

## **Cracking Open the News Feed: Exploring What U.S. Facebook Users See and Share with Large-Scale Platform Data**

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In this study, we analyze for the first time newly available engagement data covering millions of web links shared on Facebook to describe how and by which categories of U.S. users different types of news are seen and shared on the platform. We focus on articles from low-credibility news publishers, credible news sources, purveyors of clickbait, and news specifically about politics, which we identify through a combination of curated lists and supervised classifiers. Our results support recent findings that more fake news is shared by older users and conservatives and that both viewing and sharing patterns suggest a preference for ideologically congenial misinformation. We also find that fake news articles related to politics are more popular among older Americans than other types, while the youngest users share relatively more articles with clickbait headlines. Across the platform, however, articles from credible news sources are shared over 5 times more often and viewed over 7 times more often than articles from low-credibility sources. These findings offer important context for researchers studying the spread and consumption of information — including misinformation — on social media.

*Keywords:* *misinformation, social media, clickbait, computational social science*

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Since the rise of so-called “fake news” outlets on social media was linked to populist political victories, including that of Donald Trump in the United States, intense scholarly and popular interest has focused on the kinds of information — and misinformation — people encounter on their social news feeds, and where it comes from (Lazer et al., 2018; Allcott et al., 2019; Grinberg et al., 2019; Guess et al., 2020a). The stakes are high: If misleading and inflammatory content is widespread, social media present a challenge for democracies that both rely on informed debate and seek to protect free expression.

One of the major responses to these developments has been the refinement of a large research literature focusing on informational, skills-based and other interventions that could help to counteract online misinformation (e.g., Wittenberg and Berinsky, 2020; Guess et al., 2020b; Pennycook et al., 2020), though scholars continue to debate how to share best practices and collaborate with platforms while maintaining independence (Amazeen et al., 2020). Regardless, any sustainable response — whether from social platforms or government policy — depends not only on credible research on the impact of these strategies, but on a solid descriptive foundation about the ways in which people encounter, share, and interact with online misinformation in the first place. This is critical for assessing the relative costs and benefits of proposed alternatives as well as for effectively tailoring interventions to relevant contexts or contingencies.

Fortunately, the past four years have already yielded some clear answers. In contrast to popular narratives, researchers have consistently found that consumption of untrustworthy news (through website visits on desktop and mobile devices) represents a small share of most people’s news diets, though it is more concentrated among those with the most conservative-leaning media diets (Guess et al., 2020a; Allen et al., 2020). Similarly, the likelihood of both encountering and sharing links from untrustworthy news sources on Twitter is very low (Grinberg et al., 2019). Similar results have been found in terms of sharing links from untrustworthy news sources on Facebook (Guess et al., 2019), but up until now there has not been individual-level data available to researchers working outside the platform on exposure to news (whether untrustworthy or not) within Facebook’s News Feed, though web visit data suggests that it was the most important source of referrals to these websites during the 2016 U.S. campaign (Guess et al., 2020a). Thus, in a relatively short amount of time, the accumulated evidence has shed light on key patterns in the consumption and

dissemination of online misinformation.<sup>1</sup>

Despite these advances, key questions remain about the proliferation of untrustworthy content on social media. While much research to date has focused on individual-level exposure and engagement with “fake” or misleading content, the question of the precise boundaries between so-called “fake news” and adjacent categories has been neglected. This is partially because these distinctions are often subtle (Tucker et al., 2018), and it is difficult to produce reliable classifications from datasets of limited size. Yet some of the outstanding puzzles about online misinformation — such as the relationship between consumption and sharing, and the role of age-related differences in explaining these patterns — may depend on disaggregating these categories of content.

The best evidence to date leverages important advances in the use of digital trace data to understand the correlates of visits to untrustworthy news websites (e.g., Stier et al., 2020). Even so, researchers have been unable to assemble a complete picture of the “fake news” ecosystem due to a conspicuously missing piece: data on what users encounter on social platforms themselves, particularly on Facebook. This inability to observe activity on the Facebook News Feed has placed a sharp limit on research focusing on incidental exposure to different types of news via snippets and headlines that may draw users’ attention, if not motivate a click (see Anspach and Carlson, 2018). In this study, we thus look specifically at *views* as distinct from clicks.

In addition to this major shortcoming, two additional challenges continue to plague existing research. First, most studies rely on conventional-sized samples (for exceptions, see Grinberg et al. 2019 and Allen et al. 2020), which are not ideally suited to accurately estimating the prevalence of habits and behaviors that are rare on average. Second, since the relevant digital trace data are costly and difficult to obtain, the timeline of gathering, analyzing, and publishing data about the role of social media means that the rate of change of target phenomena in the real world is vastly greater than the pace at which scientific evidence about those phenomena accumulates (for a discussion, see Munger, 2018).

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<sup>1</sup>For a review of recent evidence from the United States and elsewhere, see Guess and Lyons 2020.

Until very recently, large-scale evidence that speaks directly to these concerns has not been available for a variety of technical and privacy-related reasons (Tucker et al., 2018). Behavioral data of the kind needed to describe the varied experiences of hundreds of millions of social media users presents staggering new computational, privacy, and ethical challenges for social scientists working with proprietary data (Lazer et al., 2020). Fortunately, the Social Science One partnership<sup>2</sup> has emerged as a way to facilitate independent scholars' access to aggregated Facebook platform data under a differential-privacy framework (King and Persily, 2018). In this paper, we analyze the “Condor” dataset of URL-level Facebook activity<sup>3</sup> to precisely quantify both shares and views of different kinds of news content across age and ideological categories according to three dimensions of interest: whether a news source is untrustworthy or not; whether it is related to politics; and whether it is “clickbait.”

We combine this unprecedented access to platform data on URL views and engagements with classification methods to provide new, fine-grained evidence on news consumption and sharing on Facebook. Specifically, we focus on the following research questions:

1. How prevalent is the *sharing* of and *exposure* to low-credibility news in the U.S. Facebook population?
2. What ideological groups are most likely to share and view low-credibility news on Facebook?
3. What age groups are most likely to share and view this content on Facebook?
4. When looking at patterns of consumption and engagement, how does low-credibility news differ from “clickbait” or simply news articles that are related to politics?

By providing aggregate numbers of URL shares and views across age brackets and different ideological categories, we are able for the first time to provide answers to these basic

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<sup>2</sup>See <http://socialscience.one> for more information.

<sup>3</sup>See: <https://socialscience.one/blog/unprecedented-facebook-urls-dataset-now-available-research-through-social-science-one>

descriptive questions concerning the overall quality of the information people encounter or share on their Facebook News Feeds.

### **Literature, Research Questions and Hypotheses**

Despite its prevalence in academic and popular discourse, we seek to avoid the term “fake news” due to its unclear connotations and any confusion that could result due to a mismatch between the term and our inability to measure the underlying factual accuracy of specific content (Egelhofer and Lecheler, 2019). As we discuss below, we focus on *credibility* and *quality* at the news domain level. Our conception of low-credibility or low-quality news relies on definitions used in prior research which emphasize attributes of news at the source level as determined by adherence to journalistic norms and practices designed to ensure a commitment to factual accuracy (Lazer et al., 2018; Grinberg et al., 2019). In this article, we interchangeably refer to “low-quality” and “low-credibility” sources as opposed to “high-quality” or “credible” sources. We specify our methods of classifying categories of news, including low-quality and credible news, in the next section.

A starting point for our investigation is a recent study that analyzed “fake news” sharing behavior during the 2016 U.S. presidential campaign by merging Facebook profile data obtained via an authenticated application with individual-level survey responses (Guess et al., 2019). Three main findings stand out from this study. First, sharing activity appeared to be quite rare: over 90% of the sample did not appear to share any so-called fake news content whatsoever, and this was not related to overall sharing behavior. The sharing of misinformation appeared to exhibit a highly skewed distribution with a “long tail” of respondents who made up the bulk of all “fake news” shares. Second, there was a robust relationship between ideological self-placement and “fake news” sharing activity, with more conservative-leaning respondents more likely to share dubious content. Third, the older respondents were, the more likely they were to share “fake news” content. Holding constant other demographic and political features (including ideology, education, and the total number of web links shared), the study found that being over the age of 65 was associated with sharing nearly 7 times as many links to “fake news” domains as those in the youngest age group or about 2.3 times as many as those in the next-oldest age group. These findings motivate our present focus on two predictors of URL-level viewing and sharing activity on

Facebook: age and ideological self-placement.<sup>4</sup>

As suggested, since these sharing patterns are highly skewed, inferences about the kinds of behaviors comprising the “long tail” are limited in conventional samples. Indeed, in the study’s dataset a total of 101 respondents out of 1,191 shared any “fake news” articles to their friends on Facebook — 302 shares in all. Subsequent research has found comparable patterns using a much larger sample of Twitter users matched to the voter file (Grinberg et al., 2019), but questions still remain about the generalizability of these findings to later periods and to the Facebook platform, which is more widely used in the population (Gottfried and Shearer, 2016). By encompassing much more of the population of interest in this study, we are able to achieve precise inferences that are not subject to small- $N$  or sample attrition concerns.

In motivating our hypotheses and research questions, we begin with a simple descriptive analysis of the relative prevalence of low-credibility news and credible news among both overall views and shares of URLs on Facebook in the United States. We ask: **Is the total number of views and shares of credible news articles on Facebook greater than the number of views and shares of low-credibility news? (RQ1)**

Following prior research, we next turn to individual-level predictors that speak to debates about the mechanisms underlying low-credibility news engagement on social media. Since these may differ for private (viewing) and relatively more observable (sharing) behavior (Osmundsen et al., 2021), we separately explore each type of outcome.

People may share articles and other forms of content on social media for numerous reasons. One hypothesized purpose is to signal affiliation with one’s identity or affinity with a particular cultural or social group (Kahan, 2017). In other words, people share content not to inform their friends and social connections but to affirm their membership in an ingroup (and possible opposition to an outgroup). We focus here on ideological affiliation as a potential marker of political identity (Mason, 2018). First, we expect low-quality news

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<sup>4</sup>Associations with age and partisanship have more recently been replicated by Osmundsen et al. (2021) using surveys linked to Twitter data, with sample size of a comparable magnitude. They also investigate a number of other potential predictors of “fake news” sharing, such as cognitive reflection (Pennycook and Rand, 2019), which we cannot test here.

sharing to be more common among those at the poles of the ideological continuum (**H1a**). Additionally, following research on the asymmetry of low-credibility news production and consumption in 2016 (for examples, see Benkler et al., 2018; Grinberg et al., 2019; Guess et al., 2020a), we additionally expect low-credibility news sharing to be more common among conservative users than liberal users (**H1b**). We also expect that low-credibility news is shared predominately by Facebook users that are ideologically congruent to the ideological slant of the news publisher (**H1c**). *Viewing* content on social media feeds may be governed by different mechanisms, though we expect that homophily will tend to produce viewing patterns that reflect the basic sharing dynamics of users' social networks (**H2a–c**).

A second factor proposed as an explanation for low-credibility news sharing and viewing relates to digital literacy, a generalized set of skills and competencies that include the ability to spot online deception and assess the trustworthiness of information sources (Hargittai and Micheli, 2019). People with lower levels of digital literacy may not share others' understanding of how to interpret the relationship between content disseminated on one's feed and one's identity, beliefs, and other characteristics. This disconnect could lead to more indiscriminate sharing (and viewing) behavior, especially if having lower digital literacy is associated with being connected to others with similarly low levels (though see Hargittai 2010). Given that older Americans tend to have lower levels of digital literacy, this has been suggested as an explanation for why older Americans have been previously found to be the most likely to share low-quality news (Guess and Munger 2020).

Of course, age is a blunt category associated with a whole host of period, life-cycle, and individual-level traits, but there have been a number of suggested reasons why older Americans could be more likely to share online misinformation. In addition to internet skills and digital literacy, these include systematic differences in social trust and social ties; increased tendency toward source amnesia; difficulty detecting lies; or fewer potential concerns with the consequences of being out of the labor market (Brashier and Schacter, 2020; Van Bavel et al., 2020; Guess et al., 2019). Regardless of the particular explanation, based on prior research **we expect both sharing and viewing of low-credibility news to be more common among older users than younger users (H3a–b)**.

Finally, we explore an additional, under-appreciated possible explanation for dif-

ferences in engagement with low-credibility news: that specific characteristics of news on social media are relatively more attractive to people in different age categories. Though so-called “fake news” has been noted for its novelty and ability to surprise (Vosoughi et al., 2018), it tends to have characteristics in common with two other basic forms of online content: “clickbait,” which describes articles with headlines optimized to entice clicks (often via dubious appeals to curiosity); and, more simply, any content that is related to politics. Clickbait exploits a psychological phenomenon known as the curiosity gap (Loewenstein, 1994) and tricks readers into clicking a headline to fill this created knowledge gap (see also Munger 2020). Since some scholars have found evidence that older Americans have a higher preference for clickbait headlines (Munger et al., 2020), it is possible that false clickbait headlines could drive higher levels of low-credibility news sharing among older Americans. Given that older adults are more likely to be interested in politics (Delli Carpini, 2000) and vote (Mesch and Coleman, 2007; Henn and Foard, 2012), and that low-credibility news is often about politics, it is also possible that the political nature of this content has a similar effect.<sup>5</sup>

Clickbait is a common form of online content that in an important sense relies on deception or trickery to attract engagement (Munger et al., 2020). Not surprisingly, then, content analyses of “fake news” articles have found a relationship between clickbait and the characteristics of misinformation (Mourão and Robertson, 2019). We build on these stylized facts to suggest a reductive — and perhaps inaccurate — way to describe the kind of online, politically charged “fake news” studied since 2016 as the intersection of clickbait and political content. Following this logic, we test whether these characteristics of online news are more likely in low-credibility news stories and if articles that contain these characteristics are more likely to be shared among older Americans. Focusing on URL shares, we expect that low-quality news is more likely to be classified as clickbait than credible news (**H4a**). We also expect that low-credibility news is more likely to be political than credible news (**H4b**). We then explore which age groups are more likely to share clickbait headlines (**RQ2a**) and political news (**RQ2b**). Finally, as an exploratory analysis we investigate how sharing patterns for different combinations of these news categories vary across age groups (**RQ3**).

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<sup>5</sup>We define an online article as political if the central claim of the story relates to government institutions, policy, or a political actor.



## Data and Methods

### *Condor Dataset*

The release of the Social Science One (SS1) “Condor” dataset of URLs shared on Facebook allows us to test these relationships in a de-identified, privacy-protecting manner (Messing et al., 2020). The dataset summarizes information about 38 million URLs shared worldwide more than 100 times publicly on Facebook (between January 1, 2017 and July 31, 2019, inclusive). Each row for U.S. users represents a count of actions (e.g., likes, shares, views, clicks) at the URL-year-month-age-gender-“political page affinity” level, with Gaussian noise added to each count designed according to a differential-privacy framework.<sup>6</sup> Political page affinity is a five-point integer scale (from -2 to 2) that categorizes users’ political affinity based on the pages they follow, adapting the method used by Barberá et al. (2015). We treat this as an estimate of a user’s ideological self-placement. Two important features of these data are important to keep in mind for our analysis. First, the 100-shares threshold induces potential selection bias in that we cannot observe links from the far end of the “long tail” of engagement on Facebook. Second, we observe aggregated counts of URLs within the available categories, which creates limitations with regard to inferences about individuals. We return to both of these issues in the discussion.

We observe a noisy value where random noise is drawn from a zero-centered normal distribution with standard deviation  $\sigma$ , where  $\sigma$  is constant for each attribute, such as age category (see Messing et al. 2020 for a detailed explanation). Hence, when calculating the frequency of shares or views within a given category  $c$ , we can only construct a noisy estimate of this quantity  $\hat{X}_c$ . Given that the noise-injection process is public<sup>7</sup> and we have the number of rows ( $r$ ) that we sum over to create these counts for a given category ( $c$ ), we can create confidence intervals around the counts that we present (Eq. 1):

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<sup>6</sup>Given our study’s focus, we aggregate over the month and gender dimensions. The age categories are: 18-24, 25-34, 35-44, 45-54, 55-64, 65+. There is also an “NA” age category, which is excluded from our figures. This represents Facebook users for whom age could not be determined from their profiles.

<sup>7</sup> $\sigma = 14$  for shares and  $\sigma = 2,228$  for views (Messing et al., 2020)

$$\hat{X}_c \pm 1.96 \times \sqrt{\sum_{r \in c} \sigma^2} \quad (1)$$

We find that the confidence intervals are tight enough that we can still make inferences never before possible about Facebook engagement; in most of our figures, these error bars are barely visible. For every statistic, we report 95% confidence intervals for all of the measures. Adding random noise induces measurement error, which leads to attenuation bias when using statistical methods such as linear or logistic regression (Evans and King, 2020), but by only presenting the sums of rows we do not suffer from this problem. However, by presenting these sums we also introduce an additional challenge to interpretation that we return to in the discussion, namely, that it is important to keep in mind how even large counts can translate into relatively small proportions given the amount of content people are exposed to on social media (see, e.g., Guess et al., 2020a).

We collect all URLs located in the Condor dataset that were first posted on Facebook between January 1, 2018 and December 31, 2018 (inclusive), filtered in the following additional ways. First, we only include URLs from domains evaluated by NewsGuard, an independent organization that comprehensively evaluates the quality of online information sources with a transparent rating scheme and a staff of full-time journalists.<sup>8</sup> We additionally eliminate all URLs from sites classified by NewsGuard as satire or sites not given a numeric rating, including YouTube. We opted for NewsGuard given its extensive coverage of credible and low-quality online news producers (it contains ratings for over 5,000 news domains).<sup>9</sup> We focus strictly on 2018 given that at the time of analysis it was the most recent full year for which we could retrieve data.<sup>10</sup> We further limit URLs to those that

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<sup>8</sup>NewsGuard scores inform an internet plug-in that surfaces metadata on news sources' credibility in search results pages and social media feeds. More information can be found at <https://www.newsguardtech.com>.

<sup>9</sup>Reassuringly, the NewsGuard list contains most of the "fake news" publishers identified by Allcott et al. (2019); in the Condor dataset, more than 96% of URL shares from domains in the Allcott et al. (2019) list are also captured by the NewsGuard list. As further validation, we note that 88% of the online news domains in the Allcott et al. (2019) list are rated as unreliable by NewsGuard. In addition, 99% of mainstream online news domains identified by Microsoft Project Ratio are rated as reliable by NewsGuard.

<sup>10</sup>NewsGuard's coverage also begins in 2018.

received more shares from American Facebook users than users from any other country. The aggregated counts we use also cover American Facebook users only. These steps leave us with 966,591 URLs.

### *URL Classification*

At the URL level, we create three binary measures: (1) credible vs. low-credibility news source; (2) political topic; (3) clickbait. We also classify URLs according to the estimated political slant of their parent domain.

**Credibility.** We use NewsGuard’s ratings to determine the “credibility” of a domain. NewsGuard employs a team of trained journalists and editors to review and rate news and information websites based on nine criteria assessing basic practices of credibility and transparency. Based on a site’s performance on these criteria, it is assigned a red or green rating. A histogram of NewsGuard scores (from 0 to 100) for the majority of online news domains can be found in the Online Appendix in Figure 13. Domains that receive a score of 60 points or higher are deemed credible; otherwise, we code them as “low-quality” (i.e., a publisher of low-credibility news). This is the same threshold that NewsGuard’s browser extension uses to determine whether users see a “red” or “green” shield next to a news headline. Following the standard in the literature, we classify URLs on the basis of their parent domains’ credibility rating.

**Political news.** We determine each news URL’s relevance to politics using a supervised machine classifier. To create a training set, three independent coders labelled a random sample of headlines and blurbs as political or not (expressed as a binary yes or no).<sup>11</sup> Given that we are comparing credible and non-credible sources, this sample was balanced between the two.<sup>12</sup>

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<sup>11</sup>We define an online article as political if the central claim of the story relates to government institutions, policy, or a political actor.

<sup>12</sup>This is especially important given that headlines/blurbs from low-quality and credible sources are likely to rely on different language styles.

We used a ground-truth dataset (100 headlines/blurbs from non-credible sources and 400 headlines/blurbs from mainstream sources) to train three undergraduate coders. Once they achieved acceptable reliability, they labeled a large balanced set of additional headlines/blurbs. 8,552 headlines/blurbs were labeled in total (3,971 from credible sources and 4,581 from non-credible sources) by independent coders. We monitored their reliability by having two coders label 15% of the headlines/blurbs.<sup>13</sup> For this subset labeled by two coders, there was 86% agreement.<sup>14</sup> We then used these labels to train a random forest classifier to classify the rest of the URLs in our dataset. Using a train/test split of 70-30, this model produced 90% accuracy and an F1 score of 0.90. Additional validation details are provided in Table 3 in the Online Appendix.

**Clickbait.** To classify URLs as clickbait or not, we employed a pre-trained classifier based on prominent linguistic features of headlines. Specifically, we used a support vector machine (SVM) with radial basis function kernel built by Chakraborty et al. (2016) using a training set of 16,000 clickbait (BuzzFeed, Upworthy, ViralNova, Scoopwhoop, and ViralStories) and 16,000 non-clickbait headlines (from Wikinews articles collected by News-Reader). This model has an accuracy of 93%, a precision of 0.95 and recall of 0.9 on the original authors' set of headlines. To measure the performance of this classifier on this dataset, a random set of 1,000 headlines were coded as clickbait or not clickbait by at least one coder,<sup>15</sup> and then compared to the predicted labels. The classifier correctly predicted whether the headline was clickbait or not clickbait for 74.4% of the 1,000 headlines, but only achieved a precision of 0.46 and recall of 0.53 for clickbait headlines. Given this performance, it is possible that using these predicted labels may lead to biased estimates. To correct for possible bias, we follow work by Hopkins and King (2010) that utilizes misclassification probabilities between each pair of predicted labels and the true value to produce a corrected, and statistically consistent, estimate of the true proportion of a specific label. We build on this strategy and use a bootstrap technique to impute whether a headline was

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<sup>13</sup>In cases of disagreement, we had a third coder break the tie before adding the result to our final training set.

<sup>14</sup>Table 2 in the Online Appendix provides more detailed inter-rater reliability statistics.

<sup>15</sup>Three coders labeled these headlines and 20% of these headlines were coded by two coders. In the case of ties, a third coder rated the headline and that label was used. Instructions for these coders and inter-rater reliability statistics can be found in the Supplementary Materials.

clickbait using the predicted label (clickbait or not) and the misclassification probability of each predicted label. (For example, we have established that if a headline is labeled as clickbait by our classifier, it is clickbait 46% of the time, whereas if a headline is labeled as not clickbait by our classifier, it is not clickbait 85% of the time.) We use the predicted label and misclassification probability for that label to produce 100 samples of the clickbait label (with replacement) for each of the 966,591 URLs in our dataset. We then run analyses for each of these 100 samples and report the means and the 95% confidence interval of all estimates in Figure 10, 12, and 16 (in the Online Appendix) and the mean proportion (given tight confidence intervals, they are not reported) in Table 1.

**Ideological slant.** To compare news sources across the ideological spectrum, we employ two different estimates of source ideology. For credible news, we use media partisanship scores developed by Eady et al. (2020), which are estimated from URLs jointly shared by social media users and news accounts.<sup>16</sup> For low-credibility news sources, we rely on manual classifications by Aslett et al. (2020) covering the still-active low-quality sources identified by Allcott et al. (2019). They classified each source as liberal leaning, conservative leaning, or with no clear partisan orientation. Combined with NewsGuard ratings, these slant estimates allow us to disaggregate both quality and low-quality news domains to those from a primarily liberal or conservative viewpoint.<sup>17</sup>

## Results

### *Prevalence of Low-credibility News (RQ1)*

Figures 1 and 2 present the number of shares<sup>18</sup> and views of news URLs on Facebook in the United States in 2018, according to whether their domains are classified as credible or low-quality. Of URLs from sources rated by NewsGuard in the Condor dataset, we

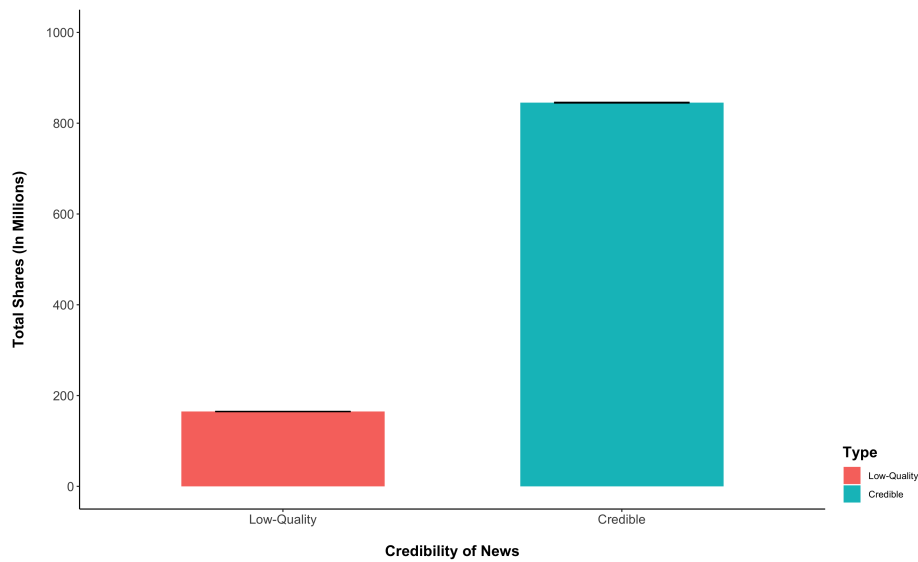
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<sup>16</sup>Sites with a score below zero are classified as liberal and those above zero are classified as conservative.

<sup>17</sup>The list of sources with ideological scores (70 low-quality domains, 150 credible domains) can be found in the Online Appendix. Half of the URL shares recorded in the dataset are from domains for which we have an ideological score.

<sup>18</sup>Share counts include reshares.

find that approximately 84% of shares were from credible news domains.<sup>19</sup> The rest (15%) were shared from low-quality news domains. We find that a slightly larger share of views, approximately 89%, was from credible news domains, and, not surprisingly, there are on the order of 100 times more views across categories than shares. Clearly, views and shares of high-quality news far outnumber those of low-quality or untrustworthy news. Though the proportion of credible news that we find is significantly higher than public perceptions — a recent Knight Foundation study estimated that Americans believe 65% of news on social media constitutes misinformation (Knight, 2018) — news from low-quality sources still achieves a nontrivial amount of circulation: roughly one out of eight views of at least moderately popular news articles on Facebook are from these sources.<sup>20</sup>

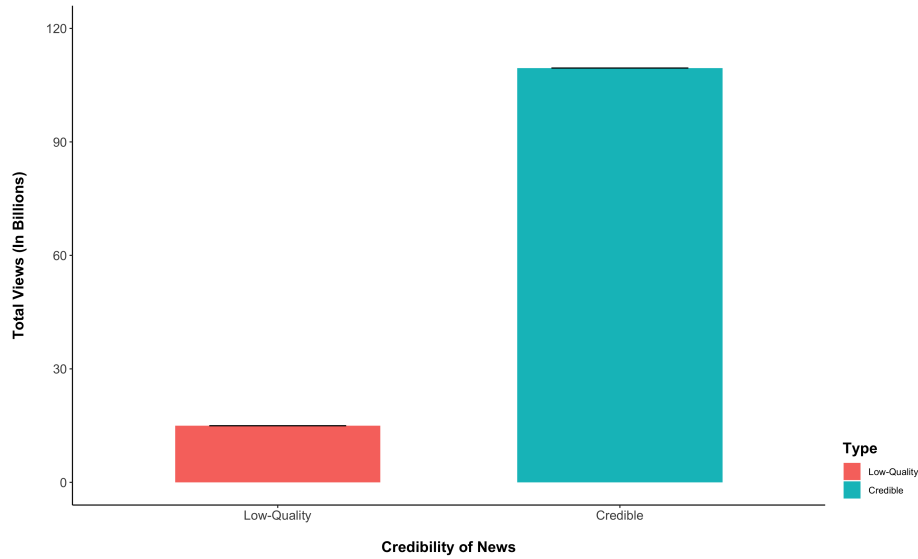


**Figure 1. News URL Shares by Source Credibility.**

*Note.* 95% confidence intervals are displayed.

<sup>19</sup>Calculating percentages using two different sums of differentially private data may induce bias, but work using this dataset has demonstrated that with a sufficient number of views or shares, the bias in this estimator is not practically significant (Buntain et al., 2021). Given that every viewing and sharing estimate we report in this paper is much higher than minimum thresholds set by Buntain et al. (2021), we can confidently report percentages throughout this paper.

<sup>20</sup>It is worth reiterating here that we only have access to news links shared at least 100 times publicly in the Condor dataset.

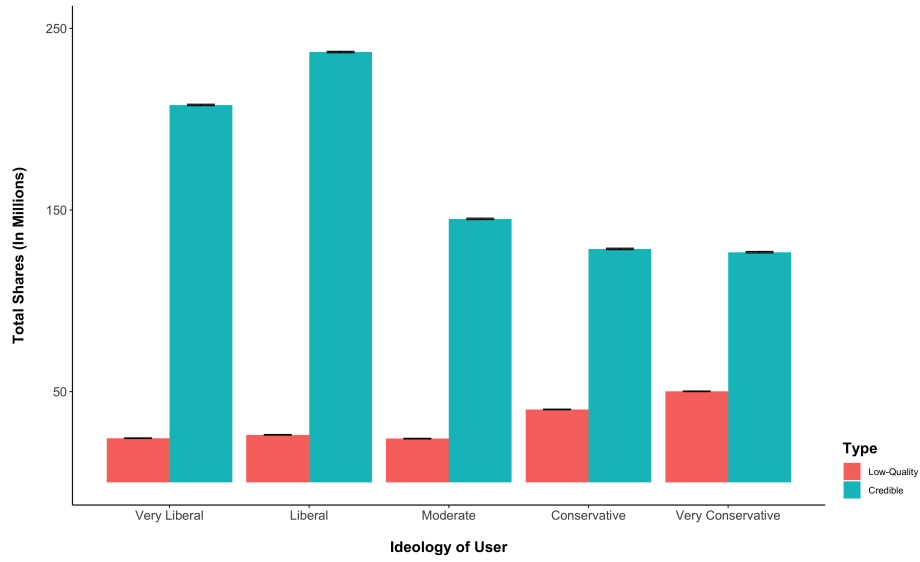


**Figure 2. News URL Views by Source Credibility.**

*Note.* 95% confidence intervals are displayed.

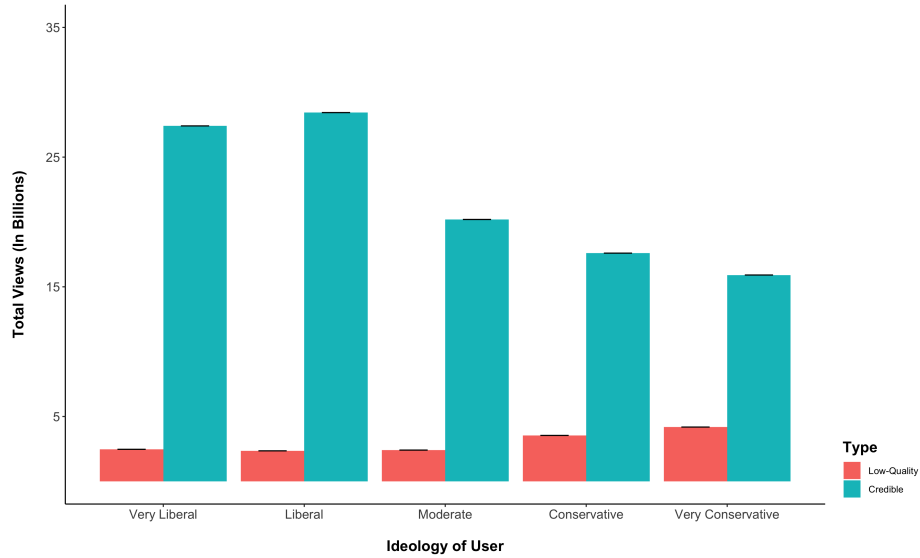
### ***Ideology and Low-credibility News (H1, H2)***

Next, we turn to the distribution of these shares and views by users' inferred ideological category. In Figure 3, looking purely at counts, we see that somewhat more links to articles from low-quality news domains were shared by conservatives (especially those estimated to be in the most conservative category). This is not driven by more shares overall; the most conservative categories are associated with *fewer* shares from credible news domains. In fact, 27% of news URLs shared by very conservative Facebook users are from low-quality news publishers, but only 9% of news URL shared by very liberal Facebook users are from low-quality news publishers. A similar pattern is visible in Figure 4 for views, though the overall ideology gradient is more slight: 19% of news URLs very conservative Facebook users view are from low-quality news publishers, but only 7% of news URLs very liberal Facebook users view are from low-quality news publishers. For both types of behavior, low-credibility news as a proportion of all news is the greatest for the most conservative category, supporting **H1b/H2b** but not **H1a/H2a**, which predicted more engagement at both ideological poles.



**Figure 3. News URL Shares by User Ideology.**

*Note.* 95% confidence intervals are displayed.

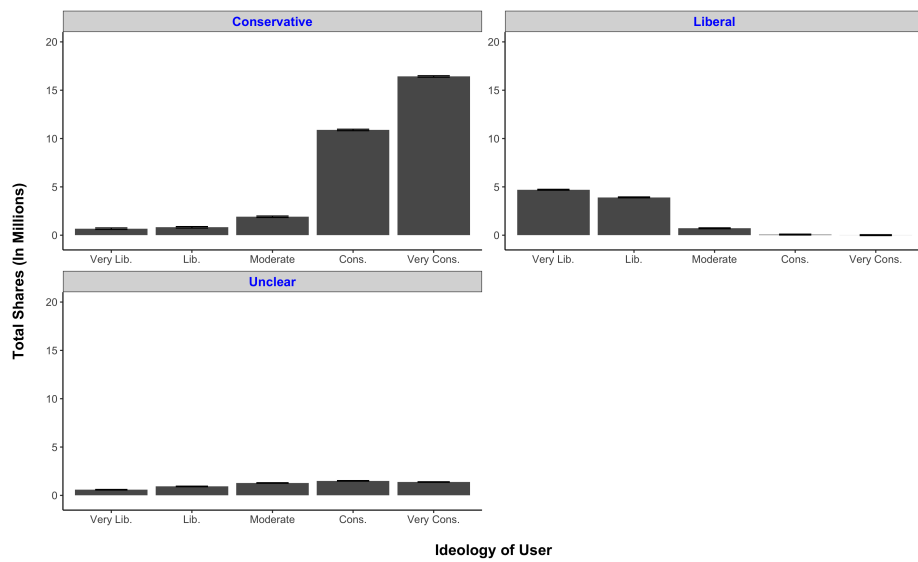


**Figure 4. News URL Views by User Ideology.**

*Note.* 95% confidence intervals are displayed.



Exploring further, **Hypotheses 1c/2c** predict that Facebook users will view and share more news from ideologically congruent low-credibility sources. Disaggregating our untrustworthy news measure by estimated ideological slant, we find that this is the case for both types of behavior. The number of shares and views of low-quality news by both estimated ideological slant of the source and inferred user ideological category are reported in Figures 5 and 6. As expected, Facebook users appear to mainly view and share ideologically congenial low-credibility news. (We present analogous results for credible news domains in the Online Appendix in Figures 14 and 15.) Our results, especially among the liberal subgroup, illustrate the advantage of large-scale platform data for studying what is often relatively tail-end behavior: subtle patterns emerge that would be obscured by sampling variability in datasets of conventional size.

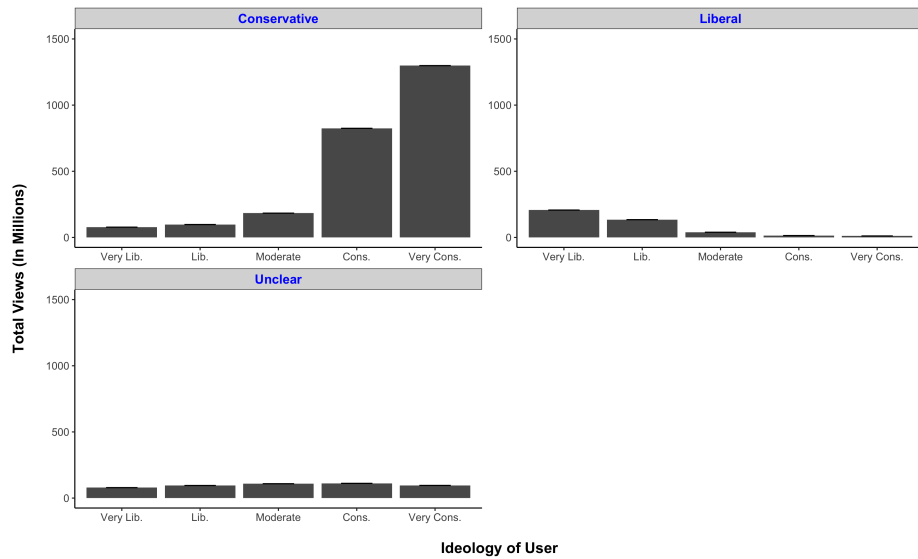


**Figure 5. Low-Quality News URL Shares by User Ideology and News Slant.**

*Note.* 95% confidence intervals are displayed.

### *Age and Low-credibility News (H3)*

In Figures 7 and 9 we present the number of shares and views of URLs from low-quality and credible domains by Facebook users across different age brackets. As previous



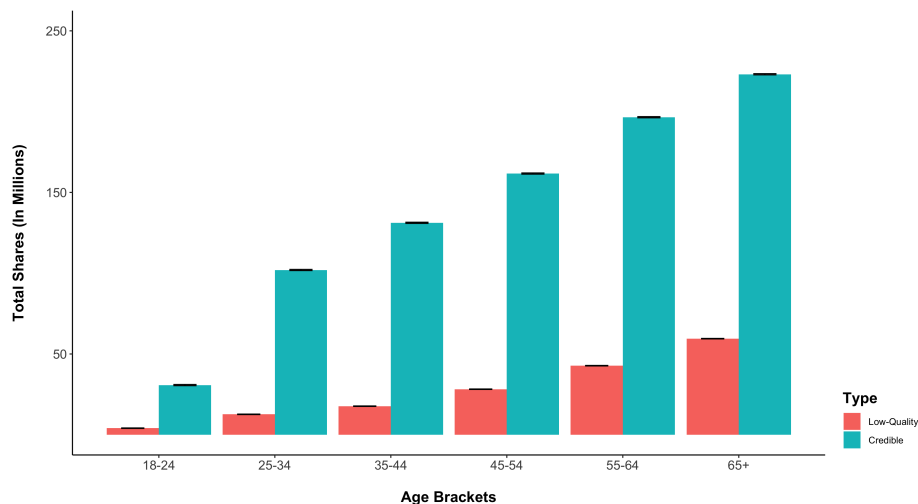
**Figure 6. Low-Quality News URL Views by User Ideology and News Slant.**

*Note.* 95% confidence intervals are displayed.

research suggests, we find that older Americans share more links to articles from low-credibility news domains (**H3a**) than do younger Americans. Taking into account the number of shares from credible news sources, we see that low-credibility news is also greatest in proportional terms among Americans in the oldest age category: 20% of news URLs shared by Facebook users 65 years old or older are from low-quality news domains, but only 10% of news URLs shared by Facebook users from the second-lowest age bracket (24-35)<sup>21</sup> are from low-quality news domains. We also look at the age gradient within ideological subgroups and find a similar pattern in each, with the exception of moderates (Figure 8). Interestingly, older Americans as a group do not seem to view much more low-credibility news (**H3b**). However, a different pattern emerges when we consider the proportion of news URLs within age categories: 19% of news URLs the oldest Facebook users view are from low-quality news publishers, but only 7% of news URLs viewed by those in the second-lowest age bracket are from low-quality publishers. These results are consistent with the idea that differential sharing patterns by age and other categories are driven by differences in what

<sup>21</sup>We do not compare to the lowest age bracket (18-24), because this is not the group with the highest Facebook usage (Perrin and Anderson, 2019), so it does not necessarily serve as a proper baseline.

people see in their feeds (which could reflect unobserved characteristics such as news feed quality), and we return to this interpretation (and its limitations) in the Discussion.

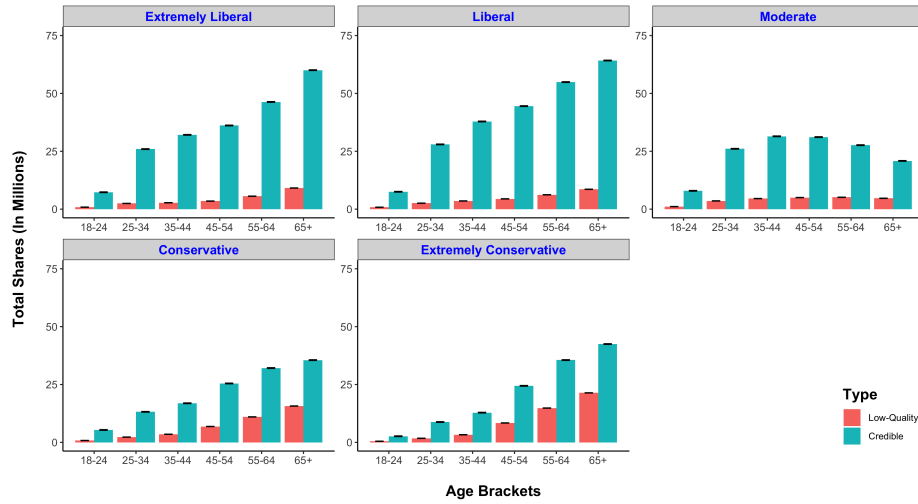


**Figure 7. News URL Shares by Age Group.**

*Note.* 95% confidence intervals are displayed.

#### ***Low-credibility News, Clickbait, and Politics (H4, RQ2–3)***

Having provided new descriptive evidence on both credible and non-credible news viewing and sharing activity on Facebook across age and ideological groups, we now explore whether similar patterns exist for related but distinct categories — political news and clickbait. First, we look at how these classifications relate to each other. Aggregating over all our URLs, we calculate the proportion classified as political/non-political and clickbait/non-clickbait among both credible and low-quality domains (Table 1). In support of **H4a** and **H4b** we find that URLs from low-quality news domains are both more likely to have clickbait headlines and to have a central claim that is political than URLs from credible news domains, though the latter difference is especially pronounced (53.4% vs. 31.3%). Among low-quality domains, 12.3% are classified as both political and clickbait (compared to 6.3% of credible news domains), which suggests that “fake news” tends to be more than the intersection of clickbait headlines about political topics.



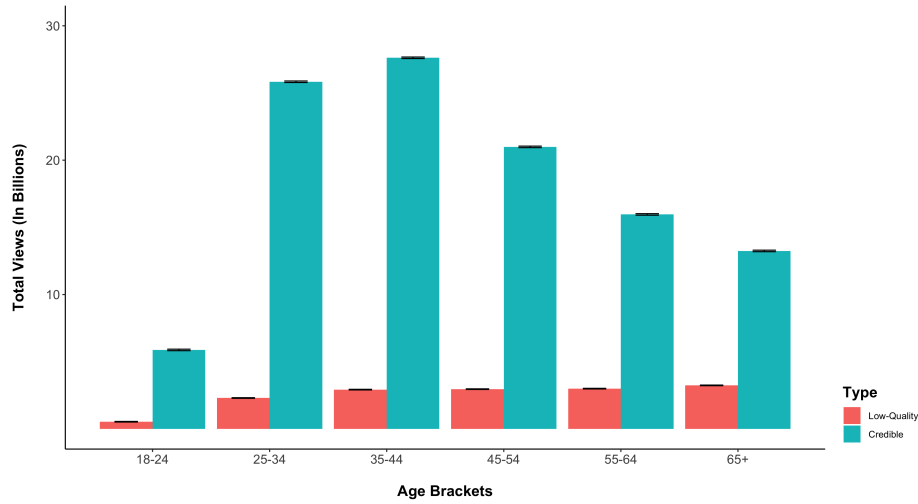
**Figure 8. News URL Shares by Ideology and Age Group.**

*Note.* 95% confidence intervals are displayed.

**Table 1: Proportion of Links that are Clickbait and Political from Credible and Low-Quality Sources.**

Clickbait	Political	Percentage of Links
Credible News Domains		
Yes	Yes	6.3%
Yes	No	16.9%
No	Yes	25.0%
No	No	51.4%
Low-Quality News Domains		
Yes	Yes	12.3%
Yes	No	14.1%
No	Yes	41.2%
No	No	32.3%

*Note.* The mean of each estimate is presented using bootstrapped samples.

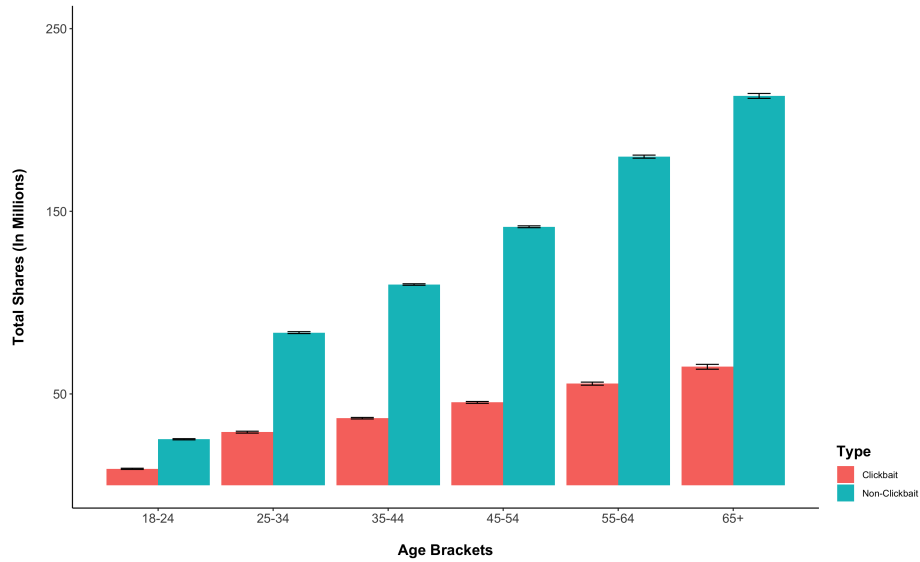


**Figure 9. News URL Views by Age Group.**

*Note.* 95% confidence intervals are displayed.

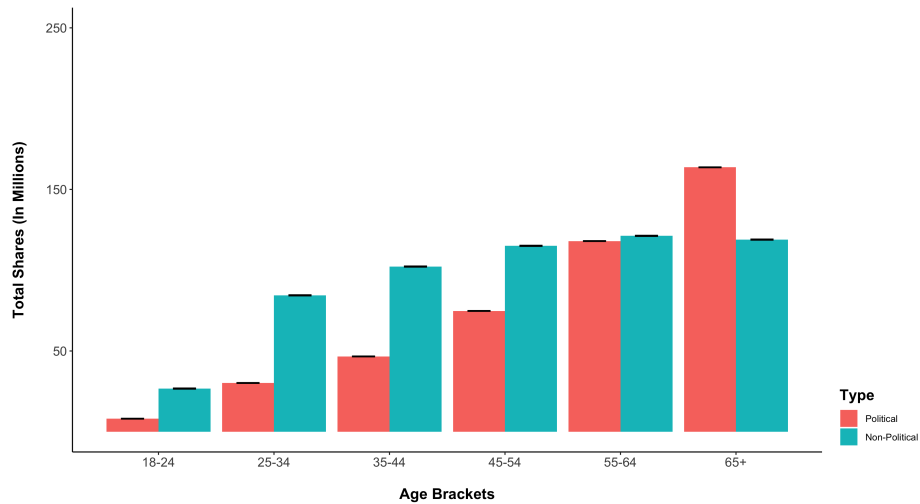
Given limited overlap across these categories, we investigate whether Facebook users in certain age groups are more likely to share news with clickbait headlines or political news (**RQ2a/RQ2b**). Figure 10 presents the number of shares of URLs with clickbait headlines from all domains in our dataset across age categories. We do not find support for our hypothesis that older users are more likely to share clickbait articles than younger users: in the second-youngest age bracket (25-34), around 26% of news shares were from URLs that had a clickbait headline, compared to 23% of URLs shared in the oldest age bracket (65 and over). This finding holds when we only look at shares from low-quality news domains as well (see Figure 16 in the Online Appendix).

Figure 11 presents the number of shares of political URLs across age categories. Here we do find support for our hypothesis that older Facebook users are more likely to share political articles than younger users: in the second-youngest age bracket, around 27% of news shares were from URLs that are political compared to 58% of shares from the oldest age bracket. As before, this finding also holds when we only look at shares from low-quality news domains (see Figure 17 in the Online Appendix).



**Figure 10. News URL Shares by Age Category and Clickbait.**

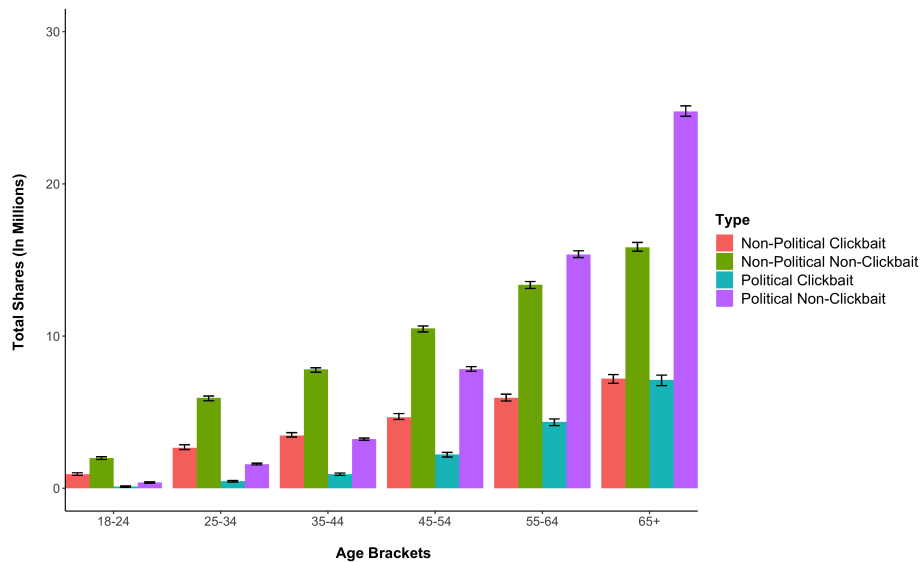
*Note.* The mean and 95% confidence interval of each estimate are presented using bootstrapped samples.



**Figure 11. News URL Shares by Age Category and Political Topic.**

*Note.* 95% confidence intervals are displayed.

Finally, we explore whether any notable variation emerges *within* the set of low-credibility news URL shares by age category. In other words, do the sharing patterns we uncovered appear to be driven by one of the specific subsets of low-quality news that we identified in the bottom half of Table 1 above? Figure 12 presents the number of URLs shared from low-quality news domains by age bracket and their clickbait and political classifications. According to the figure, a large percentage of low-credibility news shared by the oldest age bracket is political (around 58%), but only a small percentage of low-credibility news shared by the second-youngest group of Americans is (around 19%). Clickbait articles only make up around 26% of low-credibility news shared by the oldest Americans, while it makes up around 30% of low-credibility news shared by the second-youngest group of Americans. By placing all URLs shared from low-quality news domains into four possible categories of political/non-political  $\times$  clickbait/non-clickbait we can display the number of URLs shared for each category in Figure 12. As the purple bars in the figure indicate, political *and* non-clickbait low-credibility news make up close to a majority of low-credibility news shares for the oldest age bracket (around 45%), whereas it makes up 15% of low-credibility news shares among the second-youngest group.



**Figure 12. News URL Shares from Low-Quality News Domains.**

*Note.* The mean and 95% confidence interval of each estimate are presented using bootstrapped samples.

## Discussion

Using a new dataset of large-scale Facebook URL engagement, we document several findings that contribute to our understanding of descriptive patterns in the quality of information Americans view and share in their News Feeds. Focusing on URLs shared in 2018, we confirm findings from earlier research that sharing and consumption of online misinformation on Facebook is relatively rare, with only 12% of news shares — and 16% of news exposures — being linked to what NewsGuard classifies as non-credible news domains (Guess et al., 2019, 2020a). We also confirm the existence of a relationship between the conservatism of inferred ideological affinity and both the number and proportion of shares to low-credibility news domains by users in that category. This likely reflects the greater popularity of conservative-leaning low-credibility news overall, though we see among both the most liberal and most conservative user categories a relatively greater number of shares and views of ideologically congenial content from low-quality news domains.

Also in line with earlier work, we find an even stronger relationship between the user age category and the number of shares from low-quality domains, one that is most pronounced within the two most conservative ideological groups — among which older users also share more links to suspect news domains. Strikingly, this pattern is not as clear in the view counts, which suggests that low-quality news sharing among older Americans may not simply reflect a greater prevalence of low-quality news posts in their feeds (e.g., Grinberg et al., 2019). Given prior evidence suggesting that low-credibility news engagement mainly occurs within smaller subgroups than the relatively coarse categories made available to researchers in the Condor release (Grinberg et al., 2019; Guess et al., 2020a), it is important to note that the data we analyze are counts aggregated over users, with observations (in this case) at the *URL-age category* level. Thus, we cannot rule out the explanation that more low-credibility news sharing *is* conditional on greater exposure on the News Feed — but only among a smaller group than we can identify within our existing categorization scheme.

Our analyses demonstrate how combining large-scale URL data with machine classification enhances our understanding of news sharing patterns. Looking beyond the traditional credible/low-credibility dichotomy, we show that clickbait constitutes a larger propor-



tion of news shares for the youngest age category than the oldest. Perhaps less surprisingly, the oldest Americans share more news about politics than any other topic, while political news is relatively rare among the youngest group. The ability to deploy highly accurate supervised learning classifiers trained on large- $N$  platform data enables a more nuanced account of the kinds of content people engage with on social media.

In addition to its necessarily aggregated nature, several other caveats regarding the Condor dataset bear repeating. First, each count we observe is the sum of the true count plus a random number drawn from a known distribution. Though this process adds statistical noise, we are able to report counts with extremely narrow confidence intervals. In addition to this differential-privacy protocol, the URLs themselves are selected for inclusion into the dataset according to a threshold of more than 100 global public shares (Messing et al., 2020). Thus our conclusions are not based on an unbiased sample of the complete universe of web links ever shared by users on Facebook; they are instead limited to inferences based on more popular URLs.<sup>22</sup> Finally, though our estimated counts have the advantage of being straightforward to interpret and unbiased, they risk misleading conclusions about prevalence that can arise without a reasonable denominator. In most cases, we display counts for both low-quality and credible news, which allows for a natural comparison. Even so, it is important to keep in mind how news exposure on social media compares to other content users may encounter on their feeds. Our data span nearly 280 billion URL views by American users in 2018 of which over 124 billion (44.5%) are from our set of news domains, and nearly 2.1 billion shares of which over 1 billion (48.2%) are from those news domains. These proportions are an order of magnitude greater than other studies have found,<sup>23</sup> which is a striking divergence, though it may in part reflect our imperfect denominator: much of people’s News Feeds contain content that does not originate with URLs. At the same time, the 100-shares threshold means that we do not observe a potential long tail of non-news links, which could likewise inflate the proportion of URLs from news domains.

Despite these qualifications, the analyses presented here offer a proof of concept

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<sup>22</sup>This does not, however, mean that we are not picking up private shares in our analyses, as private shares are included in observed counts if a given URL was *also* shared publicly more than 100 times.

<sup>23</sup>By one recent estimate, news content accounts for no more than 4.2% of total online consumption (including social media) on average (Allen et al., 2020).

for future research. Though we cannot make inferences about individuals or causal mechanisms, our descriptive findings help to build a foundation of evidence that can inform future research and policy debates. We view this as part of an ongoing, cumulative process: Our evidence will not indefinitely capture the reality of engagement with news URLs on Facebook, and we encourage researchers to build on our work to further replicate and refine our approach as more recent data become available. In addition to refreshing this foundation of evidence, we hope that such efforts will continue to build trust between independent academic researchers and platforms as they work to expand the scope and resolution of future data releases.

### Acknowledgments

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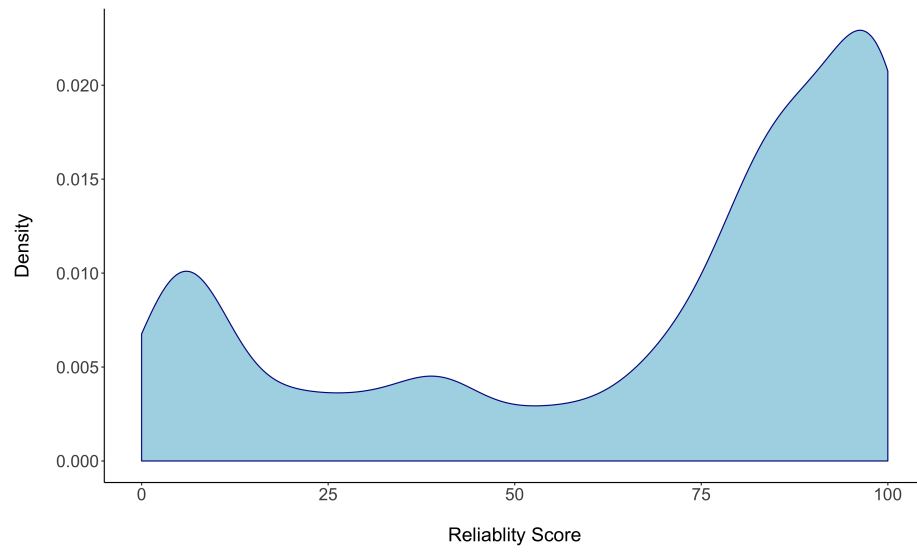
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### Online Appendix



**Figure 13. Distribution of NewsGuard Scores**



**Coding instructions for research assistants coding URLs as political or not:**

For each headline/blurb you will determine if the main subject story informing readers of events that relate to government institutions, policy, or political actors. If the headline or blurb directly references a political figure it is political. The central claim has to fit this definition. Below are some example of headlines that are political and headlines that are not political:

**Political Headlines:**

- (1) For the first time, prosecutors have tied President Trump to a federal crime. But can a sitting president be indicted?
- (2) Poll: Freedom Caucus Republican losing to Dem challenger in longtime GOP-held district
- (3) China says U.S. should withdraw arrest warrant for Huawei executive
- (4) Border Patrol agent kills undocumented woman in Texas
- (5) Migrants describe hunger and solitary confinement at for-profit detention center

**Not Political Headlines:**

- (1) American Airlines agent saves two teenage girls from human trafficking scheme
- (2) Sharks vs. humans: At 100 million deaths against 6 each year, it's not a fair fight
- (3) Puerto Rico says hurricane death toll 20 times higher than first reported
- (4) Men Outtalk Women 2 to 1 on the Big Screen, Study Finds
- (5) Longwood Area Evacuated, Reported Gas Main Leak: Boston Fire

Note: You can use background knowledge and context to help you make judgements on these articles. If you are unaware of the situation, please do online research to obtain necessary context.

**Inter-Rater Reliability Statistics:****Table 2: Inter-Rater Reliability Statistics For The Training Data For The Political Classifier**

Coders	Agreement	Cohen Kappa Score	Headlines/Blurbs Coded By Both
01 and 02	0.844	0.699	531
01 and 03	0.874	0.739	509
02 and 03	0.865	0.730	453

**Table 3: Confusion Matrix and Precision and Recall of the Political Classifier**

True Label	Predicted Label	
	Political	Non-Political
Political	909	96
Non-Political	121	865
Precision	0.90	0.88
Recall	0.88	0.90
F1	0.89	0.89

### **Coding instructions for research assistants coding URLs as clickbait or not:**

Use the Clickbait column to code each headline/blurb as clickbait (1) or not clickbait (0). For each headline you will ask yourself: Is the headline's main purpose is to attract attention and encourage visitors to click on a link to a particular web page? Essentially, is this headline optimized to entice clicks (often via dubious appeals to curiosity)? Clickbait headlines share a few similar characteristics:

**Hyperbolic words:** Often clickbait headlines consist of words with “very emotional” sentiment, such as awe-inspiring, breathtaking, gut-wrenching, soul-stirring, etc. These kinds of words are rarely used in non-clickbait headlines.

**Internet slang:** Internet slang words such as LOL, LMAO, AF, etc. are often used in clickbait headlines to catch the attention of the reader.

**Punctuation patterns:** Clickbait headlines often contain informal punctuation patterns such as “!?” , “..” , “!!!” These are rarely ever used in non-clickbait headlines.

**Common bait phrases:** Further, several catch phrases are used in clickbait headlines. These exploit the “curiosity gap” of users, such as “Will Blow Your Mind”, “You Won't Believe.”

**Capitalization every letter in word:** For example, “MUST WATCH.”

If the headline is empty, please code it as not clickbait. Below are some example of headlines that are clickbait and headlines that are not clickbait:

#### **Clickbait Headlines:**

- (1) Man tries to hug lion. You won't believe what happens next!
- (2) 15 Things That Happen When Your Best Friend Is Obsessed With FIFA.
- (3) CNN Selectively Edits, Hates Trump, and Think Voters Are Stupid
- (4) Jennifer Lopez puts on the biggest spectacle Summerfest has ever seen for her first Milwaukee concert
- (5) This Is What "The Old Man" From Pawn Stars Was Like Off Camera, And I Never

Had Any Idea

**Not Clickbait Headlines:**

- (1) Police identify body as missing Baltimore mother, say boyfriend is 'person of interest' in killing.
- (2) Maryland will join alliance of states supporting Paris climate agreement, Hogan says
- (3) Singapore Heading for Recession Next Quarter, Maybank Says
- (4) Galileo satellites experiencing multiple clock failures - BBC News
- (5) US-Mexico-Canada chosen to host World Cup 2026

Note: You can use background knowledge and context to help you make judgements on these articles. If you are unaware of the situation, please do online research to obtain necessary context.

**Inter-Rater Reliability Statistics:**

**Table 4: Inter-Rater Reliability Statistics For Labeled Clickbait Headlines**

Coders	Agreement	Cohen Kappa Score	Headlines/Blurbs Coded By Both
01 and 02	0.823	0.576	100
01 and 03	0.848	0.680	100

**Table 5: Confusion Matrix and Precision and Recall of the Clickbait Classifier**

True Label	Predicted Label	
	Clickbait	Non-Clickbait
Clickbait	123	111
Non-Clickbait	145	621
Precision	0.46	0.85
Recall	0.53	0.81
F1	0.49	0.83

**Table 6: Credible News Domains in Dataset and Their Ideological Lean**

	Domain	Ideological Lean
1	altnet.org	Liberal
2	apnews.com	Liberal
3	atlantablackstar.com	Liberal
4	attitude.co.uk	Unclear
5	axios.com	Liberal
6	bizpacreview.com	Conservative
7	blackamericaweb.com	Liberal
8	blavity.com	Liberal
9	bloomberg.com	Liberal
10	breitbart.com	Conservative
11	businessinsider.com	Liberal
12	buzzfeednews.com	Liberal
13	c-span.org	Conservative
14	campusreform.org	Conservative
15	cbsnews.com	Liberal
16	circa.com	Conservative
17	cjr.org	Liberal
18	cnbc.com	Conservative
19	cnn.com	Liberal
20	cnsnews.com	Conservative
21	commentarymagazine.com	Conservative
22	commondreams.org	Liberal
23	conservativereview.com	Conservative
24	cookpolitical.com	Liberal
25	counterpunch.org	Liberal
26	crooksandliars.com	Liberal
27	csmonitor.com	Liberal
28	dailycaller.com	Conservative
29	dailydot.com	Liberal
30	dailysignal.com	Conservative
31	dailywire.com	Conservative
32	democracynow.org	Liberal
33	dennismichaellynch.com	Unclear
34	economist.com	Liberal
35	elitedaily.com	Liberal
36	endtimeheadlines.org	Conservative
37	express.co.uk	Conservative
38	factcheck.org	Liberal
39	fivethirtyeight.com	Liberal
40	forbes.com	Liberal



**Table 7: Credible News Domains in Dataset and Their Ideological Lean**

	Domain	Ideological Lean
41	foreignaffairs.com	Liberal
42	foreignpolicy.com	Liberal
43	fortune.com	Liberal
44	foxbusiness.com	Conservative
45	foxnews.com	Conservative
46	freebeacon.com	Conservative
47	gallup.com	Conservative
48	good.is	Liberal
49	governing.com	Liberal
50	harpers.org	Liberal
51	hbr.org	Liberal
52	hotair.com	Conservative
53	huffingtonpost.com	Liberal
54	ibtimes.com	Liberal
55	ijr.com	Conservative
56	ijr.com	Unclear
57	inquisitr.com	Unclear
58	inthesetimes.com	Liberal
59	jacobinmag.com	Liberal
60	jezebel.com	Liberal
61	judicialwatch.org	Conservative
62	justsecurity.org	Liberal
63	lawfareblog.com	Liberal
64	lifezette.com	Conservative
65	mashable.com	Liberal
66	mcclatchydc.com	Liberal
67	mediaite.com	Conservative
68	mediamatters.org	Liberal
69	mic.com	Liberal
70	motherjones.com	Liberal
71	mrctv.org	Conservative
72	msmagazine.com	Liberal
73	msnbc.com	Liberal
74	nationalinterest.org	Conservative
75	nationalreview.com	Conservative
76	nbcbnews.com	Liberal
77	newrepublic.com	Liberal
78	newsbusters.org	Conservative
79	newsmax.com	Conservative
80	newsone.com	Liberal

**Table 8: Credible News Domains in Dataset and Their Ideological Lean**

	Domain	Ideological Lean
81	newsweek.com	Liberal
82	newyorker.com	Liberal
83	nowthisnews.com	Liberal
84	npr.org	Liberal
85	nymag.com	Liberal
86	nypost.com	Conservative
87	nytimes.com	Liberal
88	observer.com	Liberal
89	ozy.com	Liberal
90	pbs.org	Liberal
91	pewresearch.org	Liberal
92	politico.com	Liberal
93	politicususa.com	Liberal
94	politifact.com	Liberal
95	poynter.org	Liberal
96	propublica.org	Liberal
97	prospect.org	Liberal
98	psmag.com	Liberal
99	publicintegrity.org	Liberal
100	qz.com	Liberal
101	rare.us	Conservative
102	rasmussenreports.com	Conservative
103	rawstory.com	Liberal
104	realclearpolitics.com	Conservative
105	reason.com	Conservative
106	reuters.com	Liberal
107	revealnews.org	Liberal
108	rollcall.com	Liberal
109	salon.com	Liberal
110	slate.com	Liberal
111	snopes.com	Liberal
112	spectator.org	Conservative
113	splcenter.org	Liberal
114	splinternews.com	Liberal
115	talkingpointsmemo.com	Liberal
116	taskandpurpose.com	Conservative
117	theamericanconservative.com	Conservative
118	theatlantic.com	Liberal
119	theblaze.com	Conservative
120	theconversation.com	Liberal

**Table 9: Credible News Domains in Dataset and Their Ideological Lean**

	Domain	Ideological Lean
121	thedailybeast.com	Liberal
122	theepochtimes.com	Conservative
123	theguardian.com	Liberal
124	thehill.com	Liberal
125	theintercept.com	Liberal
126	themarshallproject.org	Liberal
127	thenation.com	Liberal
128	therealnews.com	Liberal
129	theroot.com	Liberal
130	theweek.com	Liberal
131	thinkprogress.org	Liberal
132	time.com	Liberal
133	townhall.com	Conservative
134	tribunist.com	Unclear
135	truth-out.org	Liberal
136	truthdig.com	Liberal
137	univision.com	Liberal
138	upi.com	Conservative
139	usatoday.com	Liberal
140	usnews.com	Liberal
141	vanityfair.com	Liberal
142	vice.com	Liberal
143	voanews.com	Liberal
144	vox.com	Liberal
145	washingtonexaminer.com	Conservative
146	washingtonmonthly.com	Liberal
147	washingtonpost.com	Liberal
148	washingtontimes.com	Conservative
149	weekystandard.com	Conservative
150	worldpoliticsreview.com	Liberal
151	wsj.com	Conservative

**Table 10: Low-Quality News Domains in Dataset and Their Ideological Lean**

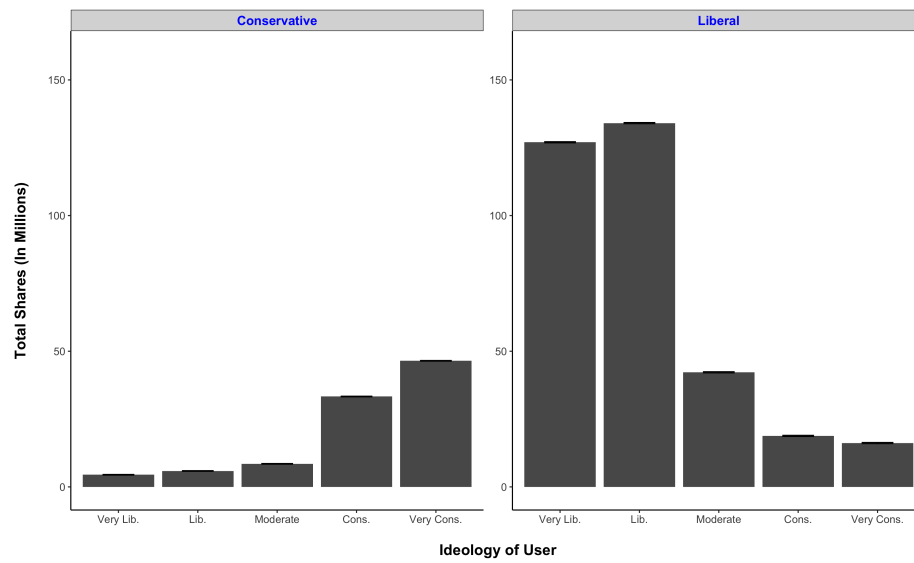
	Domain	Ideological Lean
1	100percentfedup.com	Conservative
2	ahtribune.com	Conservative
3	americanjournalreview.com	Conservative
4	americanthinker.com	Conservative
5	anonews.co	Unclear
6	awarenessact.com	Unclear
7	bb4sp.com	Conservative
8	beforeitsnews.com	Unclear
9	bipartisanreport.com	Liberal
10	blacknews.com	Liberal
11	clashdaily.com	Conservative
12	collective-evolution.com	Unclear
13	conservativedailypost.com	Conservative
14	conservativefiringline.com	Conservative
15	conservativetribune.com	Conservative
16	dailykos.com	Liberal
17	dcclothesline.com	Conservative
18	disclose.tv	Unclear
19	downtrend.com	Conservative
20	drudgereport.com	Conservative
21	eaglerising.com	Conservative
22	en-volve.com	Conservative
23	frontpagemag.com	Conservative
24	healthnutnews.com	Unclear
25	higherperspectives.com	Unclear
26	huzlers.com	Unclear
27	ilovemyfreedom.org	Conservative
28	infowars.com	Conservative
29	intellihub.com	Conservative
30	joeforamerica.com	Conservative
31	madworldnews.com	Conservative
32	medicalkidnap.com	Unclear
33	mintpressnews.com	Conservative
34	naturalnews.com	Unclear
35	neonnettle.com	Conservative
36	nowtheendbegins.com	Conservative
37	oann.com	Conservative
38	palmerreport.com	Liberal
39	pjmedia.com	Conservative
40	projectveritas.com	Conservative

**Table 11: Low-Quality News Domains in Dataset and Their Ideological Lean**

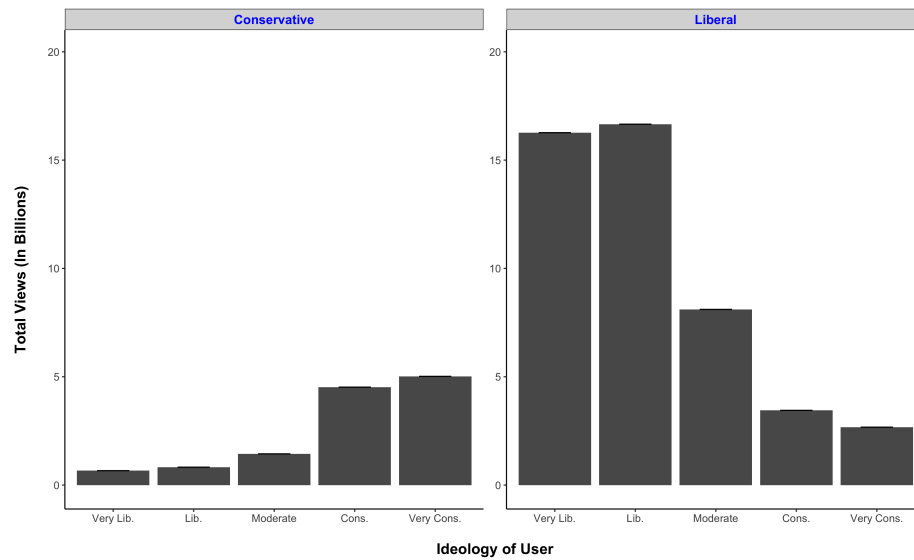
	Domain	Ideological Lean
41	projectveritasaction.com	Conservative
42	puppetstringnews.com	Conservative
43	redstate.com	Conservative
44	redstatewatcher.com	Conservative
45	reverbpres.com	Liberal
46	rt.com	Conservative
47	shareblue.com	Liberal
48	stream.org	Conservative
49	teaparty.org	Conservative
50	theconservativetreehouse.com	Conservative
51	thedailybanter.com	Liberal
52	thefederalist.com	Conservative
53	thehornnews.com	Conservative
54	themindunleashed.com	Unclear
55	thenationalmarijuananeews.com	Unclear
56	thepoliticalinsider.com	Conservative
57	therightscoop.com	Conservative
58	trueactivist.com	Unclear
59	truepundit.com	Conservative
60	trunews.com	Conservative
61	truthuncensored.net	Unclear
62	twitchy.com	Conservative
63	uschronicle.com	Conservative
64	westernjournal.com	Conservative
65	whatdoesitmean.com	Unclear
66	wnd.com	Conservative
67	worldnewsdailyreport.com	Unclear
68	worldtruth.tv	Unclear
69	yournewswire.com	Conservative
70	zerohedge.com	Unclear

*Slant Coding for Low-Quality News Sources*

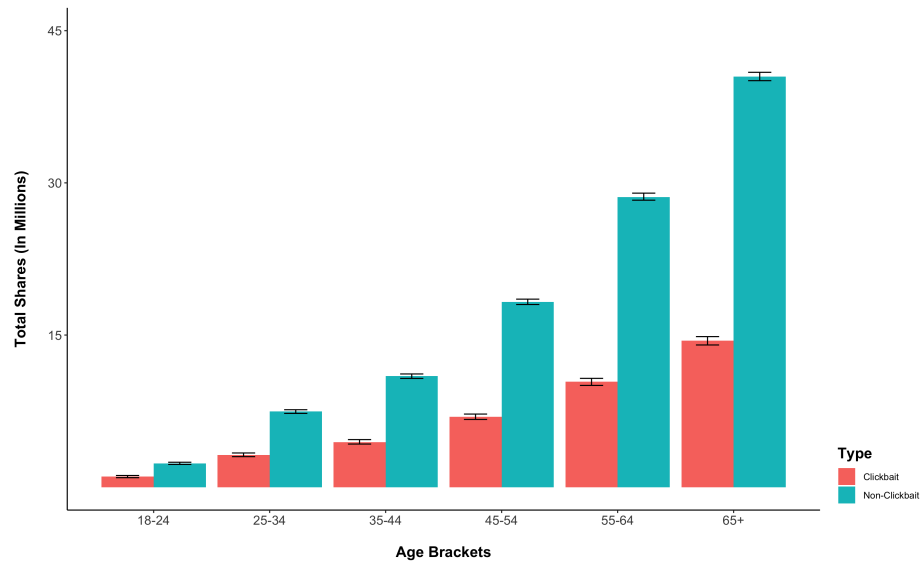
We determine the partisan lean of the low-quality domains by asking three independent coders to determine the partisan perspective of the all low-quality websites located in the Allcott et al. (2019) list of “fake news” publishers (conservative, liberal, and unclear). Coders were asked to use the headlines, the content of the articles, as well as the websites’ domain and about pages to make this determination, and to classify websites that had a clear partisan affiliation based on this information. Websites were not classified as liberal or conservative unless at least 50% of their content appeared to have a partisan or political nature. If websites did not meet this threshold they were classified as unclear. If the coders did not unanimously agree, a fourth coder was asked to evaluate the website, and the majority decision was used (split cases were included as active). There was over 75% level agreement among the coders and the Fleiss’ Kappa is .705. In total, six domains were placed in the liberal low-quality news stream, fifty domains were placed in the conservative low-quality news stream, and forty-three domains were placed in the unclear low-quality news stream. The prevalence of conservative and unclear low-quality news streams is in line with previous research that provides evidence for the asymmetric production of false/misleading news (Guess et al. 2020a).



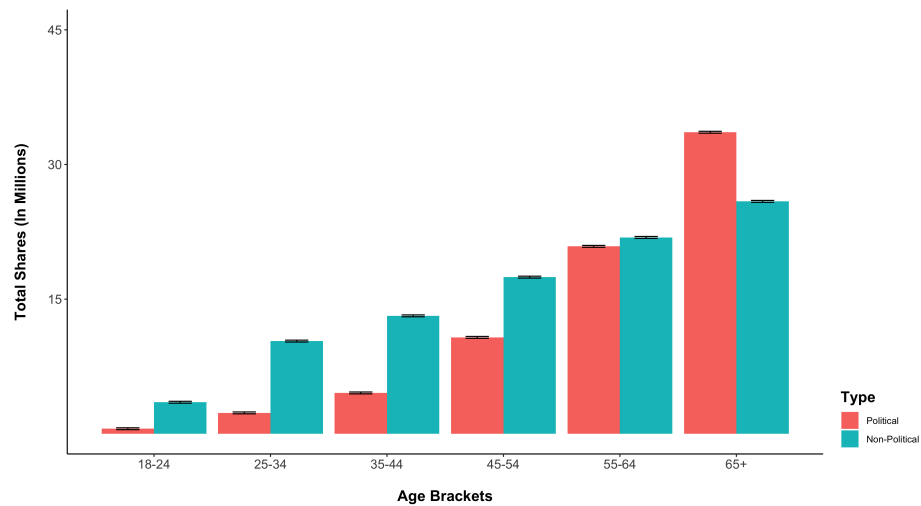
**Figure 14. All News URLs Shares by Ideology of User.** 95 percent confidence intervals are displayed.



**Figure 15. All News URLs Views by Ideology of User.** 95 percent confidence intervals are displayed.



**Figure 16. All News URLs Shares by Whether the Article is Clickbait from Low-Quality News Domains.** The mean and 95% confidence interval of each estimate are presented using bootstrapped samples.



**Figure 17. All News URLs Shares by Whether the Article is Political from Low-Quality News Domains.** 95% confidence intervals are displayed.