

Informational Asymmetries in the **Consumption and Production** of **Digital Media**

Subhayan Mukerjee, Ph.D.

Department of Communications and New Media

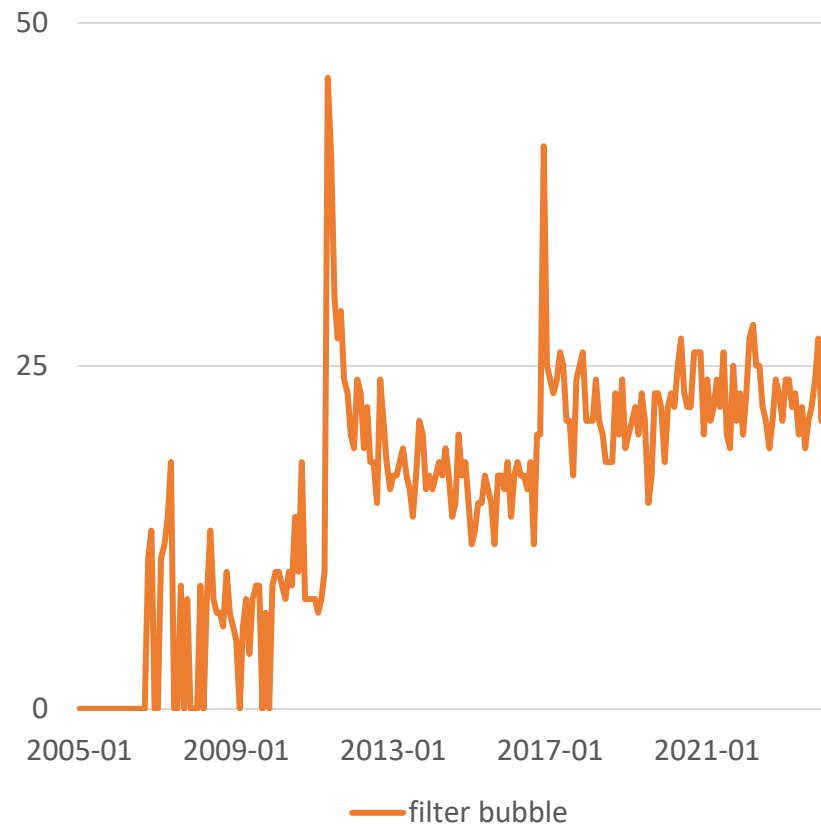
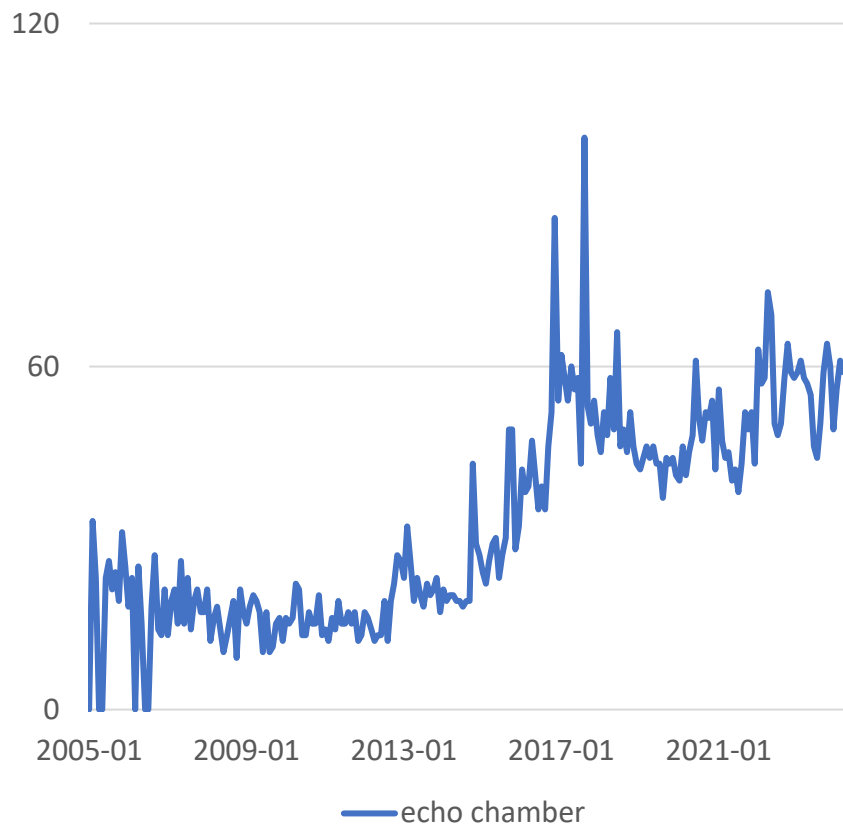
Centre for Trusted Internet and Community



NUS
National University
of Singapore

The 2010s was the decade of the Echo Chamber.

... and its closely related cousin, the Filter Bubble.



Worldwide Google Search Trends (2005 – present) [\(Source\)](#)

IN THEORY

Opinion | Confir



SECURITY POLITICS G

News Opinion Spor

World UK Climate crisis Ukraine

WIRED SECURITY POLITICS GEAR BACKCHANNEL BUSINESS MORE

KARTIK HOSANAGAR BUSINESS NOV 25, 2016 7:00 AM

Blame the Echo Chamber on Facebook. But Blame Yourself, Too

Opinion: It's easy to criticize Facebook for filtering our news. But when we fail to click on stories presenting opposing viewpoints, it's our fault.



POLICY

Technologists are trying to fix the "filter bubble" problem that tech helped create

as clear-cut as people think.

NOVEMBER 28, 2016 | 6 MIN READ

Fake Online News Spread in Social Echo Chambers

Online recommendation systems

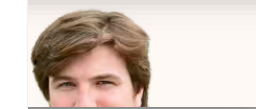


ANTISOCIAL NETWORKS —

The social media "echo chamber"

Active social media users are self-segregated and polarized

ROHEENI SAXENA - 3/14/2017, 2:25 AM



EMAILS

serious problem Gates



... we trapped within
... online filter bubbles?



Technologists are trying to fix the “filter bubble” problem that tech helps

as clear-cut as people think

NOVEMBER 28, 2016 | 6 MIN READ

Fake Online News & Social Echo Chambers

Online recommendation systems

ars TECHNICA

ANTISOCIAL NETWORKS —

The social media “echo chamber”

Active social media users are self-segregated and polarized

ROHEENI SAXENA - 3/14/2017, 2:25 AM

KARTIK HOSANAGAR

BUSINESS NOV 25, 2016 7:00 AM

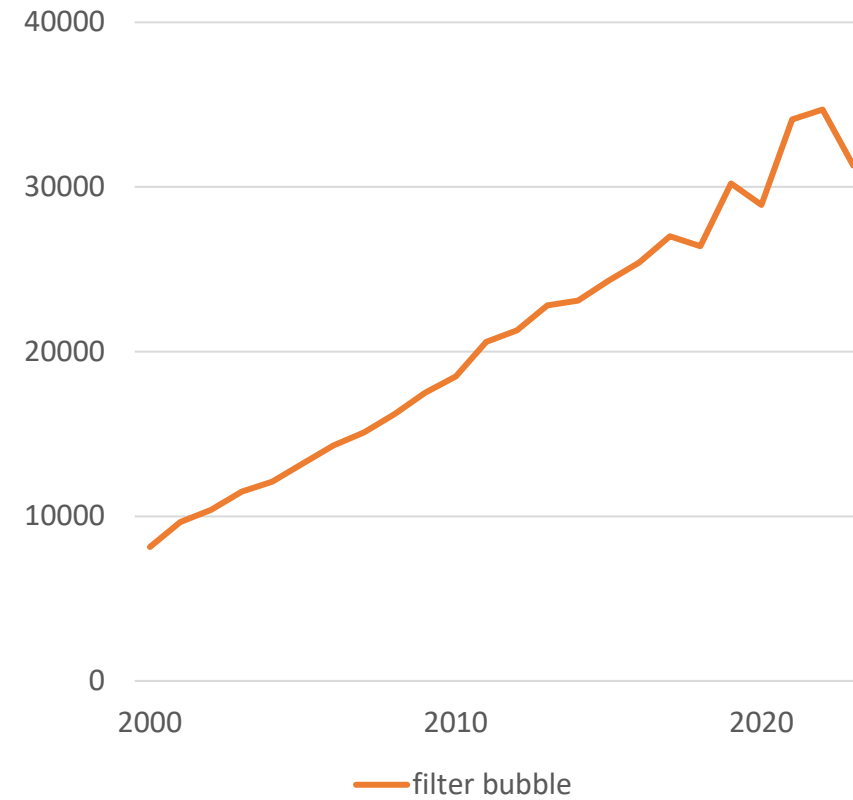
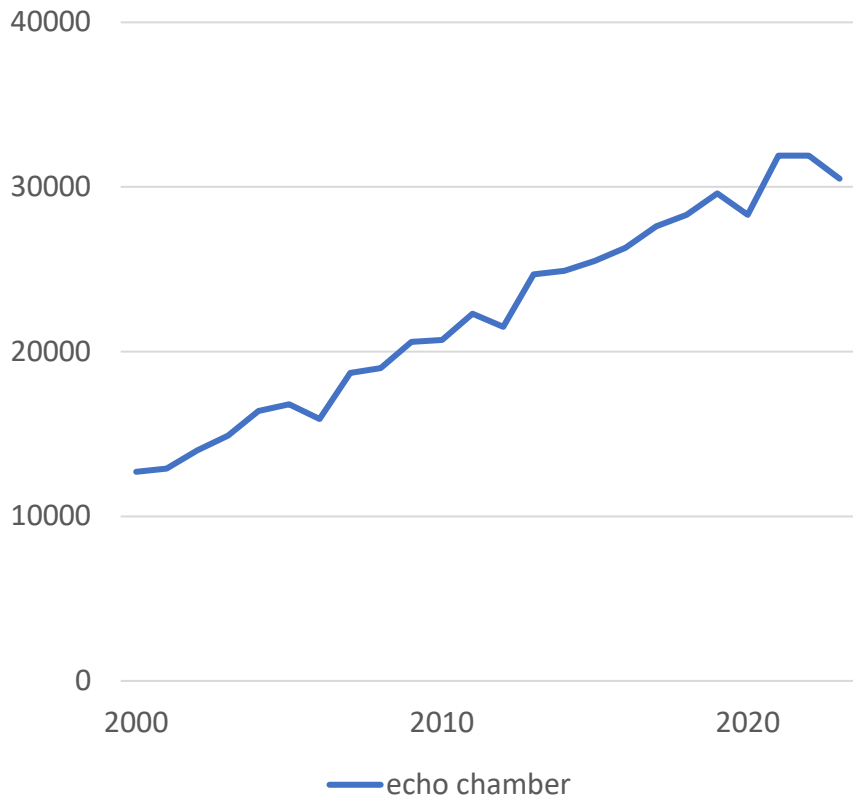
Blame the Echo Chamber on Facebook. But Blame Yourself, Too

Opinion: It's easy to criticize Facebook for filtering our news. But when we fail to click on stories presenting opposing viewpoints, it's our fault.



Are we trapped within online filter bubbles?





Google Scholar Keyword Trends (2000 – present)

Volker Strobel. (2018, April 14). Pold87/academic-keyword-occurrence: First release (Version v1.0.0). Zenodo. <http://doi.org/10.5281/zenodo.1218409>

The death of the echo chamber?



**KNIGHT
FOUNDATION**

AVOIDING THE ECHO CHAMBER ABOUT ECHO CHAMBERS:

Why selective exposure to like-minded
political news is less prevalent than you think

ANDREW GUESS

Department of Politics
Princeton University
aguess@princeton.edu

BRENDAN NYHAN

Department of Government
Dartmouth College
nyhan@dartmouth.edu

BENJAMIN LYONS

Department of Politics
University of Exeter
b.lyons@exeter.ac.uk

JASON REIFLER

Department of Politics
University of Exeter
j.reifler@exeter.ac.uk

knightfoundation.org | @knightdn

Guess, A., Nyhan, B., Lyons, B., & Reifler, J. (2018).
Avoiding the echo chamber about echo chambers. *Knight
Foundation*, 2(1), 1-25.



NUS
National University
of Singapore



KNIGHT
FOUNDATION

AVOIDING THE ECHO CHAMBER ABOUT ECHO CHAMBERS:

Why selective exposure to like-minded
political news is less prevalent than you think

—

ANDREW GUESS

Department of Politics
Princeton University
aguess@princeton.edu

BRENDAN NYHAN

Department of Government
Dartmouth College
nyhan@dartmouth.edu

BENJAMIN LYONS

Department of Politics
University of Exeter
b.lyons@exeter.ac.uk

JASON REIFLER

Department of Politics
University of Exeter
j.reifler@exeter.ac.uk

Guess, A., Nyhan, B., Lyons, B., & Reifler, J. (2018).
Avoiding the echo chamber about echo chambers. *Knight
Foundation*, 2(1), 1-25.



Echo Chambers, Filter Bubbles, and Polarisation: a Literature Review

Amy Ross Arguedas, Craig T. Robertson,
Richard Fletcher, and Rasmus K. Nielsen



Ross Arguedas, A., Robertson, C., Fletcher, R., & Nielsen, R. (2022). Echo chambers, filter bubbles, and polarisation: A literature review.

Echo Chambers, Filter Bubbles

In summary, the work reviewed here suggests echo chambers are much less widespread than is commonly assumed, finds no support for the filter bubble hypothesis and offers a very mixed picture on polarisation and the role of news and media use in contributing to polarisation.

Am
Richard Fletcher, and Rasmus K. Nielsen



Ross Arguedas, A., Robertson, C., Fletcher, R., & Nielsen, R. (2022). Echo chambers, filter bubbles, and polarisation: A literature review.

... but what about selective exposure?

... but what about selective exposure?

**Decades of social science research tells us
that selective exposure is real.**

... but what about selective exposure?

**Decades of social science research tells us
that selective exposure is real.**

**How then, do we explain the lack of echo-
chambers?**

... but what about selective exposure?

Decades of social science research tells us that selective exposure is real.

How then, do we explain the lack of echo-chambers?

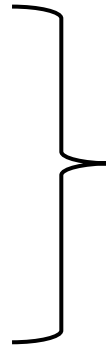
(One) Answer lies in how we define selective exposure.

**Democrat versus Republican
Liberal versus Conservative
Remain versus Leave (Brexit)
Left versus Right**



Partisanship

Democrat versus Republican
Liberal versus Conservative
Remain versus Leave (Brexit)
Left versus Right



Partisanship

**This presupposes the prominence of
politics in the lives of ordinary people.**

People don't care about politics.



~~People don't care about politics.~~

People care far less about politics than we think.



Outline

• **Study 1: The Political Landscape of the US Twitterverse**

• **Study 2: Metrics in Action: How Facebook Metrics Dictate News Production**

Study 1


The Political Landscape of the U.S Twitterverse

POLITICAL COMMUNICATION
<https://doi.org/10.1080/10584609.2022.2075061>

 **Routledge**
Taylor & Francis Group

 Check for updates

The Political Landscape of the U.S. Twitterverse

Subhayan Mukerjee ^a, Kokil Jaidka ^a, and Yphtach Lelkes ^b

^aDepartment of Communications and New Media, National University of Singapore, Singapore; ^bAnnenberg School for Communication, University of Pennsylvania Philadelphia, Pennsylvania, USA

ABSTRACT

Prior research suggests that Twitter users in the United States are more politically engaged and more partisan than the American citizenry, who are generally characterized by low levels of political knowledge and disinterest in political affairs. This study seeks to understand this disconnect by conducting an observational analysis of the most popular accounts on American Twitter. We identify opinion leaders by drawing random samples of ordinary American Twitter users and observing whom they follow. We estimate the ideological leaning and political relevance of these opinion leaders and crowdsource estimates of perceived ideology. We find little evidence that American Twitter is as politicized as it is made out to be, with politics and hard news outlets constituting a small subset of these opinion leaders. Ordinary Americans are significantly more likely to follow nonpolitical opinion leaders on Twitter than political opinion leaders. We find no evidence of polarization among these opinion leaders either. While a few political professional categories are more polarized than others, the overall polarization dissipates when we factor in the rate at which the opinion leaders tweet: a large number of vocal nonpartisan opinion leaders drowns out the partisan voices on the platform. Our results suggest that the degree to which Twitter is political has likely been overstated in the past. Our findings have implications about how we use Twitter and social media, in general, to represent public opinion in the United States.

KEYWORDS

Twitter; social media; politicization; polarization; echo-chambers

Mukerjee, S., Jaidka, K., & Lelkes, Y. (2022). The political landscape of the US Twitterverse. *Political Communication*, 39(5), 565-588.



Background

Twitter as a highly **politically charged** platform

Initial Q: How polarized is Twitter?

However, when we looked at the data, we quickly changed our question to:

How political is Twitter, really?

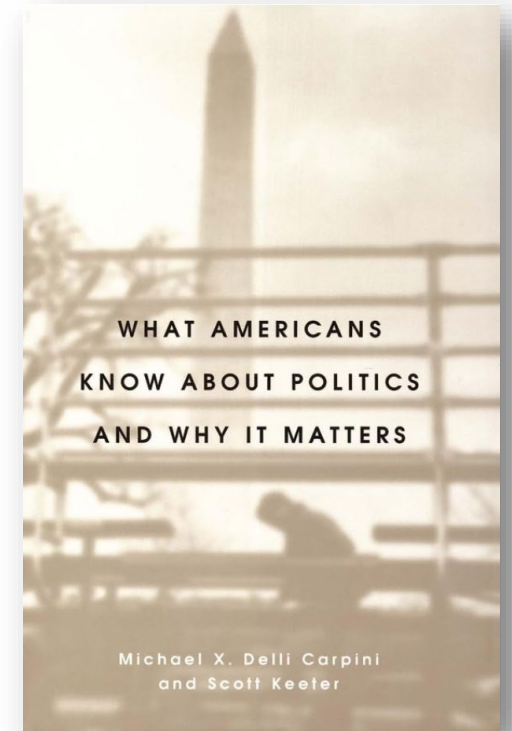
Background

Americans are notoriously **uninterested** in politics.

Has among the **lowest voter turnouts** among developed countries

Severely **low levels** of political knowledge

Is this reflected in their use of Twitter?



Carpini, M. X. D., & Keeter, S. (1996). What Americans know about politics and why it matters. Yale University Press.



What we did

**Collect a large geo-tagged sample of
American Twitter users**

What we did

**Collect a large geo-tagged sample of
American Twitter users**

**Obtain their friend networks
(i.e. which accounts do they follow?)**

What we did

Collect a large geo-tagged sample of
American Twitter users

Obtain their friend networks
(i.e. which accounts do they follow?)

Identify the most followed “elites” on American Twitter

What we did

Collect a large geo-tagged sample of
American Twitter users

Obtain their friend networks
(i.e. which accounts do they follow?)

Identify the most followed “elites” on American Twitter

Each “elite” becomes the unit of analysis

Who or What is important on Twitter, is not pre-decided, but informed by behavioural trace data

What we did

Collect a large geo-tagged sample of
American Twitter users

Obtain their friend networks
(i.e. which accounts do they follow?)

Identify the most followed “elites” on American Twitter

Each “elite” becomes the unit of analysis

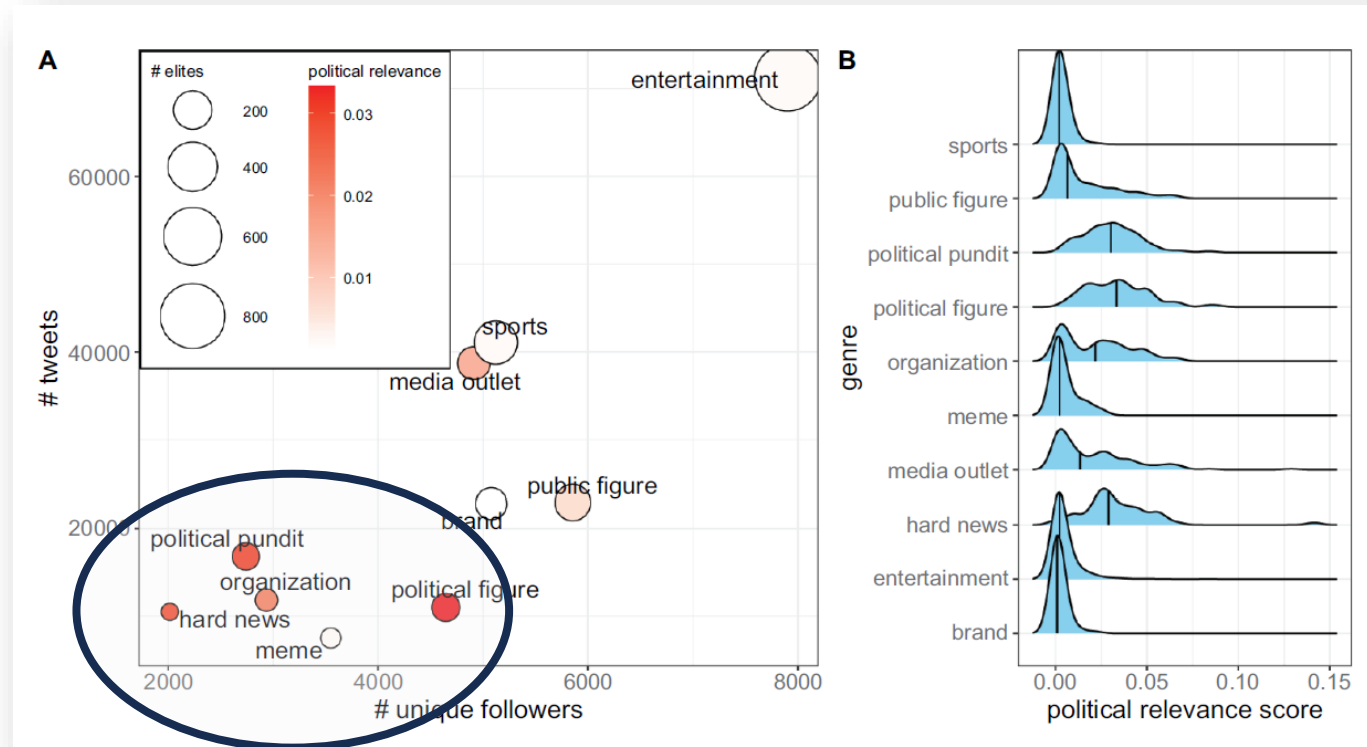
**Categorized manually
into genres**
(sports, politics, media, entertainment
etc)

**Ideological slant
inferred**
(Bayesian ideal point estimation
techniques)

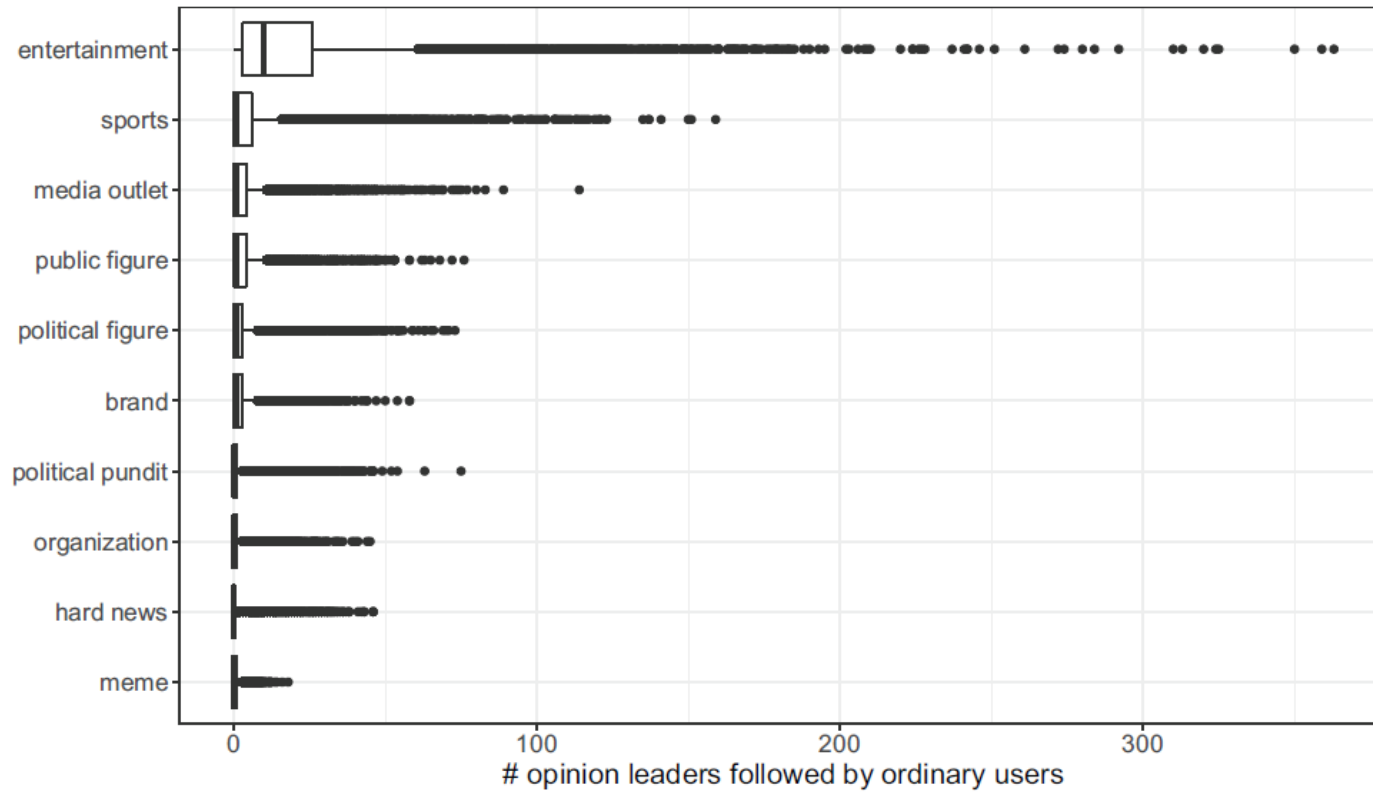


Findings

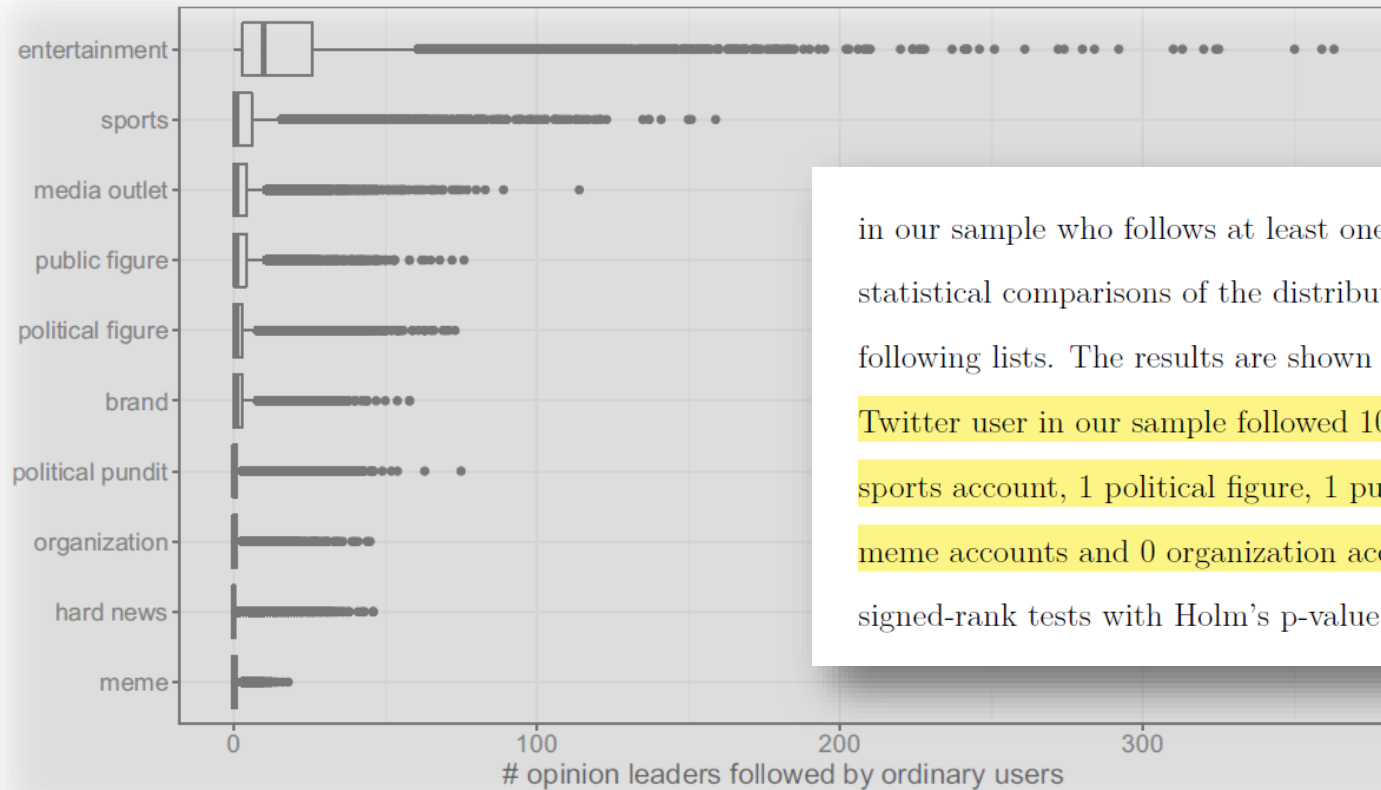
Politics is a sideshow on Twitter!



Findings



Findings

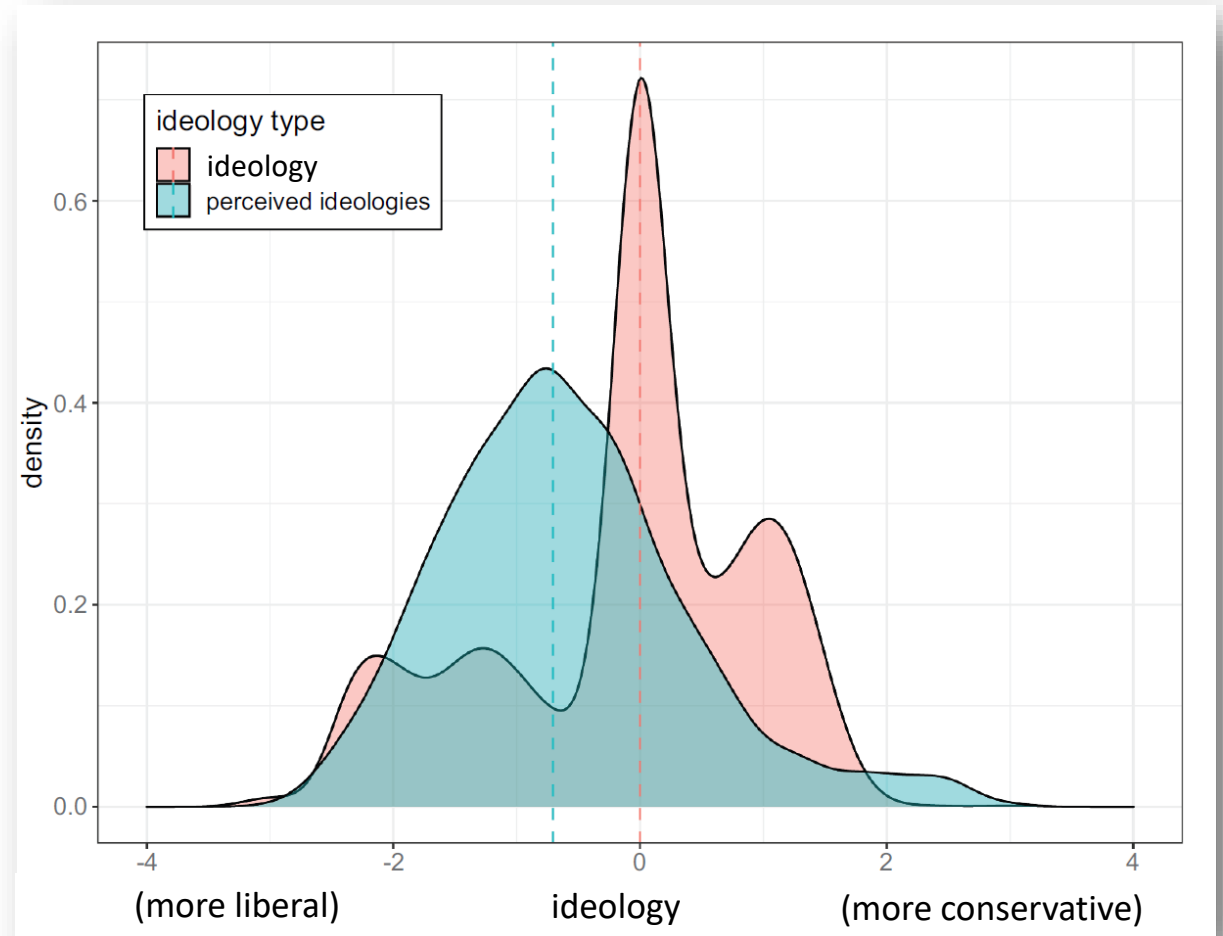


in our sample who follows at least one account ($N = 9378$), we make non-parametric statistical comparisons of the distribution of opinion leaders (by category) in their following lists. The results are shown in Figure 2 (panel A). We find that the median Twitter user in our sample followed 10 entertainment accounts, 1 brand account, 1 sports account, 1 political figure, 1 public figure, 0 political pundits, 0 hard news, 0 meme accounts and 0 organization accounts. Pairwise paired one-sided Wilcoxon's signed-rank tests with Holm's p-value correction show that of all possible 45

Findings

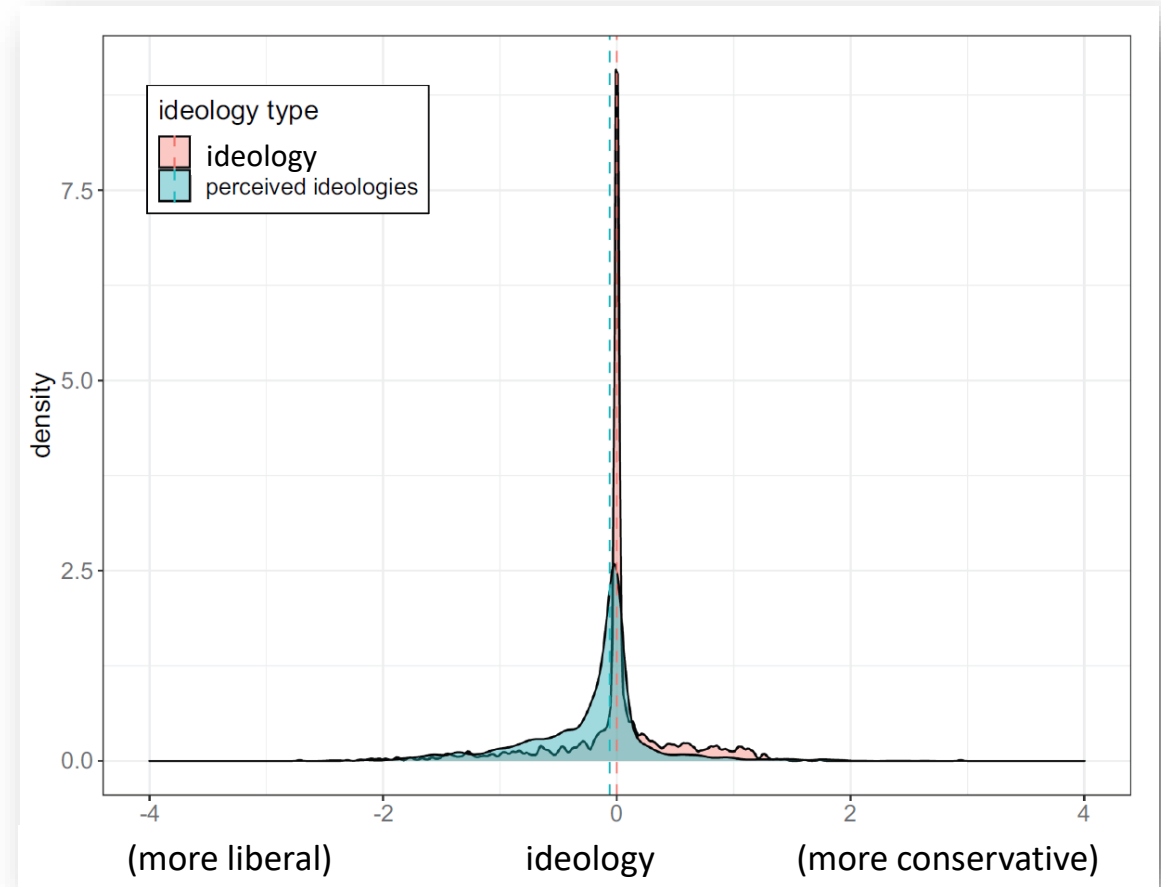
The **pink** distribution shows the lack of polarization in ideologies

The **cyan** distribution shows the lack of polarization in perceived ideologies (according to Mturk workers)



Findings

**Once “weighted” –
those who tweet more
get a higher weight –
polarization completes
disappears.**



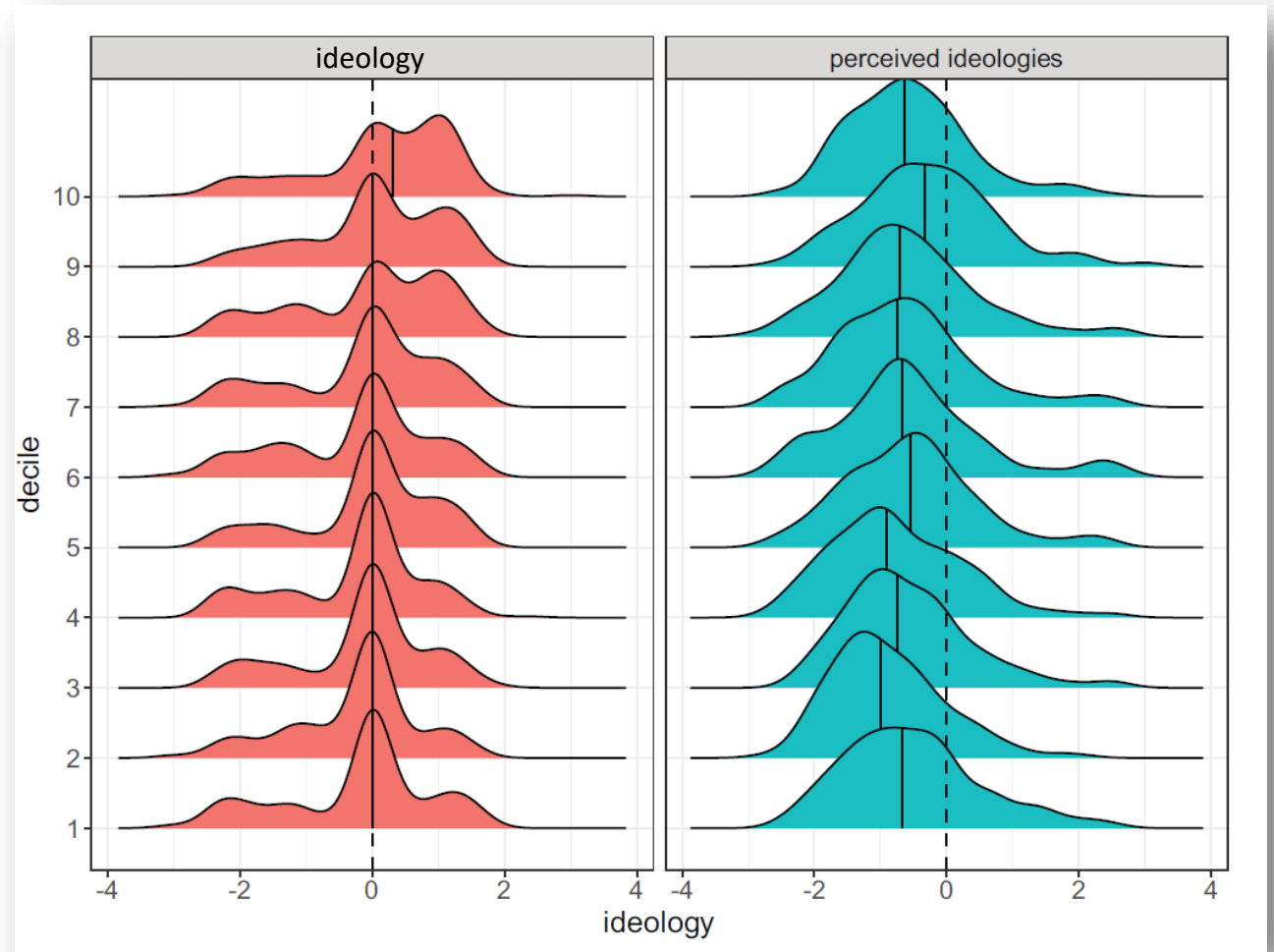
Findings

Considerably more right-wing elites among the most active tweeters than among the least active tweeters

Most active tweeters



Least active tweeters



What does all this mean?

Much scholarship about political communication **presumes the prominence of politics** in people's everyday lives

Findings are often an artefact of this assumption

What does all this mean?

Much scholarship about political communication **presumes the prominence of politics** in people's everyday lives

Findings are often an artefact of this assumption

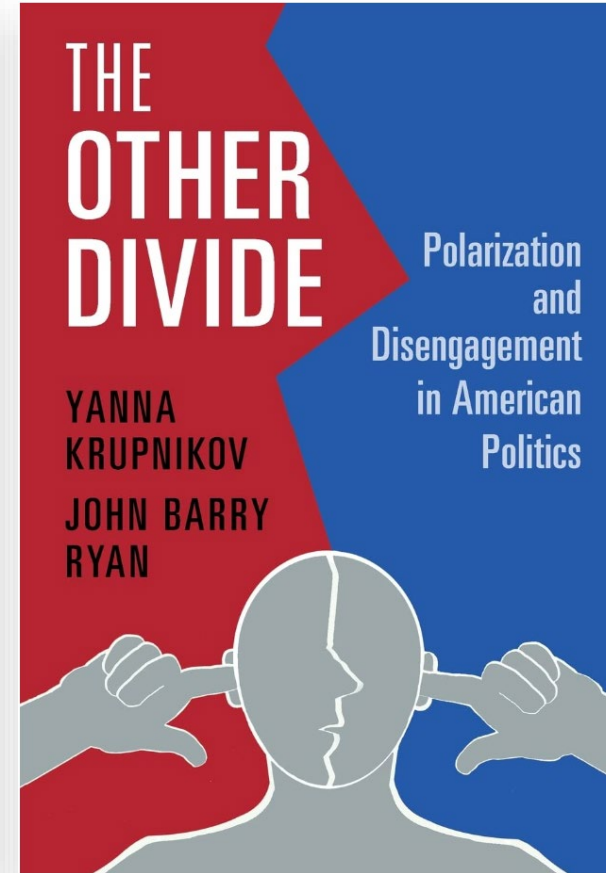
There are two key asymmetries we find –

Right wing elites tweet more than left wing elites

More importantly, most people don't care too much about politics

We scholars are in an echo-chamber, just not the one we think!

Supporting Evidence



Krupnikov, Y., & Ryan, J. B. (2022). *The Other Divide*. Cambridge University Press.



Study 2

Metrics in Action: How Facebook Metrics Dictate News Production

Journal of Communication, 2023, 00, 1–13
<https://doi.org/10.1093/joc/jqad012>
Original Article



Metrics in action: how social media metrics shape news production on Facebook

Subhayan Mukerjee¹, Tian Yang², Yilang Peng^{3,*}

¹Department of Communications and New Media, National University of Singapore, Singapore

²School of Journalism and Communication, The Chinese University of Hong Kong, Hong Kong, China

³Department of Financial Planning, Housing and Consumer Economics, University of Georgia, Athens, Georgia, USA

*Corresponding author: Yilang Peng. Email: yilang.peng@uga.edu

Abstract

Social media metrics allow media outlets to get a granular, real-time understanding of audience preferences, and may therefore be used to decide what content to prioritize in the future. We test this mechanism in the context of Facebook, by using topic modeling and longitudinal data analysis on a large dataset comprising all posts published by major media outlets used by American citizens ($N \approx 2.23M$, 2015–2019). We find that while the overall effect of audience engagement on future news coverage is significant, there is substantial heterogeneity in how individual outlets respond to different kinds of topics. A handful of right-wing media outlets are more likely to respond to audience engagement metrics than other outlets, but with partisan politics topics and not with entertainment-oriented content. Our research sheds new light on how social media platforms have shaped journalistic practices and has implications for the future health of journalism in the United States.

Keywords: audience engagement, Facebook, metrics, news production, partisan media, social media

Mukerjee, S., Yang, T., & Peng, Y. (2023). Metrics in action: how social media metrics shape news production on Facebook. *Journal of Communication*, 73(3)



Motivation

When the news moved online, journalists were suddenly able to get a granular understanding of what their audiences actually liked.

Did this change how journalists did their job?

Motivation

Specifically, do journalists **use social media engagement metrics** to decide what news to publish?

Are there **similar divides in news production** on social media as there are in consumption?

Left leaning outlets versus right leaning outlets?

Political topics versus non-political topics?

Methods: Data

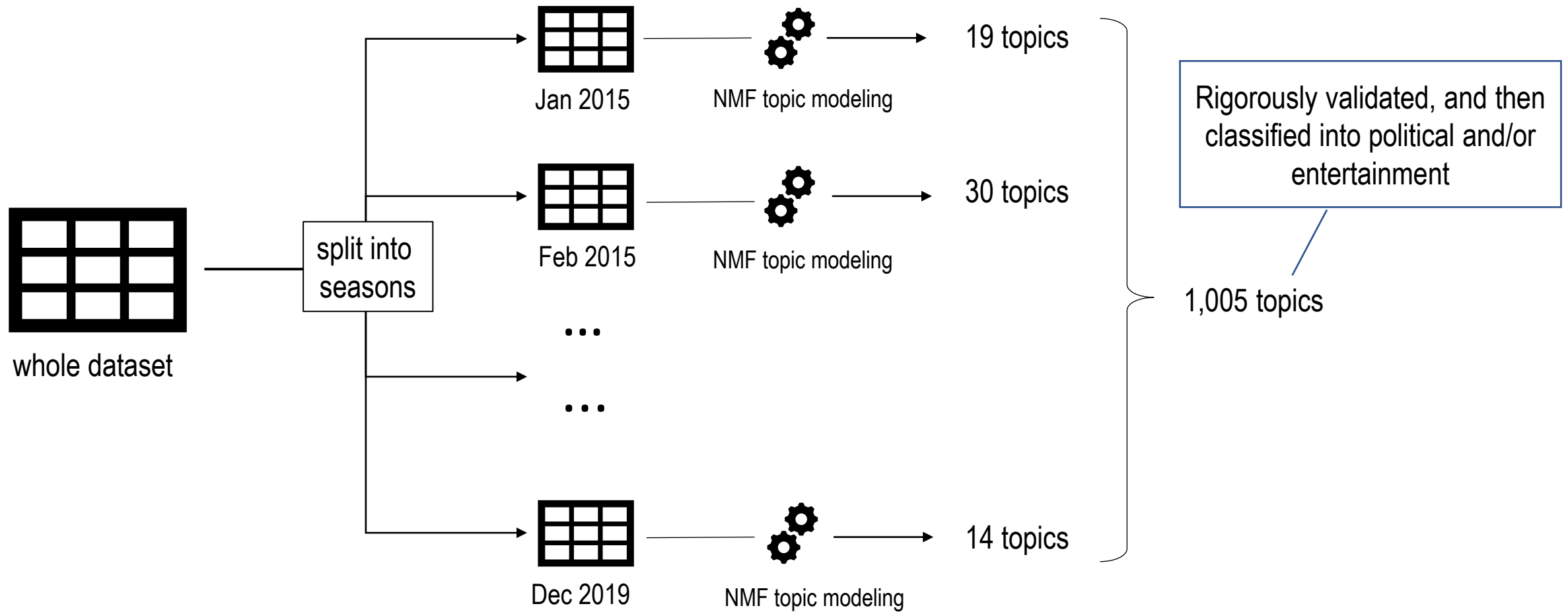
29 English-language outlets (Pew's American Trend Panel.
57th wave)

All Facebook posts from Jan 1, 2015 - Dec 31, 2019
their textual content
their engagement (reactions, shares, likes)

N ~ 2.23 million posts



Methods: Topic Modeling



Methods: Measuring Responsiveness

Responsiveness

$$Freq_{k,t,m} = \beta_0 + \beta_1 ES_{k,t-lag,m} + \text{covariates}$$

Intercept

Dependent Variable
Frequency of occurrence for
topic k ,
at time t ,
for outlet m

Independent Variable
Engagement Signal for
topic k ,
at time t -lag,
for outlet m

(was log transformed)

News value of
topic k at time t -lag

Engagement signal
received by topic k
at time t -lag across all
outlets

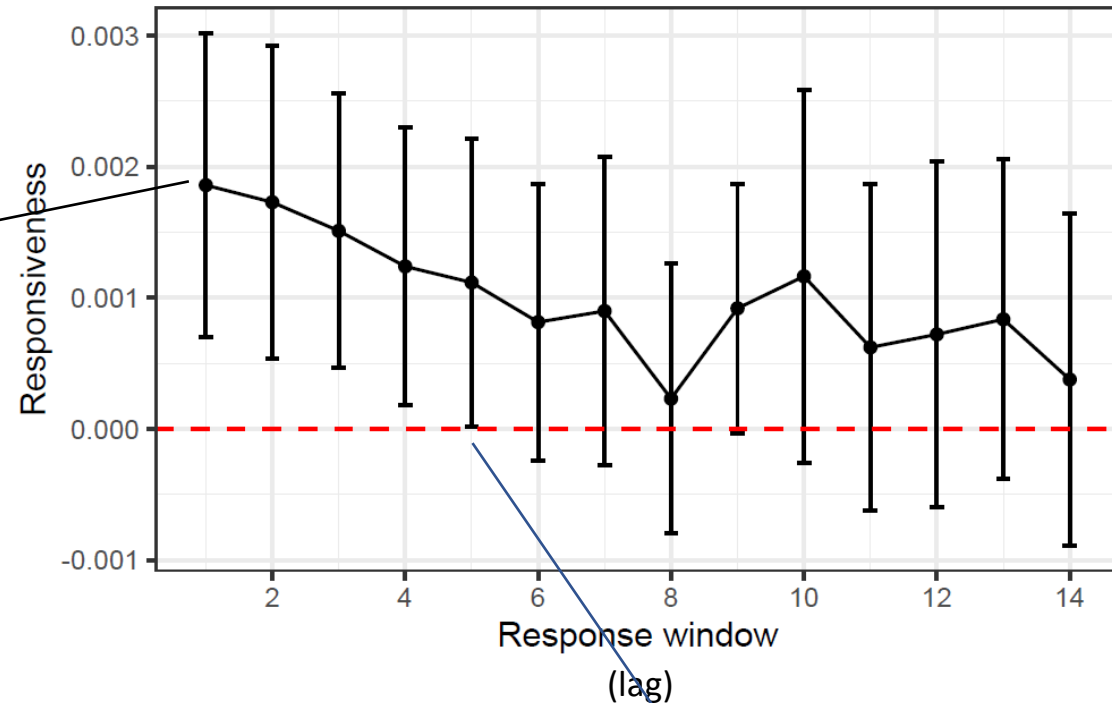
Fixed effects for
time t

Fixed effects for
outlet m

Fixed effects for
topic k

Results: Overall Responsiveness

An increase in engagement signal, on average, increases the frequency of that topic the very next day

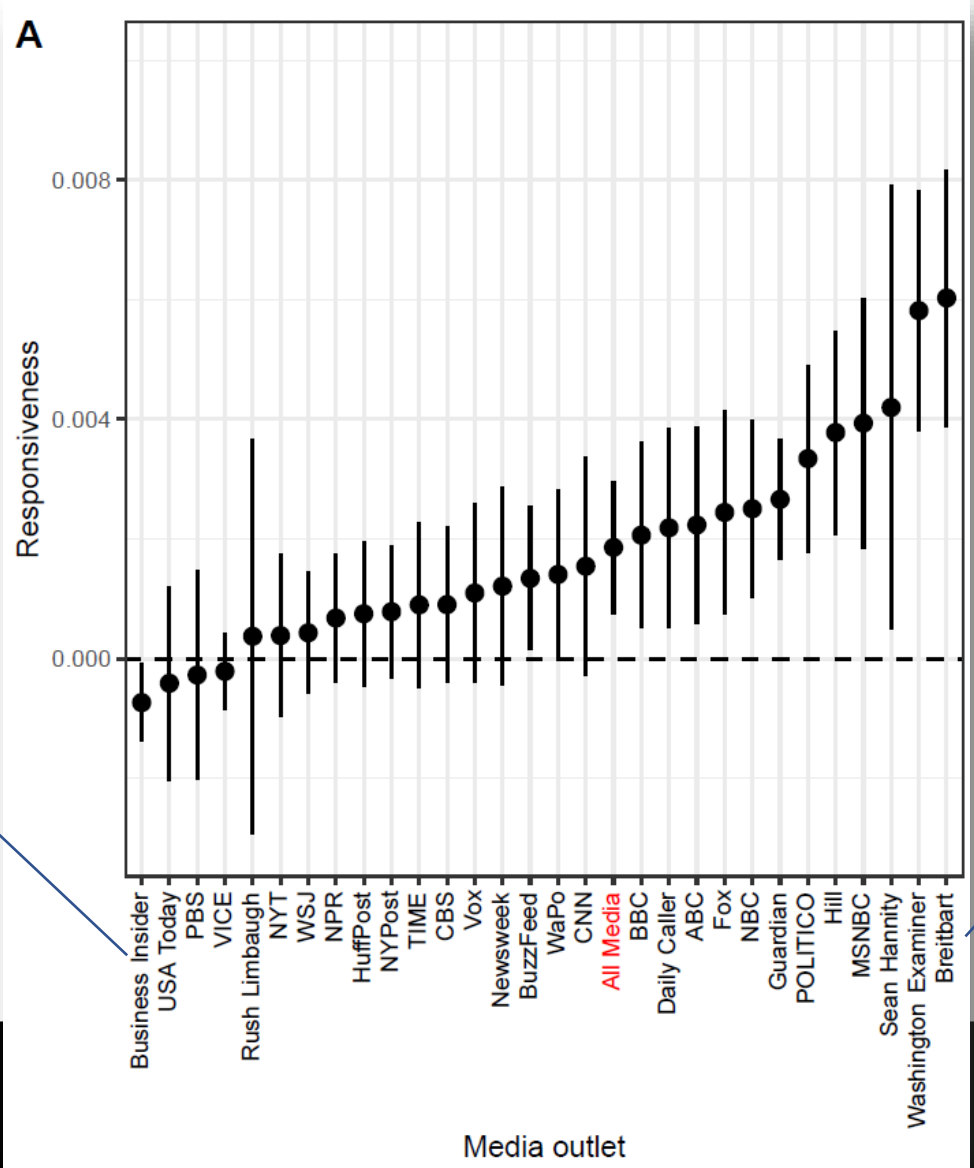


All subsequent results use lag = 1

Responsiveness was not statistically significant for lags > 4

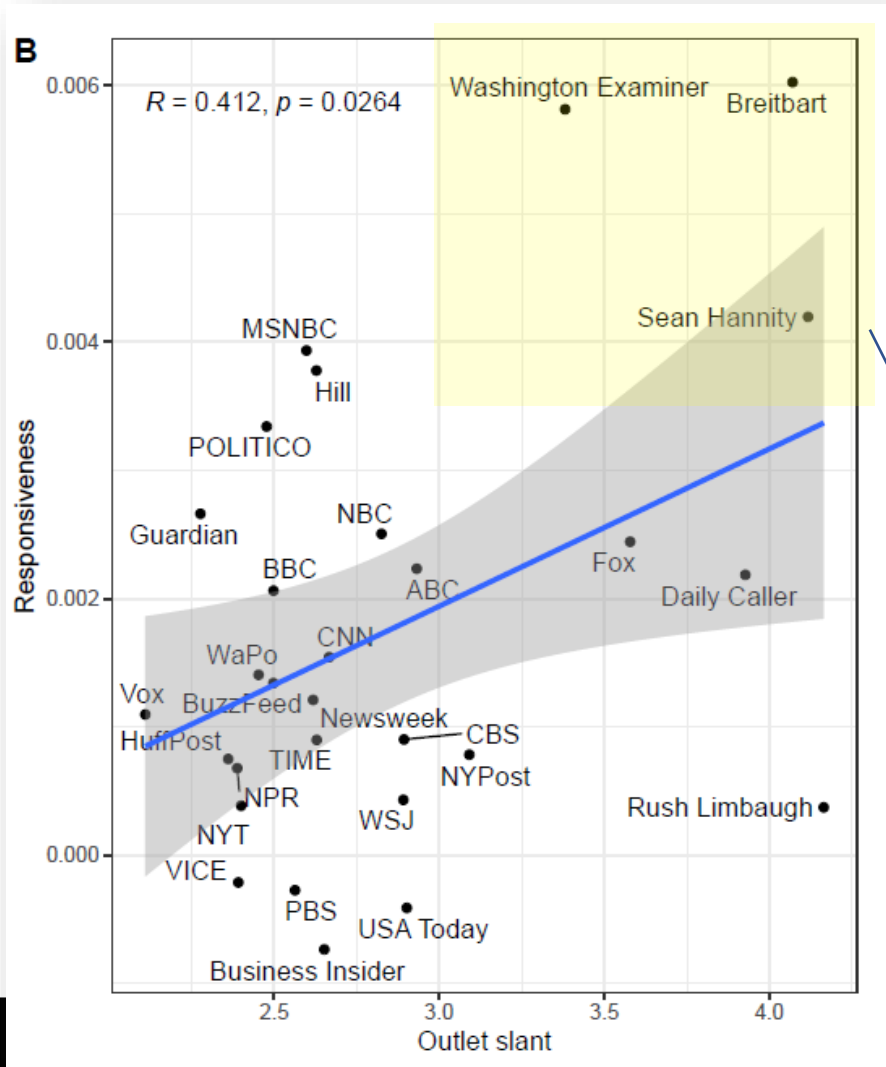
Results: Responsiveness across Outlets

Business Insider responds the least to audience engagement metrics



Breitbart responds the most to audience engagement metrics

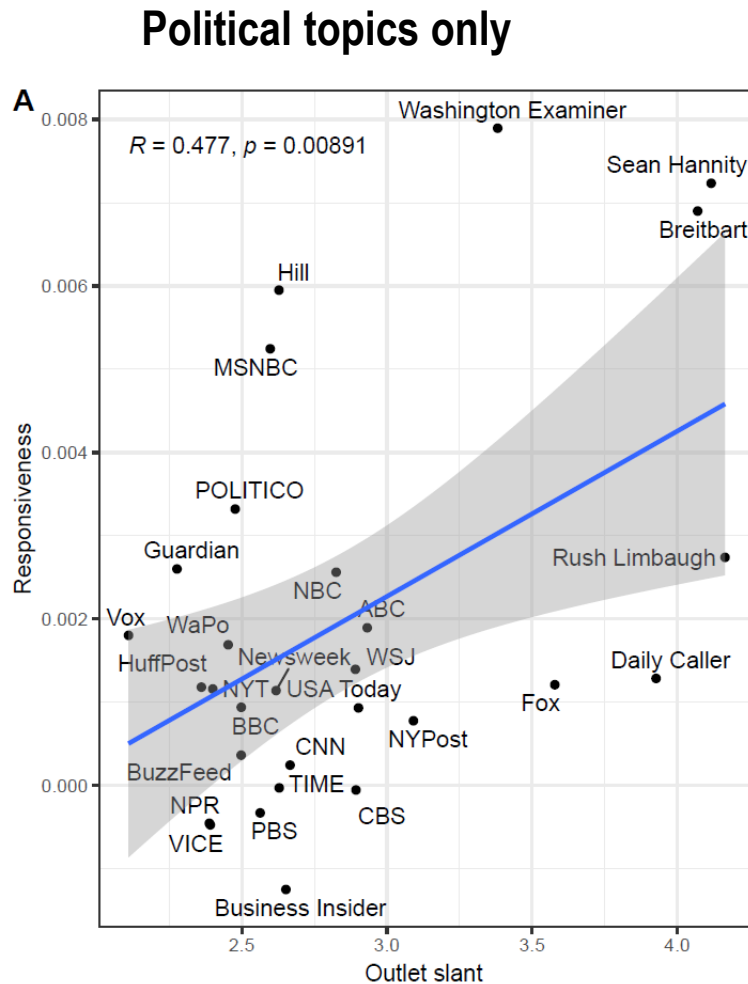
Responsiveness and Outlet Slant



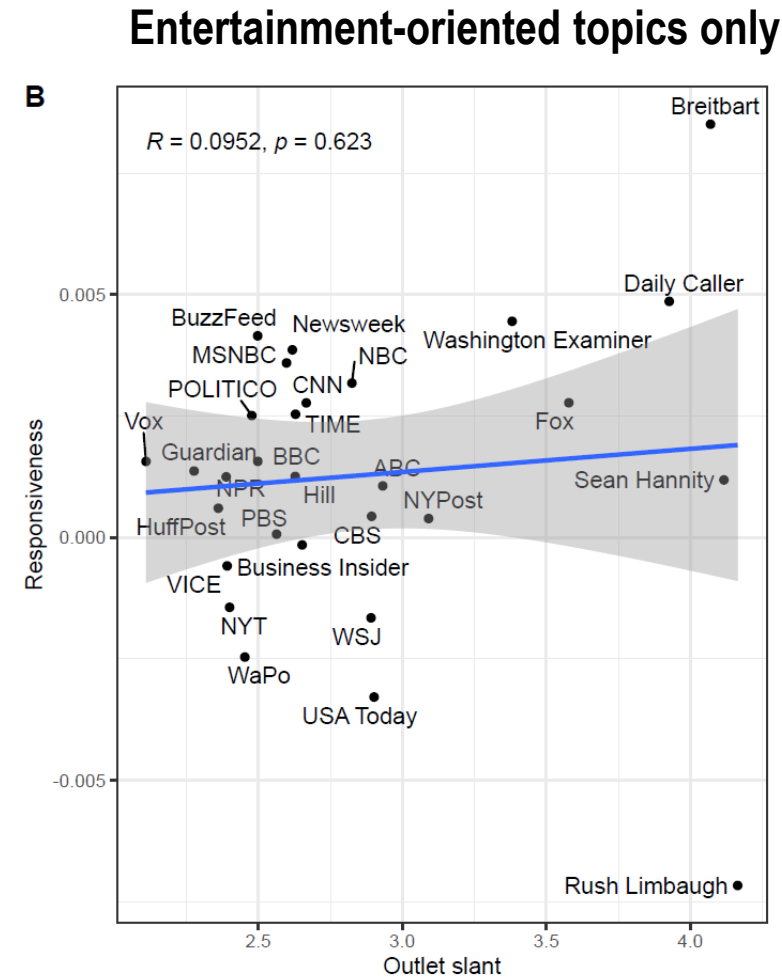
Right leaning outlets are more likely to respond to audience engagement metrics than left leaning outlets

However, correlation possibly driven by a handful of extreme outlets on the right

Results: Outlet Slant and Content Type



Strong significant correlation between slant and responsiveness



No significant correlation between slant and responsiveness

Results: Summary

Audience metrics, on average, **affect** news production

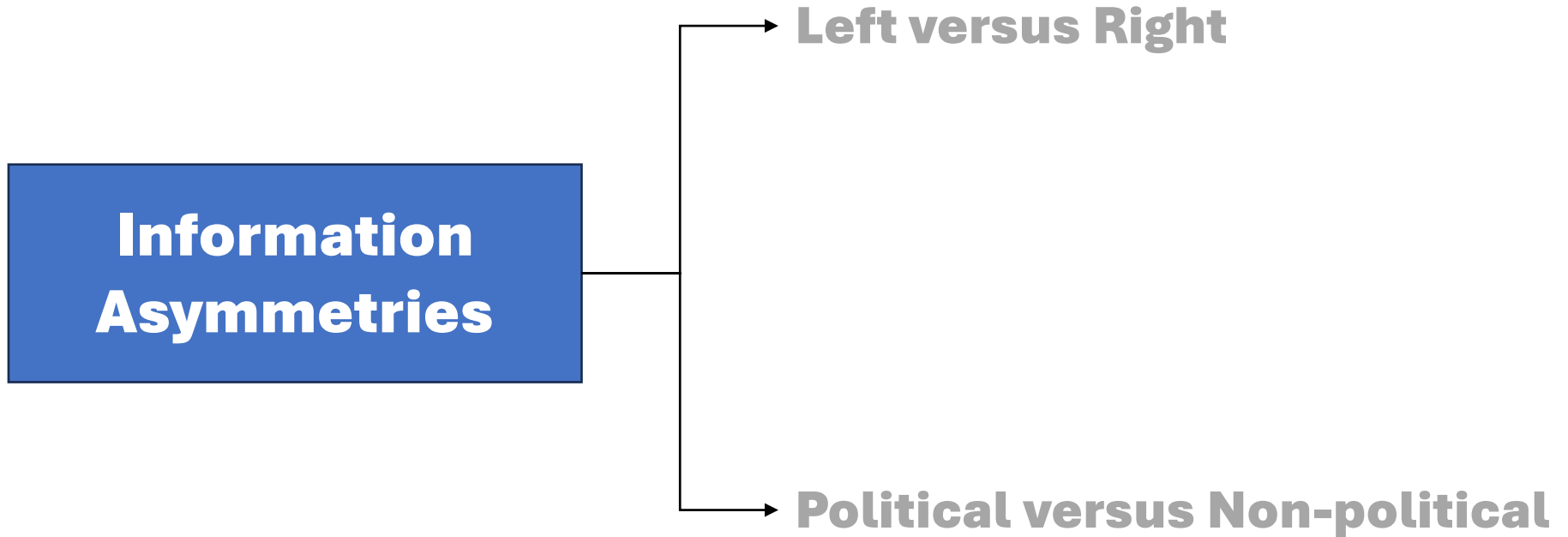
Substantial **heterogeneity** across outlets (some respond more, some less)

Responsiveness **is contingent** on outlet slant

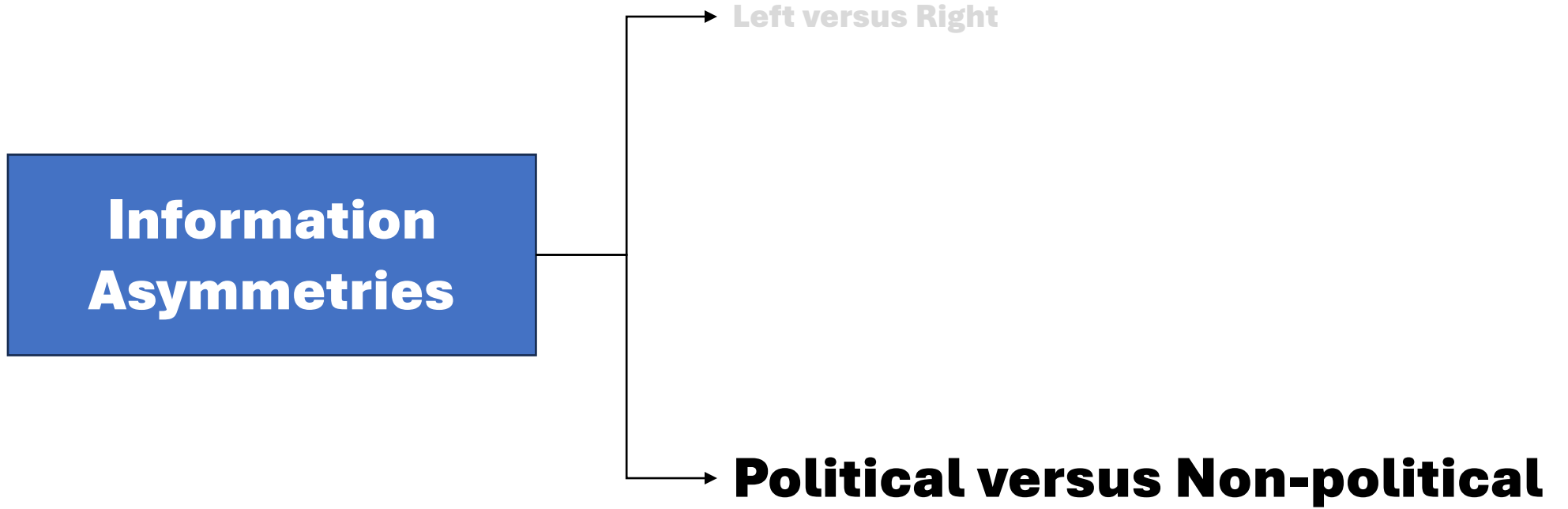
A handful of right-wing outlets are more responsive than other outlets

But specifically, to **political topics**

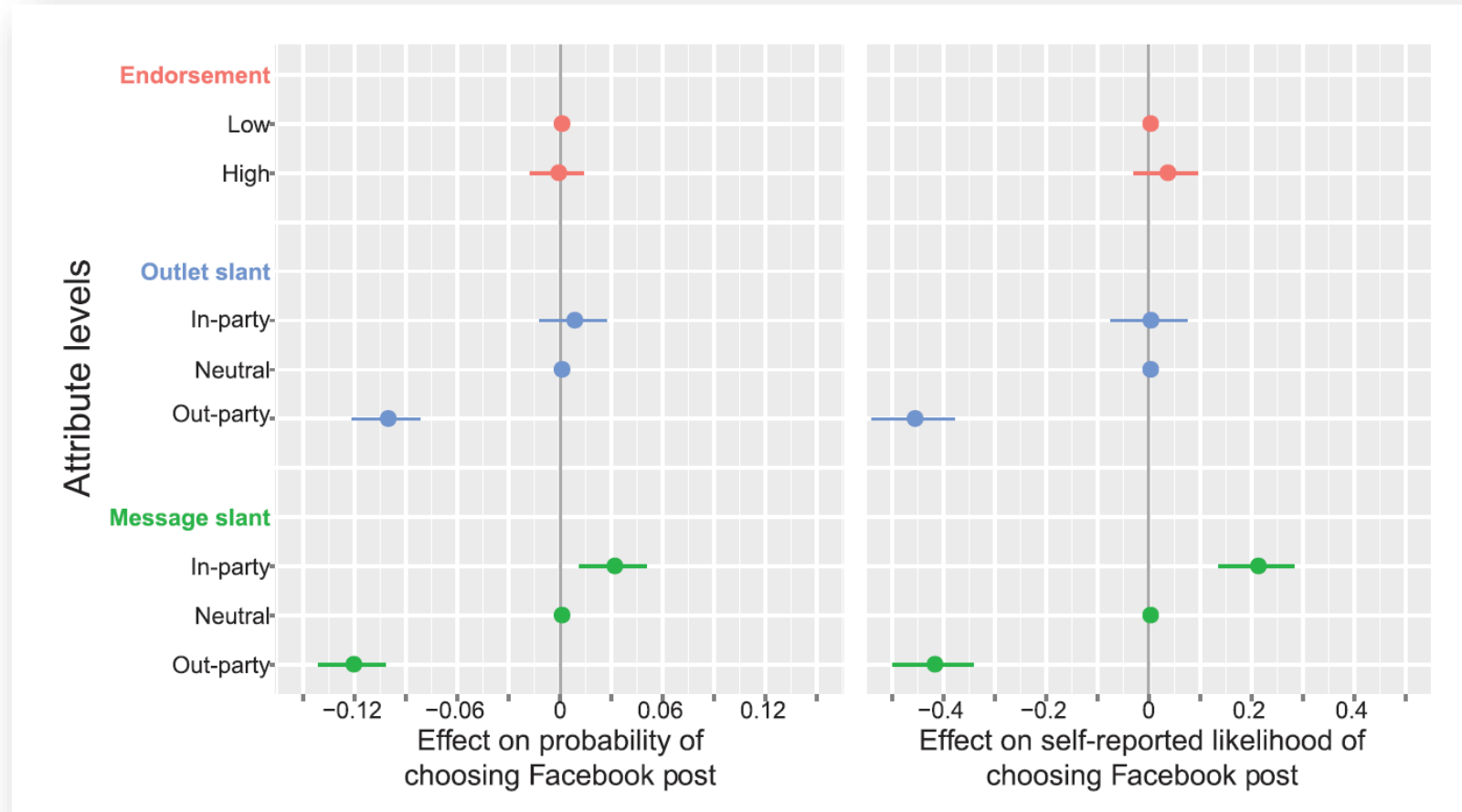
Closing Thoughts



Closing Thoughts



Closing Thoughts



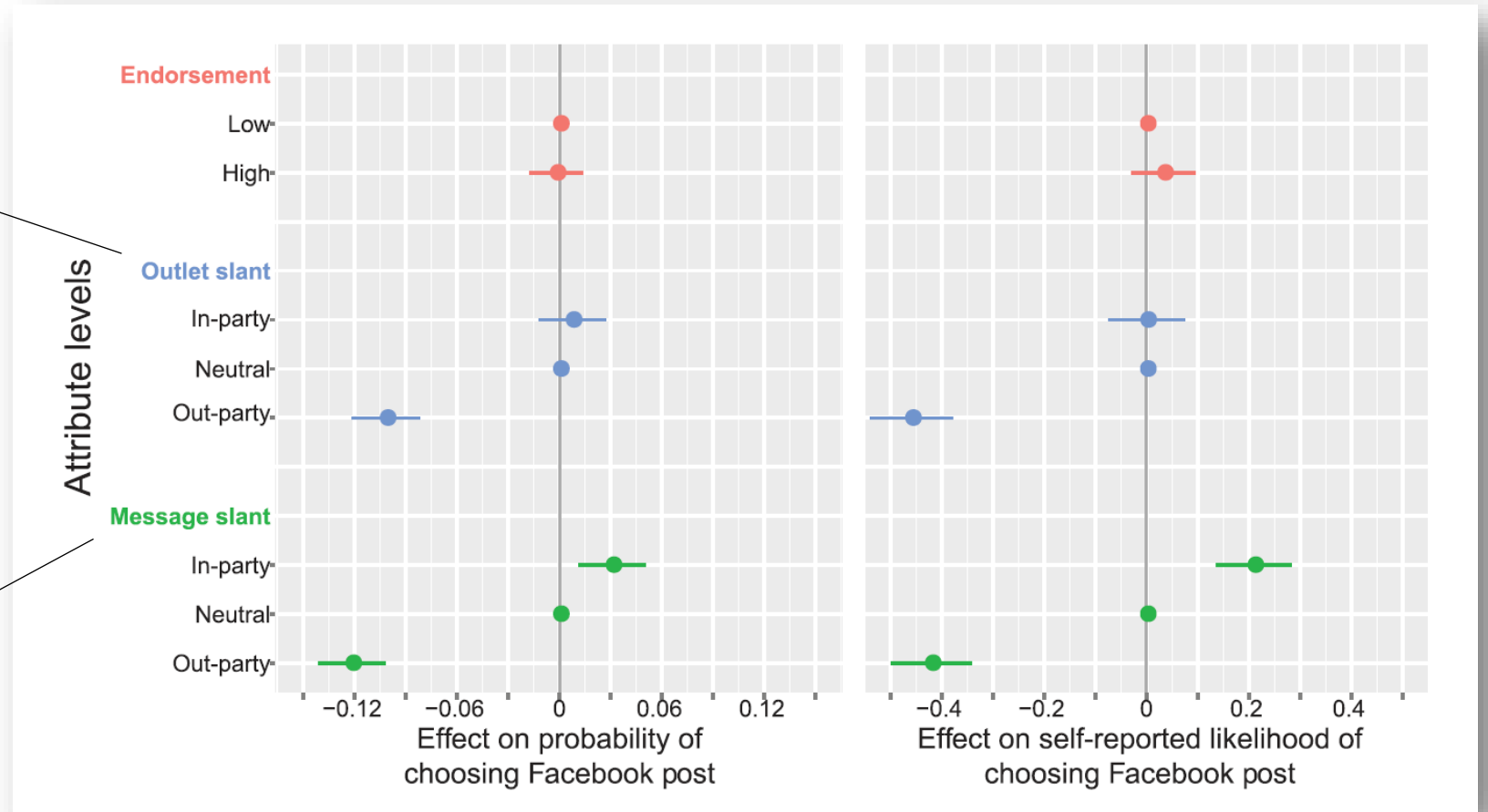
Mukerjee, S. and Yang T. (2021). *Political Communication*



Closing Thoughts

People avoid outlets with an out-party slant

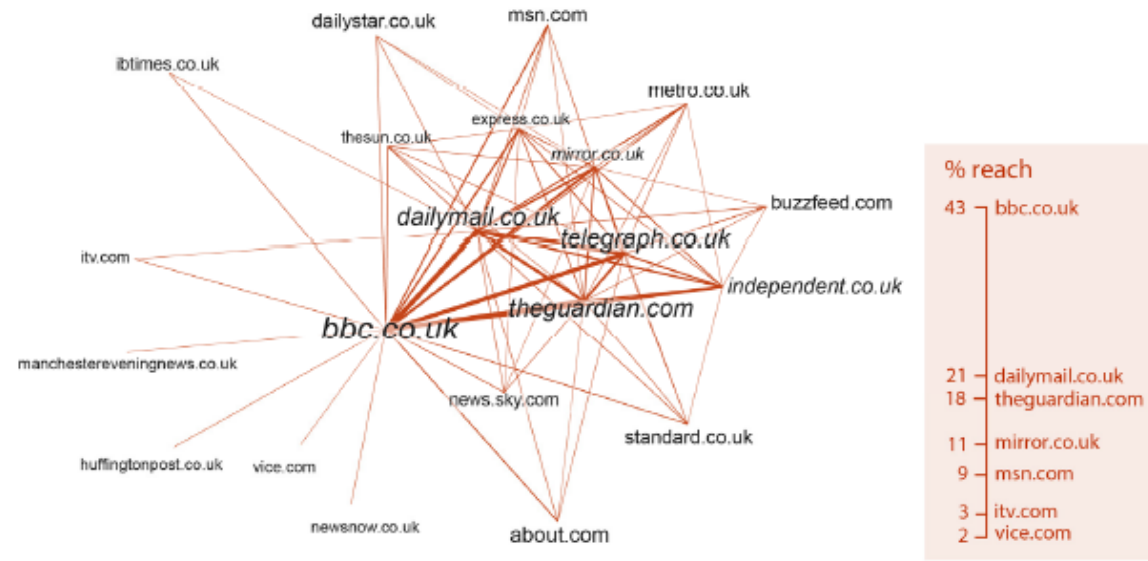
People avoid messages with an out-party slant, and choose messages with an in-party slant



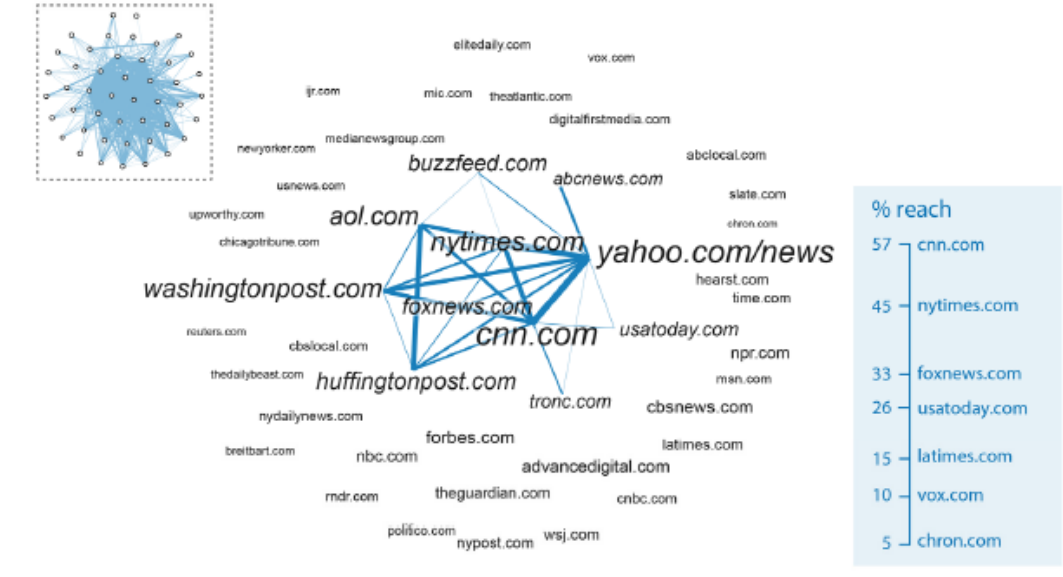
Mukerjee, S. and Yang T. (2021). *Political Communication*

Closing Thoughts

A. UK core media network



B. US core media network



No fragmentation! Heavy overlap between (for e.g.) the Daily Mail and the Guardian and Fox News and Washington Post

Mukerjee, S. et al. (2018). *Journal of Communication*

Closing Thoughts

Informational asymmetries exist in news consumption and production on digital platforms

Closing Thoughts

Informational asymmetries exist in news consumption and production on digital platforms

In consumption, **the non-political/political divide >> the left/right divide**

Closing Thoughts

Informational asymmetries exist in news consumption and production on digital platforms

In consumption, **the non-political/political divide >> the left/right divide**

In production, these **divides intersect in very interesting ways**

Thank You!



Thank You!

Collaborators

Tian Yang, The Chinese University of Hong Kong

Kokil Jaidka, National University of Singapore

Yilang Peng, University of Georgia

Silvia Majó-Vázquez, Vrije University, Amsterdam

Yphtach Lelkes, University of Pennsylvania

Sandra González-Bailón, University of Pennsylvania

Informational Asymmetries in the **Consumption and Production** of **Digital Media**

Subhayan Mukerjee, Ph.D.

Department of Communications and New Media

Centre for Trusted Internet and Community



NUS
National University
of Singapore