Supplementary Document for

Anti-intellectualism Amid the COVID-19 Pandemic:

The Dynamics of Anti-Fauci Speech on Twitter

Table S1. Most tweeted and retweeted hashtags

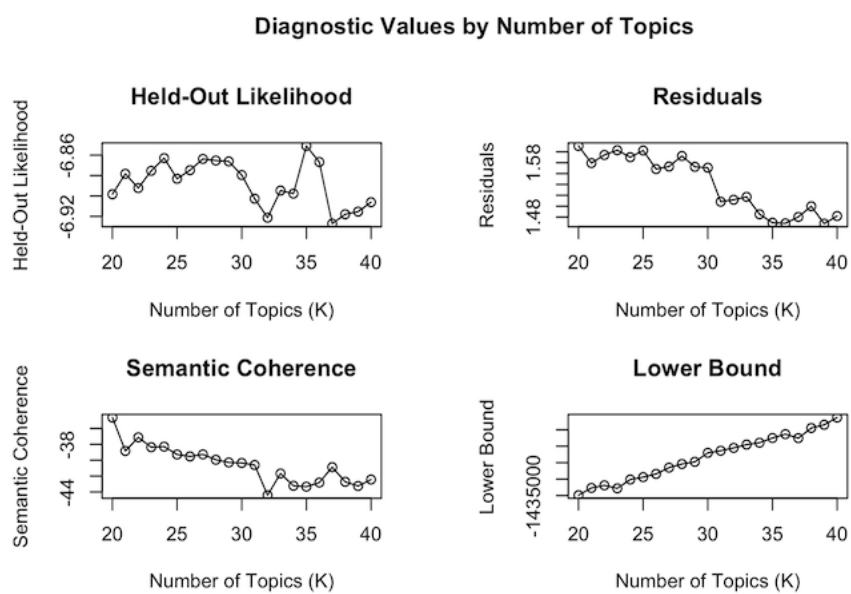| Time	Most tweeted and retweeted hashtags
2020	
Jan-Feb	fauci --no anti-fauci tweets
March-April	#firefauci, #faucifraud
May-June	#firefauci, #PlagueOfCorruption, #plagueofcorruption, corruption, #faucithefraud, #faucifraud, #billgates, #birx, #openeconomynow, #reopenamerica, #Wuhan
Sep-Oct	#firefauci, #faucifraud, #China, #maga, #arrestfauci
Nov-Dec	#firefauci
2021	
Jan-Feb	#firefauci, #maskoff, #maga
March-April	#firefauci, #warroompandemic, #oann
May-June	#firefauci,#fauciliedpeopledied,#truthbrigade,#faucileaks,#fauciemails, #fauciknew, #crimesagainsthumanity, #ccp,#wuhan, #oann
Sep	#firefauci, #bigpharma, #fauciliedmillionsdied,#wuhan,#wuhanlab,#dictatorbiden, #oann

Figure S1. Comparison of topic model parameters

Table S2. Structural Topic Modeling Results

Topic	Topic label	Most correlated words (FREX)	Topic proportion	Relevance
9	Fauci and Trump antagonism	thank, act, fire, call, paul, wrong, white, still, presid, rand	6.80%	a mix of relevant and irrelevant tweets
21	promoting shows	bordercrisi, buildthewal, bidenharri, crt, greatreset, bidenadministr, levin, dan, fox, maga	6.40%	irrelevant
2	fire Fauci advocacy	get, pleas, time, need, shut, rid, back, move, enough, let'	6.20%	delegitimization of motivation
1	covid conspiracy theory	plandem, arrestbillg, wakeupamerica, covidhoax, arrestbirx, scamdem, falseflag, billgatesvirus, qanon, obamag	6.00%	delegitimization of motivation
17	criticize Biden	want, believ, cure, lie, die, yet, doesnt, peopl, plan, hurt	5.90%	a mix of relevant and irrelevant tweets
6	covid conspiracy theory and anti-vaccine	judi, mikovit, pharma, read, bigpharma, investig, treatment, vaccin, expens, trial	5.80%	delegitimization of motivation
18	Pro-Fauci and the firefauci hashtag is trending	hashtag, trend, help, ask, start, tweet, think, your, side, post	5.00%	irrelevant
5	Fauci funded Wuhan lab	lab, wuhan, fund, research, institut, chines, virolog, bioweapon, knew, niaid	4.90%	delegitimization of motivation
8	Critisism to Fauci	thing, realli, look, just, pretti, won't, understand, count, buttar, sure	4.90%	people-scientist antagonism
3	Hidden agenda from Fauci	follow, account, well, man, mad, must, lose, hold, remov, discredit	4.80%	delegitimization of motivation
12	hydroxychloroquine effects and cure/hospital/death rates	rate, caus, patient, play, damag, year, death, hospit, number, mortal	4.70%	delegitimization of knowledge
19	anti-vaccine (Fauci/bill gates is corrupted)	make, money, stand, gate, bill, sens, give, friend, viral, nobodi	4.50%	delegitimization of motivation
10	Fauci is against human	crimesagainsthuman, faucig, run, shot, inform, faucili, arrest,	4.10%	people-scientist antagonism

		fauciliedpeopledi, video, check		
13	against mask mandates	wear, hampshir, massachusett, mandat, chris, face, distanc, placat, state', mask	3.90%	people-scientist antagonism
7	against local close down policies	dont, economi, second, lock, sweden, usa, wait, instead, immun, reach	3.80%	people-scientist antagonism
4	Fauci is for Democrats	truth, hes, globalist, speak, reopenamericanow, hillari, quack, clinton, isn't, sad	3.70%	delegitimization of motivation
15	Fauci is corrupted/ignored facts/caused damage	ignor, fact, posit, scienc, polit, base, vote, parti, author, complet	3.60%	a mix of delegitimization of motivation, knowledge, and people-scientist antagonism
16	Fauci email	drfauci, fauciemail, email, employe, feder, arrestfaucinow, ccp, commit, came, prove	3.60%	delegitimization of motivation
20	Fauci had ambiguous stance/controversial judgement	life, begin, save, didn't, much, far, monger, zero, sinc, zinc	3.50%	delegitimization of knowledge
14	support Trump and against Democrats and Fauci	makeamericagreatagain, spread", trumpwon, slow, flatten, curv, threaten, began, worst, histori	3.30%	irrelevant
11	against local shut down policies	end, endthef, shutdown, curfew, quarantin, lockdownend, war, lockdownrebellion, drshiva, reopenamerica	2.50%	people-scientist antagonism
22	Fauci is wrong in numbers and models	listen, say, come, now, behind, right, can, one, turn, will	2.10%	delegitimization of knowledge

Table S3. The instruction for data labeling to build supervised machine learning model

Label	Explanation	Example from data
1=Confrontation between people and scientists	1. Fauci (or/and scientists) caused problems and trouble to the common people.	1. Fauci did America a disservice by deceiving us & for being an antagonistic head wind against Trump.
	2. Fauci (or/and scientists) is evil AND people are good	2. As "Elites" profit from "pandemic" in very huge ways...rest of America suffers. No job, no food, no necessities for many households.
2= Question the motivation of Fauci	The motivations of Fauci (and other scientists) are problematic. Specifically, scientists are corrupted. They always have a hidden agenda, only maximizes their own commercial interests or political influence by utilizing their own knowledge	1. Fauci has a separate agenda. CDC needs to be reorganized. Industry members need to be purged from Board. CDC funding needs to be TOTALLY INDEPENDENT. DITTO FDA, NIH.
		2. Fauci a deep state pawn was the one who told us and @realDonaldTrump back in January and Feb 29 that COVID posed little to no risk to Americans. Now he's blaming Trump for his horribly wrong call.
3=Question the knowledge of Fauci	Fauci (and other scientists) does not have the true knowledge about Covid-19. Specifically, the models, data, research are wrong or not enough to guide the real-life situation.	1. OMG! Feckless Clown Dr. Fauci NOW SAYS Staying Closed Too Long Could Cause "Irreparable Damage" -- AFTER USING JUNK MODEL TO DESTROY ECONOMY!
		2. The real data is drastically lower than all of Fauci's speculations and models.
4 = Support Fauci	This category includes tweets that support Fauci (and other scientists).	1. The #MAGA cult wants to #FireFauci. I trusted Fauci more than those morons.
5 = None of the above	Often just tweets promoting videos that cover a mix of topics, show no opinion about Fauci, or tweets that attack Democratic political elites.	1. My New Video Premieres at 1145pm et. Its only 15m long so dont be late.#firefauci
		2. Watch this video #firefauci
		3. The #firefauci hashtag was trending

Figure S2. Task preview of Amazon Mechanical Turks.

Note: We tested and improved the design of HIT task. We randomly sampled 300 tweets for MTurkers to code, calculated inter-MTurker agreement rate, and improved the design of HIT task. We selected a version that reached 96% inter-MTurker agreement.

Table S4 The proportion of each type of discursive elements in the labeled data.

Discursive elements	Proportion
People-scientist antagonism	27% (n=756)
Delegitimize the motivation of scientists	46% (n=1,288)
Delegitimize the knowledge of scientists	12% (n=331)
Support Fauci	4% (n=120)
None of the above	11% (n=302)

Notes. Since the pro-Fauci tweets represented for a small proportion of all tweets, we merged them into tweets that belong to the "None of the above" category. We then split 70% of the data as a training set and the remaining 30% as a testing set. Due to the unbalanced data in each class, we used downsampling, which means we reduced the sample of the major category (i.e., questioning the motivation of Fauci) in training data.

Table S5. Coding internal sources of Twitter accounts

Actor type	Definition and Criteria
Politicians	People who are known for their relationship with the government, including those who have or run for a seat in the government. To identify politicians, look for individual accounts that have "representative", "senator", "governor", "mayor", "running for" or "candidate" in the profile description or include "Rep." in the Twitter name.
Non-institutionalized masses	(1) Individual Twitter users who are not politicians; (2) Organizational accounts that conduct advocacy work, including policy advocacy, coalition building, media advocacy, and mobilization. Look for organizational accounts that mentioned "grassroot" in the profile description.
News media	Organizations that mainly produce news to the public, including mainstream media, alternative media, online news websites, or news blogs. If an account belongs to a person who works in a news media (e.g., journalists, TV anchor), this account should be counted as individuals. Look for organizational accounts that mentioned "news" in the profile description.
Other	Organizational accounts that are not news or grassroot advocacy organizations

Notes. To identify the type of account, we applied automatic coding, mixed with manual validation based on keywords mentioned in the account's profile description. We examined Twitter accounts that post anti-Fauci tweets. We used an R package *rtweet* to scrape the Twitter metadata (e.g., the profile description, account established time, the number of friends and followers) of each account from Twitter public API. To assist the automatic coding, we also referred to a variable that was estimated by Brandwatch. This variable indicates whether an account is managed by an individual person or an organization, based on Twitter profile data. Ultimately, a non-expert account that mentioned "representative", "senator", "governor", "mayor", "running for" or "candidate" in the profile description or included "Rep." in the account name were coded as politicians. The rest of the individual accounts were coded as "individual". Any organizational accounts that mentioned "grassroot" or mentioned their major mission as conducting advocacy works were coded as non-expert citizens too. Any organizational accounts that mentioned "news" were coded as news media. The remaining organizations were coded as "other".

Figure S3A: Important Features for predicting tweets emphasizing people-science antagonism.
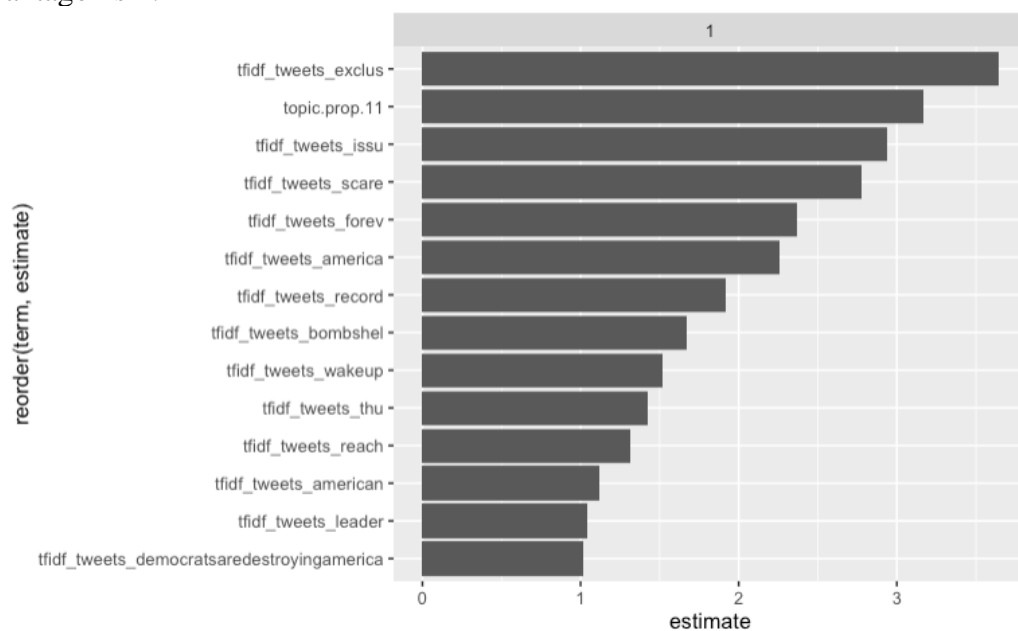

Figure S3B: Important Features for predicting tweets delegitimizing the motivation of scientists.
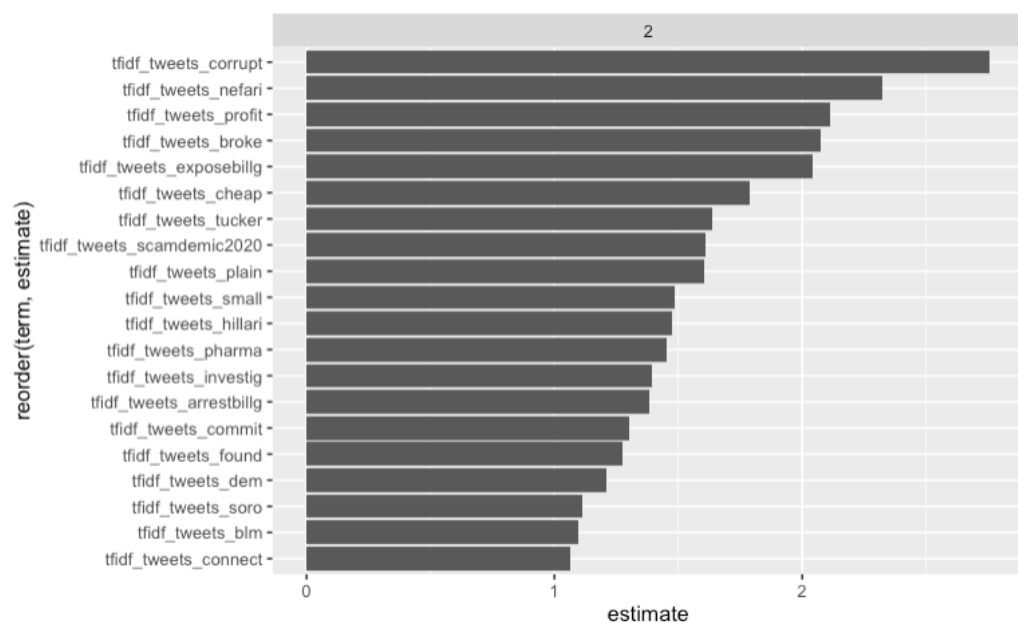
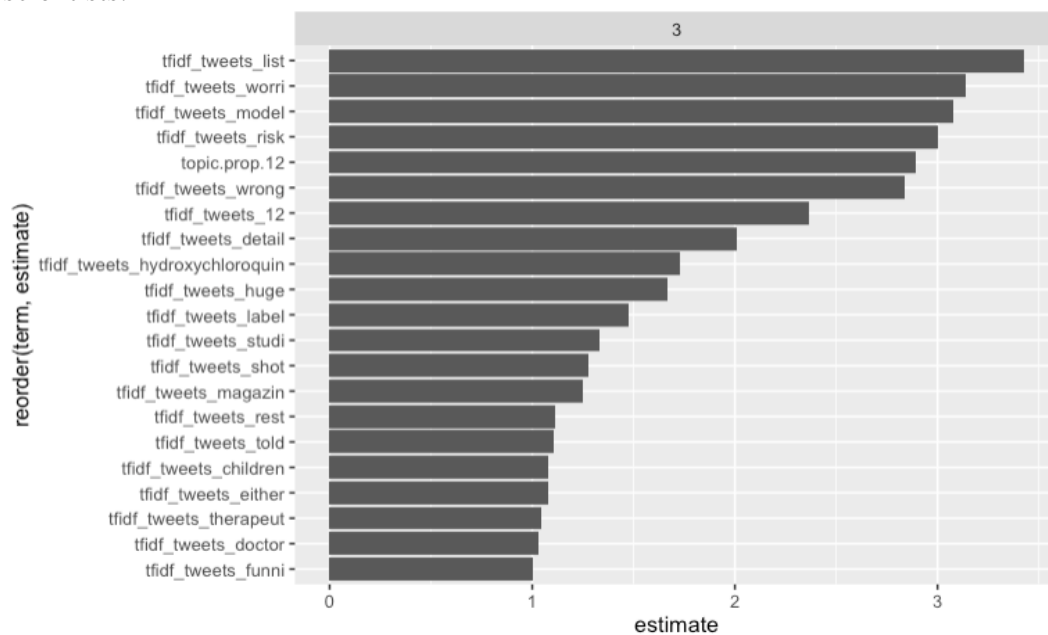Figure S3C: Important Features for predicting tweets delegitimizing the knowledge of scientists.
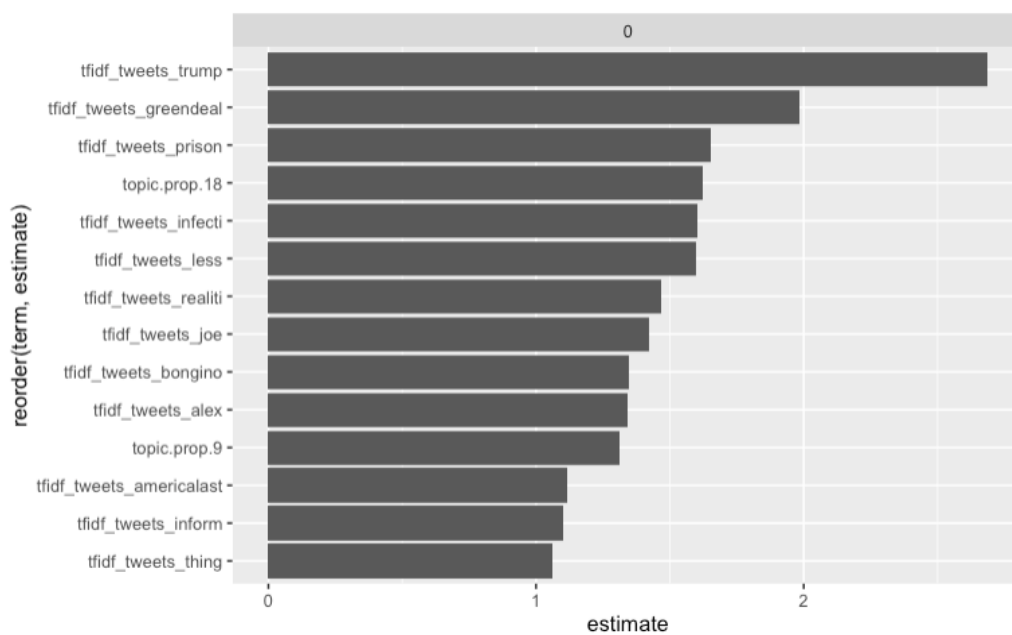

Figure S3D: Important Features for predicting other types of tweets.

Notes. The numbers in the x-axis are the coefficients from the GLM model.

Table S6. News media accounts on Twitter

News media Twitter handle	Ideological bias	Sour credibility	Brief introduction
The College Fix	right	medium credibility	conservative news media
The Colorado Herald	far right	questionable credibility	conspiracy website
Washington Examiner	right	medium credibility	conservative news media
The Jewish Voice	NA	NA	conservative weekly newspaper
TruNews	far right	low credibility	Christian conservative news, conspiracy-pseudoscience source
The Western Journal	far right	questionable credibility	conservative news website
El American	NA	NA	alternative news media for Hispanics in the US
FOX Baltimore	right-center	high credibility	WBFF, virtual channel 45, is a dual Fox/MyNetworkTV-affiliated television station
SportsNewsTN	NA	NA	sports news in Tennessee

Notes. The source of information for ideology bias, credibility, and brief introduction is https://mediabiasfactcheck.com and the website of the domain. NA means the website does not provide any evaluation in ideological bias or source credibility.

Table S7. Analysis of domain names (most frequently appeared domains)

Most appeared domain names	Frequency	Ideological bias	Credibility	Brief introduction
youtube.com	594	NA	NA	social media
thegatewaypundit.com	199	far right	questionable credibility	alternative media
foxnews.com	64	right	medium/high credibility	mainstream news media
breitbart.com	61	far right	questionable credibility	alternative media
nypost.com	48	right center	medium credibility	tabloid newspaper
pscp.tv	34	NA	NA	Twitter tool for live streaming. Soon to become non-operational.
truepundit.com	34	far right	questionable credibility	conspiracy/pseudoscience source
banned.video	25	far right	questionable credibility	conspiracy/pseudoscience source (no Twitter Accounts)
facebook.com	24	NA	NA	social media
zerohedge.com	23	right	questionable credibility	conspiracy/pseudoscience source
childrenshealthdefense.org	22	NA	questionable credibility	anti-vaccine advocacy organization
justthenews.com	21	far right	questionable credibility	alternative media
dailymail.co.uk	21	right	questionable credibility	tabloid newspaper
newsweek.com	20	left center	high credibility	mainstream media
nationalfile.com	20	far right	questionable credibility	conspiracy/pseudoscience source

Notes. The source of information for ideology bias, credibility, and brief introduction is https://mediabiasfactcheck.com and the website of the domain. NA means the website does not provide any evaluation in ideological bias or source credibility.

Table S8. Analysis of domain names (most retweeted domains)

Most retweeted domain names	Retweets	Ideological bias	Credibility	Brief introduction
forbes.com	9475	right-center	high credibility	mainstream news media
thenationalpulse.com	3556	far right	questionable credibility	alternative media
msn.com	3255	left center	high credibility	mainstream media/Web portal
youtube.com	3160	NA	NA	social media
washingtontimes.com	2448	right-center	questionable credibility	Conservative media
nytimes.com	2213	left center	high credibility	mainstream news media
today.com	1582	left center	high credibility	mainstream news media
judicialwatch.org	1530	extreme right	questionable credibility	American conservative activist group
technologyreview.com	1410	NA	high credibility	pro-science source
reddit.com	1282	NA	NA	social media
fiercepharma.com	1231	NA	NA	pharmaceutical industry news websites
banned.video	1114	far right	questionable credibility	conspiracy/pseudoscience source (no Twitter Accounts)
washingtonexaminer.com	1063	right	medium credibility	alternative media
foxnews.com	1050	right	medium/high credibility	mainstream news media
oann.com	988	extreme right	questionable credibility	alternative media

Notes. The source of information for ideology bias, credibility, and brief introduction is https://mediabiasfactcheck.com and the website of the domain. NA means the website does not provide any evaluation in ideological bias or source credibility.