# Collecting Social Media Data

Slides: go.gwu.edu/socialmediadata

Dan Kerchner kerchner@gwu.edu

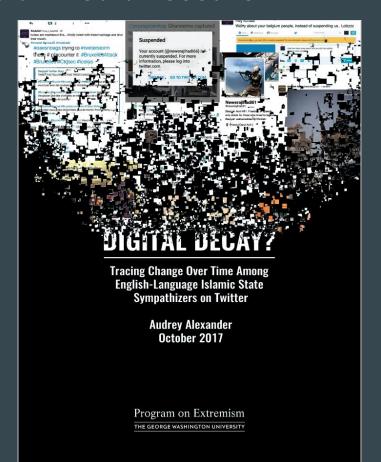
Laura Wrubel lwrubel@gwu.edu

Optional hands-on part of the workshop requires logging into Twitter. Either go to <a href="twitter.com">twitter.com</a> to create a Twitter account (if you don't have one), or look on with someone else.

# Agenda

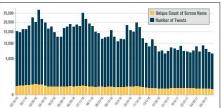
- Overview of social media APIs and data formats
- Twitter's API in depth
- Collecting new datasets
  - O Hands-on: Social Feed Manager
- Using existing datasets
  - o Hands-on: TweetSets
- Approaches for other social media platforms
- Ethics of social media collecting

### Social media research



Audrey Alexander

### Tweet Frequency and Unique Screen Names By Week



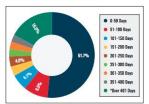
(Figure S) This graph shows how the relationship hetween unique screen names and tweet frequency the course of the sh-week period. As discussed in the method chapter, this graph, like several others in the study, uses square root in the y-axis to more clearly represent the relationship between the two variables.

of activity' is quantified by the number of days between an account's first and last tweet. Twitter's API does not discern the date or time at which the company suspends accounts, nor does it identify accounts that were created and then subsequently abandoned by their respective users. Consequently, this measurement allows the study to grasp the chronological span of sympathizers that actively use the platform to share content. While overwhelmingly skewed by outliers, the average lifespan for this sample of English-language pro-IS accounts on Twitter was 251 days. It is critical to note, however, that dispersion of lifespan is highly concentrated (see Figure 6). Approximately 51.7 percent of accounts did not remain active longer than 50 days. On the other hand, however, a substantive portion of accounts lasted over a year, suggesting that Twitter's attempts to detect and suspend pro-IS account may be missing some long-term users. One possible explanation for long-standing users relates to the data collection method, as researchers are more likely to identify accounts the longer they are open.13 Ultimately, accounts that opted to leave the platform are likely included in this breakdown. although multiple factors- including the threat of suspension-likely affect user activity in this regard.

In order to maintain their presence on Twitter, some English language IS sympathizers appeared to have created multiple accounts at the same time to avoid shutdowns. On February 17, 2016, for example, four separate accounts were

fashioned from a core handle," possibly from the same individual. One account (@Erhabi33) survived only eight days, whereas another account (@Erhabi39) stayed active for 62 days. Although the study attempted to annotate cases where the same individual controlled multiple accounts, as the trend is common, quantitative figures are generally not reliable due to the relative anonymity Twitter affords users. It is hard to ascertain whether users that demonstrate similar behavioral patterns are simply individuals attempting to inoculate their dieiral presence against susernious or are

### **Duration of Account Activity**



(Figure 6) This chart depicts the duration of account activity, meaning the number of days a pro-IS Twitter account was active, and displays the breakdown in percentages.

### Social media research



Research Article

Twitter Makes It
Worse: Political Journalists,
Gendered Echo Chambers,
and the Amplification of
Gender Bias

The International Journal of Press/Politics 2018, Vol. 23(3) 324–344

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DOI: 10.1177/1940161218781254
journals.sagepub.com/home/hij

Nikki Usher<sup>1</sup>, Jesse Holcomb<sup>2</sup>, and Justin Littman<sup>3</sup>

### Abstract

Given both the historical legacy and the contemporary awareness about gender inequity in journalism and politics as well as the increasing importance of Twitter in political communication, this article considers whether the platform makes some of the existing gender bias against women in political journalism even worse. Using a framework that characterizes journalists' Twitter behavior in terms of the dimensions of their peer-to-peer relationships and a comprehensive sample of permanently credentialed journalists for the U.S. Congress, substantial evidence of gender bias beyond existing inequities emerges. Most alarming is that male journalists amplify and engage male peers almost exclusively, while female journalists tend to engage most with each other. The significant support for claims of gender asymmetry as well as evidence of gender silos are findings that not only underscore the importance of further research but also suggest overarching consequences for the structure of contemporary political communication.

### Keywords

political journalism, gender, Twitter, Washington journalism, beltway journalism, women in journalism

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### Populist communication by digital means: presidential Twitter in Latin America

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### ABSTRACT

In this paper, we analyze the uses of Twitter by populist presidents in contemporary Latin America in the context of the debates about whether populism truly represents a revolution in public communication - that is, overturning the traditional hierarchical model in favor of popular and participatory communication. In principle, Twitter makes it possible to promote the kind of interactive communication often praised in populist rhetoric. It offers a flattened communication structure in contrast to the topdown structure of the traditional legacy media. It is suitable for horizontal, unmediated exchanges between politicians and citizens. Our findings, however, suggest that Twitter does not signal profound changes in populist presidential communication. Rather, it represents the continuation of populism's top-down approach to public communication. Twitter has not been used to promote dialogue among presidents and publics or to shift conventional practices of presidential communication. Instead, Twitter has been used to reach out the public and the media without filters or questions, it has been incorporated into the presidential media apparatus as another platform to shape news agenda and public conversation. Rather than engaging with citizens to exchange views and listen to their ideas, populists have used Twitter to harass critical journalists, social media users and citizens. Just like legacy media, Twitter has been a megaphone for presidential attacks on the press and citizens. It has provided with a ready-made, always available platforms to lash out at critics, conduct personal battles, and get media attention.

### ARTICLE HISTORY Received 30 November 2016 Accepted 4 May 2017

### KEYWORDS Social media; populism; presidential communication; political communication;

Populism as communication style

Growing interest in the study of populism, media, and communication (Aalberg, Esser, Reinemann, Strömback, & de Vreese, 2017) inevitably confronts the long-standing fuzziness of the concept of populism. It is commonly acknowledged that 'populism' is perennially imprecise. Definitions have underscored differs aspects as essential characteristics of populism, including economic policies, style of political leadership, political discourse, and ideology (Moffit, 2016). Populism remains the subject of constant semantic squabbles, largely because it has taken various shapes across time and

University of Illinois at Urbana-Champaign, IL, USA <sup>2</sup>Calvin College, Grand Rapids, MI, USA

# Targeting Persuadable Voters Through Social Media: The Use of Twitter in The 2015 UK General Election Open Access

How do political campaigns target and persuade voters to support their candidates? Since 2000, US political campaigns have focused heavily on data analytics to micro target individual voters with personalized messages. Micro targeting moves away from the traditional assumption that voting behavior is determined purely by demographics. Instead, this method allows campaigns to predict accurately an individual's voting behavior and deliver to them the most appropriate message. This paper focuses on the use of social media by the Labour and Conservative campaigns in the 2015 UK General Election and whether it was employed as a targeting tool and a method to engage with targeted voters. More specifically, it examines the claim that Labour used social media purely to communicate with its core supporters whilst Conservatives used it effectively to target and engage with persuadable voters and this ultimately contributed to the Conservatives' victory.

### Relationships

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### Descriptions

Attribute Name Values

Author Roper, Caitlin Grace

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By Caitlin Roper

B.A. Jobst Howard in History and Politics, July 2018, University of Sussess

A Thesis submitted to

The Faculty of The Columbian College of Arts and Sciences of The George Washington University in partial faitlineart of the requirements for the degree of Master of Arts

May 15, 2016

Thesis directed by

Duvid Karpf Assistant Professor of Media and Public Affairs

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Elites and foreign actors among the alt-right: The Gab social media platform by Yuchen Zhou, Mark Dredze, David A. Broniatowski, and William D. Adler

### **Abstract**

Content regulation and censorship of social media platforms is increasingly discussed by governments and the platforms themselves. To date, there has been little data-driven analysis of the effects of regulated content deemed inappropriate on online user behavior. We therefore compared Twitter — a popular social media platform that occasionally removes content in violation of its Terms of Service — to Gab — a platform that markets itself as completely unregulated. Launched in mid-2016, Gab is, in practice, dominated by individuals who associate with the "alt-right" political movement in the United States. Despite its billing as "The Free Speech Social Network," Gab users display more extreme social hierarchy and elitism when compared to Twitter. Although the framing of the site welcomes all people, Gab users' content is more homogeneous, preferentially sharing material from sites traditionally associated with the extremes of American political discourse, especially the far right. Furthermore, many of these sites are associated with state-sponsored propaganda from foreign governments. Finally, we discovered a significant presence of German language posts on Gab, with several topics focusing on German domestic politics, yet sharing significant amounts of content from U.S. and Russian sources. These results indicate possible emergent linkages between domestic politics in European and American far right political movements. Implications for regulation of social media platforms are discussed.

### Contents

### Social media on the web



## Social media as data

user\_screen\_name text

created\_at

	droutou_ut	aser_sereen_name			masmage means		
1042227342666620929	Wed Sep 19 01:42:16 +0000 2018	timkaine	To all observing Yom Kippur in Virginia and around the world — I want to wish you a meaningful day of reflection and an easy fast.	original			774
1042227342000020929	Wed 3ep 19 01.42:16 +0000 2018	tiiikaiile	The FBI background investigation into Judge Kavanaugh should be reopened in light of the serious charges	Original			//4
1042170182377111557	Tue Sep 18 21:55:08 +0000 2018	timkaine	against him.	original			8565
			99-1. That was the final vote of the Opioid Crisis Response Act tonight in the Senate. Because we worked				
			together, we've made progress toward preventing tens of thousands of deaths from this horrible epidemic				
1041874309004881920	Tue Sep 18 02:19:27 +0000 2018	timkaine	each year. https://t.co/EYf65k6FFS	original		https://ww	1599
			RT @GovernorVA: Please take precautions and stay tuned to local news alerts—a tornado watch is still in				
1041818089510371328	Mon Sep 17 22:36:03 +0000 2018	timkaine	effect for many parts of the Common	retweet			0
			RT @SarahPeckVA: Tim Kaine comments on the courage of Dr. Ford for speaking out and calls on Senate				
1041527946907987968	Mon Sep 17 03:23:07 +0000 2018	timkaine	Judiciary to delay the vote on Kavanaug	retweet			0
			Judge Kavanaugh. The Judiciary Committee should not vote on his nomination until this allegation is fully				
1041504668659212288	Mon Sep 17 01:50:37 +0000 2018	timkaine	investigated.	original			18185
			RT @MarkWarner: Hurricane Florence is likely to bring heavy rain to the Roanoke Valley and Southwest				
1040422041588064257	Fri Sep 14 02:08:39 +0000 2018	timkaine	Virginia over the coming weekend. The	retweet			0
			In 2012, @TyroneGayle was one of my closest campaign aides. We drove all over Virginia together. A				
	Thu 5 12 17 20 25 10000 2010	Marketon	former Clemson track star, he hasn't run much since his cancer diagnosis. Now his friends run for him and			h	720
1040291669302755328	Thu Sep 13 17:30:36 +0000 2018	timkaine	have set up this cool fundraiser. Give if you can! https://t.co/mKZ1PvaOuL	original		https://ww	728
			WIRGINIANS: Please take all precautions as Hurricane Florence approaches. FOLLOW: @VDEM for emergency updates. VISIT: https://t.co/v6IYVxaj9v for more information. A federal emergency declaration				
1039594806912139264	Tue Sep 11 19:21:31 +0000 2018	timkaine	has been made, and efforts are underway to prepare for this dangerous storm.	original		http://VAe	380
	Tue Sep 11 15.21.51 10000 2018	tilikalile	Today we laid a wreath in Arlington with brave law enforcement officers and first responders in memory of	Original		nttp.// vac	360
			those we lost 17 yrs ago on 9/11. With each passing year, it becomes more important to commemorate				
1039569177793708039	Tue Sep 11 17:39:40 +0000 2018	timkaine	these lives and that day so future generations #NeverForget what happened. https://t.co/sV3Hueu5Dp	original	NeverForge https://tw	itter.com/ti	1386
			RT @GovernorVA: It's important to prepare your family, home and business before a storm arrives. Visit				
1039210775087329285	Mon Sep 10 17:55:31 +0000 2018	timkaine	https://t.co/5iKSQcE0wc and make sur	retweet		http://www	0
			Roger Stone just coined one of the best band names ever - "Playing bluegrass with reckless abandon, please				
1038959106621693952	Mon Sep 10 01:15:28 +0000 2018	timkaine	welcome The Insubordinate Hillbillies!" https://t.co/tSeAEWP9gl	original		https://ww	2457
			To all those in Virginia and around the world celebrating the new year tonight, L'Shanah Tovah! I hope your				
1038887381917728768	Sun Sep 09 20:30:28 +0000 2018	timkaine	year ahead is filled with peace, health, joy, and light.	original			1436
			RT @ElectConnolly: Fired up group of volunteers ready to knock doors in Vienna for me @JenniferWexton				
1038485507741765637	Sat Sep 08 17:53:33 +0000 2018	timkaine	and @timkaine . Thanks for going out	retweet			0
1020405417627100240	Cat Can 09 17 E2 12 10000 2019	+imkaina	aur Washand of Action for HKa	rotwoot			0

tweet\_type hashtags media

urls

favorite\_count

## Tweets are data, too.

- Example tweet: go.gwu.edu/emse4197sampletweet
- Twitter's guide to the structure of a tweet

# JSON: JavaScript Object Notation

- { key: value, key: value... }
- keys are strings
- a value may be:
  - o string in quotes: "GW"
  - o number
  - o boolean true or false
  - another JSON object
  - o array (denoted by square brackets [ ]) of JSON objects
  - o null

# JSON example

```
"text": "Yesterday, #GWU students, faculty,
staff...https://t.co/8Tz29odc11",
   "favorite count": 56,
   "truncated": false,
   "entities": {
      "user mentions": [],
      "hashtags": {
         "indices": [11, 15],
         "text": "GWU"
```

# Social Media APIs

## What's an API?

Short for "Application Programming Interface"

Allows you to request or send data to another service on the web, using HTTP.

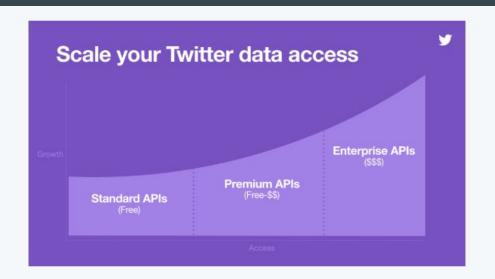
Request: http://an.api.com/query?term=pizza

Response: structured data (XML, JSON)

# Why use an API for working with social media?

- You don't want to scrape it from the web page!
- An API gives you:
  - Data you can't get by scraping.
  - Data in a structured format, easier for analyzing.

The Twitter API



### Standard APIs

Our free, standard APIs are great for getting started, testing an integration, validating a concept, or creating solutions that complement what you can create with premium and enterprise products. Examples include posting content to Twitter and getting data not available in high volumes.

### **Premium APIs**

Our premium APIs offer scalable access to Twitter data for those looking to grow, experiment, and innovate. When the standard API doesn't offer the amount of data necessary, upgrading to premium allows you to continue building and growing. Test in the free sandbox and then upgrade to month-to-month access.

### **Enterprise APIs**

Our enterprise APIs offer the highest level of access and reliability to those who depend on Twitter data. Perfect as you scale beyond premium and need more reliable access, custom tailored packages, or annual contracts. Enterprise API access comes with dedicated account managers and technical support.

# **Understanding the Twitter API**

- There are many Twitter APIs, only some are free.
- Their restrictions and affordances shape what you can collect.
- Understanding the APIs allows you to best choose which research questions can be addressed.

## Most useful API methods for collecting tweets

- User timeline: GET statuses/user\_timeline
  - Up to the most recent 3,200 tweets
- Search: GET search/tweets
  - Sampling of tweets from last 7 days.
  - O Query by keyword, phrases, hashtags, author, date, more.
  - Not the same as search via twitter.com
- Filter stream: POST statuses/filter
  - Filter by keyword, user, or location

## User timeline: GET statuses/user\_timeline

- Gets most recent tweets posted by a user.
- Limited to last 3,200 tweets.
- Returns 200 at a time, so must page.
- Rate limit: 900 tweets per 15 minutes
- https://api.twitter.com/1.1/statuses/user\_timeline.json?screen\_name=gelmanlibrary&max\_id=8298861563345
   715

## Search: GET search/tweets

- Search recent tweets.
  - Sampling of tweets from last 7 days.
  - Ouery by keyword, phrases, hashtags, author, date, more.
- Returns up to 100 at a time, so must page.
- Not the same as search on Twitter website.
- Rate limit: 180 tweets per 15 minutes
- https://api.twitter.com/1.1/search/tweets.json?q=%2 3onlyatgw

## Filter Stream: POST statuses/filter

- Real-time filtering of all public tweets.
  - Filter by keyword, user, or location.
- Continue to receive additional tweets over a single call to API. (No paging.)
- Limits:
  - When high volume, will not receive all tweets.
  - One stream at a time per set of credentials.
- https://stream.twitter.com/1.1/statuses/filter.json ?track=gwu

## More Twitter API methods

Get a specific tweet: GET users/lookup

Get user info: GET users/lookup

Get trends near a location: GET trends/place

More: developer.twitter.com/en/docs

**Acquiring Twitter datasets** 

# Options for acquiring a Twitter dataset

- Collect a new dataset.
- Use an existing dataset.
- Purchase data or access to a platform.

# Collecting a new dataset - using coding

### Command line:

- Twarc: github.com/docnow/twarc
- Twurl: github.com/twitter/twurl

### Python libraries

- twarc github.com/DocNow/twarc
- tweepy: <u>www.tweepy.org</u>

R package: rtweet: <u>github.com/mkearney/rtweet</u>

# Collecting a new dataset - no coding required

Social Feed Manager:

go.gwu.edu/sfmgw

TAGS (Twitter Archiving Google Sheet):

tags.hawksey.info

Collecting new Twitter data

# Social Feed Manager software

- Open source software by GW Libraries.
- User interface for collecting, managing, and exporting social media data.
- Collect from Twitter, Tumblr, Flickr, Sina Weibo.
- Libraries run this for their users as a service. (Not typically a local install on your laptop.)

More: go.gwu.edu/sfm

# Hands-on: Social Feed Manager

### Steps we'll perform:

- 1. Sign up
- 2. Request credentials (API keys)
- 3. Create a collection
- 4. Perform a harvest
- 5. Export data

Go to: gwsfm-sandbox.wrlc.org

# **Exporting datasets**

- Formats: Excel, CSV, JSON
- Limit by date ranges
- Splits into separate files

Using existing Twitter data

## Datasets from other researchers

Twitter's terms generally do not allow datasets of full JSON data to be shared.

OK to share: Text file of tweet identifiers

id\_str: "775347040196894720"

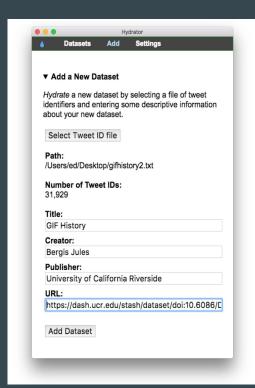
Use Twitter API to request tweets by identifier and get back the full tweet.

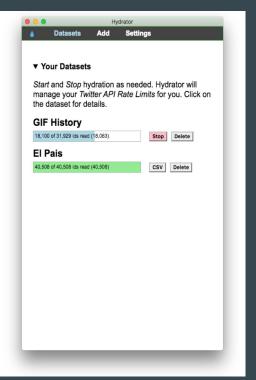
Won't include deleted/protected tweets.

## Working with tweet identifiers

Hydrator desktop app

https://github.com/DocNow/hydrator





## Using an existing dataset

- DocNow Catalog: <u>www.docnow.io/catalog/</u>
- Data repositories such as <u>Dataverse</u>
- TweetSets: <u>tweetsets.library.gwu.edu/</u>
  - Datasets collected by GW Libraries.
  - Full tweets available as JSON or CSV
     Only for GW users, for academic purposes only.

## Datasets collected by GW Libraries

- 2020 U.S. Presidential election (in progress)
- 2018 U.S. midterm election
- 2016 U.S. election (280 million tweets)
- Congress (all senators and representatives)
- Federal govt (3000 U.S. government accounts)

- News outlets (4500 media organization accounts)
- Hurricanes
- Make America Great Again
- Tax reform
- Immigration & travel ban
- Climate change

More ...

## **TweetSets**

### Steps we'll demo:

- 1. Select a source dataset.
- 2. Filter the source dataset.
- 3. Create a new dataset.
- 4. Generate and download dataset derivatives.

tweetsets.library.gwu.edu/

# Purchasing data or access to a platform

# **Options**

- Subscribe to an analytics platform such as CrimsonHexagon or CrowdTangle. Limitations on data export.
- Subscribe to <u>Twitter Premium or Enterprise APIs</u>.
- Purchase historical batch data from Twitter.
- Subscribe to historical search API access from Twitter.

## Can I get Tweets from the past without cost?

- If <u>GW</u> collected it already: yes (TweetSets or SFM)
- If <u>someone else</u> collected it:
  - Need to hydrate tweet IDs, won't be complete.
- Using Twitter collections in SFM:
  - User timeline: up to ~3,200 tweets per account
  - Search: ~7 days
  - Filter: No.

## FAQ: Are tweets geotagged?

- Geotagging is opt-in. Only ~2% geotagged.
  - Lat, long or place name (e.g., DC or Middle Earth)
- Search API: Limit to a specified distance of a lat, long.
- Filter Stream: Limit to a bounding box.

More: gwu-libraries.github.io/sfm-ui/posts/2017-04-12-geographic-collecting

**Exploring and analyzing** 

Twitter data

# Before analysis

Clean and validate your data.

- Are the terms you queried used for other meanings and events?
- Are the accounts valid?
- O Are there gaps in the data?

# Working with datasets

- Jupyter notebooks for Python and pandas analysis: <a href="mailto:bit.ly/2uhN252">bit.ly/2uhN252</a> also see <a href="mailto:here">here</a>
- R
- jq command-line tool
  - "Recipes for Twitter data" bit.ly/2t9cStF
- Excel or Google Sheets

Other social media platforms

## Other platforms?

Facebook: little/no API available

Instagram: no API available

Commercial tools may have access to some data, consider web archiving.





### The Forum

### Computational Research in the Post-API Age

### DEEN FREELON

Keywords API, computational, Facebook, Twitter, social media

On April 4, 2018, the post-API age reached a milestone. On that day, Facebook closed access to its Pages API, which had allowed researchers to extract posts, comments, and associated metadata from public Facebook pages (Schroepfer, 2018). This decision followed the company's April 2015 closure of its public search Application Programming Interface (API), which provided searchable access to all public posts within a rolling two-week window (Facebook, n.d.). The closure of the Pages API eliminated all terms of service (TOS)-compliant access to Facebook content. Let me underscore the magnitude of this shift: There is currently no way to independently extract content from Facebook without violating its TOS.

At the flip of a metaphorical switch, Facebook instantly invalidated all methods that depended on the Pages API. For example, I gave a Facebook data collection workshop in January 2018 at the University of Michigan whose lessons are now mostly unusable. A Python module I wrote to extract data from the Pages API is similarly obsolete. The specific implications for Facebook research are immense, but larger still are those for API-based research more generally. When companies can restrict or eliminate API access at any time, for any reason, and without any recourse, computational researchers and students need to seriously consider how to proceed. We find ourselves in a situation where heavy investment in teaching and learning platform-specific methods can be rendered useless overnight: This is what I mean by "the post-API age."

In this brief article I provide two guiding lights for graduate education in computational methods going forward. APIs will continue to be important sources of digital communication data, but the closure of the Pages API demonstrates the dangers of relying on them exclusively. Researchers of social and other online media content should start by doing two things as they brace themselves for the uncertainty ahead. First, they should learn how to scrape the Web; and second, they should understand the potential consequences of violating platforms' TOS by doing so.

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What do you do when there's no API available?

Web scraping and capture tools are an alternative approach.

Deen Freelon (2018) <u>Computational Research in the Post-API Age</u>, Political Communication, 35:4, 665-668. <u>Also available as preprint</u>.

## Webrecorder

## webrecorder.io

- "Record" your web browsing and capture sites as viewed by a human.
- Provides a complementary view to API data.
- Sign in for 5GB account. Can make collections public or export them.

**Ethical considerations** 

# Social media data comes from people

- Consider impact of your work on the creator of the social media.
- Do not have creator's permission for research.
- Impact on creator is balanced against public good of your research.
- Requires judgment call.

### More: go.gwu.edu/sfmethics

"Participant Perceptions of Twitter Research Ethics." Casey Fiesler, Nicholas Proferes, *Social Media + Society*. First published March 10, 2018. doi.org/10.1177/2056305118763366

# Data collecting

Be thoughtful collecting social media of:

- Vulnerable individuals (e.g., minors, social activists)
- Sensitive or harmful topics (e.g., questionable behavior, mental illness)
- Geography-based collecting

# Data sharing

- Get familiar with platform terms of use.
  - Don't republish full datasets
  - Share in accordance with terms (e.g., tweet ids only)
  - Consider copyright
- Sharing summary statistics is usually OK.

# Publishing

- When possible, get permission from creator for quotes.
- Do not rely on anonymizing posts.

# **Questions?**

Make a consultation appointment: <u>calendly.com/social-media-consulting-gw</u>

Social Feed Manager team: sfm@gwu.edu

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