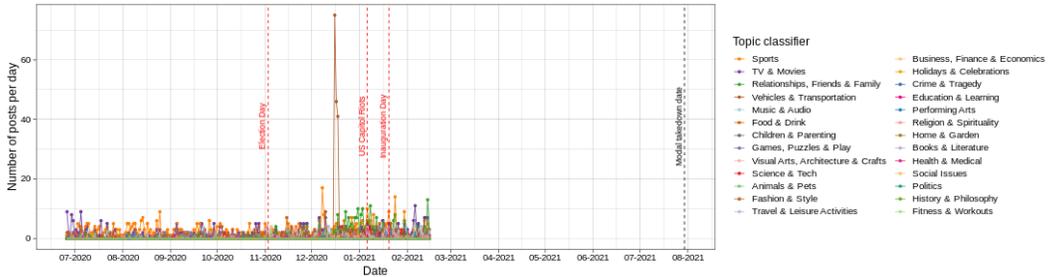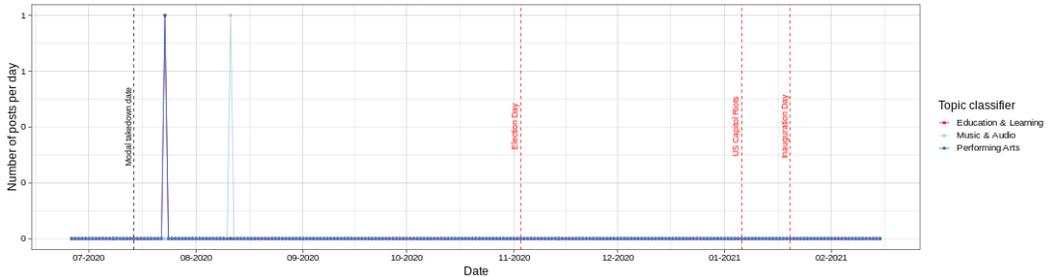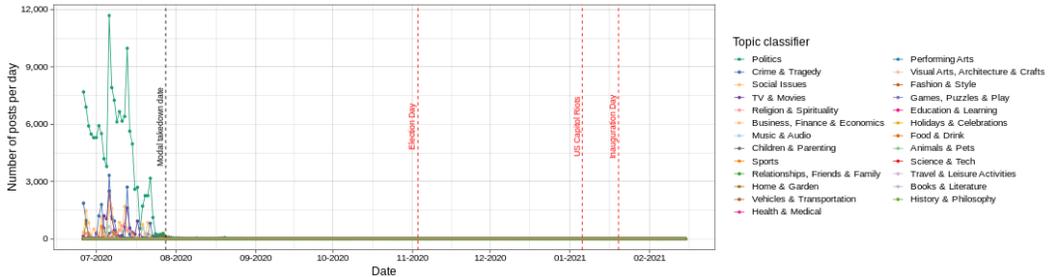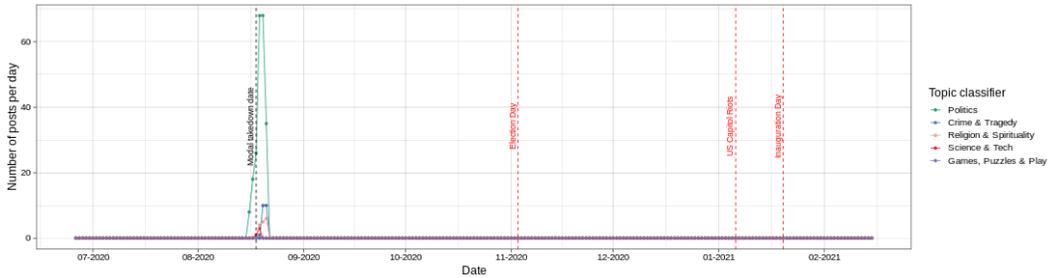Table S43: Total number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook by candidate mention (Trump, Biden, Pence, Harris)

Network ID	Network type	Trump	Biden	Harris	Pence
1	CIB	471	2	0	0
2	CIB	447	136	1	69
3	CIB	86	50	0	1
4	CIB	21	23	0	0
5	CIB	44	16	7	1
6	CIB	7	4	0	0
7	CIB	247	37	4	0
8	CIB	0	0	0	0
9	CIB	129,682	32,237	10,319	1,859
10	CIB	0	0	0	0
11	CIB	0	0	0	0
12	CIB	6	6	0	0
13	CIB	1	1	0	0
14	FMO	1	0	0	0
15	FMO	3	1	0	0
16	FMO	71	0	0	0
17	FMO	7	0	0	0
18	FMO	0	0	0	0
19	FMO	0	0	0	0
20	FMO	1	0	0	0
21	FMO	0	0	0	0
22	FMO	0	0	0	0
23	FMO	262	51	0	0
24	FMO	1,383	286	5	2
25	FMO	26	15	0	2
26	FMO	1	0	0	0
27	FMO	1,299	338	141	0
28	FMO	2	0	0	0
29	FMO	2,088	23	2	1
30	FMO	0	0	0	0
31	FMO	49	0	0	0
32	FMO	0	0	0	0
33	FMO	2	0	0	0
34	FMO	2,821	9	0	1
35	FMO	13,226	1,546	95	178
36	FMO	2,403	2,109	3,007	87
37	FMO	0	0	0	0
38	FMO	7	1	0	0
39	FMO	7	4	0	0
40	FMO	497	910	36	41
41	FMO	74	0	0	0
42	FMO	503	72	4	4
43	FMO	481	269	33	45
44	FMO	1,792	181	2	5
45	FMO	2	4	0	0
46	FMO	30	21	1	5
47	FMO	117	122	0	0
48	FMO	698	131	0	0
49	FMO	1	1	0	0

Note: See Definitions of Terms and Metrics for more details on how political candidate mentions were derived.
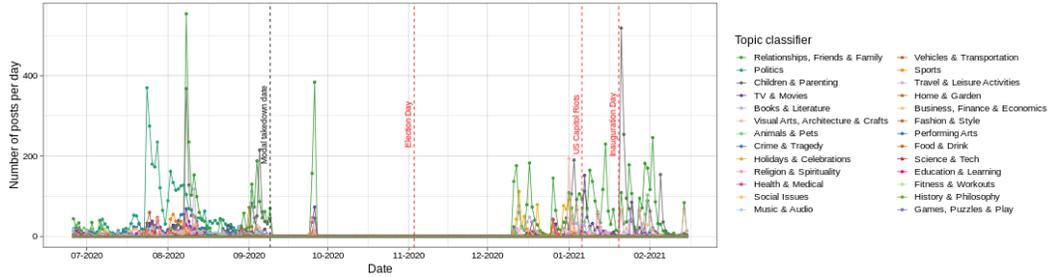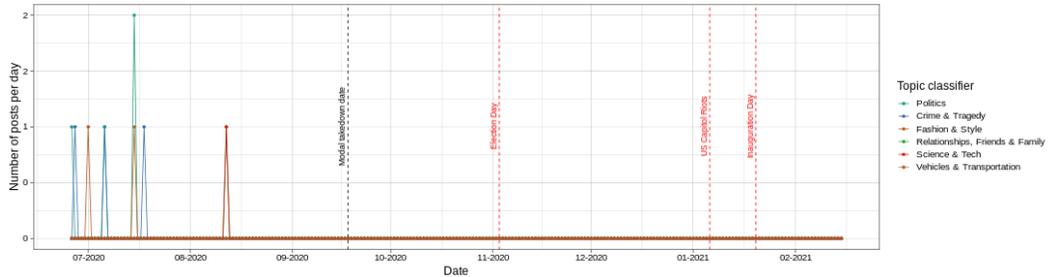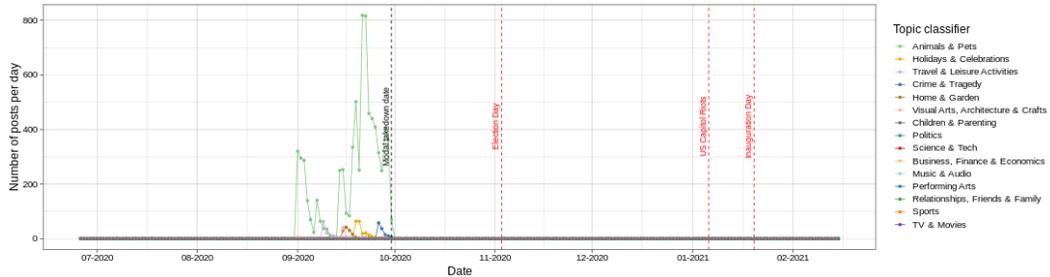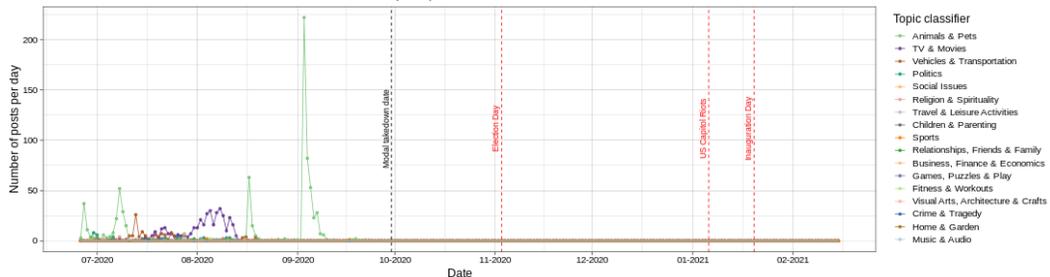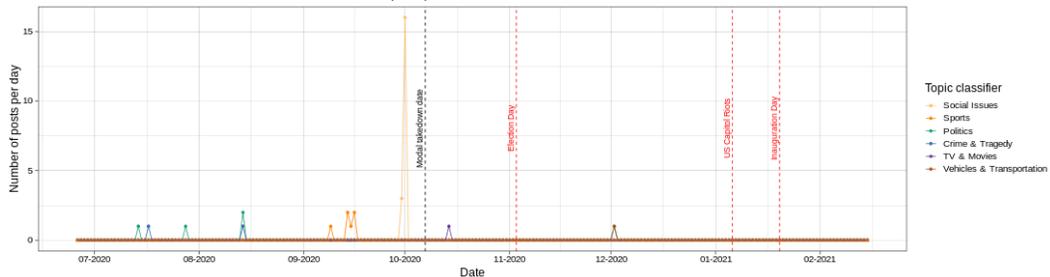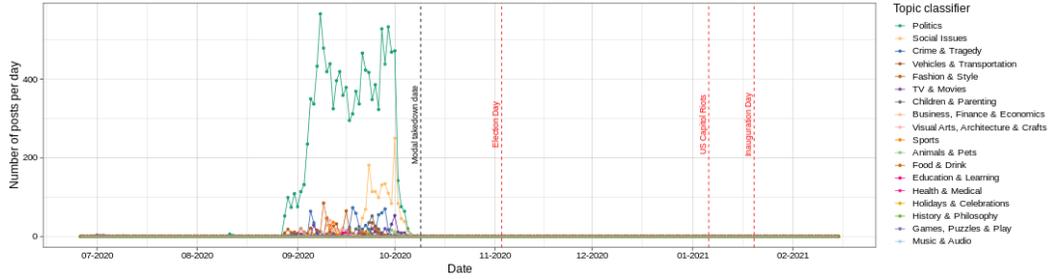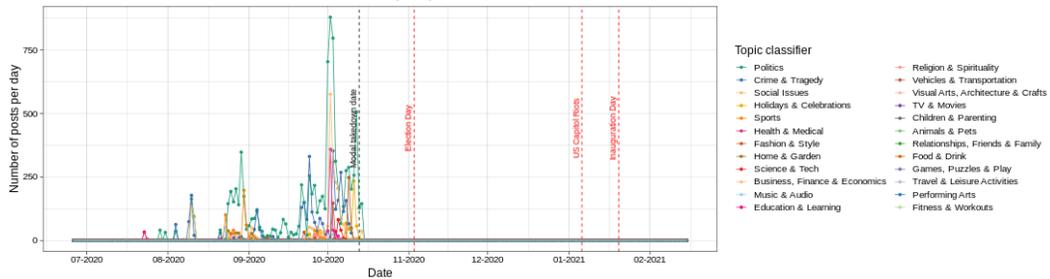
Table S44: Total number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook by classifier or category

Network ID	Network type	Civic	Content with slur words	COVID-19	Incivility	Political memes	Potentially false	Voter suppression	News	Local news
1	CIB	6,401	2	2,848	271	2,313	600	0	2,898	2
2	CIB	10,083	0	943	54	7,841	144	0	1,473	10
3	CIB	59,924	0	34,943	239	10,550	3,680	0	35,792	20
4	CIB	621	0	193	4	0	27	0	687	0
5	CIB	10,583	0	5,007	47	8,253	1,099	0	543	26
6	CIB	273	0	24	0	0	1	0	307	1
7	CIB	3,640	0	519	18	11	543	0	4,095	1
8	CIB	1,570	0	220	1	1	140	0	36	0
9	CIB	2,789,157	510	516,800	42,047	533,566	13,102	3	587,759	241
10	CIB	0	0	0	0	0	0	0	0	0
11	CIB	0	0	0	0	0	0	0	0	0
12	CIB	164	0	24	0	3	30	0	71	0
13	CIB	25	0	23	1	6	12	0	38	0
14	FMO	0	0	0	0	0	0	0	0	0
15	FMO	123,054	122	4,798	2,891	26,901	654	0	102,266	0
16	FMO	217	0	2	2	129	5	0	0	0
17	FMO	4,385	1	846	18	894	689	0	3,635	0
18	FMO	4	0	0	1	0	4	0	7	0
19	FMO	3	0	3	31	0	3	0	0	0
20	FMO	45	1	2	23	0	30	0	23	0
21	FMO	0	0	0	0	0	0	0	0	0
22	FMO	24	0	0	27	0	0	0	48	0
23	FMO	11,385	0	767	54	10,114	42	0	112	0
24	FMO	7,610	25	998	279	43	7,060	1	7,281	7
25	FMO	183	0	27	2	0	143	0	211	1
26	FMO	1	0	1	0	0	0	0	0	0
27	FMO	15,655	16	3,317	1,177	0	85	0	18,616	1
28	FMO	535	0	9	12	0	1	0	37	2
29	FMO	8,171	10	1,073	348	289	915	0	6,982	10
30	FMO	165	0	141	0	42	1	0	11	0
31	FMO	75	0	3	3	0	15	0	65	0
32	FMO	127	0	35	0	13	0	0	2	0
33	FMO	62	0	0	4	0	1	0	315	0
34	FMO	35,455	27	36,453	973	2,354	55	0	99,570	2
35	FMO	64,900	87	2,455	3,691	31,369	12,436	1	24,650	63
36	FMO	20,748	7	1,638	135	20,551	489	0	1,027	2
37	FMO	0	0	0	0	0	0	0	0	0
38	FMO	81	0	2	0	0	7	0	95	0
39	FMO	141	0	13	1	2	73	0	139	0
40	FMO	2,028	0	250	30	1,603	63	1	78	0
41	FMO	319	0	7	0	145	15	0	21	0
42	FMO	8,210	55	41	460	2	2,911	0	8,050	0
43	FMO	1,739	0	879	2	2	1	0	3,233	0
44	FMO	3,439	10	821	420	827	445	0	2,449	0
45	FMO	21	0	2	0	0	3	0	25	0
46	FMO	117	0	105	0	0	16	0	333	0
47	FMO	109	0	133	0	12	1	0	20	0
48	FMO	1,031	4	133	103	0	1,455	0	810	0
49	FMO	3	0	1	0	0	0	0	9	0

Note: See Meta Classifiers and Categorization Methods and Other Classifiers and Categorization Methods for more details on classifiers and categories.
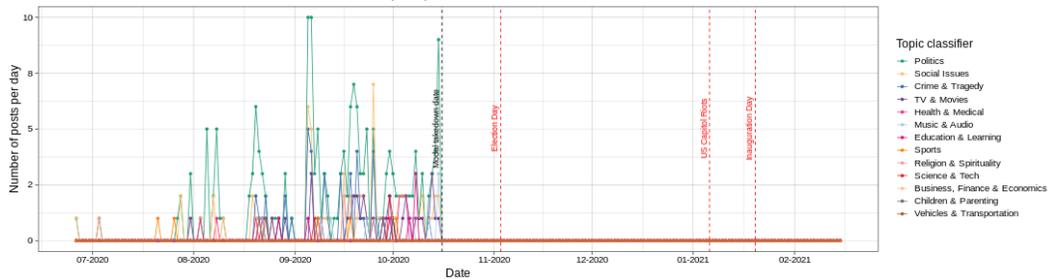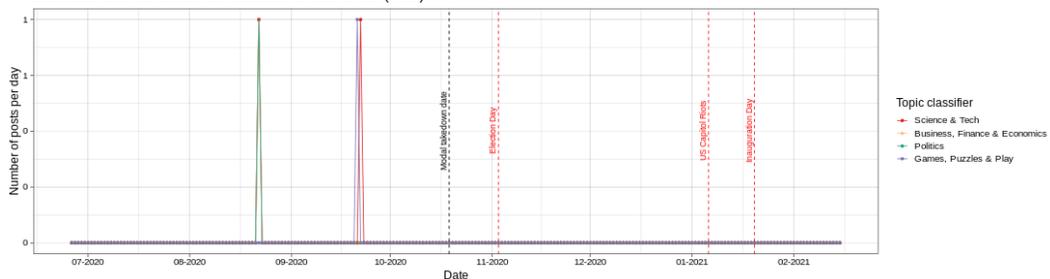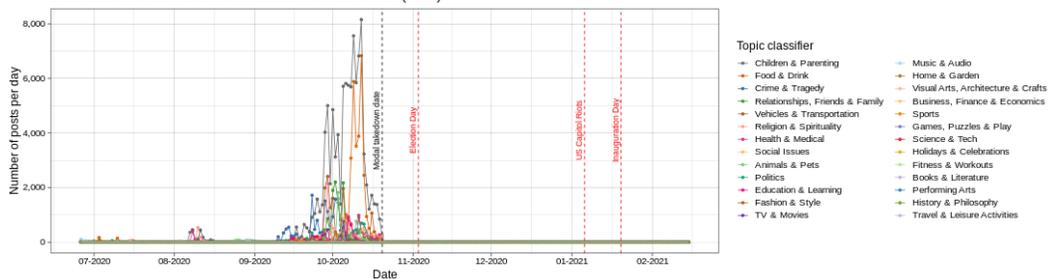
Figure S31: Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook over time by topic classifier
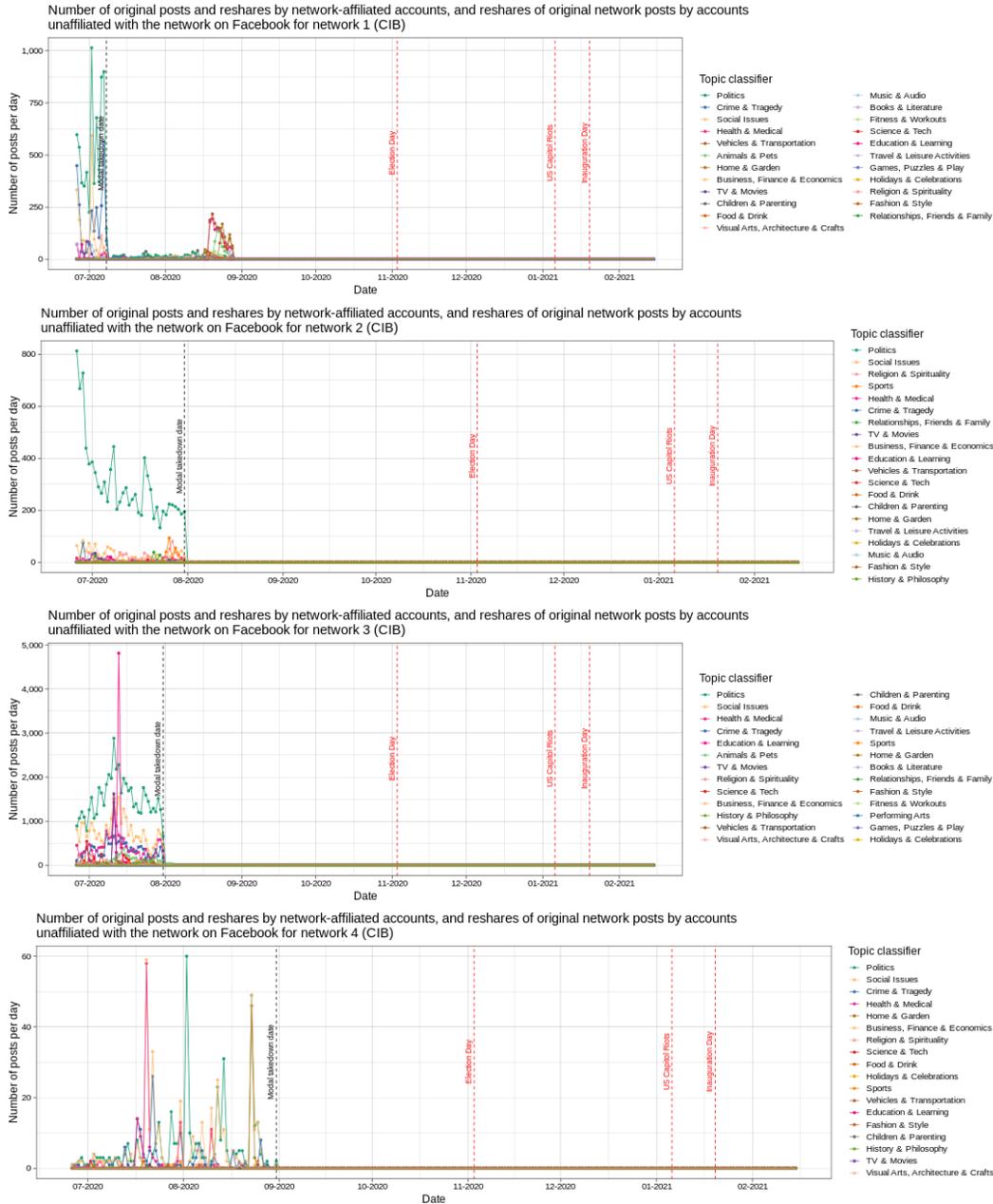
Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
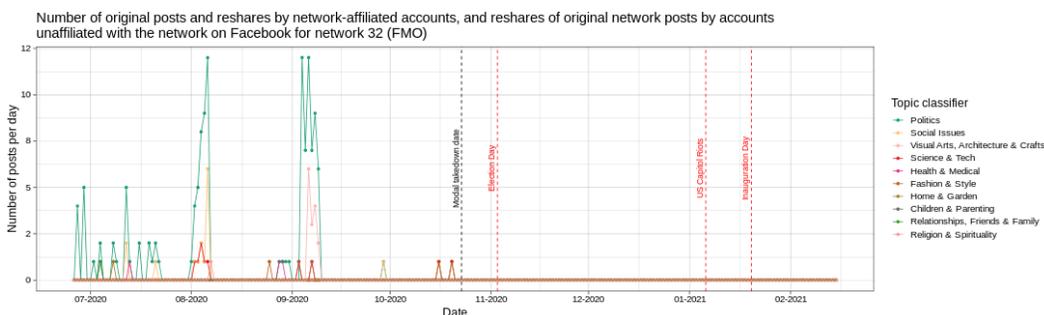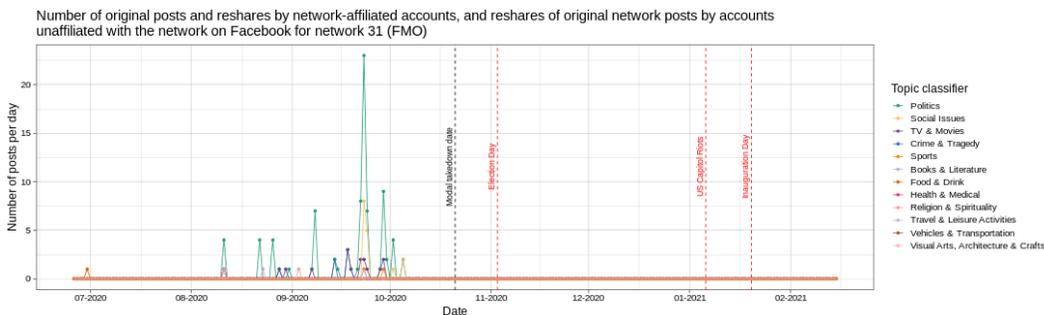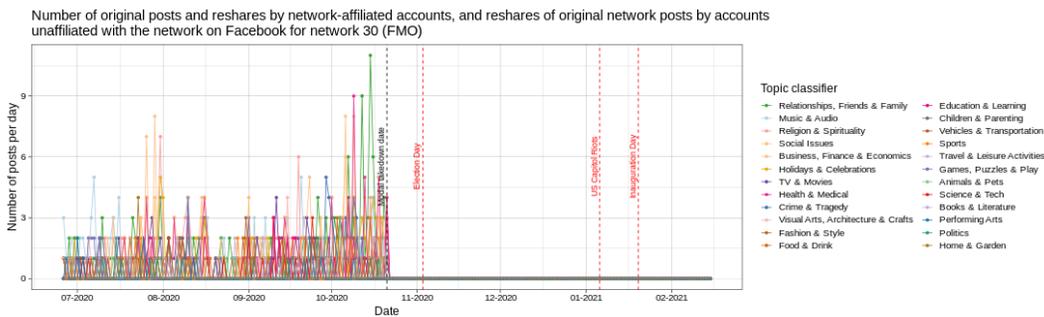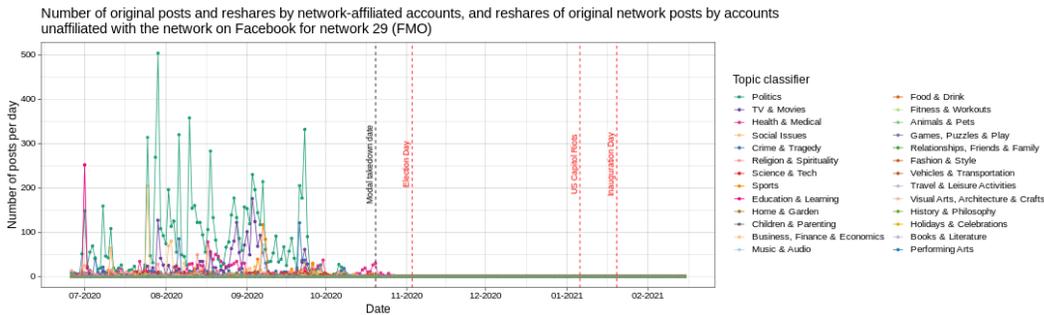unaffiliated with the network on Facebook for network 5 (CIB)
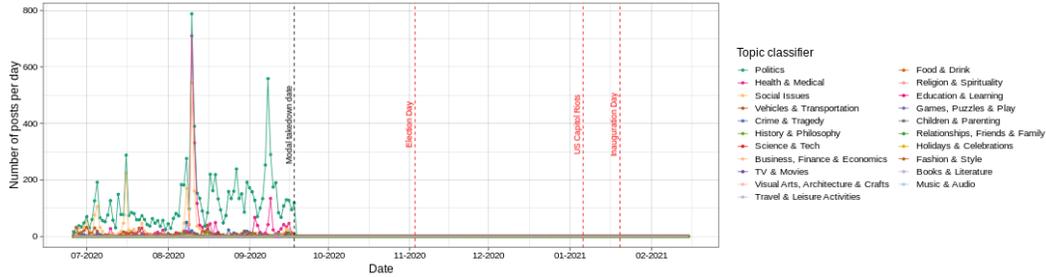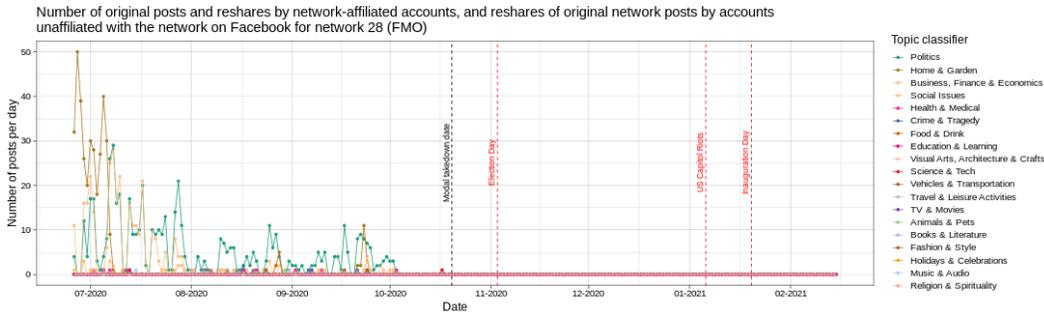

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 6 (CIB)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 7 (CIB)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 8 (CIB)
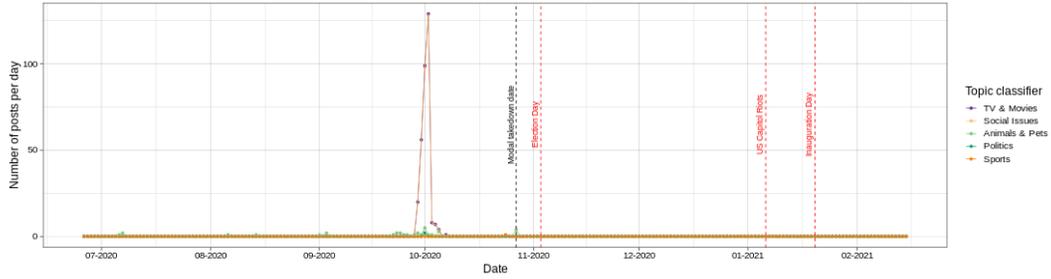

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 9 (CIB)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 12 (CIB)
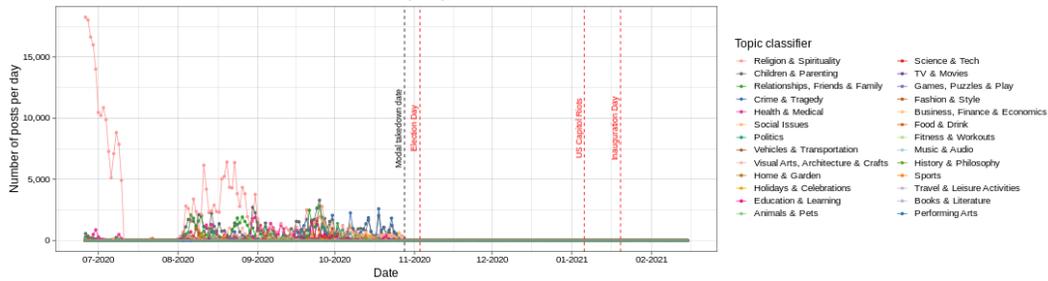

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 13 (CIB)
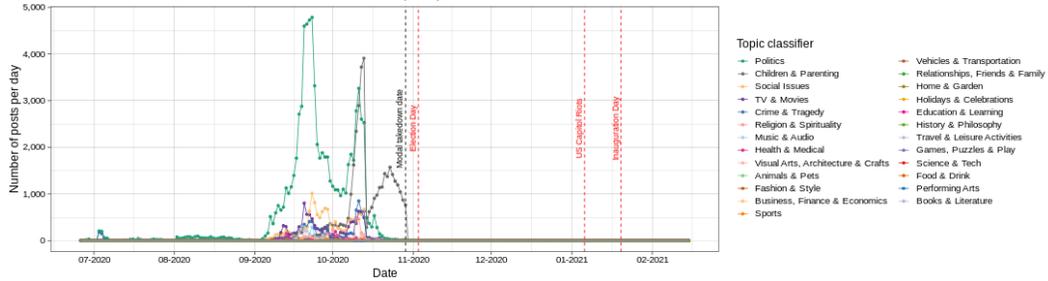

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 14 (FMO)

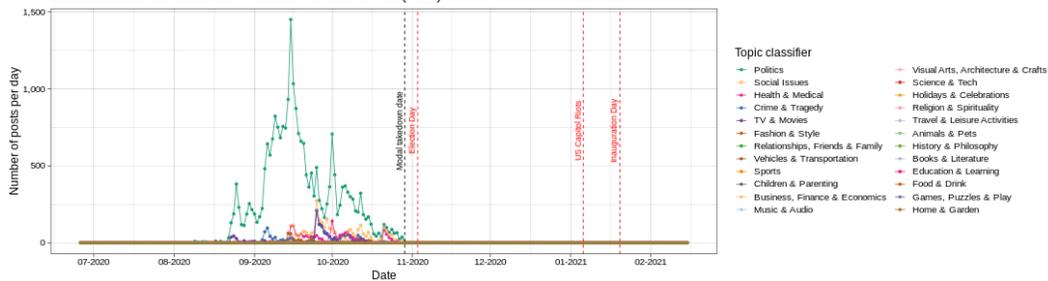Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 15 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 16 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 17 (FMO)
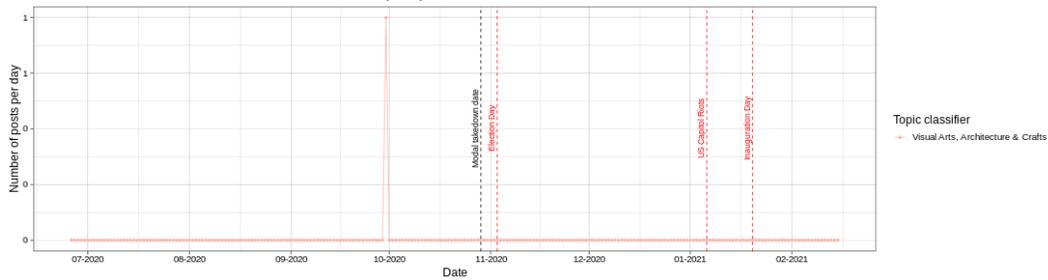

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 18 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 19 (FMO)

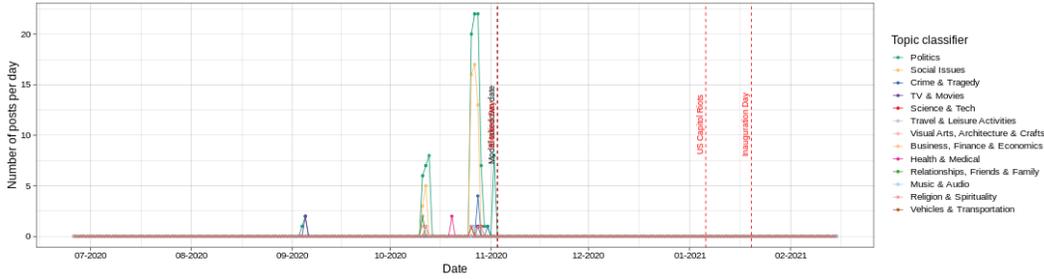Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 20 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 22 (FMO)
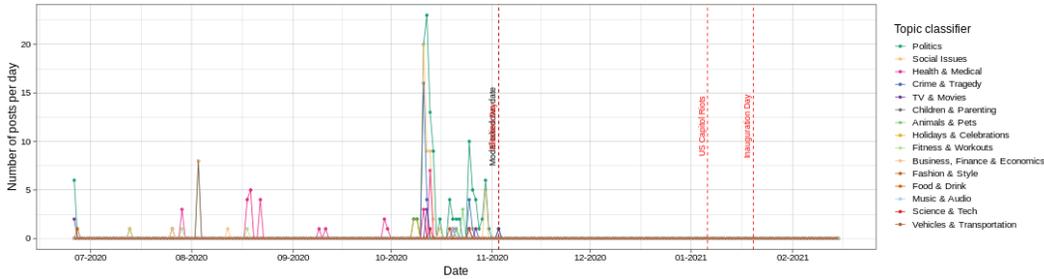
Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 23 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 24 (FMO)
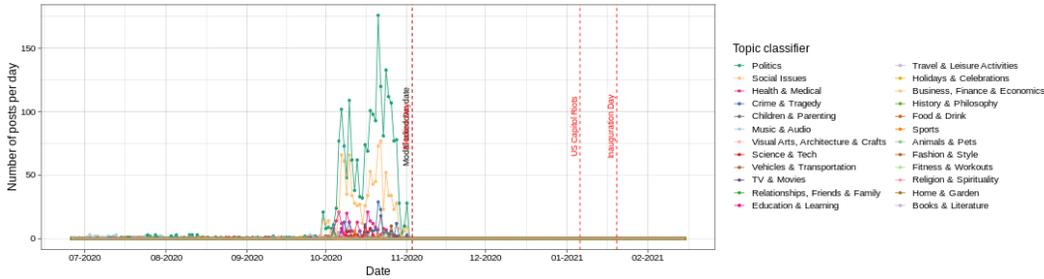

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 25 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 26 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 27 (FMO)
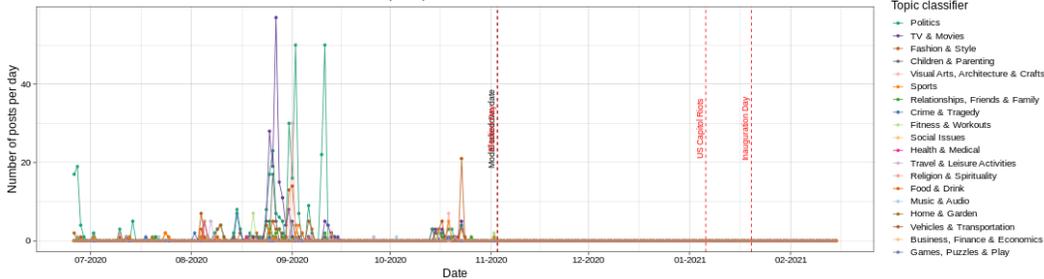
Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 28 (FMO)
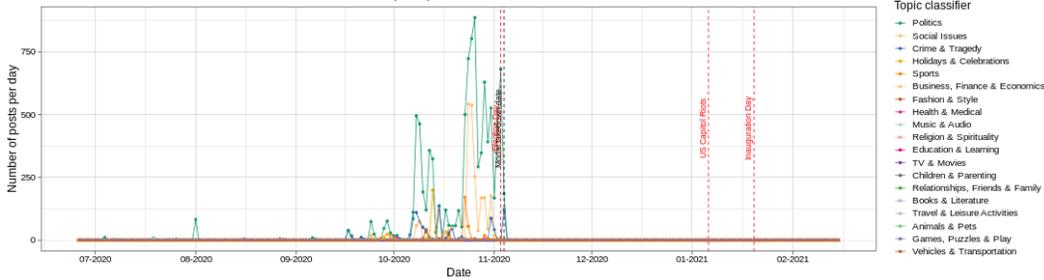
Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 29 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 30 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 31 (FMO)
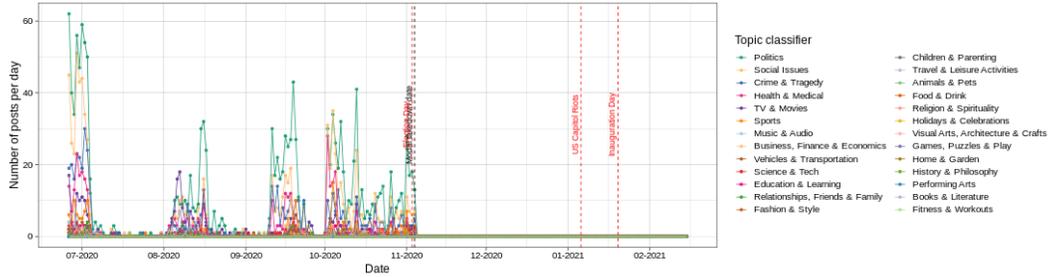
Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 32 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
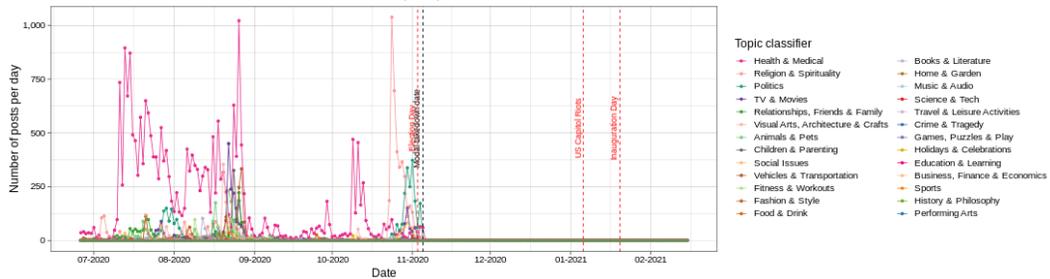unaffiliated with the network on Facebook for network 33 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 34 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 35 (FMO)

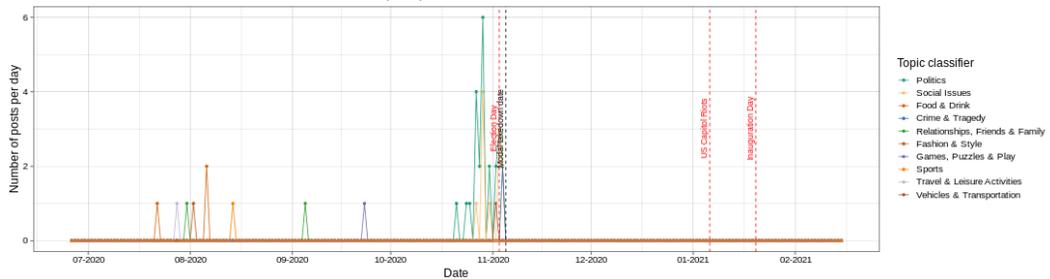Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 36 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
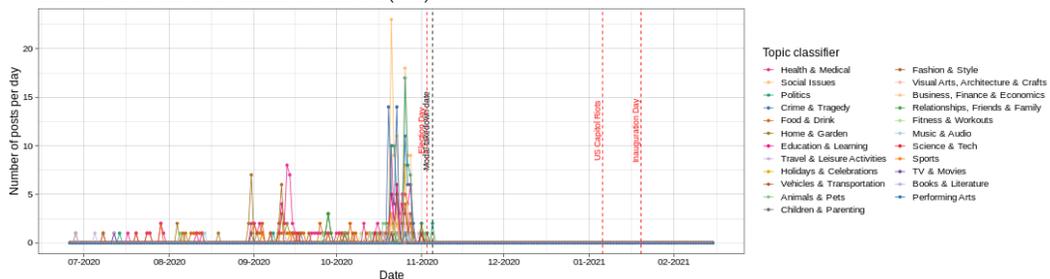unaffiliated with the network on Facebook for network 37 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 38 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 39 (FMO)
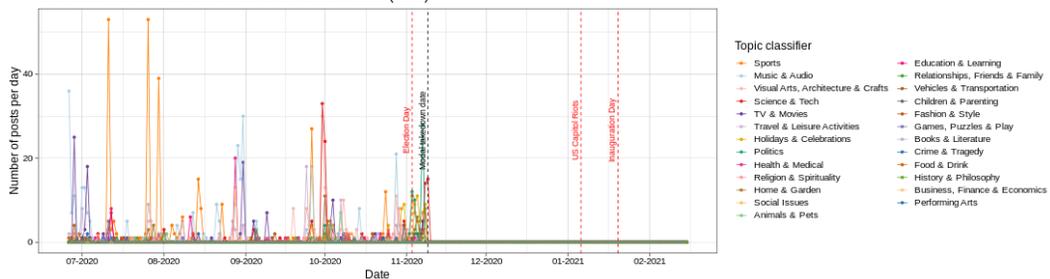

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 40 (FMO)

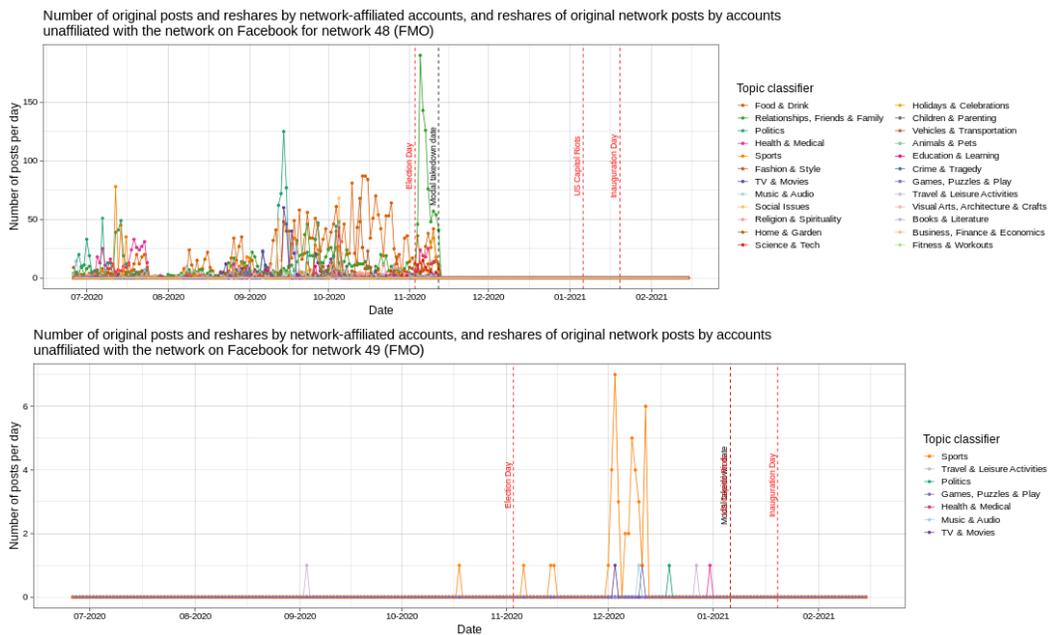Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 41 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 42 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 43 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 44 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 45 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 46 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts unaffiliated with the network on Facebook for network 47 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 48 (FMO)

Number of original posts and reshares by network-affiliated accounts, and reshares of original network posts by accounts
unaffiliated with the network on Facebook for network 49 (FMO)

Note: No data to show for networks: 10, 11, 21. See Meta Classifiers and Categorization Methods for a detailed description of the Topic classifier.

S7 Results of All Pre-registered Analyses

We provide all results of pre-registered analyses in a separate document, the Supplementary Repository (SR), which can be found at https://bit.ly/SupplementaryRepo (passcode: aZXGdq).

S8 Deviations and Clarifications

We disclose the following deviations from the pre-analysis plan (PAP), along with the justifications for altering the PAP.

Deviation #1 (see p. 13, footnote 22 of PAP): We planned to examine exposures to the selected network for downstream analysis (what we now refer to as correlational analysis) between survey Waves 2 and 3, 3 and 4, and 4 and 5. This means the data would have been aggregated between Wave 2 and 3, 3 and 4, and 4 and 5. However, because the survey-based outcomes we examine are in Wave 4 and the selected networks for the correlational analysis were active during Wave 3, we aggregate between Wave 2 and 4 to maximize the number of exposures (i.e., exposures to the network that occurred during the implementation of Wave 3 are now included, whereas those between Wave 4 and 5 are excluded).

Deviation #2 (see p. 16 of PAP): For the hierarchically regularized entropy balancing, we said we would include consenting respondents who had completed the relevant pre- and post-treatment survey waves and for whom platform- and survey-based variables had less than 1% missingness. To maximize the number of exposure to the selected networks from the participant data, we are including data from two sets of experimental interventions (the first set is chronological feed, no reshares, less like-minded content, and less untrustworthy content; the second set is no political ads and no targeted political ads); however, the pre-exposure variables between these two sets of studies did not fully overlap so there was greater than anticipated missingness. In all downstream analyses, we note the sample size.

Deviation #3 (see pp. 15-16 of PAP): We deviated from the PAP by using entropy balancing (ebal) instead of hierarchically regularized entropy balancing (hbal). This was done for several reasons. First, we found that full feature expansion (to the second order) was infeasible due to the overwhelming number of covariates. When we implemented limited feature expansion on subsets of pre-exposure covariates, the results did not change our findings substantively. Therefore, we turned off feature expansion (along with double selection), which makes hbal essentially the same as ebal. Note that the latter seeks an exact balance on all existing pre-exposure covariates. Retreating back to ebal is justified for two reasons. The primary motivation for using hbal was to control for at least as many covariates as ebal and potentially more, by adjusting for higher-order terms. However, since including (subsets of) higher-order terms does not change our results, going back ebal simplifies the method and makes it more accessible to readers. Second, our argument for a null result is strengthened by the inclusion of fewer pre-exposure covariates than originally planned, as it demonstrates robustness even without the inclusion of higher-order features.

Deviation #4 (see p. 6 of PAP): For the analyses of hazard, exposure and engagement, we planned to examine variation along user characteristics including the location variables: inferred state, inferred Congressional district. However, a variable indicating whether a state was a battleground state captured the variation across states that we were interested in, and we added additional location variables that might capture other important variation (e.g., population density, racial composition of location). Therefore, we we examined variation along user characteristics including the location variables: inferred census geographic division, inferred Congressional district, battleground state, swing district, population density tercile, majority Non-Hispanic/Non-Latino White Congressional District.

Deviation #5 (see p. 11 of PAP): We planned to analyze prior exposure to untrustworthy information users (users in top 20%, based on number VPVs to 3PFC or content from Repeat Offender

pages/groups/domains) vs. others. However, we did not have data on exposure prior to the start of the study period. Therefore, we analyzed exposure to content from untrustworthy sources (users in top 20) vs. others. See Untrustworthy Sources definition in SI Section S2.0.2.

Deviation #6 (see p. 8 of PAP): We planned to analyze the distribution of mentions of Trump and Biden overall, by content type, by channel, by paid (boosted posts and native ads) vs. unpaid. We also calculated this for Pence and Harris because we thought adding metrics on these candidates would provide a more comprehensive picture.

Deviation #7 (see p. 7 of PAP): We now refer to the "hateful and intolerant speech classification method" as the "content with slur words classifier" (see Section S2.0.3).

Deviation #8: We do not report all analyses described in the pre-analysis plan in the main text or Supplementary Information. This is because, when pre-registering this observational study, we did not know in advance what we would find and aimed to be as comprehensive as possible in describing how the data would be analyzed so that we would not miss key insights. The result is that many descriptive analyses outlined in the pre-analysis plan were explored but ultimately not included in the final paper. All such analyses are shown in the Supplementary Repository (see https://bit.ly/SupplementaryRepo, passcode: aZXGdq). Specifically, they include SR2.3 "Characteristics of Deceptive Online Networks" and SR2.4 "Reach of Deceptive Online Networks." Other portions of the SR, provides definitions of terms and metrics (SR1), repeating what is contained in S2 of this document, for ease of access; provide guidance on how to navigate the SR document (SR2.1) and additional notes on scope and definitions (SR2.2). The additional pre-registered analyses included in the SR do not differ from the main results, they simply encompass additional details or other aspects of deceptive online networks.

In addition to these explicit deviations, we also report the following clarifications for items that were somewhat unclear in the filed PAP:

Clarification #1 (see p. 4 of the PAP): The PAP states that we would examine the count of activity over time by classifier-based content categorizations, including News. We can only examine count of activity over time for News for Facebook as the classifier is not available for Instagram.

Clarification #2 (see pp. 5-6 of the PAP): The PAP states that we will examine reshares. We can only examine reshares of posts for Facebook and reshares for stories (but no other type of post) for Instagram. We cannot look at diffusion cascades for Instagram because other reshare data are not relevant for Instagram, and there is no diffusion cascade data.

Clarification #3 (see p. 5 of the PAP): For asset administration and membership, the PAP states that we will analyze the "density of co-admin ties." This is operationalized as the distribution of admins per Page and admins per group (5th, 50th, 95th percentile, mean and standard deviation).

Clarification #4 (see p. 6 of the PAP): Clarification regarding "date of takedown": if data is not available on the date of takedown, data comes from the closest preceding date for which data is available. If there is no preceding date, data comes the closest date after the takedown for which data is available.

Clarification #5 (see p. 10 of the PAP): The PAP states that we will examine the intensity of exposure in terms of absolute number of views. For organic posts we use "validated viewport views" (VPVs) to denote views, whereas for ads we use Legal Impressions. These are the correct metrics for the two types of content.

Clarification #6 (see p. 11 of the PAP): For the analyses of hazard, exposure and engagement, we planned to examine variation along user characteristics including the inferred Congressional district. We did not have any data for the Congressional district of Puerto Rico (PRPR), so it does not appear in our Congressional district map plots.

Clarification #7 (see pp. 7-8 of the PAP): The PAP states that we will look at network activity over time, topics, and candidate mentions by "channel (FB accounts, FB Pages, FB groups, IG accounts)". This definition was imprecise because the channel could be either the type of the account which created the data, or the content source (as defined in the section Definitions of Terms and Metrics). For activity over time, we analyze it for Facebook and Instagram by content source (which can take on the values Facebook user, Facebook Page, or Facebook group for Facebook, and the value Instagram user for Instagram). We also analyze activity over time for Facebook by the account type creating it (which can take on the values Facebook user and Facebook Page for Facebook). For Instagram, analyzing by account type is not insightful because the only account type are Instagram users, so this would be redundant with the analysis by content source or the number of posts with network content overall. We further analyze candidate mentions (for Facebook and Instagram) and topics (available for Facebook only) by content source.

Clarification #8 (see pp. 7 and 9): The PAP states that we analyze advertisements from deceptive online networks. We clarity that we look at ad activity over time and reach of ads as mentioned in the PAP. We did not break down ad activity and reach to the same extent as the activity and reach of organic posts, therefore we focus on the following metrics for ads: counts of network ads over time (overall and by candidate mention) for Facebook and Instagram combined, diffusion metrics (cascade size, cascade depth, cascade maximum breadth and structural virality overall) for Facebook, ad impressions for Facebook and Instagram combined (overall and for the different active user subgroups, separately for Facebook and Instagram).

Clarification #9 (see pp. 6): The PAP refers to the proportion of Facebook and Instagram

accounts self-locating in battleground states and congressional swing districts. The PAP does not specify how we would obtain information on where accounts are located. For self-location in this paper, we use inferred location.

Clarification #10 (throughout): The PAP uses the term "asset" to refer to accounts created by deceptive online networks. Throughout the paper, we use the word "account" and specify when we are dealing with network-affiliated accounts.

Clarification #11 (see p. 11 of PAP): The PAP specified that we would examine reach of deceptive online networks by user characteristics including users' "prior exposure to untrustworthy information users (users in top 20%, based on number VPVs to 3PFC or content from Repeat Offender Pages/groups/domains) vs. others." Instead of "untrustworthy information," the correct terminology is "content from untrustworthy sources." The precise definition relates to Meta's Repeat Offender Policy as well as third-party fact-checkers and is provided in Section S2.0.2.

Clarification #12 (see p. 10 of PAP): The PAP states that "A view of campaign content is defined as post from campaigns on users' surface, post/reshare of others' content from campaigns on users' surface, and posts from campaigns and VPVs of them reshared on other surfaces." While this is correct for Facebook, on Instagram, a view of campaign content (what we now refer to as network content) is defined as a view of original content.

Clarification #13 (see p. 5 of PAP): The PAP states that we will analyze "[n]ode properties (where each removed asset is a node, and edges include linkages known to Meta): degree, strength, closeness, betweenness" and "[n]etwork properties: size, mean distance, edge density, reciprocity, transitivity". We provide these network metrics for the network of Facebook users. More specifically, we provide networks metrics on their engagements with other network user accounts. This implementation decision thus does not include other types of nodes, such as network-affiliated Facebook Pages or groups.

Clarification #14: All non-integer numeric variables in this study's replication data contain double-precision floating-point numbers and are therefore subject to floating point error. Given double-precision floating point numbers have 15.95 decimal digits of precision, and differences smaller than 1e-17 are within their margin of error, we have rounded the results of all computations involving variables of this data type to the 15th decimal digit. For participant datasets containing multiple rows per participant, some platform data variables known to contain duplicate values across rows in practice have minor numeric differences in the last few digits due to floating point error. To address this issue, we consistently selected the value in the first row per participant as it appeared in the data for these variables during data processing.

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