Computational Studies of Social Media Protests

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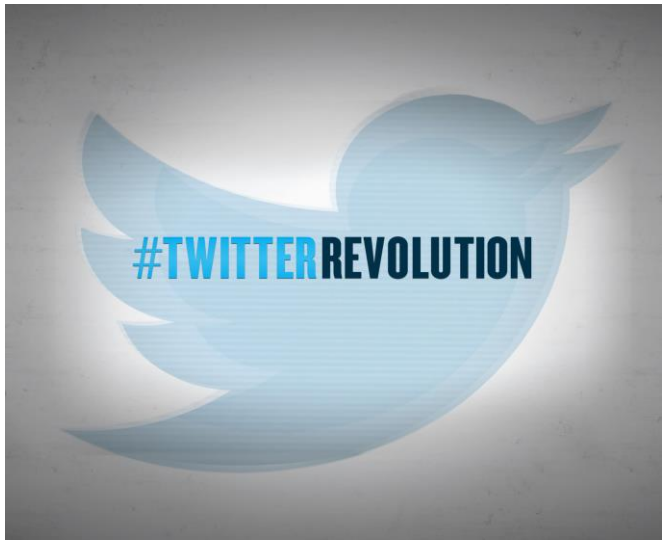
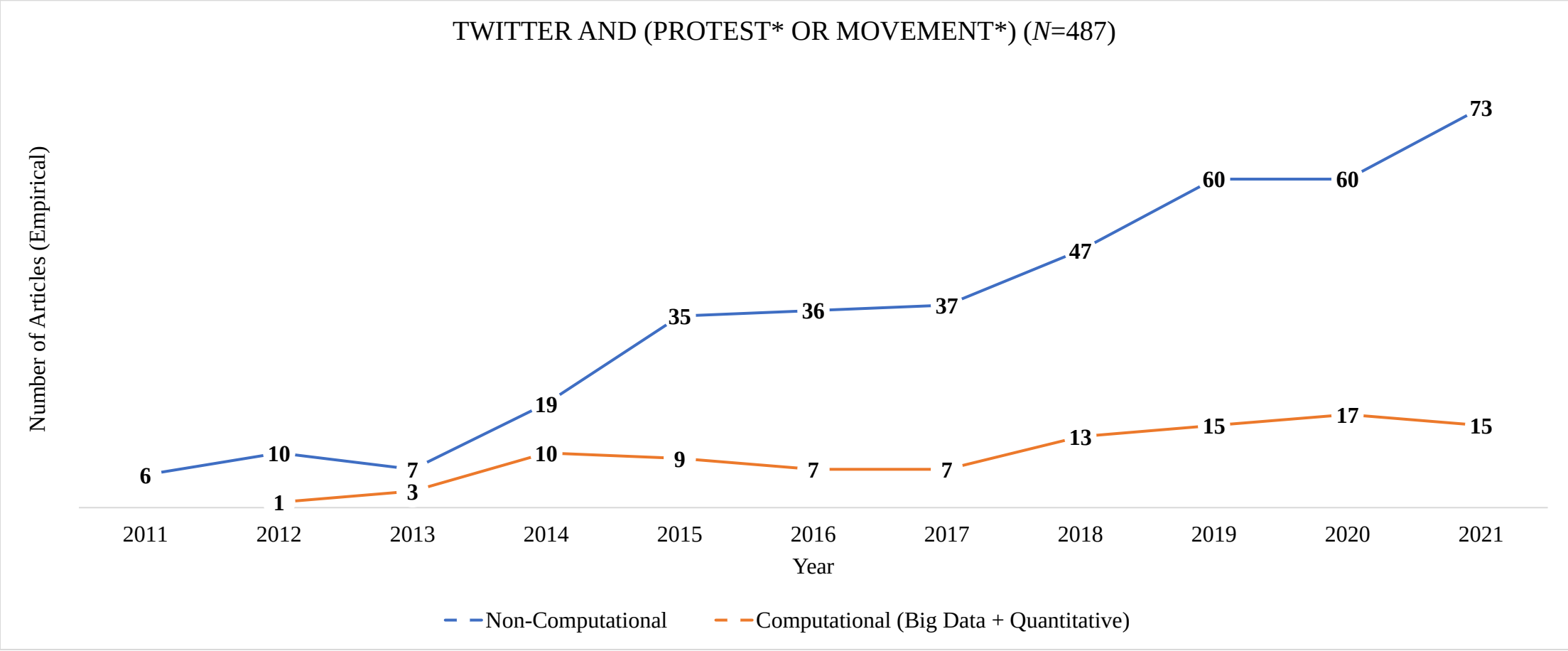

#TWITTERREVOLUTION

Facebook
#jan25
بوك ناس

WE
ARE
THE
99%

Alyssa Milano
@Alyssa_Milano
Following
If you've been sexually harassed or assaulted write 'me too' as a reply to this tweet.
Me too.
Suggested by a friend: "If all the women who have been sexually harassed or assaulted wrote 'Me too.' as a status, we might give people a sense of the magnitude of the problem."
1:21 PM - 15 Oct 2017
24,207 Retweets 52,619 Likes
67K 24K 53K

Computational OR NOT



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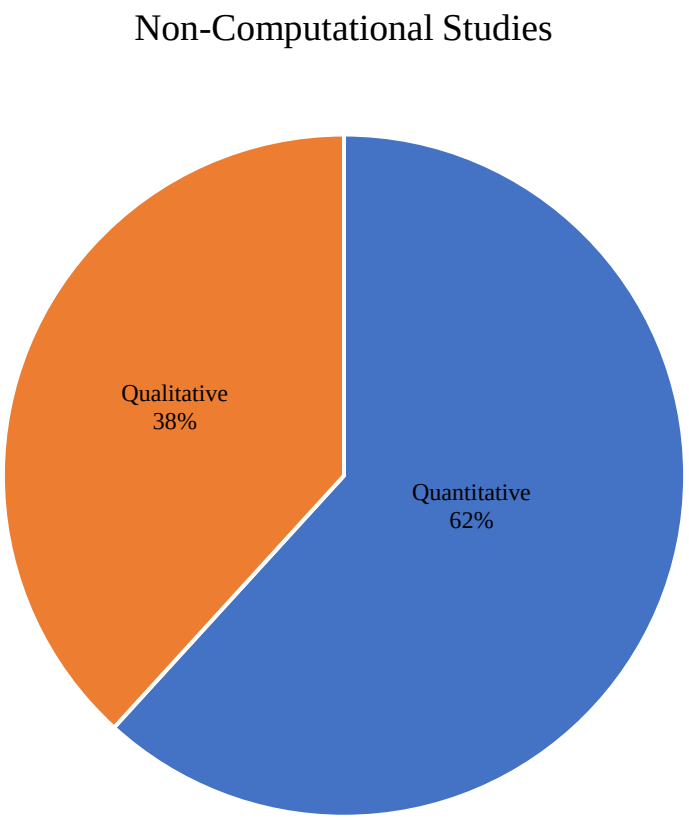
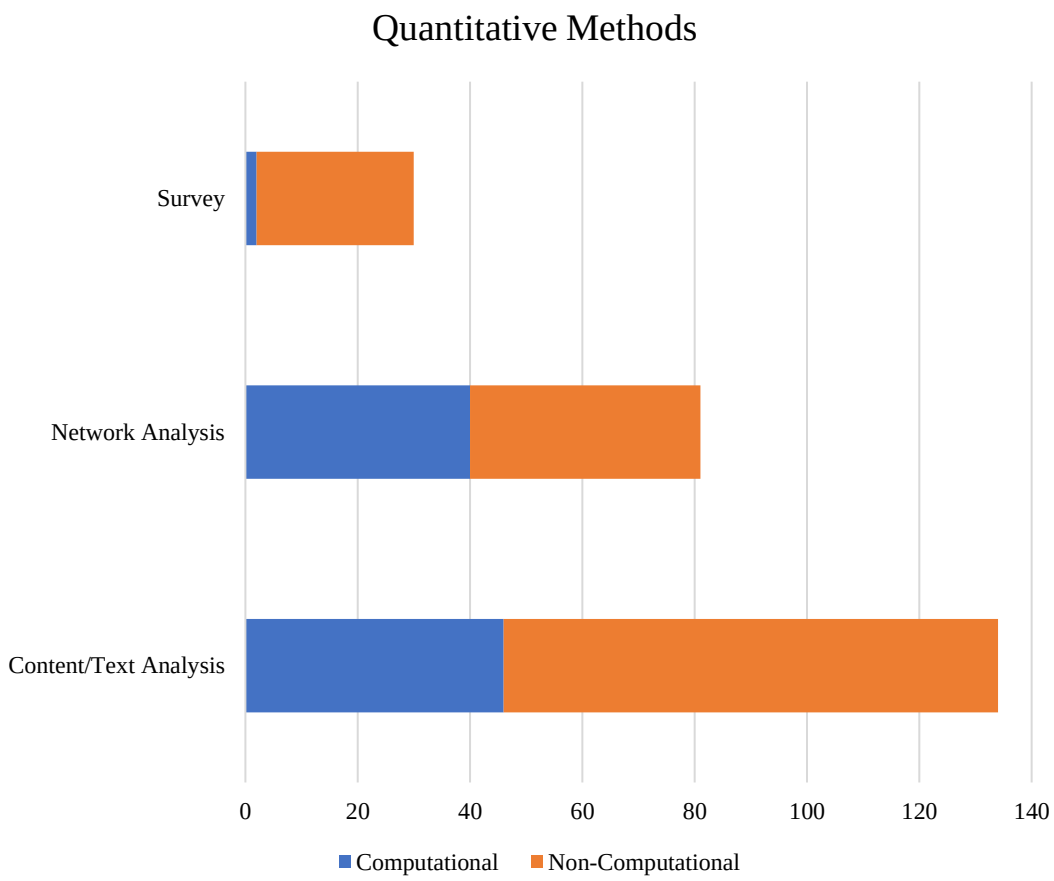
Computational OR NOT





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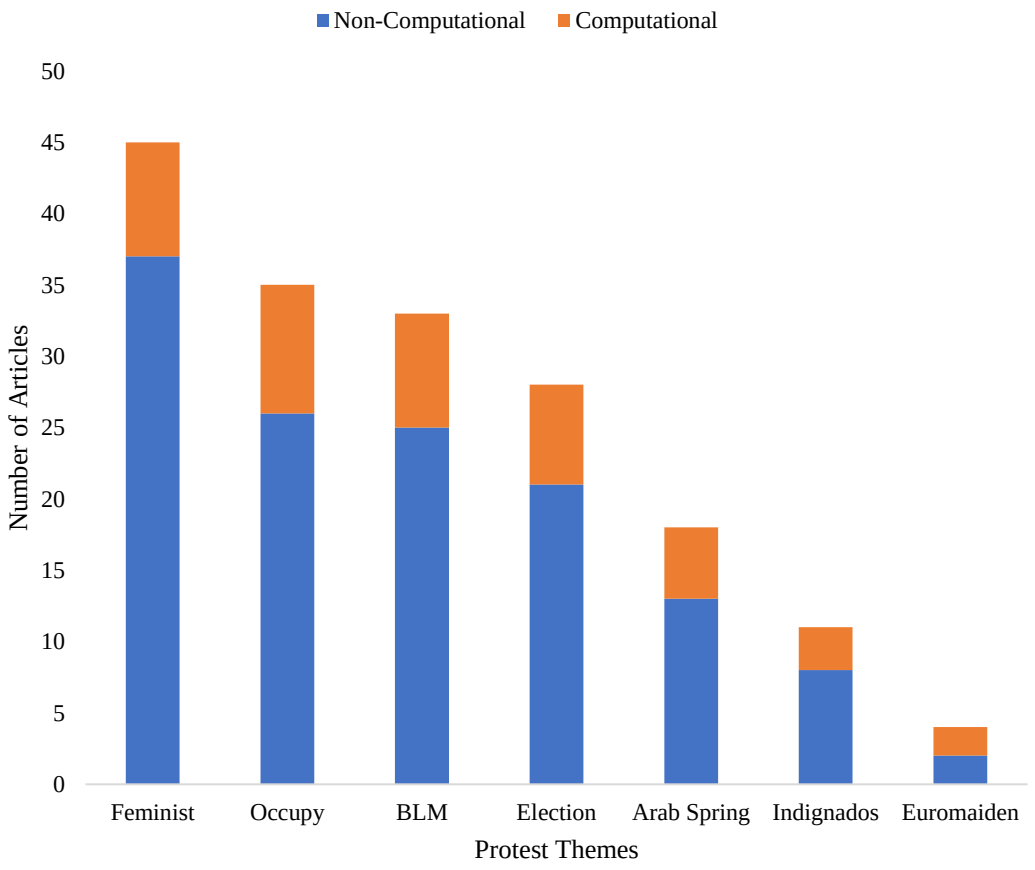
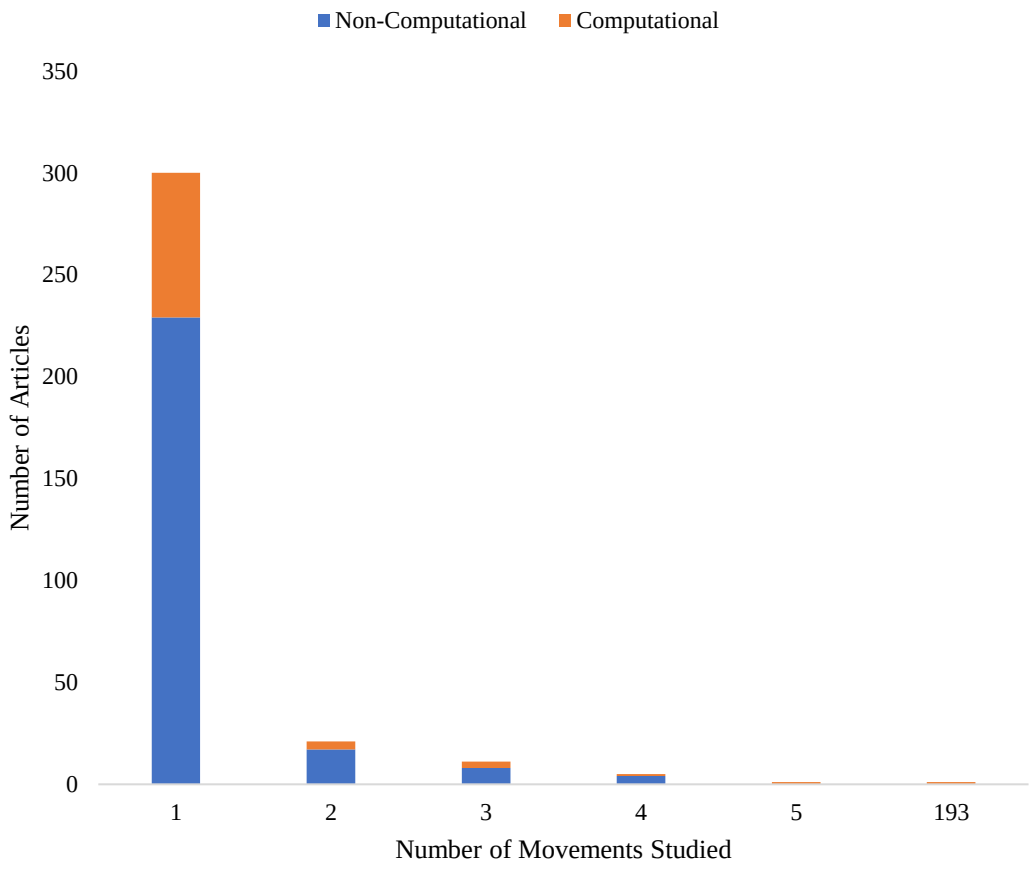
Empirical Limitations





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Knowns and Unknowns

- Collective action/ Social Movements
  - Mobilization (e.g., Jost et al., 2018)
    - Opportunities & resources (exchange info. /emotions/diffusion)
    - Network structures, e.g., core–periphery (Barbera et al., 2015; Steinert-Threlkeld, 2017)
  - Frame/framing
    - Collective action frames and collective identity (Gamson, 1989; 1993)
    - Semantic network, e.g., distributed framing (Ince et al., 2017), cascading activation (Aruguete & Calvo, 2018)
- Connective Action/ Networked Social Movements
  - Leaderless/decentralized/diffused
    - Lack of formal organizations or leaders (Castells, 2012)
    - Lack of stable opinion leaders (Liang & Lee, 2021)
  - Organization
    - Affect (especially, anger; Castells, 2012)
    - Personalized action frames (Bennett & Segerberg, 2013)
    - Attention competition (Liang & Lee, 2022)

A Systematic Archive

index	protest or movement/case	query	s_time	e_time	#tweets	scraping
260	2017 anti-Maduro protest	#16jensayoconstituyente, #banderaconstituyente, #bolivarprimerconstituyente, #constituyente!, #constituyente2017,	2017-06-01	2017-09-04	unknown	Done
303	US Occupy movement	#occupy, #occupyamsterdam, #occupyatlanta, #occupyaustin, #occupybaystreet, #occupyberlin, #occupyboston, ‡	2011-06-05	2012-07-31	16044303	Done
285	mobilization around two Russian elections	#5Dec, #6Dec, #10Dec, #24Dec, #4Feb, #4March, #5Mar, UnitedRussia, UnRu, ednorossy, Nashi, vote/voice, Nav	2011-11-17	2012-03-12	9552352	Done
239	#March for Our Lives activism	#NeverAgain, #MarchForOurLives	2018-02-14	2018-07-14	9395263	Done
275	campaign against the Dakota Access Pipeline (DAPL)	#DAPL, #NoDAPL	2016-07-27	2017-10-31	7166172	Done
268	Ayotzinapa protest	#Ayotzinapa, #Televisa, #EPNBringThemBack, #AyotzinapaSomosTodos, #TodosSomosAyotzinapa, #DemandoTul	2014-09-30	2014-12-31	7047654	Done
304	Women's March	#WomensMarch, #WhyIMarch, #NotMyPresident, #IMarchFor	2017-01-20	2017-01-27	6167351	Done
293	radical left movement	#rbnews, #Syntagma, #antireport, #svpol	2013-01-01	2015-12-31	5107469	Done
259	2016 US presidential election	#MakeAmericaGreatAgain, #MAGA, #TeamTrump, #TrumpTrain, #CrookedHillary, #Killary, #ImWithHer, #Strong	2016-11-08	2017-01-22	4860351	Done
292	Online white supremism after 311 Tsunami	Payback for Pearl Harbor, Pearl Harbor, Godzilla	2011-03-15	2014-05-03	3555760	Done
296	Supreme Court's legalization of same-sex marriage	gay marriage, gay marriages, same-sex marriage, same-sex marriages, same sex marriage, same sex marriages, san	2015-05-27	2015-08-24	3432782	Done
288	Oakland Occupy protest in 2011	#ows, #occupyseattle, #occupyoakland	2011-10-19	2011-12-31	3230965	Done
216	Fridays for Future	#fridaysforfu	2019-06-07	2020-05-29	2676078	Done
244	Boğaziçi University protests	#DevletiminYan ayım, kutsal dır, # eyiSav anFi törlerdenİşgalGirişimi, #AşağıBak	2020-01-01	2021-02-05	2375259	Done
101	online discussion on climate change and net neutrality	#ClimateChange NetNeutr	2015-11-11	2016-06-29	2309228	Done
147	Charlie Hebdo Protest	#CharlieHebdo, #JeSuisCharlie, #Beinfait, #JeSuisKouachi	2015-01-11	2015-02-11	2192873	Done
284	March for Our Lives	#MarchforOurLives	2018-03-23	2018-03-25	2146698	Done
94	Movement against the Transatlantic Trade and Investment Partners	#TTIP	2013-02-01	2015-12-31	1912191	Done
174	hashtag campaigns revolving around cases of femicide and physica	#sendeanlat, #SuleCetIcinAdalet, #AyşegülTerzininSesiOlalim, #FatmaŞengülİçinAdalet, #EmineBulut, #Melisa Sağla	2015-01-01	2019-12-31	1726289	Done
114	hashtag activism on the Wolf Pack case	#Cuéntalo, #HermanaYoSiTeCreo, #NoEstasSola y #YoSiTeCreo	2018-04-26	2018-08-30	1610841	Done
305	Women's movements	#yesallwomen, #heforshe, hobbylobby, #everydaysexism, #itsonus, #whyistayed, #banbossy, #notbuyingit, #wearel	2014-02-01	2015-05-10	1336545	Done
231	legalising abortion (LA) and eliminating violence against women (V	#abortolegal2020, #25N, #niunamenos	2020-11-01	2020-12-31	1289753	Done
118	RefugeesWelcome online campaign	#RefugeesWelcome	2015-09-01	2016-04-30	1274652	Done
41	Movember 2012	#Movember, #mobro, #mosista, Movember, Mobro, Mosista	2012-10-31	2012-12-01	1245024	Done
237	Sunrise.org and its autonomous public community	#greennewdeal, #Road2GND, #ClimateStrikeME	2019-06-01	2019-12-31	1204755	Done
62	hashtag activism after the 2014 Isla Vista killings	#YesAllWomen, #YesAllWhiteWomen	2014-05-23	2014-06-06	1197796	Done
228	Twitter sentiment toward feminism	feminist, feminism, women's rights, women's rightist, women's liberationist, women's libber, women's liberation,	2017-05-01	2017-06-30	1185195	Done
274	Brazilian Vinegar protests	#acordabrasil, #brazilianspring, #catraca_livre, #catracalivre, #changebrazil, #chupadilma, #contraoaumento, #muda	2013-06-13	2013-06-29	1139120	Done
221	American Descendants of Slavery	#ADOS	2019-02-01	2019-12-12	1080237	Done
300	The Statute of Liberty protest of Patricia Okoumou	#TheresePatriciaOkoumou, #StatueofLiberty, #FourthofJuly	2018-06-01	2020-07-31	1036628	Done
116	2015 Baltimore protest	#BaltimoreRiots, #BaltimoreUprising, #BaltimoreRiots #BaltimoreUprising	2015-04-26	2015-04-30	911092	Done
251	2009 Tehran post-election protests	#IranElection	2009-06-01	2009-06-30	886948	Done
55	2012 Canada student strike	#ggi	2012-04-22	2012-07-31	873327	Done
262	2018 Women's March	#WomensMarch2018, #WomensMarchNYC	2018-01-21	2018-01-23	862248	Done
146	online anti-vaccination movement	vaccination, vaccine, vaccines, vax, vaxine, vaxx	2015-02-01	2015-03-09	840260	Done
297	Tea Party Movement	#teaparty, Tea Party	2013-06-01	2013-08-31	782119	Done
286	movements after the 2012 Delhi rape	Rape India, Rape Delhi, Rape Nirbhaya, Rape Damini, Rape Delhigangrape, Rape Delhirape, Rape MumbaiGangRape	2013-01-16	2014-01-16	772663	Done
255	2012-2013 Nirbhaya movement	DELHI, gangrape, rape, #delhigangrape, #delhiprotest, #delhiprotests, #indiagate, #stopthsisshame&maxdate, #New	2012-12-17	2012-12-26	769210	Done

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Measuring Leaderlessness

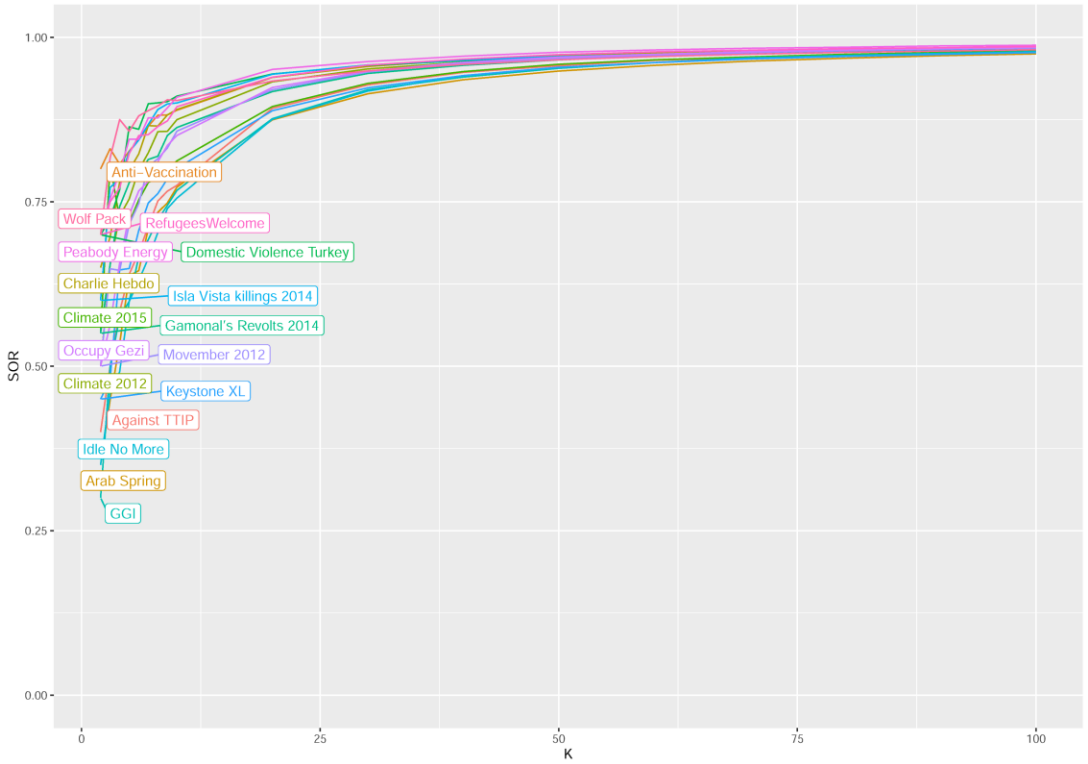
1) Consider the number of @-mentions (being mentioned, retweeted, or replied to) received by each participant in a protest movement as an indicator of that participant's influence.

2) Divide each protest movement dataset into *k* periods sequentially according to its activity (so that the number of tweets would be the same in each period), where *k* is a variable. Dividing into periods with equal time lengths will lead to some periods being extremely active, and the unequal distribution of influence depends on the number of tweets (Liang & Lee, 2022).

3) Select the top 1% (if 1% > 20, otherwise select the top $N = 20$) mentioned users as leaders in each period; based on our experiments, the beta diversity (see step 4) in *d* is not dependent on the selection of *N*.

4) Calculate the beta diversity (β), borrowed from the biology literature (Baselga & Orme, 2012), to quantify the overall diversity or the instability of leaders across periods. Beta diversity ranges from zero to one (zero means all leaders are the same; one means all leaders are different). Since the number of periods *k* is a variable, we calculate βs for *k* in [2:10, 20, 30, 40, 50, 60, 70, 80, 90, 100].

5) Beta diversity naturally increases with *k* ($k = 1$, $\beta = 0$; $k = +\infty$, $\beta = 1$) because larger divisions (i.e., with a smaller *k*) are associated with a higher likelihood of overlap and are thus less diverse. To solve this problem, we calculated different β values for different values of *k* and plot the curve as presented in **Figure 1 (upper)**. The curves (each curve represents one protest movement) follow exponential distribution in general. Therefore, we can use the area under the curve (AUC) to measure the overall leaderlessness of a given protest movement. This measure is independent of the selection of *k*.



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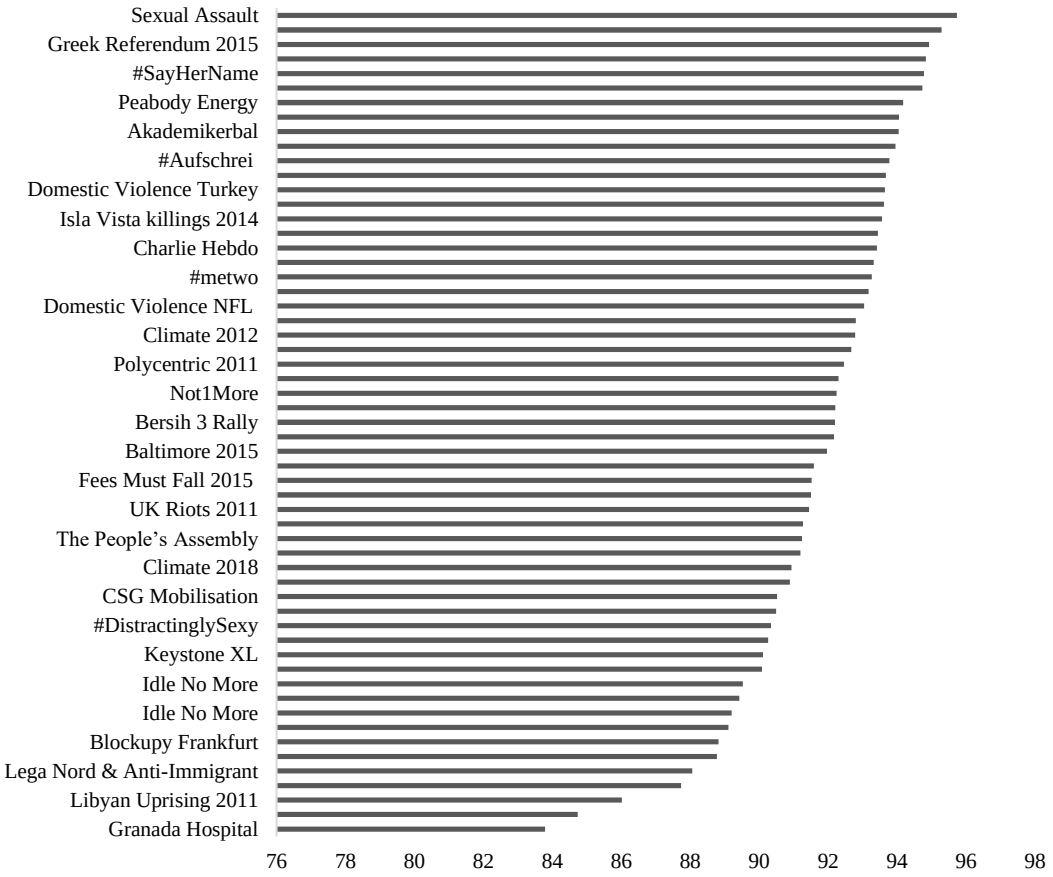
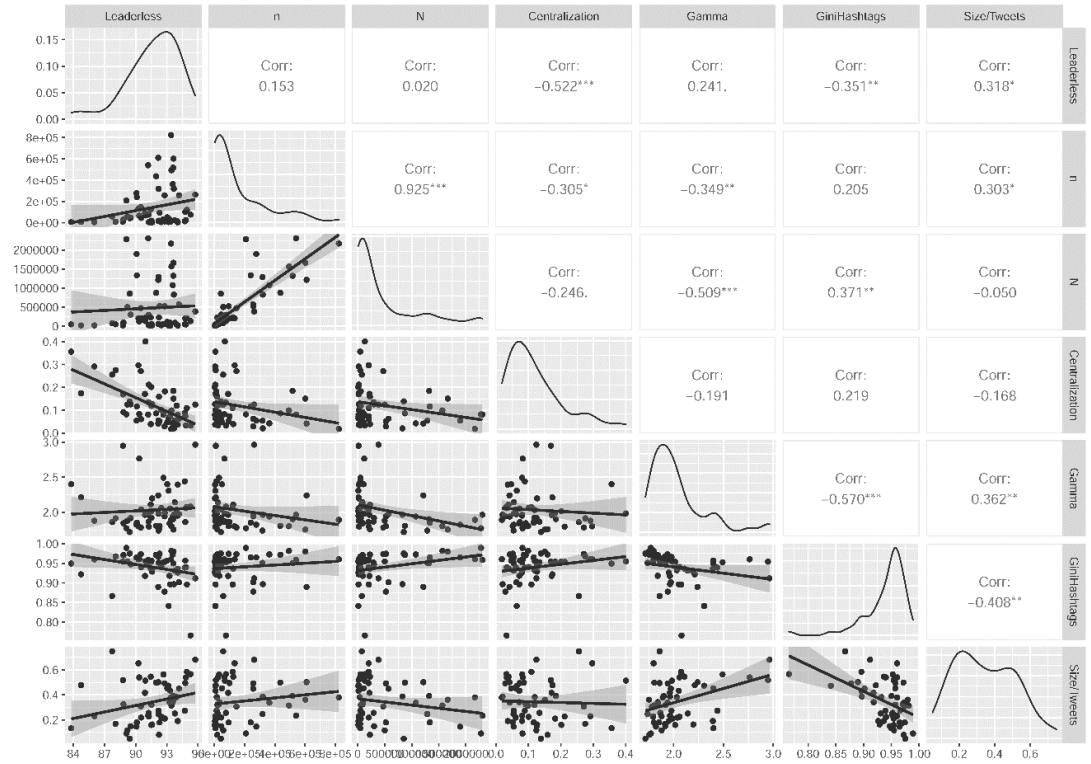
Measuring Leaderlessness





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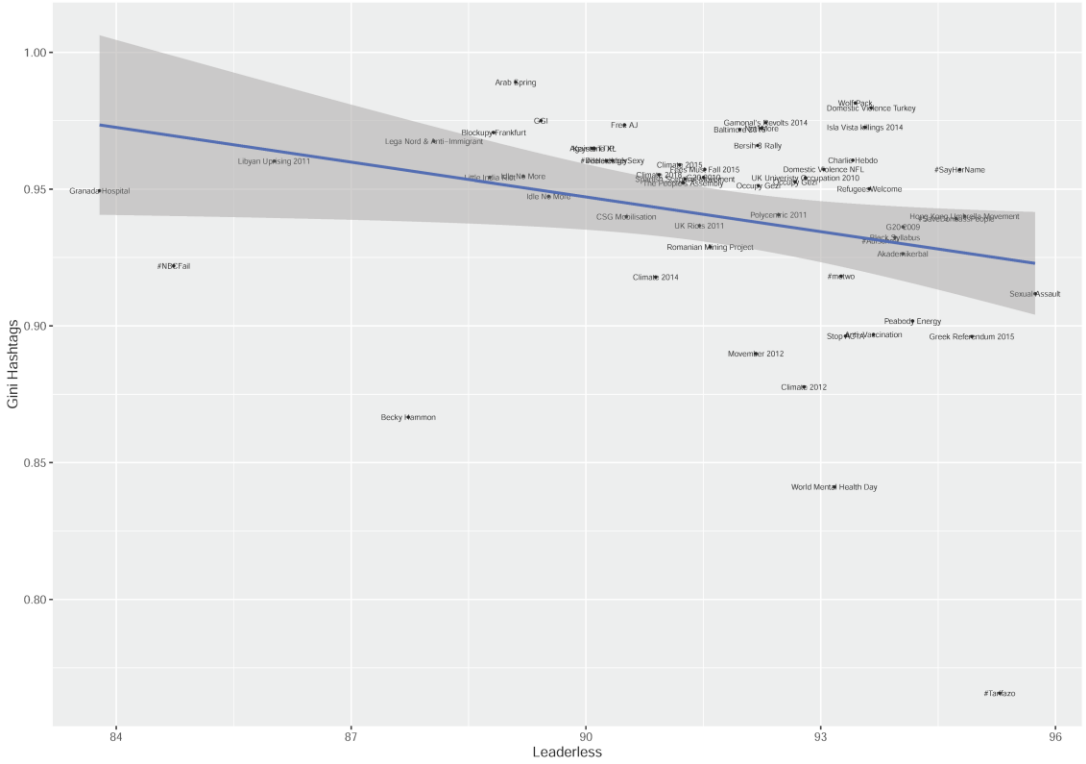
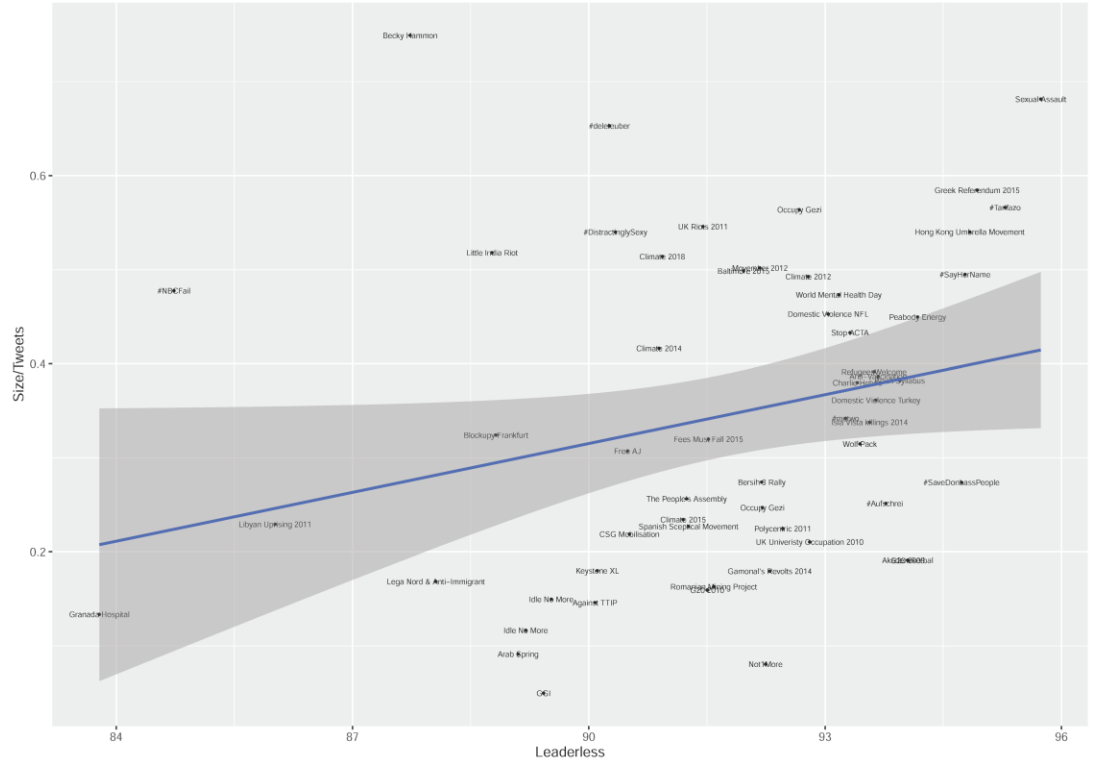
Leaderless Coordination & Mobilization





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Discussion

- To generalize social movement studies
  - Systematic archiving
  - Leaderless but organized (mobilization & coordination)?
    - - coordination
    - + mobilization
    - online vs offline
    - Under what conditions?
  - Role of social media?
    - What if there is no Twitter
    - Big (social media) data or computational methods
- Ongoing work