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# Tweeting Left, Right & Center:

How users and attention  
are distributed across Twitter

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## Executive summary

More than 48 million Americans use Twitter, one of the most popular social networking platforms, and one used extensively by media and political junkies. This study analyzed more than 86 million tweets posted in 2017 to reveal how users from across the political spectrum engage differently with news issues and major media outlets on Twitter. We assigned randomly-sampled users ideology scores based on who they follow, then divided them into four segments: extreme left, center left, center right, and extreme right.

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### Key findings:

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**The center left is the largest segment present on Twitter by far.** The extreme right is a distant second in size, followed by the center right and extreme left.

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**The extreme right is more extreme than the extreme left.** The ideology scores for users in the extreme right segment are substantially further from the center than those in the extreme left.

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**The center-left and extreme-left segments behave more like each other than the center-right and extreme-right segments do.** Both left segments referenced more of the same accounts, whereas the center-right and extreme-right were generally engaged with very different types of accounts from one another.

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**Pundits for the extremes, mainstream media for the center.** Users in the two center segments referenced mainstream media accounts much more frequently than extreme users, who engaged more with opinionated sources.

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## Introduction

This report examines how American Twitter users of differing ideologies expressed themselves in political contexts.

The four main questions addressed are:

- 1. What is the ideological balance of political discussions on Twitter? In particular, are they dominated by the center or the extremes?**
- 2. Who do politically-interested Twitter users mention and reply to most often, and how does this differ based on their ideology?**
- 3. To what extent do users of differing ideologies express civil and uncivil sentiments toward journalists and news outlets?**
- 4. How is attention distributed across users of differing ideologies?**

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### **Key findings (continued):**

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**Users are more likely to insult news outlets than praise or substantively criticize them; the extreme right is most likely to insult.** No segment emerged as a clear leader in substantive criticism, and praise is by far the rarest of the three sentiments.

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**The center segments attract more attention than the extremes.** As the largest segment, sampled users from the center left attracted the most retweets, mentions, or replies overall; but the much smaller center right segment accrued the most per user, indicating greater attention to posts on average.

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## About our datasets

Throughout this analysis, we use three distinct, U.S.-focused Twitter datasets. The first, which we call the “issue dataset,” consists of **60,735,013 tweets** posted throughout 2017 containing keywords related to one or more of the following major news issues of that year:

- Hurricanes
- North Korea
- Robert Mueller’s Russia investigation
- Sexual harassment
- White nationalism
- Mass shootings

Our second dataset, which we call the “news outlet dataset,” contains replies to the main Twitter accounts of five leading American news outlets:

- New York Times
- Washington Post
- CNN
- Yahoo! News
- Fox News

These replies span from Nov. 8, 2016 (Election Day in the U.S.) through June 6, 2018. This dataset contains **25,893,747 tweets** in total.

Our third dataset contains 1,000 unique screen names of users who claimed to live in the United States. These were sampled randomly from all public tweets posted between March 11 and March 18, 2019.

Additional details about our sample can be found in the Methodological Appendix.

**All the findings below rely on a method of scoring Twitter users based on the ideological balance of who they follow. It is a long-running assumption in political science and communication research that “birds of a feather flock together;” in other words, that individuals of similar political persuasions tend to communicate and associate with one another more than with those of differing beliefs.**

This assumption led digital politics researcher Pablo Barbera to create a method of assigning ideology scores to Twitter users on a left-right dimension based on who they follow, specifically “elite user” accounts.

Barbera generally defines “elites” as well-known individuals with some degree of interest in politics, including actors, musicians, organizations of various types and media outlets, in addition to elected officials and other governmental authorities. To oversimplify a bit, the more right-wing elite users you follow (and the more extreme they are), the more likely you are to be right-wing yourself, and the same for left-wing elites. His scoring algorithm uses a database of 1,186 elites whose scores are known, and the scores of unknown users are generated based on which of these known elites they follow. More details on this method are available in the Methodological Appendix and in Barbera’s research article introducing the algorithm.<sup>1</sup>

The ideology score spans a single numerical dimension centered on zero. Users who follow a balance of progressive and conservative elite accounts will have a score near zero, those who mostly follow the latter will have a positive score, and those who mostly follow the former will have a negative score.

Once user ideology scores in our datasets were calculated, we categorized each into one of four ideological segments based on their score: extreme left (less than -1.0), center left (-1.0 to 0), center right (0 to 1.0), and extreme right (greater than 1.0).<sup>2</sup> (For an in-depth explanation of why we chose these particular boundaries, consult the Methodological Appendix.)

Table 1 displays a few example elites and their corresponding ideology scores and segments in order from most progressive to most conservative:

**Table 1**

Example ideology scores and segments

Screen name	Description	Ideology score	Segment
@MomsDemand	Moms Demand Action (gun control advocacy group)	-1.66	EXTREME LEFT
@repjohnlewis	John Lewis (D-GA, House representative for GA's 5th district and civil rights leader)	-1.44	
@LeoDiCaprio	Leonardo DiCaprio (actor and environmental activist)	-0.87	CENTER LEFT
@sen_joemanchin	Joe Manchin (D-WV, senior senator of West Virginia, known for his bipartisanship)	-0.26	
@sendeanheller	Dean Heller (R-NV, former senator from Nevada, a moderate who initially repudiated President Trump and later embraced him)	0.31	CENTER RIGHT
@FoxNews	Fox News Channel (conservative-leaning US cable news network)	0.76	
@Heritage	The Heritage Foundation (conservative think tank)	1.17	EXTREME RIGHT
@WayneDupreeShow	Wayne Dupree (conservative radio show host and USAF veteran)	1.58	

We should note that while this method works well in the aggregate, there are certain classes of users for whom it does not work well. Probably the most relevant example here is journalists, who often follow accounts of different ideological persuasions without necessarily agreeing with them. This limitation notwithstanding, we believe the method is valid for most non-journalist users, who constitute the majority of our data samples.

# Twitter ideologies: Baseline measure

We obtained a baseline measure of Twitter ideology by drawing and assigning ideological scores to a random sample of 1,000 American Twitter users during one week in March 2019.<sup>3</sup> This sample was not topically bounded and thus includes users who engage on a variety of political and non-political subjects. The result is an ideological distribution of American Twitter users that is not biased by prior choices of topic or addressee (Figure 1).

**Figure 1**  
Baseline: American Twitter Ideology Score Distribution



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## Figure 2

Histogram of baseline ideology scores (see Appendix on page 26)

The general pattern revealed in Figures 1 and 2, which will also be present in most of the subsequent analyses, is that most American Twitter users are center-left. Specifically, 57 percent of users fall between -1 and 0 on the ideology scale: by comparison, 10 percent fall below -1 (far left), 8 percent are between 0 and 1 (center right), and 25 percent are above 1 (far right). Thus, as far as ideology can be inferred through follower patterns, the center left is the largest segment, followed by the far right, then the far left, with the center right in last place.

## News Engagement by Ideology

As with the baseline, we find that the users in our issue and news outlet samples are heavily concentrated in the center left, with much smaller numbers in the extreme left, center right, and extreme right.

To reach this conclusion, we drew random samples of 1,000 users from each outlet or issue within each dataset and calculated an ideology score for each user.

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### Engagement on news issues

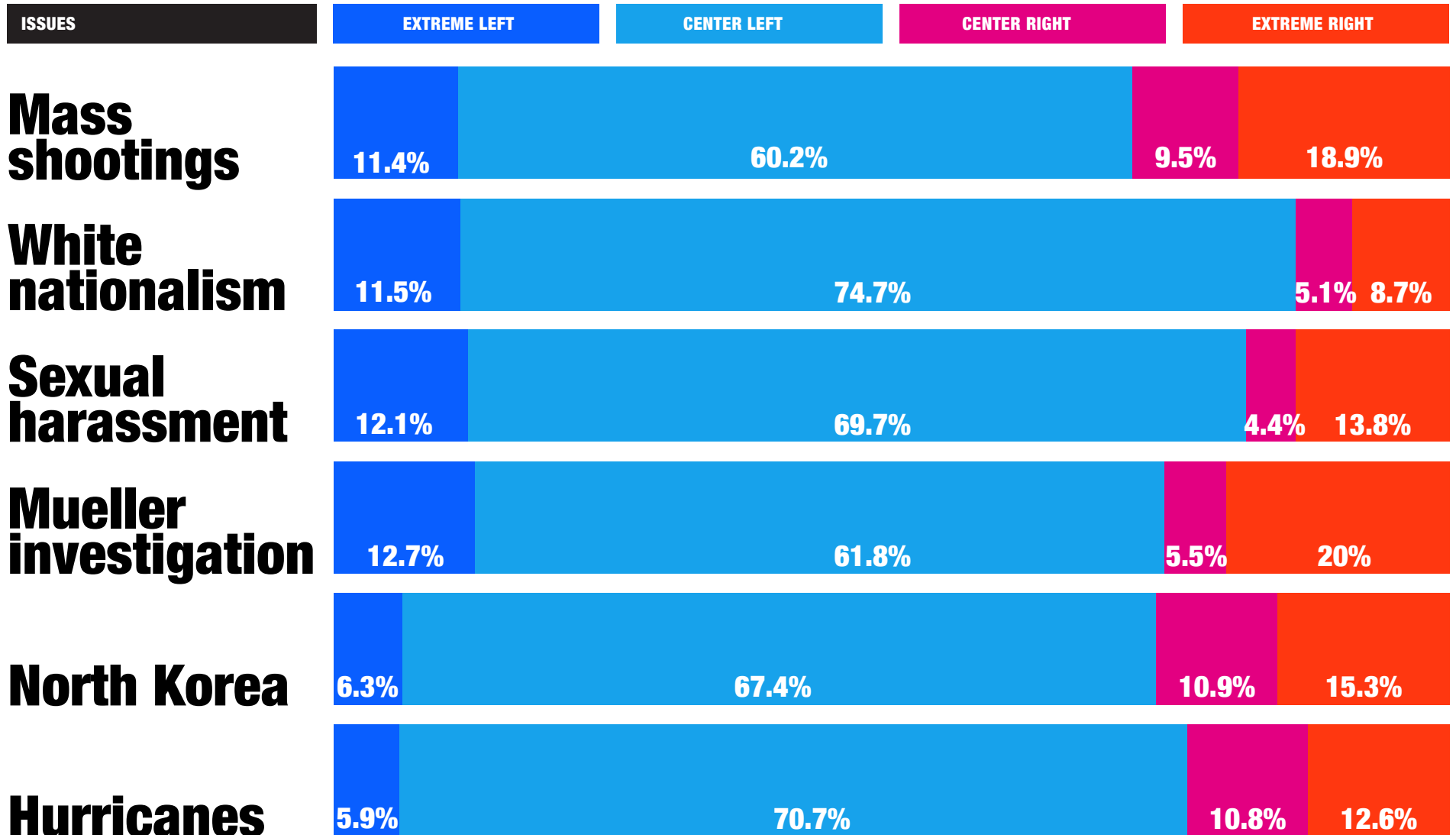
Figure 3 (See Appendix on page 26) displays the ideological distribution for all users sampled from the news issue dataset. Overall, there are far more left-leaning users than right-leaning ones engaging with these news issues on Twitter: 77.5 percent of all users have scores below zero. On the left, most users stick fairly close to the center: two-thirds (67 percent) of all users fell between -1 and 0. Only three users fell below -1.5, but 393 users scored above 1.5, indicating a stark difference between the extreme left and extreme right. Generally, the left is crammed into a narrow ideological range, while right-leaning users are spread much more evenly over a broader range. Overall, these figures skew to the left of the baseline, containing 0.2 percentage points fewer far left users, 10.3 points more center left users, 0.8 points fewer center right users, and 9.3 points fewer far right users.

Figure 5 shows the center and extremes for the issue sample.



Figure 5

Ideological segment proportions by issue



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The bars show the proportions of each issue’s sampled users that falls into each segment. The center left definitively dominates Twitter dialogue on all six issues, while the extreme left occupies a tiny proportion of each issue’s audience. The two conservative segments are comparatively small, but it is notable that the center right is much smaller across all issues than the extreme right, which is generally comparable in size to the extreme left.

### **Engagement with news outlets**

Now let’s turn to users who reply directly to news outlets. While this group is by no means representative of the U.S. population, they are among the most engaged with current events generally and news coverage thereof specifically. When we look at all sampled users across the five outlets who followed five or more political elites (94.8 percent of the total), we see that 56.2 percent of users are left-of-center while 43.8 percent are right-of-center. This might at first seem fairly balanced, but a closer look at Figure 6 reveals that the left again occupies a much narrower ideological range than the right. Without exception, every left-of-center user falls between 0 and -1.49, while the right features 962 users with scores above 1.5. As with the issue tweets, there appears to be a large but narrow center left segment, a small extreme left, and a much wider spectrum of right-wing opinion.

Applying this same analysis to each outlet individually reveals three distinct patterns of ideological participation (Figure 7, see appendix page 29). The first is exemplified by the New York Times and the Washington Post, both of which attract primarily progressive

respondents (67.8 percent left-of-center for the former and 69.4 percent for the latter). CNN and Yahoo! News are more ideologically balanced, with 53 percent and 53.9 percent left-of-center respectively. Finally, as might be expected, Fox News’ respondents are mostly right-wing, with only 36.9 percent scoring less than zero. These findings defy the conventional wisdom that social media commentary on journalism comes mostly from disgruntled trolls who don’t even read the content they’re writing about. Instead, they suggest that each outlet has an ideological “mainstream” that produces most of its digital responses, as well as a substantial minority of commenters from outside that mainstream. The Times’ and the Post’s mainstreams are left-of-center, CNN’s and Yahoo’s are more centrist, and Fox News’ is right-of-center. These findings are consistent with what we already know about which news outlets progressives and conservatives trust most.<sup>4</sup>

Breaking the user distributions down by segment reveals a rather different picture than we saw with the issue tweets (Figure 8). As with the issue tweets, the center accounts for majorities or pluralities of each outlet’s audience except for Fox News, which is understandably dominated by the far right. But compared to the issue conversations, the two right-wing segments claim a much larger combined presence here. The main similarity to the issue distributions is the small size of the extreme left, which does not differ substantially between outlets. These figures skew slightly to the right of the baseline, containing 6.3 percentage points fewer far left users, 4.8 points fewer center left users, 4.7 points more center right users, and 6.5 points more center right users.

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Together, Figures 5 and 8 paint a picture that is consistent with prior research on Twitter users' politics: a dominant center left, a moribund far left and center right, and a far-right that is much more extreme than any other segment.<sup>5</sup> The center left especially dominates discussion of popular political issues, while the right seems to be more interested in interacting directly with news outlets. However, the right only outnumbers the left in replies to @FoxNews, falling below 50 percent of users in the remaining 10 samples across both datasets. There are some interesting differences between news outlets, with the two national papers appearing to draw a more left-wing audience than CNN and Yahoo! Finally, it is worth noting how the opposing center and extreme segments differ in size between the datasets: with the issues, the extremes are relatively close in size, while the center-left dwarfs the center-right. The news dataset reprises the pattern among the center segments, but here the extreme right vastly outnumbers the extreme left.

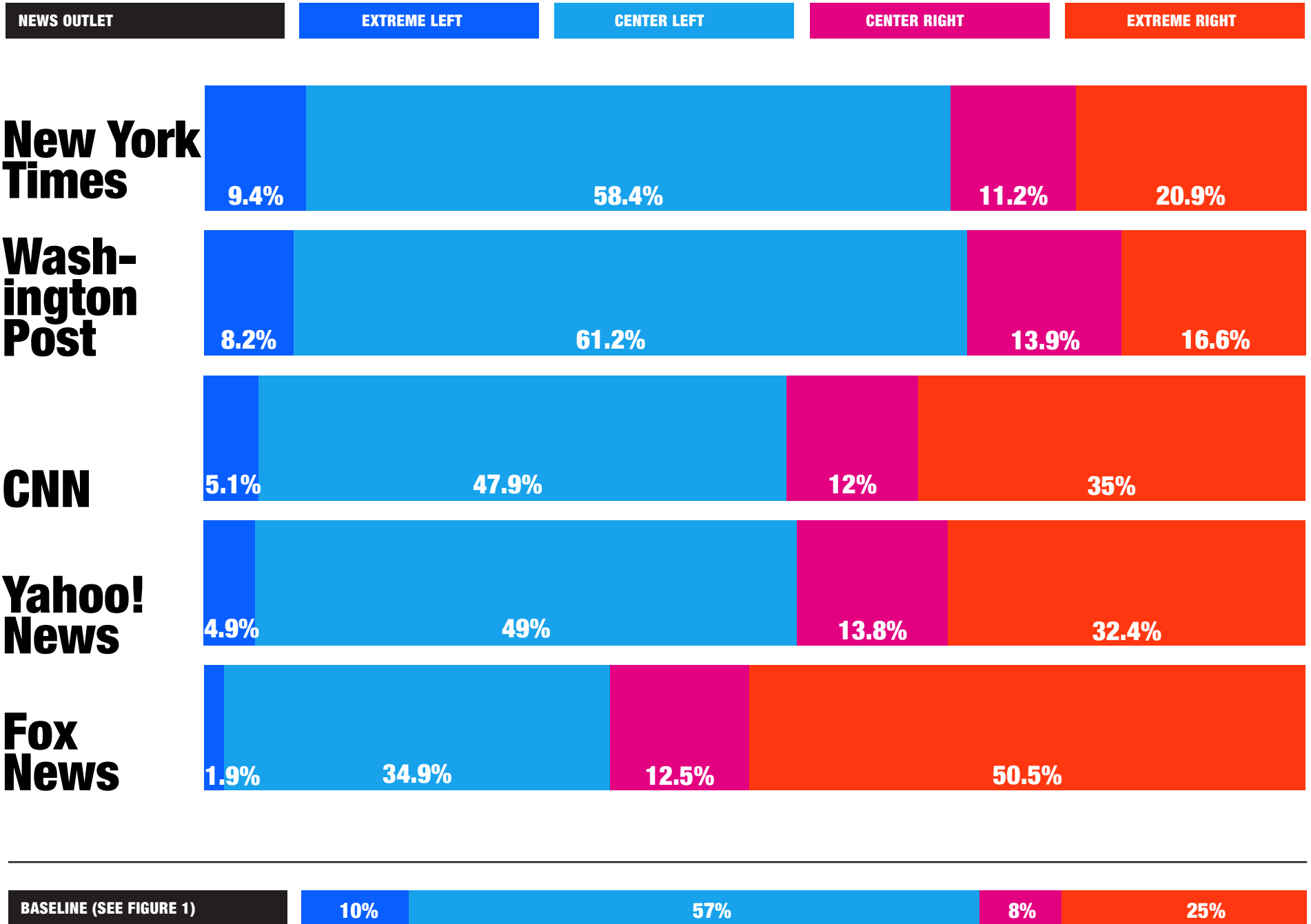
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### **Baseline comparison**

Comparing ideological distributions between the two datasets is instructive, but by comparing the baseline to the two datasets statistically, we can demonstrate how much more right- or left-wing each subsample is relative to Americans on Twitter generally. The math here is fairly simple: the proportions of each segment within each subsample is subtracted from the corresponding proportion in the baseline. Each difference thus represents the degree of deviation from the baseline segments, or in other words, how much more each segment is represented compared to a random sample of American Twitter conversation. Figure 9 displays the results of this analysis, which supports a clear distinction between the two datasets. Among all six issue subsets, the center left is overrepresented while the far right is underrepresented. But for news outlets the general pattern is reversed: the right is overrepresented in the replies to three of five outlets, while the center left is underrepresented in those same three. The extreme left and center right hew close to the baseline for the issues, but the former is consistently underrepresented for news while the latter is consistently overrepresented. The most important conclusion to draw here is that the right seems more interested in addressing news outlets than the left, which is more concerned with discussing specific political issues.

**Figure 8**

Ideological segment proportions by outlet



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Analyzing Twitter users' ideological distributions within various political contexts is only the first step toward understanding political difference on the platform. We continue by exploring who the centers and the extremes reply to in their tweets, and how these reply patterns overlap. We assume that segments that reply to similar sets of accounts are participating in the same general conversations, while those that reply to separate sets of accounts are talking past one another. To quantify this property, we extracted from each news outlet dataset the complete list of screen names replied to by at least one of the users we sampled.<sup>6</sup> Then, we calculated a “similarity score” by computing the cosine similarity between each segment pair’s reply lists for each issue and outlet. The higher the similarity score between two segments, the more similar their reply lists (see the Methodological Appendix for more details). Each outlet has six similarity scores, one per segment pair.

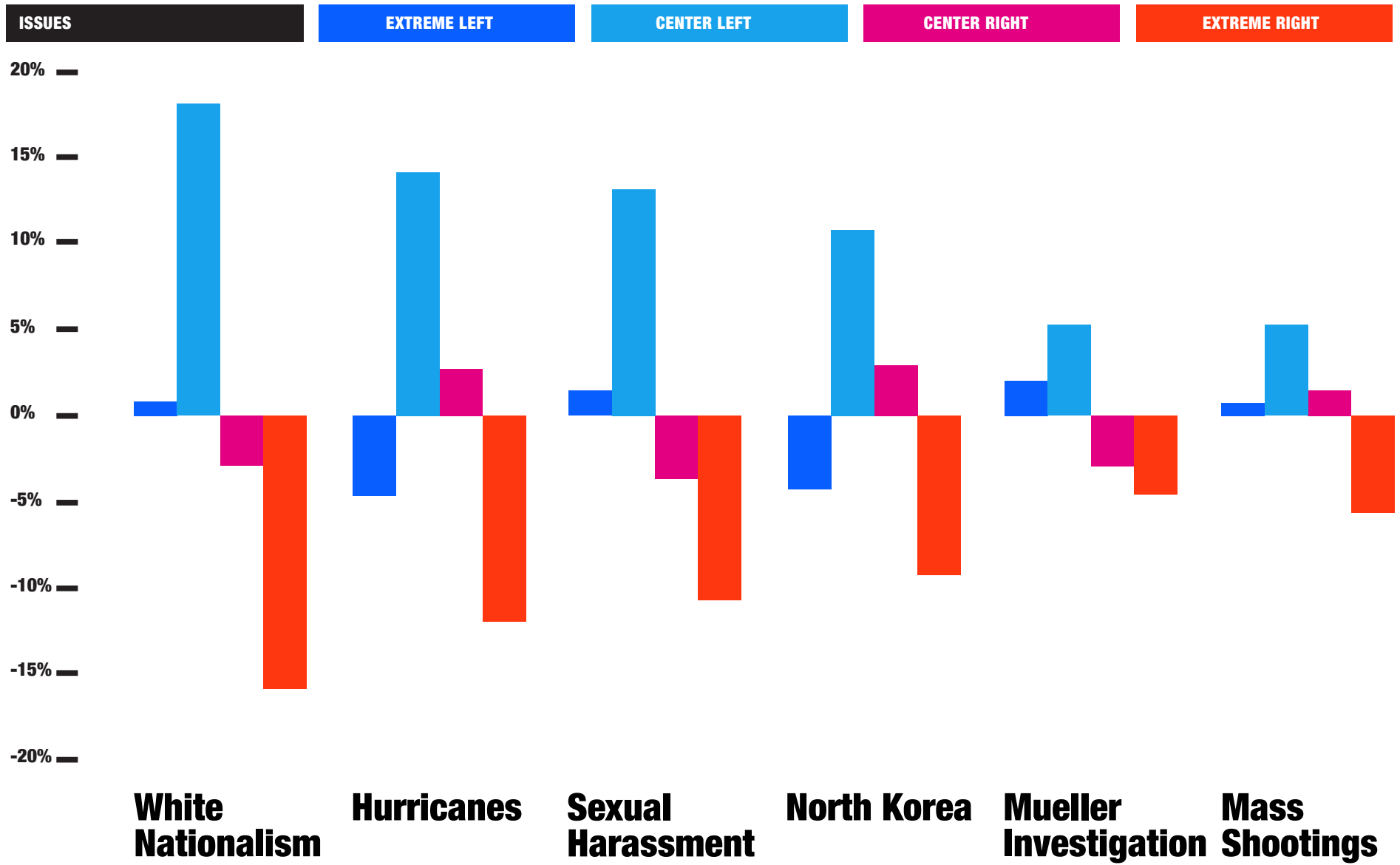
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### **News issue tweets**

In Figure 10 (see page 17), the bars represent the degree of overlap in users referenced by each segment. The height of each bar represents the magnitude of the similarity score. In other words, higher bars reference similar sets of users; lower bars reference very different sets of users. The extreme and center lefts share the most similar reference groups, as their similarity score is the highest of the six across all six issues. Most of the other segments are fairly far apart in terms of who they reference, with the exception of the center right and extreme right for the Russia investigation.

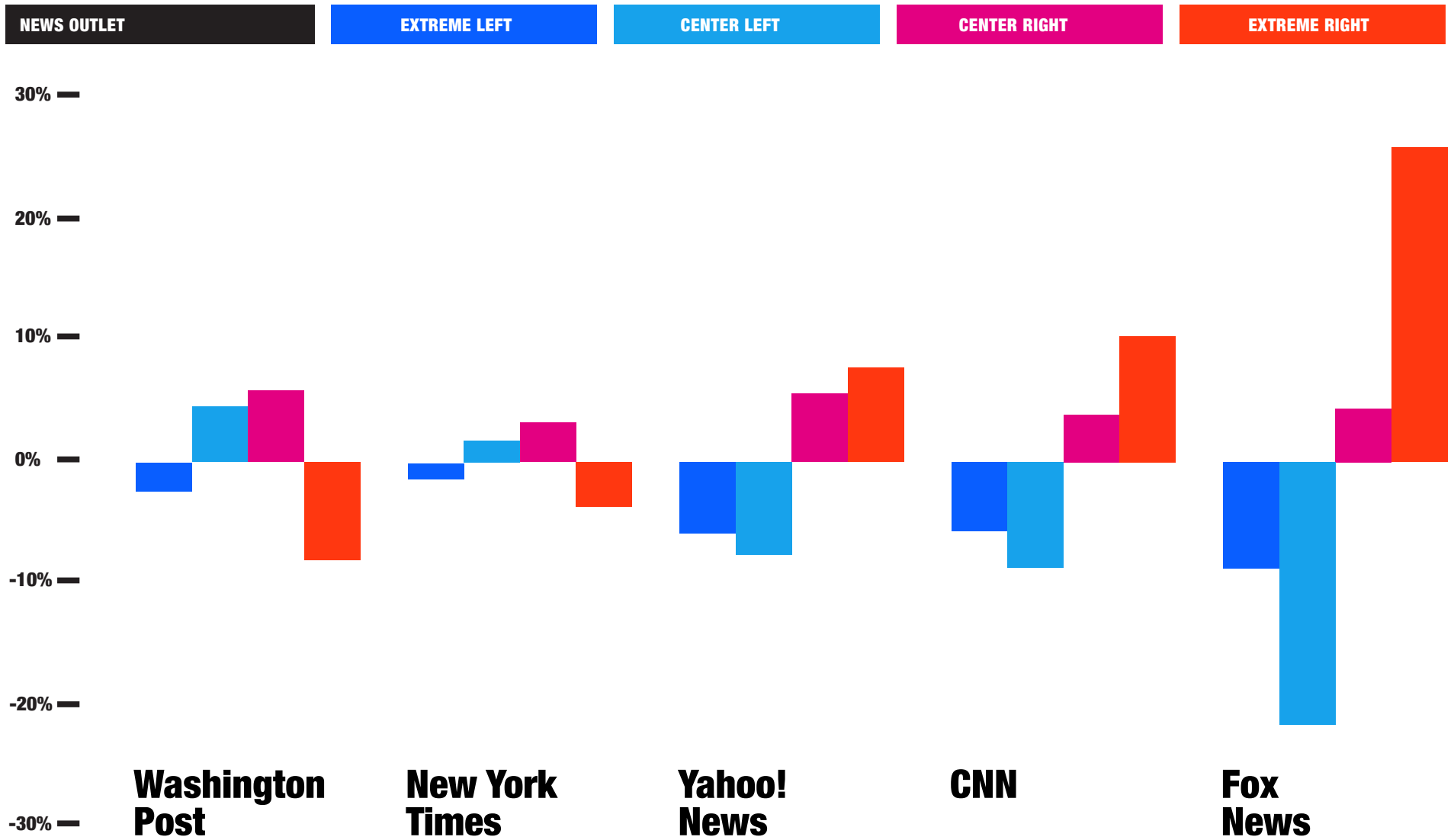
**Figure 9**

Comparison of news issues and outlet ideology segments to baseline



**Figure 9, con't.**

Comparison of news issues and outlet ideology segments to baseline



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## News Outlet References: Who is replying to whom?

Next, we analyzed which types of users each segment references most often (by “reference,” we mean retweet, mention, or reply). We divided each account into one of six categories:

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**Executive branch:** Any accounts associated with the executive branch or Donald Trump’s family.

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**Non-executive government:** Any other government account not included in the previous category.

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**“Old” (traditional) pundits:** Individuals and institutions associated with established media outlets who produce opinions as a substantial part of their jobs.

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**“New” pundits:** Individuals who operate independently from established institutions and are known for their opinions. Some of these are self-made internet personalities who make their living writing or broadcasting, while others are amateurs or volunteers.

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**Mainstream media (MSM):** Major news media outlets that produce at least some original journalism.

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**Other:** Accounts that do not fit into any of the above categories or that were suspended or deleted when we tried to classify them.

The height of each bar in Figure 11 indicates the proportion of each segment’s top10 most popular references accounted for by each of the six types. For each segment, we divided the raw count for each account type by 60 since there are 10 accounts for each of the six issues. The clearest patterns here involve the mainstream media and the two pundit categories. The extremes engage disproportionately with pundits, while the center segments rely much more on traditional media. Despite its well-known distrust of mainstream media outlets, the extreme right engages with its members more often than the extreme left. Government accounts are fairly unpopular across the board, as are unclassifiable or deleted accounts.

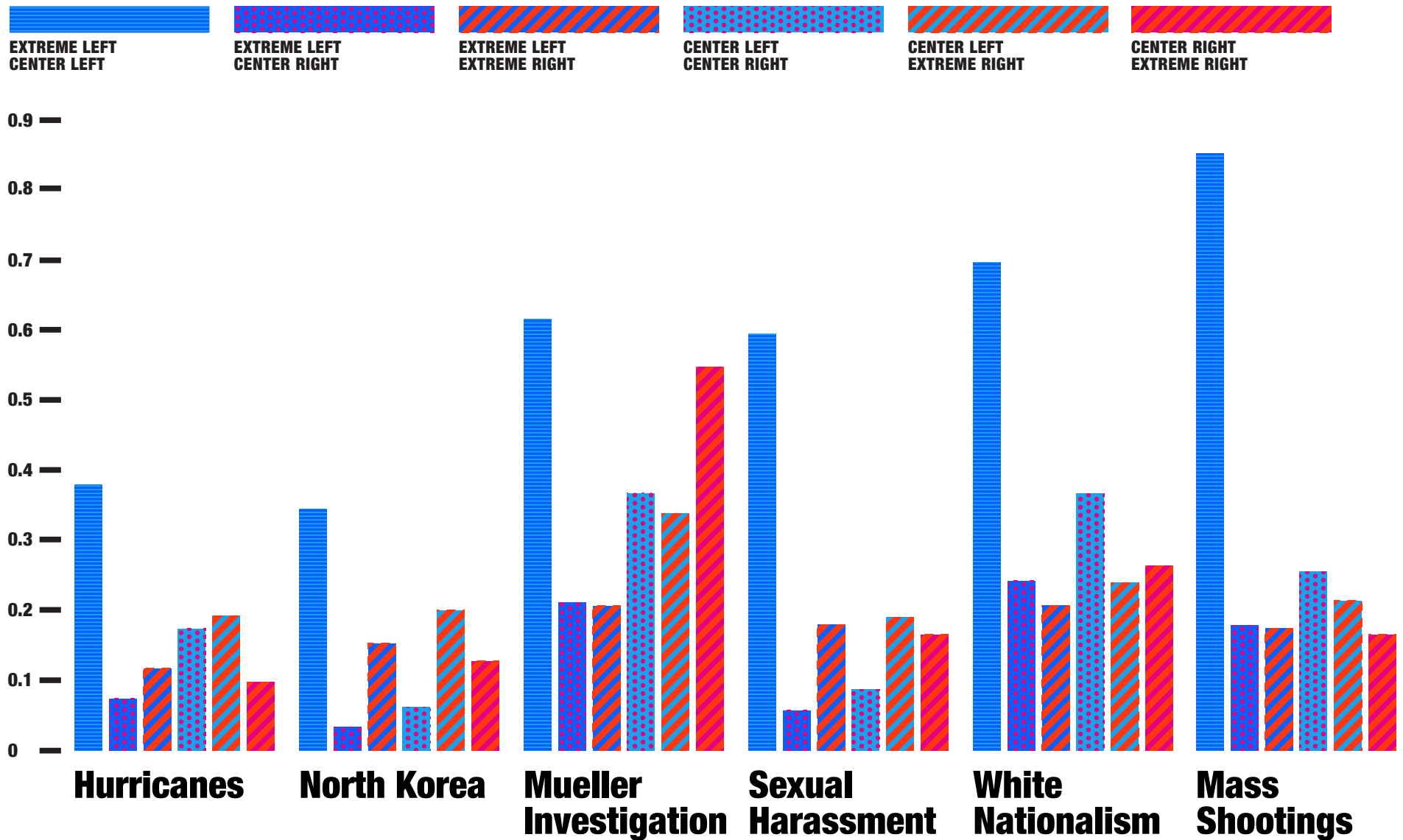
To illustrate the above, Tables 2a through 2f (see Appendix on pages 31-33) show the 10 most-referenced users by issue within each segment, along with how often they were referenced. The colors indicate the account types described above. These show that the segment’s engagement with different account types depended somewhat upon the issue. For example, mainstream media accounts generally did not make it into the extreme left’s top 10, but the issue of sexual harassment was a major exception. Similarly, the extreme right engaged with mainstream media outlets much more than usual on sexual harassment and on the Russia investigation.

These tables also reveal which accounts are major sources of general information and opinion across issues for each segment. As might be expected, Donald Trump (via either @realdonaldtrump or @potus) shows up in most of the lists regardless of ideological leaning. @foxnews appears at either #1 or #2 on all of the extreme right’s lists, with conservative actor @realjameswoods (five lists) and conspiracy theorist @prisonplanet (four lists) also proving popular.



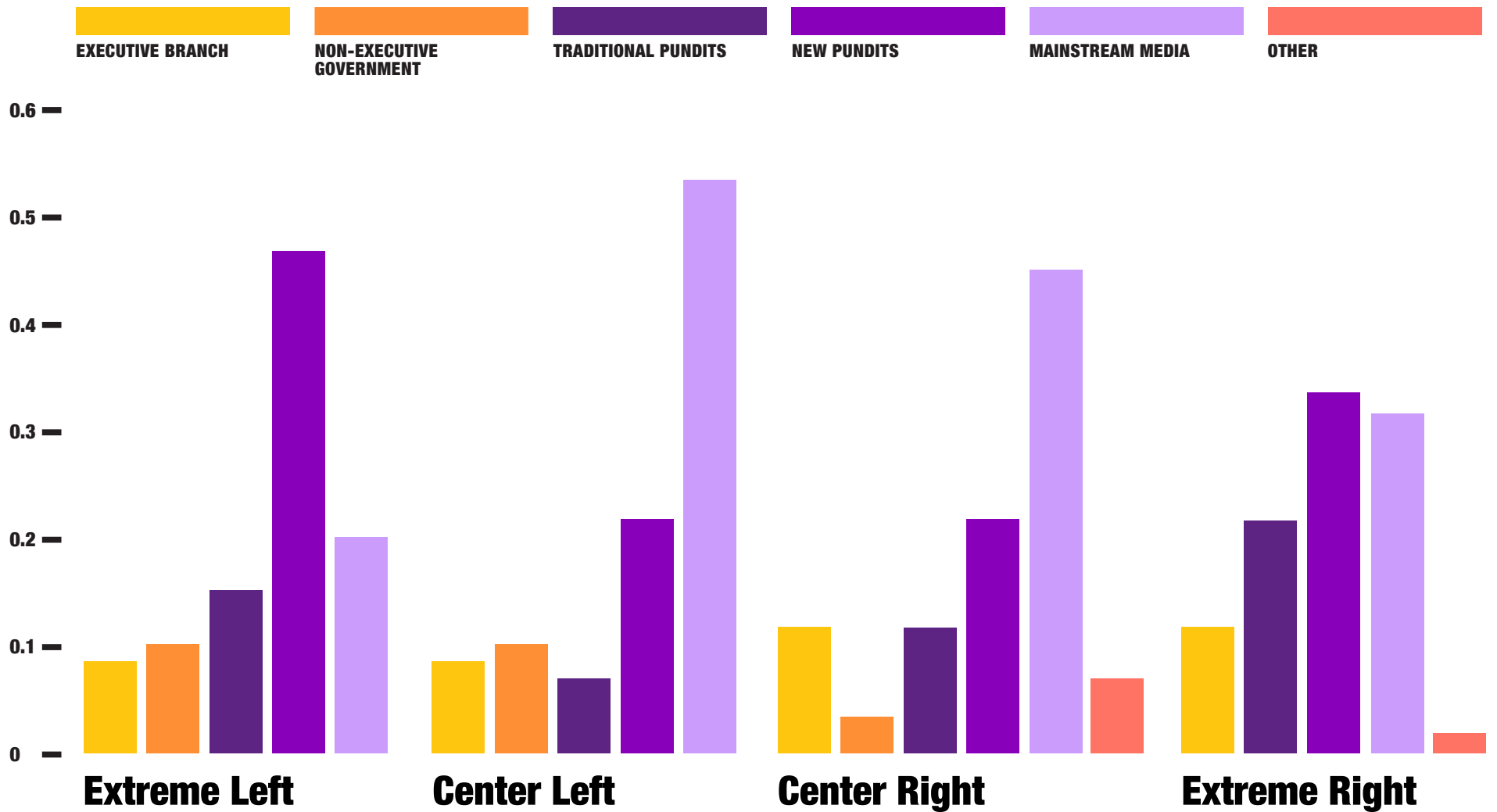
**Figure 10**

User overlap in ideological segment references by issue



**Figure 11**

References by account type (news issue tweets)



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Congressman and prominent Trump opponent @tedlieu (D-CA) appears on all 12 left lists, making him the left's most popular account by far. Other prominent accounts on the left and center-left include Virginia Commonwealth University graduate student @rvawonk (seven appearances), "Never Trump" Republican pundit @ananavarro (six appearances), and anti-Trump law professor and author @sethabramson (five appearances).

### **News outlet tweets**

Reprising the similarity scores (cosine analysis) for the news outlet tweets, we see some similarities and differences from the issue data. The bars in Figure 12 fall into three loose categories. The NYT shows a high relative degree of ideological separation: most segment pairs do not share substantial numbers of replied-to users, except for the extreme left and center left, which are much higher than the others. Users who reply to Fox News, in contrast, experience the most ideologically integrated conversation of the five outlets in that the same reply targets appear in large numbers across all segments. In the middle are the Washington Post, CNN, and Yahoo! News, which display intermediate levels of separation. If we take the average similarity score as an indication of the overall polarization of each outlet, the Times has the lowest scores (0.3), the Post, CNN, and Yahoo! are in the middle (0.57, 0.64, and 0.65 respectively), and Fox News is the highest (0.94).

A second set of conclusions pertains to how each segment relates to one another across outlets. The center- and extreme left consistently reply to similar sets of screen names, but for the center- and extreme right, this tendency varies by outlet. The two right-wing segments of the Times are talking to very different groups of users, but they are more similar for the Post, CNN, and Yahoo! and close to identical for Fox News. The two extremes increasingly occupy the same conversational space as we move from left to right. The content of these conversations is contentious in many cases and sometimes downright uncivil, themes to which we will return in the next section.

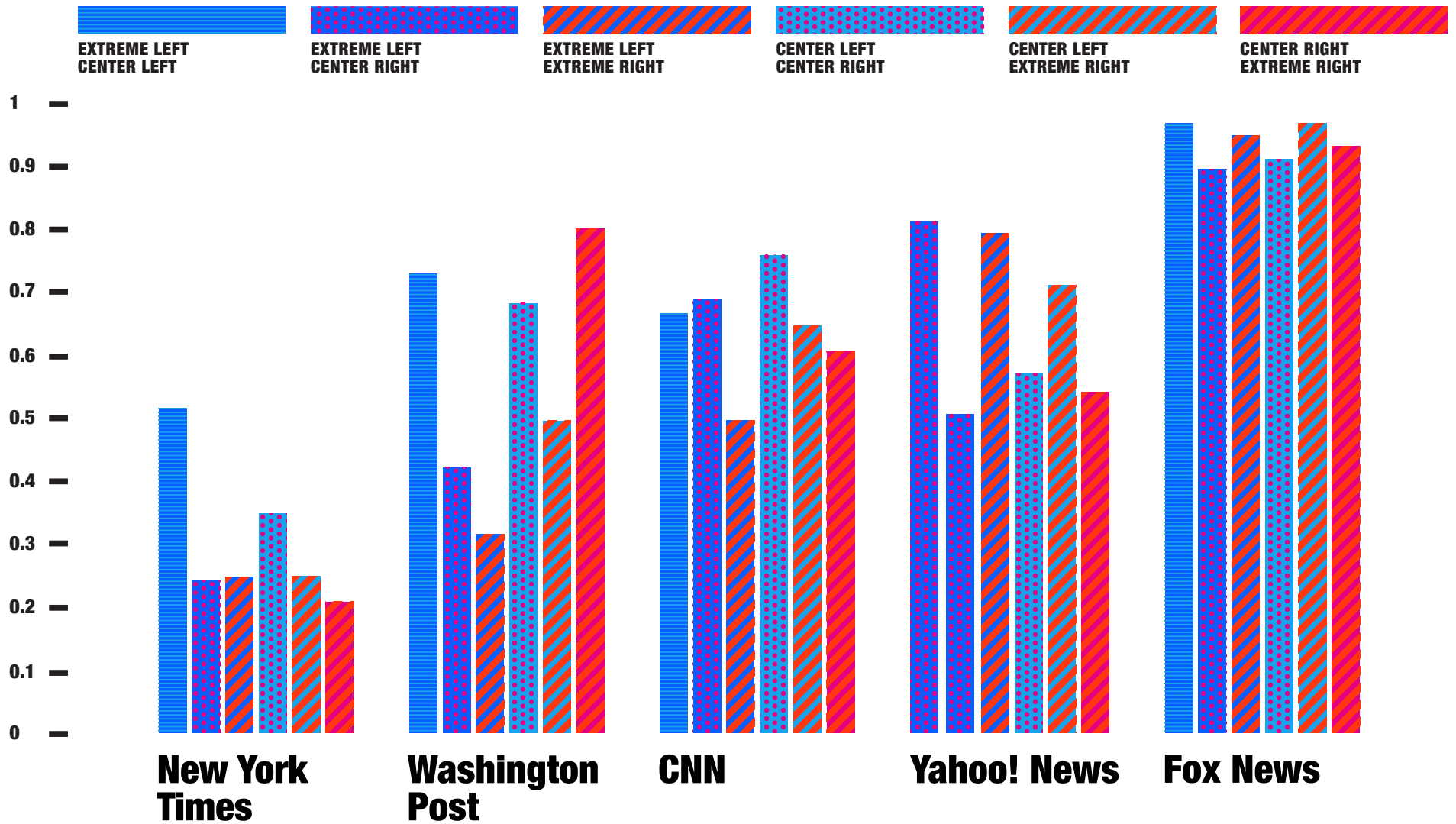
## **Direct feedback to outlets: Praise, constructive criticism or insult?**

Our third analysis considers the content of the messages that commenters directed at the outlets and other users discussed in the previous section. We collected this data by randomly sampling 1,000 replies from each outlet's tweet collection (5,000 tweets in total), ensuring that each was authored by a different user. A team of four research assistants read each reply and judged whether it contained praise, constructive criticism, or insults directed at the outlet or its employees. Each tweet had to be judged as containing the sentiment by a majority of the research assistants to be designated as such in the final dataset. For more details on how we conducted this analysis, please see the Methodological Appendix.

(See Figure 13 on page 22)

**Figure 12**

User overlap in ideological segment references by outlet



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Figure 13 provides a first look at our findings. It shows that every sentiment occupies the same ranked position within each outlet. Without exception, insult is the most common sentiment, followed by criticism, then praise. Moving to between-outlet differences, the New York Times has the highest amounts of all three sentiments, while Fox News has the least of all three (or is tied for least). Users seem to be most motivated to speak out about coverage they take issue with, while rarely seeing anything worth praising or endorsing publicly.

However, we should note that these comments collectively represent a minority of all replies posted in each sample. Users rarely addressed their comments to the quality of news coverage of a given event; instead, they typically remarked directly on the event itself. In some cases, they aimed their ire against one another in the kinds of partisan flame wars for which social media are notorious. But at least in our data, the social media discussions around major media outlets were largely not cesspits of anti-journalist enmity, even in this era of so-called “fake news.”

When we analyze praise, criticism and insults according to which segment posted each, several interesting conclusions emerge (see Figures 14d - 14e). The colored bars represent the numbers of each type of sentiment per capita. For example, Figure A shows that there were 0.54 insulting tweets per New York Times-commenting extreme right user. Correcting for the number of users in each segment is essential because the segments differed greatly in size. In fact, Yahoo! News was the only outlet that contained any extreme left users that tweeted messages falling into one of the sentiment categories.

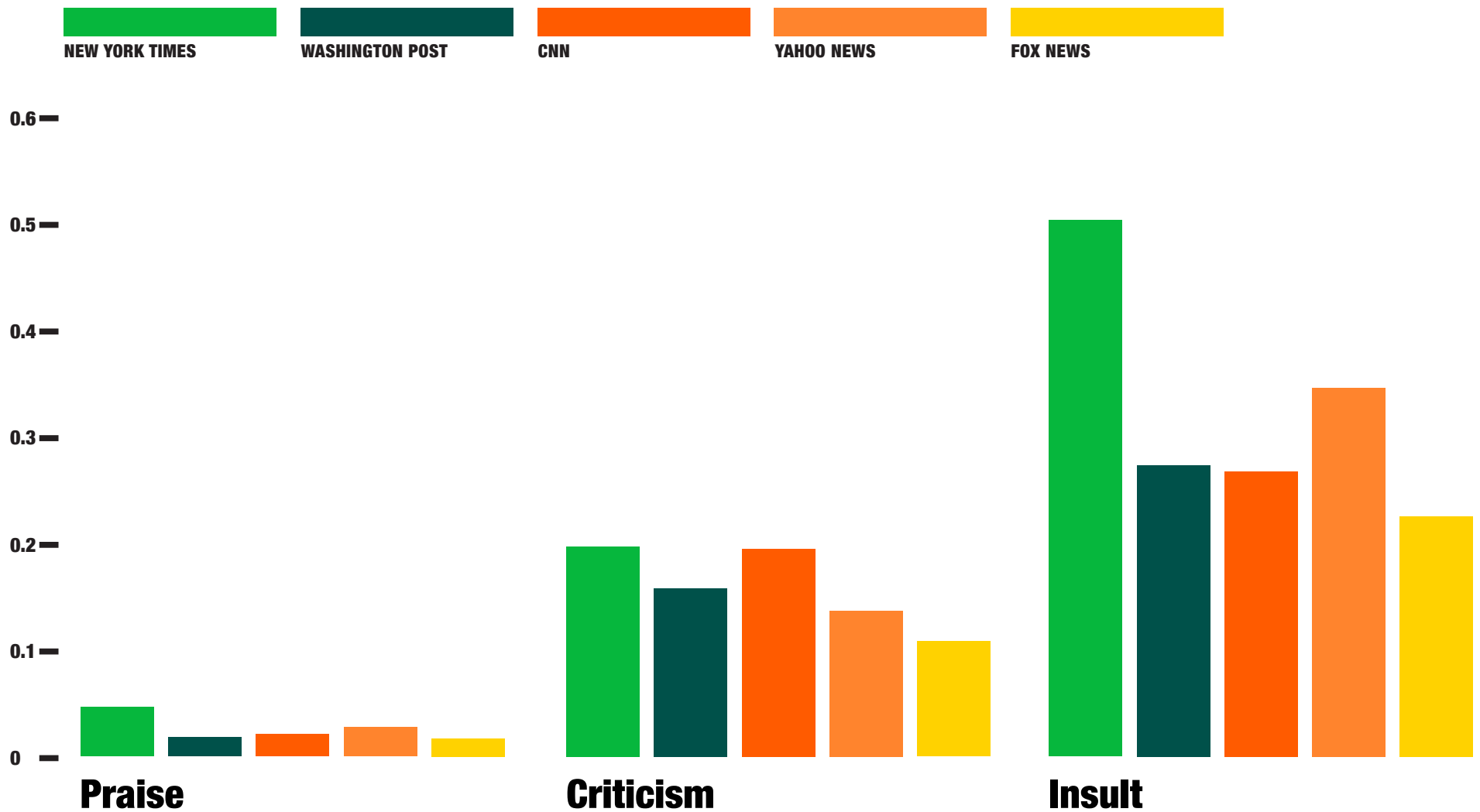
These charts provide clear evidence that most of the insulting tweets came from extreme right users. The major exception to this is Fox, from which most insulting messages come from center-left users. Yahoo appears to be another exception, but the large swath of dark blue is deceptive: there were only two insulting extreme left messages out of seven total extreme left individuals, which inflated the per capita quantity. In contrast, the group of 293 extreme right users that replied to Yahoo! News produced 61 insulting messages. So the extreme left outpaces the extreme right proportionately in terms of insults, but only because of the former’s extremely small numbers.

Comparing the two center segments to one another in terms of insults, we see that for every outlet except Fox News, the center right posts more than the center left. This pattern is reversed for Fox News. As we might expect, the center right is more insulting toward Fox than the extreme right is, and across all outlets sends far fewer insulting tweets than the extreme right. Given that the extreme left is nonexistent except for in Yahoo! News, this is clear evidence that the center segments behave very differently from the extremes.

The patterns are less clear when we move to criticism. No unambiguous leader emerges among the four segments across the five outlets — the tendency to substantively critique news coverage is much more evenly distributed than insulting behavior. It is notable that although the extreme right lobbed more insults per capita than the other segments, its members did not differ substantially from others in terms of substantive critique. Another key difference from the insulting category is that Fox News does not differ greatly from the other outlets in the ideological distribution of criticism it receives, although it does receive the lowest total amount of every sentiment.

**Figure 13**

Sentiment prevalence by type and outlet



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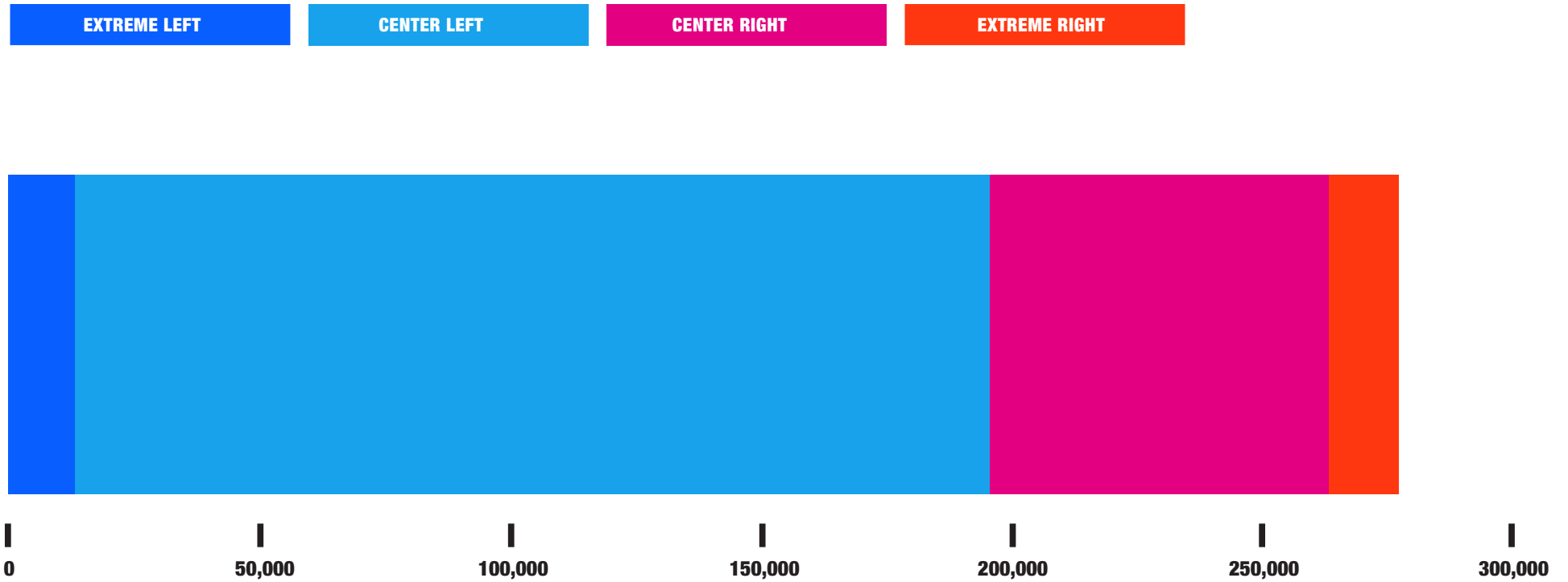
## References by Ideology: Who gets the most attention?

In our final analysis, we looked at which of the issue dataset segments received the most references. After extracting all tweets mentioning at least one of the users we sampled, we counted how many times they had been mentioned, replied to, or retweeted and then adjusted for the number of users in each segment. This generates counts of references per capita for each segment, allowing us to understand how much attention it garners relative to its size.

Figures 15 and 16 show us that the center segments clearly attracted the most attention, but before we explore further, let's start by considering the raw numbers. As Figure 15 shows, the center left sample accounted for the most references by far (183,274 in total), but it is also the largest segment, with over 4.5 times more unique accounts than the next largest segment, the extreme right. When we correct for such vast differences in segment size (Figure 16), we see that the center right attracts attention far beyond its status as the smallest segment. The center left, a distant second in terms of references per capita, nevertheless exceeds the extreme left by over double. Thus, whether we consider total references or references per capita, the center segments attract far more attention than the extremes.

**Figure 15**

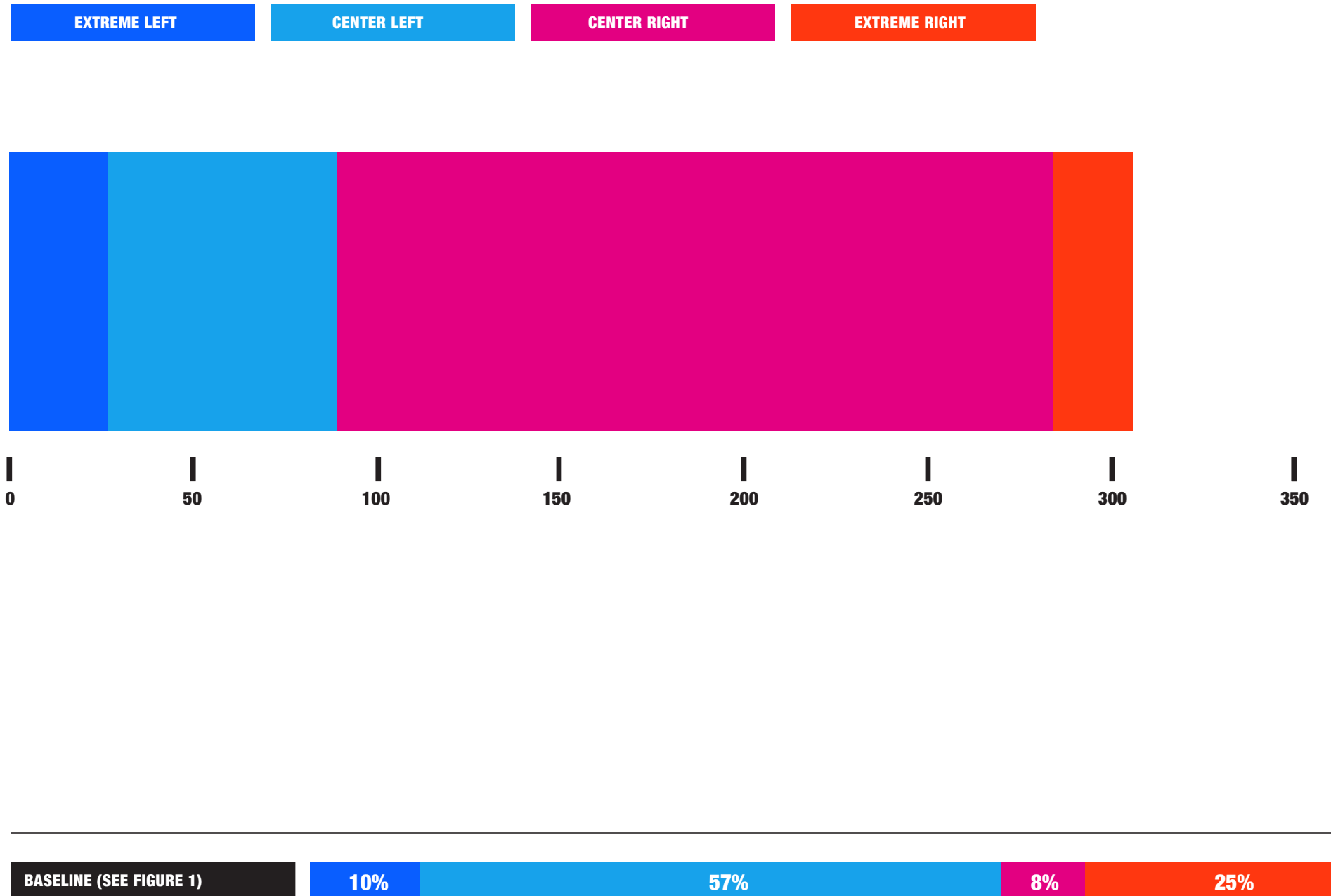
Total references by segment (issue tweets)





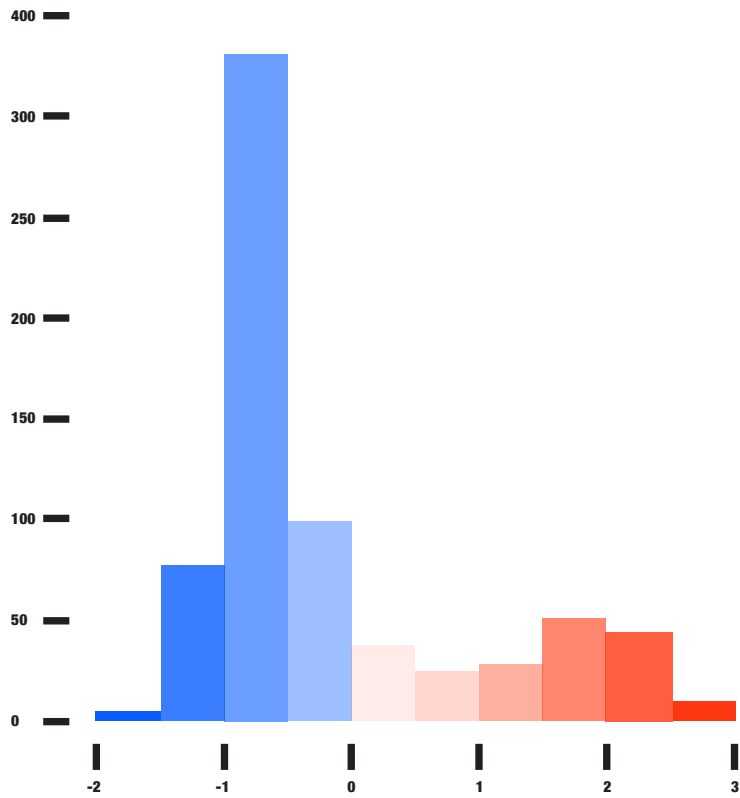
**Figure 16**

References per capita by segment (issue tweets)

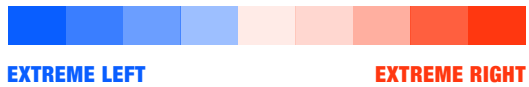
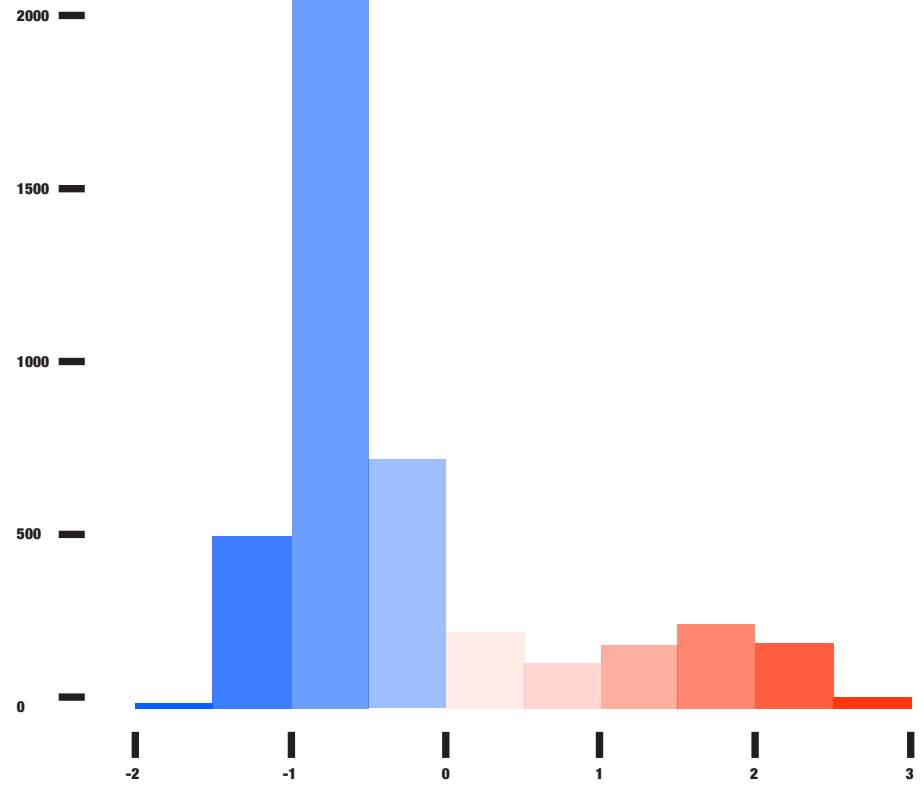


# Appendix

**Figure 2**  
Histogram Baseline:  
American Twitter Ideology Score Distribution



**Figure 3**  
Ideology histogram for issue tweets (all)



**Figure 4**

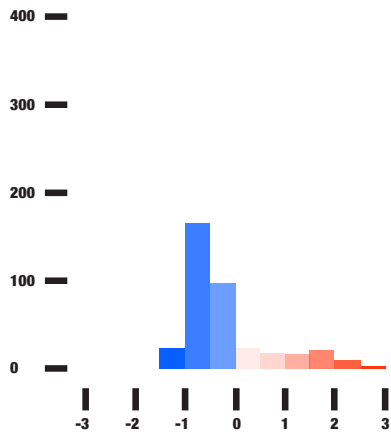
Ideology histograms for news issue tweets (by issue)



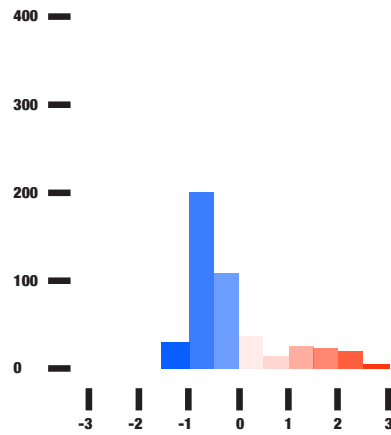
Figure 4 shows the individual ideological distributions for each of the six issues. Like the overall distribution, all are skewed toward the left, albeit to slightly differing degrees. In all six issues, the single largest microsegment lies between -1 and -0.5. It is not easy to tell from the figure,

but the number of users scoring higher than 1 is greater than those lying between 0 and 1 for all six issues. In other words, the extreme right is always larger than the center right — in some cases three to four times larger.

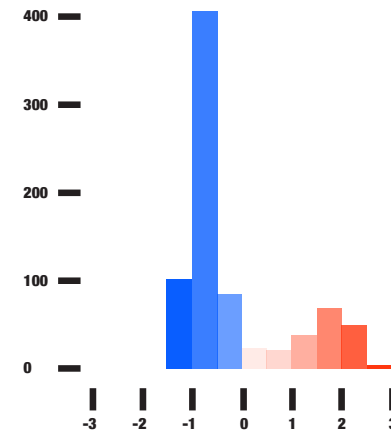
### Hurricanes



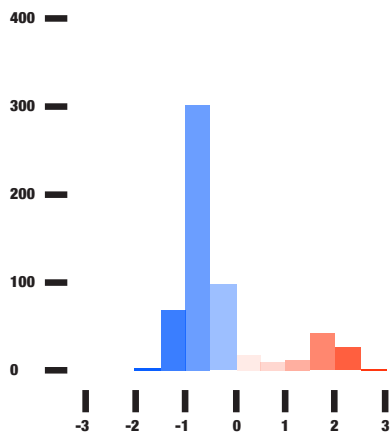
### North Korea



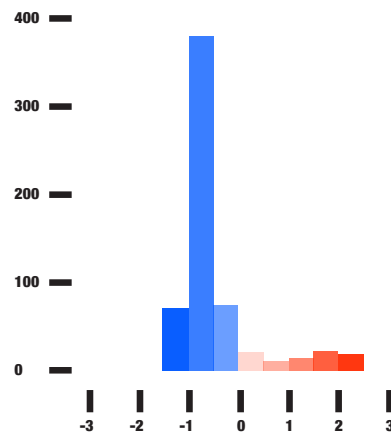
### Mueller investigation



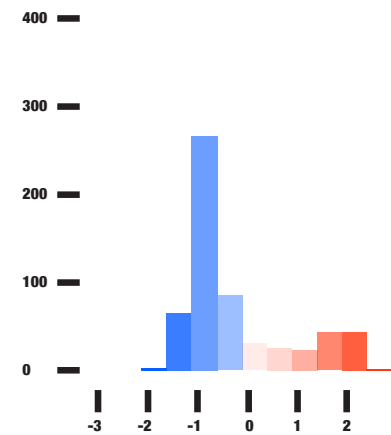
### Sexual Harassment



### White Nationalism



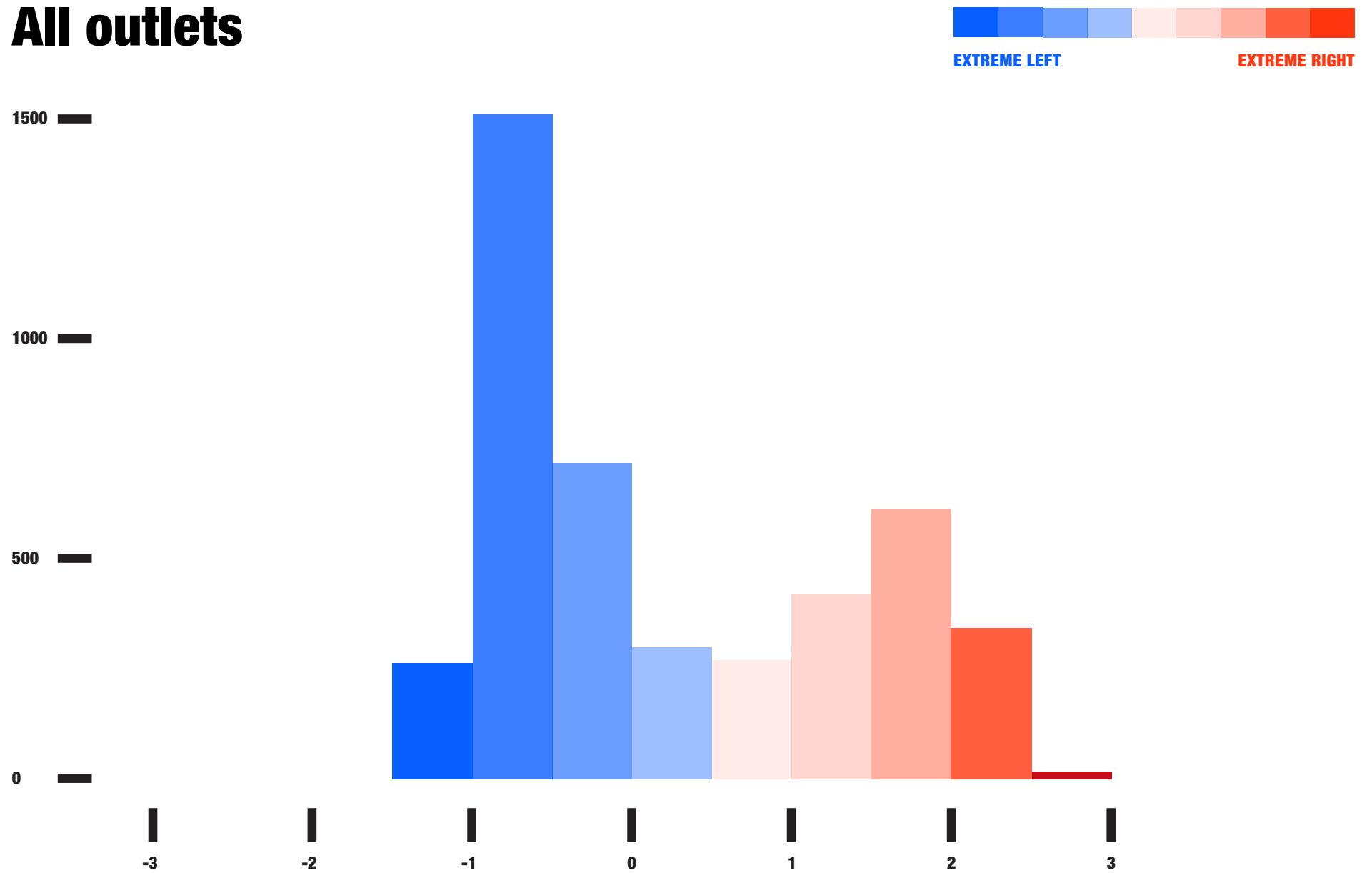
### Mass Shootings



**Figure 6**

Ideology histogram for news outlet tweets (all)

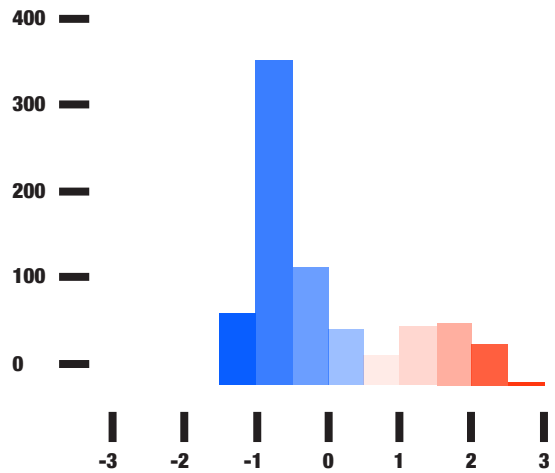
# All outlets



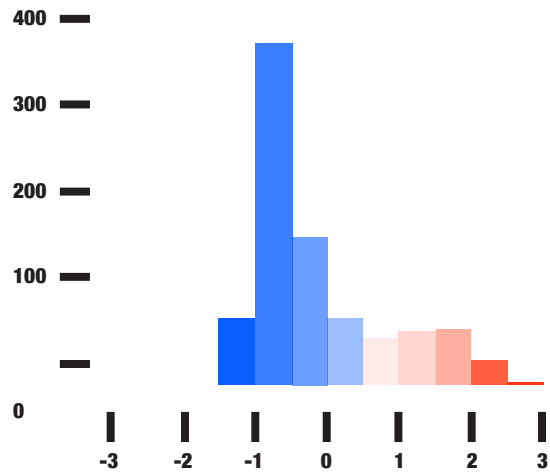
**Figure 7**

Ideology histograms for news outlet tweets (by outlet)

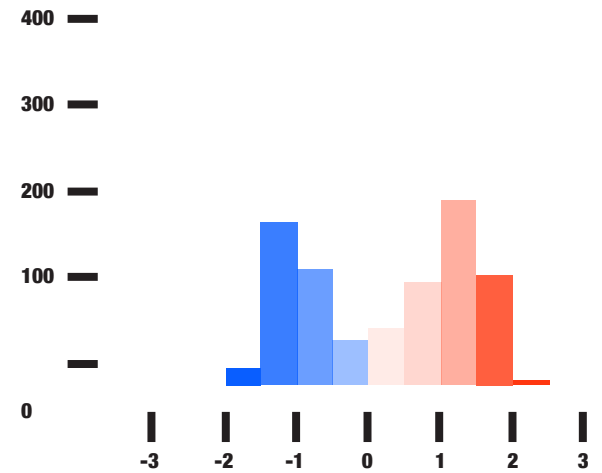
### New York Times



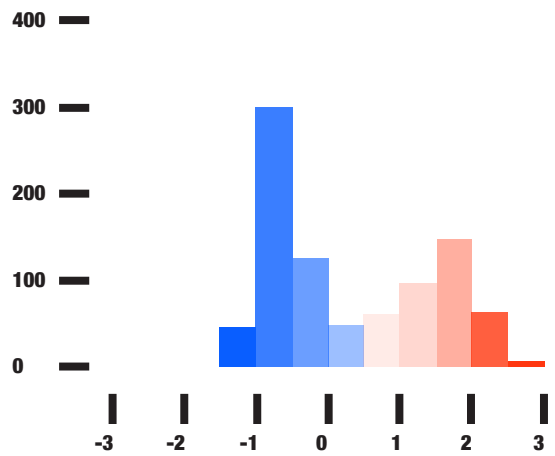
### Washington Post



### Fox News



### CNN



### Yahoo! News

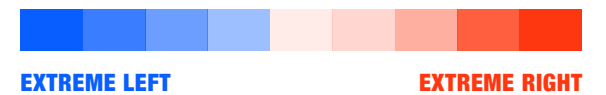
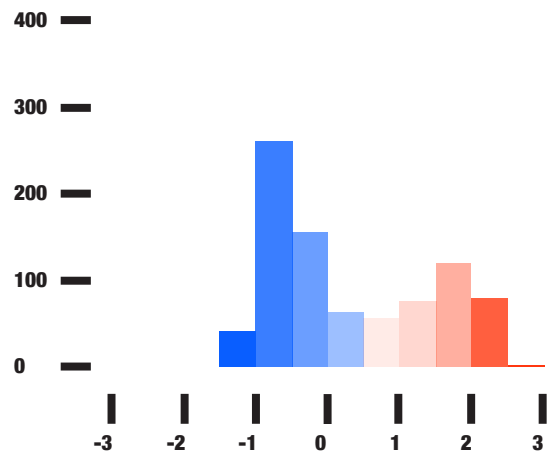
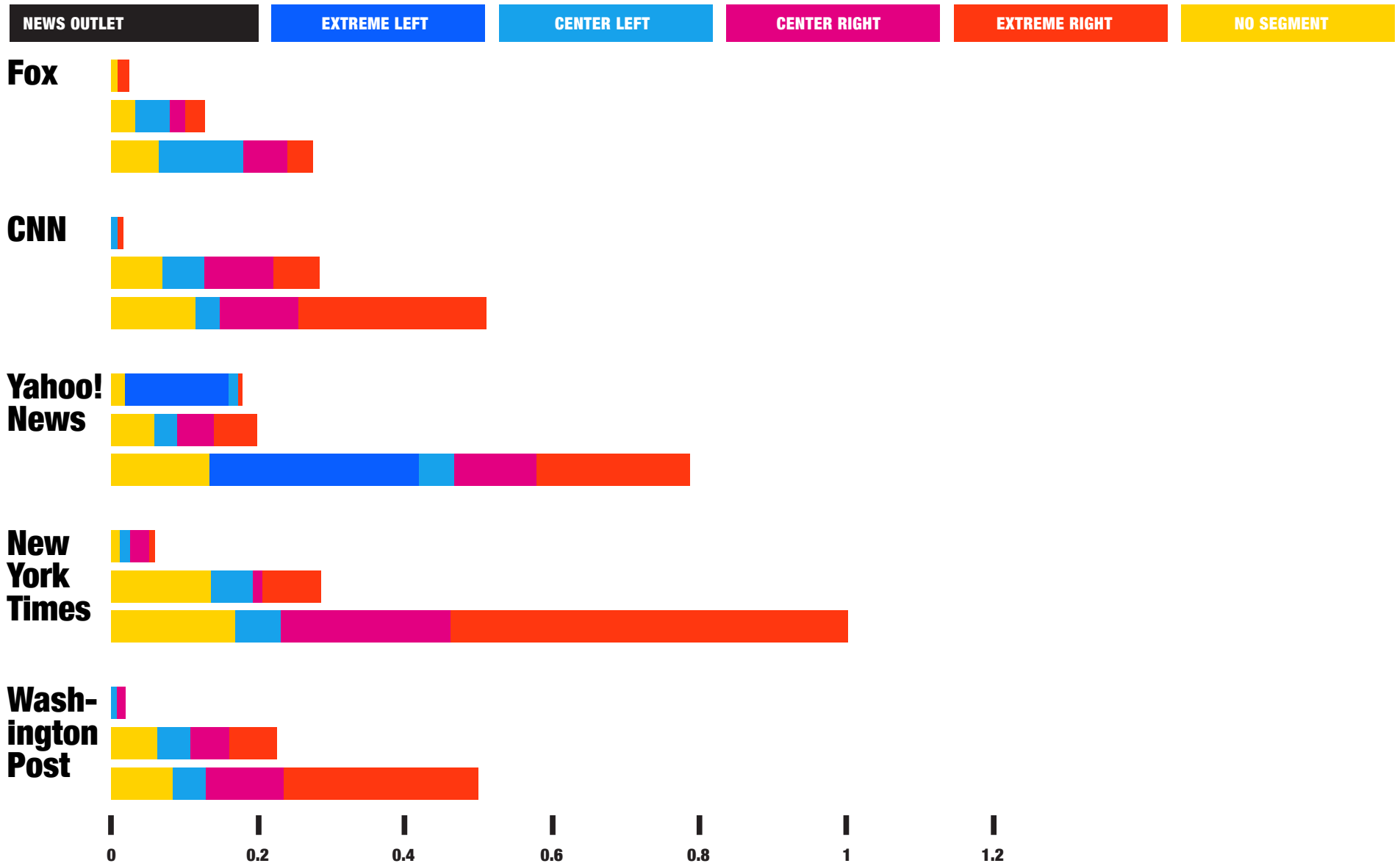


Figure 14A - 14E

Sentiment types by ideological segment (outlet tweets)



## Tables 2A - 2F

References by account type and issue

### Hurricanes

RANK	EXTREME LEFT	EXTREME LEFT COUNT	CENTER LEFT	CENTER LEFT COUNT	CENTER RIGHT	CENTER RIGHT COUNT	EXTREME RIGHT	EXTREME RIGHT COUNT
1	@tedlieu	13	@yahoonews	30	@adamjohnsonnyc	13	@foxnews	41
2	@sethabramson	10	@potus	18	@russian_market	8	@potus	39
3	@rvawonk	9	@funder	17	@lee_saks	7	@_makada_	19
4	@safetypindaily	8	@mikel_jollett	15	@spectatorindex	7	@lrihendry	18
5	@3dtruth	6	@tedlieu	15	@skynews	7	@prisonplanet	17
6	@ananavarro	6	@ananavarro	14	@defconwsalerts	6	@politicalshort	17
7	@amy_siskind	6	@nbcnews	14	@afp	5	@realjameswoods	15
8	@erinscafe	5	@cnn	14	@isamariasmith	4	@waynedupreeshow	15
9	@brianklaas	5	@ap	13	@comfortablysmug	4	@cnn	11
10	@jilevin	5	@indiewashere	12	@dprk_news	4	@donaldjtrumpjr	11

### North Korea

RANK	EXTREME LEFT	EXTREME LEFT COUNT	CENTER LEFT	CENTER LEFT COUNT	CENTER RIGHT	CENTER RIGHT COUNT	EXTREME RIGHT	EXTREME RIGHT COUNT
1	@shareblue	54	@reuters	160	@realdonaldtrump	21	@potus	32
2	@tedlieu	49	@afp	56	@politicalshort	14	@foxnews	27
3	@joyannreid	46	@ap	46	@benshapiro	7	@3lectric5heep	23
4	@kylegriffin1	31	@cnn	41	@realjameswoods	4	@yahoonews	17
5	@teapainusa	31	@telesurenglish	40	@deptofdefense	4	@cnn	14
6	@funder	28	@tedlieu	38	@johnrobb	3	@realjameswoods	13
7	@rvawonk	27	@france24_en	32	@cher	3	@mitchellvii	11
8	@amy_siskind	26	@brianklaas	30	@cnnpolitics	3	@chuckwoolery	11
9	@potus	23	@mediaite	29	@mombot	2	@foxandfriends	10
10	@ananavarro	22	@potus	29	@abc	2	@stockmonsterusa	9

## Mueller Investigation

RANK	EXTREME LEFT	EXTREME LEFT COUNT	CENTER LEFT	CENTER LEFT COUNT	CENTER RIGHT	CENTER RIGHT COUNT	EXTREME RIGHT	EXTREME RIGHT COUNT
1	@nikon_shooter	86	@nytimes	146	@potus	10	@foxnews	179
2	@teapainusa	54	@tedlieu	115	@reuters	9	@potus	130
3	@tedlieu	52	@ananavarro	107	@foxnews	8	@foxandfriends	60
4	@joyannreid	48	@cnn	105	@senschumer	7	@ap	53
5	@potus	40	@thehill	98	@joyce_karam	5	@abc	42
6	@aynrandpaulryan	36	@alboenews	87	@nbcnews	5	@cnn	40
7	@kylegriffin1	29	@potus	87	@specialreport	4	@prisonplanet	34
8	@cnn	29	@afp	83	@cbsnews	4	@thelastrefuge2	28
9	@rvawonk	28	@reuters	80	@nytimes	3	@_makada_	28
10	@truefactsstated	24	@abc	79	@thomas1774paine	3	@loudobbs	25

## Sexual Harassment

RANK	EXTREME LEFT	EXTREME LEFT COUNT	CENTER LEFT	CENTER LEFT COUNT	CENTER RIGHT	CENTER RIGHT COUNT	EXTREME RIGHT	EXTREME RIGHT COUNT
1	@voxdotcom	98	@nytimes	101	@realdonaldtrump	43	@foxnews	153
2	@kylegriffin1	95	@ap	74	@rambobiggs	19	@potus	124
3	@nytimes	81	@washingtonpost	73	@binsacksb	18	@realjameswoods	56
4	@sethabramson	79	@abc	65	@dahboo7	17	@dailycaller	56
5	@time	74	@joyannreid	34	@jerome_corsi	15	@thomas1774paine	50
6	@reuters	67	@tedlieu	34	@usatoday	12	@prisonplanet	48
7	@potus	60	@jkarsh	34	@thecoffeebibles	10	@dcexaminer	45
8	@washingtonpost	58	@ananavarro	33	@realalexjones	9	@thehill	44
9	@teamsters	54	@rvawonk	33	@lauraloomer	9	@cnn	40
10	@tedlieu	53	@bnonews	31	@youtube	7	@mitchellvii	34



## White Nationalism

RANK	EXTREME LEFT	EXTREME LEFT COUNT	CENTER LEFT	CENTER LEFT COUNT	CENTER RIGHT	CENTER RIGHT COUNT	EXTREME RIGHT	EXTREME RIGHT COUNT
1	@truefactsstated	64	@kylegriffin1	198	@cnn	40	@potus	178
2	@funder	62	@tedlieu	190	@dallasnews	33	@foxnews	129
3	@teapainusa	52	@wikileaks	179	@ap	24	@thomas1774paine	60
4	@potus	44	@thehill	177	@ianbremmer	17	@politicalshort	46
5	@tedlieu	38	@potus	150	@potus	16	@realjameswoods	44
6	@joyannreid	36	@joyannreid	149	@joenbc	15	@trumpmovementus	43
7	@kylegriffin1	36	@rvawonk	148	@davidfrum	14	@seanhannity	41
8	@ericgarland	32	@julianassange	139	@maggienyt	13	@fingersflying	39
9	@khanoisseur	30	@cnn	134	@maxboot	12	@sean_spicier	38
10	@ananavarro	28	@sethabramson	134	@ginger_ze	10	@mitchellvii	34

## Mass Shootings

RANK	EXTREME LEFT	EXTREME LEFT COUNT	CENTER LEFT	CENTER LEFT COUNT	CENTER RIGHT	CENTER RIGHT COUNT	EXTREME RIGHT	EXTREME RIGHT COUNT
1	@tedlieu	100	@kylegriffin1	175	@abc	86	@potus	232
2	@joyannreid	75	@rvawonk	171	@dailymail	42	@foxnews	206
3	@rvawonk	66	@thehill	150	@realdonaldtrump	31	@thomas1774paine	183
4	@potus	66	@cnn	147	@spectatorindex	30	@prisonplanet	108
5	@funder	61	@tedlieu	142	@ap	30	@realjameswoods	102
6	@kylegriffin1	59	@potus	138	@weatherchannel	21	@politicalshort	75
7	@ananavarro	49	@sethabramson	112	@foxnews	20	@mitchellvii	69
8	@thehill	46	@ap	108	@nbc6	19	@loudobbs	63
9	@sethabramson	46	@funder	107	@defconwsalerts	18	@anncoulter	60
10	@sarahkendzior	46	@dcpoll	106	@afp	17	@cnn	60

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## Methodological Appendix

### Twitter samples

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#### Issue sample

This sample was created by purchasing from Twitter all tweets posted during 2017 containing at least one of the following case-insensitive keywords:

- hurricane
- “north korea”
- shooter
- “sexual harassment”
- russia AND investigation
- white AND nationalist

These keywords were generated based on the following lists of 2017’s most popular news and Twitter stories:

- <http://mashable.com/2017/12/05/twitter-most-popular-2017/>
- <https://www.nbcnews.com/news/us-news/2017-year-review-here-are-top-10-biggest-news-stories-n828881>
- <http://abcnews.go.com/International/2017-review-biggest-stories-year/story?id=51792152>
- <http://www.businessinsider.com/top-news-stories-2017-google-trends-year-in-search-2017-12>
- <http://www.newsweek.com/2017-biggest-news-stories-news-events-recap-review-756536>
- <https://www.cbsnews.com/news/17-stories-that-defined-2017/>

Twitter generated this sample on November 7, 2018, which means that it included all tweets matching the above criteria that had not been deleted, suspended, or otherwise removed from Twitter prior to that date.

---

## News outlet sample

To generate the news outlet sample, all replies to the following Twitter accounts were collected between November 6, 2016 and June 6, 2018:

**@cnn**

**@foxnews**

**@nytimes**

**@washingtonpost**

**@yahoonews**

This sample contains 25,893,747 tweets in total.

---

## Baseline sample

The US baseline sample was constructed via the following steps:

1. For each day in a seven-day period beginning March 11, choose a random minute in the day prior to 11pm ET.
2. Starting at the randomly chosen minute, draw 20,000 tweets from Twitter's public *statuses/sample* API, which "returns a small random sample of all public statuses."<sup>1</sup>
3. From this sample, retain all tweets whose *lang* field is set to "en" (English) and whose location field is not blank.

4. Retain all such tweets whose locations are determined by the *geostring* Python module to lie within the US or its territories.
5. After the end of the seven-day period, randomly select 1,000 unique users from the set of all 4,580 unique sampled users determined to have claimed a US-based location.

---

## Ideology scores

The ideology scores used in this report were adapted from a technique introduced by Barbera.<sup>2</sup> The math involved in the model is complex, but its core assumption is that on social media, people tend to follow others with whom they agree politically. This assumption has been validated by a large body of research and appears to apply especially strongly to Twitter.<sup>3</sup> Barbera writes that decisions to follow certain users rather than others "provide information about how social media users decide to allocate a scarce resource—their attention."<sup>4</sup> In this sense, politics is no different from any other hobby or interest: other things being equal, when given the choice, people will choose to consume information that accords with their preexisting inclinations over that which conflicts with them.

The model also assumes that political preferences can be meaningfully compressed onto a unidimensional left-right scale. Although political identity is complex, and the left-right scaling discards useful information about it, its use in political science is widely accepted.<sup>5</sup> Indeed, in his article Barbera demonstrates that his method is able to successfully predict Twitter users' party of registration as well as the political party to which Twitter users donate money (among those who made such donations).<sup>6</sup>

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Since its introduction in 2015, Barbera's technique has found wide application in the political science research community and beyond. As of 9/12/2019, the paper has accrued 438 citations on Google Scholar. Research articles either using the technique or a similar derivative thereof have explored the 2014 European Parliament election<sup>7</sup>, political ideology in the Polish parliament<sup>8</sup>, the role of emotion in the diffusion of moralized content on Twitter<sup>9</sup>, and the effects of exposure to opposing views on political polarization<sup>10</sup>, among other topics.

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### **Cosine similarity analysis**

Cosine similarity is a mathematical measurement that assigns two sets of objects a similarity index based on their respective memberships. When applied to a pair of texts, cosine similarity measures the extent to which the texts contain similar words. Two texts containing the same set of words will return a similarity index of 1; two texts that contain no words in common will yield an index of 0. Perone offers a more detailed explanation of the math involved.<sup>11</sup>

In this case, one cosine similarity index was generated for each unique pair of issues and news outlets (see figures 10 and 12). The "texts" were each issue and news outlet's unique set of associated accounts. Thus, the similarity index between each pair represents the degree of overlap between the accounts that engaged on each issue or replied to each account. The higher the index, the greater the overlap.

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### **Outlet feedback analysis**

To determine the sentiments present in replies to the news outlet accounts, four research assistants (RAs) were assigned to assess a random sample of tweets for the presence of several specific sentiments. First, 1,000 tweets were randomly sampled from each outlet's replies, resulting in a total sample size of 5,000 tweets. The sampling program was configured to sample only unique users, so that a user could appear in each sample a maximum of once. The RAs read each of these tweets to determine whether it contained any of the following sentiments directed at the news outlet or one of its associated stories or employees:

- **Praise;**
- **Substantive criticism; or**
- **Insulting language.**

Each RA completed their work independently, recording their assessments via a custom-built web interface designed by the author. After they had all finished, final judgments were determined by majority vote: all tweets judged by three or more RAs as possessing a given sentiment were assigned that sentiment for the purposes of the analysis.

---

## Endnotes

- 1 <https://developer.twitter.com/en/docs/tweets/sample-realtime/api-reference/get-statuses-sample>
- 2 Pablo Barberá, “Birds of the Same Feather Tweet Together: Bayesian Ideal Point Estimation Using Twitter Data,” *Political Analysis* 23, no. 1 (January 1, 2015): 76–91, <https://doi.org/10.1093/pan/mpu011>.
- 3 Itai Himelboim, Stephen McCreery, and Marc Smith, “Birds of a Feather Tweet Together: Integrating Network and Content Analyses to Examine Cross-Ideology Exposure on Twitter,” *Journal of Computer-Mediated Communication* 18, no. 2 (January 1, 2013): 40–60, <https://doi.org/10.1111/jcc4.12001>; Marc A. Smith et al., “Mapping Twitter Topic Networks: From Polarized Crowds to Community Clusters” (Pew Internet & American Life Project, February 20, 2014), <http://www.pewinternet.org/2014/02/20/mapping-twitter-topic-networks-from-polarized-crowds-to-community-clusters/>; M.D. Conover et al., “Political Polarization on Twitter,” in *Proc. 5th Intl. Conference on Weblogs and Social Media* (Barcelona, Spain: AAAI, 2011), 89–96; Elanor Colleoni, Alessandro Rozza, and Adam Arvidsson, “Echo Chamber or Public Sphere? Predicting Political Orientation and Measuring Political Homophily in Twitter Using Big Data,” *Journal of Communication* 64, no. 2 (April 1, 2014): 317–32, <https://doi.org/10.1111/jcom.12084>; Andrei Boutyline and Robb Willer, “The Social Structure of Political Echo Chambers: Variation in Ideological Homophily in Online Networks,” *Political Psychology* 38, no. 3 (2017): 551–569; Yosh Halberstam and Brian Knight, “Homophily, Group Size, and the Diffusion of Political Information in Social Networks: Evidence from Twitter,” *Journal of Public Economics* 143 (November 1, 2016): 73–88, <https://doi.org/10.1016/j.jpubeco.2016.08.011>.
- 4 Barberá, “Birds of the Same Feather Tweet Together,” 78.
- 5 Matthew J. Gabel and John D. Huber, “Putting Parties in Their Place: Inferring Party Left-Right Ideological Positions from Party Manifestos Data,” *American Journal of Political Science* 44, no. 1 (2000): 94–103, <https://doi.org/10.2307/2669295>.
- 6 Barberá, “Birds of the Same Feather Tweet Together.”
- 7 Paul Nulty et al., “Social Media and Political Communication in the 2014 Elections to the European Parliament,” *Electoral Studies* 44 (December 1, 2016): 429–44, <https://doi.org/10.1016/j.electstud.2016.04.014>
- 8 Alejandro Ecker, “Estimating Policy Positions Using Social Network Data: Cross-Validating Position Estimates of Political Parties and Individual Legislators in the Polish Parliament,” *Social Science Computer Review* 35, no. 1 (February 1, 2017): 53–67, <https://doi.org/10.1177/0894439315602662>.
- 9 William J. Brady et al., “Emotion Shapes the Diffusion of Moralized Content in Social Networks,” *Proceedings of the National Academy of Sciences* 114, no. 28 (July 11, 2017): 7313–18, <https://doi.org/10.1073/pnas.1618923114>.
- 10 Christopher A. Bail et al., “Exposure to Opposing Views on Social Media Can Increase Political Polarization,” *Proceedings of the National Academy of Sciences* 115, no. 37 (September 11, 2018): 9216–21, <https://doi.org/10.1073/pnas.1804840115>.
- 11 <http://blog.christianperone.com/2013/09/machine-learning-cosine-similarity-for-vector-space-models-part-iii/>

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