

Computational History

Last updated: 2024/09/10, 07:30:42 EDT

Principles of Complex Systems, Vols. 1, 2, & 3D
CSYS/MATH 6701, 6713, & a pretend number, 2024–2025

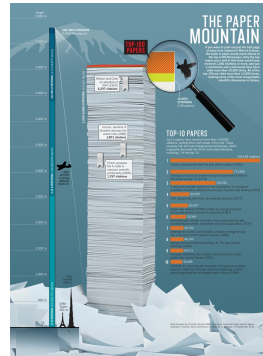
Prof. Peter Sheridan Dodds

Computational Story Lab | Vermont Complex Systems Center
Santa Fe Institute | University of Vermont

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Fame by rank

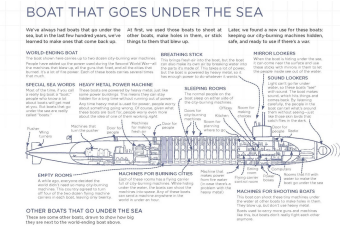


Nature (2014): Most cited papers of all time

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“Thing Explainer: Complicated Stuff in Simple Words”
by Randall Munroe (2015). ^[12]



Up goer five

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Outline

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Word frequency:

Brown Corpus (~ 10⁶ words):

rank	word	% q	rank	word	% q
1.	the	6.8872	1945.	apply	0.0055
2.	of	3.5839	1946.	vital	0.0055
3.	and	2.8401	1947.	September	0.0055
4.	to	2.5744	1948.	review	0.0055
5.	a	2.2996	1949.	wage	0.0055
6.	in	2.1010	1950.	motor	0.0055
7.	that	1.0428	1951.	fifteen	0.0055
8.	is	0.9943	1952.	regarded	0.0055
9.	was	0.9661	1953.	draw	0.0055
10.	he	0.9392	1954.	wheel	0.0055
11.	for	0.9340	1955.	organized	0.0055
12.	it	0.8623	1956.	vision	0.0055
13.	with	0.7176	1957.	wild	0.0055
14.	as	0.7137	1958.	Palmer	0.0055
15.	his	0.6886	1959.	intensity	0.0055

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The everywhere-ness of algorithms and stories:



“On the Origin of Stories: Evolution, Cognition, and Fiction”
by Brian Boyd (2010). ^[2]

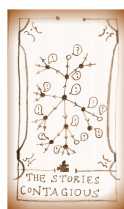
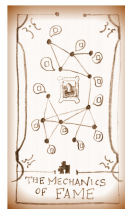


“The Storytelling Animal: How Stories Make Us Human”
by Jonathan Gottschall (2013). ^[8]



“The Written World: How Literature Shaped Civilization”
by Martin Puchner (2017). ^[14]

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Jonathan Harris's Wordcount:

A word frequency distribution explorer:

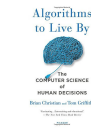


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Algorithms, recipes, stories, ...



“The Code Economy: A Forty-Thousand Year History”
by Philip E Auerwald (2017). ^[1]



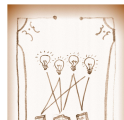
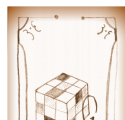
“Algorithms to Live By”
by Christian and Griffiths (2016). ^[4]



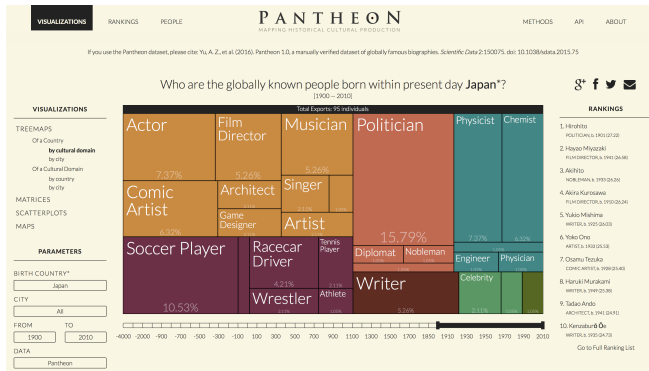
“Once Upon an Algorithm”
by Martin Erwig (2017). ^[7]

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Also: Numerical Recipes in C ^[13] and How to Bake π ^[3]

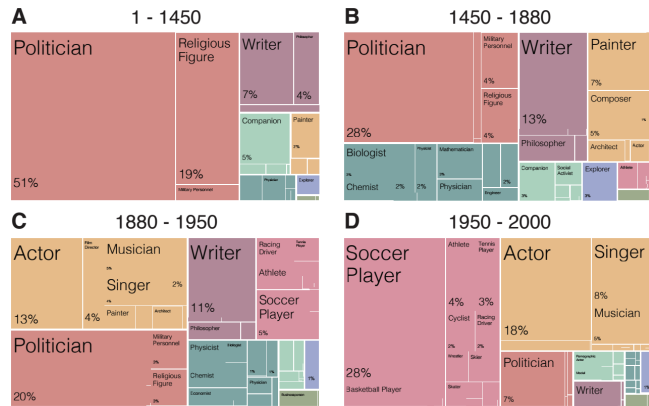


The famous are storytellers—Japan:



For people born 1950–

http://pantheon.media.mit.edu/treemap/country_exports/IP/all/1900/2010/H15/pantheon



<https://www.media.mit.edu/projects/pantheon-new/overview/>

Super Survival of the Stories:



The Desirability of Storytellers, The Atlantic, Ed Yong, 2017-12-05.

- Study of Agta, Filipino hunter-gatherers.
- Storytelling valued well above all other skills including hunting.
- Stories encode prosocial norms such as cooperation.
- Like the best stories, the best storytellers reproduce more successfully.

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The most famous painting in the world:



The dismal predictive powers of editors



Twelve ...

The completely unpredicted fall of Eastern Europe:



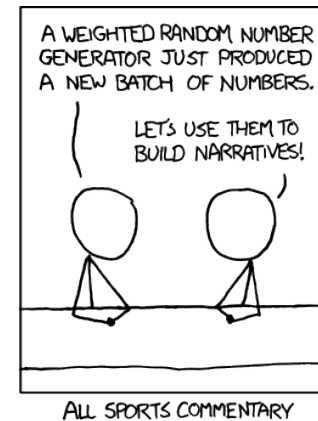
Timur Kuran: [10] “Now Out of Never: The Element of Surprise in the East European Revolution of 1989”

We understand bushfire stories:

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- Sparks start fires.
- System properties control a fire’s spread.
- But for three reasons, we make two mistakes about Social Fires ...

Reason 1—We are Homo Narrativus.



<http://xkcd.com/904/>

Reason 2—“We are all individuals.”

Archival footage:

- Individual narratives are not enough to understand distributed, networked minds.

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Reason 3—We are spectacular imitators.

BBC/David Attenborough.

Mistake 1:
Success is due to intrinsic properties

See “Becoming Mona Lisa” by David Sassoon



48 songs
30k participants

Exp 1— weak social

Exp. 2—strong social

Rank	Song	Downloads
1	Song 1	480
2	Song 2	150
3	Song 3	100
4	Song 4	80
5	Song 5	60
6	Song 6	50
7	Song 7	40
8	Song 8	30
9	Song 9	25
10	Song 10	20
11	Song 11	15
12	Song 12	12
13	Song 13	10
14	Song 14	8
15	Song 15	6
16	Song 16	5
17	Song 17	4
18	Song 18	3
19	Song 19	2
20	Song 20	1

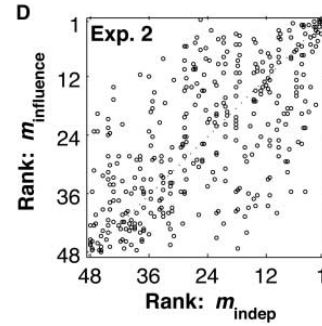
Rank	Song	Downloads
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8	Song 8	30
9	Song 9	25
10	Song 10	20
11	Song 11	15
12	Song 12	12
13	Song 13	10
14	Song 14	8
15	Song 15	6
16	Song 16	5
17	Song 17	4
18	Song 18	3
19	Song 19	2
20	Song 20	1

“An experimental study of inequality and unpredictability in an artificial cultural market”
Salganik, Dodds, and Watts,
Science, **311**, 854–856, 2006. [15]

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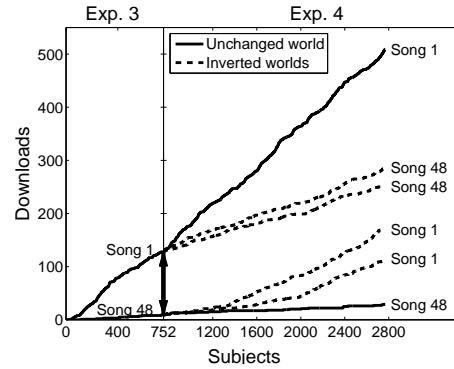
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Resolving the paradox:



Increased social awareness leads to Stronger inequality + Less predictability.

Payola/Deceptive advertising hurts us all:



“Mistake” 2:

Seeing success is ‘due to social’ and wanting to say ‘all your interactions are belong to us’

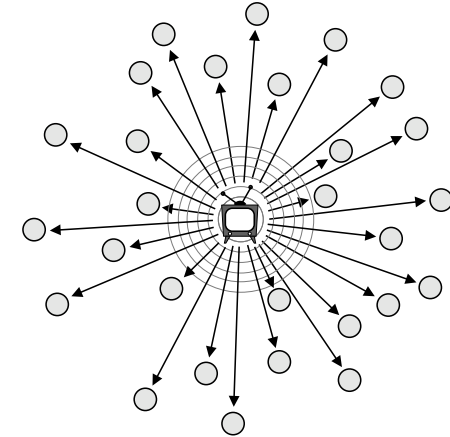


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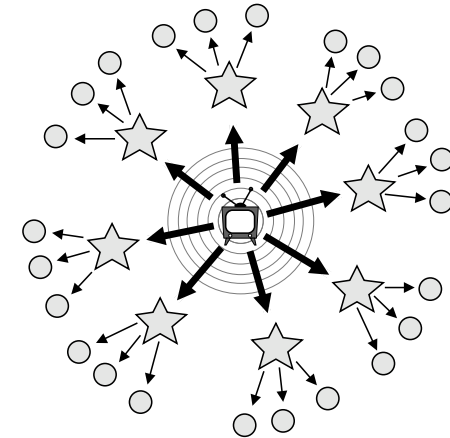
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“This is truly the last time, believe me”

The hypodermic model of influence:



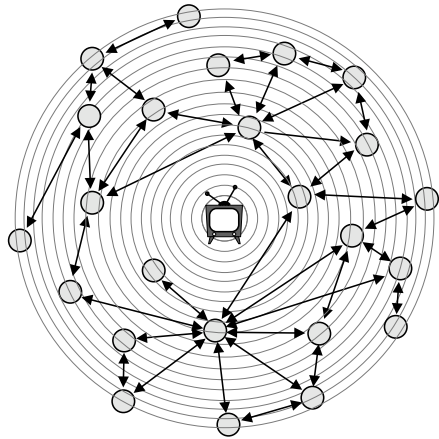
The two step model of influence: [9]



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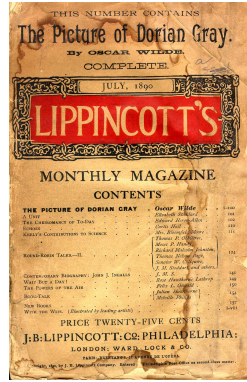
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The network model of influence:



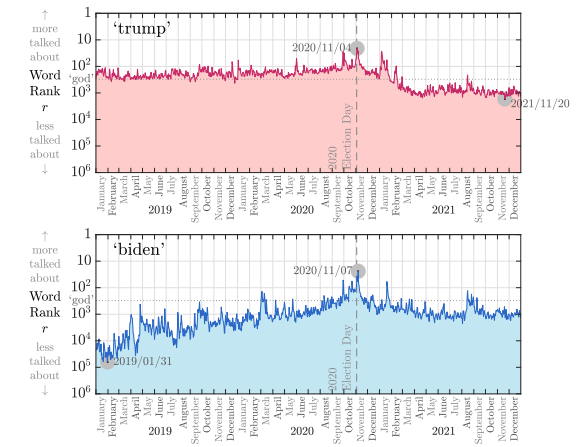
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Oscar Wilde, The Picture of Dorian Gray: Raw Fame



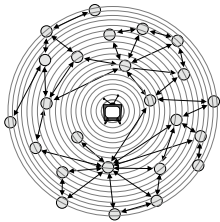
“There is only one thing in the world worse than being talked about, and that is not being talked about.”

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The network model of influence:



How superspreading works:
Many interconnected, average, trusting people must benefit from both receiving and sharing a message far from its source.

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Ultrafame: Nobody expects the Spanish Inquisition K-pop:



Vox (2019-04-17):
BTS, the band that changed K-pop, explained

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“Influentials, Networks, and Public Opinion Formation”
Watts and Dodds,
J. Consum. Res., 34, 441–458, 2007. [16]

Etymological clarity:

- ☿ **Fate**—from the Latin *fatus*: meaning “spoken”.
- ☿ Fate is talk that has been done.
“It is written”, fore-tell, pre-dict.
- ☿ “There is no such thing as fate, only the story of fate.”
- ☿ Destiny is probabilistic.
- ☿ **Fame**—from the Latin *fama*: meaning “to talk.”
- ☿ Fame is inherently the social discussion about the thing, not the thing itself.
- ☿ **Renown**: Repeatedly named, talked about. Old French *renon*, from re- + non (“name”).
- ☿ **Réclame**: “Clamo”—Proto-Indo-European: “to shout” (again). Connected to “lowing”.

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“Fame and Ultrafame: Measuring and comparing daily levels of ‘being talked about’ for United States presidents, their rivals, God, countries, and K-pop”
Dodds et al.,
Available online at
<https://arxiv.org/abs/1910.00149>, 2019. [5]

“Computational timeline reconstruction of the stories surrounding Trump: Story turbulence, narrative control, and collective chronopathy”
Dodds et al.,
, 2020. [6]

- ☿ POTUSometer with the Smorgasdashbord:
<http://compstoriylab.org/potusometer/>
- ☿ Stories surrounding Trump:
<http://compstoriylab.org/trumpstoryturbulence/>

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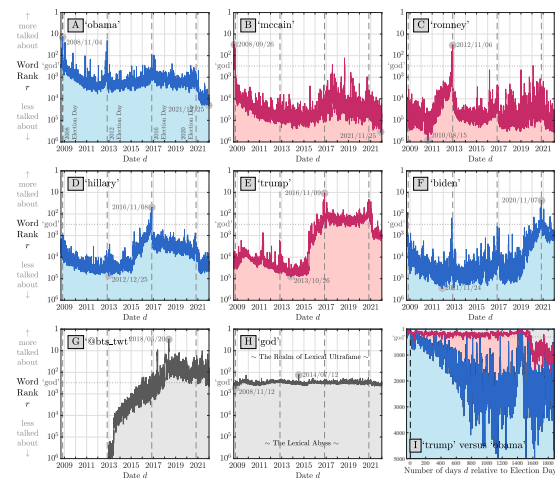
Telegonomics

Distant reading by smashing texts into storyons:

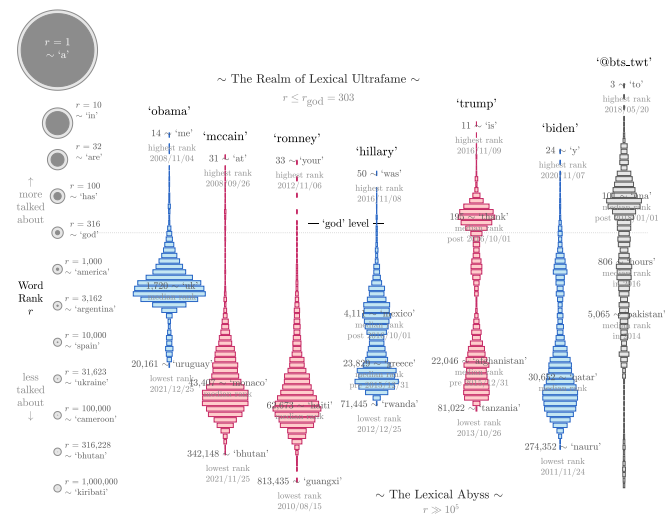
```
cd ~/work/stories/2019-10story-turbulence-trump/data/1grams
261G
more updateall.sh
file names:
compute_rank_turbulence_divergence_sweep_the_leg
```

Zip files:
zless 2018-01-06/1grams/en*.tar.tsv
zless 2021-01-05/1grams/en*.tar.tsv
zless 2021-01-06/1grams/en*.tar.tsv
zless 2021-01-07/1grams/en*.tar.tsv

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2011 Whitehouse Correspondents' Dinner



Ultraframe—Percentage of days per year ranked above 'god'

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
'barack'	1.8%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
'obama'	54.4%	6.9%	0.5%	2.2%	0.3%	2.2%	0.3%	2.2%	0.3%	0.5%	0.0%	0.0%	0.0%	0.0%
@barackobama'	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
'john'	3.5%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.8%	0.3%	0.5%	0.0%
'mccain'	39.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	1.1%	1.0%	0.0%	0.0%
@senjohnmccain'	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
'mitt'	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
'romney'	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%
@mittromney'	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
'hillary'	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
'clinton'	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
@hillaryclinton'	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
'donald'	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	2.7%	0.5%	0.0%	0.0%	1.6%	0.6%	0.0%
'trump'	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.7%	8.6%	98.6%	93.7%	92.8%	100.0%	100.2%
@realdonaldtrump'	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%	16.8%	41.4%	69.7%	90.2%	99.2%	2.2%
'joe'	3.5%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.2%	10.6%	0.0%
'biden'	1.8%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	23.8%	16.1%	0.0%
@joebiden'	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.1%	0.3%	0.0%
@bts.twt'	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	8.5%	30.7%	100.0%	100.0%	98.9%	98.1%

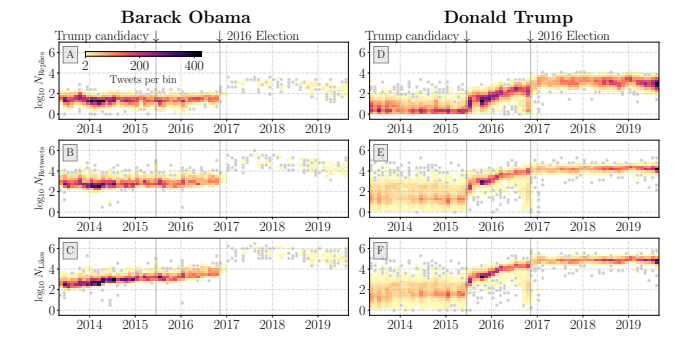
Relative median rates of 'being talked about' in the 8 weeks (56 days) pre-election day:

	2008	2012	2016	2020
'barack'	128	11	13	
'obama'	1000	392	35	71
@barackobama'	9	24	17	17
'john'	307	16	12	35
'mccain'	757	1	2	3
@senjohnmccain'	0	0	1	0
'mitt'	3	50	2	2
'romney'	2	20	3	3
@mittromney'	0	14	1	1
'hillary'	20	3	357	30
'clinton'	42	8	326	23
@hillaryclinton'	0	0	30	19
'donald'	7	5	178	35
'trump'	4	3	656	1001
@realdonaldtrump'	0	4	219	656
'joe'	128	39	32	287
'biden'	17	4	5	504
@joebiden'	0	1	1	212
@bts.twt'	0	0	146	1037
'god'	400	484	362	380

Relative median rates of 'being talked about' per year:

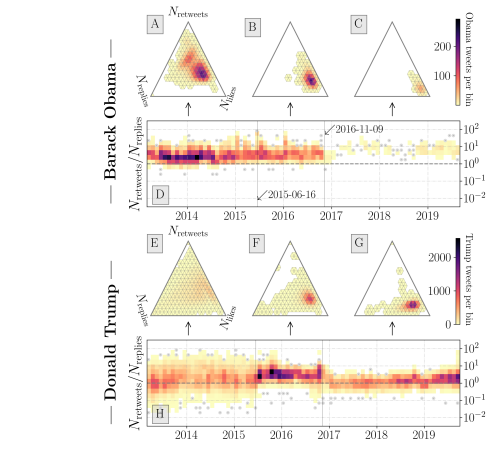
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
'barack'	150	138	17	9	10	17	8	11	14	15	14	19	19	13
'obama'	887	379	32	37	79	101	103	135	177	160	229	106	104	17
@barackobama'	10	18	11	10	17	15	16	13	13	17	13	21	15	8
'john'	401	274	38	26	17	04	13	21	18	29	18	14	108	82
'mccain'	579	111	4	2	2	2	1	1	3	15	7	5	3	2
@senjohnmccain'	0	12	1	0	1	1	1	1	9	2	0	0	0	0
'mitt'	5	8	5	6	25	6	5	4	4	2	2	3	3	2
'romney'	3	1	4	42	2	1	1	4	1	1	3	4	1	1
@mittromney'	0	0	0	5	0	0	0	0	0	0	1	1	0	0
'hillary'	28	10	5	3	3	14	6	30	69	72	61	43	33	6
'clinton'	62	25	16	10	8	6	8	27	40	65	62	45	32	8
@hillaryclinton'	0	0	0	0	0	0	0	11	71	22	19	21	23	3
'donald'	11	17	11	11	8	6	7	44	66	45	114	104	43	43
'trump'	7	20	10	7	4	3	3	77	583	1000	865	808	1134	229
@realdonaldtrump'	0	0	0	1	2	3	2	32	249	468	555	652	888	1
'joe'	157	87	38	38	66	58	14	46	50	48	44	78	97	117
'biden'	72	17	3	1	2	2	2	3	5	3	4	52	24	21
@joebiden'	0	0	0	0	0	0	0	0	1	1	2	18	162	28
@bts.twt'	0	0	0	0	5	36	23	242	595	2487	1802	1440	1437	0
'god'	666	851	687	694	791	719	607	616	601	599	612	611	612	610

Ratiometrics:

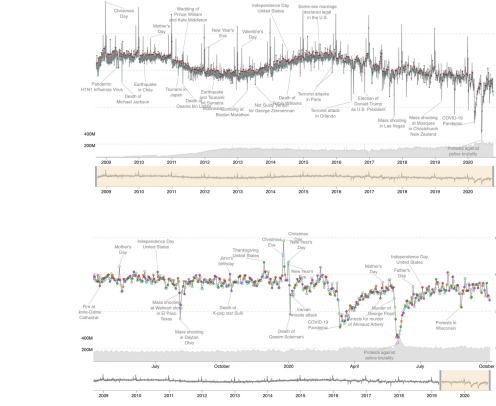


"Ratioming the President: An exploration of public engagement with Obama and Trump on Twitter," Minor et al., 2020 [11]

Ratiometrics:



Emotional turbulence:

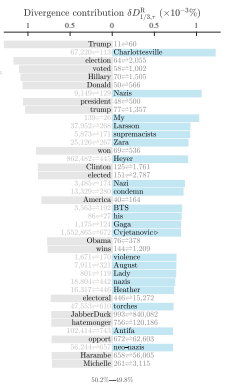
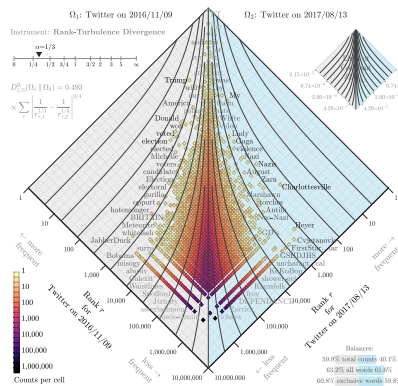


http://hedonometer.org/

Emotional turbulence:

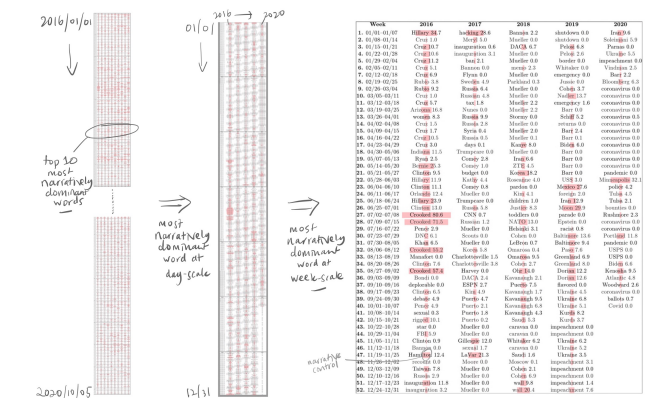


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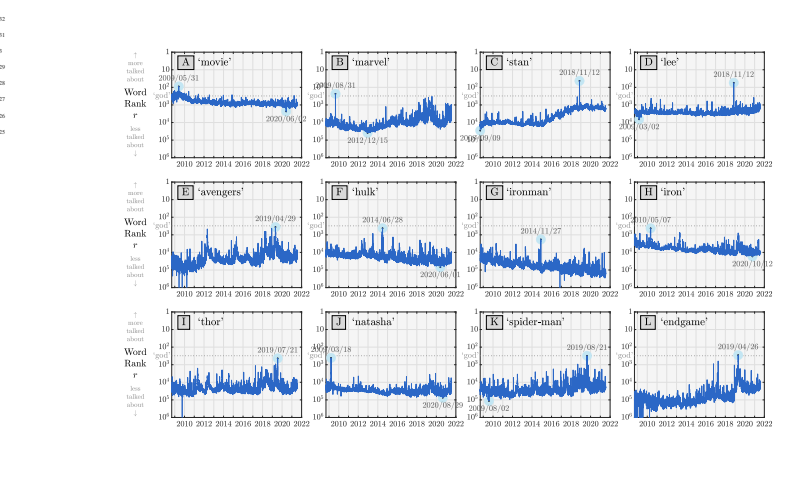
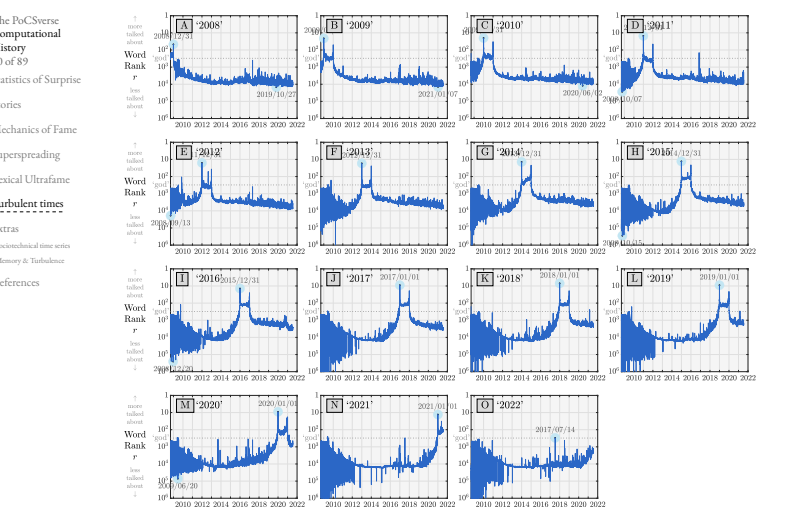
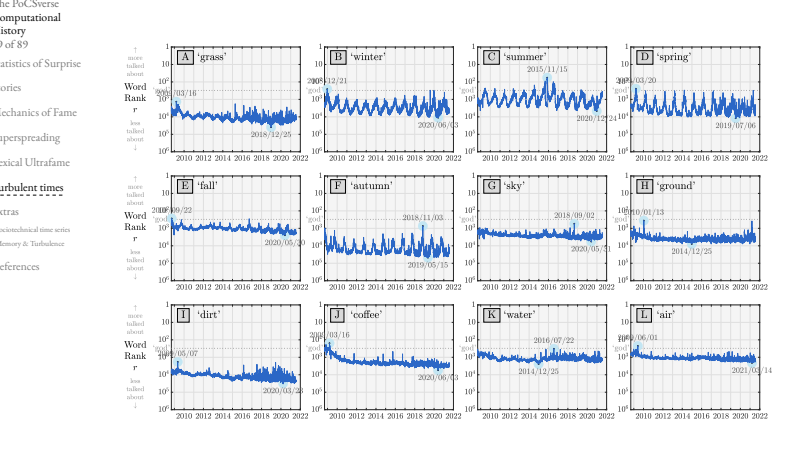
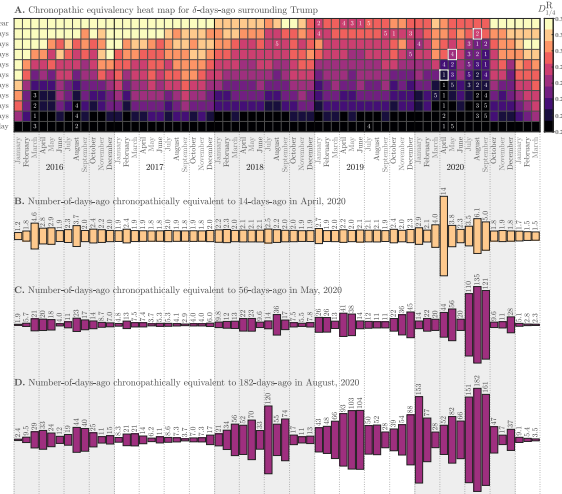
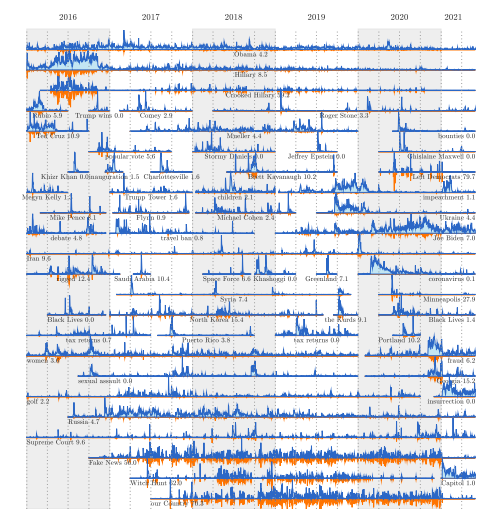


Week	2016	2017	2018	2019	2020	2021
1. 01/06/07	Hillary Clinton 2.7	Trump 8.5	Steve Bannon 5.7	the government 0.0	will 6.6	in Google 2.0
2. 01/13/07	Trump 0.0	Steve Bannon 8.5	the government 5.7	the government 0.0	the Capitol 0.0	the Capitol 0.0
3. 01/20/07	Ted Cruz 20.0	the government 8.5	the government 5.7	the government 0.0	the Capitol 0.0	the Capitol 0.0
4. 01/27/07	Mega Kelly 4.9	executive order 0.0	the FBI 9.4	the government 0.0	the Capitol 0.0	the Capitol 0.0
5. 02/03/07	New Hampshire 15.7	travel ban 1.6	the FBI 9.4	Robt Mueller 2.0	the Capitol 0.0	the Capitol 0.0
6. 02/10/07	New Hampshire 15.7	military power 0.0	the FBI 9.4	the FBI 1.7	Attorney General 0.0	the Capitol 0.0
7. 02/17/07	Ted Cruz 15.7	Michael Flynn 0.0	school shooting 3.1	national emergency 0.0	Royce Snow 4.0	the Capitol 0.0
8. 02/24/07	Ted Cruz 15.7	Trump administration 0.0	Stacy Abrams 0.0	the FBI 1.7	Bruce Siskind 1.6	the Capitol 0.0
9. 03/02/07	for Lee 1.4	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
10. 03/09/07	Ted Cruz 15.7	Stacy Abrams 0.0	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
11. 03/16/07	Trump 0.0	Melinda 0.0	Stacy Abrams 0.0	New Hampshire 15.7	the Capitol 0.0	the Capitol 0.0
12. 03/23/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
13. 03/30/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
14. 04/06/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
15. 04/13/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
16. 04/20/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
17. 04/27/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
18. 05/04/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
19. 05/11/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
20. 05/18/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
21. 05/25/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
22. 06/01/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
23. 06/08/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
24. 06/15/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
25. 06/22/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
26. 06/29/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
27. 07/06/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
28. 07/13/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
29. 07/20/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
30. 07/27/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
31. 08/03/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
32. 08/10/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
33. 08/17/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
34. 08/24/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
35. 08/31/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
36. 09/07/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
37. 09/14/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
38. 09/21/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
39. 09/28/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
40. 10/05/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
41. 10/12/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
42. 10/19/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
43. 10/26/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
44. 11/02/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
45. 11/09/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
46. 11/16/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
47. 11/23/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
48. 11/30/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
49. 12/07/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
50. 12/14/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
51. 12/21/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0
52. 12/28/07	Trump 0.0	the FBI 2.4	Stacy Abrams 0.0	the FBI 1.7	the Capitol 0.0	the Capitol 0.0

Allotaxonomy—the comparison of complex systems:
<http://compstorylab.org/allotaxonomy/>



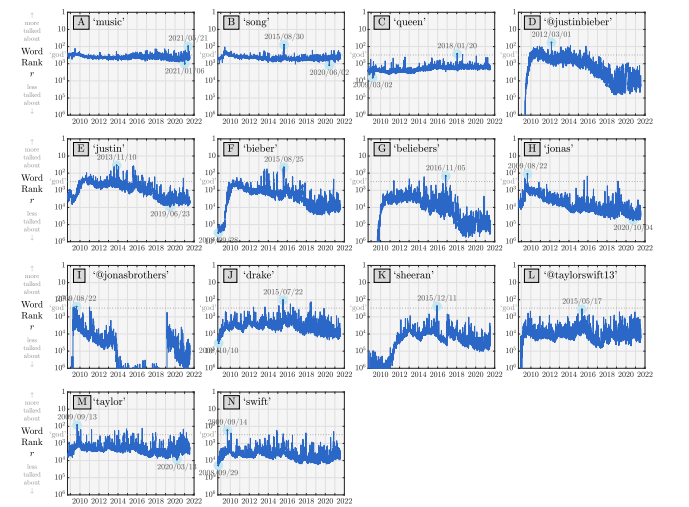
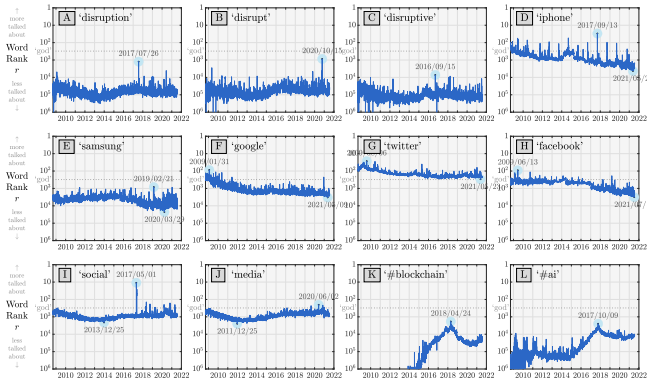
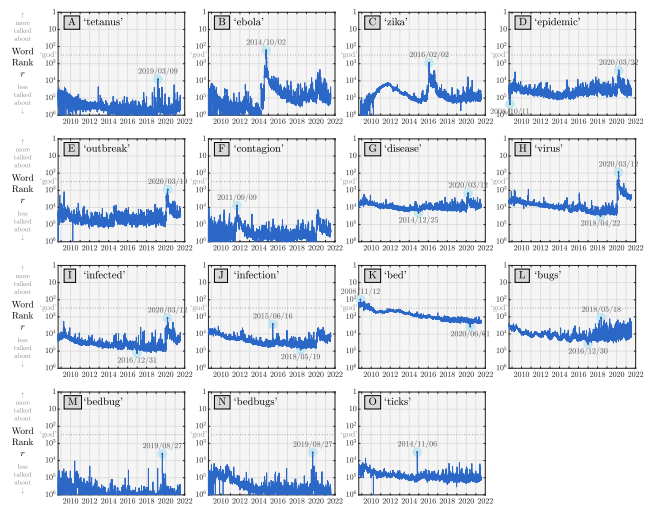
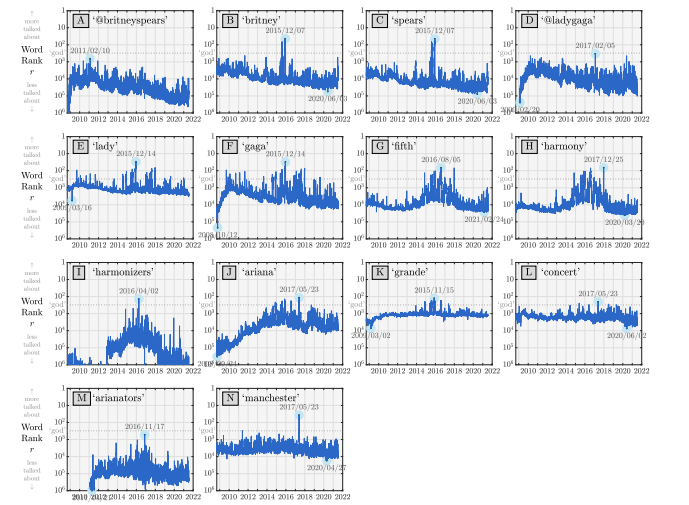
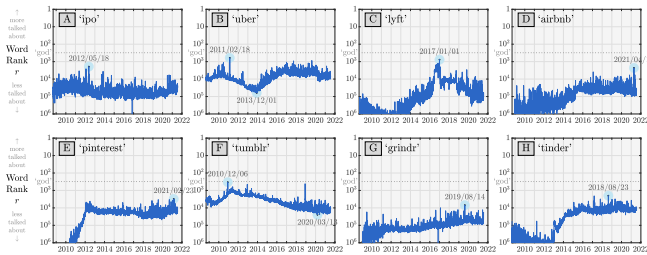
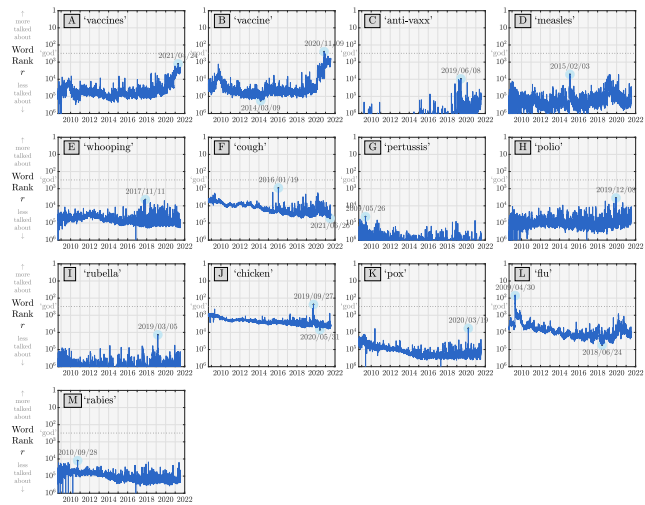
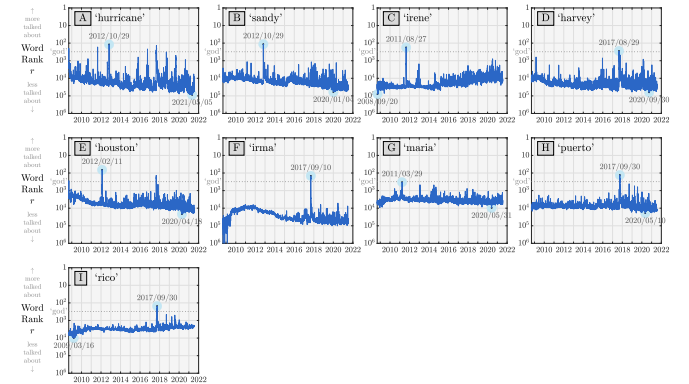
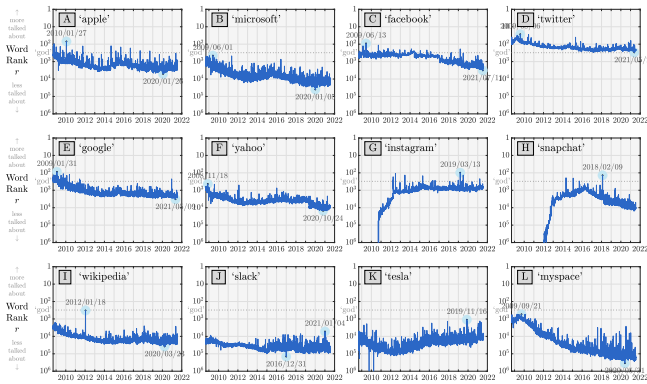
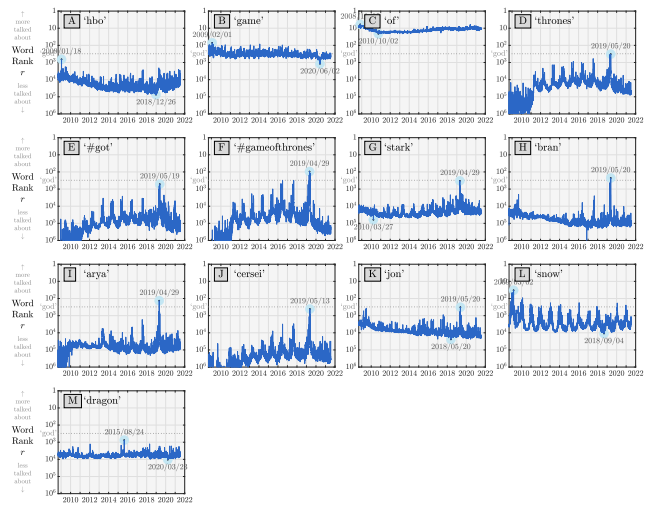
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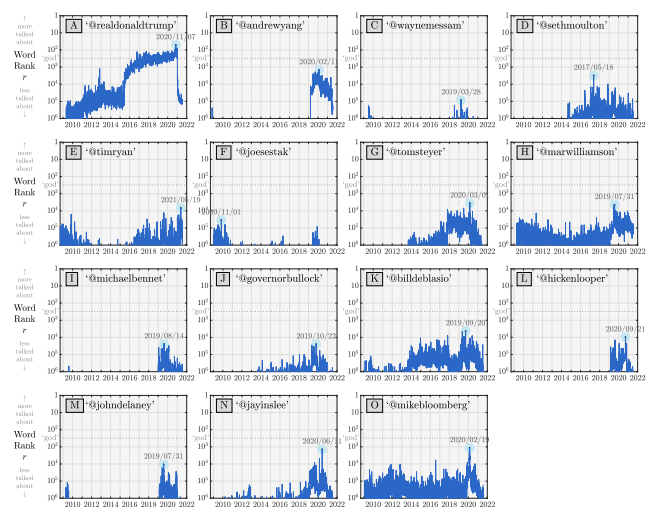
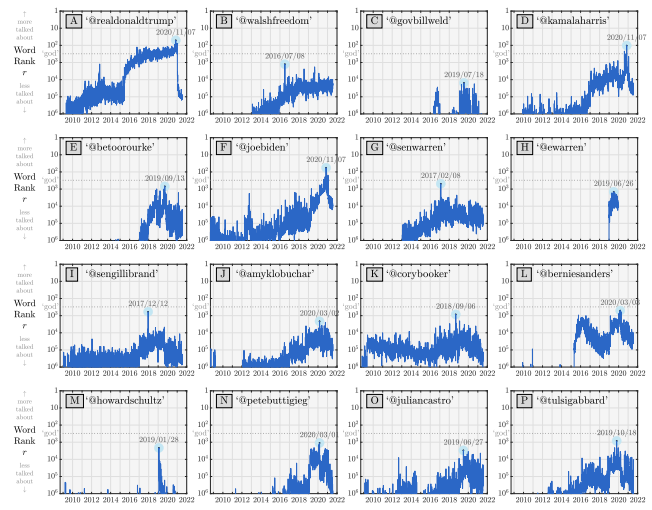
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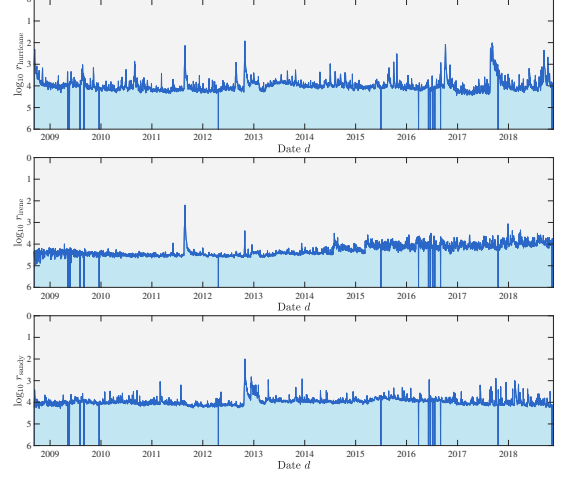
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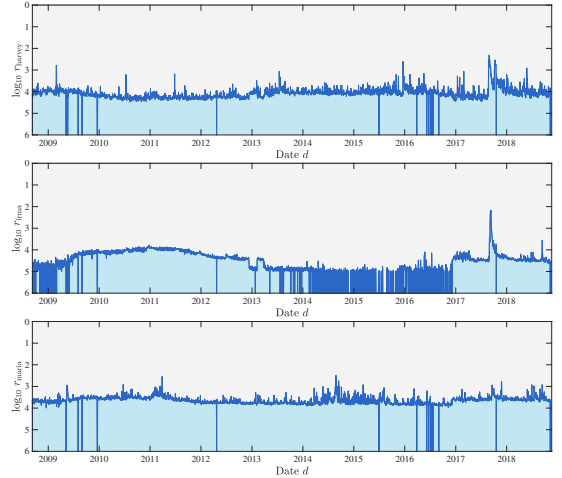


Awareness and Memory: Hurricanes

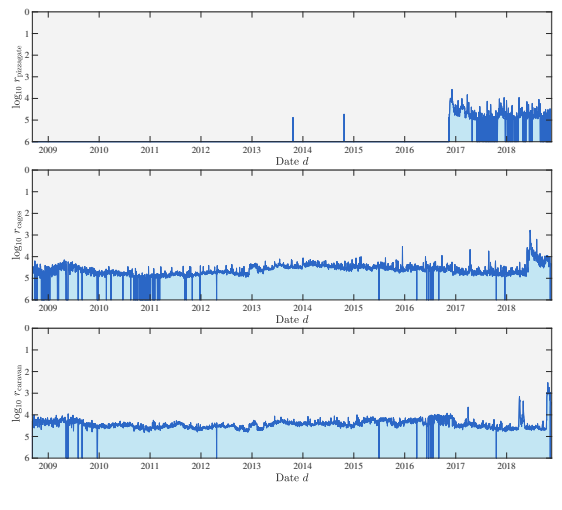
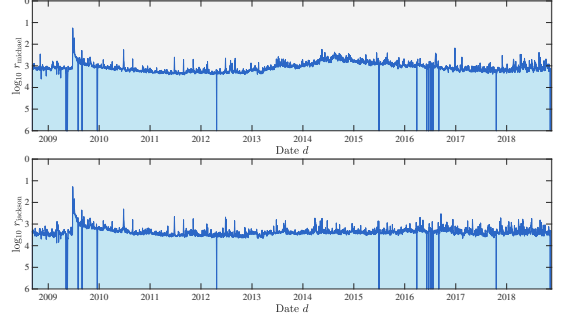


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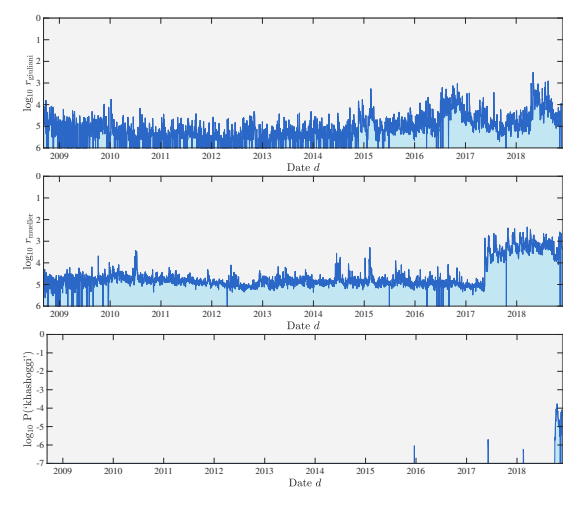
Awareness and Memory: Hurricanes



Michael Jackson

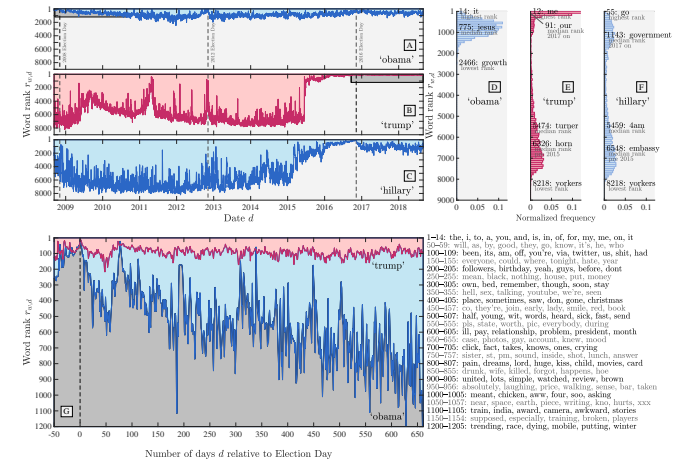


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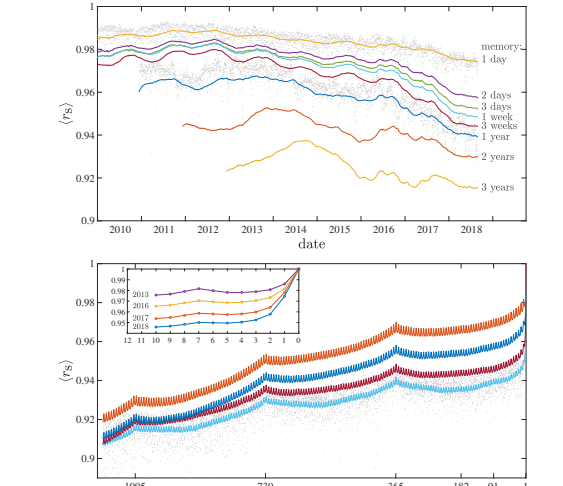
Lexical fame of POTUSes and possible POTUSes:



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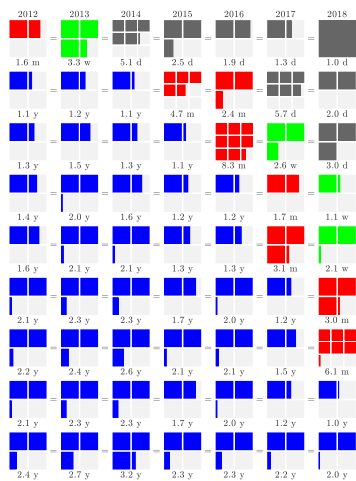
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References II

- [5] P. S. Dodds, J. R. Minot, M. V. Arnold, T. Alshaabi, J. L. Adams, D. R. Dewhurst, A. J. Reagan, and C. M. Danforth. **Fame and Ultrafame: Measuring and comparing daily levels of 'being talked about' for United States' presidents, their rivals, God, countries, and K-pop, 2019.** Available online at <https://arxiv.org/abs/1910.00149>. pdf ↗
- [6] P. S. Dodds, J. R. Minot, M. V. Arnold, T. Alshaabi, J. L. Adams, A. J. Reagan, and C. M. Danforth. **Computational timeline reconstruction of the stories surrounding Trump: Story turbulence, narrative control, and collective chronopathy, 2020.** <https://arxiv.org/abs/2008.07301>. pdf ↗
- [7] M. Erwig. **Once Upon an Algorithm.** MIT Press, 2017.

References IV

- [12] R. Munroe. **Thing Explainer: Complicated Stuff in Simple Words.** Houghton Mifflin Harcourt, 2015.
- [13] W. H. Press, S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery. **Numerical Recipes in C.** Cambridge University Press, second edition, 1992.
- [14] M. Puchner. **The Written World: How Literature Shaped Civilization.** Random, 2017.
- [15] M. J. Salganik, P. S. Dodds, and D. J. Watts. **An experimental study of inequality and unpredictability in an artificial cultural market.** *Science*, 311:854–856, 2006. pdf ↗

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References I

- [1] P. E. Auerwald. **The Code Economy: A Forty-Thousand Year History.** Oxford University Press, 2017.
- [2] B. Boyd. **On the Origin of Stories: Evolution, Cognition, and Fiction.** Belknap Press, 2010.
- [3] E. Cheng. **How to bake pi: An edible exploration of the mathematics of mathematics.** Basic Books, 2015.
- [4] B. Christian and T. Griffiths. **Algorithms to Live By.** Macmillan, 2016.

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References III

- [8] J. Gottschall. **The Storytelling Animal: How Stories Make Us Human.** Mariner Books, 2013.
- [9] E. Katz and P. F. Lazarsfeld. **Personal Influence.** The Free Press, New York, 1955.
- [10] T. Kuran. **Now out of never: The element of surprise in the east european revolution of 1989.** *World Politics*, 44:7–48, 1991. pdf ↗
- [11] J. R. Minot, M. V. Arnold, T. Alshaabi, C. M. Danforth, and P. S. Dodds. **Ratioing the President: An exploration of public engagement with Obama and Trump on Twitter, 2020.** Available online at <https://arxiv.org/abs/2006.03526>. pdf ↗

References V

- [16] D. J. Watts and P. S. Dodds. **Influentials, networks, and public opinion formation.** *Journal of Consumer Research*, 34:441–458, 2007. pdf ↗

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