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Political Behavior and Influence Dynamics in Online Networks

Meet the Experts! – GESIS online talks

N. Gizem Bacaksizlar Turbic · January 20, 2022

Leibniz
Gemeinschaft

Speaker

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- This talk will be recorded.
  We do not record the Q&A session after the talk.

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Content

- **Background and Motivation**

- **Digital Behavioral Data**
  - ▶ Protest-related Tweets
  - ▶ Comments from news websites

- **Methodology**
  - ▶ Emotion Analysis
  - ▶ Network Analysis

- **Discussion**

# Protests in the Internet Age

Protests in the Internet Age

Iceland,
Tunisia,
Greece, Spain

Arab Spring,
Occupy Wallstreet

Moscow,
Mexico

Turkey Gezi Park,
Brazil Movements

South Africa, Brazil,
Lebanese Protests

Women's March,
U.S Election Protest,
Charlottesville Protest,
Catalan Movement

Global Climate Strikes,
Ecuador Unrest,
Hong Kong Protests,
Women's March

Capitol Hill
Riots,
COVID
Protests

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

Israel, Portugal,
Chile

Italy

Hong Kong Protests,
Ferguson

Venezuela,
Dakota Pipeline,
Charlotte
Protests

National School Walkouts,
Anti-Gun Violance Protests,
March for Our Lives Rally,
Yellow Vests Movement

George Floyd
Protests,
BLM

Common Points of Social Movements*

- Networks in multiple forms: online and offline
- Occupying an urban space
- Global and local influence
- Spontaneously happening spark in **anger**
- Viral
- Togetherness
- Non-violent
- No political and/or institutional base
- No deadline, no efficiency needed

*(Castells, 2015)

Anger in Protests

- Anger (grievance) is the essential emotion that ignites protests (Tarrow, 2011).
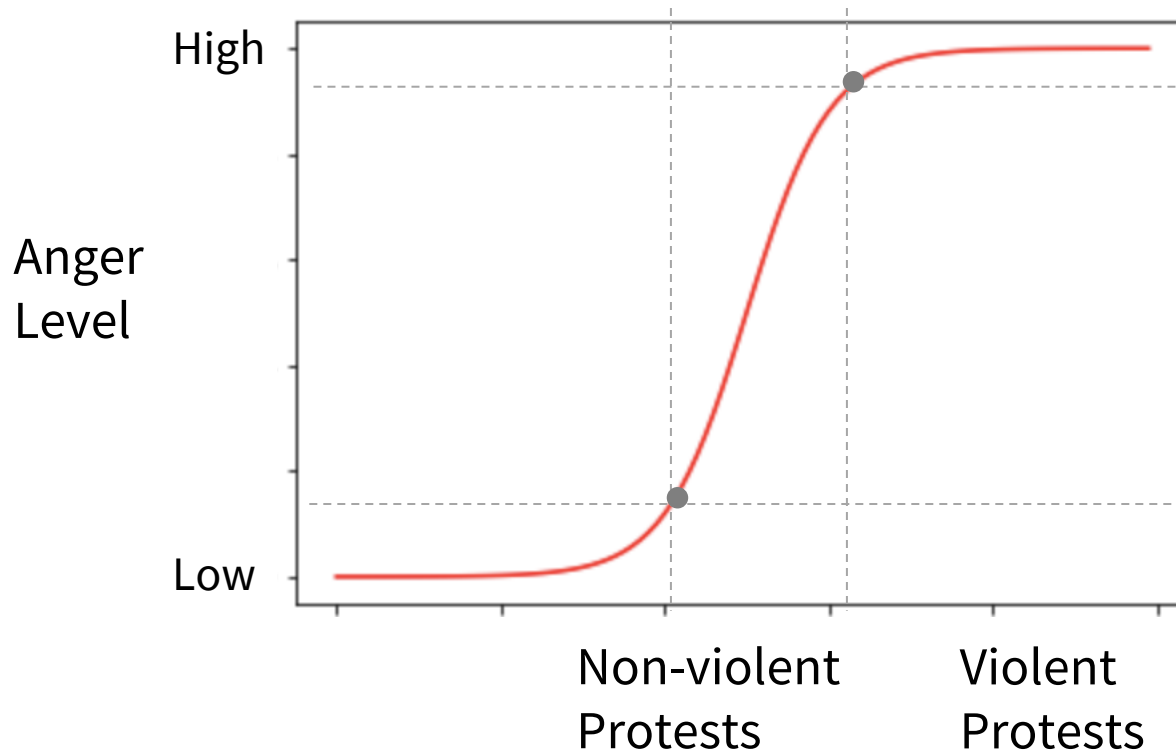
Online Discussions

The Atlantic

Righty brought brass knuckles, bats, body armor, shields and helmets to the "protest". I think that speaks to their intentions, perfectly.

They need to be medicated.

Breitbart

UniteTheRight had a lawful permit for the rally. **Their 1st and 9th amendment rights were violated.**

This is what happened: The #UniteTheRight rally was planned months in advance, proper permits were sought and granted, and everything was going according to plan. Then, a few days before the rally, the city of Charlottesville rescinded the permit; there argument was based upon the "Hecklers Veto," they claimed that it would place "undo pressure" on the police, this is a clear violation of the 1s amendment.

So, the organizers went to federal court and won; a federal judge ordered that the rally must go on and the rally goers Constitutional rights

Most liked comments in threads about Charlottesville protests on Aug 12, 2017.

Online Discussions as Data Source

- Millions of people comment daily on current societal events using a variety of online platforms (Ziegele, M. et al., 2018).

- Analysis of online discussions can yield valuable insights about real-world group dynamics,
  - with many people seeing similar online discussions in other places (Duggan, M. & Smith, A., 2016),
  - and beliefs and sentiments formed online spilling over into the "real" life (Harwell, D. et al, 2021).

Understanding User Behavior Online

- How much discussions does one event generate?

- What is the dominant sentiment of discussions?

- How do users interact with each other online?

  - Do the users get emotionally involved with the content?

- Do protest developments bring people together in online space?

- How does a group that feels threatened behave online?

Online Data Sources

Data Collection*

Twitter API

Disqus API

Facebook Graph API

API: Application Programming Interface

* Dr. R. Ulloa: Introduction to Online Data Acquisition

Data Collection Example

- Tweets with specific hashtags (#) and keywords during the intended periods:
  - millions of Tweets and hundreds of thousands users

Methodology

- Emotion analysis
  - ▶ Anger distributions

- Network analysis*
  - ▶ Influence dynamics
  - ▶ Community detection

▶ *Dr. Lietz: Social Network Analysis with Digital Behavioral Data

Emotion Analysis

- To detect anger*, the Linguistic Inquiry and Word Count (LIWC), analysis can be applied on tweets or comments (Pennebaker, et al., 2015).

  ▸ Words are categorized in different emotions and the frequency of words denoting each emotion are compared to overall number of words.

* The Grievance Dictionary: understanding threatening language use (van der Vegt, I. et al., 2021).

Anger Distribution over Protest Periods
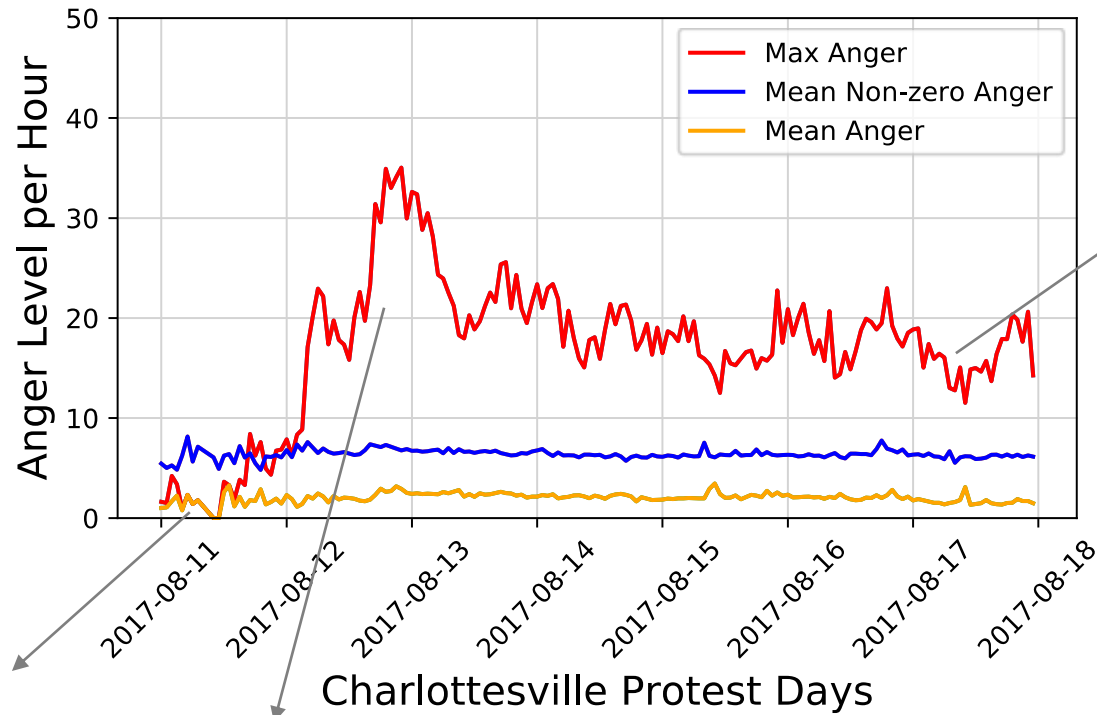
Networks from Online Discussions

- Another interesting aspect is the interaction between people and the networks they form.

- In the Network Science terminology

  - ▸ Users/actors are nodes/vertices

  - ▸ Connections/ties such as mentions, retweets, following, or replies are edges/links

Mention and Retweet Networks

- Links from mentions (@username) and retweets

Node/Vertex: User

Link/Edge: Mention

Node/Vertex: TWCNewsCLT
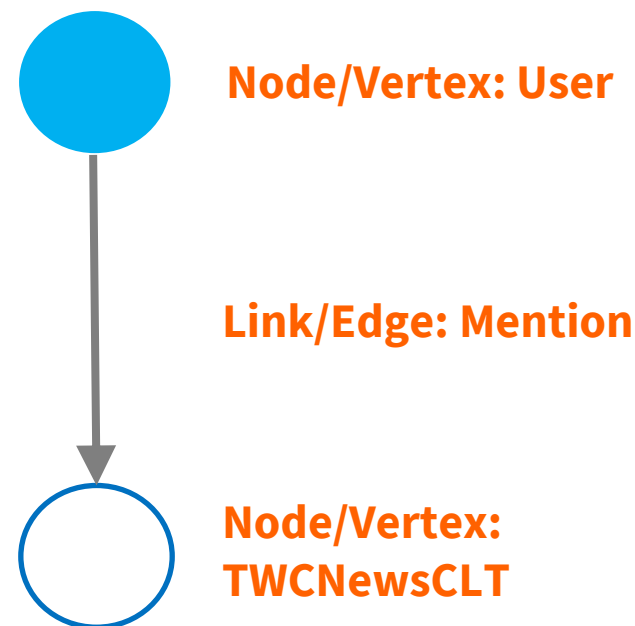
Commenter Networks

- Links from replies of comments

Commenter A

America has spoken and the 45th President of the United States is…
DONALD J. TRUMP
We finally have a voice!

66 ∧ | ∨ 1 · Reply · Share ›
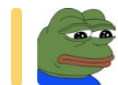
Commenter B   3 years ago · edited

Praise Kek!
Meanwhile Hillary did not have the guts to face her supporters.
No longer had a use for them!

ALL CELEBRITIES THAT VOWED TO LEAVE THE U.S.A. IF TRUMP
WINS, WE NOW DEMAND YOU TO FOLLOW THROUGH!
OUT! OUT! OUT!

72 ∧ | ∨ · Reply · Share ›

Influence and Group Dynamics

- What are the important aspects of these networks?
  - Who are the most influential actors?
  - How does influence change in the network?
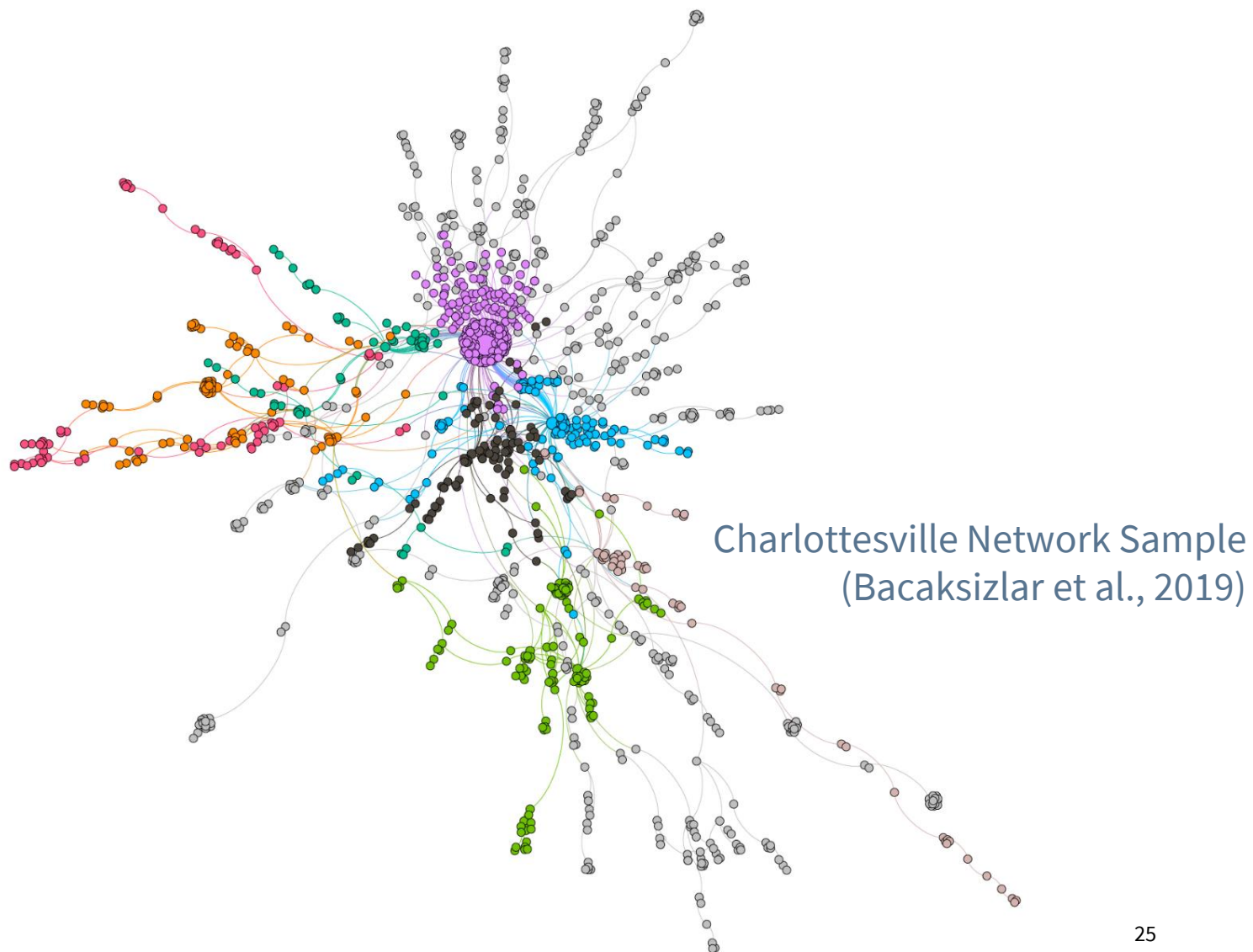 - Do people group around a specific actor?

Influence

- **Influence or importance** of users reflects the level of attention that their contents receive or their positions in the network .

- It can be calculated by centrality measures that use graph theory (Newman, 2018).

  - In-Degree centrality

    - Depends on the number of **incoming links** a node has
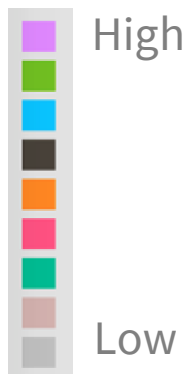
    - Shows how **well-connected** the user is

Community detection: Groups of nodes

- The community structure can be measured with modularity (Newman, 2006).

- A **high modularity score** indicates possible **presence of community** structure.

- It also shows that **influential users** occur as the **highest In-Degree nodes**.

User Interactions: Protests

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Modularity

High

Low

Charlottesville Network Sample
(Bacaksizlar et al., 2019)

User Interactions: Threatening Events

News Websites Comments
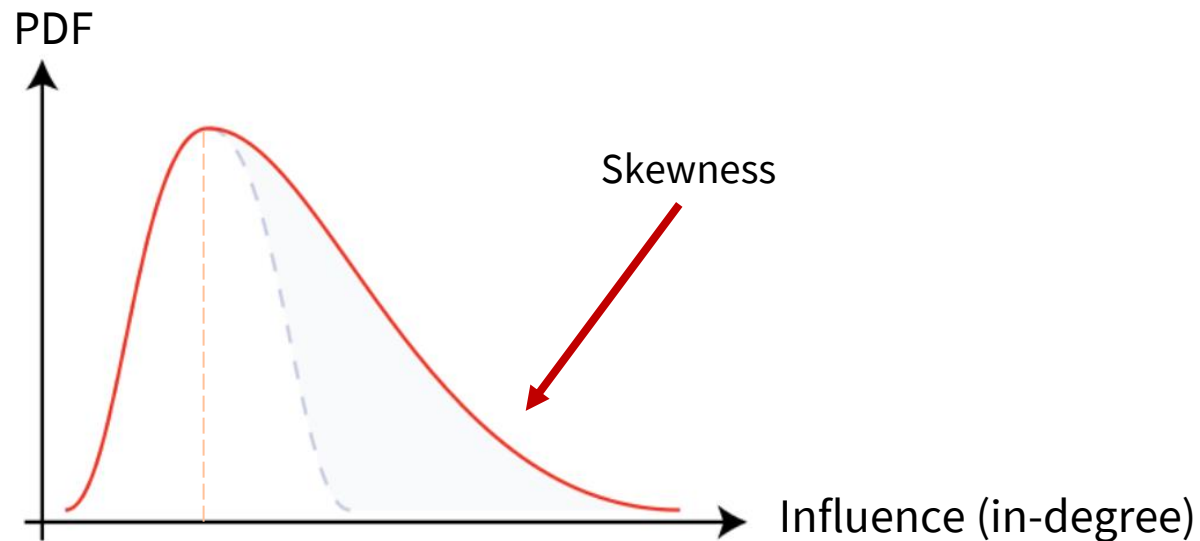
2016 US Election

**2017 Inauguration**

2017 Charlottesville Rally

2018 US Election

Group Threat's Effect on Discussions

- Do people tend to group around fewer individuals in times of threat?

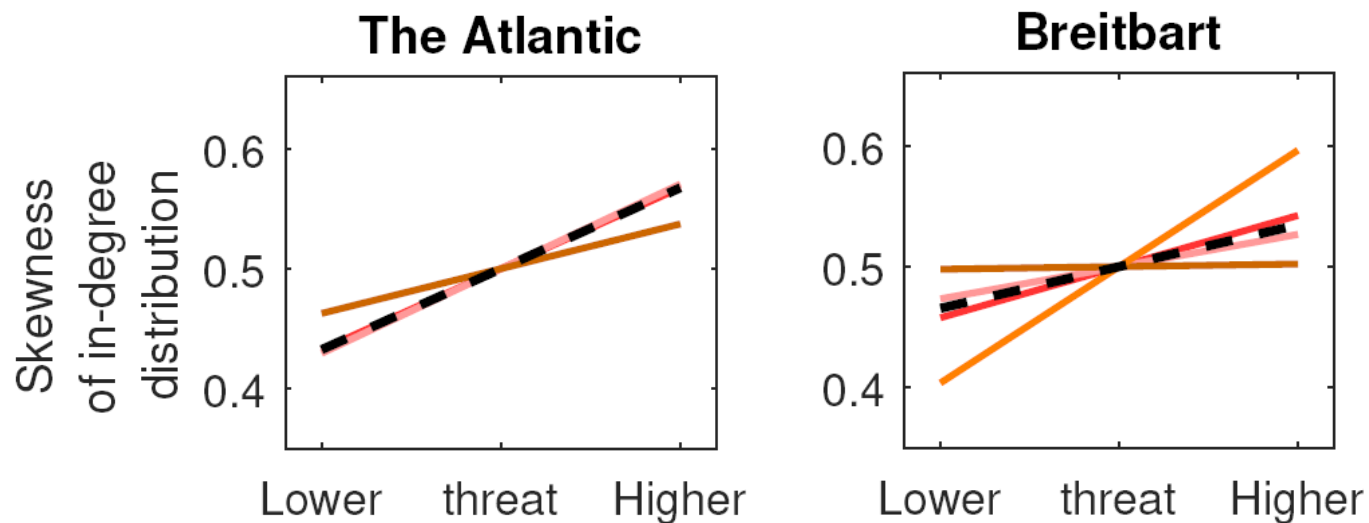 - Calculated indices of inequality of commenters' network of influence

Outgroup Threat

- Groups under threat tend to become more homogeneous and follow thought leaders (Janis et al. 1982, Turner et al., 1992).

  ▸ Hypothesis: **Inequality of influence** increases after clear outgroup threats.
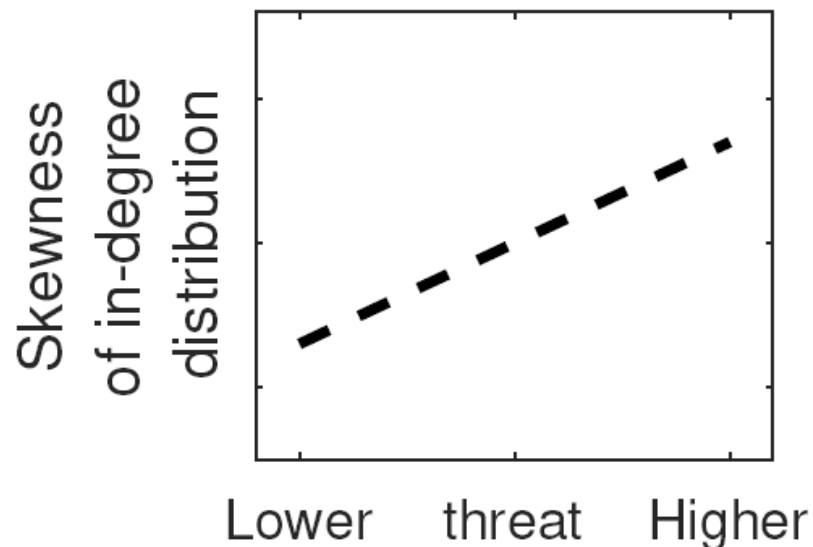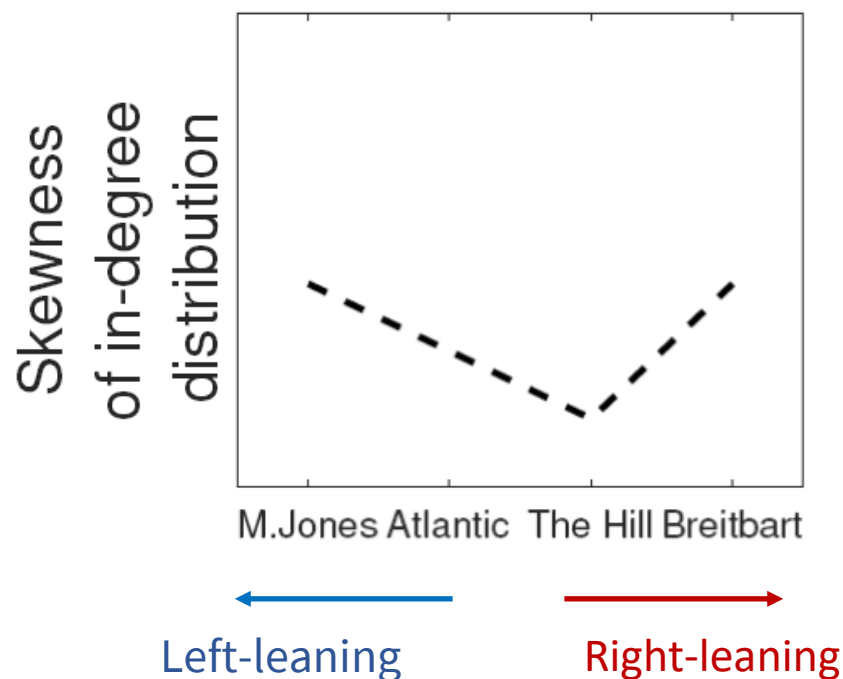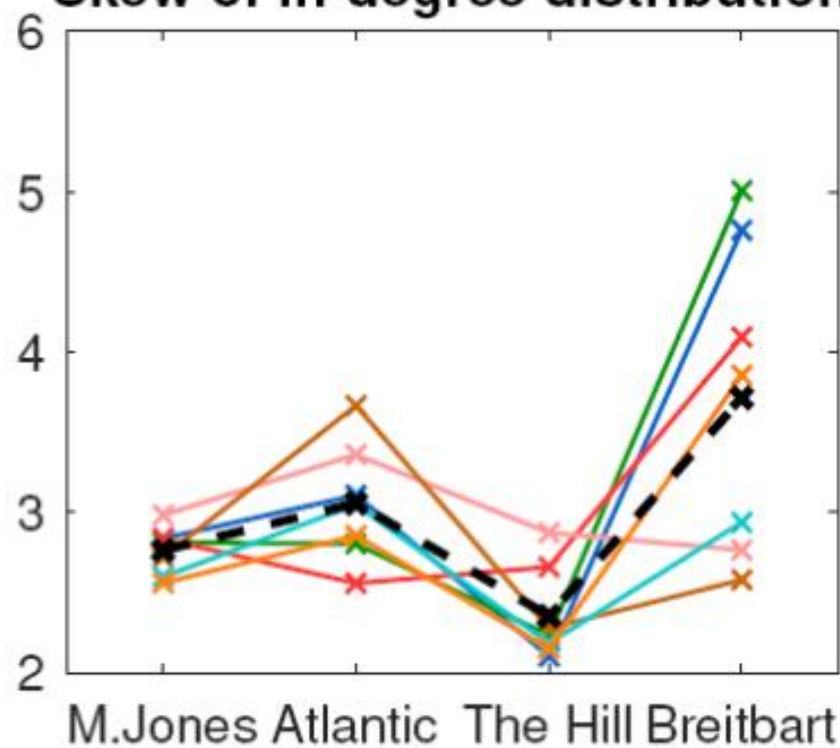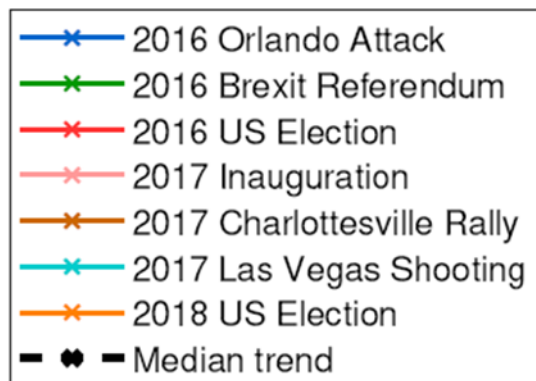
Outgroup Threat: News Websites

Political Extremes

- Extreme orientations have more respect to authorities compared to more moderate ones (Jost et al., 2003).
  - ▶ Hypothesis: Inequality of influence is higher at political extremes.

Political Extremes: News Websites

Discussion (1)

- Protest-related tweets of *influential users* are **more often** mentioned and retweeted than the tweets of the *general public users*.

- Anger peaks then tapers off with time.

- Users with **fewer followers** are **angrier**.

- Groups experiencing **higher threat** from specific other groups tend to show an **increase** in inequality of influence.

- Commenters on **more extreme** political sites tend to show **more inequality** of influence than commenters on more moderate political sites.

Discussion (2)

- Many factors beyond those that are shown here affect user behaviors, including related political and societal events, **automated algorithms** and **trolls**.

  ▸ Effects of these factors should be studied in more detail in future studies.

- Another important research avenue is a detailed **content** study, how it changes over time and in response to different events, and how it might anticipate further events and developments.

Presentation Summary (1)

- Background and Motivation
- Digital Behavioral Data
  - Protest-related Tweets
  - Online discussions/comments from news websites
- Methodology
  - Emotion analysis
    - Anger distributions
  - Network analysis
    - Influence dynamics in the network
    - Communities/groups in the network
- Discussion

Presentation Summary (2)

- Several online data sources as well as traditional ones are available for Computational Social Science studies:
  - ▶ Comments/Posts from Facebook public pages
  - ▶ YouTube comments
  - ▶ Reddit comments
  - ▶ Online surveys
  - ▶ Images
  - ▶ Videos
  - ▶ Reviews
  - ▶ …

Further Information

- With network analysis approach, in addition to anger and influence dynamics, the spread of
  - Happiness (Fowler, J. H. & Christakis, N. A., 2008)
  - Misinformation, rumors (Vosoughi, S. et al., 2018, Ognyanova, K. et al., 2020).
  - Team formation (Margolin, D. R. E. W et al., 2012)
  - … have been studied.

Meet the Experts

Further Information

- If you are interested in related studies, you can check out Meet the Expert Talks below and references:

  - ▶ [Dr. K. Weller: Introducing Computational Social Science & Digital Behavioral Data](#)

  - ▶ [Dr. R. Ulloa: Introduction to Online Data Acquisition](#)

  - ▶ [Dr. M. Sältzer and Dr. S. Stier: The German Federal Election: Social Media Data for Scientific (Re-)use](#)

  - ▶ [Dr. Lietz: Social Network Analysis with Digital Behavioral Data](#)

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Collaborators

- **Case Study 1:** Anger in Protest Networks on Twitter, with Mirsad Hadzikadic and Samira Shaikh

- **Case Study 2:** Dynamics of Commenters' Networks Across Time and Political Spectrum, with Mirta Galesic

Thank you !

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July 08   Sebastian Stier, Johannes Breuer: **Combining Survey Data and Digital Behavioral Data**

Sept 16   Katrin Weller, Oliver Watteler: **Ethics and Data Protection in Social Media Research**

Sept 30   Roberto Ulloa: **Introduction to Online Data Acquisition**

Oct 07   Roberto Ulloa: **Auditing Algorithms: How Platform Technologies Shape our Digital Environment**

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