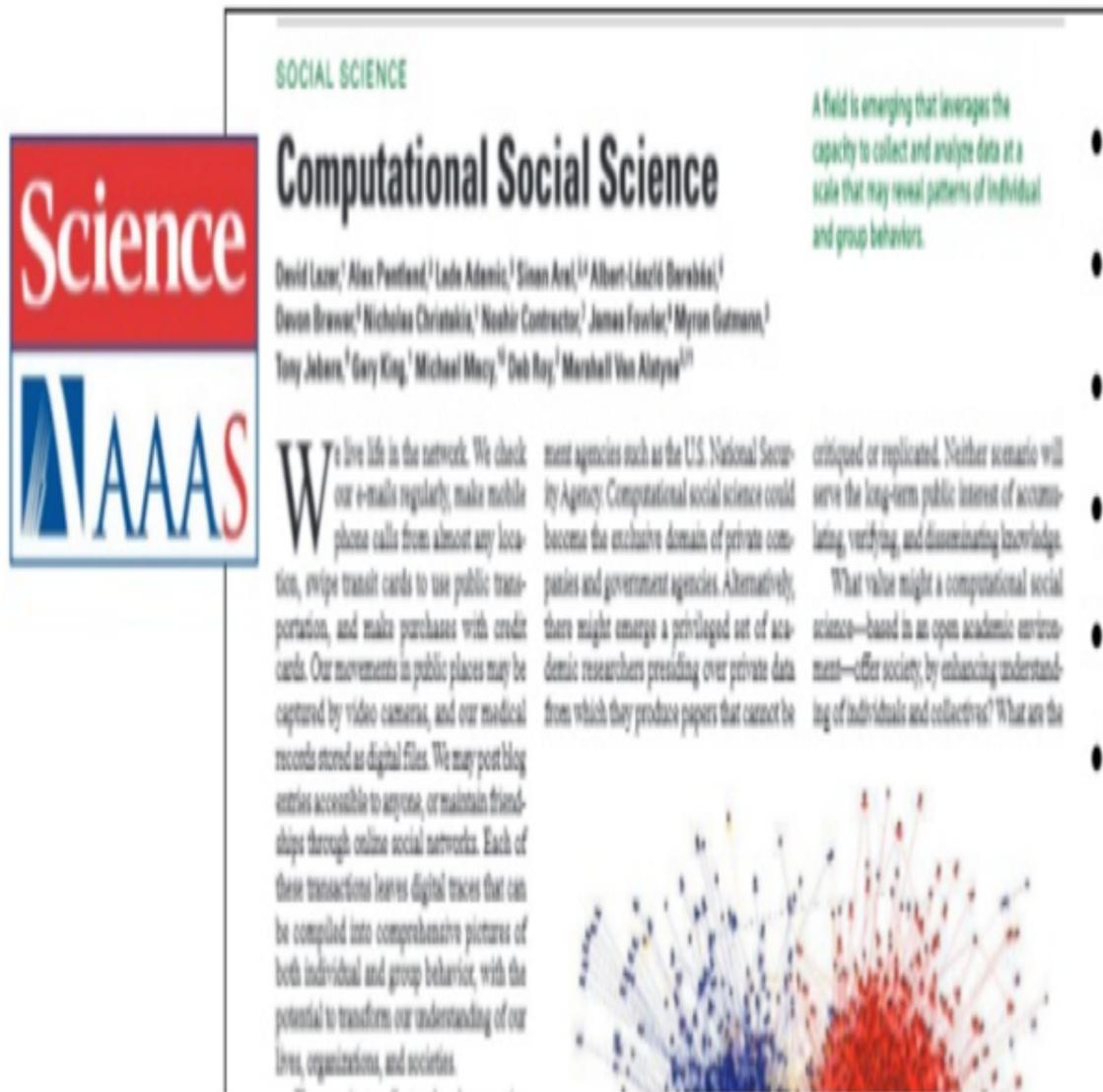


Post Truth Society

Walter Quattrociocchi
walterquattrociocchi@gmail.com



Computational social science refers to the academic sub-disciplines concerned with **computational approaches** to the **social sciences**.



Science

MAAS

SOCIAL SCIENCE

Computational Social Science

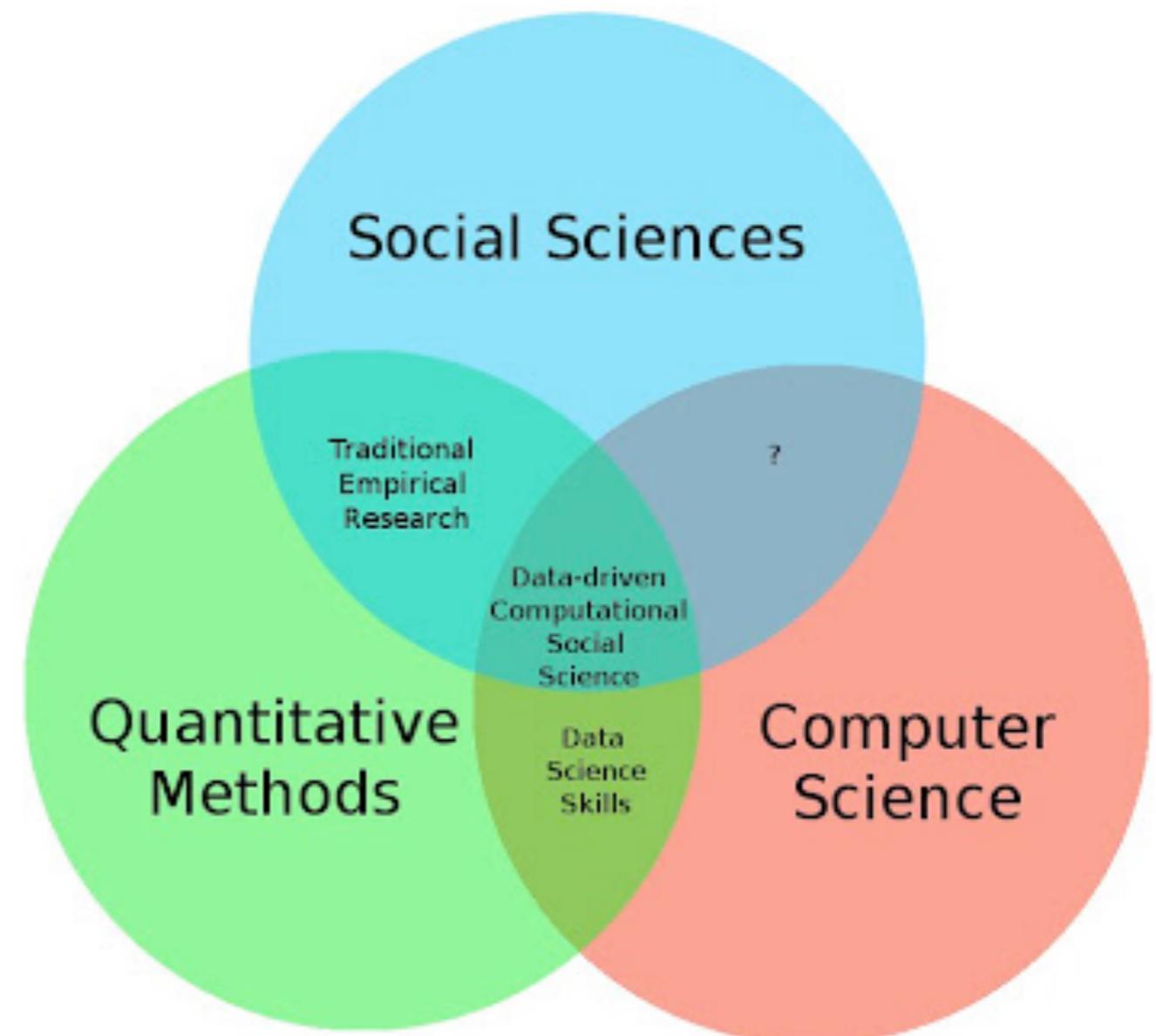
David Lazer,¹ Alex Pentland,² Luis Adamic,³ Simon Aral,^{1,4} Albert-László Barabási,⁵ Devon Brewer,⁶ Nicholas Christakis,¹ Noshir Contractor,⁷ James Fowler,⁸ Myron Gutmann,⁹ Tony Heurns,⁴ Gary King,¹ Michael Macy,¹⁰ Deb Roy,¹ Marshall Van Alstyne¹¹

A field is emerging that leverages the capacity to collect and analyze data at a scale that may reveal patterns of individual and group behaviors.

We live life in the network. We check our e-mails regularly, make mobile phone calls from almost any location, swipe transit cards to use public transportation, and make purchases with credit cards. Our movements in public places may be captured by video cameras, and our medical records stored as digital files. We may post blog entries accessible to anyone, or maintain friendships through online social networks. Each of these transactions leaves digital traces that can be compiled into comprehensive pictures of both individual and group behavior, with the potential to transform our understanding of our lives, organizations, and societies.

ment agencies such as the U.S. National Security Agency. Computational social science could become the exclusive domain of private companies and government agencies. Alternatively, there might emerge a privileged set of academic researchers presiding over private data from which they produce papers that cannot be critiqued or replicated. Neither scenario will serve the long-term public interest of accumulating, verifying, and disseminating knowledge.

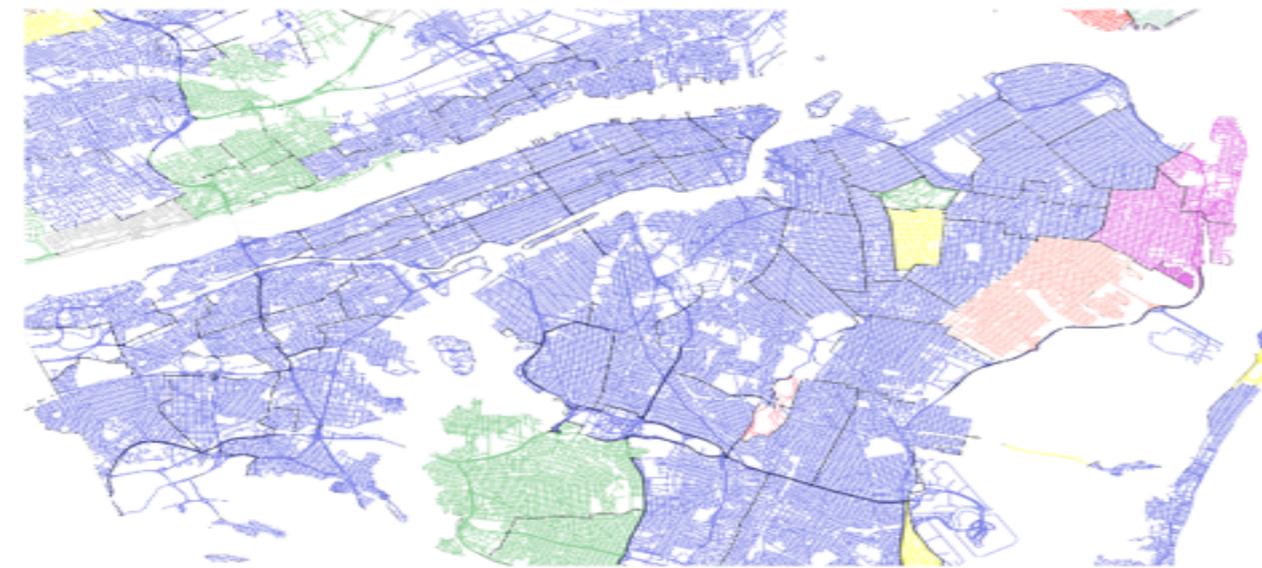
What value might a computational social science—based in an open academic environment—offer society, by enhancing understanding of individuals and collectives? What are the



OBSERVING SOCIAL PHENOMENA

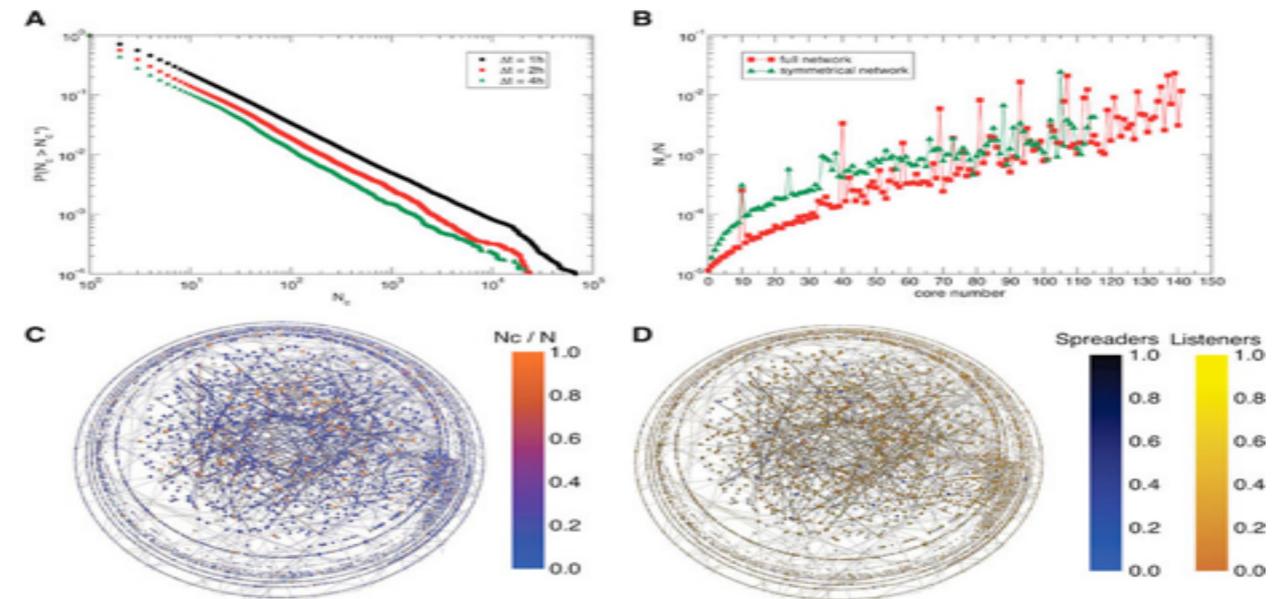
The Twitter of Babel: Mapping World Languages through Microblogging Platforms

(Mocanu et al PlosOne 2013)



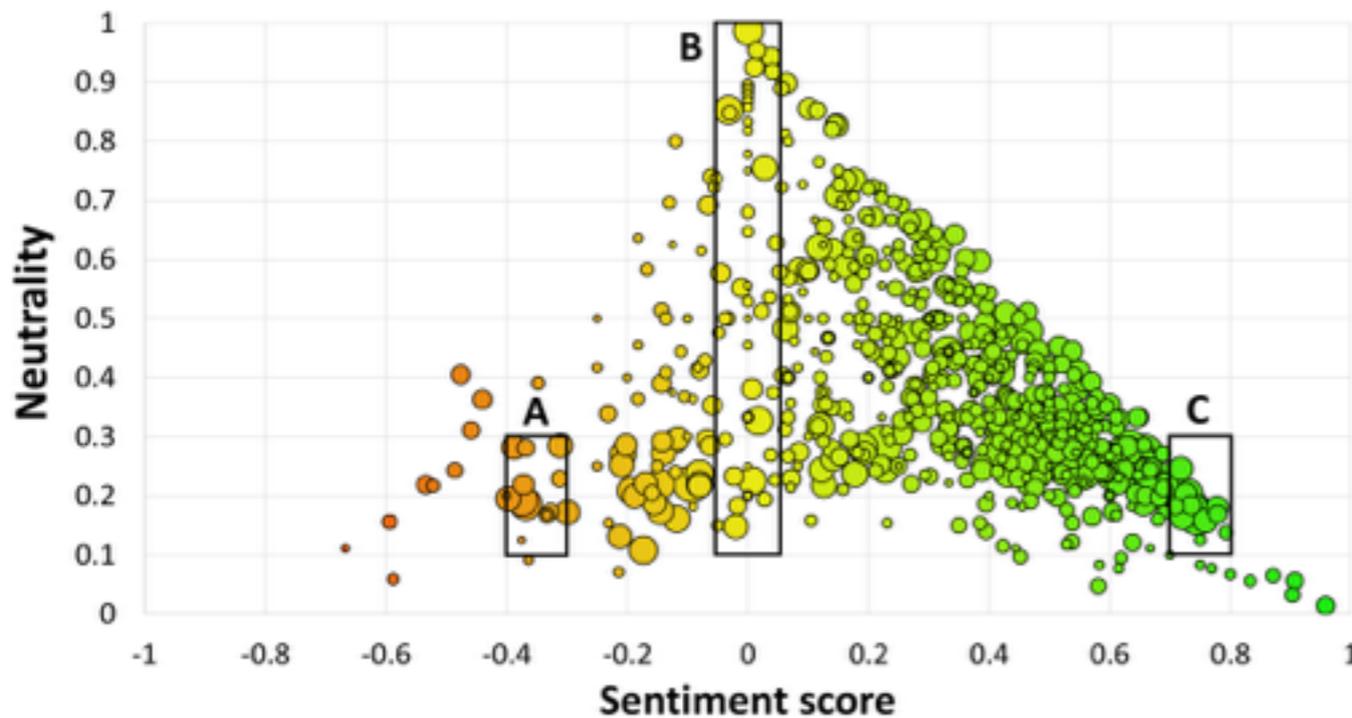
The dynamics of protest recruitment through an online network.

(S. González-Bailón et al" Sci rep 1 (2011).)



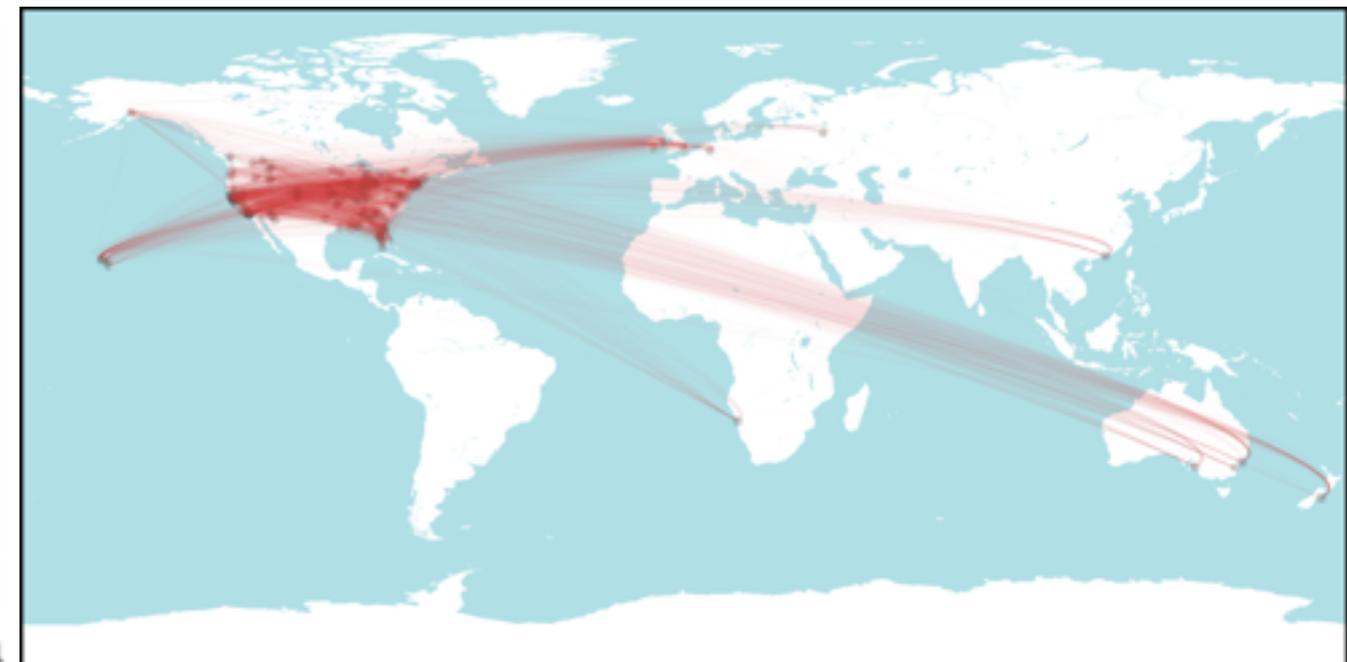
Sentiment of emojis

(P. Novak et al. PLoS One 2015)

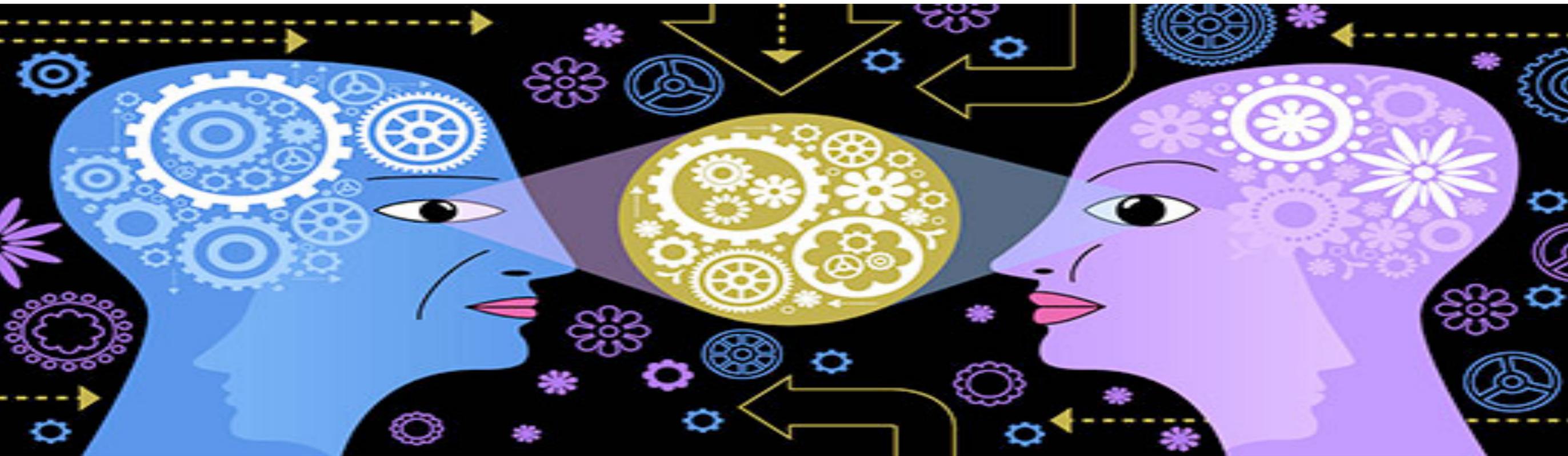


Structural Patterns of the Occupy Movement on Facebook

(Del Vicario et al. submitted to SNAM)

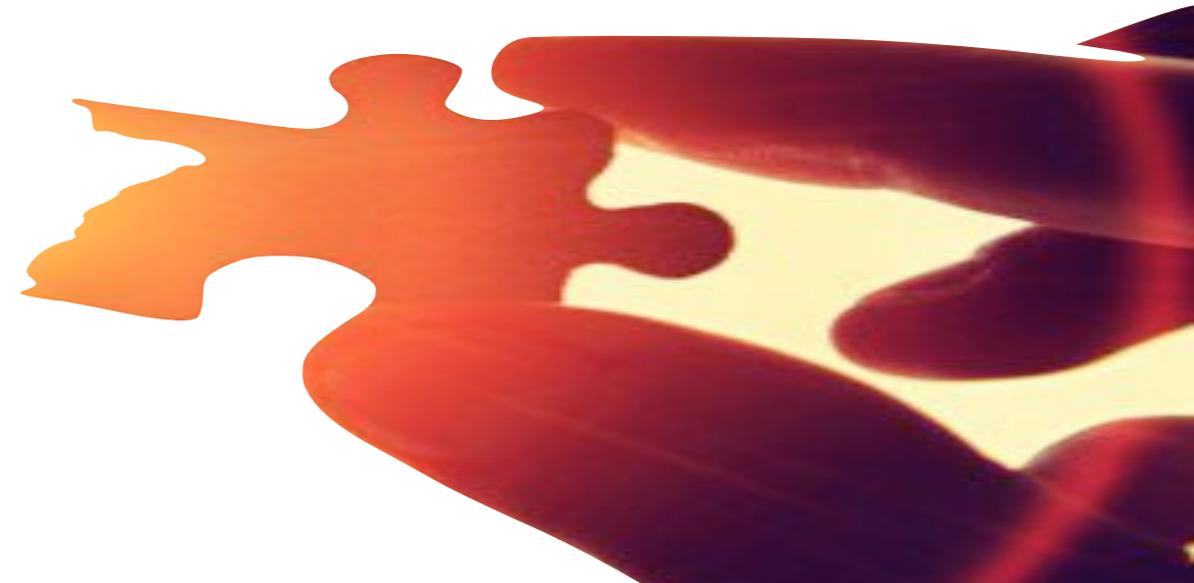
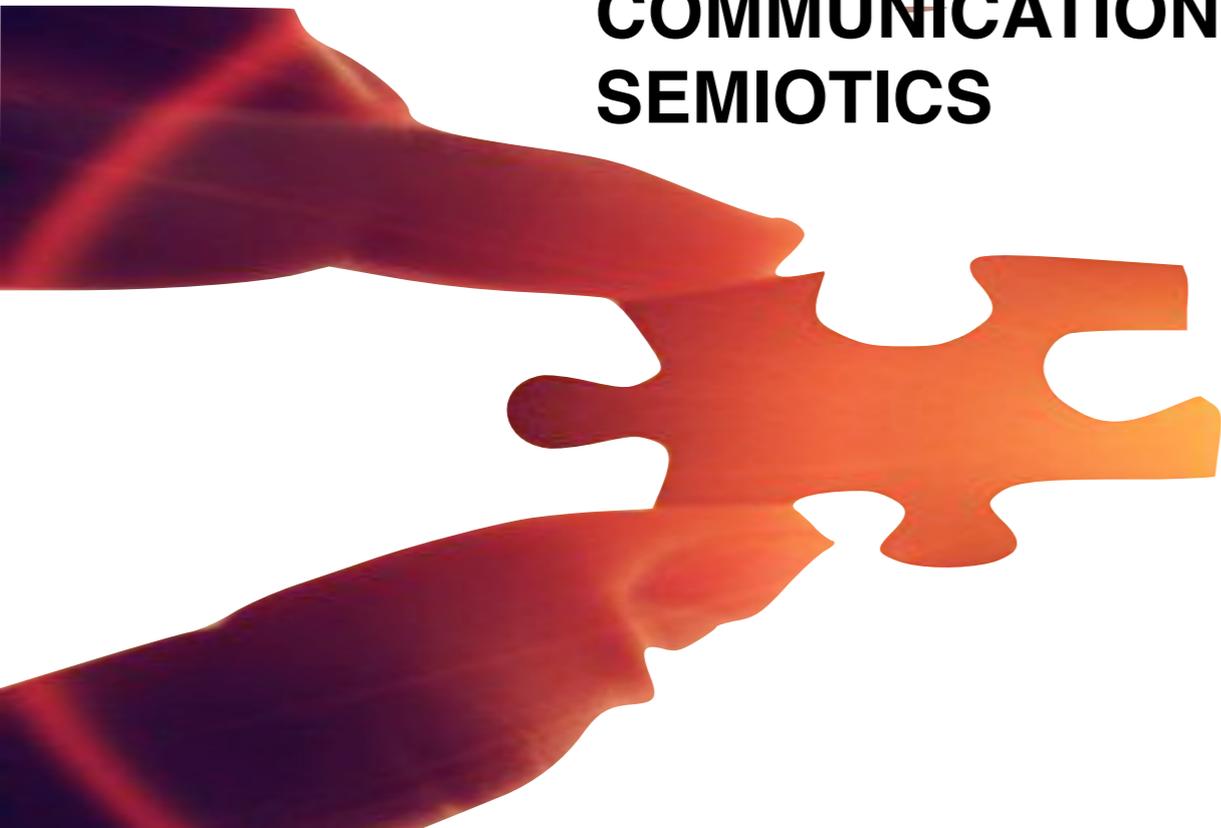


FAR AND BEYOND



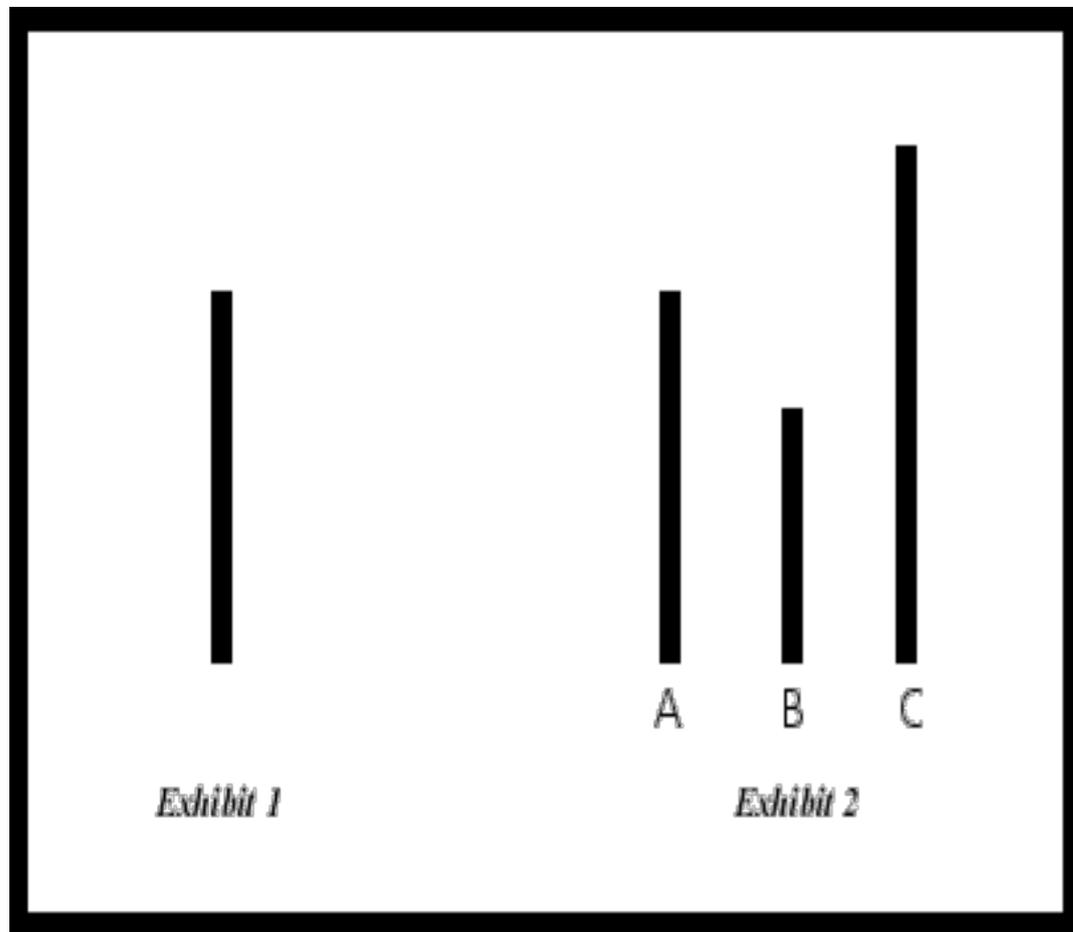
SOCIAL SCIENCE
PSYCHOLOGY
COMMUNICATION SCIENCE
SEMIOTICS

COMPUTER SCIENCE
MATHEMATICS
PHYSICS
STATISTICS



THE ASCH DILEMMA (1951)

Which line of the right panel matches the one in the left panel?



8-10 participants

Only **one** is the really subject
Other participants are **actors**

Occasionally other
participants intentionally give
the wrong answer.

On 18 Trials **12** the answer was wrong

SOCIAL CONTAGION



Epidemics:
Simple Contagion



Ideas and behaviors:
Complex Contagion

Under the **Virus** metaphor the receptor for an information is complex

Intentionality
Trust
Attitudes
Social Norms
Confirmation Bias

THE ROLE OF THE MEDIA

“The press may not be successful much of the time in telling people what to think, *but it is stunningly successful in telling its readers what to think about*”

(Bernard Cohen, 1963)



Agenda Setting is the process of the mass media presenting certain issues **frequently** and **prominently** with the result that large segments of the public perceive those issues as more important than others.

MORE COVERAGE → MORE IMPORTANT

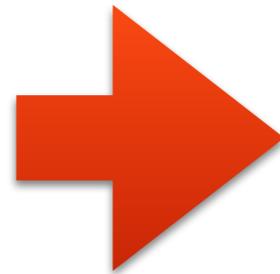
A SHIFT OF PARADIGM



OLD MEDIA

- Follow the “Ritual of Objectivity”
- Publication patterns are driven by most followed sources (imitation) (Marlow 2005)

MEDIATED

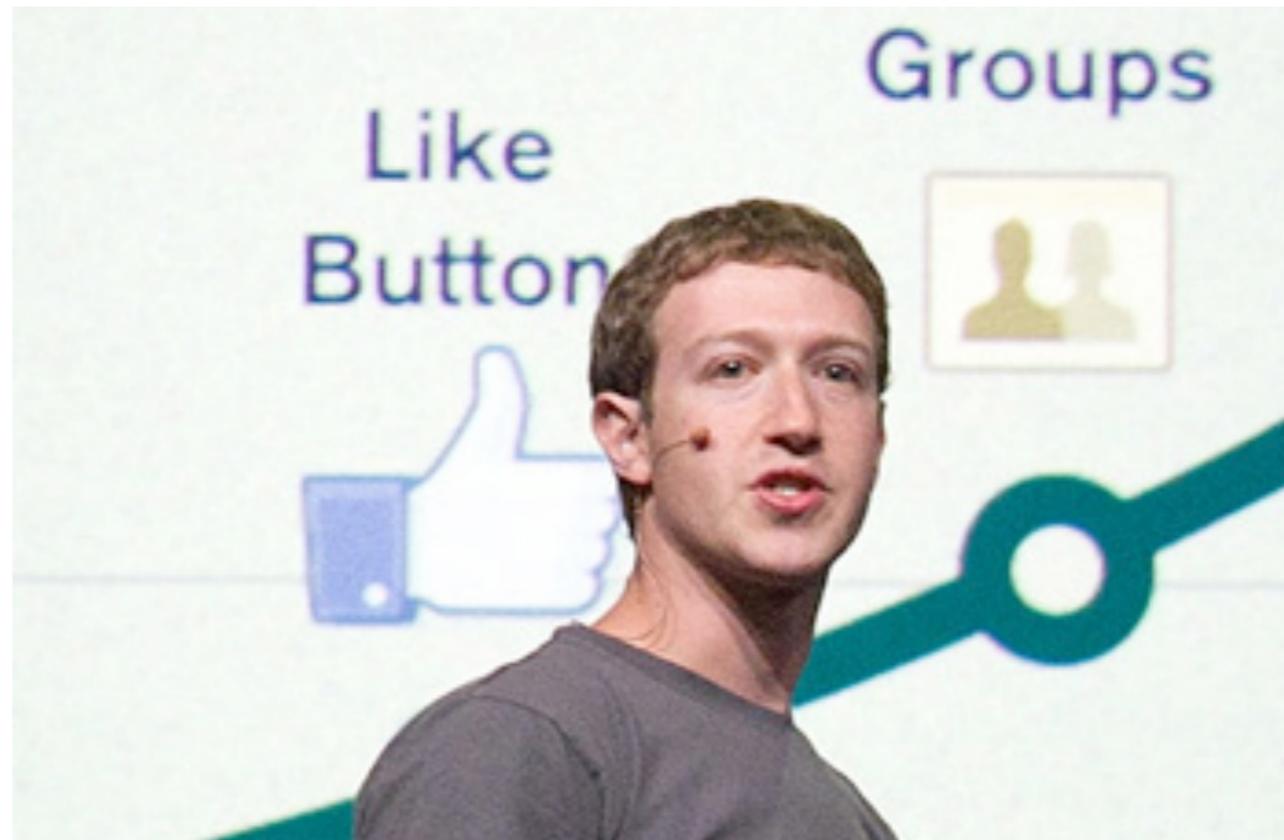


NEW MEDIA

- Information production is the work of interconnected actors spanning over organizations, professional identity and geographical location

DISINTERMEDIATED

FACEBOOK AS A CROWD DRIVEN BROADCASTER



“We're not thinking about ourselves as a community — we're not trying to build a community — we're not trying to make new connections. [...]

What we're trying to do is just make it really efficient for people to communicate, **get information and share information.**

We always try to emphasize the utility component.”

Mark Zuckerberg Jul. 2007

WHAT ABOUT THE QUALITY OF INFORMATION?

Conspiracy theories running rampant: How misinformation spreads on Facebook

Researchers studied how people interacted with "trolls" posting false information -- the results are terrifying

SARAH GRAY

Share 387 93 13 20

TOPICS: CONSPIRACY THEORIES, FACEBOOK, POLITICS, TECHNOLOGY, MISINFORMATION, INNOVATION NEWS, TECHNOLOGY NEWS, POLITICS NEWS



From the steady roll of theories on what happened to Malaysian Airlines Flight 370, to Sarah Palin's "death panels" panic, to Donald Trump's birther theories, misinformation spreads like wildfire in the age of Facebook.

In 2013, professor Walter Quattrociocchi of Northeastern University along with his team studied how more than 1 million Facebook users engaged with political information during the Italian election. During that election a post appeared titled: "Italian Senate voted and accepted (257 in favor and 165 abstentions) a law proposed by Senator Cirenga to provide policy makers with €134 billion Euros to find jobs in the event of electoral defeat."

READ IT ON THE
INTERNET



JADE HELM 15

The Washington Post

More

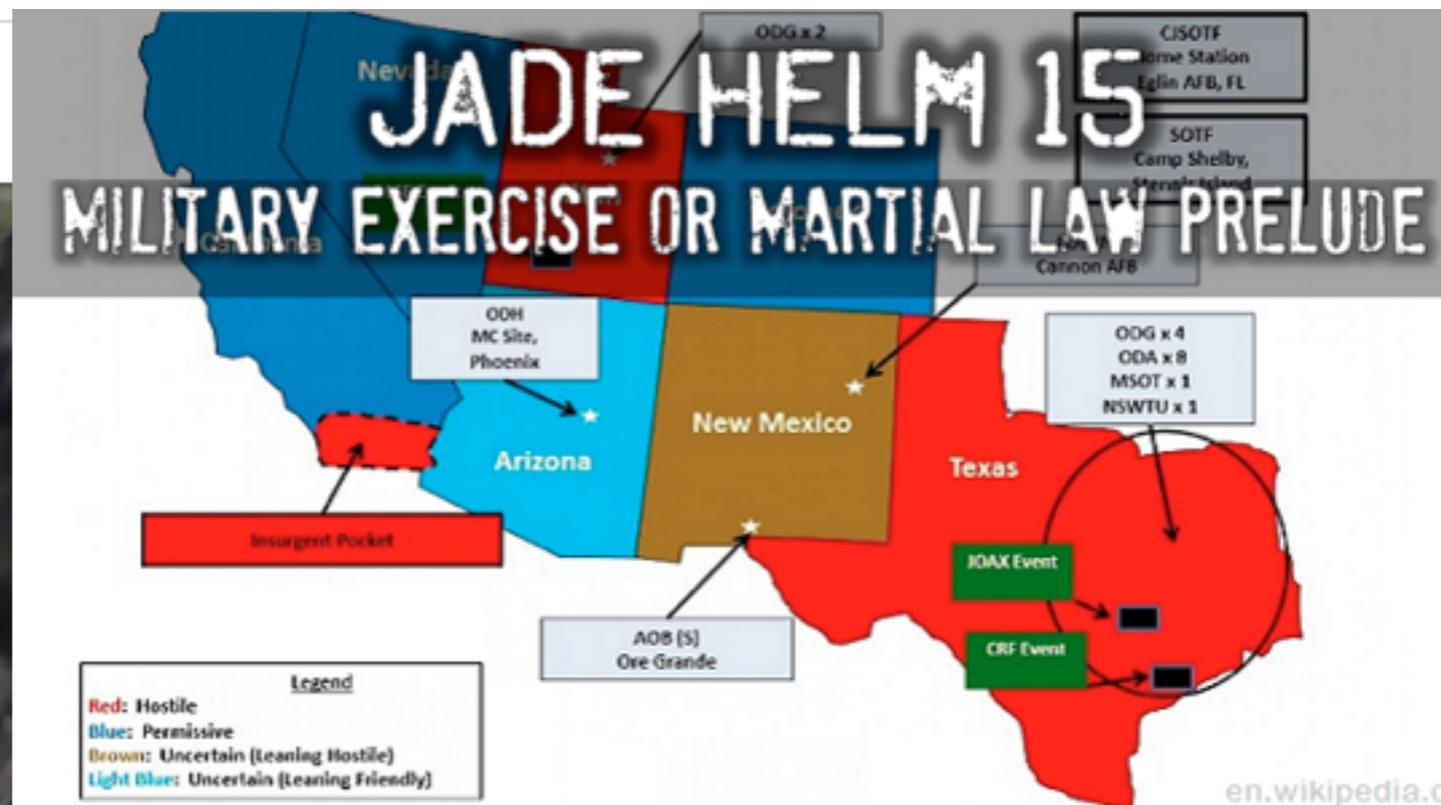
Save

Checkpoint

Why Operation Jade Helm 15 is freaking out the Internet – and why it shouldn't be

A   57

By Dan Lamothe March 31   Follow @danlamothe



1 Win or lose, far right's tough rhetoric against

en.wikipedia.c

THE EFFECT OF FALSE RUMORS



Sandro Pertini never said
“when the government does not do what people want must be fired with stones and sledgehammers.”

He has been President of the Republic (1978-1985).

INSIGHTS OF THE PROCESS



A GLIMPSE OF CONFIRMATION BIAS

<< Ci piace, ma non sappiamo >>

<< We like it, but we don't know...>>



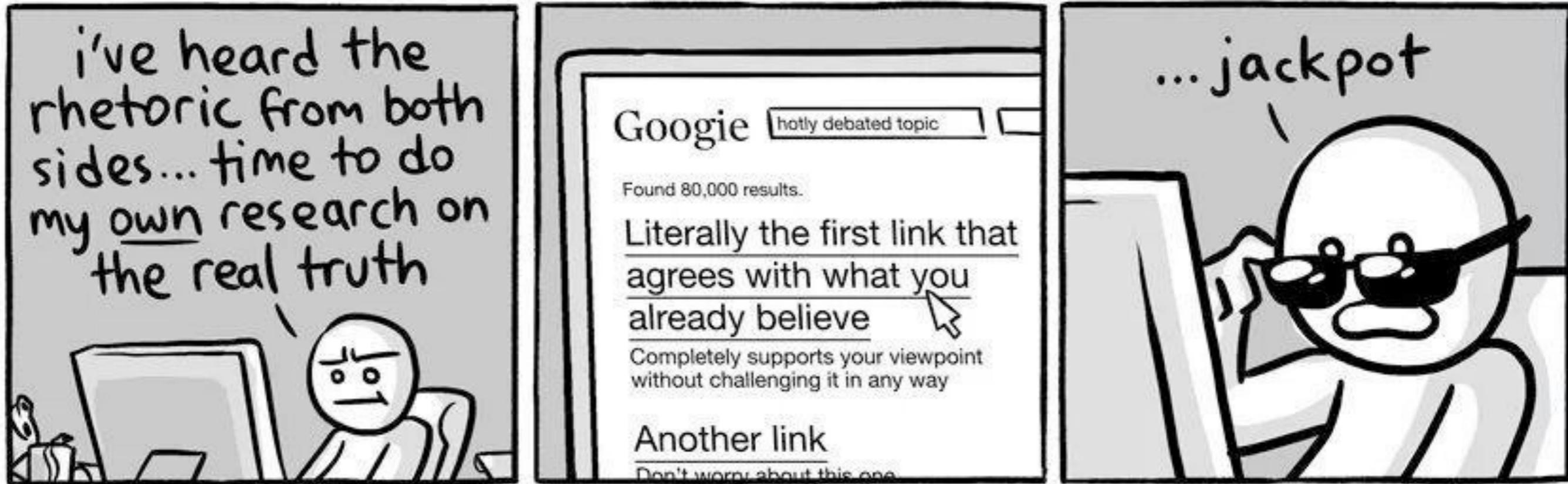
CLAPPING.....

TROLLING FOR UNDERSTANDING OLINE MISINFORMATION



CONFIRMATION BIAS

CHAINSAWSUIT.COM



The cognitive attitude to search for, interpret, favor, and recall information in a way that confirms one's beliefs

Le dinamiche sono sempre le stesse.



Bufale, i complottisti sono tutti uguali - Wired
Uno studio italiano svela il comportamento degli utenti che seguono pagine che diffondono bufale su Facebook: seguono tutti le stesse dinamiche
WIRED.IT | DI SANDRO JANNACCONE

👍 Mi piace 💬 Commenta ➦ Condividi

Walter Quattrocchi e un altro...
Mi piace · Rispondi · 👍 1 · 22 aprile 2015 alle ore 12:18

Deboroh La Roccia Risalta benissimo come l'utente che si crede informato e illuminato sia la persona meno aperta mentalmente, chiusa com'è nel suo loop di auto(dis)informazione. Patetici.

Mi piace · Rispondi · 👍 25 · 22 aprile 2015 alle ore 12:11

^ Nascondi 83 risposte

Walter Quattrocchi perche meglio invece chi si informa sulle fonti ufficiali come cicap o quark? svegliatevi.

Mi piace · Rispondi · 22 aprile 2015 alle ore 12:19

Deboroh La Roccia Eccallá. Hai letto l'articolo? Mi pare evidente che leggere notizie su pagine che si autocitano e si autorimandano non sia una buonissima cosa. Serve una visione d'insieme, il WEBBE non ha la risposta definitiva. E tranquillo che sono sveglio ed attento A TUTTO, anche alle bufalate deliranti.

Mi piace · Rispondi · 👍 8 · 22 aprile 2015 alle ore 12:22

Simone Romitti Eccolo è arrivato puntuale il fenomeno che dice sveglia al resto del mondo .Le scie chimiche fanno brutti effetti 😊

Mi piace · Rispondi · 👍 1 · 22 aprile 2015 alle ore 12:25

Walter Quattrocchi E la risposta di insieme te la da piero angela (o il figlio)? Non lo sai che da sempre la storia la scrivono i vincitori e i potenti?

Mi piace · Rispondi · 22 aprile 2015 alle ore 12:30

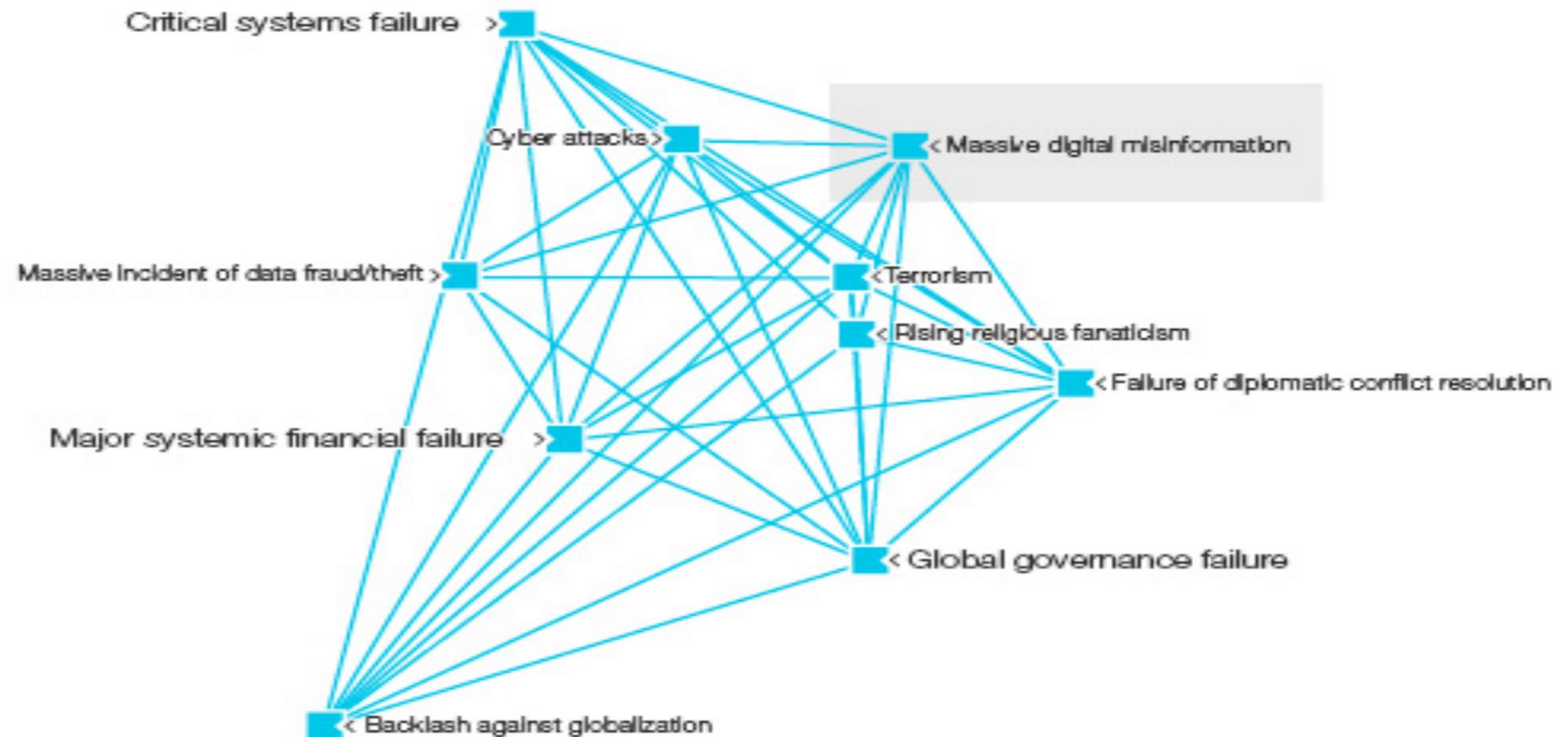
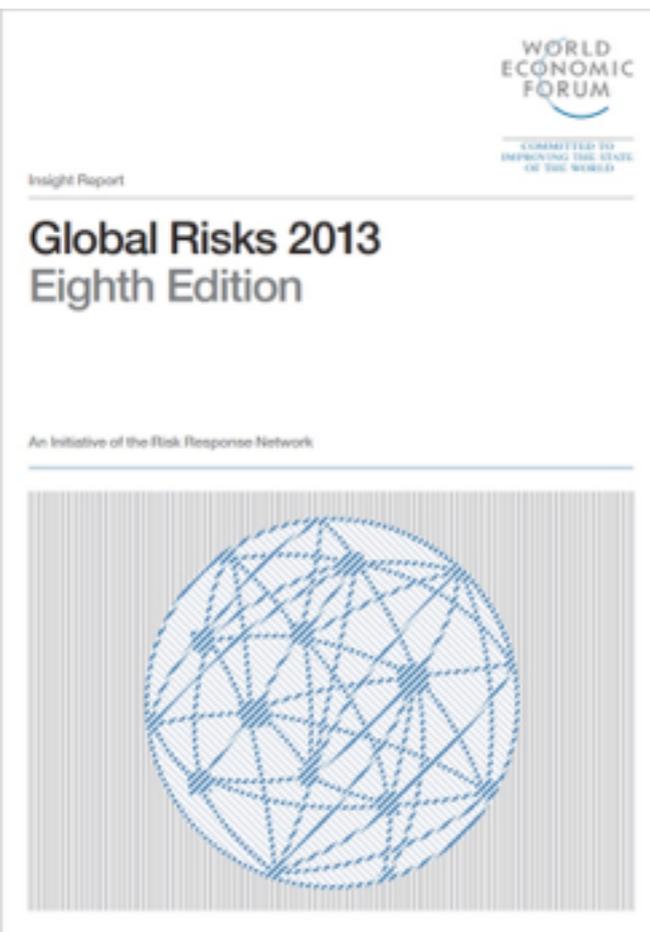
Andrea Pesetti Se la "storia" è scritta dai vincitori, lo è anche la "storia" narrata su internet.

Mi piace · Rispondi · 👍 1 · 22 aprile 2015 alle ore 12:33 · Modificato

Deboroh La Roccia Quello che mi fa piu ridere della gente come te è che rinnegate il confronto, siete un disco rotto, provo più piacere a conversare con un muro

Mi piace · Rispondi · 👍 5 · 22 aprile 2015 alle ore 12:32

MISINFORMATION ONLINE

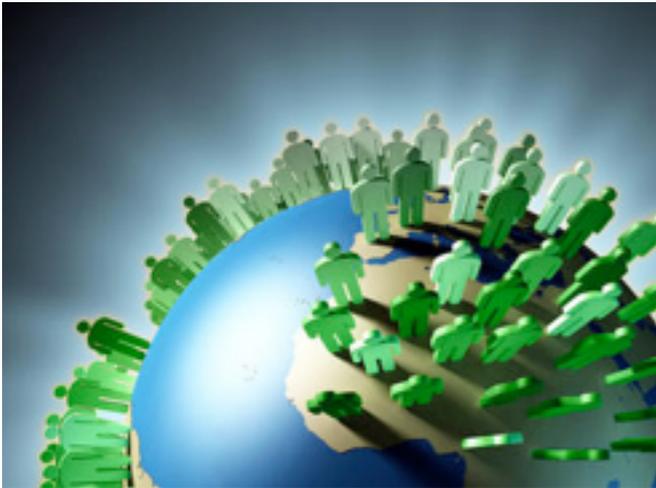


THE WORLD ECONOMIC FORUM HAS POINTED OUT
MASSIVE DIGITAL MISINFORMATION
AS ONE OF THE MAIN RISKS FOR OUR SOCIETY

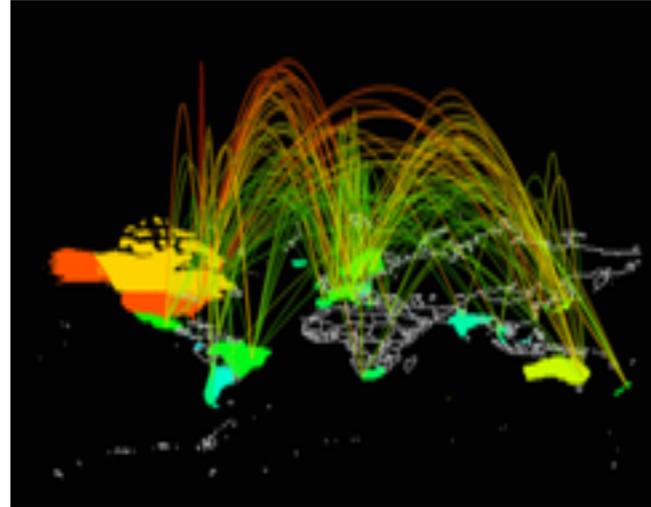
WHY?

Complexity of the world exploded

GLOBALIZATION



INTERCONNECTIVITY



SCIENTIFIC PROGRESS



FUNCTIONAL ILLITERACY

Nazione	Persone funzionalmente analfabete (% con età 16-65) 2003-2008 ^[7]
 Italia	47,0
 Messico	43,2
 Stati Uniti	20,0
 Ungheria	17,0
 Svizzera	15,9
 Canada	14,6
 Australia	13,9
 Nuova Zelanda	13,4

INFORMATION OVERLOAD



SETTING UP THE (DATA) EXPERIMENT



Focus:

Understand the role of confirmation bias in the diffusion of (mis)information

Methodology:

- a) Analyze users' behavior on specific contents **Conspiracy** and **Science** News (cont)
- b) Response to **intentional false claims** (Trolls)
- c) Response to **contrasting information** (Debunking)

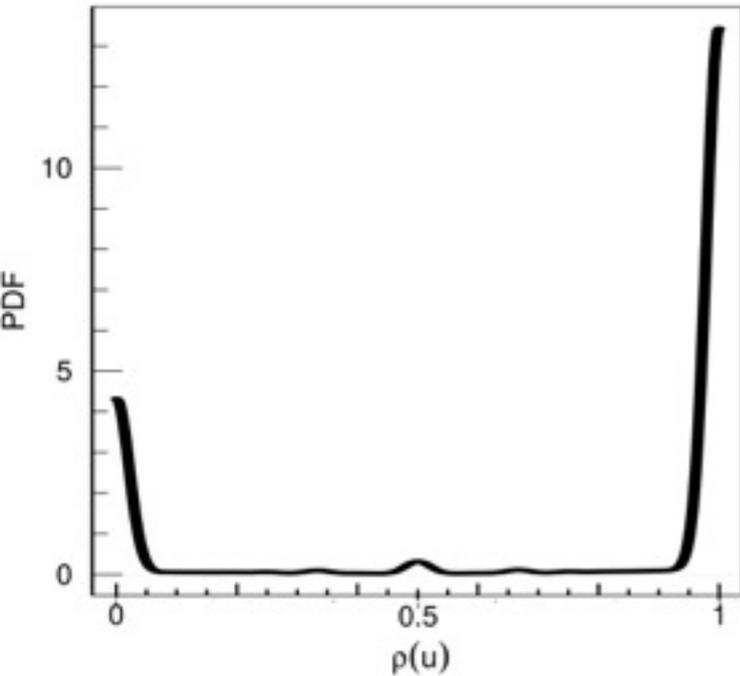
THE DATASET(s)

Facebook ITALY and **USA** from Jan 2010 to Dec 2014

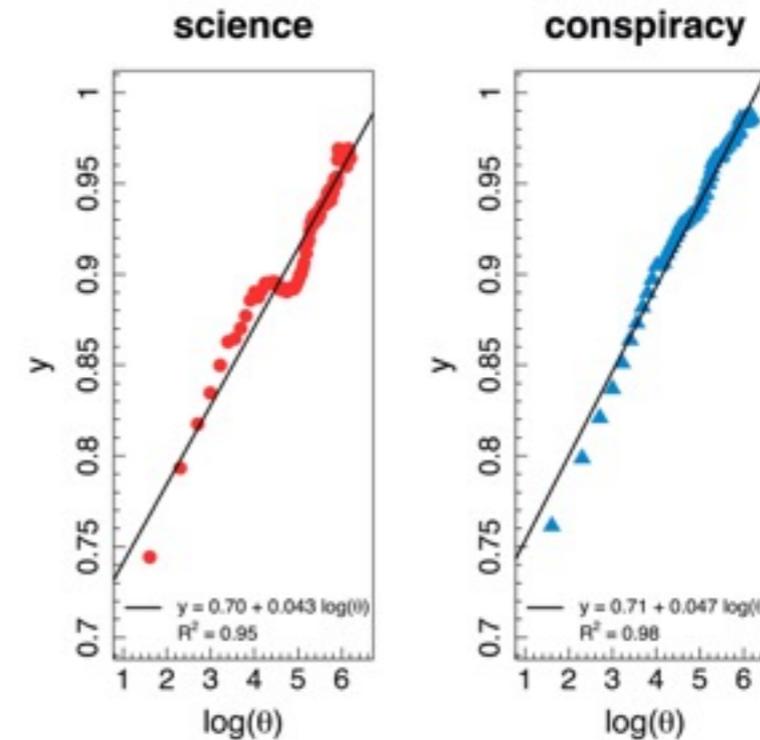
FB ITALY	TOTAL	SCIENCE	CONSPIRACY	TROLL
Pages	73	34	39	2
Posts	271,296	62,705	208,591	4,709
Likes	9,164,781	2,505,399	6,659,382	40,341
Comments	1,017,509	180,918	836,591	58,686
Likers	1,196,404	332,357	864,047	15,209
Commentsers	279,972	53,438	226,534	43,102

FB USA	TOTAL	SCIENCE	CONSPIRACY	DEBUNKING
Pages	478	83	330	66
Posts	679,948	262,815	369,420	47,780
Likes	603,332,826	453,966,494	145,388,117	3,986,922
Comments	30,828,705	22,093,692	8,304,644	429,204
Likers	52,172,855	39,854,663	19,386,131	702,122
Commentsers	9,790,906	7,223,473	3,166,726	118,996

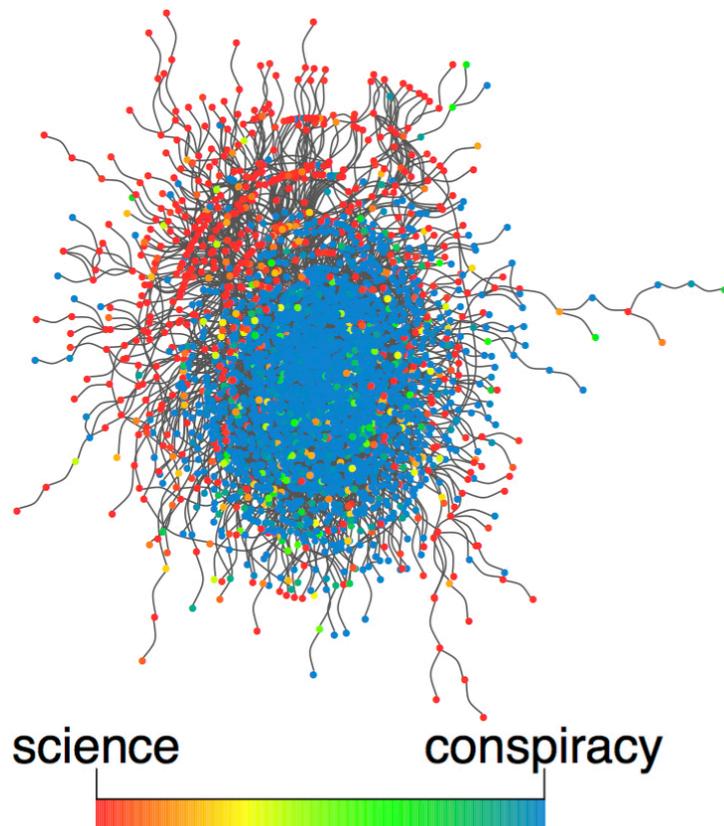
CONTENT CONSUMPTIONS AND FRIENDS



Polarization on contents. Probability density function (PDF) of users' polarization. Notice the strong bimodality of the distribution, with two sharp peaks localized at $0 < \rho < 0.005$ (science users) and at $0.95 < \rho < 1$ (conspiracy users).



Homophily. Fraction of polarized friends with the same polarization respect to the number of likes $\log(\theta(u))$ of user u .



ECHO-CHAMBERS

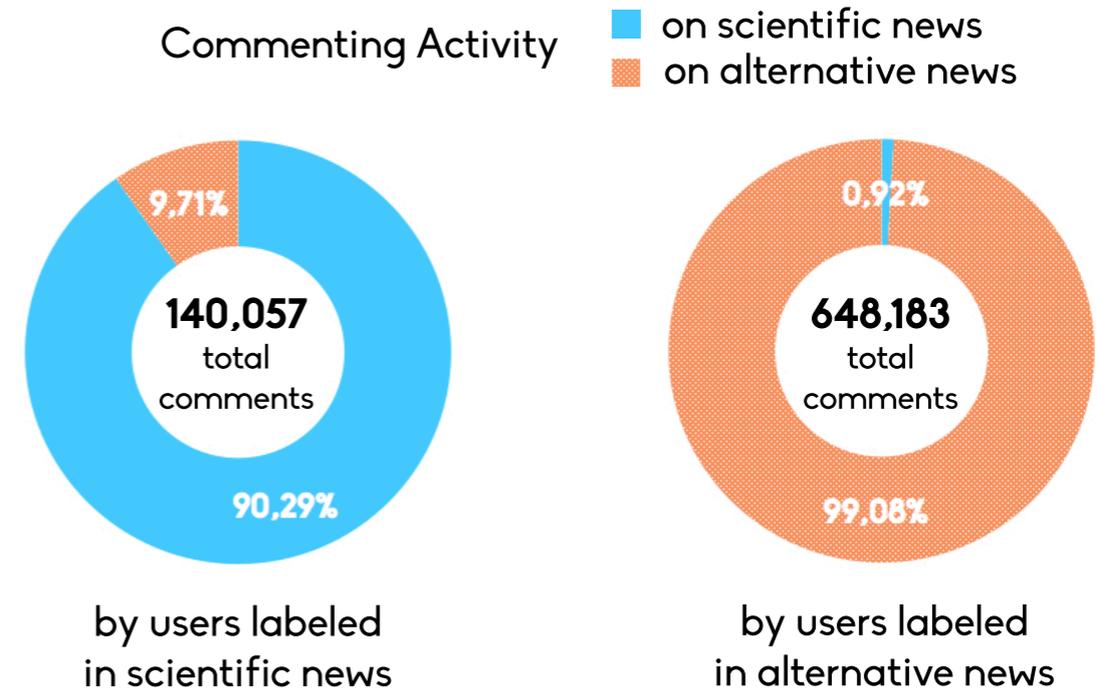
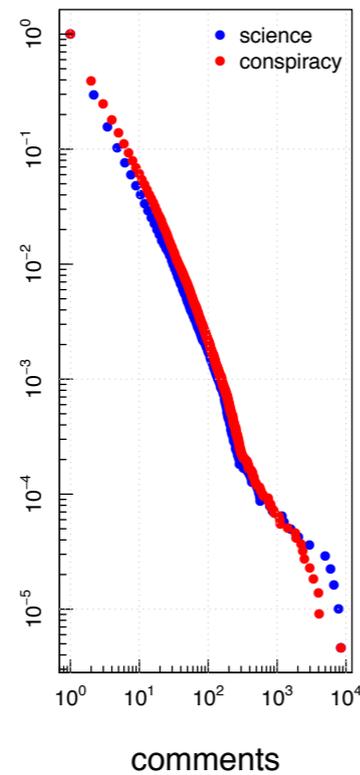
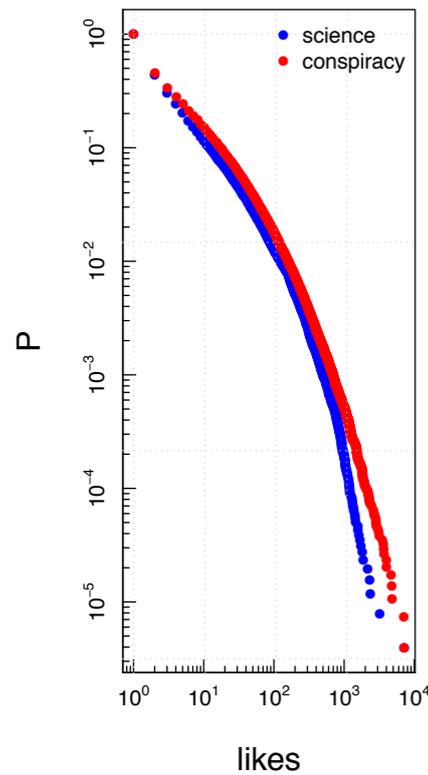
- Highly separated activity on the 2 categories
- The more the liking activity the higher the probability to have friends with the same attitude
- The more the activity on the narrative, the more the exposure to it

Viral Misinformation: The Role of Homophily and Polarization
webSci@WWW (Bessi *et al.* 2015)

Homophily and Polarization in the age of misinformation
EPJ Special Topics (Bessi *et al.* to appear)

POLARIZED USERS

	Users Classified	% Users Classified	Comm on their category	Comments on the opposite category
Science	225,225	76,79	126,454	13,603
Conspiracy	790,899	91.53	642,229	5,954



Consumption patterns for polarized users.

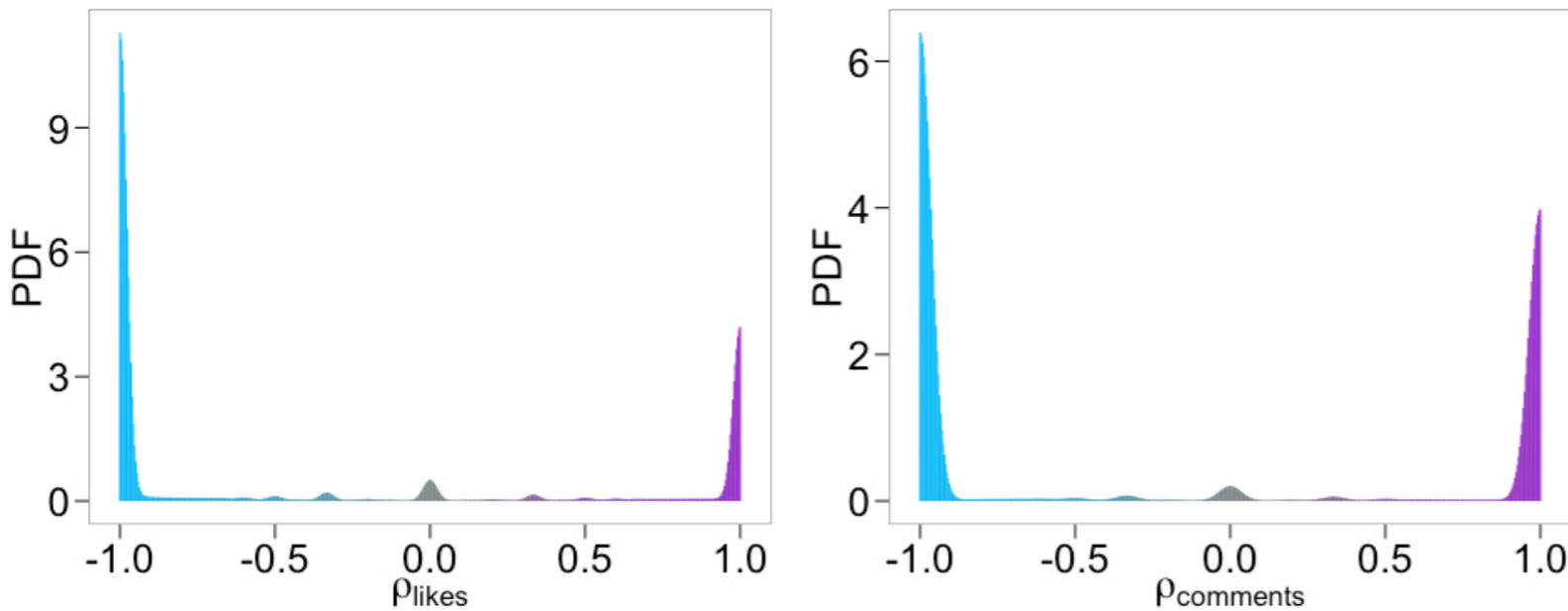
Cumulative Distribution Function for likes (panel a) and comments (panel b) of polarized users. Also the analysis on polarized users show some similarities in consumption patterns.

Commenting activity of polarized users.

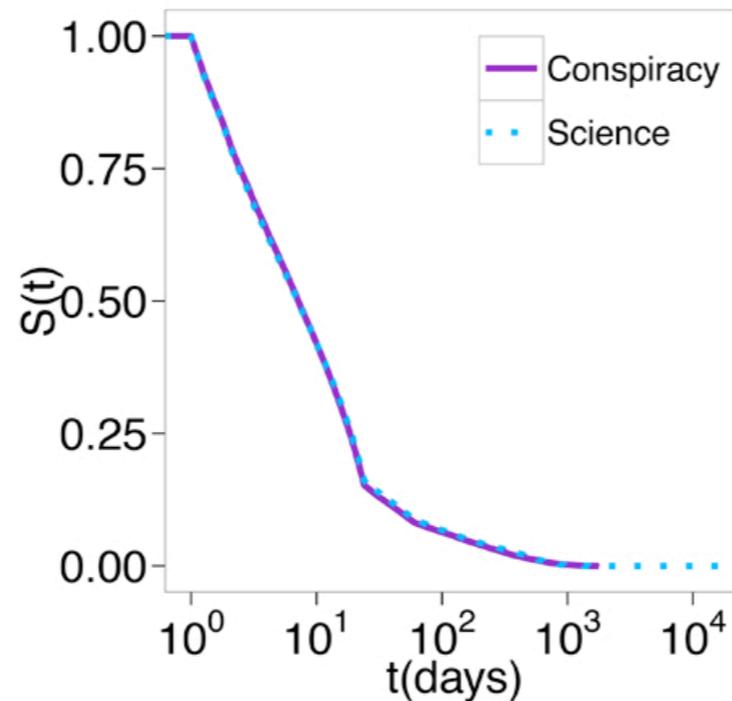
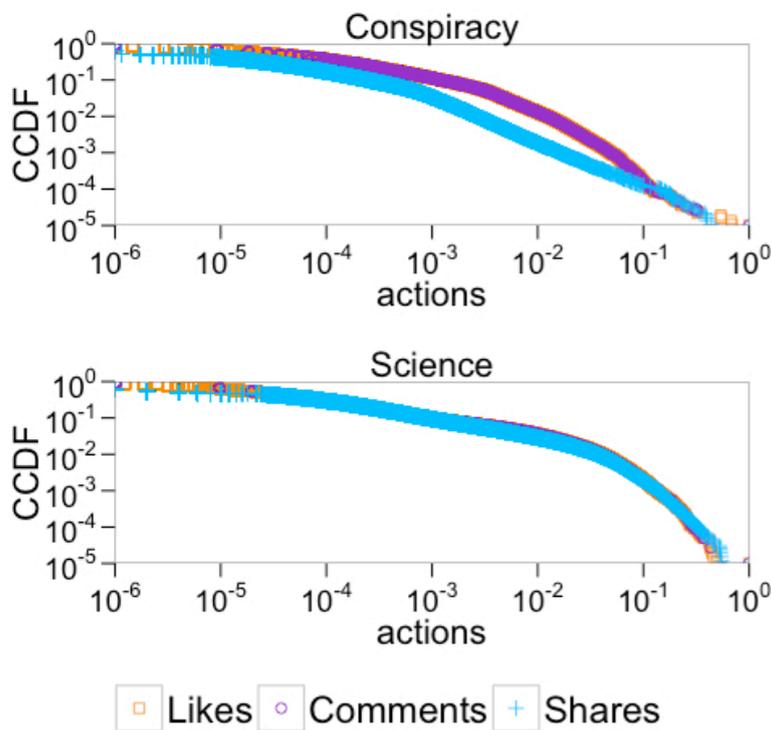
7551 posts (**1991** in Science and **5790** in Conspiracy) polarized users on the opposite category in terms of comments.

CONSUMPTION PATTERNS (FB USA)

Science Conspiracy



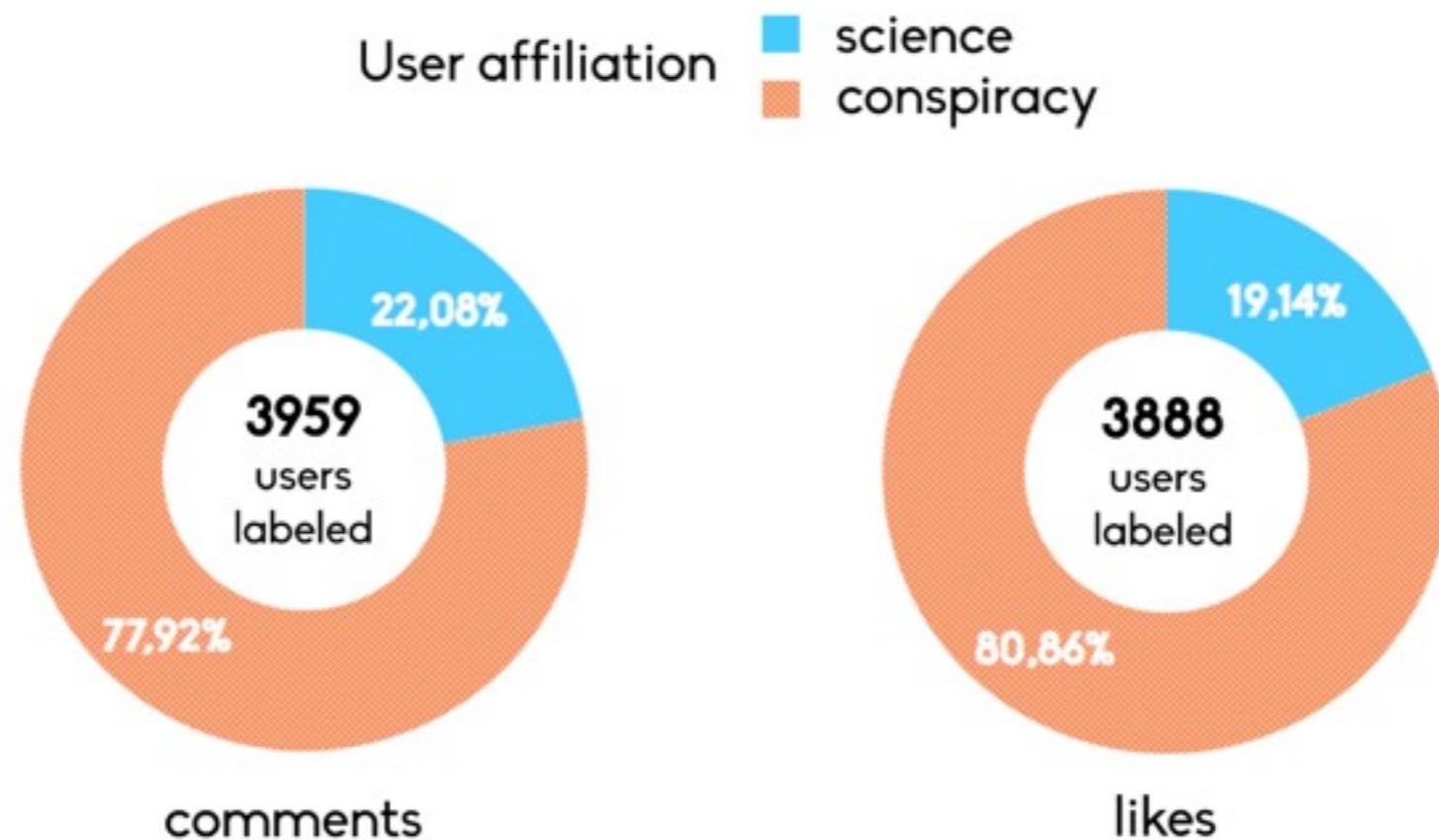
Users polarization. Probability density functions (PDFs) of the polarization of all users computed both on likes (left) and on comments (right).



Consumption patterns and lifetime. Left panel: Complementary cumulative distribution functions (CCDFs) of the number of likes, comments, and shares received by posts belonging to conspiracy (top) and scientific (bottom) news.

Right panel: Kaplan-Meier estimates of survival functions of posts belonging to conspiracy and scientific news.

RESPONSE TO **4,709** INTENTIONAL FALSE CLAIMS (TROLLS)



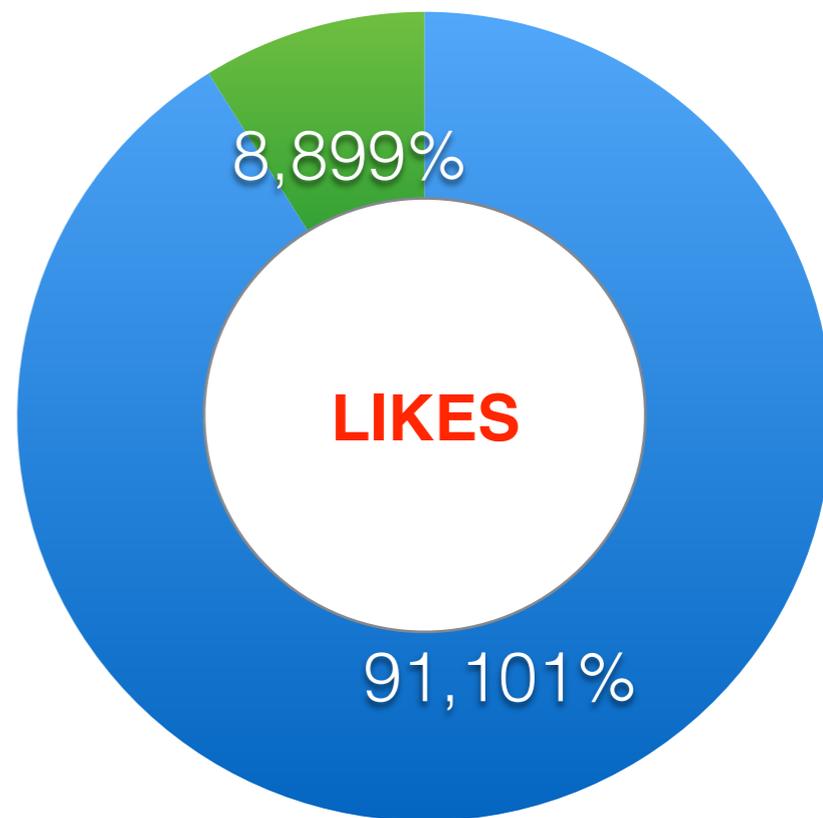
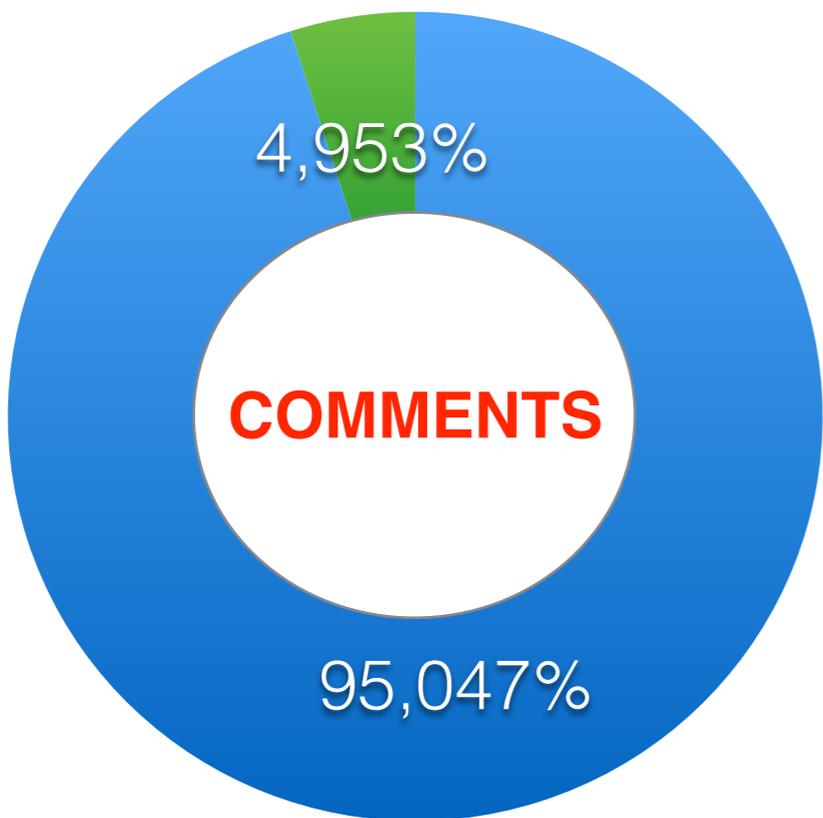
Polarized users on false information.

Percentage of likes and comments on intentional false information posted by a satirical page from polarized users of the two categories.

RESPONSE TO **47,780** DEBUNKING POSTS (1)

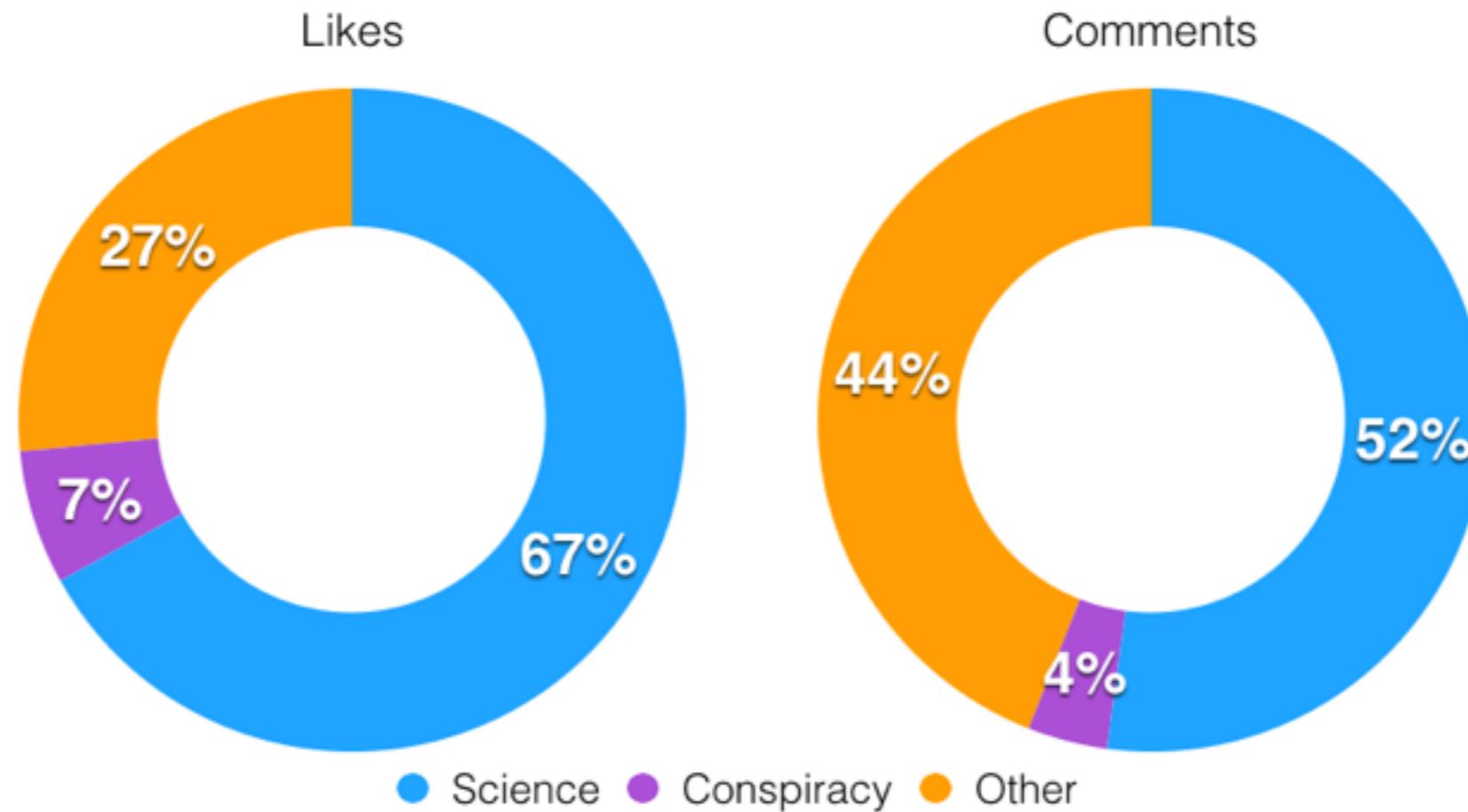
● Science ● Conspiracy

● Science ● Conspiracy



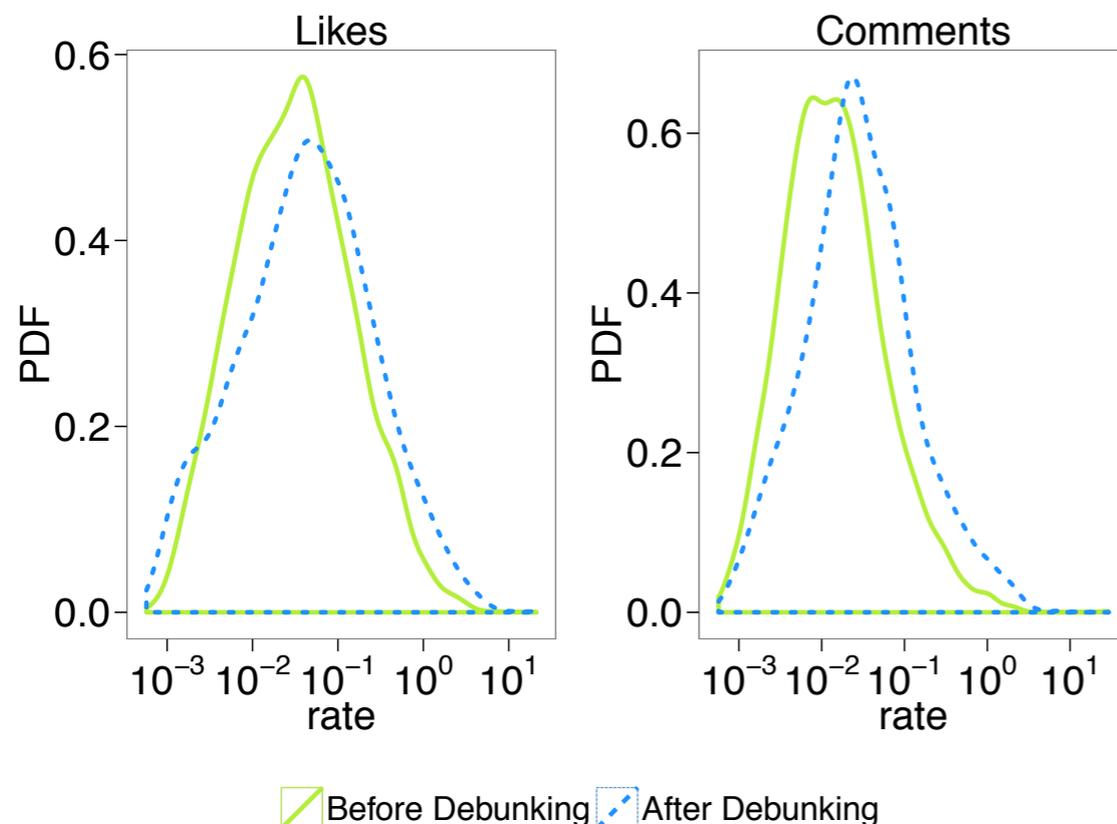
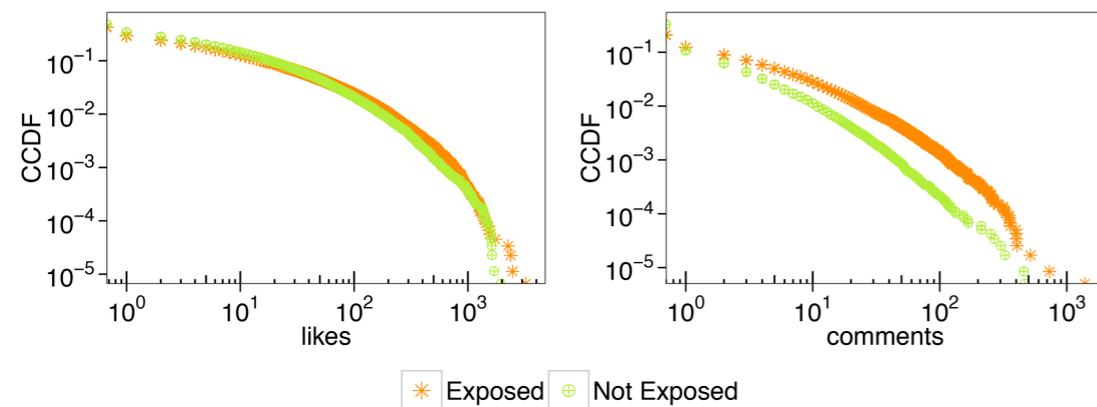
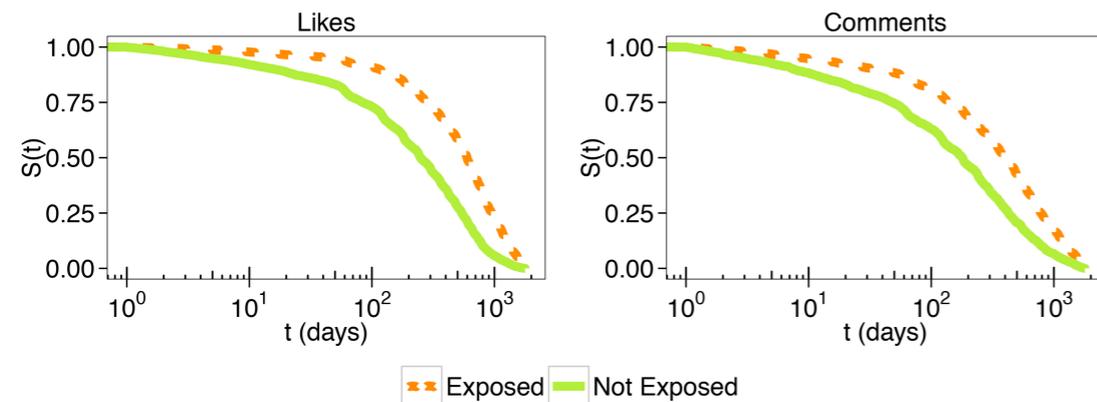
Debunking information are ignored by users in the conspiracy echo-chamber (out of 9,790,906 polarized conspiracy users only 5, 831 interact)

RESPONSE TO **47,780** DEBUNKING POSTS (1)



Debunking information are ignored by users in the conspiracy echo-chamber (out of 9,790,906 polarized conspiracy users only 5, 831 interact)

RESPONSE TO 47,780 DEBUNKING POSTS (1)



Exposure to debunking: survival functions and attention patterns. Top panel: Kaplan-Meier estimates of survival functions of users exposed and not exposed to debunking. Users lifetime is computed both on their likes (left) and comments (right).

Bottom panel: Complementary cumulative distribution functions (CCDFs) of the number of likes (left) and comments (right), per each user exposed and not exposed to debunking.

Exposure to debunking: comments and likes rate. Rate –i.e., average number of likes (left) (resp., comments (right)) on conspiracy posts over time of users exposed to debunking posts.

BACKFIRE EFFECT



“An especially useful account suggests that what makes (unjustified) conspiracy theories unjustified is that those who accept them must also accept a kind of spreading distrust of all knowledge-producing institutions, in a way **that makes it difficult to believe anything at all.**”

Prof. Cass Sunstein “Conspiracy Theories”

Acquiring information coherent with your system of beliefs
even if those contains intentional false claims

Rejecting information from oppositions

Debunking reinforce the beliefs of people already in the science echo chamber rather than convince people in the conspiracy echo chamber to change their views. only a small fraction of usual consumers of unsubstantiated information interact with the posts.

Those few are often the most committed conspiracy users and rather than internalizing debunking information, they often react to it negatively. After interacting with debunking posts, users retain, or even increase, their engagement within the conspiracy echo chamber.

The spreading of misinformation online

Michela Del Vicario^a, Alessandro Bessi^b, Fabiana Zollo^a, Fabio Petroni^c, Antonio Scala^{a,d}, Guido Caldarelli^{a,d}, H. Eugene Stanley^e, and Walter Quattrociocchi^{a,1}

^aLaboratory of Computational Social Science, Networks Department, IMT Alti Studi Lucca, 55100 Lucca, Italy; ^bIUSS Institute for Advanced Study, 27100 Pavia, Italy; ^cSapienza University, 00185 Rome, Italy; ^dISC-CNR Uos "Sapienza," 00185 Rome, Italy; and ^eBoston University, Boston, MA 02115

Edited by Matjaz Perc, University of Maribor, Maribor, Slovenia, and accepted by the Editorial Board December 4, 2015 (received for review September 1, 2015)

The wide availability of user-provided content in online social media facilitates the aggregation of people around common interests, worldviews, and narratives. However, the World Wide Web (WWW) also allows for the rapid dissemination of unsubstantiated rumors and conspiracy theories that often elicit rapid, large, but naive social responses such as the recent case of Jade Helm 15—where a simple military exercise turned out to be perceived as the beginning of a new civil war in the United States. In this work, we address the determinants governing misinformation spreading through a thorough quantitative analysis. In particular, we focus on how Facebook users consume information related to two distinct narratives: scientific and conspiracy news. We find that, although consumers of scientific and conspiracy stories present similar consumption patterns with respect to content, cascade dynamics differ. Selective exposure to content is the primary driver of content diffusion and generates the formation of homogeneous clusters, i.e., “echo chambers.” Indeed, homogeneity appears to be the primary driver for the diffusion of contents and each echo chamber has its own cascade dynamics. Finally, we introduce a data-driven percolation model mimicking rumor spreading and we show that homogeneity and polarization are the main determinants for predicting cascades’ size.

misinformation | virality | Facebook | rumor spreading | cascades

The massive diffusion of sociotechnical systems and micro-

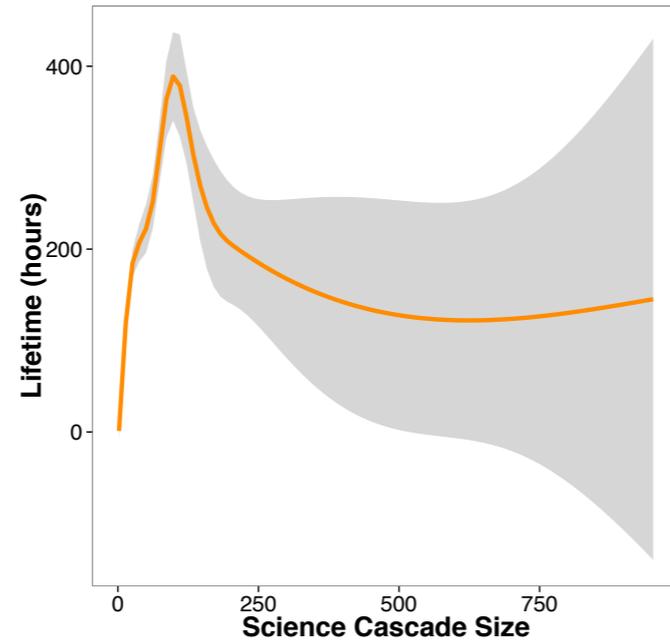
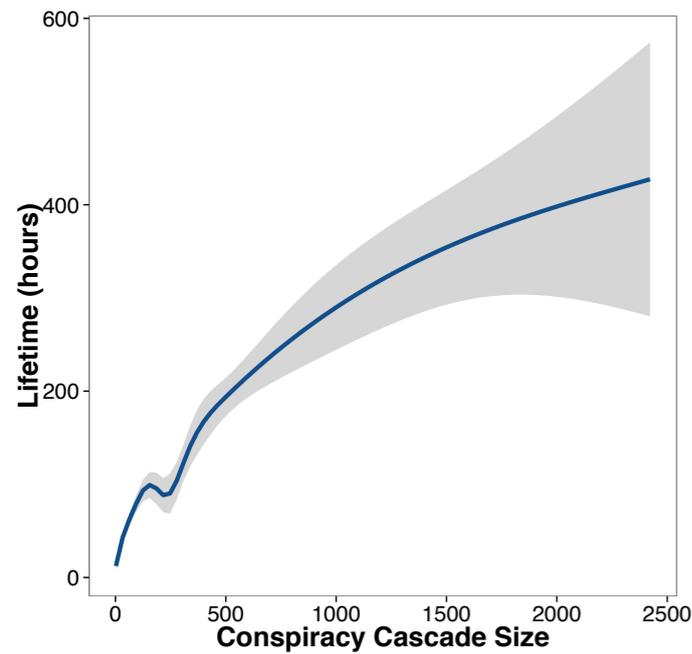
blogging platforms on the World Wide Web (WWW) creates a

the main difference between the two is content verifiability. The generators of scientific information and their data, methods, and outcomes are readily identifiable and available. The origins of conspiracy theories are often unknown and their content is strongly disengaged from mainstream society and sharply divergent from recommended practices (22), e.g., the belief that vaccines cause autism.

Massive digital misinformation is becoming pervasive in online social media to the extent that it has been listed by the World Economic Forum (WEF) as one of the main threats to our society (23). To counteract this trend, algorithmic-driven solutions have been proposed (24–29), e.g., Google (30) is developing a trustworthiness score to rank the results of queries. Similarly, Facebook has proposed a community-driven approach where users can flag false content to correct the newsfeed algorithm. This issue is controversial, however, because it raises fears that the free circulation of content may be threatened and that the proposed algorithms may not be accurate or effective (10, 11, 31). Often conspiracists will denounce attempts to debunk false information as acts of misinformation.

Whether a claim (either substantiated or not) is accepted by an individual is strongly influenced by social norms and by the claim’s coherence with the individual’s belief system—i.e., confirmation bias (32, 33). Many mechanisms animate the flow of false information that generates false beliefs in an individual, which, once adopted, are rarely corrected (34–37).

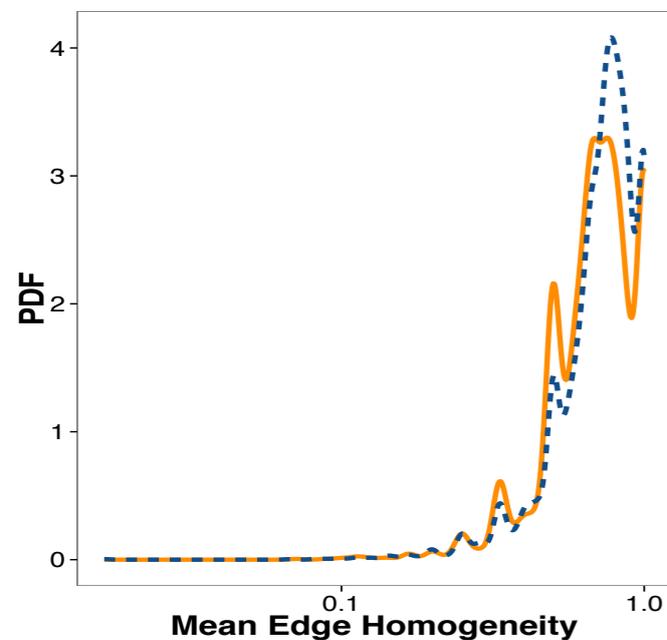
VIRAL PROCESSES AND ECHO CHAMBERS



Lifetime as a function of the cascade size for conspiracy news (left) and science news (right).

Science news quickly reach a higher diffusion, a longer lifetime does not correspond to a higher level of interest.

Conspiracy rumors are assimilated more slowly and show a positive relation between lifetime and size.



Probability density function (PDF) of edge homogeneity for science (orange) and conspiracy (blue) news.

Homophilic paths are dominant on the whole cascades for both scientific and conspiracy news.

CASCADES

MODELING RUMOR SPREADING

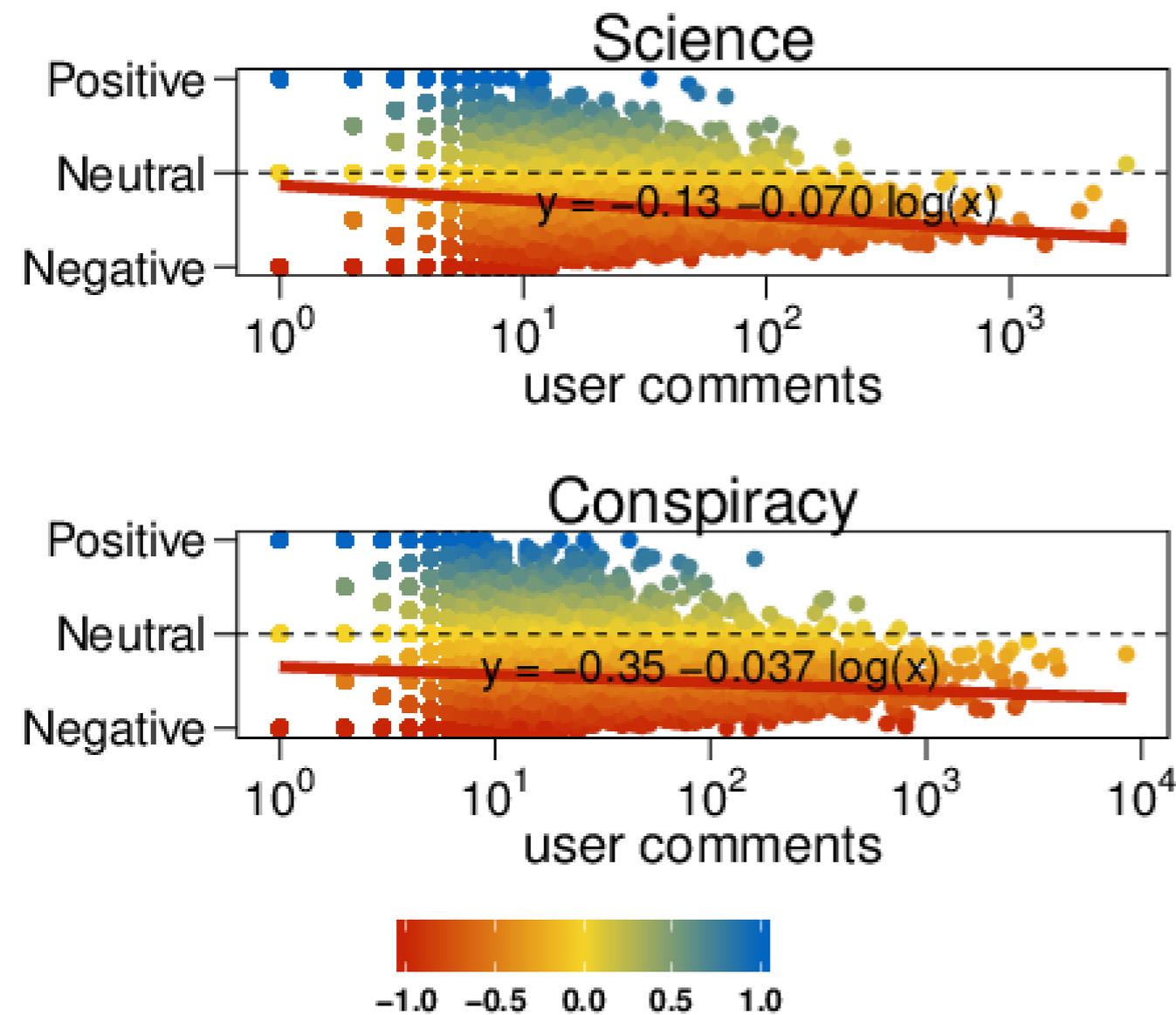
- Predicting where certain kind of rumors are more likely to spread
- Cascades' size is bounded to the size of the echo-chamber



EMOTIONAL DYNAMICS AND ECHO-CHAMBERS

DISCUSSION AND GROUP POLARIZATION

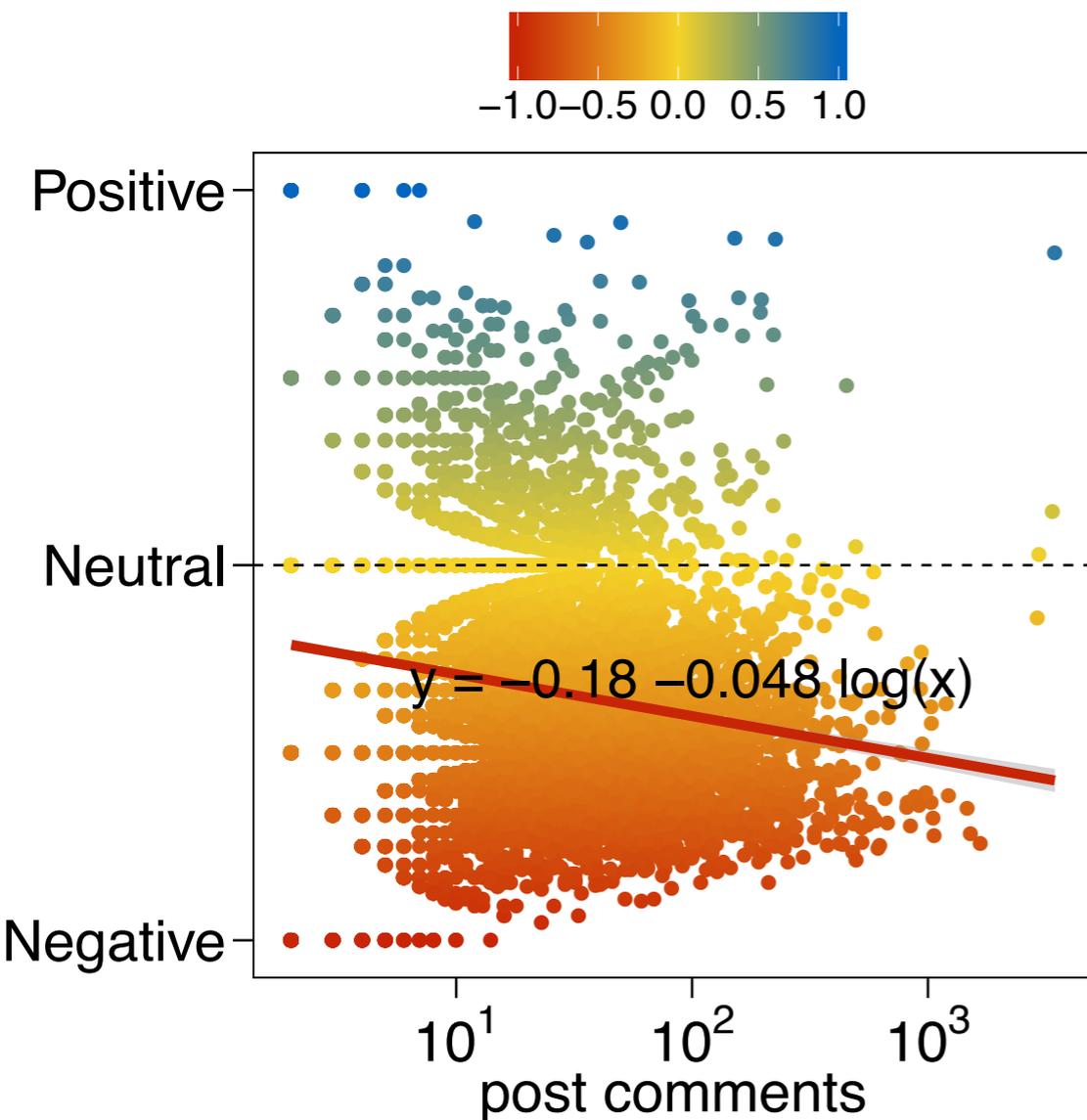
“It is well known that when like-minded groups deliberate, they tend to polarize, in the sense that they generally end up in a more extreme position in line with their predeliberation tendencies” **(Sunstein, 2008)** *Going to extremes: how like minds unite and divide. Oxford University Press*



Sentiment and commenting activity.

Average sentiment of polarized users as a function of their number of comments. Negative (respectively, neutral, positive) sentiment is denoted by red (respectively, yellow, blue) color. The sentiment has been regressed w.r.t. the logarithm of the number of comments.

WHEN THE ECHO CHAMBERS MEET



Sentiment and discussion.

Aggregated sentiment of posts as a function of their number of comments. Negative (respectively, neutral, positive) sentiment is denoted by red (respectively, yellow, blue) color.

RESEARCH IMPACT



More

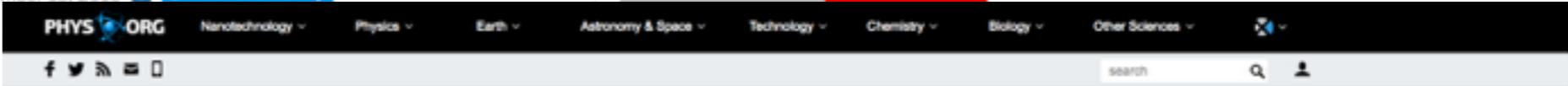


The Intersect

What was fake on the Internet this week: Why this is the final column

A 128 Save for Later Reading List

By Gillian Triggs, December 18, 2015 [Follow @gillandewey](#)



Facebook study suggests online users reinforce their views by creating echo chambers

January 5, 2016 by Bob Ylka [report](#)

11k Like 43



(Phys.org)—A team of researchers from several institutions in Italy and one in the U.S. has found evidence that suggests Internet users follow a pattern similar to that found in other media regarding how they look for and use information they find. In their paper published in *Proceedings of the National Academy of Sciences*, the team describes how they downloaded data from Facebook, analyzed it and found examples of echo chamber type behaviors.



Featured Last comments Popular

- Did Henry VIII suffer same brain injury as some NFL players? Feb 03, 2015 0
- New technique leads to creation of elastic high-strength carbon nanotube film 20 hours ago 1
- Film coating transforms contact lenses into computer screens Feb 04, 2016 6

W.R.T INTERDISCIPLINARITY: FEEDBACKS FROM OTHER FIELDS

A FAN LETTER...

Greetings from the USA - just discovered your papers on polarization, misinformation, debunking etc. - they are amazing and fabulous! Pathbreaking, I think. All best wishes.

Prof. Cass Sunstein, Harvard University

BloombergView

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SOCIAL MEDIA

How Facebook Makes Us Dumber

149 ● JAN 8, 2016 9:51 AM EST

By [Cass R. Sunstein](#)

Why does misinformation spread so quickly on the social media? Why doesn't it get corrected? When the truth is so easy to find, why do people accept falsehoods?



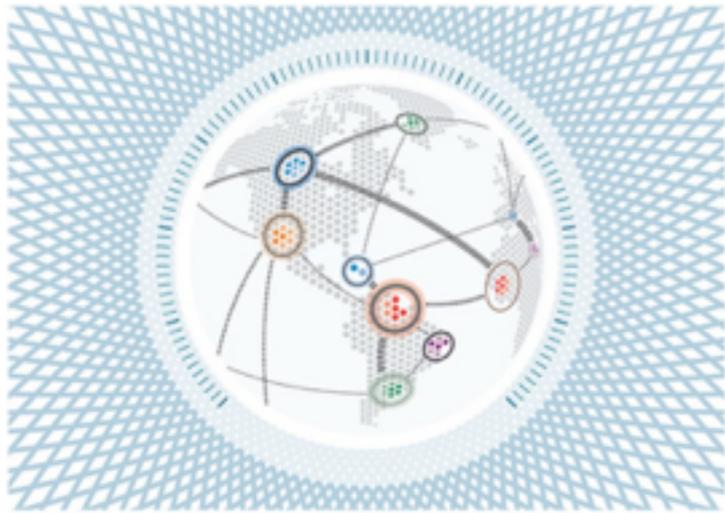
Cass R. Sunstein, the former administrator of the White House Office of Information and Regulatory Affairs, is the Robert Walmsley university professor at Harvard Law School and a Bloomberg View columnist. [Read more.](#)

[Follow @CassSunstein](#)

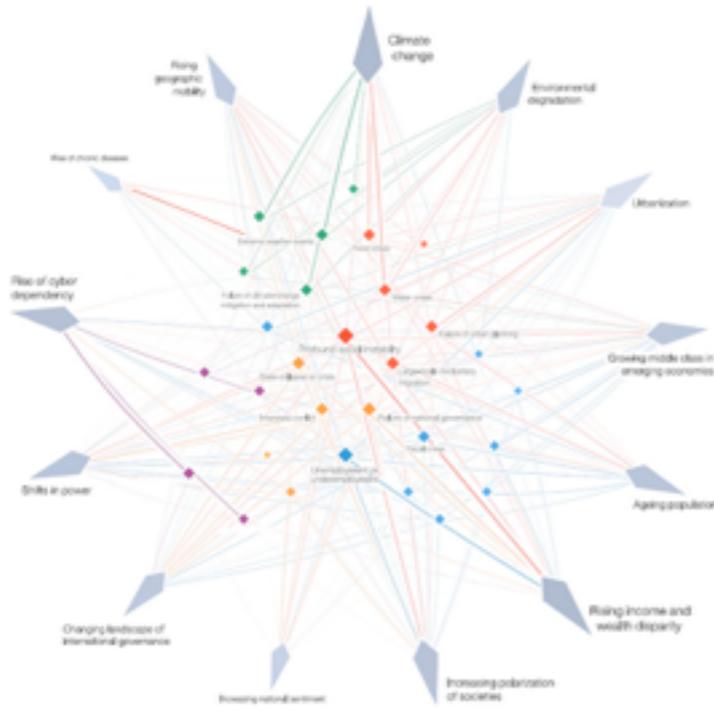
MOST POPULAR

Insight Report

The Global Risks Report 2016 11th Edition



The Risks-Trends Interconnection Map 2016



Global Agenda > Digital > Risk and Resilience > Social Media

How does misinformation spread online?



Image: A man poses with his iPad tablet as he sits in a bar, in this photo illustration taken in Rome September 20, 2012. REUTERS/Tony Gentile

Written by

Walter Quattrociocchi, Head of the Laboratory of Computational Social Science, IMT Lucca in Italy

Published

Thursday 14 January 2016

In the run up to the 2013 Italian elections, a social media post exposing the corruption of parliament went viral. Italian politicians were quietly certain that, win or lose, they would be financially secure by taking money from the taxpayer. Parliament had quietly passed a special welfare bill specially designed to protect policy-makers by ensuring them an incredible unemployment package should they lose their seat in the upcoming election. The bill, proposed by Senator

THE BOOK

Walter Quattrocioni, Antonella Vicini

MISINFORMATION

Guida alla società dell'informazione e della credulità

pp. 176, € 23,00

cod. 666.9 (V)

Collana: NEO

ISBN 9788891742254

Previsto in libreria: 5 ottobre 2016 – SN 13



Potenziale di vendita: 

Argomento: Attualità / Comunicazione e media

Livello: Saggi, scenari, interventi

Promozione: Digital e social media marketing. Interviste. Recensioni.

Il World Economic Forum ha inserito la disinformazione digitale (casuale o costruita ad arte) nella lista dei 'rischi globali': capace di avere risvolti politici, geopolitici e, perfino, terroristici.

I social network sono il terreno di coltura e di diffusione perfetta del virus della disinformazione, con conseguenze che vanno ben al di là del recinto del mondo digitale. Perché?

Questo libro offre una panoramica sui meccanismi sociali e cognitivi di un fenomeno che ormai è sotto gli occhi di tutti, anche di quelli meno attenti.



“So you have to find a way to break out of your echo chambers. This is tougher than it sounds — especially when it comes the issues you care most about. But it’s in your interest to engage the people you disagree with, rather than shutting them out or shutting them up. Not only because it gives you a chance to challenge their views, and maybe even change them. But also because sometimes they might just be right.”

Samantha Power, Ambasciatore USA all’ONU

The problem behind misinformation spreading is
POLARIZATION

PANDOORS

Permanent Observatory on News Spreading on Social Media

Creating synergies among Institutions, Scholars and
Communicators to reframe the information system

- Disseminating the awareness of the problem
- Determining the polarizing issues
- Exploiting Science to Create Bridges

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IN EXPANSION

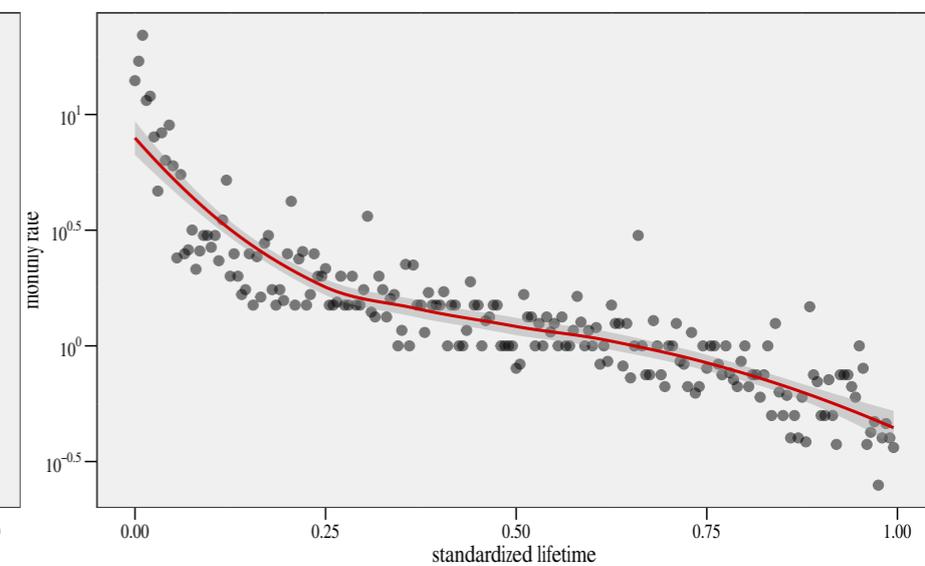
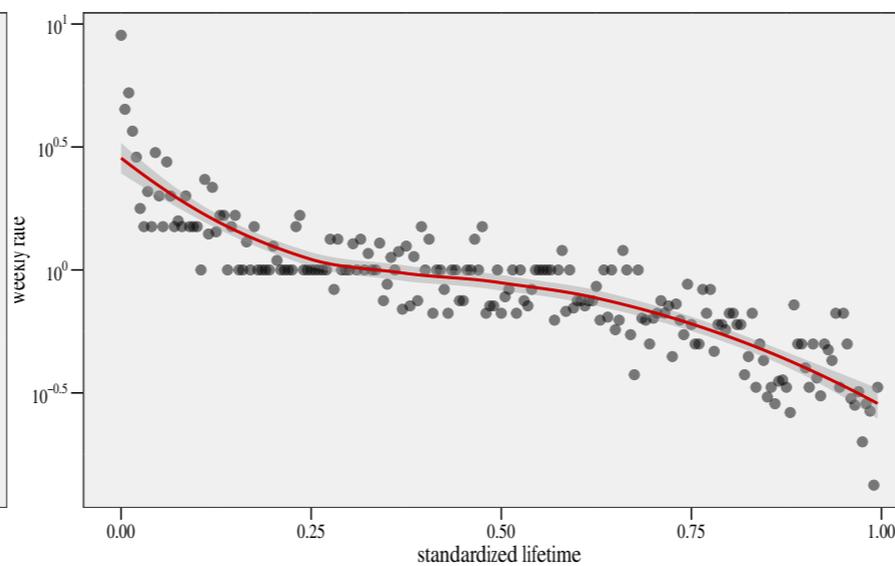
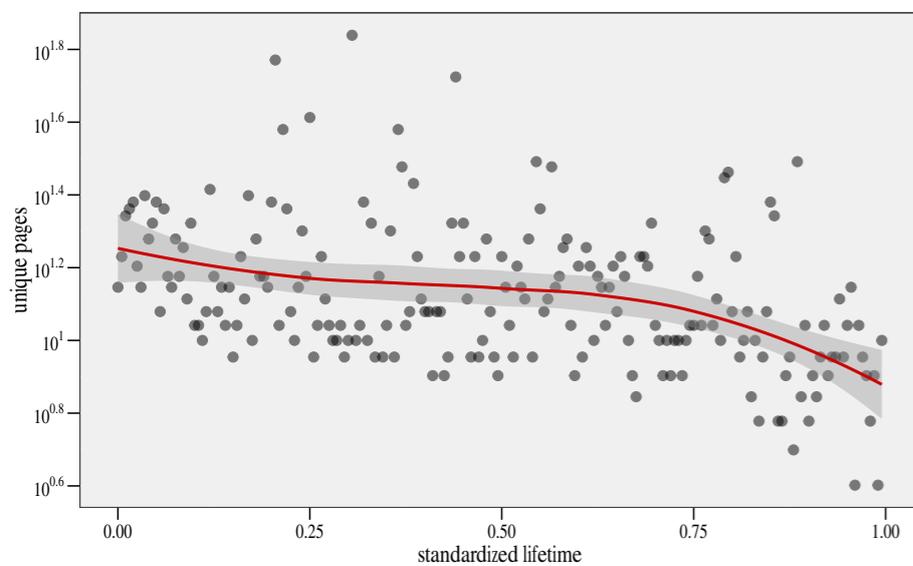
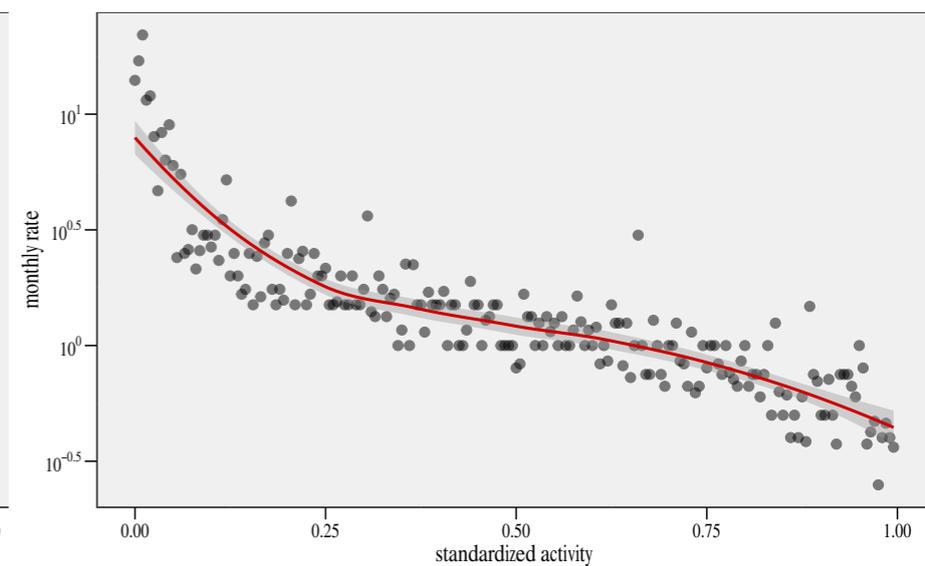
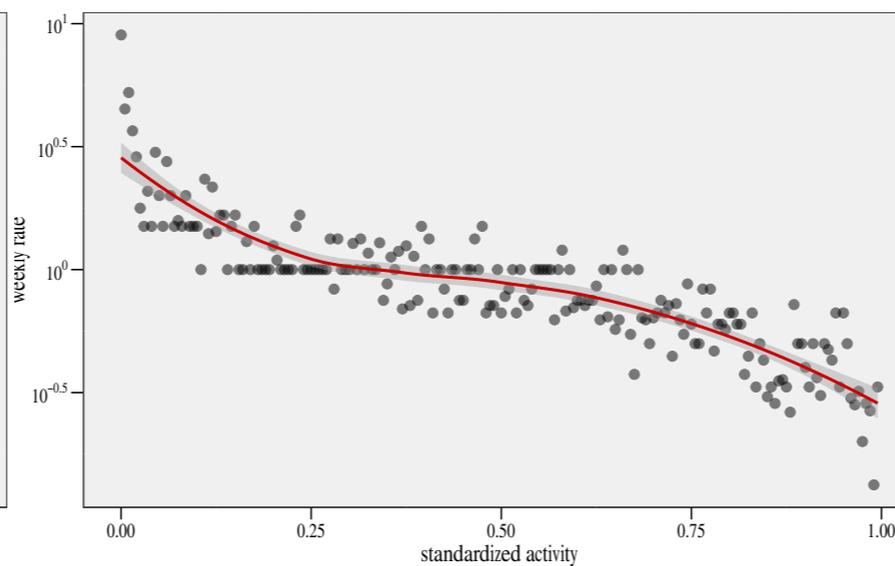
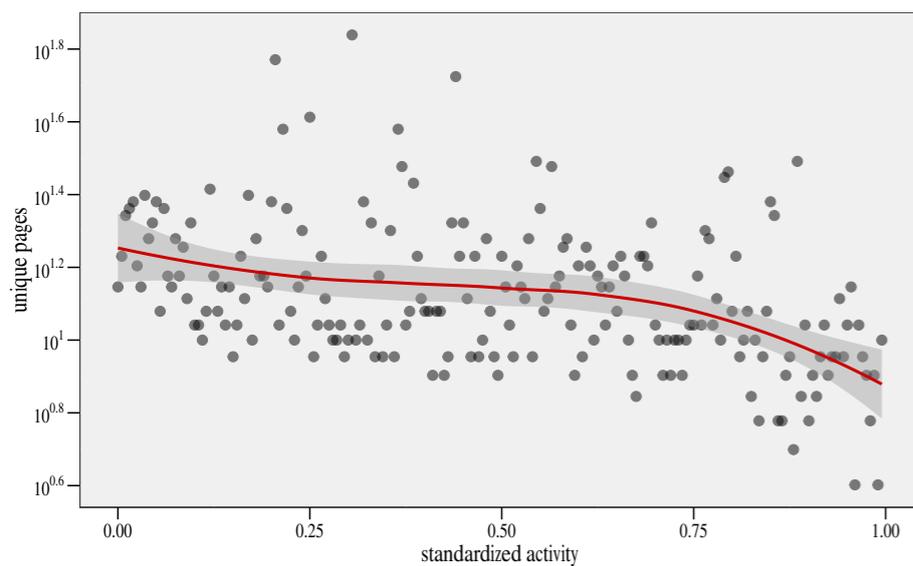
The anatomy of news consumption on Facebook

A.L. Schimdt, A. Bessi, F. Zollo, M. Del Vicario, A. Scala, G. Caldarelli, H. Gene Stanley, W. Quattrociocchi
submitted to PNAS

376 Million of Facebook Users (Jan 2010- Dec 2015)

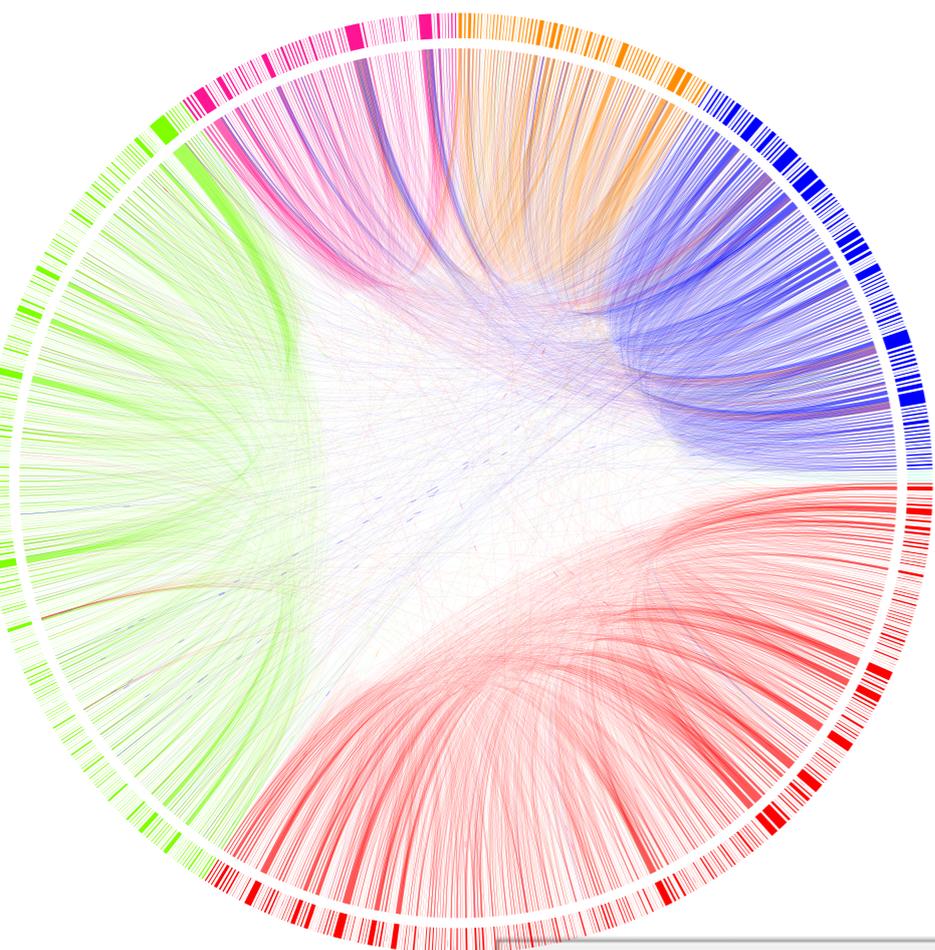


Users tend to focus on a limited set of information sources

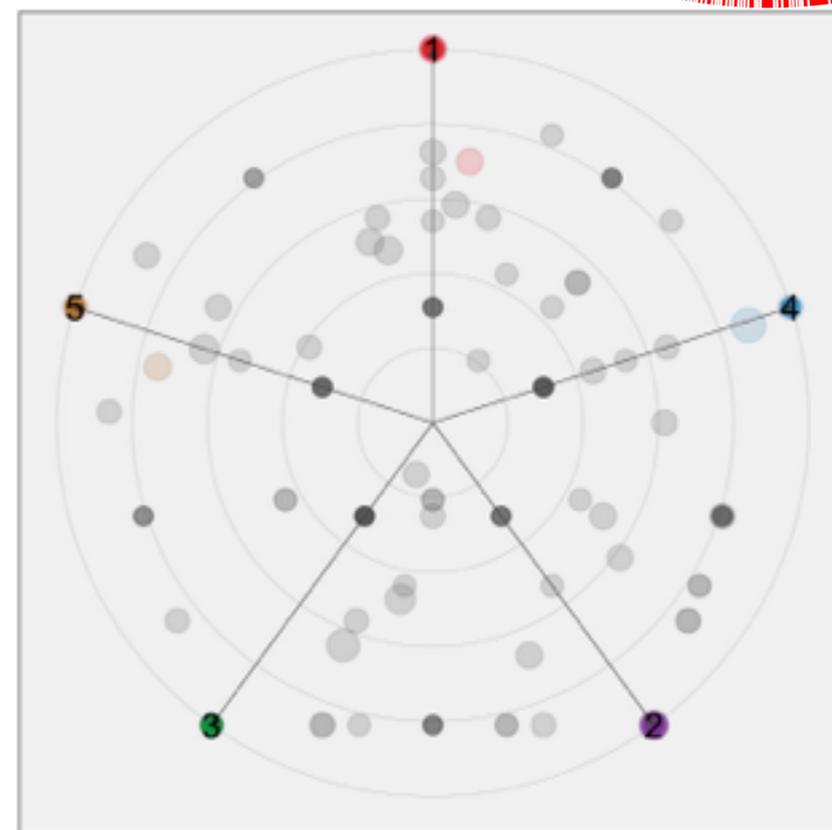
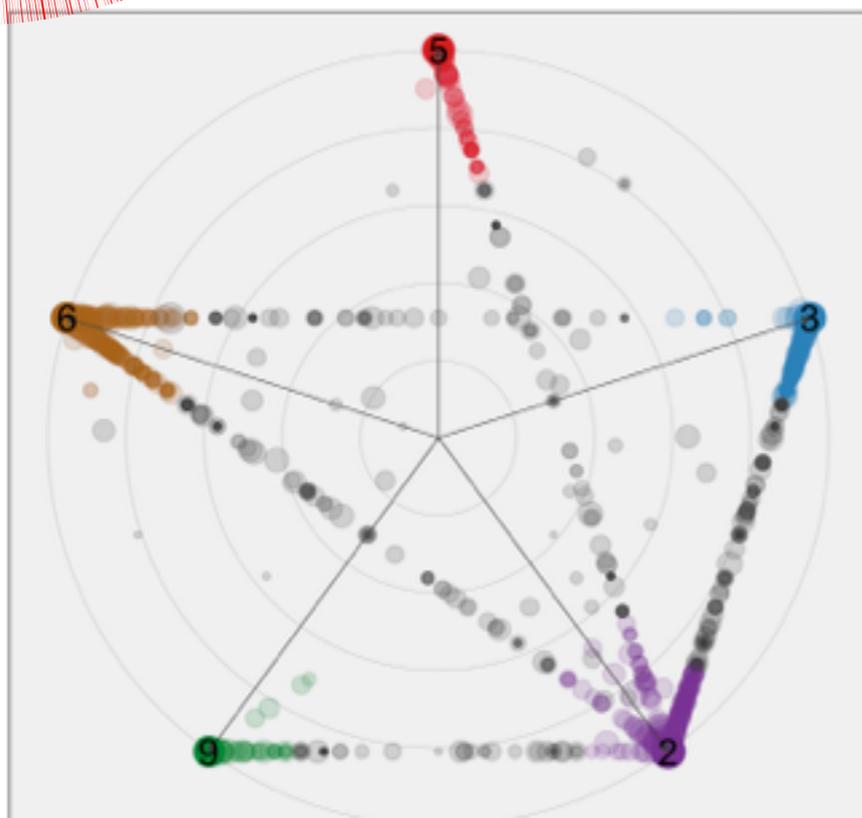
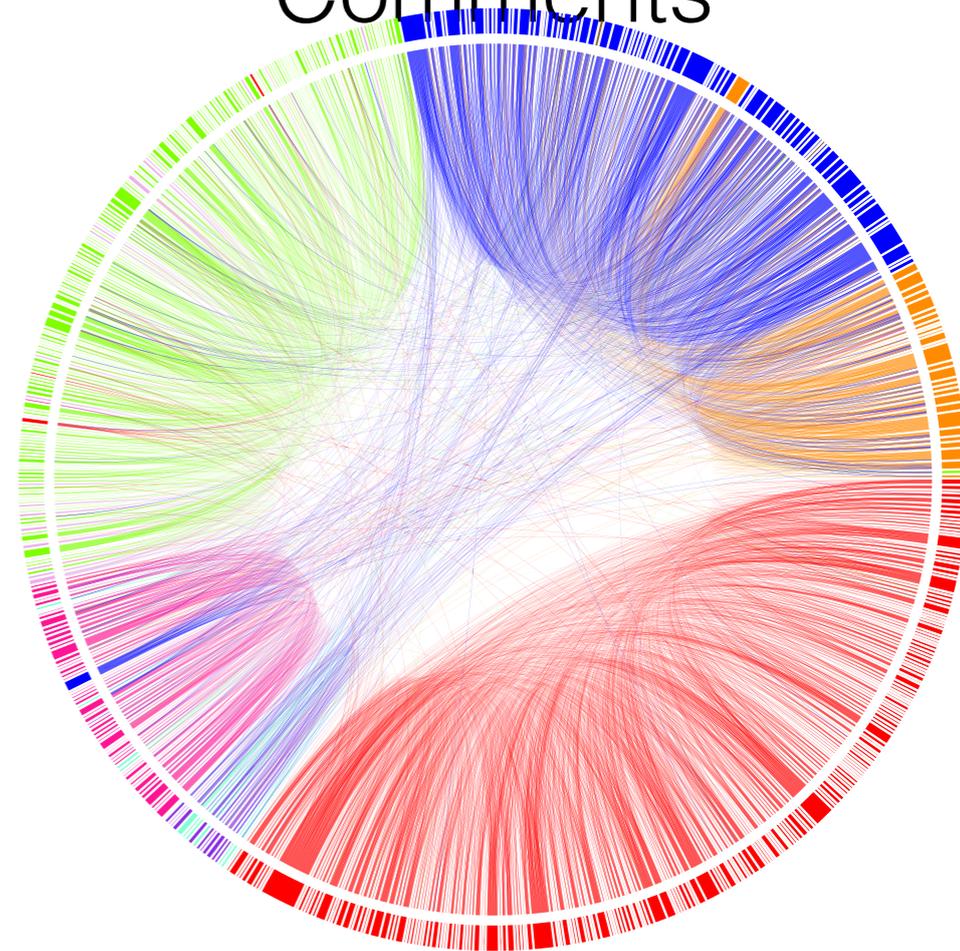


Clusters and Users Polarization

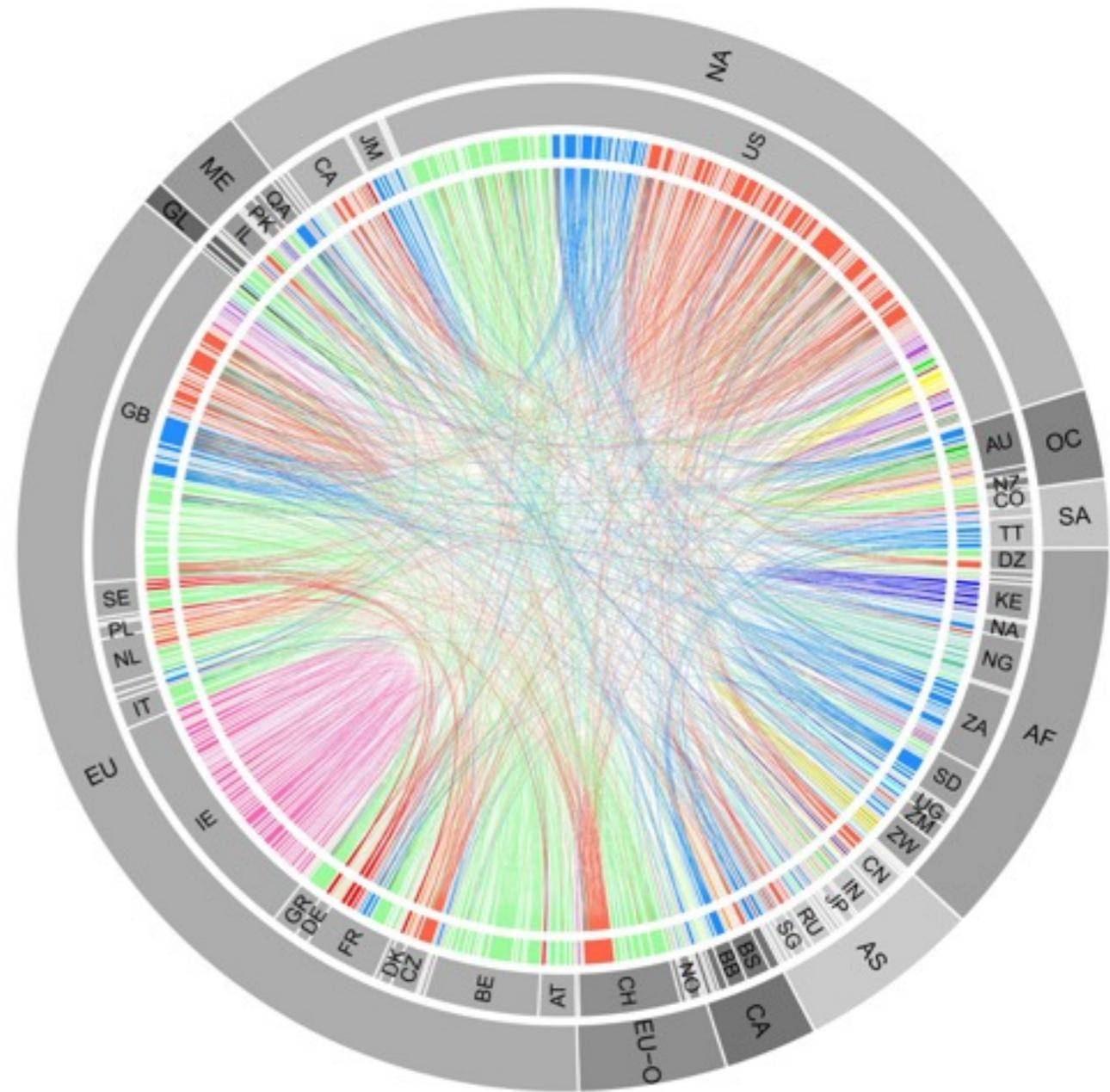
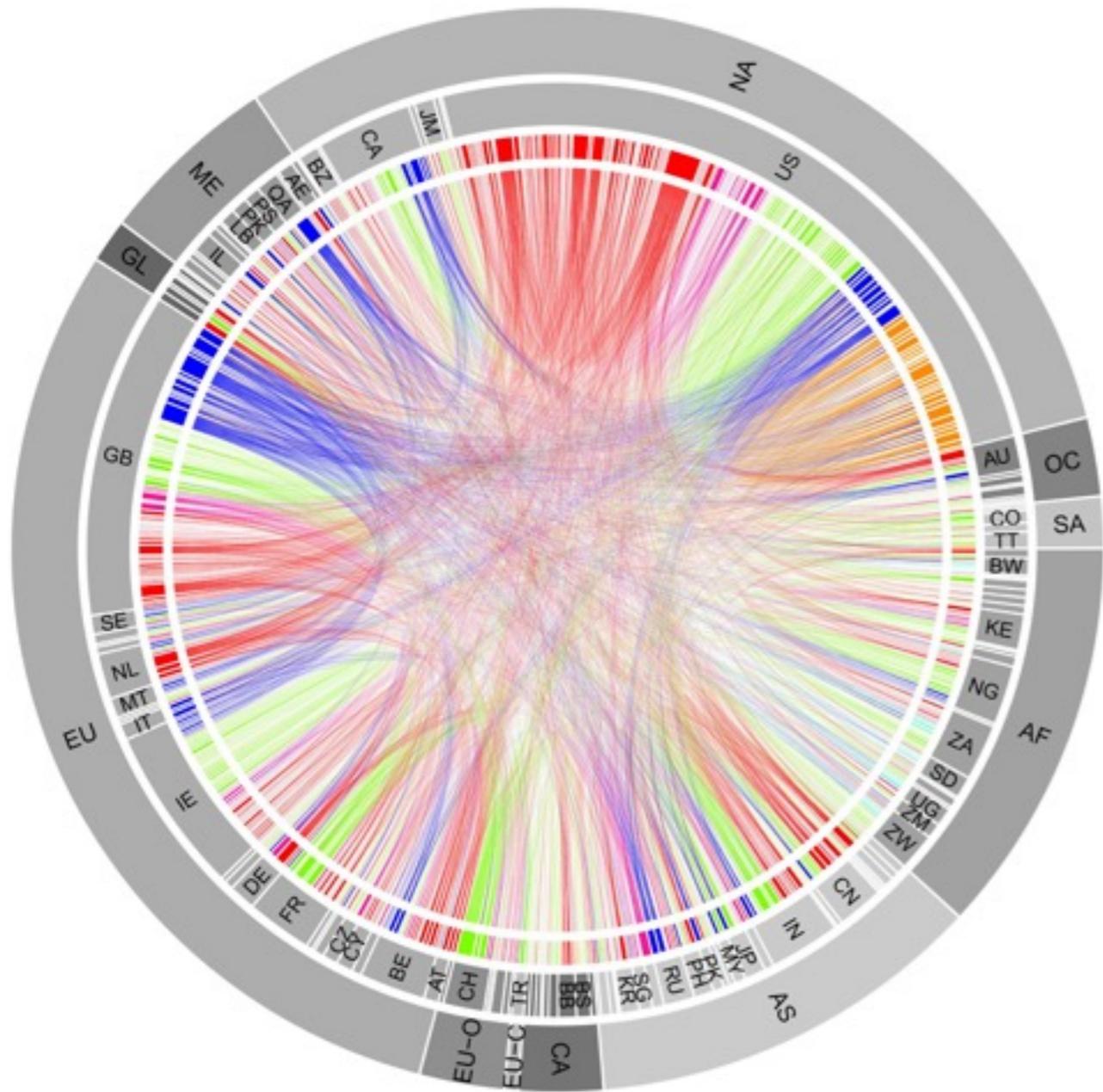
Likes



Comments

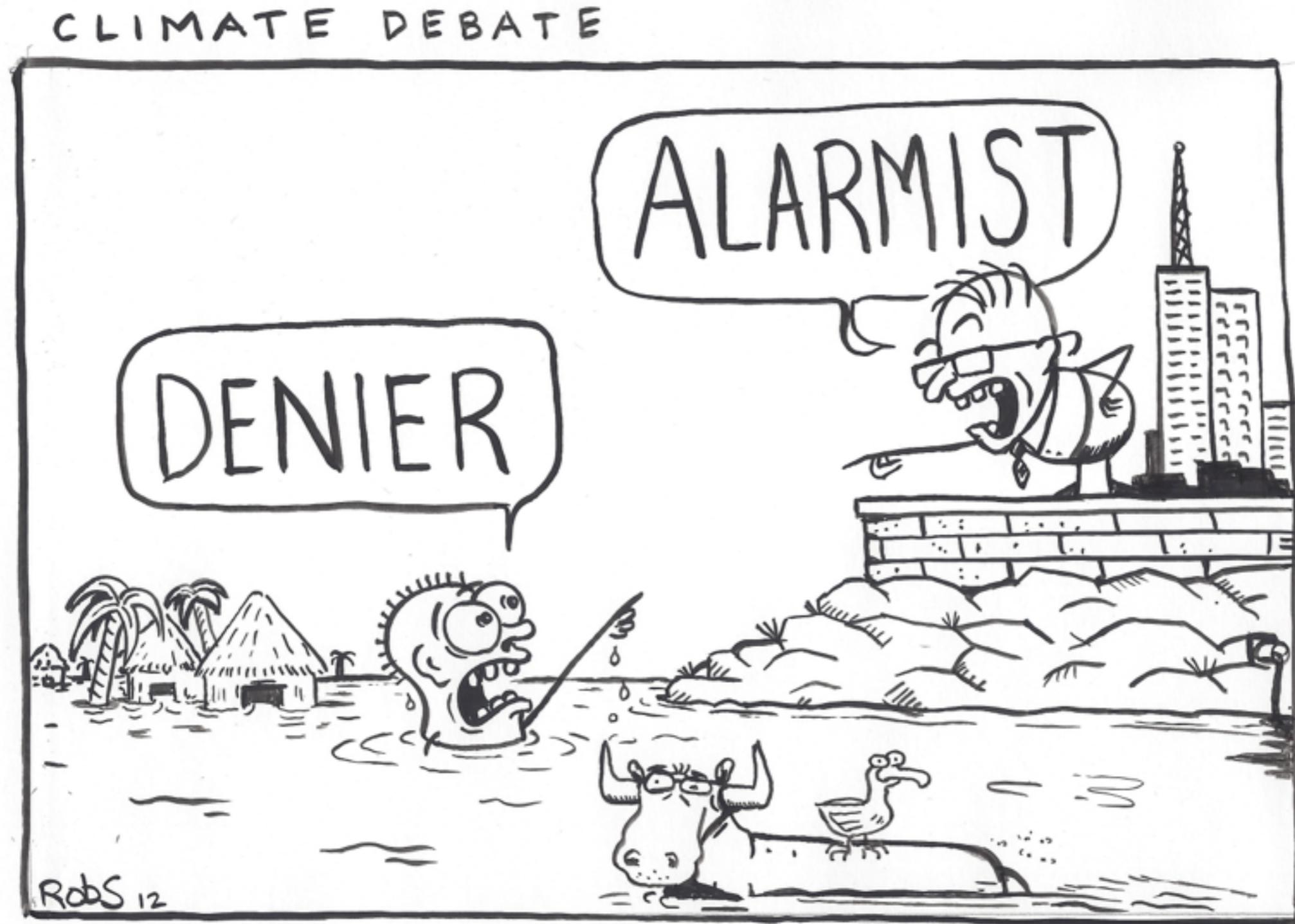


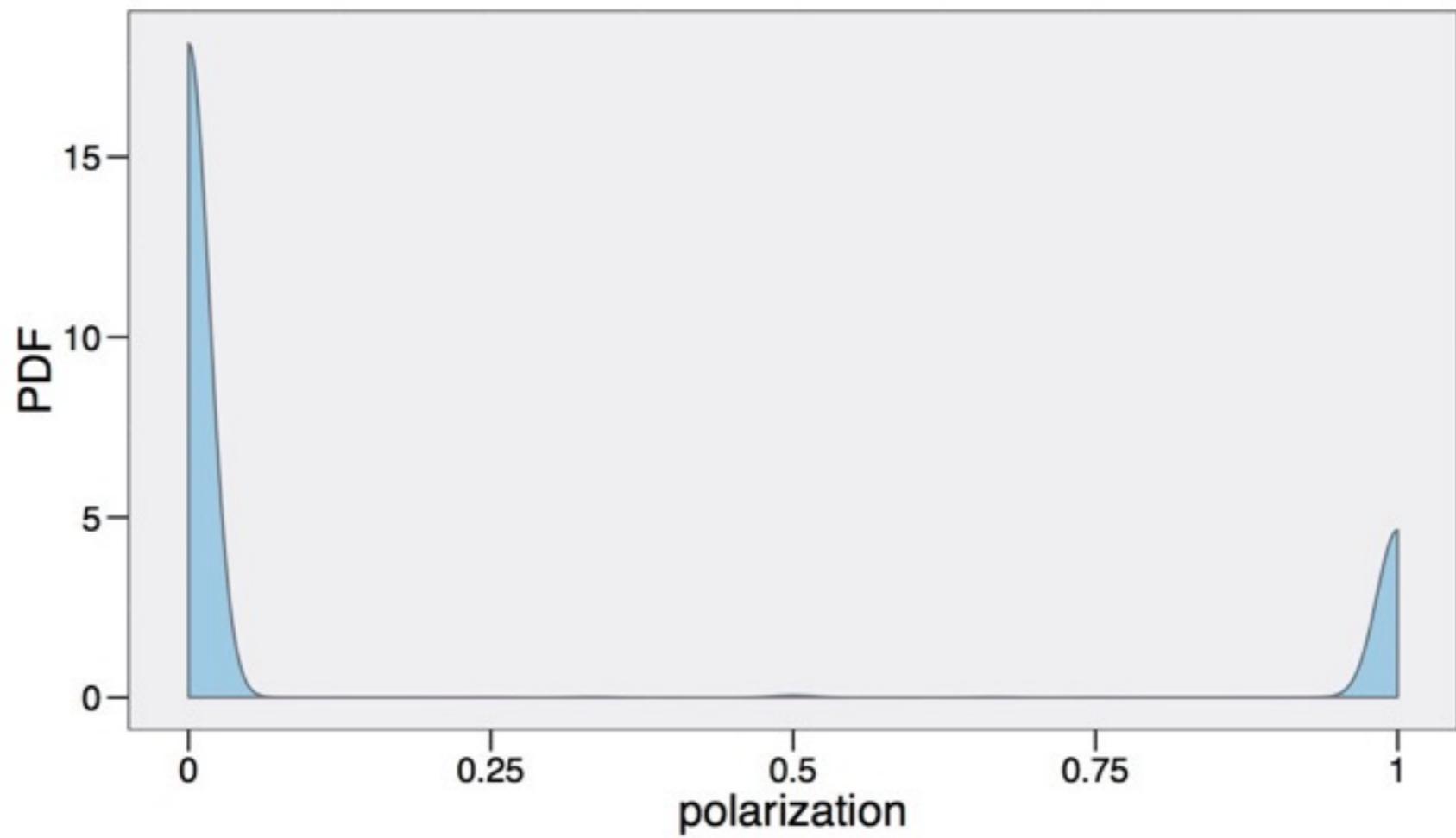
Comparing News Providers and Users Consumption



Social debate around Climate Change

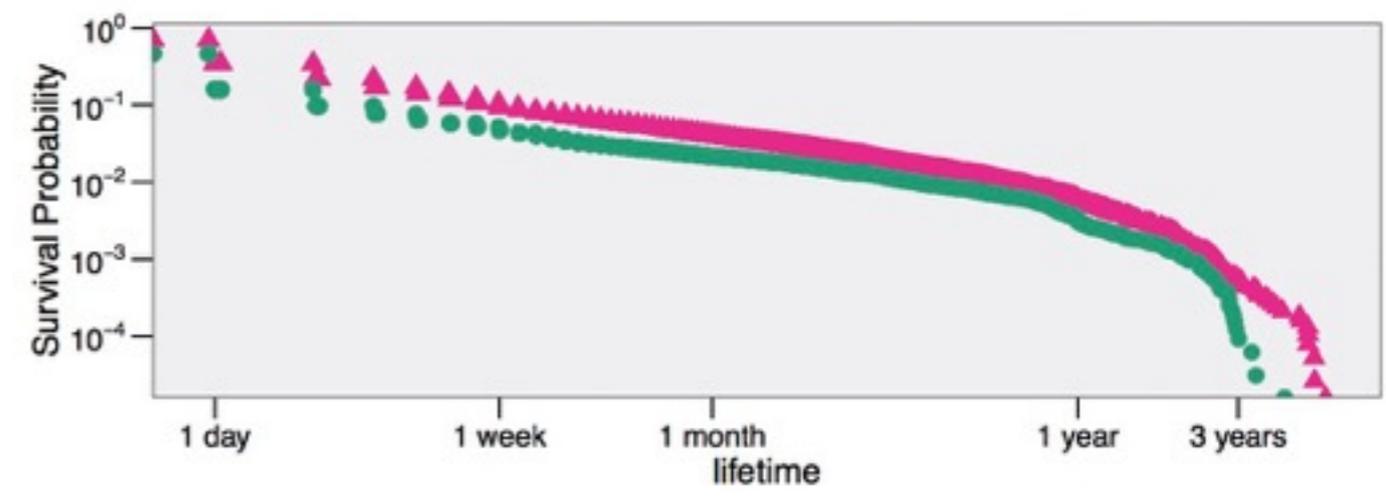
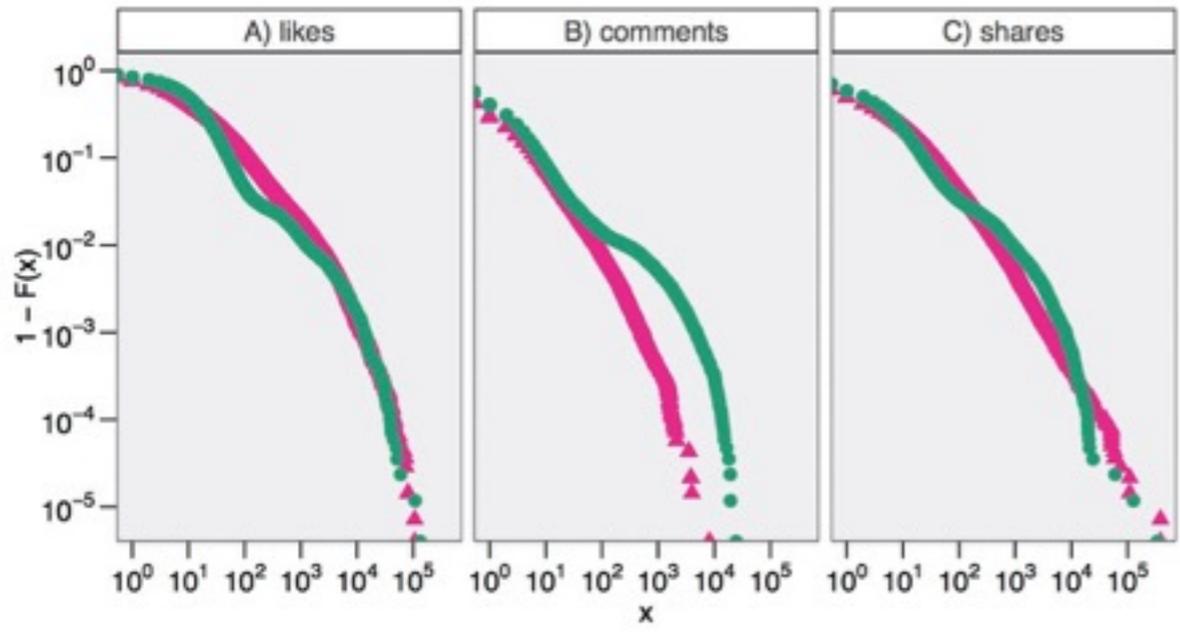
A. Bessi, F. Zollo, M. Del Vicario, A. Scala, R. Dunlap, W. Quattrociocchi
submitted to Nature Climate Change





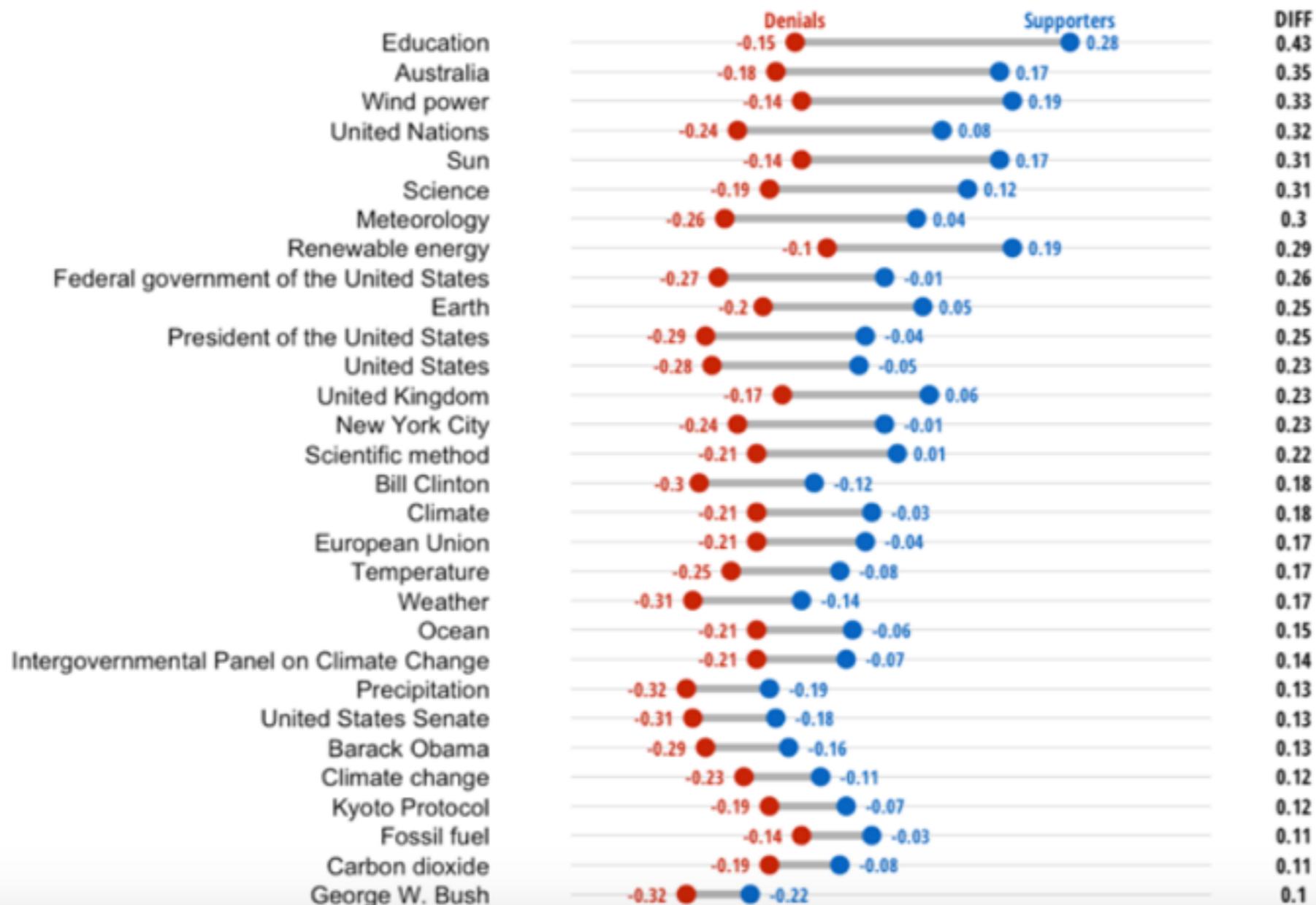
● Denials ▲ Supporters

● Denials ▲ Supporters

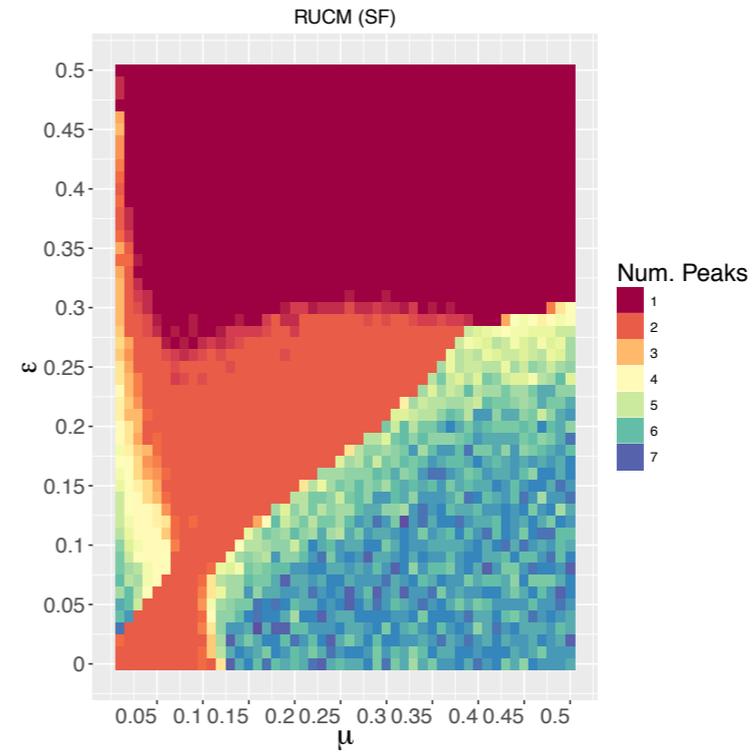
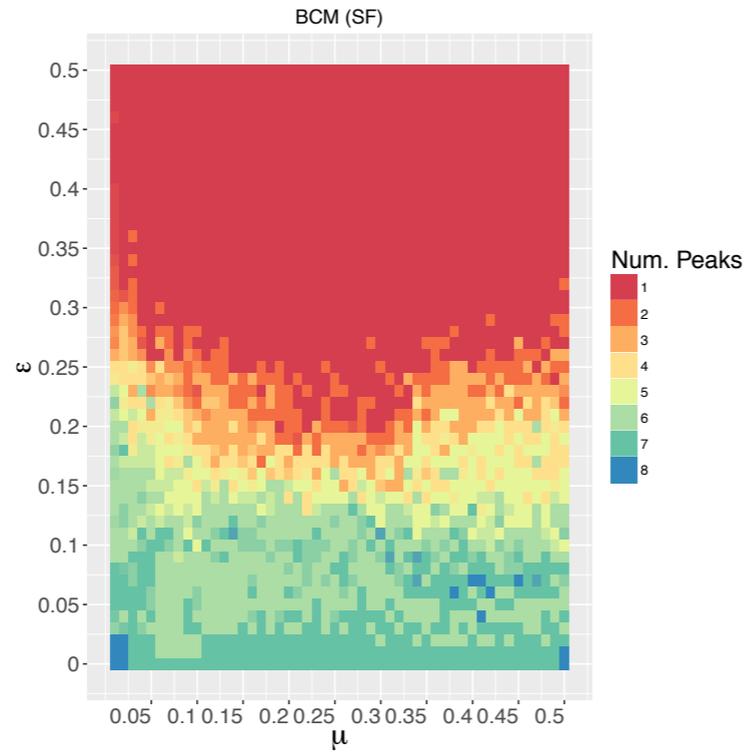


Distinguishing the narratives: Measuring polarizing topics

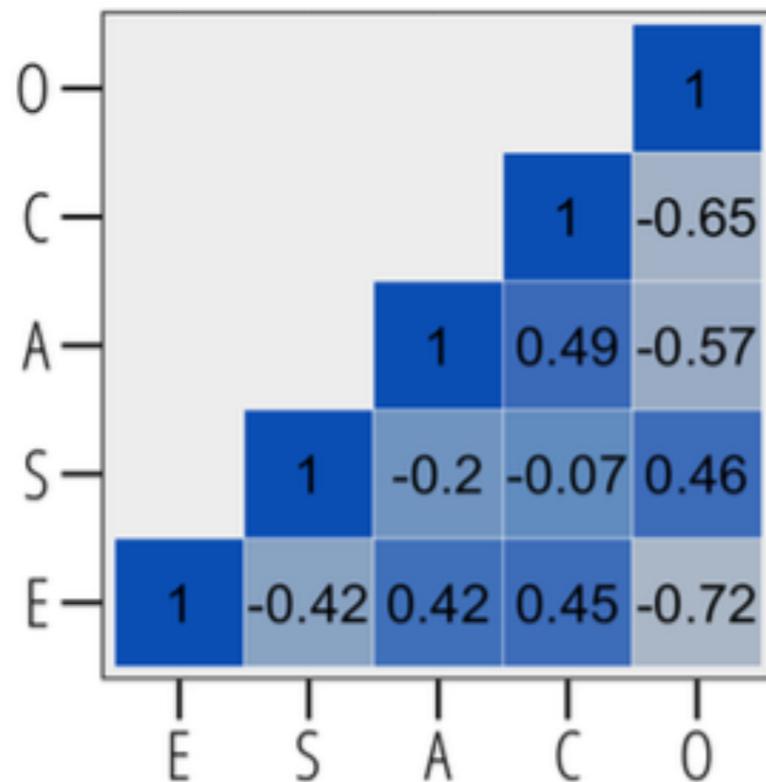
SENTIMENT OF COMMON CONCEPTS INSIDE THE TWO ECHO CHAMBERS



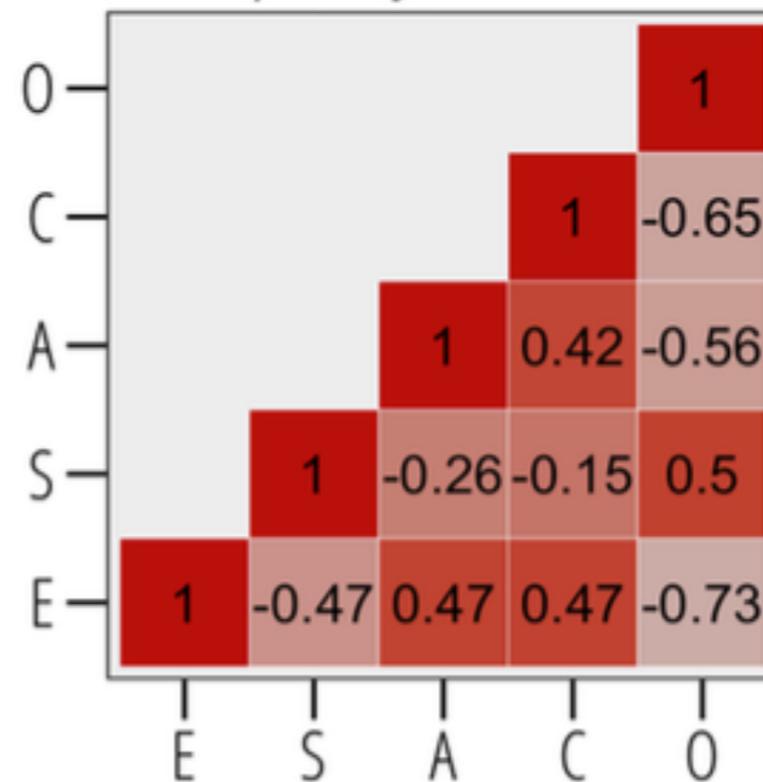
Echo Chambers and Personality Traits



Science



Conspiracy

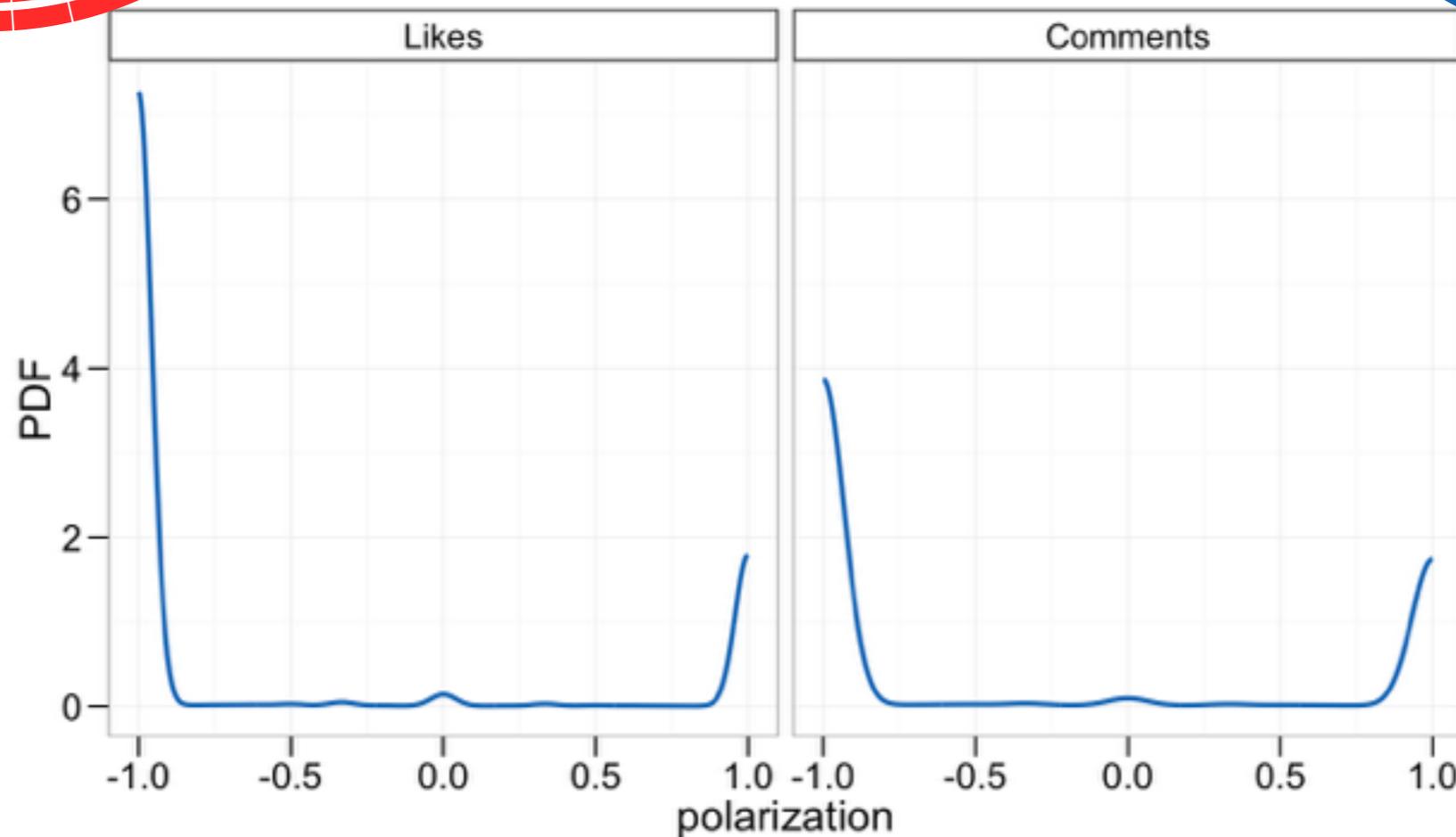
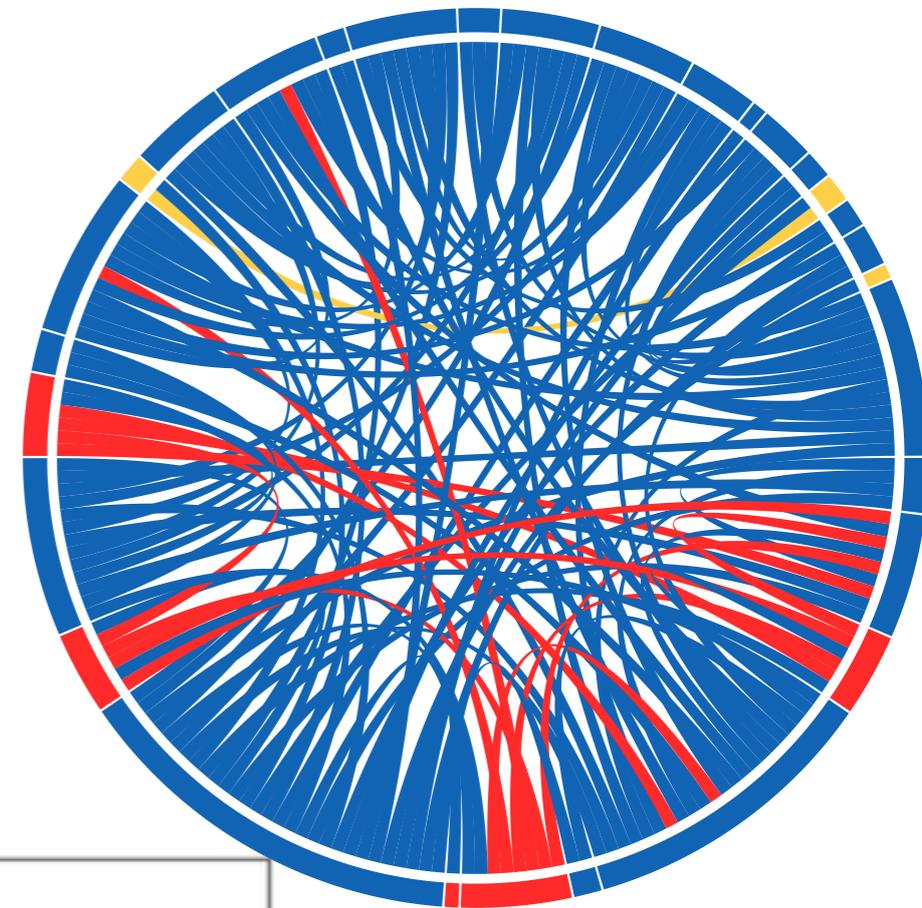
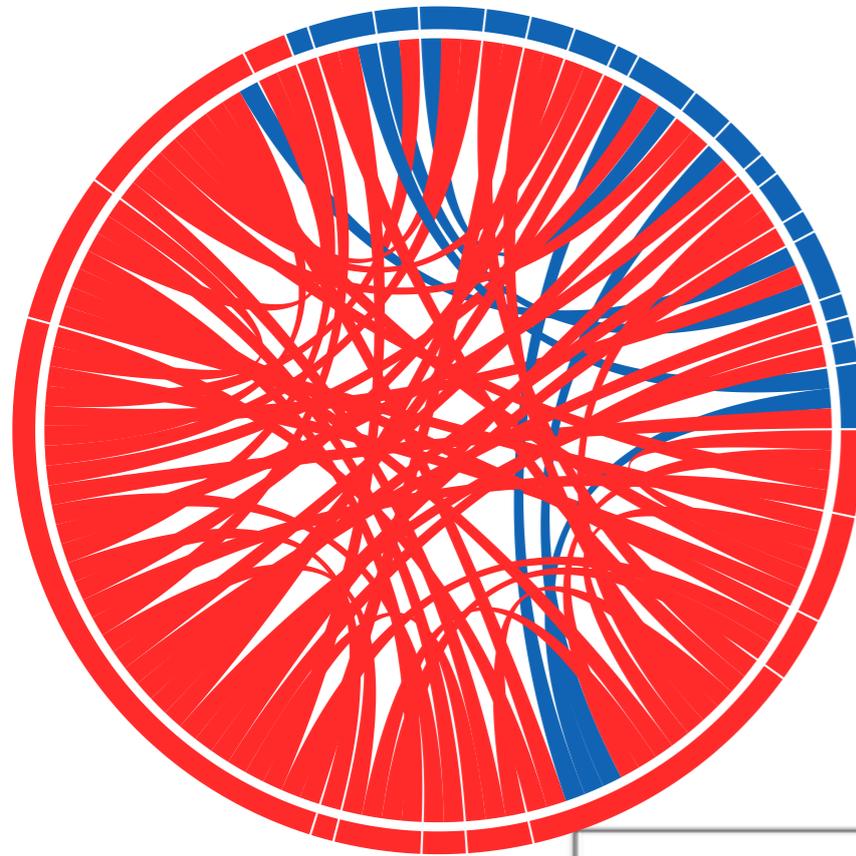


Extraversion (E), Emotional Stability (S), Agreeableness (A), Conscientiousness (C), and Openness (O)

Brexit on Facebook

Community Structure

Backbone of the projections on pages of the users likes (left) and comments (right).



Polarization: Distribution of Users likes and comments on the 2 communities

NEWS OUTLETS

Community #1:

"BBC News", "Channel 4 News", "EurActiv", "Financial Times", "Huffington Post UK", "International Business Times UK", "New Economics Foundation", "New Statesman", "Open Europe", "Reuters", "Reuters UK", "The Economist", "The Guardian", "The Independent", "The Register", "WN.com"

Community #2:

"Belfast Telegraph", "Daily Express", "Daily Mail", "Daily Record", "East Anglian Daily Times", "ITV News", "London Evening Standard", "MSN UK", "Metro", "News Letter", "Nottingham Post", "Sky News", "The Mirror", "The Scotsman", "The Spectator", "The Sun", "The Telegraph", "The Times and The Sunday Times", "Wales Online", "Wandsworth Guardian", "Western Telegraph", "Yorkshire Post"

(some) WORKS IN PROGRESS

EMPIRICAL EVIDENCE OF GROUP POLARIZATION

- Measuring the penetration of different types of communication strategies

PERSONALITY TRAITS AND CONTENT CONSUMPTION

- Metrics and Models to predict virality of contents

COMMUNICATION TAILORING TO SMOOTH POLARIZATION

- Measuring the penetration of different types of communication strategies (together with NATO)

GEOGRAPHY AND NEWS CONSUMPTION

- Measuring the penetration of different types of communication strategies (in collaboration with Mark Girolami)

NEWS SPREADING ON FACEBOOK AND TWITTER

- Measuring the penetration of different types of communication strategies (in collaboration with University of Milan and European Journalism Observatory)

LINGUISTIC CONTAGION INSIDE ECHO CHAMBERS

- Measuring the penetration of different types of communication strategies

THAT'S JUST THE BEGINNING...

