Political Behavior and Influence Dynamics in Online Networks

Meet the Experts! – GESIS online talks

N. Gizem Bacaksizlar Turbic • January 20, 2022
Dr. N. Gizem Bacaksizlar Turbic

- Post-doctoral researcher in the team Digital Society Observatory, CSS Department at GESIS
- Ph.D. in software and information systems
- Social-Political Networks, Complex Adaptive Systems
- Contact: gizem.bacaksizlarturbic@gesis.org
Logistics

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

- Participants are muted during the session. Questions will be collected during presentation and answered after the talk.

- Please use the private chat function and send questions to the account "Q&A host (MTE)". If you post in the general chat, your name and message will be visible to all participants. Of course, this is also possible; we kindly ask you to prefer the private chat to "Q&A host (MTE)" while the presentation is going on.

- Recording and slides will be made publicly available on the GESIS website and on our YouTube channel.
Political Behavior and Influence Dynamics in Online Networks

Meet the Experts! – GESIS online talks

N. Gizem Bacaksizlar Turbic • January 20, 2022
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

2010
- Iceland, Tunisia, Greece, Spain

2011
- Arab Spring, Occupy Wallstreet

2012
- Turkey Gezi Park, Brazil Movements
- Moscow, Mexico

2013
- South Africa, Brazil, Lebanese Protests
- Italy

2014
- Iceland, Tunisia, Greece, Spain
- Israel, Portugal, Chile

2015
- Hong Kong Protests, Ferguson

2016
- Women’s March, U.S Election Protest, Charlottesville Protest, Catalan Movement
- Venezuela, Dakota Pipeline, Charlotte Protests

2017
- Women’s March, U.S Election Protest, Charlottesville Protest, Catalan Movement

2018
- Global Climate Strikes, Ecuador Unrest, Hong Kong Protests, Women’s March
- National School Walkouts, Anti-Gun Violence Protests, March for Our Lives Rally, Yellow Vests Movement

2019
- Capitol Hill Riots, COVID Protests

2020
- Capitol Hill Riots, COVID Protests

2021
- 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**
Rightly 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 goes. 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

- Twitter
- Disqus
- Facebook
- YouTube
- WhatsApp
- Reddit
- Instagram
- Telegram
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 of 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.

Anger Distribution over Protest Periods

![Graph showing anger distribution over protest periods. The x-axis represents days from 2017-08-11 to 2017-08-18. The y-axis represents anger level per hour. The legend includes three lines: Max Anger, Mean Non-zero Anger, and Mean Anger. The graph highlights fluctuations in anger levels during the protest days.](image-url)
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
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

Charlottesville Network Sample (Bacaksizlar et al., 2019)
User Interactions: Threatening Events

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.

![Graph showing the skewness of in-degree distribution increasing with threat level.](image-url)
Outgroup Threat: News Websites

**The Atlantic**

- Skewness of in-degree distribution
- Lower, threat, Higher

**Breitbart**

- Skewness of in-degree distribution
- Lower, threat, Higher

Legend:
- 2016 US Election
- 2017 Inauguration
- 2017 Charlottesville Rally
- 2018 US Election
- Median trend
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

Skew of in-degree distribution

- 2016 Orlando Attack
- 2016 Brexit Referendum
- 2016 US Election
- 2017 Inauguration
- 2017 Charlottesville Rally
- 2017 Las Vegas Shooting
- 2018 US Election
- Median trend

Left-leaning

Right-leaning
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.
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
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)
  - Team formation (Margolin, D. R. E. W et al., 2012)
- ... have been studied.
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
References


References

References

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
Political Behavior and Influence Dynamics in Online Networks

Meet the Experts! – GESIS online talks

N. Gizem Bacaksizlar Turbic • January 20, 2022
Contact: you can reach the speaker/s via e-mail: gizem.bacaksizlarturbic@gesis.org

GESIS Consulting: GESIS offers individual consulting in a number of areas – including survey design & methodology, data archiving, digital behavioral data & computational social science – and across the research data cycle.

Please visit our website www.gesis.org for more detailed information on available services and terms.
More Services from GESIS

- Get materials for [capacity building in computational social science](#) and take advantage of our expanding expertise and resources in [digital behavioral data](#).
- Use GESIS data services for [finding data](#) for secondary analysis and [sharing your own data](#).
- Check out the [GESIS blog](#) "Growing Knowledge in the Social Sciences" for topics, methods and discussions from the GESIS cosmos – and beyond.
- Keep up with GESIS activities and subscribe to the monthly [newsletter](#).
- Search [GESIS](#) for publications, tools & services.
More from CSS Experts in the Series

June 24  Katrin Weller: A Short Introduction to Computational Social Science and Digital Behavioral Data
July 01  Fabian Flöck, Indira Sen: Digital Traces of Human Behavior from Online Platforms – Research Designs and Error Sources
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 14  Marius Sältzer, Sebastian Stier: The German Federal Election: Social Media Data for Scientific (Re-)Use
Nov 04  Arnim Bleier: Introduction to Text Mining
Nov 11  Haiko Lietz: Social Network Analysis with Digital Behavioral Data
Dec 02  Olga Zagovora, Katrin Weller: Altmetrics: Analyzing Academic Communications from Social Media Data
Dec 16  Andreas Schmitz: Online Dating: Data Types and Analytical Approaches
Jan 20  N. Gizem Bacaksizlar Turbic: Political Behavior and Influence in Online Networks
Jan 27  David Brodesser: SocioHub – A Collaboration Platform for the Social Sciences
Feb 27  Regina Pfeifenberger, Wolfgang Otto: Pollux – Literature and Research Tools for Political Scientists