

The ‘Fairness Doctrine’ lives on? Theorizing about the Algorithmic News Curation of Google’s Top Stories

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ABSTRACT

When one searches for political candidates on Google, a panel composed of recent news stories, known as Top stories, is commonly shown at the top of the search results page. These stories are selected by an algorithm that chooses from hundreds of thousands of articles published by thousands of news publishers. In our previous work, we identified 56 news sources that contributed 2/3 of all Top stories for 30 political candidates running in the primaries of 2020 US Presidential Election. In this paper, we survey US voters to elicit their familiarity and trust with these 56 news outlets. We find that some of the most frequent outlets are not familiar to all voters (e.g. *The Hill* or *Politico*), or particularly trusted by voters of any political stripes (e.g. *Washington Examiner* or *The Daily Beast*). Why then, are such sources shown so frequently in Top stories? We theorize that Google is sampling news articles from sources with different political leanings to offer a balanced coverage. This is reminiscent of the so-called “fairness doctrine” (1949-1987) policy in the United States that required broadcasters (radio or TV stations) to air contrasting views about controversial matters. Because there are fewer right-leaning publications than center or left-leaning ones, in order to maintain this “fair” balance, hyper-partisan far-right news sources of low trust receive more visibility than some news sources that are more familiar to and trusted by the public.

CCS CONCEPTS

- **Human-centered computing** → **Empirical studies in HCI**;
- **Information systems** → *Search interfaces*.

KEYWORDS

algorithmic news curation, media bias, elections, Google, survey

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1 INTRODUCTION

The US presidential election of 2020 is still months away, but the Democratic candidates who are vying for their party’s nomination have been campaigning since early 2019. How do voters access news about these campaigns? Increasingly, they might turn to the Web,¹ where often an algorithm is in charge of choosing and ranking content. Thus, it is important to study the role that algorithmic news curation products by Google, Apple, and Facebook play in amplifying some news publishers and their stories over others. This task has become urgent, since surveys show that a majority of the public (62% as of July 2019) believe that the platforms have “too much control over the news people see.”²

The 2016 US Presidential Election was a turning point in the history of digital platforms and online political polarization. Platforms such as Facebook were regarded as enablers of the proliferation of low-quality news publishers, according to a much cited report that revealed that stories from so called “fake news” sources received more engagement on Facebook than traditional news publishers [19]. Meanwhile, other researchers pointed the finger at right-wing online news websites such as *Breitbart News* for engaging in misleading and harmful journalism [3] that generated “alternative facts”, as well as at the mainstream media for their negative coverage of both candidates, presenting the public with a situation of false equivalency: both candidates were very flawed [15, 25].

What can be said about the build-up to the 2020 US Presidential Election? After the public criticism following the 2016 Election, Facebook has made many changes to its News Feed algorithm to reduce the presence of most news publishers on users feeds, which has led to a decrease of referrals from Facebook to news websites.³ Additionally, Facebook has also changed its user interface to remove the panel of Trending News,⁴ which promoted low-quality news. Meanwhile, Google has chosen a different path. Given the proliferation of mobile devices, Google has emphasized a “mobile-first”

¹<https://www.pewresearch.org/fact-tank/2019/09/11/key-findings-about-the-online-news-landscape-in-america/>

²<https://www.journalism.org/2019/10/02/americans-are-wary-of-the-role-social-media-sites-play-in-delivering-the-news/>

³<https://digiday.com/media/promised-facebook-traffic-news-publishers-declines-post-news-free-change/>

⁴<https://www.marketwatch.com/story/facebook-to-remove-trending-news-from-its-site-amid-fake-news-criticism-2018-06-01>

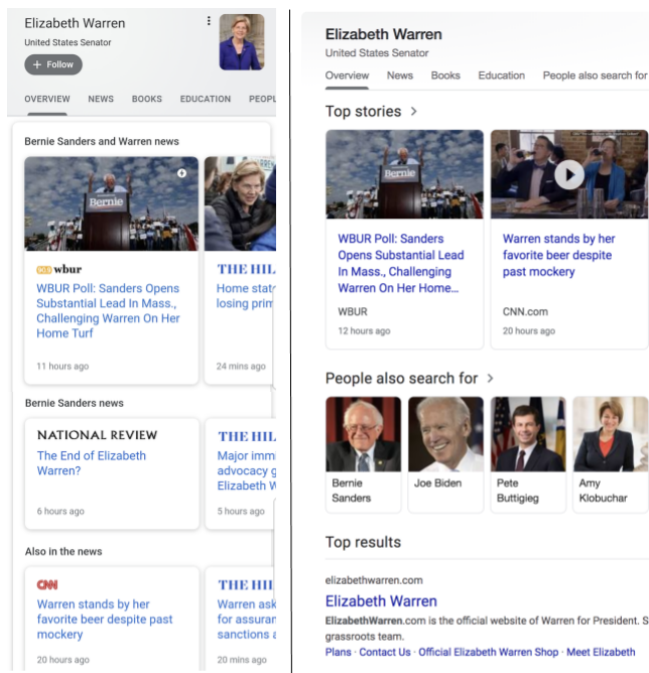


Figure 1: On the left side, a mobile phone screenshot for the search “Elizabeth Warren”, on the right side, a desktop screenshot for the same query. The mobile screenshot indicates three rows with news items, compared to only one row with news on the desktop screenshot. The prominent showing of Top stories on both devices indicates Google’s emphasizes on promoting news. While our data collection covers only desktop devices, future work should focus on collecting Top stories on mobile devices, as well as user interaction with news on mobile devices.

approach to its services and interfaces, especially for delivering news. Since 2015, Google has been nudging news publishers toward embracing its technology of Accelerated Mobile Pages (AMP), which allows news articles to load faster on mobile devices.⁵ Using this technology, on February 2016, Google introduced a new panel named Top stories as part of the search results page on mobile devices,⁶ examples of which can be found in Figure 1. It took more than ten months to add this feature on desktop devices,⁷ which highlights Google’s strategy of prioritizing mobile, given the ongoing trends in online content consumption: more users rely now on mobile devices to access online information than on laptop or desktop devices [14].

On one hand, the importance of Facebook’s role to drive news traffic has declined; on the other, Google’s referrals to news publishers have been surging.⁸ Given that news on Google is promoted entirely by algorithms that do not explicitly rely on signals from

social sharing as in Facebook, we are interested in understanding how such algorithms make decisions about curating the news. Recently, research on algorithm audits [18] has been focusing on Google’s Top stories, which is one of most prominent sources of news among Google’s products [11, 17, 23]. Results from these studies raise important questions in the context of political elections (these studies were not about elections). For example, [23] found a left-leaning ideological skew in the composition of news publishers, while [11] found that for exclusively political queries, articles from *Fox News* (a right-leaning source) are more likely to be shown on the first position of Top stories. Given the highly polarized nature of American politics at the moment, we would like to monitor the algorithmic choices of Top stories, since they have the potential to shape the public opinion about the candidates, by promoting some news sources over others.

In this paper, we combine results from two datasets: (1) a short online survey with 951 US voters about their knowledge of Top stories and their familiarity with and trust of news sources shown by Top stories, and (2) a one-year dataset generated by continuously auditing Google’s Top stories for 30 political candidates, who were running for the 2020 US Presidential elections. The Top stories dataset contains 79,903 news story URLs published by 2,168 unique news sources. In our analysis, we found that 56 news sources alone are responsible for 2/3 of the entire news coverage, replicating an earlier finding about “concentration of sources” [23]. We refer to these news publishers as the ones “preferred” by Google’s Top stories. Without revealing Google’s preference, we showed the names of these news outlets to our survey participants to measure how much they trust them. Then, we compared the various rankings based on calculated news sources trust scores (for three different political orientations) to Google’s preferred ranking to find out whether they are correlated. Here is a summary of our most important findings in this paper:

- (1) The overwhelming majority of the respondents, 83.6% has noticed the Top stories panel on Google search, and 63.4% read the headlines in the panel at least half of the time when present. A plurality of respondents, 43%, state that their most frequently used method of getting news online is through search engines. Together, these results suggest that Google’s Top stories is very likely to expose users to a diverse news coverage about daily events. Thus, such power to influence voters through algorithmic news curation should be audited.
- (2) The composition of the Top stories panel indicates a left-leaning bias. But, a “left-leaning” bias might be an artifact of how the polarized public consumes media. As Pew Research has established, conservative voters make use of fewer news outlets than liberal ones,⁹ and such preferences might reflect themselves into a more concentrated right-leaning news ecosystem and a more disperse left-leaning one in the United States.
- (3) Google’s preference of news sources (the 56 news outlets that contribute 2/3 of Top stories) does not match the ranking of trusted sources for Democratic, Republican, or Independent voters. Instead, Google might be trying to create a “balanced”

⁵<https://fortune.com/2016/08/16/google-publishers-amp/>

⁶<https://searchengineland.com/amp-top-stories-now-live-243314>

⁷<https://searchengineland.com/google-replaces-news-box-top-stories-desktop-264993>

⁸<https://www.poynter.org/tech-tools/2018/as-google-shifts-to-mobile-its-referrals-to-news-sites-keep-growing/>

⁹<https://www.journalism.org/2020/01/24/u-s-media-polarization-and-the-2020-election-a-nation-divided/>

offering, by sampling articles from sources that are trusted by or popular with at least one of these groups. This result leads us to liken Google's approach to "the fairness doctrine".

Auditing news aggregation systems is a relatively new research endeavour. Our contribution is two-fold: (a) our audit of Google's Top stories extends over a one-year period (no previously reported audits have this duration); (b) we compare the algorithm's preferences to those of voters of three different political leanings and find little agreement.

2 RELATED RESEARCH

2.1 The Fairness Doctrine

The fairness doctrine was a policy established in the United States in 1949 by the Federal Communication Commission (FCC), to protect the First Amendment free speech rights, during an era in which radio and TV started contributing to an unequal amplification of speech. It was abolished in 1987, and then removed entirely from the federal books in 2011. The doctrine required broadcasters to devote "adequate time to important and controversial issues" and do so by "allowing reasonable opportunity for opposing viewpoints to be expressed on air" [20]. From the beginning the doctrine was controversial, with some arguing that it limited the freedom of press, and others that it contributed to a more informed electorate. Research has shown that the doctrine often led to harassment of the press by groups that believed they were not treated fairly [21]. This is reminiscent of present day, when some conservative politicians blame Google for being biased against them by showing in its results mostly left-leaning sources.¹⁰

The Fairness Doctrine impacted media in a profound way by establishing the "public interest" standard [9]. This meant that the right of the public to be informed was paramount. Publishers, as public trustees, had an obligation to the public. This imperative to be balanced in their coverage and represent a diversity of viewpoints was embraced by many publishers and continues to be a cornerstone of mainstream journalism. Meanwhile, publishers who wanted to represent only a viewpoint, e.g. religion, aggressively pushed the boundaries of the doctrine challenging FCC and its rules [8]. The advent of digital technologies that did not require access to the limited wave spectrum (a public good) weakened FCC's argument for a diversity of viewpoints. Additionally, the political mantra of Reagan's administration for less intrusion by the Federal Government and broad deregulation, created the context for doctrine's demise. One of the direct outcomes of this event was the explosion of conservative right-wing media, that created its own alternative reality, whose consequences culminated in the election of Trump in 2016 [12].

2.2 Online News and the 2016 US Election

In their book "Network Propaganda" [3], the authors consider a set of actors and technological drivers that have been identified as causing the present state of information disorder: "fake news" entrepreneurs, political clickbait fabricators; Russian hackers, bots, and sockpuppets; the Facebook Newsfeed algorithm and online

echochambers; Cambridge Analytica; or white supremacists and alt-right trolls. Ultimately, they settle on the right-wing media ecosystem as "the primary culprit in sowing confusion and distrust in the broader American media ecosystem." Their focus is *Breitbart News*, which was instrumental in setting an election agenda centered on immigration issues and Clinton's scandals, which was also embraced by mainstream media, as detailed analyses of their election coverage showed [15, 25]. Although a few of the most problematic hyperpartisan news sources were discredited (e.g. *InfoWars*), many continue to operate and are surfaced by news aggregators like Google's Top stories.

What is found on Google Search, matters. Studies have shown that as more people abandon traditional forms of news exposure such as newspapers and TV, a new way of accessing news is spreading, distributed discovery [22]. "I just google it" has become a new way of getting informed, in the hope of getting unbiased coverage [24]. The most recent survey that investigated how distributed discovery is divided among the various channels: search engines, social media, news apps, etc., indicated that 20% of respondents use search to get news, compared to 24% who use social media [13]. Interestingly, using search media to get access to news is "associated with more diverse and more balanced news consumption" [6], which conforms with the findings of this paper (in terms of diversity and balance of coverage by Google's Top stories).

2.3 Algorithm Audits of News Aggregators

As the amount of search engine referrals to news websites increases, it is worth investigating what news is shown by search engines. Top stories is the first element of the search page for many important events (e.g. elections). Given the immense supply of news stories, by selecting only a few of them at a time, Google's Top stories is engaging on what is known as "algorithmic news curation" [4]. If algorithms are curating news, how are they choosing, especially with respect to news sources with problematic credibility? Are the right-wing publications identified in [3] as the cause of our current information disorder (pre- and post- 2016 US Election) being promoted by Google Top stories? Does that apply to left-wing publications?

This line of research, which falls under the umbrella of algorithm auditing [18], is important for two reasons: 1) more people use search engines than social media on a daily basis. If they are being exposed to news in this way, we need to understand how algorithms are curating the news; 2) there is evidence that as many as half of all search queries don't lead to clicks,¹¹ because a user's information need is fulfilled by the search page content. Thus, the news headlines that a user reads in Top stories might be all they remember about a news event. Together, these headlines can frame issues in a partisan way and help with media agenda setting. Although there have been already several audits of Google's Top stories [11, 17, 23] and Apple News [2], this study has the longest duration (a whole year) and a specific focus on candidates for a political election.

It is important to summarize some of the biggest findings from the previous literature on auditing top stories: 1) concentration of

¹⁰<https://www.politifact.com/factchecks/2018/aug/29/donald-trump/no-96-google-news-stories-trump-arent-left-wing-ou/>

¹¹<https://searchengineland.com/49-of-all-google-searches-are-no-click-study-finds-318426>

sources; and 2) a left-leaning bias of news coverage. With concentration of sources is meant the phenomenon of encountering the same news sources frequently. Our own audit of 2020 Top stories reinforces this finding, since 1/3 of the news articles in the dataset belonged to only eight publishers [10]. The left-leaning bias is connected to the shift of news consumption in the public. What were usually considered main-stream media for decades, now appear left-leaning (or center left) due to the political polarization of the audience.

3 DATA AND METHODS

In the following, we describe three datasets that are relevant to this research. Two datasets were created by our research group and the third one originates with [17].

3.1 Top Stories Dataset

Throughout 2019, we monitored and captured the Top stories element of Google's search results pages for queries that are the names of 30 political figures, for example, Joe Biden, Kamala Harris, Donald Trump, etc., who were running (or rumored to run) in the primary season of the 2020 US presidential election. Out of the 30 candidates, 28 are Democrats and 2 are Republicans. There are only two republicans, because one of them is the incumbent president, Donald Trump, and no other republicans decided to challenge a sitting president running for a second presidential term. Our dataset¹² is publicly available and a detailed overview of the process and data appears in [10]. We refer the reader to that paper to learn about the technical details of the data collection such as use of Selenium to automate the Chrome browser in incognito mode, the capture of HTML web pages of results, and repetition of the data collection in a second location to establish lack of personalization of Top stories based on location.¹³

From December 2018 to June 2019, Top stories were observed every 6 hours, then from the end of June 2019 to December 2019, every 2 hours. For the majority of candidates, the data collection has been successful 95% of the time. An observation is a Top stories panel identified by the query and the time of collection. In general, every panel consists of 10 news stories. From each panel, we extracted the news story, its headline, URL, second-level domain to identify a source, and the position of story on the panel.

Overall, the dataset contains a total of 588,112 observed stories in the panels of the 30 candidates. For popular politicians such as President Trump and Joe Biden, the panels are refreshed frequently, leading to a large overall number of articles. Meanwhile, less familiar candidates are covered infrequently by the media and their Top stories panels are often composed of the same articles over multiple days. Within all these observations, we find 79,903 unique news articles, which were published by 2,168 unique news sources. The distribution of articles is heavily concentrated among a handful of sources. For example, 1/3 of articles originate from only 8 (0.37% of) sources: *The Hill*, *CNN*, *Fox News*, *Politico*, *Washington Post*, *Washington Examiner*, *NY Post*, *NY Times*. Another 1/3 of the articles come from 48 news outlets, including very popular publishers such

as *NBC News* or *USA Today*. As a stark contrast, 34.18% of news sources in the dataset are represented by only one article, although it's hard to believe they have not written more often about the candidates during the whole year. For the purposes of this paper, we decided to focus on the 56 news sources (out of a total of 2,168 sources) that together contributed 2/3 of the collected articles. Such a source concentration suggests that for political news, Google's algorithm has picked its "preferred" sources and samples from them more frequently than from all other sources combined.

3.2 Partisan Audience Bias

In the United States, it is particularly difficult to characterize news sources in terms of political orientation (or partisanship), because most of them declare themselves independent of any political influence. Some of the major newspapers such as *New York Times* and *The Washington Post* maintain a separate Opinion section that covers a range spectrum of opinions covering the spectrum.¹⁴ This is different from news outlets in European countries, where newspapers are often openly affiliated with political parties or movements. To overcome this obstacle, researchers have tried to measure the partisan bias indirectly through the bias of their audiences. A well known example was presented by Facebook [1]. A more recent one is [17], which created the Partisan Audience Bias (PAB) dataset¹⁵ from website links shared by real users on Twitter. Using voter registration records of US citizens with Republican and Democratic affiliations, the study identified 519,000 Twitter accounts matching these citizens. By extracting second-level domains from URLs that appeared in tweets of at least 50 different users, the authors obtained a dataset of 19,022 sites. For each site, they calculated a bias score between -1 (a site shared only by Democratic voters) to +1 (a site shared only by Republican voters). Sites that get a bias score between -1 and +1 were shared by a mix of Democratic and Republican voters. For example, *The Wall Street Journal* had a score of 0.0106, signaling that it is a news source shared almost equally by both sides.

By mapping news sources from the two datasets, we obtained the PAB score for 1,508 out of 2,168 sources. PAB scores for 660 sources are missing, and since these sources only contribute a very small percentage (3.3% of stories) to the dataset, they were discarded.

3.3 A survey with US Voters

Due to our focus on the Top stories panel, we were interested in learning whether users notice or care about Top stories. Although there are surveys that indicate that users access news from search engines [13], such surveys are not specific to components of the search results page. Therefore, we decided to run our own large-scale survey to learn about the extent to which users pay attention to Top stories. The survey was deployed through Amazon Mechanical Turk and successfully completed by 951 participants. Participants provided consent before beginning the survey and were paid

¹² Available at <https://doi.org/10.7910/DVN/0ZLHOK>

¹³ Google in its documentation that explain the Top stories feature has confirmed that Top stories generally are not localized. For more, refer to: <https://newsinitiative.withgoogle.com/hownewsworks/approach/presenting-news-in-helpful-ways/>.

¹⁴ As an example, recall the controversy about Tom Cotton's op-ed in *New York Times*, that led to the resignation of the editor: https://www.washingtonpost.com/lifestyle/media/new-york-times-editorial-page-editor-resigns-after-uproar-over-cotton-op-ed/2020/06/07/bca09606-a8fd-11ea-9063-e69bd6520940_story.html.

¹⁵ Available at <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/QAN5VX>

\$0.25 for its completion, which on average lasted one minute. No personally-identifying data of any kind were collected.

The survey focused on two types of questions: 1) Demographic questions to characterize participants' news access habits and factors that can influence news preferences, and 2) Perception-based questions regarding participants' trust towards sources frequently shown on Top stories. Answers to all questions of the first type are displayed on Table 1.

Table 1: Summary of survey responses from n = 951 participants. A big majority of participants are aware of Top stories and access news via mobile phones.

Data Type	Response
Registered political party	Democratic (504, 53.00%) Republican (253, 26.60%) Independent (194, 20.40%)
Have you ever noticed the Top stories panel?	Yes (795, 83.60%) No (156, 16.40%)
How often do you read the headlines in the Top Stories panel when it appears?	Always (45, 5.66%) Most of the time (276, 34.72%) About half the time (183, 23.02%) Sometimes (263, 33.08%) Never (28, 3.52%)
What is your most frequently used method of getting news online?	Search engine results (403, 42.38%) Direct access to website (238, 25.03%) Links to social feeds (186, 19.56%) Mobile app (95, 9.99%) Email newsletters (18, 1.89%) I don't read news online (11, 1.16%)
Do you use your mobile phone to search for news?	Yes (798, 83.91%) No (153, 16.09%)

For the second set of questions on respondents' levels of trust towards news sources, we utilized the 56 most frequently shown news sources which were identified by our analysis of the Top stories dataset [10]. From these 56 sources, the survey randomly selected five sources for each participant. For each of these five sources, participants were asked to answer how much they trust the news source (A lot, Somewhat, Not at all) or indicate if they have never heard of them (Never heard of them). Throughout this paper, we refer to calculated trust scores for each source. The scores are a weighted average of participants' responses where A lot = 1, Somewhat = 0.5, and Not at all = 0.

Surveys with crowdworkers often suffer from the fact that participants develop survey-fatigue and are rushing to answer quickly and move on to the next earning opportunity [7]. We were very conscious of this limitation and took protective measures: the respondents needed to have a high approval rating of their previous work (above 90%). Additionally, we made the survey short by limiting the number of questions for each participant. While it would have been ideal to ask every participant to provide a trust score for each of the 56 news sources, we reasoned that this will lead participants to answer randomly due to fatigue.

Our survey targeted those who voted during the 2016 US presidential elections. Thus, the responses correspond to a demographic that is more likely to regularly consume political news. While this demographic's survey responses are particularly suitable for understanding the influence of Top stories on political queries, the

results may be skewed by an audience that is more attuned to the political landscape. Questions regarding noticing the Top stories panel, reading news online, or familiarity with news sources may be an upper bound for a more general, less politically-interested audience.

Finally, because the survey was completed by crowdworkers, many demographic factors were contingent on who was available to work. We didn't ask for any demographic information, except for the political party registration. We notice that the participant pool is skewed toward individuals who identified as registered Democrats. The Democratic to Republican participant ratio is roughly 2:1, the same for Democratic to Independent. In order to account for this imbalance, we report results for each group separately, so that answers don't suffer from the oversampling of one group.

4 SURVEY RESULTS

Table 1 summarizes the responses to some of the survey questions. One of them asked participants about their main method of getting news online. A plurality (42.38%) indicates that they use search engine results instead of directly accessing news websites (ca. 25%), clicking on links in social media (ca. 20%), or using mobile apps (ca. 10%). When segmented across political orientation, we find that close to half of Republican participants, at 49.8%, use search engines most frequently, followed by 40.28% of Democratic participants and 38.14% of Independent participants. The fact that more Republicans seem to use search engines to look up news conforms with previous ethnographic research with Republican voters [24], that established their reliance on Google search to get "unbiased" news.

Most importantly for the purposes of our long-term research, we find that the overwhelming majority of the survey participants (83.60%) have noticed the Top stories panel when searching on Google. This is important, because Top stories are not part of every search result page. Of those that have noticed Top stories, the majority (96.48%) read the headlines at least sometimes. These counts are close to evenly spread across the political parties; 87.1% of the Democratic participants, 76.68% of the Independent participants, and 83.51% of the Republican participants have noticed Top stories.

Finally, we notice that an overwhelming majority also use mobile devices to search for news. This tracks with Google's efforts to deliver news faster on mobile and with its changes on interface design that emphasize multiple scrollable elements with news items (as we saw on Figure 1). The people who searched for news on mobile devices were indeed more likely to have noticed Top stories compared to those who didn't use mobile for news (85.4% vs 74.7%).

In addition to asking about respondents' awareness of the Top stories feature, we also surveyed them on their levels of trust and familiarity with the 56 news sources frequently shown within the Top stories panels for political queries. The survey randomly chose 5 of these sources to display to respondents. Each of the news sources received an average of 85 responses (standard deviation = 9.23). For each set of Democrats, Republicans, and Independents who were asked about a source, we calculated a trust score based on their responses, ranging from 0 (no trust at all) to 1 (a lot of trust) in each news source. In Table 2, we summarize the percent of asked participants who were familiar with the source, the source's three trust scores, the total number of participants who received the

Table 2: Participants' levels of trust in the 56 most frequently featured news sources on Google Top stories. Sources are ranked based on survey participants' cumulative familiarity of the source. Total # responses indicates the total number of participants who were randomly assigned to respond to a question regarding that news source. D, R, and I within the columns represent Democratic, Republican, and Independent party responses, respectively.

Rank	News Source	Percent Known	D Trust Score	R Trust Score	I Trust Score	Overall Trust Score	Total # Responses	Top Stories Rank	PAB Score
1	Fox News	100.0%	0.22	0.72	0.29	0.36	83	3	0.61
1	The Washington Post	100.0%	0.8	0.33	0.66	0.65	83	5	-0.23
1	The New York Times	100.0%	0.78	0.38	0.62	0.62	81	8	-0.26
1	NBC News	100.0%	0.68	0.42	0.46	0.56	80	9	-0.16
1	USA Today	100.0%	0.53	0.45	0.4	0.48	92	10	0.06
1	Youtube	100.0%	0.35	0.66	0.35	0.44	87	16	0.13
1	ABC News	100.0%	0.68	0.38	0.47	0.57	84	17	-0.04
1	MSNBC	100.0%	0.59	0.32	0.43	0.49	76	22	-0.62
1	The Wall Street Journal	100.0%	0.64	0.67	0.57	0.63	93	23	0.01
1	Yahoo	100.0%	0.49	0.53	0.41	0.49	101	25	0.06
1	Fox Business	100.0%	0.14	0.68	0.3	0.27	85	42	0.61
1	Yahoo News	100.0%	0.47	0.38	0.47	0.45	82	25	0.06
1	Rolling Stone	100.0%	0.52	0.27	0.34	0.42	89	51	-0.39
2	CNN	98.96%	0.71	0.23	0.42	0.56	96	2	-0.12
3	Huffington Post	98.86%	0.57	0.32	0.47	0.5	88	45	-0.31
4	New York Post	98.8%	0.32	0.41	0.43	0.37	83	7	0.18
5	AOL	97.18%	0.3	0.32	0.26	0.29	71	34	0.01
6	Yahoo Finance	97.09%	0.51	0.45	0.5	0.49	103	29	0.15
7	Newsweek	96.43%	0.58	0.42	0.67	0.56	84	12	-0.41
8	CNBC	96.05%	0.61	0.3	0.41	0.5	76	11	0.08
9	NPR	92.54%	0.77	0.53	0.73	0.69	67	49	-0.42
10	Bloomberg	92.42%	0.53	0.42	0.46	0.49	66	24	-0.08
11	LA Times	91.86%	0.51	0.28	0.27	0.42	86	31	-0.26
12	Washington Times	90.59%	0.43	0.5	0.53	0.47	85	37	0.63
13	Reuters	89.16%	0.69	0.57	0.57	0.64	83	44	-0.13
14	Politico	88.06%	0.45	0.29	0.6	0.42	67	4	-0.19
15	Boston Globe	86.02%	0.52	0.29	0.41	0.44	93	36	-0.35
16	The Atlantic	82.76%	0.54	0.34	0.31	0.44	87	30	-0.41
17	AP News	82.5%	0.8	0.46	0.62	0.7	80	32	-0.33
18	NY Daily News	81.61%	0.35	0.34	0.36	0.35	87	39	-0.25
19	Business Insider	79.0%	0.47	0.68	0.57	0.55	100	28	-0.04
20	Breitbart News	78.05%	0.11	0.55	0.28	0.29	82	13	0.74
21	Boston Herald	76.53%	0.54	0.33	0.44	0.46	98	50	0.08
22	The Daily Beast	75.0%	0.31	0.28	0.25	0.28	92	14	-0.38
23	Vox	71.77%	0.5	0.23	0.3	0.4	85	15	-0.55
24	Seattle Times	70.33%	0.44	0.19	0.32	0.35	91	55	-0.28
25	Washington Examiner	68.42%	0.19	0.39	0.35	0.28	95	6	0.54
26	The Hill	65.56%	0.32	0.15	0.5	0.31	90	1	-0.06
27	Slate	64.63%	0.45	0.25	0.33	0.38	82	20	-0.51
28	Market Watch	64.1%	0.59	0.58	0.57	0.5	78	46	0.28
29	National Review	60.36%	0.29	0.41	0.23	0.31	111	19	0.64
30	The Dallas Morning News	60.0%	0.35	0.23	0.4	0.33	80	52	-0.22
31	Salon	56.32%	0.3	0.0	0.15	0.21	87	41	-0.59
32	Mother Jones	56.18%	0.53	0.15	0.27	0.4	89	48	-0.70
33	The Des Moines Register	46.67%	0.53	0.31	0.5	0.45	90	35	0.20
34	Daily Caller	46.53%	0.06	0.42	0.17	0.18	101	33	0.70
35	The Week	40.23%	0.4	0.25	0.36	0.36	87	21	-0.18
36	Axios	39.74%	0.5	0.3	0.33	0.45	78	26	-0.34
37	Deadline	39.47%	0.33	0.21	0.4	0.32	76	56	-0.21
38	CNNNews	31.17%	0.3	0.44	0.4	0.38	77	18	-0.02
39	The Washington Free Beacon	29.87%	0.17	0.21	0.5	0.24	40	53	0.79
41	Real Clear Politics	27.94%	0.38	0.5	0.5	0.42	68	38	0.57
42	Mediaite	19.18%	0.42	0.33	0.2	0.32	73	54	0.14
43	Common Dreams	13.25%	0.5	0.38	0.25	0.41	83	40	-0.65
44	Splinter News	11.91%	0.12	0.17	0.17	0.15	84	43	-0.83
45	WMUR	9.64%	0.25	0.0	0.5	0.19	83	27	0.19

question, and its rank based on the Top stories algorithm within our dataset. We can notice that 24 news sources have a higher than 90% familiarity rate and 14 news sources had a less than 60% familiarity. One of the most striking findings here is that the news source *The Hill* which ranks first in terms of its frequency of Top stories is familiar to only 65.6% of respondents and is not particularly trusted either by Democrats or Republicans (trust scores of 0.32 and 0.15). Most importantly, Democrats and Republicans differ starkly on which sources they trust the most, with Republicans picking Fox News (0.72) and Democrats picking The Washington Post (0.80). In both these cases, there is an a gap of 3.5 times in the trust scores for the opposing opposite political orientation, highlighting the polarization of the public.

5 ALGORITHMIC CHOICE VS. HUMAN TRUST

Google Search by showing some results ahead of others has the ability to influence the public's opinion about candidates. In the literature this is known as the search engine manipulation effect (SEME) [5]. What kind of balance is Google's algorithm striking, given that some news sources clearly have a partisan bias?

5.1 The Partisan Bias in Top Stories

Our Top stories dataset contains articles from 2,168 news sources, and we mapped them to bias scores from the PAB dataset.¹⁶ The distribution of news sources by bias scores is shown in Figure 2. We first notice that the overwhelming majority of sources are in the center (between -0.5 and 0.5). Using chunks of 0.5 to divide the [-1,+1] political bias segment, we find 221 far-left, 587 center-left, 598 center-right, and 102 far-right sources in each corresponding segment. Thus, in the center, Google is equally sampling from center-left and center-right sources. Things look different for the two tails, with far-left sources outnumbering far-right sources 2:1 (221 versus 102). It is this difference that leads to the finding (see related research too) of an overall left-leaning bias in Google's news products. However, this result might be open to revision, given that the bias scores were calculated based on the audience bias.

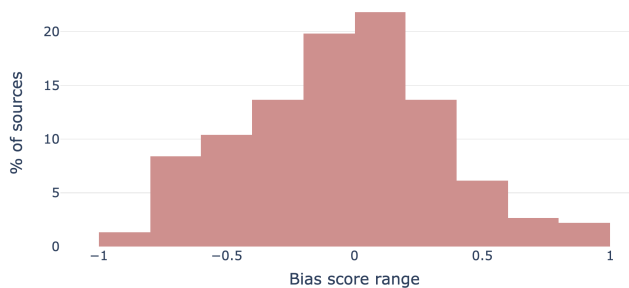


Figure 2: Distribution of Partisan Audience Bias (PAB) scores for 1,508 sources in the Top stories dataset. This distribution shows the overall sources from which Top stories samples articles. It shows that apriori to article selection, there is somewhat a balanced selection of sources.

¹⁶Reminder: Many news sources didn't have a PAB score, but these sources contributed only 3.3% of articles and were excluded from the analysis.

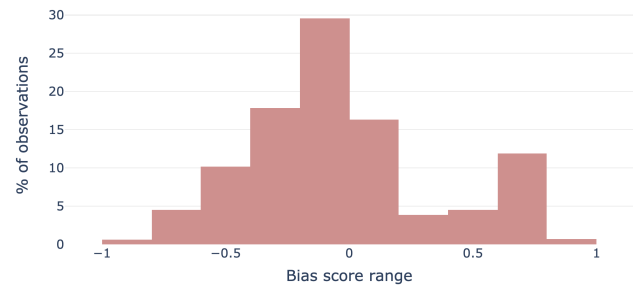


Figure 3: Distribution of PAB scores for article observations in Top stories panels. The percentage is observations of sources with bias score > 0.5 is higher than expected. That is, despite the small number of far-right sources in the overall distribution of Figure 2, articles from these sources are over represented.

Differently from the balanced distribution of news sources in Figure 2, the article distribution over almost 600K observations in our dataset present a different picture. Here we see that center-right contributes very little to the overall distribution, while far-right articles seem to make up for the anemic showing of the center-right.

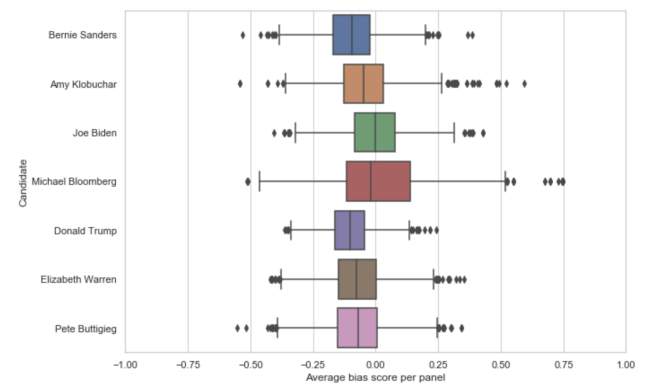


Figure 4: Average panel PAB score distribution by candidate. Distribution of scores for most candidates is slightly shifted to the left, while Joe Biden's and Michael Bloomberg's distributions are more centered.

In addition to looking at the overall bias distribution among news sources and news articles from our dataset, we considered the average bias scores of individual Top stories panels, given that users will experience one panel at a time when searching Google. For each observation, identified by a unique (candidate name, time of collection) pair, we computed the average bias score of news sources present in the panel. Sources with missing PAB scores were not included. Figure 4 displays box plots of the average panel PAB score for seven candidates (one is President Trump and the six others were still in the race at the end of February 2020. We are focusing on them, because they emerged as front-runners after one year of campaigning). Here, too, the distribution is shifted slightly to the left for most candidates. Joe Biden's and Michael Bloomberg's

panels are centered very close to 0. Statistical t-tests for all distributions indicated that all candidates but Biden and Bloomberg differ significantly from a mean=0 bias. When we compared Biden's panels' bias distribution with that of Sanders (the other main contender for the Democratic nomination), we noticed that Biden had 8% more coverage from far-right sources (22.1% vs 14.3% is the coverage from far-right sources). This can be explained by the fact that during most of 2019, Biden was regarded as the Democratic candidate with the highest chance of becoming the nominee, and thus far-right sources, particularly *Breitbart News* were focused on attacking his record. As a comparison point, there are 346 articles by *Breitbart News* about Biden in our Top stories dataset, but only 6 Breitbart articles for Sanders.

	1	2	3	4	5	6	7	8	9	10
overall	-0.05	-0.06	-0.0	-0.0	-0.02	-0.03	-0.04	-0.05	-0.05	-0.07
Pete Buttigieg	-0.08	-0.08	-0.03	-0.05	-0.06	-0.06	-0.08	-0.09	-0.08	-0.1
Elizabeth Warren	-0.04	-0.07	-0.07	-0.08	-0.07	-0.07	-0.07	-0.08	-0.09	-0.09
Donald Trump	-0.07	-0.09	-0.1	-0.09	-0.1	-0.1	-0.11	-0.12	-0.12	-0.13
Michael Bloomberg	-0.01	0.01	0.04	0.06	0.06	0.02	-0.01	0.01	-0.02	-0.04
Joe Biden	0.06	0.01	0.03	0.03	-0.01	-0.01	-0.02	-0.04	-0.04	-0.04
Amy Klobuchar	-0.13	-0.1	0.02	0.02	-0.03	-0.06	-0.06	-0.04	-0.04	-0.05
Bernie Sanders	-0.02	-0.07	-0.09	-0.11	-0.11	-0.11	-0.12	-0.11	-0.1	-0.12

Figure 5: Average PAB score per position in Top stories panel. Overall scores hover around 0, indicating balanced coverage.

Further, we looked at the distribution of PAB scores along each of the 10 Top Stories panel positions, in order to find out whether bias is evenly distributed across the positions or concentrated in the top positions.

Figure 5 aggregates average PAB scores from all observations for each of the top seven candidates. Values in the heatmap cells range between -0.18 to 0.06. While overall (first row of heatmap) the distribution of bias looks mostly even, there are differences among the candidates. Earlier we focused on Joe Biden, for whom the average bias score was around 0, but with a strong component of the distribution coming from right-leaning sources. In Figure 5 we notice that the most right-leaning coverage is concentrated in the first four positions, meaning that not only did right-leaning sources target Biden more consistently than other candidates, but these sources got a prime spot on Top stories.

Overall, we observe that each individual Top stories panel seems politically balanced, by combining articles that come from a majority of center-left sources with articles coming from a minority of far-right sources.

5.2 A Semblance of Known and Trusted Sources

Although on average the top 56 news sources seem to be known and trusted by the survey participants, a closer look gives us two notable results: (1) A plurality of the surveyed news sources are not well trusted by both Democrats and Republicans; and (2) There

exists a set of sources that are neither well-known nor well-trusted by participants of all political orientations. First, 26 out of the surveyed 56 sources are widely trusted by participants of one of the two main political parties, but not both. On average, Democrats trusted more sources at 20, while Republicans trusted only 6. On the other hand, 21 out of 56 news sources were not widely trusted by either Democrats or Republicans, among which 17 sources were not trusted by all of the three groups. Here, we consider 'not trusted' sources as sources with trust scores less than 0.5. Next, there are 14 sources that are not well known by Democrats, Republicans, and Independents. Here, we consider sources to be not well known if more than 1/3 of respondents indicated they have not heard of them.

These findings suggest that public's perception of trustworthy news sources is not aligned with that of the Top stories algorithm. We hypothesize that Google may be prioritizing showing a 'fair and balanced' set of news sources, even if the sources are not familiar or trusted, as long as they provide political diversity. Using our before-mentioned categorization of sources into far-left, center-left, center-right, and far-right by a 0.5 PAB score unit, we find 7 far-left, 26 center-left, 14 center-right, and 9 far-right in the group of 56 sources in Table 2. Google seems to make up for this imbalance in the number of available sources in two ways: (a) by oversampling from the far-right sources. Concretely, the 9 far-right sources contributed 12.58% of unique stories while 7 far-left sources contributed only 4.89%, a stark contrast. (b) by giving more volume to far-right sources at the top-tier. In the group of 8 most frequent sources that cover together 31% of all stories, two (*Fox News* and *Washington Examiner*) are far-right sources whereas none are far-left sources. As a result, the higher volume of these far-right sources compensates for the larger number of center-left mainstream media sources.

Here is one more fact: *Fox News* has a 0.72 trust score among Republicans, but an overall trust score of 0.36. Meanwhile, *Washington Examiner* is not that well-known (68.7% familiarity) or trusted by Republicans with a score of 0.39, but it is still the second most frequent conservative news source in Top stories. This provides additional evidence that neither popularity nor perceived trustworthiness are the main criteria for being included in the Top stories.

5.3 The interaction of bias and trust

Looking at the trust based rankings of the 56 sources between participants with different political affiliations, we found significant positive correlations between the ranking of Independent participants and both Democrats $rr = 0.40$, $p < .001$, and Republicans, $rr = 0.20$, $p < .05$. As demonstrated in Figure 6, we can see that the trust scores of Independents move in the same direction as Democrats and Republicans, and the majority of the trust scores lie near the diagonal line, where they have the same trust score for the news sources. That Democrats and Independents are more aligned than Democrats and Republicans, shows one more time that trust is driven by political polarization. The results also align with the findings from [16], in which the trust rankings of Democrats and Republicans were found to be significantly positively correlated with a political neutral group, fact-checkers. As for the comparison between Google's algorithm and participants, there is no significant correlation between Google ranking and either composite trust

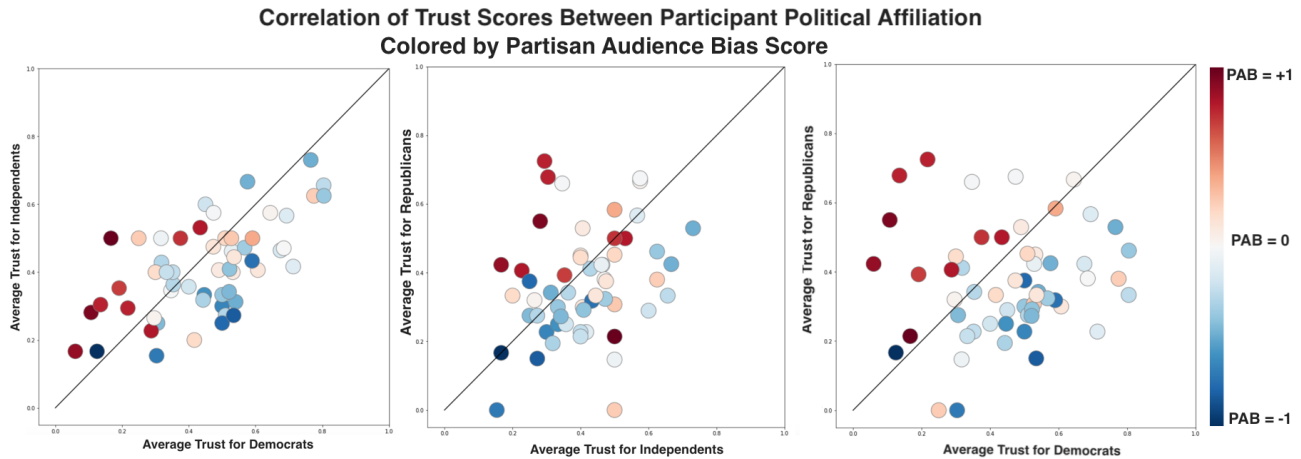


Figure 6: Correlation between Republican vs. Independent vs. Democratic participants' levels of trust towards the top 56 news sources in our Top stories dataset. Trust scores fall in $[0,1]$, where 0 indicates the participant has no trust for the source, while 1 indicates lots of trust. Plots are colored by Partisan Audience Bias (PAB) scores $[-1,1]$ where closer to -1 indicates far-left and closer to +1 indicates far-right.

score based ranking, or categorized rankings from three political parties. It reinforces our claim that Google's algorithm does not rely on public's perceived trust as a criterion for preferring a news source.

Meanwhile, Table 2 provides additional evidence that the ranking of sources by the participants and Google's ranking are not aligned. The top ranked news sources based on Democrats, Republicans, and Independents' trust scores are *The Washington Post*, *Fox News*, and *NPR* respectively, but the top Google ranked news source, *The Hill*, is not within the top 10 of any of the participants' ranking list. To explore this further, we conducted Wilcoxon signed-rank tests to compare the difference between Google's ranking and the trust score ranking from respondents with different political affiliations. We found that Google's top 10 ranked news sources have a significantly different ranking order as compared to the Democrats' trust score based rankings ($z = 8.0$, $p < .05$), Republicans' trust score based rankings ($z = 1.0$, $p < .01$), and Independents' rankings ($z = 5.0$, $p < .05$). We also observe such significant differences between participants and Google's rankings in the top 20 and last third of the 56 news sources.

To conclude, our various tests and visualizations indicate that no group of a certain political orientation in the US can be satisfied with Google's ranking, because Google is not relying solely on commonly used metrics such as familiarity or trust of news sources to assemble the panel of Top stories.

6 DISCUSSION

6.1 Google Top Stories and 'The Fairness Doctrine'

Google has the difficult task of aggregating news stories from many sources, so that every user can find a multitude of diverse perspectives. However, as our survey indicates, the public disagrees about which news sources are trustworthy, therefore, Google has

to select a few sources that are trusted only by minority groups in the audience. How is Google doing this? According to Google's public documentation, they use human Search raters¹⁷ to rate news sources across several criteria, and then have algorithms that automatically learn how to rank articles based on such signals. Furthermore, Google explains that it doesn't try to assess the "ideological or political leaning" of publishers or users, while at the same time, promising a diversity of points of views. There is a tension here that Google's documentation doesn't resolve. What kind of diversity are they referring to?

The evidence from our one-year long audit shows that Google is sampling from a diverse set of news publishers (where diversity here is simply the partisan audience bias score), as shown in Figure 2. We consider this as an effort to be "fair and balanced" in the spirit of the old "fairness doctrine" which required broadcasters to strive fulfilling the "public interest". However, as with the doctrine itself, the meaning of "fair" remains contested. Fair to the audience? Fair to the political candidates? Fair to the news publishers? As everything that is determined algorithmically, such choices are both open to criticism as well as exploitation. To an individual that has a limited number of trusted news sources, as it seems to be the case with Republican voters (they trusted 6 out of 56, compared to 20 out of 56 for Democrats), any Top stories panel configuration will look as heavily left biased, although the very concept of "left" here is doubtful, because it simply means that people registered as Democrats find this source trustworthy. In order to be fair to Republicans, Google has to surface news from the right. But the distorted right-wing news ecosystem, with a few far-right sources dominating the coverage, leads to their disproportionate amplification, often at the expense of trustworthy journalism that is less polarizing. One thing is clear, Top stories do not create an echo chamber, and might be even susceptible to right-wing propaganda.

¹⁷<https://newsinitiative.withgoogle.com/hownewsworks/approach/surfacing-useful-and-relevant-content/>

6.2 The Growth of Top Stories and Mobile News

In anticipation of mobile devices' usage passing that of desktop devices, which happened around the end of 2016,¹⁸ Google pushed news publishers to adopt its new content-delivery technology, AMP (Accelerated Mobile Pages), and made that the cornerstone of a new user interface element: a scrollable carousel of Top stories explicitly made for mobile devices. Google's efforts seem to have paid off. In our survey, we learned that most US voters are aware of Google's Top stories, especially the ones who use mobile devices to access online news. Our survey also indicates a large number of voters using search engines to find news (more than for any other online medium). However, that number might be an over-estimation, due to our sample being entirely composed of crowdworkers whose digital habits might differ from the general voting population. Nevertheless, Top stories seem to have become a very noticeable news aggregator. Given that more people use Google Search daily than any other service, the integration of Top stories on Google Search is an important development that needs to receive more attention from researchers, in terms of understanding how users access and consume news online. This move toward consuming news on mobile devices poses a technical challenge for the auditing community. The audits we cite and our own audit as well were carried out on desktop machines. A recent small-scale test we performed manually on a mobile device indicated that the first row of Top stories on a mobile device conforms with Top stories on a desktop device, but as we can notice in Figure 1, on a mobile device Google Search is showing several rows of Top stories. Thus, we need to develop an auditing infrastructure that can run on mobile devices, something that is currently missing.

7 CONCLUSION AND FUTURE WORK

The high visibility of Top stories on Google Search makes them vulnerable to accusation of bias from political actors. Which news sources should get selected? In a politically polarized environment, voters disagree on what news sources to trust, creating a low-trust environment. The analysis of trust scores provided by our survey participants revealed a wide-range variability in the trust scores for the 56 news sources that were responsible for 2/3 of all articles on the election candidates displayed on Google's Top stories, that is, for the news sources that Google is elevating through its algorithm. We theorize that Google is resorting to the long-defunct "fairness doctrine", which gives equal opportunity to opposing viewpoints with its efforts to sample from across the political spectrum. Because there are far fewer far-right leaning sources than center-left sources, the far-right news publishers get greater visibility on Top stories than publishers that have a history of credible journalism.

Are all Top stories equal? Future work could analyze their headlines and corresponding images as well as their perceived political bias. Our findings are specific to queries about the 2020 US presidential candidates. To understand Top stories' impact holistically, future work should include collecting data on other topics, on mobile devices, as well as in other countries and languages other than English.

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¹⁸<https://techcrunch.com/2016/11/01/mobile-internet-use-passes-desktop-for-the-first-time-study-finds/>