

“Is it a Qoincidence?”: A First Step Towards Understanding and Characterizing the QAnon Movement on Voat.co

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Abstract

Conspiracy theories, and suspicion in general, define us as human beings. Our suspicion and tendency to create conspiracy theories have always been with the human race, powered by our evolutionary drive to survive. Although this evolutionary drive to survive is helpful, it can often become extreme and lead to “apophenia.” Apophenia refers to the notion of connecting previously unconnected ideas and theories. Unlike learning, apophenia refers to a cognitive, paranoid disorder due to the unreality of the connections they make.

Social networks allow people to connect in many ways. Besides communicating with a distant family member and sharing funny memes with friends, people also use social networks to share their paranoid, unrealistic ideas that may cause panic, harm democracies, and gather other unsuspecting followers. In this work, we focus on characterizing the QAnon movement on Voat.co. QAnon is a conspiracy theory that supports the idea that powerful politicians, aristocrats, and celebrities are closely engaged in a pedophile ring. At the same time, many governments are controlled by the “puppet masters” where the democratically elected officials serve as a fake showroom of democracy. Voat, a 5-year-old news aggregator, captured the interest of many journalists because of the often hateful content its users’ post. Hence, we collect data from seventeen QAnon related subverses to characterize the narrative around QAnon, detect the most prominent topics of discussion, and showcase how the different topics and terms used in QAnon related subverses are interconnected.

1 Introduction

The dictionary defines the term “conspiracy theory” as a theory that credits a secret organization, or a group of people for an event while rejecting the standard explanation given by officials [13]. Also, conspiracy theories can be the belief and idea that many important political events or economic and social trends are the products of deceptive plots that are mostly unknown to the general public. Some examples of such conspiracy theories surround many events like the disappearance of Malaysia Airlines Flight MH370 that supposedly was taken over hackers that piloted it to Antarctica [34]. Other, most

recent conspiracy theories target democracies and presidential candidates. Specifically, pizzagate, a conspiracy theory that surfaced during the 2016 US presidential elections, supposedly involves the presidential candidate Clinton in worldwide pedophile rings [28]. Even though fake, such stories can trigger voters question the morals of the person they elect.

Hence, conspiracy theories can potentially impose significant threats to democracies. A closely related conspiracy theory to the one of pizzagate, is QAnon. QAnon is a conspiracy theory that originates on 4chan’s Politically Incorrect board. This conspiracy theory was started by a user with the nickname “Q,” after posting numerous threads where he claims to be in US government official personnel with a top-secret clearance. This user explains to the audience of the Politically Incorrect board that pizzagate is real and that many celebrities, aristocrats, and elected politicians are included in this pedophile ring. He also claims that the president of the US, Donald Trump, works against this cabal trying to bring it down and arrest all of the people involved. Alarmingly, this conspiracy theory incorporates many conspiracy theories together, making it into a boldly defined, super conspiracy theory. QAnon followers also believe that many world happenings, including COVID-19, the pandemic started in Wuhan, China, is only a plan of the “puppet masters” which include the co-founder of Microsoft Corporation, Bill Gates.

Zuckerman [56] explains that the Qanon movement supporters create a vast amount of material across various platforms that eventually becomes viral. For example, a book drafted by Qanon followers, titled “QAnon: An Invitation to a Great Awakening” [54] rank second among the top Amazon best selling books [22]. To this end, we aim to collect data related to QAnon towards characterizing the narratives around this term. After Reddit banned many popular QAnon related subreddits [42, 36] in September 2018, we turn our attention to Voat.co. Voat is a news aggregator, similarly structured to Reddit, where users can subscribe to different channels of interest (subverses). Newcomers are not allowed to post new submissions in subverses, but they can upvote or downvote the submissions and comments they see. They are also able to comment on existing submissions. Once users manage to get a total of ten upvotes, they can create their own submission in any subverse by posting a link or discussion topic.

Although Voat is quite young, it has a troubling history. Specifically, the founders of the website vigorously promote freedom of expression. Barely a year after its creation, HostEurope.de cancels Voat’s contract because of the content the website features [2]. Only days following the contract cancellation by HostEurope, PayPal freezes the site’s account for the same reason [8]. Alarming, the founders of the site posted on Voat explaining that they will do anything possible to keep their services up, to enable their users to speak freely.

The next event that brought Voat back into the spotlight was when Reddit banned various hateful subreddits like */r/CoonTown*, and */r/fatpeoplehate* [45, 43]. Many journalists and following research explain that a large number of users that were closely engaged with these hateful Reddit communities migrate to Voat [31, 1, 7]. Based on all the above, we search Voat to find all the QAnon related subverses and try to answer the following research questions:

- RQ1: Do users migrate to Voat after Reddit bans QAnon related subreddits?
- RQ2: Is the narrative on QAnon movement hateful?
- RQ3: Which words best describe the QAnon movement?

Paper Organization. The rest of the paper is organized as follows. First, we provide a detailed explanation of the origins of QAnon and how Voat works in Section 2. Then, we discuss our data collection infrastructure and provide an overview of our dataset in Section 3. We then provide a statistical characterization of the data we collect (Section 4), and we deploy topic modeling techniques, named entity recognition, and word embeddings to analyze the content of our dataset in Section 5. Then, we review related work on QAnon and Voat in Section 6, before concluding in Section 7.

2 Background

In this section, we discuss the history, origins, and beliefs of the QAnon movement. Also, we provide a high-level explanation of the main functionalities and features of Voat.

2.1 What is QAnon?

QAnon refers to an anonymous user, that goes with the nickname “Q”. On October 28, 2017, Q posted a new thread with the title “Calm before the Storm” on 4chan’s Politically Incorrect board. On that thread and many subsequent cryptic posts, Q claimed to be a government insider with top security clearance. Presumably, that user got his hands on documents related to, among others, the struggle over power involving Donald Trump, Robert Mueller, the “deep state”, and Clinton’s pedophile rings [53]. The so-called deep state is believed to be a secret network of powerful and influential people, like politicians, military officials, and others, that penetrated governmental entities, intelligence agencies, and other official entities. Supposedly, the deep state controls state policy and democracies behind the scenes, while the officials elected via democratic means are merely puppets.

Q claims war against the so-called deep state in service to the 45th president of the United States: Donald Trump [44].

Since then, Q has continued to drop “breadcrumbs” on 4chan and 8chan, fostering a community, named after the nickname of the anonymous user: “QAnon”. The community is devoted towards decoding the cryptic messages of Q to figure out the real truth of the evil intentions of the deep state, aristocracy’s pedophile rings, and praise the noble war of their president, who supposedly is after that evil global cabal.

Although this movement did not use to be very popular and was a fringe belief held by a small group [53], it managed to extend to a greater audience, via mainstream social networks like Reddit and Twitter. We set to explain the reasons for the importance of studying and understanding QAnon.

Many studies and news press outlets explain the dangers and threats conspiracy theories pose to democracies and the general public. Specifically, Douglas and Sutton [14] explain how the conspiracy theory surrounding the global warming phenomenon potentially threatens the whole world. The authors note that the uncertainty, fear, and denial of climate change, causes people to seek other explanations. Alarming, climate change conspiracy theories can be harmful as people who believe them often deny to take environmentally friendly initiatives. Therefore, governments and many environmental organizations face significant challenges towards convincing people to take action against global warming.

More precisely, Sternisko et al. [51] and Schabes [48] argue that conspiracy theories, including QAnon, are extremely dangerous for democracies. This claim is why government officials and media often get involved in starting or promoting such conspiracy theories to benefit their political agendas and interests. On this note, we refer to Pam Patterson: a councilwoman who publicly asked God to bless her city, country, and QAnon during her farewell address [49]. Alarming, at a rally for Donald Trump, the person that introduced Mr Trump used the QAnon motto “where we go one, we go all” to conclude his speech [25]. Cases like the ones above are perfect examples of government officials promoting conspiracy theories to benefit their political agendas and gain the trust of conspiracy theorists. Upon the 2020 U.S. Presidential Elections, the FBI describes the QAnon movement as a domestic terror threat [25], and its followers as “domestic extremists”.

Mainstream social networks like Reddit and Twitter are trying to ban any QAnon related group or conversation. Specifically, Reddit banned numerous subreddits devoted to QAnon discussion [11, 36, 33]. Similarly, Twitter put restrictions on 150K user accounts and suspended over 7K others that promoted this conspiracy theory. Twitter also reported that they would stop recommending content linked to QAnon [4, 35]. We strongly believe that there is a pressing need to investigate this movement, and hence the community that emerged on Voat. Specifically, in this study, we aim to understand and characterize the discourse around the QAnon movement.

2.2 Voat.co

Voat.co is a news aggregator founded in April 2014, initially under the name “WhoaVerse”. The platform was renamed to “Voat” in December 2014. The website was a hobby project of Atif Colo, who used to be a student pursuing a BSc, then. Ar-

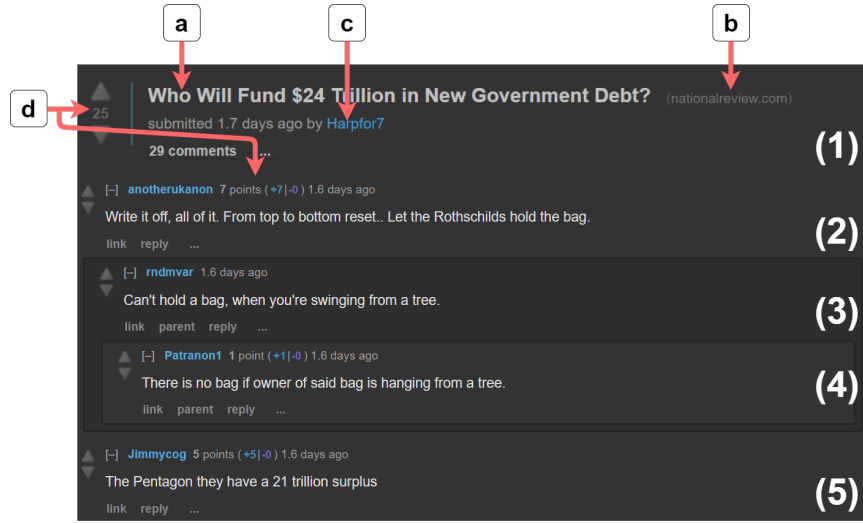


Figure 1: Example of a typical Voat submission.

eas of interest called “subverses” organize posts on Voat. Users can create subverses upon request, hence the exact number of the total subverses on Voat is undefined. When a user registers a new subverse, they become the *owner* of the subverse. The owner of a subverse can delete the subverse, and nominate moderators and co-owners, which can delete comments and submissions in the subverse. Notably, Voat limits the number of subverses a user may own or moderate, to prevent a single user from gaining outsized influence.

Users can register on Voat using a username, a password, and an email (optional). In case the user does not provide an email for their account, password reset functionality is not possible. Once a user is registered, they can subscribe to subverses of interest, see, vote, and comment on submissions, but is ineligible to post new submissions at this stage. The name users on Voat use to refer to a registered user is “goat”.

Figure 1 depicts an example of a Voat Submission: (1) shows the submission, (2) and (5) are comments made under the submission, and (3) and (4) are child and grandchild of comment (2), respectively. A user can create a new submission by posting a title and a description or sharing a link and a description. In case the user shared a link, the title of the submission (see “a” in Figure 1) becomes a hyperlink to the source website. The source website also appears next to the title of the submission (see b in figure), along with the username of the user that posted the submission (see c in figure). Note that some subverses allow users to post anonymously.

Other users can then comment on the submission (comment 2 and 5 in Figure 1), or comment on comments of other users (comments 3 and 4). Also, users can “upvote” or “downvote” the submission (d in figure) or the comments of other users. Submissions and comments may have a negative vote rating based on the votes they receive from users.

A user becomes eligible for posting new submissions, only if their *Comment Contribution Points* (CCP) is equal or greater than ten. When a user comments on submission, or a comment, other users can upvote or downvote her comment. The upvotes a user receives, are added towards her CCP, while the

downvotes are subtracted. Note that users lose their eligibility to post new submissions once their CCP falls under ten.

Many online press outlets have declared Voat as a Reddit clone [2]. In reality, Voat combines features from many online social networks. One of the features that stands out is the *em-pemerality* of its content, similar to 4chan. Each subverse has a limit of 500 active submissions at a time: up to 25 submissions in 20 pages (page 0 to page 19). When a user creates a new submission on Voat, that submission appears first on page 0: the home page of the subverse. At the same time, the submission at the end of page 19, usually the one with the least recent comment, disappears. The disappeared submission is still findable, only if one knows its direct link, but it is archived and new comments cannot be posted. Notably, when a submission gets a new comment, it bumped to the top of page 0, no matter when the submission was originally posted. Papasavva et al. [37] explain that ephemerality on 4chan is achieved with the use of a “bumping system”: when a thread gets more than 300 posts, it stops bumping and eventually drops off the end of the active threads. Alas, it is not clear when submissions on Voat stop being bumped when they get new comments.

3 Data Collection

We now discuss the methodology we follow to detect Voat subverses related to the QAnon movement, and how we collect the submissions and the comments of these subverses.

Based on related studies and articles from online press outlets [18, 38, 45, 42], we notice that the overwhelming majority of banned subreddits reemerge on Voat. Thus, we use these sources [11, 36, 33] and search Voat for subverses with similar names. We identify seventeen different subverses, listed in Table 1, devoted to QAnon related discussion.

We start crawling the QAnon related subverses on May 28, 2020, using Voat’s JSON API.¹ Since Voat lacks an archive for the submissions that fall out of the 20 pages limit, we devise

¹<https://api.voat.co/swagger/index.html>

Subverse	Submissions	Comments
/v/QAnon	211	620
/v/QanonMemes	387	457
/v/QRVoat	154	326
/v/QProofs	16	25
/v/BiblicalQ	215	1,459
/v/FactCheckQanons	114	180
/v/Quoincidence	38	91
/v/Awakening	357	863
/v/QAwakening	35	45
/v/GreatAwakening	4,328	54,211
/v/QProofs	74	171
/v/TheGreatAwakening	612	2,950
/v/GreatAwakeningMeta	50	910
/v/PatriotsAwoken	59	94
/v/PatriotsSoapbox	334	1,712
/v/Spud4ever	13	31
/v/CalmBeforeTheStorm	501	5,058
Total	7,498	69,203

Table 1: Number of submissions and comments in the dataset.

the following methodology to collect all the submissions’ comments. Our crawler requests from Voat’s API the submissions of page 0, up to page 19, for each subverse. The unique submission ID of each submission of every page, along with all the submission’s metadata are stored in a PostgreSQL database.² Once the list of subverses has been exhausted by our crawler, we request Voat’s API for each submission’s comments using the unique submission ID we obtained previously.

We note that Voat’s API only returns up to 25 comments at a time for a given submission: a segment of comments. To collect all the comment segments, we use the tags “StartingIndex” and “EndingIndex” included in Voat’s API response. These values help us understand whether there is more than one index of comment segments we need to request from Voat’s API. Also, we consider that comments on Voat may reach many depth levels since Voat allows users to directly reply to a comment, creating a comment tree hierarchy, identical to Reddit. To ensure that we collect all comments across all the depth levels, our crawler requests the child comments of every comment returned by the Voat API in the first request. Then, we repeat the same request for every child comment, in a nested loop manner. Once all the depth levels of comments have been exhausted, our crawler requests for the next segment of comments and repeats the same approach for every comment segment until each one of the comments already collected has been checked for the existence of child comments.

When all the comments for all the submissions of each subverse have been collected, our crawler will start from the beginning, requesting Voat API for the submissions of every page of each subverse. In case a submission does not already exist in our database, we mark it for comment collection. On the other hand, if the submission exists in our database, we compare whether the comment count of the submission we already have is the same as the one returned by the API. If the com-

ment count is not the same, it means that the submission has new comments that need to be collected. Thus, we mark the submission for comment collection. Otherwise, we ignore it.

Our crawler goes idle only in the case of Voat API failure, and it restarts automatically once Voat API is back in operation. Also, we observe that our crawler revisits the pages of every subverse, looking for new submissions, numerous times per day, ensuring the collection of the full state of submissions before they fall off the page 19 limit.

Table 1 lists the number of submissions and comments we collect for each subverse analyzed in this study. The analysis presented in later sections spans from May 28 to August 1, 2020. Alas, some gaps are present in our dataset, possibly due to failure of our data collection infrastructure, and because Voat was down numerous times during our data collection period for maintenance purposes. Specifically, we miss a great number of submissions posted between June 9 and June 13.

We also collect openly accessible user profile data. We note that Voat does not show the user accounts that subscribed to subverses. Instead, we collect user profile data from the users that posted a submission or a comment to the QAnon related subverses listed in Table 1. Users do not need to subscribe to a subverse for posting submissions or comments to it, but we assume that the users who post in these subverses are engaged to these communities. In total, we found 7.4K unique usernames in the communities’ submissions and comments. Using Voat’s API, we collect, among others, the following user profile data: i) registration date; ii) bio; iii) the subverses the user moderates or owns; and iv) the total number of upvotes and downvotes the user received on their submissions and comments. We note that for about 25.15% of the total users, Voat’s API returned 404 errors. It turns out that 1.8K user profiles have been deleted or inactivated, and hence Voat’s API could not return any data for these users, hence the 404 error. In total, we collect the user profile data of the remaining 5.5K active users, engaging in the QAnon related communities.

Ethical considerations. We only collect openly available data and follow standard ethical guidelines [39]. Also, we do not attempt to de-anonymize users. The collection of data analyzed in this study does not violate Voat’s API Terms of Service. Finally, we advise our readers that some of the content presented and discussed in later sections may be disturbing.

4 General Characterization

In this section, we provide a general characterization of the data we collect, listed in Section 3. The subverses data we manage to collect span only two months, but we are confident we can shed light on how engaging users are in QAnon related subverses on Voat. Also, we use the user profile data we collect to showcase the time users registered on Voat, and how often these users post submissions in QAnon related subverses.

Posting Activity. First, we look at how often submissions and comments are posted on the Voat subverses we collect. We note that it is very probable our crawler missed some submissions and comments made over the two months collection period, either because of data collection infrastructure failure or

²<https://www.postgresql.org/about/>

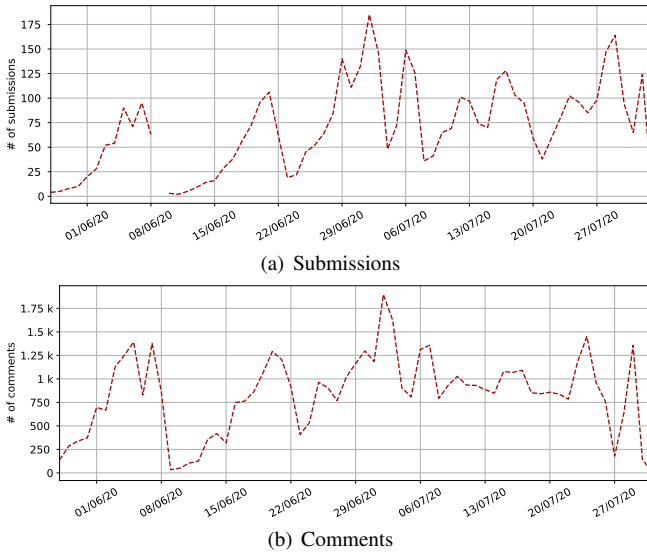


Figure 2: Number of submissions and comments posted per day.

because Voat was down because for maintenance purposes.

Since /v/GreatAwakening is by far the most active QAnon focused subverse in our dataset, we focus on it for most of our analysis. Specifically, we look at how /v/GreatAwakening submissions and comments are posted over time. Figure 2(a) and Figure 2(b) show the number of submissions and comments posted per day on /v/GreatAwakening, respectively. Over a span of ~two months, over 66 submissions and 834 comments are posted per day on /v/GreatAwakening, on average. We observe a peak in submission and comment posting activity between June 29 and July 3 with the most submissions on July 2 (Jeffrey Epstein ex-girlfriend being arrested by the FBI [32]) with 185 submissions and almost 1.9K comments.

Links. Since Voat is a news aggregator, we set to detect the websites Voat users tend to share the most. Specifically, we collect the hyperlinks the titles of all the QAnon related subverses link to, and we find that out of the ~7.5K submissions in our dataset, ~5.5K submissions link a website.

Table 2 lists the top 20 domains linked in submission titles in our dataset, along with the times they appear. Interestingly, about 20% of all the submissions link Twitter profile users or tweets. Following Twitter, YouTube ranks second with about 11% of the total submissions linking it.

Also, we use CYREN’s URL category check to better understand where the top 20 domains fall.³ We find that “News Politics Business” category sites like thegatewaypundit.com, Breitbart.com, zerohedge.com, wearethere.ws, dailymail.co.uk, washingtonexaminer.com, foxnews.com, americanthinker.com, nypost.com, naturalnews.com, citizenfreepress.com, and justthenews.com hold about 21.5% of the total links shared in QAnon focused subverses on Voat during our collection period. Interestingly, we notice that sites falling in the category “Media Sharing”, like catbox.moe, imgoat.com, kek.gg, and twimg.com take over about 10% of the sites shared on these subverses.

Domain	# of Submissions	(%)
twitter.com	1,055	19.20
youtube.com	636	11.56
thegatewaypundit.com	368	6.69
catbox.moe	300	5.45
Breitbart.com	204	3.71
imgoat.com	170	3.09
zerohedge.com	111	2.01
wearethere.ws	85	1.55
dailymail.co.uk	67	1.22
washingtonexaminer.com	66	1.21
foxnews.com	57	1.03
americanthinker.com	55	1.00
naturalnews.com	52	0.94
kek.gg	44	0.80
voat.co	43	0.78
nypost.com	41	0.75
citizenfreepress.com	41	0.75
twimg.com	40	0.73
imgur.com	38	0.69
justthenews.com	35	0.64

Table 2: Number and percentage of domain appearance in submission titles in our dataset.

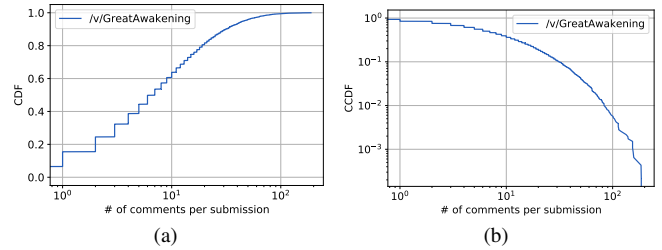


Figure 3: CDF and CCDF of the number of comments per submission on /v/GreatAwakening.

Since Voat does not allow its users to upload images along with their submissions and posts, users resort to media sharing websites. Users on Voat can upload images to media sharing websites like kek.gg. Then, they can share the kek.gg publicly available link to Voat to share an image with their audience.

Submission Engagement. Next, we try to shed light on how engaging users are in Voat communities. Since /v/GreatAwakening is the most popular and active QAnon related subverse in our dataset, we focus only on that subverse for this analysis. On average, submissions on /v/GreatAwakening receive ~12 comments. To visualize the distribution of comments per submission, we plot the Cumulative Distribution Function (CDF) and the Complementary Cumulative Distribution Function (CCDF) in Figure 3. Specifically, Figure 3 depicts that only 19.60% of the submissions on /v/GreatAwakening have more than 20 comments. The median number of comments on /v/GreatAwakening submissions is 7, while the most popular submission has 189 comments.

Next, we look at how often users upvote and downvote the /v/GreatAwakening submissions. Overall, the submissions tend to get, approximately 57 upvotes and only 1.7 downvotes. The most upvoted submission on /v/GreatAwakening

³<https://www.cyren.com/security-center/url-category-check>

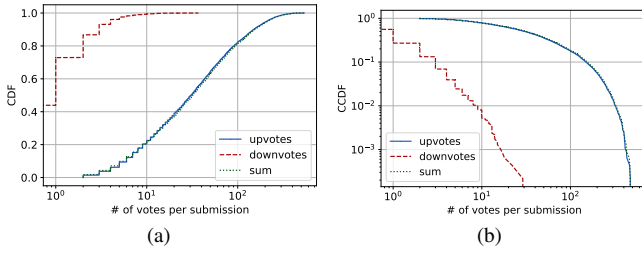


Figure 4: CDF and CCDF of the number of votes per submission on /v/GreatAwakening.

received 537 upvotes, while the most disliked submission got only 37 downvotes. The median upvote is 31, and the median downvote is only 1. On average, the submissions on /v/GreatAwakening tend to be positively voted with the final vote (*sum*) being 59, and the median sum being ~32.

To better demonstrate the user liking of /v/GreatAwakening submissions, we plot the CDF and CCDF of upvotes, downvotes, and total votes the submissions get in Figure 4. Alarming, we observe that 72.5% of the submissions on /v/GreatAwakening have more than 15 upvotes, and 73% has a total sum count of more than 15. At the same time, only 0.55% of the submissions on the subverse get more than 10 downvotes. We also test the distributions of upvotes, downvotes, and total votes for statistically significant differences, using a two-sample Kolmogorov-Smirnov (KS) test. We find that the upvote and downvote pair has ($p = 0.0$). Thus, this suggests that we can confidently reject the null hypothesis as the difference between upvotes and downvotes is indeed significant. On the contrary, the distributions of upvotes and total votes return ($p > 0.69$), which suggests that the two pairs are likely similar distributions.

Similarly, we plot the CDF and CCDF of the number of upvotes and downvotes comments on /v/GreatAwakening tend to get in Figure 5. On average, comments tend to get ~2 upvotes and ~0.17 downvotes. The median number of upvotes per comment is 1, and 0 for downvotes. The most liked comment on /v/GreatAwakening received 71 upvotes, while the most disliked comment received 24 downvotes. Again, we test for statistically significant differences between the distributions using a two-sample KS test, and find them ($p = 0.0$) between upvotes and downvotes, ($p < 0.01$) between upvotes and total votes, and ($p = 0.0$) between downvotes and total votes.

People in /v/GreatAwakening tend to upvote the content they encounter. This is an indication that they agree or like the opinion or information shared within the community. The above findings strongly suggest the existence of an *echo chamber* on /v/GreatAwakening. Specifically, an echo chamber is an environment where a person tends only to encounter information or opinions that reflect and reinforce their own [16].

User activity. Next, we focus on user profile acquired data to answer two questions: i) how often do users post new submissions on /v/GreatAwakening; and ii) when did these users register on Voat? To answer the first question, we count the number of submissions each user posted on the subverse of interest. We find that only 241 users posted a new sub-

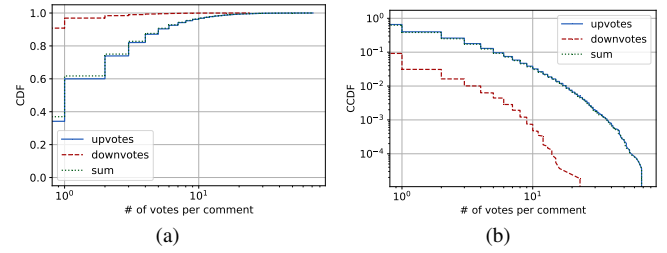


Figure 5: CDF and CCDF of the number of votes per comment on /v/GreatAwakening.

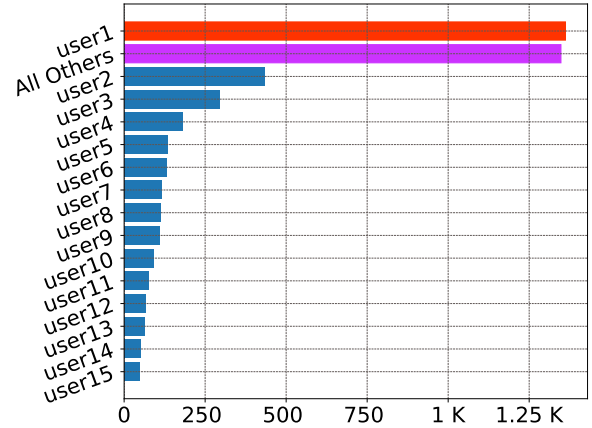


Figure 6: Number of submissions posted per user on /v/GreatAwakening.

mission on /v/GreatAwakening during the collection period. We count the number of submissions each user posted on /v/GreatAwakening and only report the top 15 in Figure 6. In an attempt to not de-anonymize users, we replace the original username with “user1,” “user2,” etc. Alarming, the top submitter “user1” posted 31.47% (1.36K) submissions on the subverse (red bar in the figure). The next top submitter “user2” posted only 10.05% (435) submissions. Excluding the top submitters, the rest 226 submitters (marked as “All Others” in the figure) are responsible for only 31.14% (1.34K) of the submissions made on /v/GreatAwakening.

Our results suggest that the audience of /v/GreatAwakening (over 19K subscribers) consumes content from a handful of users, and in great extend, from “user1.”

Next, to answer RQ1, we analyze user profile data to shed light on the exact date users joined Voat. Again, we focus on user profile data collected from the users engaging on /v/GreatAwakening. We find that, during the period our data collection infrastructure was active, over 3.42K users posted a submission or a comment on the subverse. Also, we find that 4.6% (157) of these users deactivated their account, or their account was deleted by Voat, due to 404 errors our data collection infrastructure received from Voat’s API.

Figure 7 plots when the users engaging on /v/GreatAwakening, registered a new user account on Voat. On average, every month 2.4, 28, 17.5, 21.6, 112.8, 55.8, 80.7 new users registered in 2014, 2015, 2016, 2017, 2018, 2019, and 2020, respectively. This figure highlights that over 26% (932) users registered on Voat, during September

Topic	Words per topic model
1	like (0.021), say (0.015), thing (0.010), look (0.010), vote (0.008), need (0.007), good (0.006), arrest (0.005), go (0.005), peopl (0.005)
2	come (0.012), interest (0.011), home (0.010), mean (0.010), point (0.010), rememb (0.009), know (0.007), fact (0.007), probabl (0.007), state (0.007)
3	post (0.014), time (0.014), start (0.008), news (0.007), video (0.007), sorri (0.007), make (0.006), word (0.006), peopl (0.005), articl (0.005)
4	shit (0.009), believ (0.008), fuck (0.008), year (0.007), nigger (0.007), damn (0.006), awesom (0.006), cours (0.006), antifa (0.006), like (0.006)
5	good (0.026), agre (0.023), true (0.012), happen (0.011), nice (0.010), thank (0.006), best (0.006), question (0.005), look (0.005), think (0.005)
6	thank (0.033), think (0.018), sure (0.013), great (0.011), amen (0.009), comment (0.008), edit (0.008), post (0.007), tweet (0.006), maga (0.005)
7	delet (0.044), real (0.007), peopl (0.006), wrong (0.006), wonder (0.006), understand (0.006), voat (0.005), free (0.005), okay (0.005), post (0.005)
8	yeah (0.023), fuck (0.017), love (0.016), exactli (0.011), work (0.010), link (0.010), know (0.008), go (0.008), mask (0.008), fake (0.007)
9	know (0.023), people (0.012), black (0.012), trump (0.010), want (0.010), think (0.009), hear (0.009), live (0.008), jew (0.007), need (0.007)
10	right (0.016), fail (0.006), white (0.006), say (0.006), laugh (0.005), funni (0.005), truth (0.005), go (0.005), countri (0.005), call (0.005)

Table 3: LDA analysis of the QAnon related subverses on Voat.

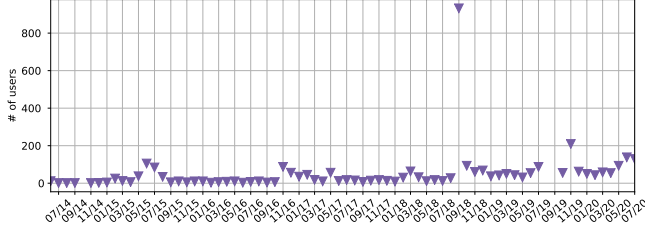


Figure 7: Number of user registrations per month.

2018: the month Reddit banned many QAnon related subreddits [42, 36, 33]. Our results show that user migration is apparent when specific communities are banned, aligned with [31]. Although this does not prove or directly answers our RQ1, it is evident that Voat received a high volume of new user registrations after Reddit banned the QAnon related subreddits. Future work, in conjunction with Reddit data, will probably help us further prove the Reddit deplatforming phenomenon and user migration.

5 Content Analysis

In this section, we provide a content analysis of all the submissions and comments in our dataset. More specifically, we detect the most popular topics discussed in the QAnon subverses, the named entities mentioned in each post, and use word2vec to generate word representations.

5.1 Topics

First, we set to detect the most prominent topics of discussion on QAnon subverses on Voat. Looking at topics frequently discussed in these subverses provides a high-level reflection of the nature of discussions taking place on the subverses. Importantly, we aim to characterize the QAnon related discussions to understand the narratives surrounding this conspiracy theory.

For this analysis, we use the text of the titles of submissions and all the submission’s comments, as all of the posts on these subverses focus on the same conspiracy theory. Also, topic modeling techniques tend to be more accurate when fed with more data so we take advantage of all the collected data. To showcase the most popular topics of discussion on the subverses, we employ Latent Dirichlet Allocation (LDA), which is used for basic topic modeling [5]. First, we collect the text provided by Voat’s API for each submission and comment in

our dataset. Then, for every post, we remove any stop words (such as “like,” “to,” “and,” etc.), URLs, and formatting characters, e.g., \n, \r. After this process, we tokenize every post, and we use every token to create a term frequency inverse document frequency (TF-IDF) array used to fit our LDA model. Specifically, TF-IDF statistically measures the importance of every word within the overall collection of words. We decide to use TF-IDF arrays to fit our LDA model as previous work suggests it yields more accurate topics [27]. Last, we use the guidelines of Susan Li [24] to build our LDA model.

In Table 3, we list the top ten topics discussed on QAnon related subverses on Voat, along with the weights of each word for that topic. We notice that, Voat users tend to discuss opinions, facts, news, politics, and events based on the frequency of appearance of words like: “point,” “know,” “fact,” “remember,” “probably” (topic 2), “news,” “video,” “article” (topic 3), “Trump” (topic 9), etc. It is also apparent that several topics of discussion on Voat include racist connotations, along with hate words, like “fuck,” “nigger,” “jew,” and “black”.

Overall, our topic detection analysis shows that discussions on Voat feature ideas, opinions or beliefs, political matters and news, hate, and racism. This analysis partially answers RQ2. We indeed observe various hateful, racist, and controversial wording included in the subverses of interest. Future work includes the use of hate detection tools to analyze every post to exactly measure how toxic it is.

5.2 Named Entity Recognition

To get an overview of the focus group of the QAnon subverses, we extract the “named entities” mentioned in Voat posts, in an attempt to better define the narrative of the conspiracy theory.

To obtain the named entities mentioned in each post, we use the Python `en_core_web_lg (v2.3)` model, publicly available via the SpaCy library [50]. We choose this specific model over other alternatives as it used the most extensive available dataset as a training set. Moreover, we note that previous work [21] ranked this model among the top two most accurate methods for recognizing named entity in text. More specifically, this model uses a board set of millions of online news outlet articles, blogs, and comments from various social networks to detect and extract various entities from text. Interestingly, this library also extracts the entity label in addition to the entity itself. For example, the entity label for “Donald Trump” is “PERSON”, for “New York” is “GPE” (Countries, cities,

Named Entity	#Posts	(%)	Entity Label	#Posts	(%)
Trump	1,991	2.60	ORG	18,992	24.76
one	1,653	2.16	PERSON	17,181	22.40
first	1,200	1.56	GPE	9,348	12.19
US	832	1.08	DATE	9,011	11.75
America	790	1.03	CARDINAL	8,149	10.62
two	660	0.86	NORP	6,310	8.23
today	616	0.80	WORK_OF_ART	2,231	2.91
American	590	0.77	ORDINAL	2,116	2.76
Twitter	557	0.73	TIME	1,584	2.07
China	531	0.69	LOC	1,401	1.83

Table 4: Top 10 named entities and entity labels mentioned in all of QAnon subverses in our dataset.

“qanon”		“q”	
Word	Cos Similarity	Word	Cos Similarity
pub	0.751	anons	0.722
qmap	0.710	qanon	0.650
qresearch	0.699	larp	0.598
psyop	0.675	posts	0.595
anon	0.672	drops	0.584
anons	0.663	chan	0.559
kun	0.653	anon	0.546
res	0.647	calm	0.527
latest	0.639	psyop	0.518
ch	0.630	comms	0.506

Table 5: Top ten similar words to the term “qanon” and “q” and their respective cosine similarity.

states), etc. The different labels range from celebrities to nationalities, products, and even events.⁴

In Table 4, we list the ten most popular named entities and labels mentioned in the collected subverses. We note that a post may mention an entity more than once. Hence we only report the number of posts that mention an entity at least once. We find that Donald Trump is the most popular named entity on the collected subverses with over 1.9K posts (2.88%) mentioning him. Other popular named entities include “US” (1.20%), “America” (1.14%), “American” (0.85%), “Twitter” (0.81%), and “China” (0.75%). Regarding the top ten popular labels, the most popular one is companies, agencies, institutions (27.44%), followed by people (24.83%), countries, and cities (13.51%), and dates (13.02%). Other popular labels include nationalities, religious, or political groups (9.12%), books, songs, and movies (3.22%) and locations (2.02%).

Our review of the most popular named entities and labels of the QAnon subverses on Voat suggests that discussions within these communities are related to world happenings and events, politics, and established organizations and institutions.

5.3 Word Embeddings

Last, we analyze the text found in the submissions and comments of all the subverses of our dataset to visualize how each word is linked to each other. For this visualization, we use a similar approach as Zannettou et al. [55].

⁴See <https://spacy.io/api/annotation#named-entities> for the full list of labels.

To test how different words are interconnected with the term “qanon”, we use word2vec: a two-layer neural network that generates word representations as embedded vectors [29]. Specifically, a word2vec model takes a large input corpus of text and maps each word in the corpus to a generated multidimensional vector space: a word embedding. Notably, words that share similar contexts tend to have almost parallel vectors in the generated vector space.

Following the methodology of Zannettou et al. [55], we map the use of different terms in our text corpus by analyzing and visualizing the word vectors of our trained word2vec model. We only train one word2vec dataset that takes as input all the posts from all the subverses in our dataset. Since all the subverses focus on the same topic, we take advantage of all the data we have. To clean our posts, we follow a similar methodology as the one explained above in Section 5.1. First, as a pre-processing step, we remove stop words, URLs, punctuation, text formatting symbols, and we tokenize every word. Using the final bag of tokens for each post, we train our word2vec model using a context window equal to 7, as posts and comments on Voat tend to be longer when compared to posts of other platforms like Twitter. The context window variable defines the maximum distance between the current word to the predicted words during the generation of the word vectors. Opposite to [55], we decide to include in our corpus only the words that appear at least 50 times. The reason for this significant change in the minimum count variable of our word2vec model is due to the small size of our dataset. Last, we train our word2vec model with 12 iterations (epochs). By default word2vec models perform two epochs. Since our corpus is very small, a number between 5 and 15 epochs is suggested to benefit the quality of the word representations [29, 30]. After training our model we extract a vocabulary of 3.35K words.

Next, we use the generated word2vec model word embeddings to understand the context in which specific terms are used. To achieve this, we generate the vectors of the word2vec model to measure how close two terms are. Then, we calculate the cosine similarity of the two generated vectors. Specifically, we first look at the term “qanon,” and “q” towards visualizing the narrative around these two terms (RQ3).

Table 5 reports the top ten most similar words to the term “qanon” and “q” along with their cosine similarity. Since both terms are similar, we expected certain words to be repeated for each term. Specifically, the word “anon” and “anons” appearing in both “qanon” and “q” with cosine similarity greater than 0.52 in all cases. Then, we notice other interesting qanon similar words like “qmap” and “qresearch” with cosine similarity equal to 0.71 and 0.69, respectively. We also observe the term “psyop” be a similar term to both “qanon” and “q”: psyop stands for psychological operations, which are operations aiming to selectively publish information to influence audience emotions, motives, reasoning, and the actions of governments and organizations. These results suggest that Voat QAnon communities discuss psychological operations, and role-playing games (term “larp”), probably because they believe that the government is corrupted.

Inspired to visualize the terms associated with the term

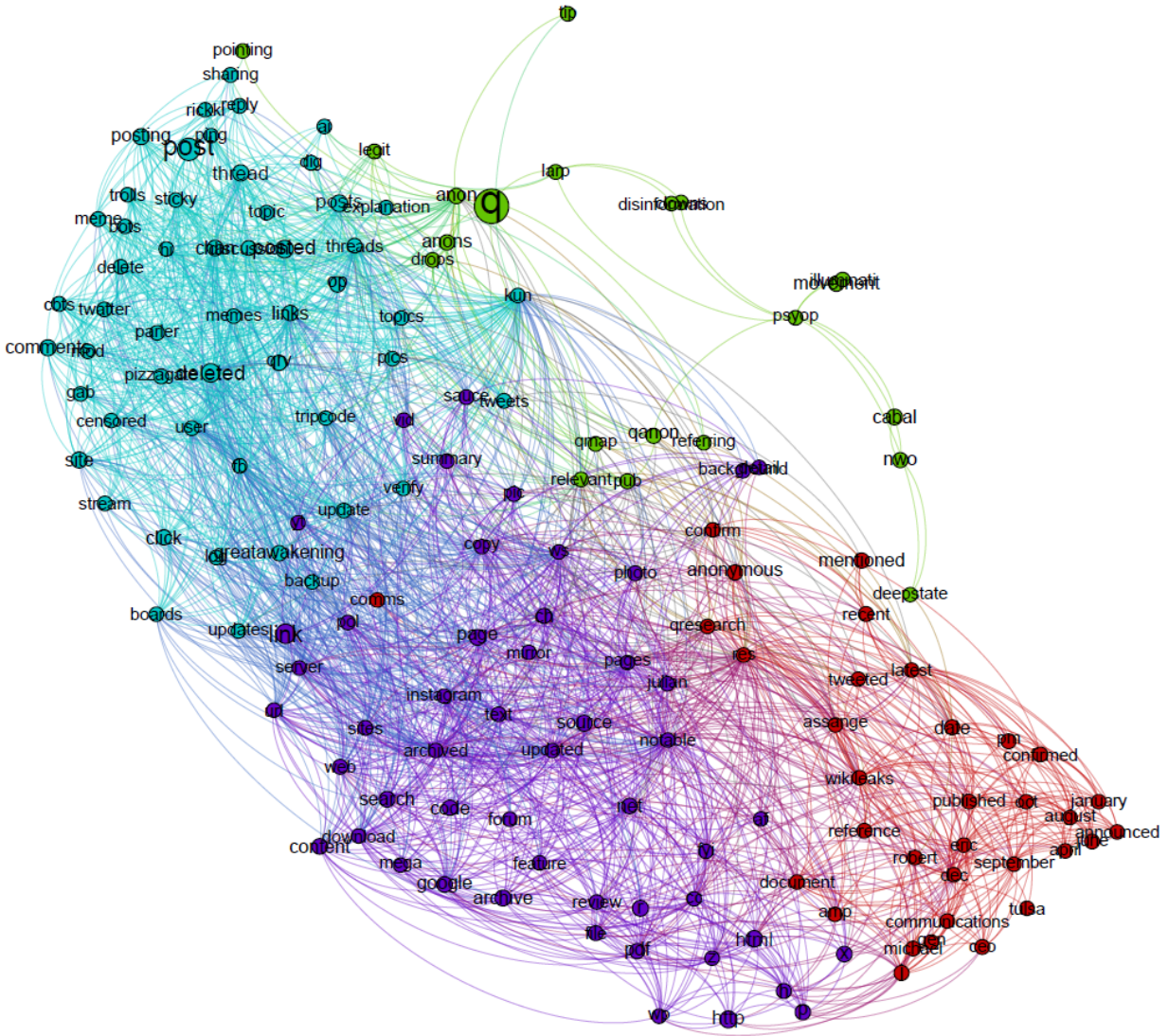


Figure 8: Graph representation of the words associated with the term “qanon” on Voat. We extract the graph by finding the most similar words, and then we take the 2-hop ego network around “qanon”. In this graph the size of a node is proportional to its degree; the color of a node is based on the community it is a member of; and the entire graph is visualized using a layout algorithm that takes edge weights into account (i.e., nodes with similar words will be closer in the visualization).

“qanon”, we plot the word representation graph in Figure 8. In the figure, the nodes are words obtained from our trained word2vec model, and the edges are weighted by the cosine similarities between these words. The graph illustrates the two-hop ego network [3] starting from the word “qanon”. Then, the graph includes all the words (nodes) that are either directly, or intermediately connected to the term “qanon”. We draw a connection between two nodes if their word vectors’ cosine similarity is greater or equal to 0.6. We use this threshold based on the findings of [55]. Again, following [55] methodology, we identify the structure and different communities in our word representation graph by running the community detection heuristic [6], and we assign a different color for each community. Finally, we use code implemented by [55] to layout our graph using the ForceAtlas2 algorithm [20], which considers the edges’ weight when laying out the nodes in the 2-dimensional space.

The visualization depicted in Figure 8 reveals how the narrative around QAnon related discussions is laid out. Taking into account how communities form distinct themes, and that nodes’ proximity implies contextual similarity, we showcase how the “qanon” community (green), and specifically the term “q” is very close and directly connected to its “sister” conspiracy theory, “pizzagate” (turquoise). Pizzagate is a conspiracy theory where Hilary Clinton is portrayed as the mastermind behind pedophile rings [28]. Then, the other significant interconnected community (purple) probably shows the sources these users mention in their posts, like “archive,” “google,” “source,” and “link.” Last, we notice that the red community of words depicts the “qresearch,” and the mention to the anonymous user (probably “Q”) that users refer to for proving their theories. This is evident by the terms appearing in the red community: “qresearch,” “confirmed,” “wikileaks,” and “anonymous.”

Using the same methodology, we plot a simpler graph, this

conspiratorial groups are not disjoint of other communities and stress the importance of understanding the QAnon movement and their influence on other communities. Darwish [12] collect 23M tweets related to the US federal judge Brett Kavanaugh during his service as a justice on the US supreme court in October 2018. They find that the hashtags #QAnon and #WWG1WGA (Where We Go One We Go All) fall in the top 6 groups of hashtags in their dataset. The author explains that Twitter users who supported or opposed the confirmation of Kavanaugh use divergent hashtags, follow different Twitter accounts, and share sources from different websites. Chowdhury et al. [10] identify 2.4M suspended Twitter user accounts and collected 1M tweets they posted. The authors perform a retrospective analysis to characterize these accounts’ properties, along with their behavioral activities. They observe that politically motivated users consistently and successfully spread controversial and political conspiracies over time.

Faddoul et al. [15] collect the top-recommended videos of 1080 YouTube channels from October 2018 to February 2020. In total, they analyzed more than 8M recommendations from YouTube’s watch-next algorithm and used 0.5K videos labeled as “conspiratory” to train a binary classifier to detect conspiracy related videos with 78% precision. Using TF-IDF, they find that within the top 15 discriminating words in the snippet of the videos of the training set, the term “qanon” ranked third. Also, QAnon related videos belong to one out of the three top topics identified by an unsupervised topic modeling algorithm. The authors conclude that YouTube’s recommendation engine operates as a “filter bubble” to a user once they watch a conspiratorial video, and stress that such content should not be recommended to users by YouTube.

Studies using data from Voat. Chandrasekharan et al. [9] set on detecting abusive content using data from 4chan, Reddit, Voat, and MetaFilter. The authors propose a novel approach towards detecting abusive content, namely, Bag of Communities (BoC). The proposed model performs with 75% accuracy without the need of training examples from the target community. It is worth mentioning that part of the Voat data collected for their work originate from /v/CoonTown, /v/Nigger, and /v/fatpeoplehate: three communities focused on hate towards groups of individuals with specific body or race characteristics. These subverses were created in Voat after Reddit banned the original /r/CoonTown, /r/fatpeoplehate, and /r/nigger, subreddits in 2015 [45, 43, 40]. Similarly, Salim et al. [46] use Reddit comments to train a classifier that can accurately detect hateful speech. The authors use this classifier to detect such content on Voat’s /v/CoonTown, /v/fatpeoplehate, and /v/TheRedPill and find that the Reddit data trained Naive Bayes, Support Vector Machines, and Logistic Regression models detect hateful content with high precision. Khalid and Srinivasan [23] collect ~872K comments from /v/politics, /v/television, and /v/travel in an attempt to detect distinguishable linguistic style across various communities. The authors compare the features of Voat comments to Reddit and 4chan comments and train a machine learning classifier that can predict with high accuracy the origin of comments, based on its style and content. The authors explain that community-style is probably acquired sub-

consciously by the community members through interactions they have between other community members, and the content they are exposed to within the community.

Last, in a qualitative study Popova [38] uses data from Voat’s /v/DeepFake and the site mrdeepfakes.com. The author finds that pornographic deepfakes are created for circulation and enjoyment within the engaged community. We note that both the website mrdeepfakes.com and the subverse /v/DeepFake were created after Reddit banned the subreddit /r/DeepFakes in 2018 [41, 18].

7 Conclusion

In this work, we presented a first characterization of Voat.co and in particular of the Qanon movement on the site. We collected posts from seventeen different subverses that focus their discussions around the QAnon conspiracy theory. Although we only managed to collect data for two months, and a relatively small number of posts (76.7K posts), we showed that users on these communities tend to be very engaged, exhibiting signs of creating echo chambers. Alarming, we found that only one user authored about 30% of the total submissions posted in the most active subverse and that many users decided to join Voat after Reddit banned the QAnon related communities on September 2018.

We also used topic modeling techniques to show that the conversations in these communities focus on world happenings, politics, and hate towards groups of specific races or religions. Notably, we relied on a word2vec model to illustrate the connection of different terms to closely related words. We found that the terms “qanon,” and “q” are closely related to other conspiracy theories like pizzagate, other social networking platforms, and the research the community performs to prove their theories, namely, “qresearch.” Finally, we highlighted how the narrative used around the terms “jew” and “nigger” are extremely hateful.

Future work. Ours is an ongoing research effort, and thus the work presented in this study is preliminary. As part of current/future work, we plan to include a comparison of our dataset to subverses with a more “neutral” discussion focus, e.g., /v/travel, /v/television, and /v/news. We also plan to use data from other social networks like Reddit, 4chan, and Twitter to assess whether the QAnon community on Voat influences communities on other social networks and viceversa.

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