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Selective Exposure to Misinformation: Evidence from the consumption of fake news during the 2016 U.S. presidential campaign

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Abstract

Though some warnings about online "echo chambers" have been hyperbolic, tendencies toward selective exposure to politically congenial content are likely to extend to misinformation and to be exacerbated by social media platforms. We test this prediction using data on the factually dubious articles known as "fake news." Using unique data combining survey responses with individual-level web traffic histories, we estimate that approximately 1 in 4 Americans visited a fake news website from October 7-November 14, 2016. Trump supporters visited the most fake news websites, which were overwhelmingly pro-Trump. However, fake news consumption was heavily concentrated among a small group — almost 6 in 10 visits to fake news websites came from the 10% of people with the most conservative online information diets. We also find that Facebook was a key vector of exposure to fake news and that fact-checks of fake news almost never reached its consumers.

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The combination of rising partisanship and pervasive social media usage in the United States have created fears of widespread "echo chambers" and "filter bubbles" (Sunstein, 2001; Pariser, 2011). To date, these warnings appear to be overstated. Behavioral data indicates that only a subset of Americans have heavily skewed media consumption patterns (Gentzkow and Shapiro, 2011; Barberá et al., 2015; Flaxman, Goel, and Rao, 2016; Guess, 2016).

However, the risk of information polarization remains. Research shows people tend to prefer congenial information, including political news, when given the choice (e.g., Stroud, 2008; Hart et al., 2009; Iyengar and Hahn, 2009; Iyengar et al., 2008), but these studies typically focus on how ideological slant affects the content people choose to consume; relatively little is known about how selective exposure extends to false or misleading factual claims. Research in political science and psychology has documented that misperceptions are often systematically related to people's political identities and predispositions (Flynn, Nyhan, and Reifler, 2017). In this article, we therefore evaluate whether people differentially consume false information that reinforces their political views as theories of selective exposure would predict.

We additionally consider the extent to which social media usage exacerbates tendencies toward selective exposure to misinformation. Though Messing and Westwood (2014) find that social endorsements can help overcome partisan cues when people are choosing news content, other research indicates that tendencies toward selective exposure to attitude-consistent news and information may be exacerbated by the process of sharing and consuming content online (e.g., Bakshy, Messing, and Adamic, 2015). In this way, social media consumption may also be a mechanism increasing differential exposure to factually dubious but attitude-consistent information.

Finally, we analyze whether fact-checking — a new format that is increasingly used to counter political misinformation — effectively reached consumers of fake news during the 2016 election. Though fact-checks are relatively widely read and associated with greater political knowledge (e.g., Gottfried et al., 2013), they are often disseminated online in a politically slanted manner that is likely to increase selective exposure and reduce consumption of counter-attitudinal fact-checks (Shin and Thorson, 2017). To date, however, no previous research has considered whether consumers of fact-checks have been exposed to the claims that they evaluate. Does selective exposure undermine the effectiveness of fact-checking?

We evaluate these questions in the context of the rise of so-called "fake news," a new form of political misinformation that features prominently in journalistic accounts of the 2016 U.S. presidential election (e.g., Solon, 2016). Data from Facebook indicates that these factually dubious for-profit articles were shared by millions of people (Silverman, 2016). Many people also report believing the claims that fake news sites promoted in post-election surveys (Silverman and Singer-Vine, 2016; Allcott and Gentzkow, 2017).

However, little is known scientifically about the *consumption* of fake news, including who read it, the mechanisms by which it was disseminated, and the extent to which fact-checks reached fake news consumers. These questions are critical to understanding how selective exposure can distort the *factual* information that people consume — a key question for U.S. democracy.

We therefore examine the prevalence and mechanisms of exposure to fake news websites in a unique dataset that combines pre-election survey responses and comprehensive web traffic data from a national sample of Americans. Our design allows us to provide the first individual-level estimates of visits to fake news websites, including who visited these websites, how much and which types of fake news they consumed, and the probability that fact-checks reached fake news website readers. We can thus provide the first measures of the prevalence of selective exposure to misinformation in real-world behavior.

Specifically, we find that approximately one in four Americans visited a fake news website, but that consumption was disproportionately observed among Trump supporters for whom its largely pro-Trump content was attitude-consistent. However, this pattern of selective exposure was heavily concentrated among a small subset of people — almost six in ten visits to fake news websites came from the 10% of Americans with the most conservative information diets. Finally, we specifically identify Facebook as the most important mechanism facilitating the spread of fake news and show that fact-checking largely failed to effectively reach consumers of fake news.

Taken together, these results suggest a need to revisit the study of selective exposure using measures of real-world media consumption and to consider the behavioral mechanisms by which people are exposed to misinformation.

Data and results

Data for the analyses below combine responses to an online public opinion survey from a national sample of 2,525 Americans with web traffic data collected passively from their computers with their consent during the October 7–November 14, 2016 period. Our primary outcome variables are computed from web traffic data and measure the type and/or quantity of websites publishing fake news that respondents visited. We employ survey weights to approximate the adult population of the U.S. (Further details on the sample and the survey weights are provided in the Supplementary Materials, where we show that the sample closely resembles the U.S. population in both its demographic characteristics and privacy attitudes.)

The survey questions we administered allow us to examine the relationship between demographic and attitudinal variables (e.g., candidate preference) and visits to fake news websites. Additionally, we compute three key explanatory measures from respondents' web traffic data: the overall ideological slant of a person's online media consumption (or "information diet"), which we divide below into deciles from most liberal to most conservative using the method from Guess (2016); their consumption of "hard news" sites classified as focusing on national news, politics, or world affairs (Bakshy, Messing, and Adamic, 2015); and their Facebook usage, which we divide into terciles by how often they visit the site.

Of course, studying fake news consumption requires defining which websites are publishing fake news. We define pro-Trump fake news websites as those that published two or more articles that were coded as fake news in Allcott and Gentzkow (2017), the first peer-reviewed study of fake news in social science, and for which 80% or more of the fake news articles identified from the site were coded as pro-Trump.[1] An identical approach is used to create our measure of pro-Clinton fake news sites. We exclude domains from these sets that were previously identified in Bakshy, Messing, and Adamic (2015) as focusing on hard news topics in order to concentrate on the new websites that were created around the election. Finally, we construct a measure of total fake news website visits that includes visits to both pro-Trump and pro-Clinton fake news websites as defined above.[2]

[1] In the Supplementary Materials, we present robustness tests using two alternate outcome measures. The results are highly consistent with those presented below.

[2] Our measures of fake news consumption thus exclude more established but often factually dubious sites such as Breitbart. Due to restrictions in the Facebook API, we also cannot observe incidental exposure to fake news or other kinds of dubious content such as "hyper-partisan" sites in the Facebook News Feed. In this sense, our estimates represent a lower bound of fake news consumption.

The fake news sites in question, which are listed in the Supplementary Materials, display little regard for journalistic norms or practices; reporting suggests most were created to generate profits (Silverman and Alexander, 2017). Though they sometimes publish accurate information, they also frequently publish false claims, distort genuine news reports, and copy or repurpose content from other outlets. It is important to note, however, that there is still considerable diversity in the stories that these sites publish. Some content is deeply misleading or fabricated (e.g., the "Pizzagate" conspiracy theory), while other articles instead selectively amplify political events in an over-the-top style that flatters the prejudices of a candidate's supporters.

Total fake news consumption

We estimate that 27.4% of Americans age 18 or older visited an article on a pro-Trump or pro-Clinton fake news website during our study period, which covered the final weeks of the 2016 election campaign (95% CI: 24.4%–30.3%). While this proportion may appear small, 27% of the voting age population in the United States is more than 65 million people. In total, articles on pro-Trump or pro-Clinton fake news websites represented an average of approximately 2.6% of all the articles Americans read on sites focusing on hard news topics during this period. The pro-Trump or pro-Clinton fake news that people read was heavily skewed toward Donald Trump — people saw an average (mean) of 5.45 articles from fake news websites during the study period of October 7–November 14, 2016. Nearly all of these were pro-Trump (average of 5.00 pro-Trump articles).

Selective exposure to fake news

There are stark differences by candidate support in the frequency and slant of fake news website visits.[3] We focus specifically in this study on respondents who reported supporting Hillary Clinton or Donald Trump in our survey (76% of our sample) because of our focus on selective exposure by candidate preference. People who supported Trump were far more likely to visit fake news websites — especially those that are pro-Trump — than Clinton supporters. Among Trump supporters, 40% read at least one article from a pro-Trump fake news website (mean = 13.1, 95% CI: 7.8, 18.3)

[3] Our analysis considers visits to fake news websites as defined above but we show in the Supplementary Materials that the results in Table 1 (below) are consistent if we instead only consider visits to specific article URLs that Allcott and Gentzkow (2017) identify as being classified as false or misleading by fact-checkers. The results are also consistent if we consider visits to websites identified by Silverman (2016) as publishing the most widely shared fake news articles before the 2016 election (see the Supplementary Materials).

compared with only 15% of Clinton supporters (mean = 0.51, 95% CI: 0.39, 0.64). Consumption of articles from pro-Clinton fake news websites was much lower, though also somewhat divided by candidate support. Clinton supporters were modestly more likely to have visited pro-Clinton fake news websites (11.3%, mean articles: 0.85) versus Trump supporters (2.8%, mean articles: 0.05). The differences by candidate preference that we observe in fake news website visits are even more pronounced when expressed in terms of the composition of the overall news diets of each group. Articles on fake news websites represented an average of 6.2% of the pages visited on sites that focused on news topics among Trump supporters versus 0.8% among Clinton supporters.

The differences we observe in visits to pro-Trump and pro-Clinton fake news websites by candidate support are statistically significant in OLS models even after we include standard demographic and political covariates, including a standard scale measuring general political knowledge (Table 1).[4] Trump supporters were disproportionately more likely to consume pro-Trump fake news and less likely to consume pro-Clinton fake news relative to Clinton supporters, supporting a selective exposure account. Older Americans (age 60 and older) were also much more likely to visit fake news conditional on these covariates, including pro-Trump fake news.

We also find evidence of selective exposure *within* fake news; pro-Trump voters differentially visited pro-Trump fake news websites compared with pro-Clinton websites. To help demonstrate this, we employ a randomization inference-style approach in which we randomly permute the coding (pro-Trump or pro-Clinton) of visits to fake news websites by Trump supporters in our panel. Total consumption of articles from pro-Trump fake news websites is as frequent as we observe or greater in 4 of 1,000 simulations ($p = 0.004$ one-sided; see the Supplementary Materials). We thus reject the null hypothesis that Trump supporters are no more likely to visit pro-Trump fake news content than pro-Clinton fake news content.

Finally, we show that individuals who engage in high levels of selective exposure to online news in general are also differentially likely to visit fake news websites favoring their preferred candidate. In general, fake news consumption seems to be a complement to, rather than a substitute for, hard news — visits to fake news websites are highest among people who consume the most hard news and do not measurably decrease among the most politically knowledgeable individuals. (See

[4] We use OLS models due to their simplicity, ease of interpretation, and robustness to misspecification (Angrist and Pischke, 2009), but we demonstrate in the Supplementary Materials that these conclusions are consistent if we instead use probit and negative binomial regression models.

Table 1: Who chooses to visit fake news websites (behavioral data)

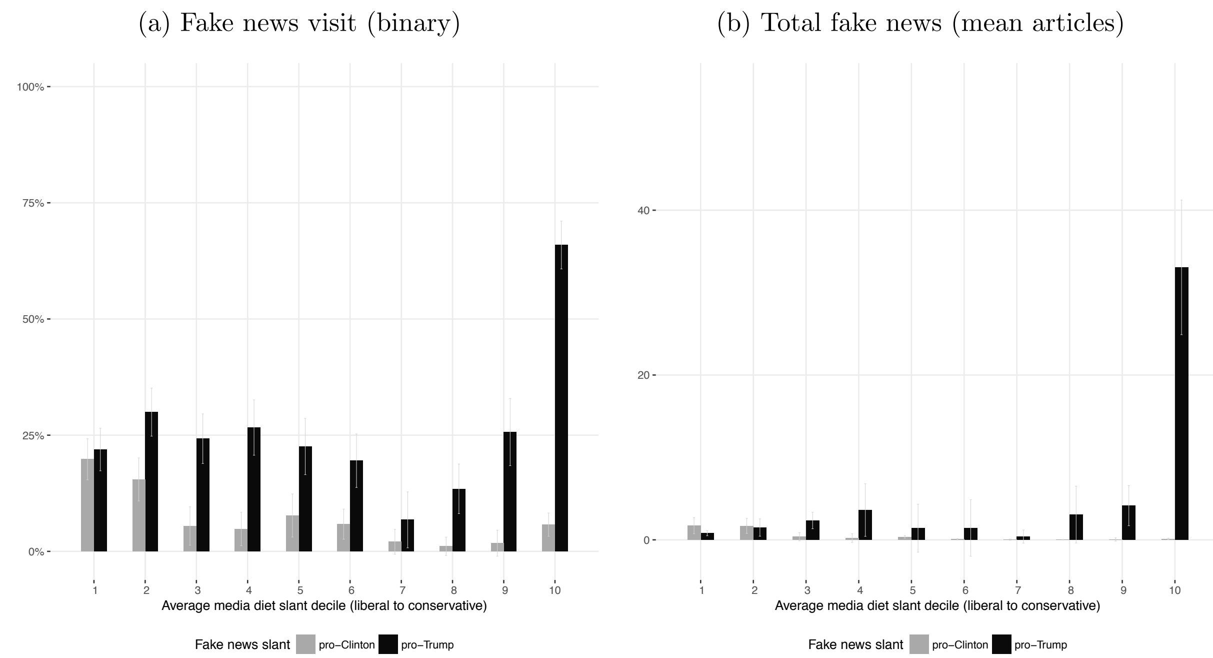
	Pro-Trump fake news consumption		Pro-Clinton fake news consumption	
	Binary	Count	Binary	Count
Trump supporter	0.220**	13.121**	-0.113**	-1.100**
	(0.033)	(3.576)	(0.019)	(0.181)
Political knowledge	0.019*	1.013	0.003	-0.003
	(0.008)	(0.609)	(0.004)	(0.039)
Political interest	0.044*	1.744	0.027	0.378**
	(0.021)	(1.028)	(0.015)	(0.117)
College graduate	-0.010	-2.655	0.015	-0.109
	(0.030)	(1.771)	(0.019)	(0.157)
Female	0.047	4.565	0.021	0.200
	(0.028)	(2.921)	(0.020)	(0.146)
Nonwhite	-0.057	5.519	-0.054*	-0.633**
	(0.035)	(4.876)	(0.024)	(0.180)
Age 30–44	-0.038	-0.040	0.053*	0.369*
	(0.055)	(1.306)	(0.023)	(0.167)
Age 45–59	0.031	1.215	0.077**	0.801**
	(0.059)	(1.472)	(0.023)	(0.225)
Age 60+	0.084	7.221*	0.107**	0.635**
	(0.056)	(2.924)	(0.024)	(0.139)
Constant	-0.110	-16.568*	-0.049	-0.692*
	(0.081)	(7.558)	(0.046)	(0.302)
R^2	0.13	0.05	0.07	0.03
N	2167	2167	2167	2167

* $p < 0.05$, ** $p < .01$ (two-sided); OLS models with survey weights. Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents supported Hillary Clinton or Donald Trump in the 2016 general election (reference category for the Trump supporter indicator is Clinton support).

Supplementary Materials for more details.)

To analyze what types of news consumers most likely to visit fake news websites, we divide users into deciles of the estimated slant of their overall online media consumption using the approach from Guess (2016) and data from Bakshy, Messing, and Adamic (2015). Figure 1 shows how fake news consumption varies across these ten deciles, which range from the 10% of respondents who visit the most liberal sites to the 10% who visit the most conservative sites (on average). The proportion of the sample that visited at least one pro-Trump fake news site ranges inconsistently from 6.8–30.0% across the first eight deciles of selective exposure from liberal to conservative, but rises steeply to 25.7% in the second most conservative decile and 65.9% in the most conservative decile. The total amount of fake news consumption is also vastly greater in the top decile; the 10% of Americans with the most conservative information diets consumed an average of 33.16 articles from pro-Trump fake news websites versus just 0.43–3.83 in the first eight deciles and 4.20 in the

Figure 1: Visits to fake news websites by selective exposure tendencies



Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied (includes 95% confidence intervals). Fake news consumption is measured as visiting domains that were coded as pro-Trump or pro-Clinton from those identified in Allcott and Gentzkow (2017) whose topical focus was classified as hard news in Bakshy, Messing, and Adamic (2015). Average media diet slant decile constructed using the measure from Guess (2016) with survey weights applied.

ninth.[5] In total, 58.9% of all visits to fake news websites came from the decile of news consumers with the most conservative information diets.

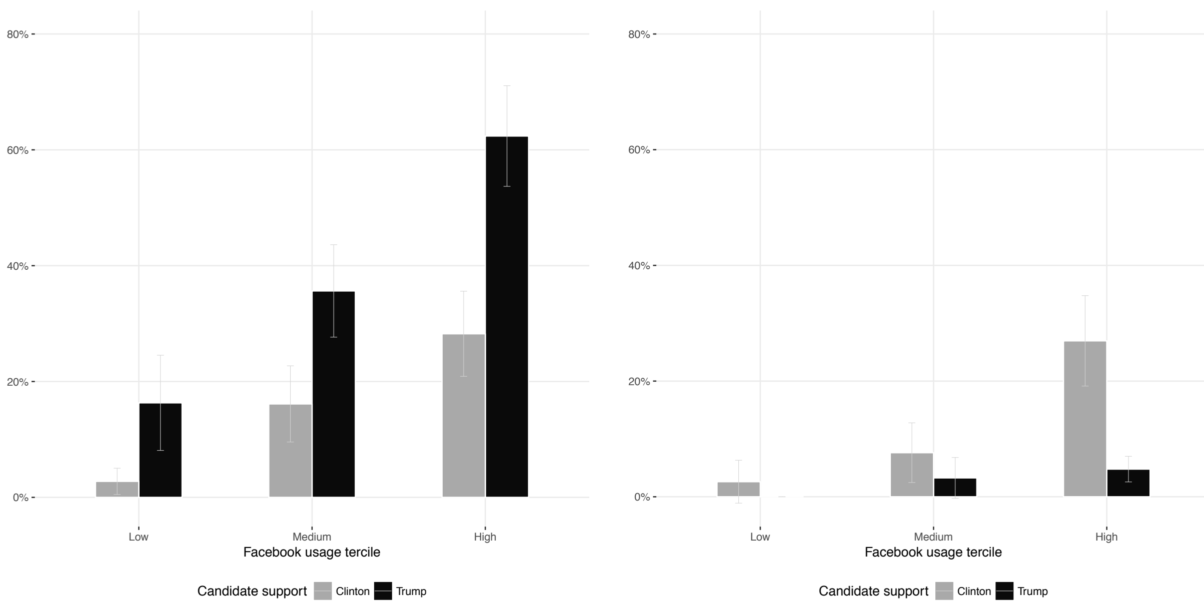
Gateways to fake news website

How do people come to visit a fake news website? Since the election, many have argued that social media, especially Facebook, played an integral role in exposing people to fake news (e.g., Allcott and Gentzkow, 2017; Silverman, 2016). While we cannot directly observe the referring site or application for the URLs visited by our survey panel, we can indirectly estimate the role Facebook played in two ways. First, we group respondents who supported either Clinton or Trump into three terciles of observed Facebook usage. The results in Figure 2 show a dramatic association between Facebook usage and fake news website visits, especially for pro-Trump fake news among

[5]These differences are statistically significant and consistent with our finding that the top domains visited by fake news readers include a number of conservative-leaning sites (see Tables S9 and S10).

Figure 2: Fake news consumption by Facebook usage

(a) Pro-Trump fake news visit (binary) (b) Pro-Clinton fake news visit (binary)



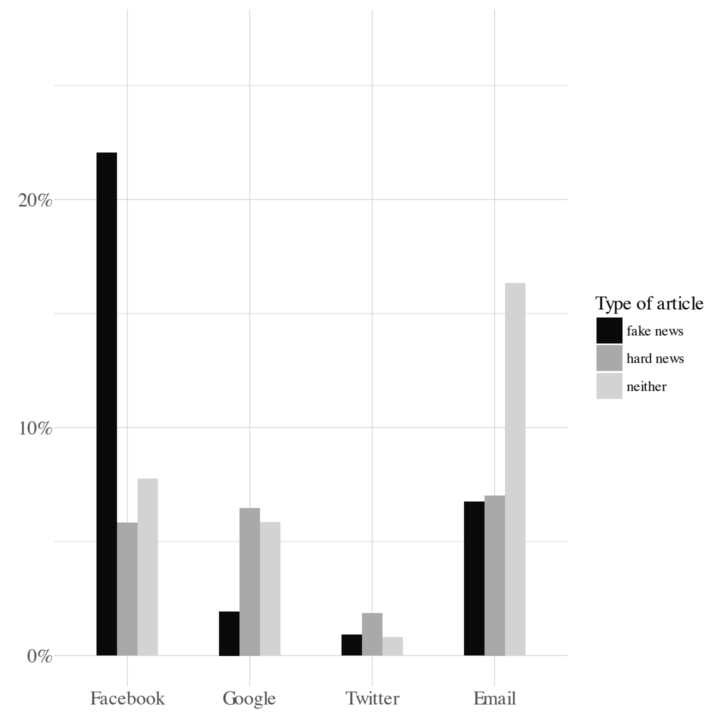
Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied (includes 95% confidence intervals). Fake news consumption is measured as visiting domains that were coded as pro-Trump or pro-Clinton from the set of sites identified in Allcott and Gentzkow (2017) whose topical focus was classified in Bakshy, Messing, and Adamic (2015) as hard news. Facebook usage groups were constructed using a tercile split on the number of visits respondents made to Facebook. Respondents who did not support Clinton or Trump were excluded.

Trump supporters. Visits to pro-Trump fake news websites increased from 2.8% among Clinton supporters who do not use Facebook or use it relatively little to 16.1% in the middle tercile and 28.2% among the Clinton supporters who use Facebook most. The increase is even more dramatic among Trump supporters, for whom visit rates increased from 16.3% in the lowest third of the Facebook distribution to 35.6% in the middle third and 62.4% in the upper third. We observe a similar pattern for visits to pro-Clinton fake news websites.[6]

We can make a more direct inference about the role of Facebook by examining the URLs visited by a respondent immediately prior to visiting a fake news website (similar to the approach used in Flaxman, Goel, and Rao, 2016). As Figure 3 demonstrates, Facebook was among the three previous sites visited by respondents in the prior thirty seconds for 22.1% of the articles from fake

[6]Table S12 in the Supplementary Materials confirms these differences in the high Facebook usage groups are statistically significant controlling for a number of demographic and political covariates.

Figure 3: Referrer estimates: Fake news website articles versus other URLs



Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Hard news consumption is defined as a visit to a site whose topical focus was classified as hard news by Bakshy, Messing, and Adamic (2015) (after excluding Amazon.com, Twitter, and YouTube). Fake news consumption is measured as visiting domains that were coded as pro-Trump or pro-Clinton from the set of sites identified in Allcott and Gentzkow (2017) whose topical focus was classified as hard news in Bakshy, Messing, and Adamic (2015). Facebook, Google, Twitter, or a webmail provider such as Gmail were identified as a referrer if they appeared within the last three URLs visited by the user in the thirty seconds prior to visiting the article.

news websites we observe in our web data. By contrast, Facebook appears in the comparable prior URL set for only 5.8% of articles on websites classified as hard news by Bakshy, Messing, and Adamic (2015) (excluding Amazon, Twitter, and YouTube). This pattern of differential Facebook visits immediately prior to fake news website visits is not observed for Google (1.9% fake news versus 6.5% hard news), Twitter (0.9% fake news versus 1.9% hard news), or webmail providers such as Gmail (6.7% fake news versus 7.0% hard news). Our results provide the most compelling independent evidence to date that Facebook was a key vector of fake news distribution.[7]

[7] See Tables S2 and S10 for details on the sites most frequently visited by fake news consumers and those that were visited most often immediately prior to and after fake news exposure.

Fact-checking mismatch for fake news

The most prominent journalistic response to fake news and other forms of misleading or false information is fact-checking, which has attracted a growing audience in recent years. We found that one in four respondents (25.3%) read a fact-checking article from a dedicated national fact-checking website at least once during the study period.

Recent evidence suggests that this new form of journalism can help inform voters (Flynn, Nyhan, and Reifler, 2017). However, fact-checking may not effectively reach people who have encountered the false claims it debunks. Only 62% of respondents report being familiar with fact-checking. Among those that are familiar with fact-checking, only 63% report having a "very" or "somewhat favorable" view of fact-checking. Positive views of fact-checking are less common among fake news consumers (48%), especially those who support Trump (24%).

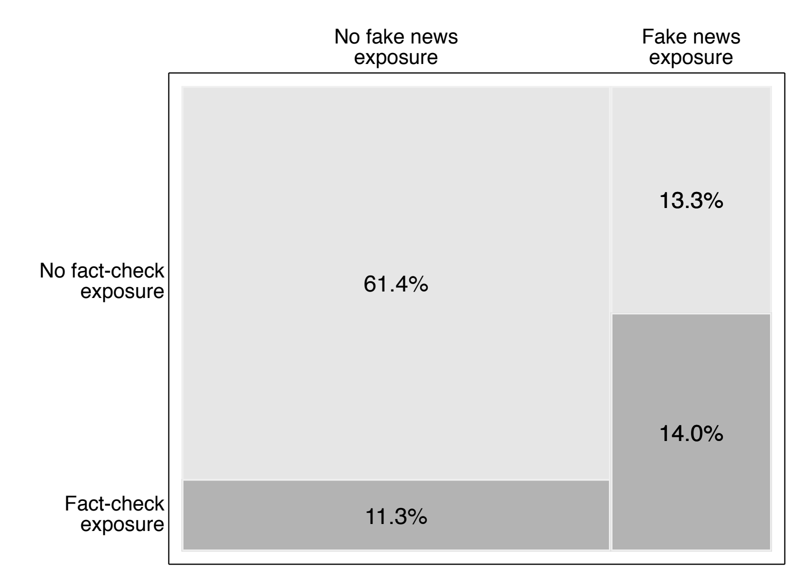
Fact-check and fake news website visits were accordingly quite disjoint in practice. As Figure 4 illustrates, only about half of the Americans who visited a fake news website during the study period also saw *any* fact-check from one of the dedicated fact-checking website (14.0%). By contrast, 11.3% read one or more fact-check articles and no fake news, 13.3% read one or more articles from fake news websites and no fact-check articles, and 61.4% did neither. Most importantly, *none* of the respondents who read one or more fake news articles that Allcott and Gentzkow (2017) specifically identified as containing a claim that had been rated false by fact-checkers saw the fact-check they identified as debunking the claim.[8]

Discussion

In this paper, we examine the severity of a particularly worrisome type of "echo chamber" or "filter bubble"— selective exposure to misinformation. These data provide the first systematic evidence of differential exposure to a key form of false or dubious political information during a real-world election campaign: "fake news" websites during the 2016 U.S. presidential election. Our data, which are unique in not relying on post-election survey recall or simulated fake news content, indicate that fake news website production and consumption was overwhelmingly pro-

[8] Searching for more information also appears to be rare. Google appears among the first three URLs visited in the thirty seconds after a visit for only 1.8% of fake news website visits among Clinton/Trump supporters compared to 5.6% for non-fake news website visits0.

Figure 4: Fake news and fact-check website visits



Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Fact-checking consumption is defined as a visit to one of the four major national fact-checkers: PolitiFact, the Washington Post Fact Checker, Factcheck.org, and Snopes. Fake news consumption is measured as visiting domains that were coded as pro-Trump or pro-Clinton from those identified in Allcott and Gentzkow (2017) whose topical focus was classified as hard news in Bakshy, Messing, and Adamic (2015).

Trump in its orientation. We also find evidence of substantial selective exposure; a narrow subset of Americans with the most conservative information diets were disproportionately likely to visit fake news websites. These results contribute to the ongoing debate about the problem of "filter bubbles" by showing that the "echo chamber" is deep (33.16 articles from fake news websites on average) but narrow (the group consuming so much fake news represents only 10% of the public).

We also provide important new evidence about the mechanisms of fake news dissemination and the effectiveness of responses to it. Specifically, we find that Facebook played an important role in directing people to fake news websites — heavy Facebook users were differentially likely to consume fake news, which was often immediately preceded by a visit to Facebook. We also show that fact-checking failed to effectively counter fake news. Not only was consumption of fact-checks concentrated among non-fake news consumers, but we almost never observe respondents reading a fact-check of a specific claim in a fake news article that they read.

Of course, our study only examines consumption of online fake news via website visits. It would be desirable to observe fake news consumption on mobile devices and social media platforms directly and to evaluate the effects of exposure to misinformation on people's factual beliefs and attitudes toward candidates and parties. Future research should evaluate selective exposure to other forms of hyper-politicized media including hyperpartisan Twitter feeds and Facebook groups, internet forums such as Reddit, more established but often factually questionable websites like Breitbart, and more traditional media like talk radio and cable news.

Future research should also seek to employ designs that allow us to assess the effects of *exposure* to fake news and other forms of misinformation, which may have pernicious consequences. While fake news is unlikely to have changed the outcome of the 2016 election (Allcott and Gentzkow, 2017), exposure to it or similarly dubious and inflammatory content can still undermine the quality of public debate, promote misperceptions, foster greater hostility toward political opponents, and corrode trust in government and journalism. Nonetheless, these results underscore the importance of directly studying selective exposure to fake news and other false and unsupported political content. Relatively few Americans are deeply interested in these extreme forms of misinformation, but they are consumed in large quantities and disseminated widely on social media (see also Benkler et al. 2017). These small groups can thus propel fabricated claims from their echo chambers to widespread visibility, potentially intensifying polarization and negative affect toward opposing candidates. This pattern represents an important development in political information consumption.

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Supplementary Materials

Materials and Methods

In this section, we provide more details about key elements of our coding and estimation procedures.

Sample and data collection details

The data for this study were collected by the survey firm YouGov from members of their Pulse panel who previously provided informed consent to allow anonymous tracking of their online data.[1] Pulse web tracking data from respondents was provided by YouGov for October 7–November 14, 2016. Survey data was collected on the YouGov survey platform from October 21–31, 2016 (approximately the middle of our web-traffic data collection period). The combination of these two types of data is unique in research on fake news; other studies have instead used post-election survey recall questions, simulated post-election fake news content, or platform-specific sharing data (Silverman and Singer-Vine, 2016; Allcott and Gentzkow, 2017; Pennycook, Cannon, and Rand, 2017; Benkler et al., 2017; Faris et al., 2017).

Among the 3,251 survey respondents, 52% are female, 68% are non-Hispanic whites, and 29% have a bachelor's degree or higher when survey weights are applied to approximate a nationally representative sample.[2] The data are likely to not be perfectly representative of the U.S. population due to the unusual Pulse panel — people with less than a high school degree are underrepresented and the sample tilts Democratic (42% Clinton versus 33% Trump on a vote intention question that included Gary Johnson, Jill Stein, other, not sure, and probably won't vote as options) — but the participants are diverse and resemble the population on many dimensions.

This study analyzes data from the 2,525 survey respondents for whom page-level online traffic data from laptop or desktop computers are also available.[3] Table S1 provides a comparison of the demographic composition and political preferences of the full Pulse sample and participants with online traffic data we analyze with the pre-election American National Election Studies (ANES) face-to-face survey, a benchmark study that was also conducted during the general election campaign. The set of respondents for whom we have page-level online traffic data is demographically very similar to the full Pulse sample and closely resembles the composition of the ANES sample. However, intention to vote and preferences for Clinton are somewhat higher in Pulse. The Pulse sample also has somewhat higher levels of home internet access (presumably 100%) compared with

[1]The software tracks web traffic (minus passwords and financial transactions) for all browsers installed on a user's computer. Users provide consent before installing the software and can turn it off or uninstall it at any time. Identifying information is not collected.

[2]YouGov describes its weighting procedure for these data as follows: "[T]he frame was constructed by stratified sampling from the full 2010 American Community Survey (ACS) sample with selection within strata by weighted sampling with replacements (using the person weights on the public use file). Data on voter registration status and turnout were matched to this frame using the November 2010 Current Population Survey. Data on interest in politics and party identification were then matched to this frame from the 2007 Pew Religious Life Survey. The full set of interviews was weighted to the sampling frame using propensity scores. The matched cases and the frame were combined and a logistic regression was estimated for inclusion in the frame. The propensity score function included age, gender, race/ethnicity, years of education, ideology, baseline party ID and region. The propensity scores were grouped into deciles of the estimated propensity score in the frame and post-stratified according to these deciles."

[3]It is unknown why not all participants did not provide online traffic data. Some participants may have chosen not to participate while others may have forgotten that they previously enabled private browsing.

Table S1: Demographics of respondents

	ANES FTF	Full Pulse sample	Laptop/desktop data available	Mobile data available
Candidate preference				
Trump	0.32	0.33	0.34	0.27
Clinton	0.36	0.42	0.42	0.47
Other/DK/won't vote	0.32	0.24	0.24	0.25
Age				
18-29	0.21	0.19	0.16	0.28
30-44	0.22	0.25	0.22	0.34
45-59	0.29	0.28	0.30	0.25
60+	0.28	0.28	0.32	0.12
Race				
White	0.69	0.68	0.69	0.64
Black	0.12	0.12	0.12	0.11
Hispanic	0.12	0.13	0.12	0.17
Asian	0.03	0.03	0.02	0.04
Sex				
Male	0.47	0.48	0.48	0.46
Female	0.51	0.52	0.52	0.54
N	1181	3251	2525	629

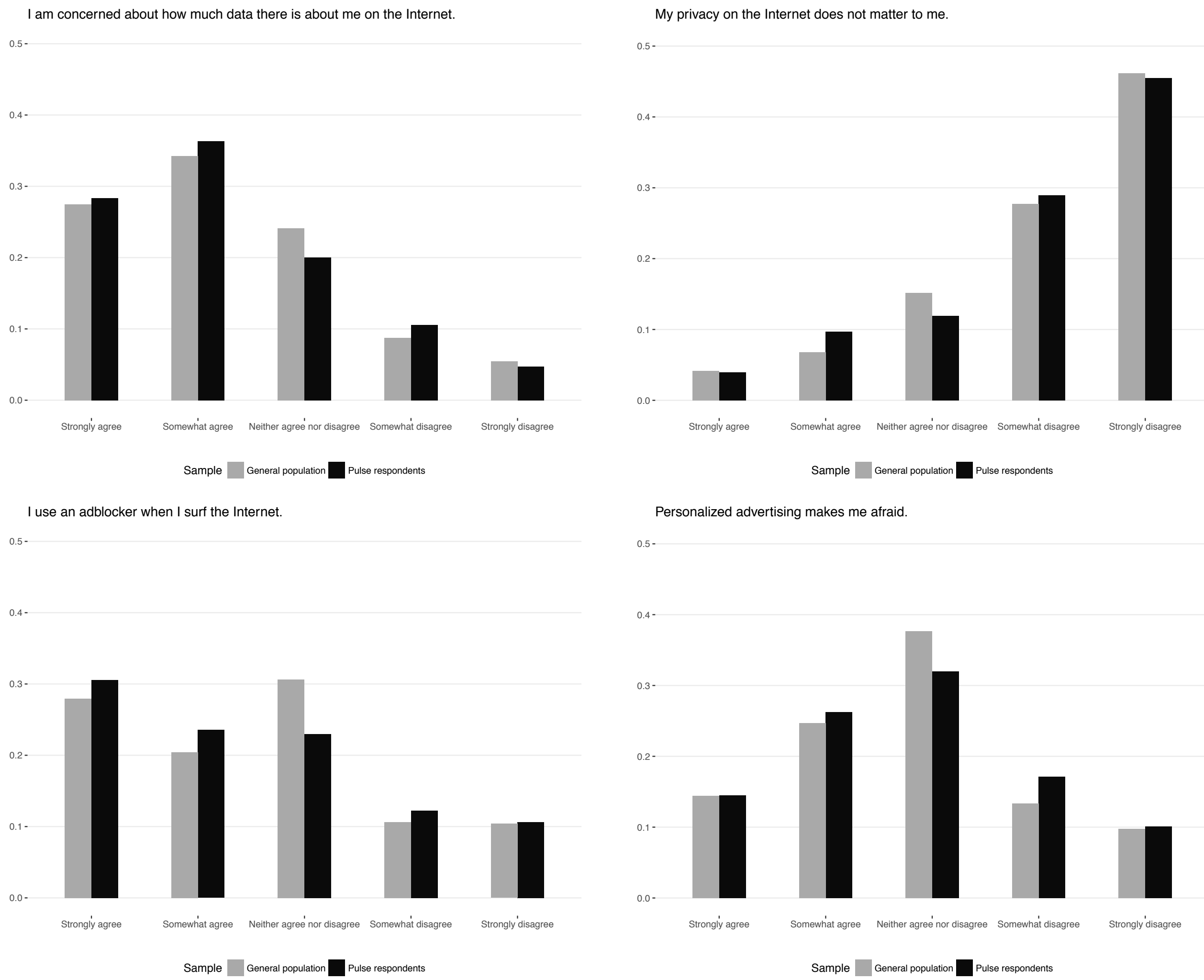
Respondents are participants in the 2016 American National Election Studies pre-election face-to-face study (ANES FTF) and YouGov Pulse panel members. The columns of YouGov Pulse data are not mutually exclusive — the third and fourth columns represent differing subsets of the full Pulse sample. Estimates calculated using survey weights.

the ANES sample (89%).[4]

We note that our sample seems to demonstrate modestly higher levels of Facebook usage than the American public — 88% visited a Facebook URL at least once and 76% did so more than ten times in our sample period compared with 62% of Americans interviewed in the 2016 American National Election Studies face-to-face survey who said they had a Facebook account and had used it in the last month. However, our measures potentially also capture visits to Facebook pages by individuals who do not have an account.

[4] YouGov also provided some mobile online traffic data. However, mobile data are only available for 19% of respondents ($n = 629$), suggesting substantial missing data. In addition, technical limitations in the Pulse mobile app prevent us from capturing the full URL of each website visited as in the laptop/desktop traffic data. We instead only receive the domains that respondents visited, which prevents us from coding the content of the specific articles they viewed. For these reasons, we omit mobile data from the analyses below. (Figure S5 in the Supplementary Materials provides more details on the domain-level traffic patterns we observe in these data.)

Figure S1: Internet privacy attitudes of YouGov respondents with and without Pulse



Results from identical surveys of both the general YouGov (non-Pulse) respondent population ($N = 1,000$) and members of the YouGov Pulse panel ($N = 6,591$). The survey of the general respondent pool is weighted using YouGov's sample matching methodology described in fn. 3 above. It was conducted in July 2017.

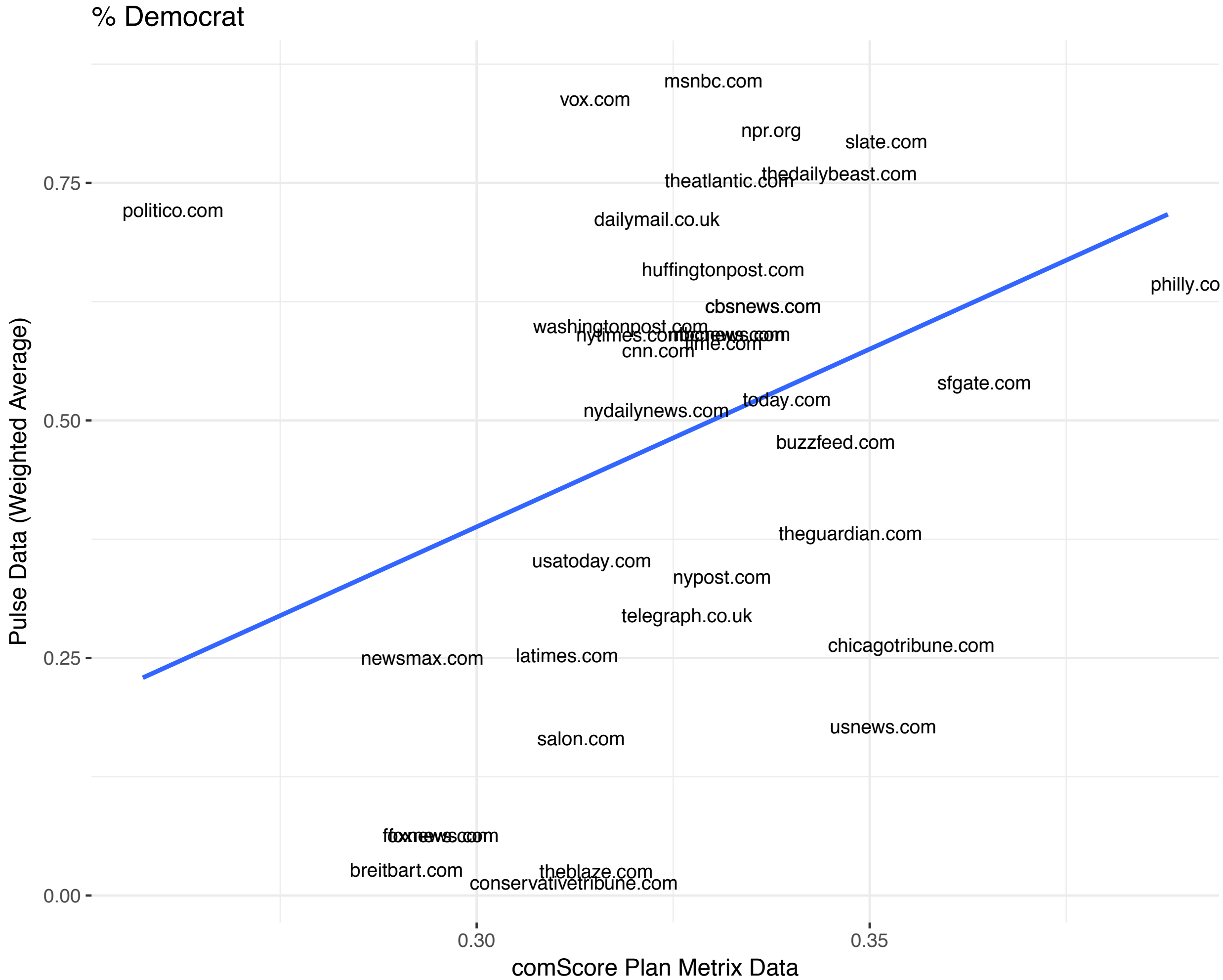
Validation of sample

Figure S1 presents results from surveys of both the general YouGov respondent population (N = 1,000) and members of the YouGov Pulse panel (N = 6,591) using identical question wordings. The survey of the general respondent pool is weighted using YouGov's sample matching methodology described in footnote 3 of the Supplementary Materials section above. It was conducted for the authors in July 2017 to match questions routinely asked to panelists as they join the Pulse panel.

All four graphs show remarkably little difference in the distribution of attitudes about online privacy between the Pulse and general YouGov samples. Respondents, including those in the Pulse panel, are generally concerned about Internet privacy and the amount of data that exists about them online.[5] We speculate that the Pulse data collection process, which is done with explicit

[5] In regression results which are available upon request, we find that YouGov Pulse panel members do not differ significantly from the YouGov general respondent population in their responses to three of the four measures of concern about online privacy presented in Figure S1 (OLS with HC2 robust standard errors; two-sided).

Figure S2: Correspondence between YouGov Pulse and comScore data



This figure plots the estimated share of Democrats among monthly unique visitors to each domain from comScore against the corresponding quantity derived from the October 2016 Pulse data weighted to demographics. comScore maintains a 12,000-person survey panel of the general internet audience called Plan Metrix. Employing both direct responses and imputation, comScore provides estimates of the overall demographic composition of individual sites' audiences. The figure compares these estimates, which were constructed in March 2015, with the corresponding estimates from our YouGov Pulse data.

consent and with strong anonymity protections, provides more reassurance than is typical in online interactions with companies and organizations which tend to assume implied consent via long, largely unread terms of service agreements. Thus, it is not a paradox that our Pulse panelists are just as concerned about protecting their personal data as those who do not share web consumption data with researchers. Overall, these results suggest that the decision to participate in Pulse is not associated with highly unusual privacy attitudes.

We also note that the relationship between demographic and political attitudes and observed browsing behavior we observe is consistent with other data. For instance, Figure S2 illustrates the strong correspondence between the partisanship of website visitors in our Pulse data and site-level data on visitor partisanship from the Internet analytics firm comScore, which gives us confidence that we are capturing real individual-level correlates of online media consumption.

Processing online traffic data

We processed the online traffic data using the following procedure. The URLs visited by Pulse participants were first purged of anchor links (part of a URL beginning with "#" and referring to a specific section within a page). Once pre-processing was completed, sequential duplicates (i.e., visits to the same page by the same respondent on the same day that occurred immediately in sequence) were removed. In this way, we ensured that automatic reloads (or clicks to certain parts of the same page) would not count as separate visits in any of our measures.

Estimating fake news consumption

We constructed our measures of fake news consumption using the following procedure:

– Begin with the list of fake news articles identified in Allcott and Gentzkow (2017) found by nonpartisan fact-checking organizations to be false.

– Filter out domains with only a single fact-checked article in the original list, leaving those with two or more identified fake news articles.

– Classify the resulting list of 289 domains as pro-Trump or pro-Clinton "fake news" websites for the purposes of this analysis. Code domains as pro-Trump (pro-Clinton) if Allcott and Gentzkow (2017) coded 80% or more of the identified fake news articles from that domain as pro-Trump (pro-Clinton).

– Drop any domains that are not strictly "fake news." To determine this, we remove those sites previously identified by Bakshy, Messing, and Adamic (2015) as focusing on hard news topics via machine learning classification.[6]

– The top 25 resulting "fake news" domains by traffic in the Pulse data are as follows:[7] `ijr.com`, `bipartisanreport.com`, `angrypatriotmovement.com`, `redstatewatcher.com`, `endingthefed.com`, `conservativedailypost.com`, `usherald.com`, `chicksontheright.com`, `dailywire.com`, `truthfeed.com`, `tmn.today`, `libertywritersnews.com`, `yesimright.com`, `therealstrategy.com`, `donaldtrumpnews.co`, `worldnewspolitics.com`, `everynewshere.com`, `ipatriot.com`, `usapoliticstoday.com`, `usanewsflash.com`, `worldpoliticus.com`, `ihavethetruth.com`, `prntly.com`, `fury.news`, `ilovemyfreedom.org`

– Create binary and count indicators for visits to pro-Clinton and pro-Trump fake news websites.

Coding any measure like this requires classifying difficult cases. In Tables S5 and S6 below, we show that the conclusions in Table 1 are robust to excluding Independent Journal Review, a conspiracy-oriented site seeking mainstream credibility (Borchers, 2017) that is included in our fake news measure, or to including Breitbart, a high-profile site that frequently traffics in conspiracy theories and inflammatory claims (Bellware, 2016) but is excluded from our fake news measure

[6]This designation is based on the topical content of these sites at the time of the Bakshy, Messing, and Adamic study, not the validity of the information on the sites in question (which is often dubious). The domains we exclude from the list of fake news sites include YouTube (`https://www.youtube.com`), Empire News (`http://empirenews.net`), Breitbart (`http://www.breitbart.com`), Infowars (`https://www.infowars.com`), Daily Caller (`http://dailycaller.com`), D.C. Clothesline (`http://www.dcclothesline.com`), Twitchy (`http://twitchy.com`), Liberty News (`http://libertynews.com`), Sons of Liberty News (`http://sonsoflibertymedia.com`), and The Political Insider (`http://thepoliticalinsider.com`).

[7]See Table S2 for the full list of domains.

because it was classified as an existing "hard news" site in its topical focus by Bakshy, Messing, and Adamic (2015).

Our estimates of fake news consumption are broadly consistent with two post-election surveys about fake news (Silverman and Singer-Vine, 2016; Allcott and Gentzkow, 2017), which found that approximately 10–25% of Americans reported seeing various specific fake news headlines (many of these would have been viewed on social media or other platforms that would not be recorded as a fake news visit in our online traffic data). However, such retrospections are vulnerable to errors in memory — people may claim to remember something they never saw or forget an article they actually did see. Our passive measurement approach offers much more precise and accurate information about actual fake news exposure.

To further validate our results, we demonstrate below that the results in Table 1 are consistent using two alternate outcome measures. Table S7 presents results using visits to the websites identified by Silverman (2016) as publishing the most widely shared fake news stories prior to the 2016 election (excluding those existing sites previously classified by Bakshy, Messing, and Adamic (2015) as hard news) and Table S8 presents results using only visits to the specific URLs of false articles identified by Allcott and Gentzkow (2017) rather than the website-level measure described above.

Fake news domains

Domain	Lean	Domain	Lean
24usainfo.com	Pro-Trump	libertywritersnews.com	Pro-Trump
abcnews.com.co	Pro-Trump	mainerepublicemailalert.com	Pro-Trump
aldipest.com	Pro-Trump	mediazone.news	Pro-Trump
americanflare.com	Pro-Trump	morningnewsusa.com	Pro-Trump
americanjournalreview.com	Pro-Trump	msfanpage.link	Pro-Trump
americasnewest.com	Pro-Trump	myfreshnews.com	Pro-Trump
angrypatriotmovement.com	Pro-Trump	nationalinsiderpolitics.com	Pro-Trump
awarenessact.com	Pro-Trump	nevo.news	Pro-Trump
bients.com	Pro-Trump	prntly.com	Pro-Trump
bigbluevision.org	Pro-Trump	redstatewatcher.com	Pro-Trump
bignuggetnews.com	Pro-Trump	rickwells.us	Pro-Trump
buzzfeedusa.com	Pro-Trump	statenation.co	Pro-Trump
chicksontheright.com	Pro-Trump	stateofthenation2012.com	Pro-Trump
choiceandtruth.com	Pro-Trump	superstation95.com	Pro-Trump
christiantimesnewspaper.com	Pro-Trump	tdnewswire.com	Pro-Trump
chuckcallesto.blogspot.com	Pro-Trump	thefreepatriot.org	Pro-Trump
consciouslyenlightened.com	Pro-Trump	theinternationalreporter.org	Pro-Trump
conservativedailypost.com	Pro-Trump	thenewsclub.info	Pro-Trump
conservativefiringline.com	Pro-Trump	therealstrategy.com	Pro-Trump
conservativeinsider.co	Pro-Trump	therightists.com	Pro-Trump
conservativestudio.com	Pro-Trump	tmn.today	Pro-Trump
consnation.com	Pro-Trump	truthfeed.com	Pro-Trump
cooltobeconservative.com	Pro-Trump	truthkings.com	Pro-Trump
daily-sun.com	Pro-Trump	usadailyinfo.com	Pro-Trump
dailyheadlines.net	Pro-Trump	usadailytime.com	Pro-Trump
dailyoccupation.com	Pro-Trump	usanewsflash.com	Pro-Trump
dailypresser.com	Pro-Trump	usapoliticsnow.com	Pro-Trump
dailywire.com	Pro-Trump	usapoliticstoday.com	Pro-Trump
departed.co	Pro-Trump	usasupreme.com	Pro-Trump
dineal.com	Pro-Trump	usatodaypolitics.com	Pro-Trump
donaldtrumpnews.co	Pro-Trump	ushealthyadvisor.com	Pro-Trump
embols.com	Pro-Trump	usherald.com	Pro-Trump
endingthefed.com	Pro-Trump	vesselnews.io	Pro-Trump
eutimes.net	Pro-Trump	wearechange.org	Pro-Trump
everynewshere.com	Pro-Trump	westernsentinel.com	Pro-Trump
fanzinger.com	Pro-Trump	whatdoesitmean.com	Pro-Trump
freedomsfinalstand.com	Pro-Trump	whatsupic.com	Pro-Trump
friendsofsyria.wordpress.com	Pro-Trump	worldnewspolitics.com	Pro-Trump
fury.news	Pro-Trump	worldpoliticus.com	Pro-Trump
guerilla.news	Pro-Trump	yesimright.com	Pro-Trump
halturnershow.com	Pro-Trump	zootfeed.com	Pro-Trump
ihavethetruth.com	Pro-Trump	bipartisanreport.com	Pro-Clinton
ijr.com	Pro-Trump	greenvillegazette.com	Pro-Clinton
ilovemyfreedom.org	Pro-Trump	politicops.com	Pro-Clinton
intrendtoday.com	Pro-Trump	uspoln.com	Pro-Clinton
ipatriot.com	Pro-Trump	worldinformation24.info	Pro-Clinton

Table S2: Pro-Trump and pro-Clinton fake news domains (derived from Allcott and Gentzkow) used in the analysis.

Estimating "hard news" consumption

We estimate "hard news" consumption using visits to websites classified as focusing on national news, politics, world affairs, or similar by Bakshy, Messing, and Adamic (2015). (They define "soft" news as stories that focus on sports, entertainment, travel, or similar.) We further exclude the websites of Amazon, Twitter, and YouTube from their list of hard news sites. While these sites may contain hard news content, they are not primarily news publishers and thus not the main focus of our analysis.

Total online news consumption is measured as the sum of the number of visits to hard news sites, fake news sites, and fact-checking websites (identified below). The proportion of visits to election-relevant fake news was then calculated by dividing total visits to pro-Clinton or pro-Trump fake news by the total online news consumption measure.

Coding referral websites

Referrals to articles were estimated as follows. For each individual respondent, we tabulated the three pages visited immediately prior to each web visit logged in the Pulse data. We additionally identified the pages seen within the previous 15, 30, and 45 seconds of each web visit. Using these measures, we coded a visit to one of our designated referring domains (Facebook, Google, Twitter, or a webmail provider [gmail.com, mail.google.com, mail.yahoo.com, mail.live.com, or hotmail.com]) within the previous three URLs in a given user's clickstream *and* within the given time interval (15–45 seconds depending on the variant reported) as a referral. We then compared the proportion of times these sites appeared as referrers to fake versus non-fake news URLs.

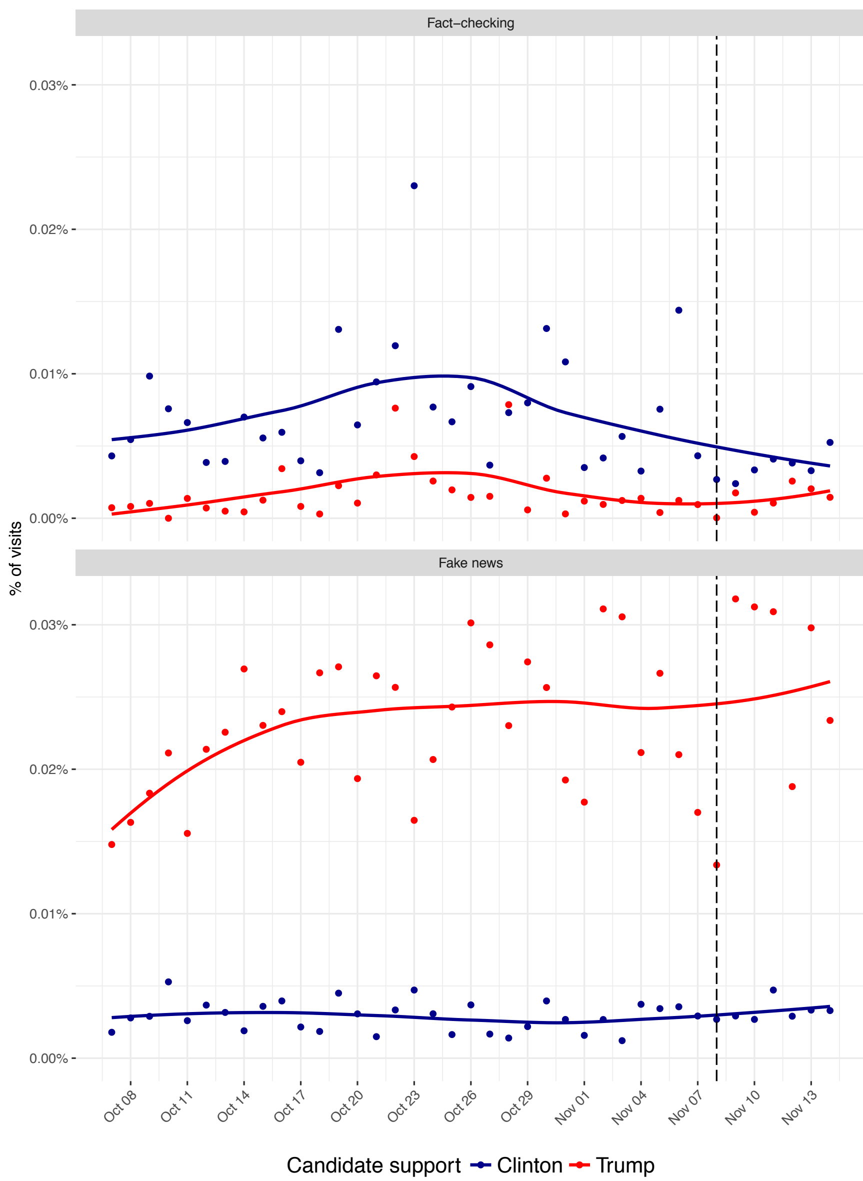
Estimating fact-checking consumption

Fact-checking consumption is measured using visits to the four major national fact-checkers: PolitiFact (including state affiliates included on the main PolitiFact domain), the Washington Post Fact Checker, Factcheck.org, and Snopes (which specializes in rumors and urban legends and is thus especially relevant to the fake news phenomenon). We focus on visits to actual articles and thus do not include visits to a fact-checking site's homepage or to search pages within a site.

Additional Results and Analysis

When we disaggregate the data by the date on which the articles were read, we observe that differences in election-relevant fake news consumption and fact-checking consumption by candidate preference were relatively stable over the October 7–November 14, 2016 sample period (though, unsurprisingly, both make up a tiny share of the URLs that our participants visited).

Figure S3: Fact-check and fake news consumption over time



Respondents are YouGov Pulse panel members who supported Hillary Clinton or Donald Trump in the 2016 general election. Estimates calculated using survey weights. Values represent the percentage of all URLs visited by Clinton and Trump supporters from the four dedicated national fact-checking sites (Snopes, PolitiFact, Factcheck.org, and the Washington Post Fact Checker) or the set of fake news sites listed in Methods and Materials.

The primary findings in Table 1 hold if we use probit regression for the binary outcome measures and negative binomial regression for the count outcome measures rather than OLS (Table S3). They are also consistent if we control for total visits to websites focusing on mainstream news topics (Table S4) or if the pro-Trump fake news measures exclude visits to Independent Journal Review (Table S5) or include visits to Breitbart (Table S6). Finally, they are largely unchanged if we use two alternate outcome measures — visits to the websites identified as publishing the most widely shared "fake news" by Silverman (2016) (Table S7) or visits to the specific URLs identified as false or misleading in the data from Allcott and Gentzkow (2017) (Table S8).[8]

Table S3: Who chooses to read fake news (generalized linear models)

	Pro-Trump fake news consumption		Pro-Clinton fake news consumption	
	Binary	Count	Binary	Count
Trump supporter	0.721**	2.829**	-0.905**	-3.205**
	(0.108)	(0.199)	(0.136)	(0.315)
Political knowledge	0.070*	0.126*	0.031	0.095
	(0.029)	(0.063)	(0.038)	(0.090)
Political interest	0.198*	0.714**	0.237	0.828*
	(0.084)	(0.144)	(0.137)	(0.383)
College graduate	-0.025	-0.046	0.071	-0.122
	(0.102)	(0.244)	(0.136)	(0.286)
Female	0.182	0.404	0.177	0.659*
	(0.102)	(0.217)	(0.167)	(0.302)
Nonwhite	-0.287*	-0.280	-0.375	-1.438**
	(0.141)	(0.299)	(0.234)	(0.400)
Age 30–44	-0.176	0.258	0.892*	2.869**
	(0.232)	(0.496)	(0.372)	(0.736)
Age 45–59	0.123	0.774*	1.109**	3.918**
	(0.231)	(0.384)	(0.338)	(0.660)
Age 60+	0.257	1.012**	1.285**	3.902**
	(0.215)	(0.379)	(0.338)	(0.611)
N	2167	2167	2167	2167

* $p < 0.05$, ** $p < .01$ (two-sided); probit (binary) and negative binomial (count) regression models with survey weights. Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents supported Hillary Clinton or Donald Trump in the 2016 general election (reference category for the Trump supporter indicator is Clinton support). Political knowledge is measured as the number of correct answers on an eight-question scale (see the Supplementary Materials for the full scale). Political interest is a self-reported measure on a scale from 4 (people who say they pay attention to what's going on in government and politics "most of the time") to 1 (those who pay attention "hardly at all").

[8] The differences in consumption of pro-Trump fake news between Trump and Clinton supporters remain statistically significant in Tables S7 and S8. We do not observe significant differences in exposure to pro-Clinton fake news by candidate support in Table S8 due to how rare consumption of such articles is in the URL-level Allcott and Gentzkow (2017) data (there is little variance to explain).

Table S4: Who chooses to read fake news (hard news consumption control)

	Pro-Trump fake news consumption		Pro-Clinton fake news consumption	
	Binary	Count	Binary	Count
Trump supporter	0.228**	13.350**	-0.109**	-1.056**
	(0.031)	(3.587)	(0.018)	(0.174)
Political knowledge	0.010	0.763	-0.001	-0.051
	(0.008)	(0.625)	(0.005)	(0.041)
Political interest	0.040	1.619	0.025	0.354**
	(0.021)	(1.012)	(0.015)	(0.116)
College graduate	-0.015	-2.782	0.013	-0.133
	(0.029)	(1.775)	(0.019)	(0.161)
Female	0.062*	4.981	0.028	0.280
	(0.027)	(2.917)	(0.019)	(0.157)
Nonwhite	-0.052	5.664	-0.052*	-0.606**
	(0.033)	(4.881)	(0.024)	(0.177)
Age 30–44	-0.019	0.485	0.062**	0.469*
	(0.048)	(1.348)	(0.022)	(0.182)
Age 45–59	0.053	1.820	0.087**	0.917**
	(0.052)	(1.558)	(0.023)	(0.243)
Age 60+	0.105*	7.823**	0.117**	0.750**
	(0.049)	(2.987)	(0.023)	(0.149)
Total hard news/100	0.011**	0.310**	0.005**	0.059**
	(0.002)	(0.094)	(0.001)	(0.019)
Constant	-0.130	-17.131*	-0.058	-0.800*
	(0.079)	(7.564)	(0.045)	(0.313)
R^2	0.17	0.06	0.09	0.05
N	2167	2167	2167	2167

* $p < 0.05$, ** $p < .01$ (two-sided); OLS models with survey weights. Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents supported Hillary Clinton or Donald Trump in the 2016 general election (reference category for the Trump supporter indicator is Clinton support). Political knowledge is measured as the number of correct answers on an eight-question scale (see Supplementary Materials for questionnaire). Political interest is a self-reported measure on a scale from 4 (people who say they pay attention to what's going on in government and politics "most of the time") to 1 (those who pay attention "hardly at all"). Total hard news consumption is measured as the number of articles visited from websites classified as focusing on hard news topics (Bakshy, Messing, and Adamic, 2015) (after excluding Amazon.com, Twitter, and YouTube).

Table S5: Who chooses to read fake news (excluding IJR)

	Pro-Trump fake news consumption		Pro-Clinton fake news consumption	
	Binary	Count	Binary	Count
Trump supporter	0.209**	6.908**	-0.113**	-1.100**
	(0.033)	(0.992)	(0.019)	(0.181)
Political knowledge	0.014	0.028	0.003	-0.003
	(0.008)	(0.232)	(0.004)	(0.039)
Political interest	0.042*	1.699**	0.027	0.378**
	(0.020)	(0.633)	(0.015)	(0.117)
College graduate	-0.025	-0.165	0.015	-0.109
	(0.029)	(0.864)	(0.019)	(0.157)
Female	0.055*	1.572	0.021	0.200
	(0.028)	(1.119)	(0.020)	(0.146)
Nonwhite	-0.071*	-0.278	-0.054*	-0.633**
	(0.034)	(0.800)	(0.024)	(0.180)
Age 30–44	-0.020	-0.287	0.053*	0.369*
	(0.053)	(0.849)	(0.023)	(0.167)
Age 45–59	0.043	0.587	0.077**	0.801**
	(0.058)	(0.924)	(0.023)	(0.225)
Age 60+	0.085	3.443**	0.107**	0.635**
	(0.055)	(1.325)	(0.024)	(0.139)
Constant	-0.100	-7.279**	-0.049	-0.692*
	(0.077)	(2.226)	(0.046)	(0.302)
R^2	0.12	0.05	0.07	0.03
N	2167	2167	2167	2167

* $p < 0.05$, ** $p < .01$ (two-sided); OLS models with survey weights. Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents supported Hillary Clinton or Donald Trump in the 2016 general election (reference category for the Trump supporter indicator is Clinton support). Political knowledge is measured as the number of correct answers on an eight-question scale (see Supplementary Materials for questionnaire). Political interest is a self-reported measure on a scale from 4 (people who say they pay attention to what's going on in government and politics "most of the time") to 1 (those who pay attention "hardly at all"). Pro-Trump fake news measure is modified from the main text to exclude visits to Independent Journal Review (IJR).

Table S6: Who chooses to read fake news (including Breitbart)

	Pro-Trump fake news consumption		Pro-Clinton fake news consumption	
	Binary	Count	Binary	Count
Trump supporter	0.245**	19.987**	-0.113**	-1.100**
	(0.034)	(4.684)	(0.019)	(0.181)
Political knowledge	0.027**	2.195*	0.003	-0.003
	(0.008)	(0.868)	(0.004)	(0.039)
Political interest	0.063**	2.684*	0.027	0.378**
	(0.022)	(1.179)	(0.015)	(0.117)
College graduate	0.010	-3.698	0.015	-0.109
	(0.031)	(2.557)	(0.019)	(0.157)
Female	0.052	4.610	0.021	0.200
	(0.029)	(3.430)	(0.020)	(0.146)
Nonwhite	-0.065	8.614	-0.054*	-0.633**
	(0.037)	(5.905)	(0.024)	(0.180)
Age 30–44	0.030	-5.298	0.053*	0.369*
	(0.058)	(5.489)	(0.023)	(0.167)
Age 45–59	0.061	-4.356	0.077**	0.801**
	(0.059)	(5.966)	(0.023)	(0.225)
Age 60+	0.100	0.968	0.107**	0.635**
	(0.056)	(6.650)	(0.024)	(0.139)
Constant	-0.211*	-20.769*	-0.049	-0.692*
	(0.083)	(8.417)	(0.046)	(0.302)
R^2	0.16	0.06	0.07	0.03
N	2167	2167	2167	2167

* $p < 0.05$, ** $p < .01$ (two-sided); OLS models with survey weights. Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents supported Hillary Clinton or Donald Trump in the 2016 general election (reference category for the Trump supporter indicator is Clinton support). Political knowledge is measured as the number of correct answers on an eight-question scale (see Supplementary Materials for questionnaire). Political interest is a self-reported measure on a scale from 4 (people who say they pay attention to what's going on in government and politics "most of the time") to 1 (those who pay attention "hardly at all"). Pro-Trump fake news measure is modified from the main text to include visits to Breitbart.

Table S7: Who chooses to read fake news (shared article outcome measure)

	Pro-Trump fake news consumption		Pro-Clinton fake news consumption	
	Binary	Count	Binary	Count
Trump supporter	0.178**	2.793**	-0.046**	-0.161**
	(0.025)	(0.494)	(0.012)	(0.035)
Political knowledge	0.013*	-0.095	0.003	-0.001
	(0.006)	(0.116)	(0.002)	(0.009)
Political interest	0.017	0.838*	0.010	0.064**
	(0.014)	(0.338)	(0.005)	(0.022)
College graduate	-0.011	0.029	-0.012	-0.002
	(0.024)	(0.434)	(0.010)	(0.027)
Female	0.057*	0.689	0.001	0.050*
	(0.022)	(0.573)	(0.010)	(0.025)
Nonwhite	-0.052*	-0.480	-0.043**	-0.127**
	(0.023)	(0.319)	(0.011)	(0.028)
Age 30–44	0.005	-0.169	0.011	0.030
	(0.032)	(0.366)	(0.008)	(0.018)
Age 45–59	0.083*	0.049	0.035*	0.117**
	(0.034)	(0.372)	(0.016)	(0.030)
Age 60+	0.117**	1.773**	0.023**	0.103**
	(0.034)	(0.652)	(0.009)	(0.032)
Constant	-0.125*	-2.957**	-0.006	-0.125**
	(0.052)	(1.122)	(0.024)	(0.046)
N	2167	2167	2167	2167

* $p < 0.05$, ** $p < .01$ (two-sided); OLS models with survey weights. Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents supported Hillary Clinton or Donald Trump in the 2016 general election (reference category for the Trump supporter indicator is Clinton support). Political knowledge is measured as the number of correct answers on an eight-question scale (see the Supplementary Materials for the full scale). Political interest is a self-reported measure on a scale from 4 (people who say they pay attention to what's going on in government and politics "most of the time") to 1 (those who pay attention "hardly at all"). The fake news consumption measure is modified from the main text to use those sites identified by Silverman (Silverman, 2016) as having produced the most widely shared fake news articles on Facebook in the period before the 2016 U.S. presidential election excluding those domains from this set that were previously identified by Bakshy, Messing, and Adamic (2015) as focusing on hard news topics.

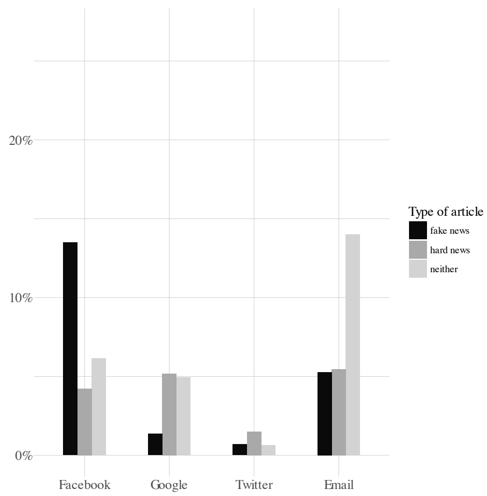
Table S8: Who chooses to read fake news (URL-level outcome measure)

	Pro-Trump fake news consumption		Pro-Clinton fake news consumption	
	Binary	Count	Binary	Count
Trump supporter	0.052**	0.153**	-0.001	-0.001
	(0.013)	(0.052)	(0.001)	(0.002)
Political knowledge	0.006	0.010	0.000	0.000
	(0.004)	(0.008)	(0.000)	(0.000)
Political interest	0.011	0.051*	0.000	0.000
	(0.007)	(0.025)	(0.000)	(0.000)
College graduate	-0.019	-0.006	0.002*	0.004*
	(0.011)	(0.062)	(0.001)	(0.002)
Female	0.017	0.072	0.000	0.000
	(0.012)	(0.052)	(0.001)	(0.001)
Nonwhite	-0.013	-0.046	-0.001	-0.000
	(0.013)	(0.036)	(0.001)	(0.002)
Age 30–44	0.025*	0.042	0.000	0.000
	(0.012)	(0.026)	(0.000)	(0.000)
Age 45–59	0.026**	0.057	0.001	0.003
	(0.010)	(0.033)	(0.001)	(0.002)
Age 60+	0.050**	0.177**	0.001	0.002
	(0.012)	(0.049)	(0.001)	(0.001)
Constant	-0.077**	-0.277**	-0.002	-0.004
	(0.023)	(0.100)	(0.001)	(0.003)
N	2167	2167	2167	2167

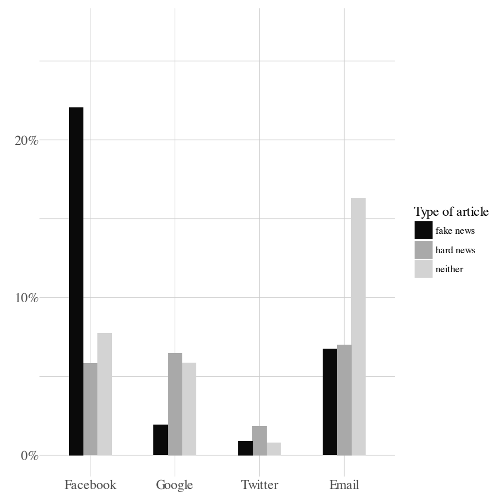
* $p < 0.05$, ** $p < .01$ (two-sided); OLS models with survey weights. Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents supported Hillary Clinton or Donald Trump in the 2016 general election (reference category for the Trump supporter indicator is Clinton support). Political knowledge is measured as the number of correct answers on an eight-question scale (see the Supplementary Materials for the full scale). Political interest is a self-reported measure on a scale from 4 (people who say they pay attention to what's going on in government and politics "most of the time") to 1 (those who pay attention "hardly at all"). The fake news consumption measure is modified from the main text to only include visits to specific URLs identified as false or misleading in the Allcott and Gentzkow (2017) data.

Figure S4: Referrer estimates: Fake news versus other URLs

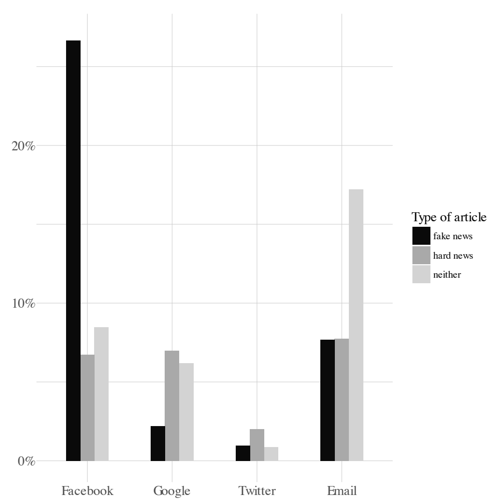
(a) Visited within 15 seconds



(b) Visited within 30 seconds



(c) Visited within 45 seconds



Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Hard news consumption is defined as a visit to a site whose topical focus was classified as hard news by Bakshy, Messing, and Adamic (2015) (excluding Amazon.com, Twitter, and YouTube). Fake news consumption is measured as visiting domains that were coded as pro-Trump or pro-Clinton from the set of sites identified in Allcott and Gentzkow (2017) whose topical focus was classified as hard news in Bakshy, Messing, and Adamic (2015). Facebook, Google, Twitter, or a webmail provider such as Gmail were identified as a referrer if they appeared within the last three URLs visited by the user in the time specified above prior to visiting the fake news article.

Table S9: Fake news consumption by average media diet

	Pro-Trump fake news Binary	Pro-Trump fake news Count	Pro-Clinton fake news Binary	Pro-Clinton fake news Count
Decile 2 news consumption	0.086	1.184	-0.035	0.069
	(0.059)	(0.782)	(0.053)	(0.710)
Decile 3 news consumption	0.028	1.431	-0.140**	-1.318**
	(0.057)	(1.160)	(0.044)	(0.434)
Decile 4 news consumption	0.061	2.982*	-0.141**	-1.421**
	(0.062)	(1.249)	(0.044)	(0.417)
Decile 5 news consumption	0.042	0.888	-0.103	-1.200*
	(0.067)	(0.946)	(0.056)	(0.489)
Decile 6 news consumption	0.023	1.750*	-0.114*	-1.422**
	(0.060)	(0.867)	(0.058)	(0.418)
Decile 7 news consumption	-0.110*	0.158	-0.157**	-1.506**
	(0.047)	(0.752)	(0.047)	(0.413)
Decile 8 news consumption	-0.046	2.270	-0.170**	-1.526**
	(0.054)	(1.794)	(0.043)	(0.422)
Decile 9 news consumption	0.100	4.094**	-0.161**	-1.472**
	(0.058)	(1.420)	(0.045)	(0.403)
Decile 10 news consumption	0.411**	31.026**	-0.152**	-1.722**
	(0.057)	(8.528)	(0.046)	(0.393)
Political interest	0.053**	1.529**	0.014	0.143
	(0.015)	(0.440)	(0.011)	(0.101)
College	-0.006	-2.392	0.020	0.102
	(0.027)	(1.554)	(0.018)	(0.221)
Female	0.039	3.228	0.019	0.149
	(0.025)	(2.172)	(0.018)	(0.173)
Nonwhite	-0.141**	1.846	-0.005	-0.262*
	(0.028)	(3.186)	(0.023)	(0.129)
Age 30–44	-0.001	0.621	0.016	0.211
	(0.047)	(0.928)	(0.034)	(0.148)
Age 45–59	0.053	1.344	0.039	0.585**
	(0.047)	(1.117)	(0.031)	(0.180)
Age 60+	0.062	5.409*	0.079**	0.715**
	(0.045)	(2.162)	(0.029)	(0.248)
Constant	0.018	-8.143*	0.089	0.677
	(0.085)	(3.197)	(0.076)	(0.478)
R^2	0.16	0.09	0.07	0.04
N	2409	2409	2409	2409

* $p < 0.05$, ** $p < .01$ (two-sided); OLS models with survey weights. Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Fake news consumption is measured as visiting domains that were coded as pro-Trump or pro-Clinton from the set of sites identified in Allcott and Gentzkow (2017) whose topical focus was classified as hard news in Bakshy, Messing, and Adamic (2015). Average media diet slant decile constructed from the measure created by Guess (2016) using data from Bakshy, Messing, and Adamic (2015) with survey weights applied. Political interest is measured on a scale from 1 (people who say they pay attention "hardly at all") to 4 (people who say they pay attention to what's going on in government and politics "most of the time").

Table S10: Most visited domains by fake news consumption

Rank	Non-fake news consumers	Fake news consumers
1	msn.com	msn.com
2	en.wikipedia.org	foxnews.com
3	aol.com	en.wikipedia.org
4	huffingtonpost.com	aol.com
5	nytimes.com	nytimes.com
6	cnn.com	huffingtonpost.com
7	foxnews.com	cnn.com
8	washingtonpost.com	washingtonpost.com
9	dailykos.com	fivethirtyeight.com
10	fivethirtyeight.com	finance.yahoo.com
11	realclearpolitics.com	breitbart.com
12	dailymail.co.uk	realclearpolitics.com
13	politico.com	dailykos.com
14	finance.yahoo.com	buzzfeed.com
15	slate.com	politico.com
16	nbcnews.com	quizony.com
17	npr.org	msnbc.com
18	salon.com	cbsnews.com
19	usatoday.com	slate.com
20	buzzfeed.com	nbcnews.com
21	cbsnews.com	conservativetribune.com
22	msnbc.com	theblaze.com
23	worldstarhiphop.com	usatoday.com
24	video.foxnews.com	thedailybeast.com
25	motherjones.com	westernjournalism.com

Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents supported Hillary Clinton or Donald Trump in the 2016 general election.

Table S11: Sites visited immediately before/after fake news consumption

Rank	Before fake news	After fake news
1	facebook.com	facebook.com
2	mg.mail.yahoo.com	mg.mail.yahoo.com
3	google.com	google.com
4	mail.google.com	mail.google.com
5	youtube.com	youtube.com
6	twitter.com	twitter.com
7	l.facebook.com	outlook.live.com
8	clicks.aweber.com	apps.facebook.com
9	outlook.live.com	clicks.aweber.com
10	lb.ocucom.com	lb.ocucom.com
11	apps.facebook.com	mail.aol.com
12	links.injo.com	l.facebook.com
13	mail.aol.com	yahoo.com
14	conservativetribune.com	bing.com
15	westernjournalism.com	myconnection.cox.com
16	myconnection.cox.com	msn.com
17	bing.com	foxnews.com
18	breitbart.com	conservativetribune.com
19	bhtv.brighthouse.com	bhtv.brighthouse.com
20	plus.google.com	plus.google.com

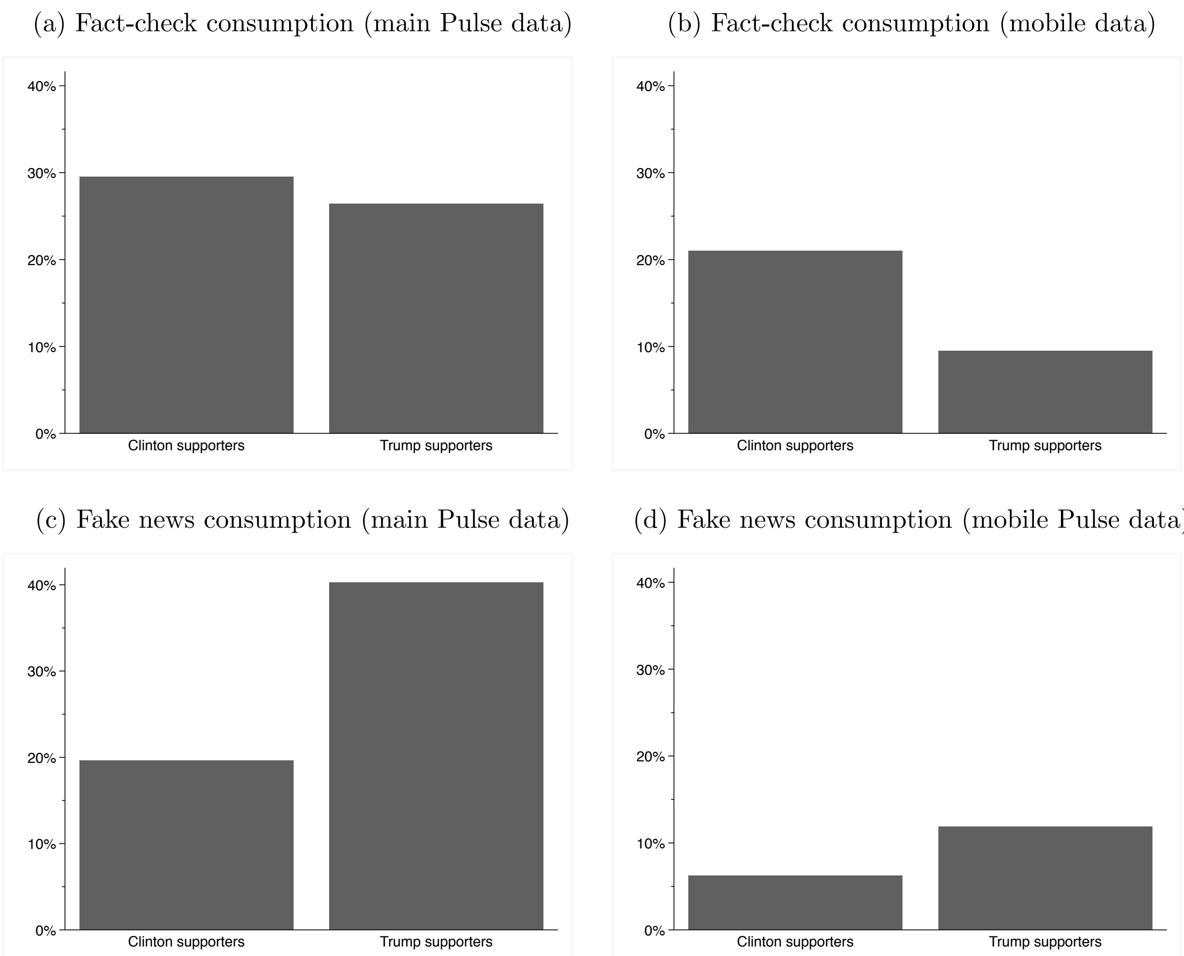
Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents supported Hillary Clinton or Donald Trump in the 2016 general election. Sites listed are those that appear most frequently among the three visited prior to or after a visit to pro-Clinton or pro-Trump fake news article.

Table S12: Fake news consumption by Facebook usage levels

	Pro-Trump fake news		Pro-Clinton fake news	
	Binary	Count	Binary	Count
Trump supporter	0.092	4.648	-0.051*	-0.290**
	(0.048)	(2.410)	(0.025)	(0.092)
Facebook usage: Tercile 2	0.126**	0.135	0.046	0.341
	(0.037)	(0.680)	(0.033)	(0.193)
Facebook usage: Tercile 3	0.215**	-0.458	0.225**	2.239**
	(0.039)	(0.903)	(0.043)	(0.406)
Trump supporter × Tercile 2	0.070	4.385	-0.015	-0.298
	(0.065)	(2.993)	(0.039)	(0.208)
Trump supporter × Tercile 3	0.244**	18.182**	-0.184**	-2.218**
	(0.070)	(6.559)	(0.045)	(0.425)
Political interest	0.063**	2.965**	0.027*	0.335**
	(0.017)	(1.108)	(0.011)	(0.094)
College	0.022	-1.107	0.021	-0.090
	(0.027)	(1.256)	(0.019)	(0.159)
Female	-0.010	2.607	0.007	0.111
	(0.029)	(2.306)	(0.020)	(0.150)
Nonwhite	-0.033	5.789	-0.038	-0.473**
	(0.038)	(4.905)	(0.026)	(0.176)
Age 30–44	-0.037	-0.703	0.070**	0.555**
	(0.062)	(1.324)	(0.026)	(0.211)
Age 45–59	0.036	1.261	0.081**	0.831**
	(0.065)	(1.453)	(0.027)	(0.254)
Age 60+	0.074	7.199*	0.098**	0.533**
	(0.064)	(2.994)	(0.024)	(0.173)
Constant	0.23	0.07	0.14	0.07
	(0.077)	(7.045)	(0.056)	(0.415)
Trump supporter + Trump × T2	0.162**	9.033**	-0.066*	-0.589**
	(0.050)	(2.524)	(0.031)	(0.191)
Trump supporter + Trump × T3	0.336**	22.831**	-0.235**	-2.508**
	(0.050)	(7.104)	(0.038)	(0.449)
R^2	0.23	0.07	0.14	0.07
N	2167	2167	2167	2167

* $p < 0.05$, ** $p < .01$ (two-sided); OLS models with survey weights. Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents supported Hillary Clinton or Donald Trump in the 2016 general election (reference category for the Trump supporter indicator is Clinton support). News consumption groups were constructed using a tercile split on a measure of visits to the sites whose topical focus was classified by Bakshy, Messing, and Adamic (2015) as hard news excluding any domains classified as fake news by the authors using data from Allcott and Gentzkow (2017) as well as Amazon, Twitter, and YouTube, which may contain political news content but are not primarily news publishers and thus not the main focus of this analysis. Political interest is a self-reported measure on a scale from 4 (people who say they pay attention to what's going on in government and politics "most of the time") to 1 (those who pay attention "hardly at all").

Figure S5: Mobile fact-check/fake news consumption (domain-level)



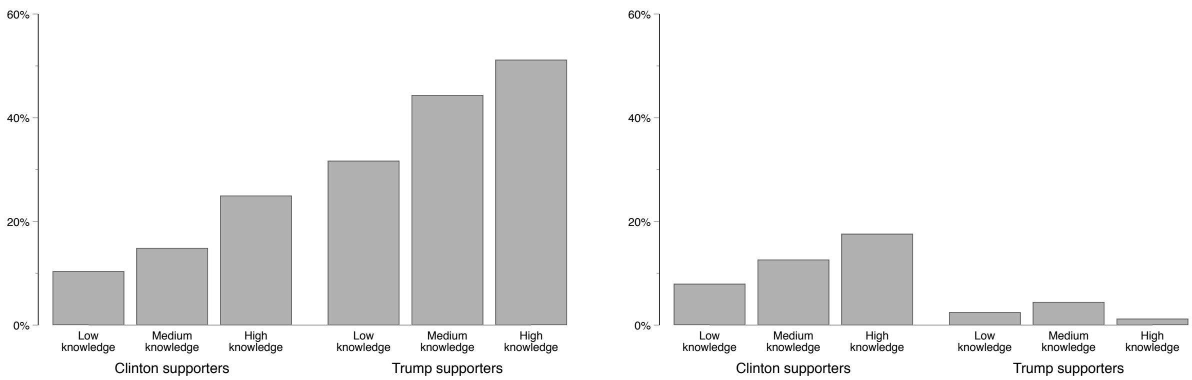
URL-level Pulse data and domain-level mobile traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents who did not support Clinton or Trump were excluded.

The role of political knowledge

While it may seem plausible that fake news consumption is simply the result of ignorance about politics, we find no evidence that people who are less knowledgeable consume more fake news than people who are better informed about politics. To examine how knowledge is associated with fake news consumption, we conduct a tercile split based on scores on a political knowledge scale, which measures respondents' ability to correctly answer eight questions about political news, elected officials, and institutions (e.g., how many years are in a term for a U.S. senator?).[9] As Figure S6 demonstrates, consumption of fake news does not diminish among either Clinton or Trump supporters who are more informed about politics.

Figure S6: Fake news consumption by candidate support and knowledge

(a) Pro-Trump fake news consumption (binary) (b) Pro-Clinton fake news consumption (binary)



Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Fake news consumption is measured as visiting domains that were coded as pro-Trump or pro-Clinton from the set of sites identified in Allcott and Gentzkow (2017) whose topical focus was classified as hard news in Bakshy, Messing, and Adamic (2015). Knowledge groups were constructed using a tercile split on a scale of political knowledge. Respondents who did not support Clinton or Trump were excluded.

In the bottom tercile of knowledge, 32% of Trump supporters consumed one or more articles from pro-Trump fake news websites. This proportion actually increases to 44% and 51% among Trump supporters in the middle and high-knowledge terciles. Even high-knowledge Clinton supporters were more likely to view pro-Trump fake news (25%) compared to their counterparts in the low- and medium-knowledge terciles (10% and 15%, respectively). These patterns are similar, though weaker in magnitude, for pro-Clinton fake news. Just 8% of Clinton supporters in the bottom political knowledge tercile consumed one or more articles from pro-Clinton fake news websites. This proportion increases among the top two terciles of knowledge, but only to 13% for those in the middle tercile and 18% for those in the top tercile. Table S13 in the Supplementary Materials confirms these results, showing that there is no evidence that consumption of fake news diminishes among respondents who are more politically informed after adjusting for covariates.

[9]The knowledge scale is provided in the survey questionnaire, which is also included in the Supplementary Materials.

Table S13: Fake news consumption by political knowledge levels

	Pro-Trump fake news		Pro-Clinton fake news	
	Binary	Count	Binary	Count
Trump supporter	0.167**	8.979**	-0.091**	-0.895**
	(0.044)	(2.985)	(0.029)	(0.251)
Political knowledge: Tercile 2	0.007	-0.624	0.015	0.247
	(0.040)	(1.026)	(0.045)	(0.347)
Political knowledge: Tercile 3	0.084	1.050	0.045	0.265
	(0.049)	(2.331)	(0.040)	(0.321)
Trump supporter × Tercile 2	0.090	10.089	-0.015	-0.353
	(0.065)	(6.896)	(0.046)	(0.340)
Trump supporter × Tercile 3	0.093	3.225	-0.074*	-0.389
	(0.076)	(4.304)	(0.038)	(0.316)
Political interest	0.049*	2.320*	0.028	0.352**
	(0.020)	(1.055)	(0.015)	(0.109)
College	-0.015	-2.355	0.014	-0.128
	(0.030)	(1.724)	(0.019)	(0.154)
Female	0.054	4.202	0.019	0.213
	(0.028)	(2.700)	(0.020)	(0.146)
Nonwhite	-0.064	4.941	-0.049	-0.596**
	(0.034)	(4.761)	(0.025)	(0.191)
Age 30–44	-0.031	0.224	0.053*	0.351*
	(0.054)	(1.257)	(0.025)	(0.176)
Age 45–59	0.038	1.562	0.077**	0.779**
	(0.057)	(1.402)	(0.024)	(0.222)
Age 60+	0.092	7.630*	0.108**	0.618**
	(0.054)	(2.983)	(0.022)	(0.139)
Constant	-0.066	-13.966*	-0.056	-0.749*
	(0.080)	(6.650)	(0.046)	(0.310)
Trump supporter + Trump × T2	0.257**	19.067*	-0.106**	-1.248**
	(0.053)	(7.994)	(0.034)	(0.310)
Trump supporter + Trump × T3	0.260**	12.204**	-0.165**	-1.284**
	(0.066)	(3.018)	(0.026)	(0.218)
R^2	0.14	0.06	0.07	0.03
N	2167	2167	2167	2167

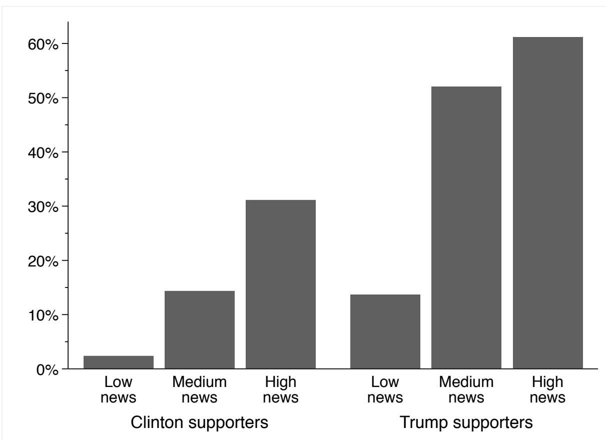
* $p < 0.05$, ** $p < .01$ (two-sided); OLS models with survey weights. Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents supported Hillary Clinton or Donald Trump in the 2016 general election (reference category for the Trump supporter indicator is Clinton support). News consumption groups were constructed using a tercile split on a measure of visits to the sites whose topical focus was classified by Bakshy, Messing, and Adamic (2015) as hard news, excluding any domains classified as fake news by the authors using data from Allcott and Gentzkow (2017) as well as Amazon, Twitter, and YouTube, which may contain political news content but are not primarily news publishers and thus not the main focus of this analysis. Political interest is a self-reported measure on a scale from 4 (people who say they pay attention to what's going on in government and politics "most of the time") to 1 (those who pay attention "hardly at all").

Does fake news crowd out hard news?

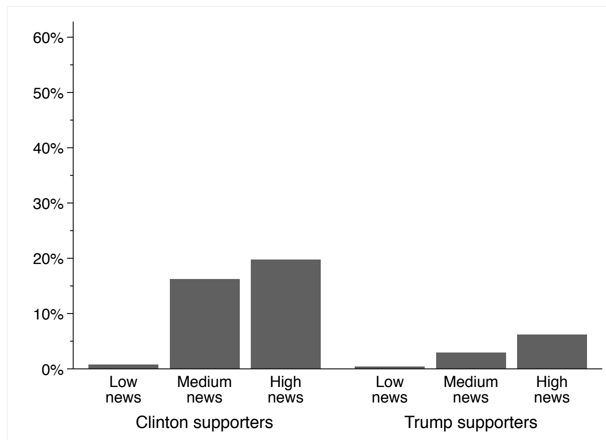
We measure consumption of articles from websites classified as focusing on hard news topics (Bakshy, Messing, and Adamic, 2015) and perform a tercile split.[10] Figure S7 shows how fake news consumption changes as hard news consumption increases. In general, the data indicate that the people who consume the most hard news also consume the most fake news. For instance, visits to pro-Clinton fake news websites among Clinton supporters increased from 0.1% in the low news consumption tercile to 19.8% in the high news consumption tercile. Most notably, however, visits to pro-Trump fake news websites increased among Trump supporters from 13.7% in the low tercile to 52.0% in the middle tercile and 61.2% in the high tercile. In general, the people who consumed the most real news also consumed the most fake news. Table S14 below shows that visits to attitude-consistent fake news websites was significantly higher among Clinton and Trump supporters who consume high levels of hard news conditional on numerous covariates.

Figure S7: Fake news consumption by hard news consumption

(a) Pro-Trump fake news consumption (binary)



(b) Pro-Clinton fake news consumption (binary)



Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Fake news consumption is measured as visiting domains that were coded as pro-Trump or pro-Clinton from the set of sites identified in Allcott and Gentzkow (2017) whose topical focus was classified as hard news in Bakshy, Messing, and Adamic (2015). News consumption groups were constructed using a tercile split on a measure of visits to the sites whose topical focus was classified by Bakshy, Messing, and Adamic (2015) as hard news (excluding Amazon, Twitter, and YouTube). Respondents who did not support Clinton or Trump were excluded.

These results suggest that fake news does not crowd out hard news consumption, which we seek to verify by combining our data from October/November 2016 with a different YouGov Pulse dataset from February/March 2015 (Guess, 2016). To protect respondent confidentiality, YouGov provided us with a new set of respondent identifiers for each of the two datasets, allowing us to examine the 265 respondents for whom online behavioral data is available in both datasets. We then conducted an analysis using a variant of a difference-in-differences approach where we compared the change in hard news consumption from 2015 to 2016 among fake news consumers to the change among people who did not consume fake news. The data appear in Figure S8.

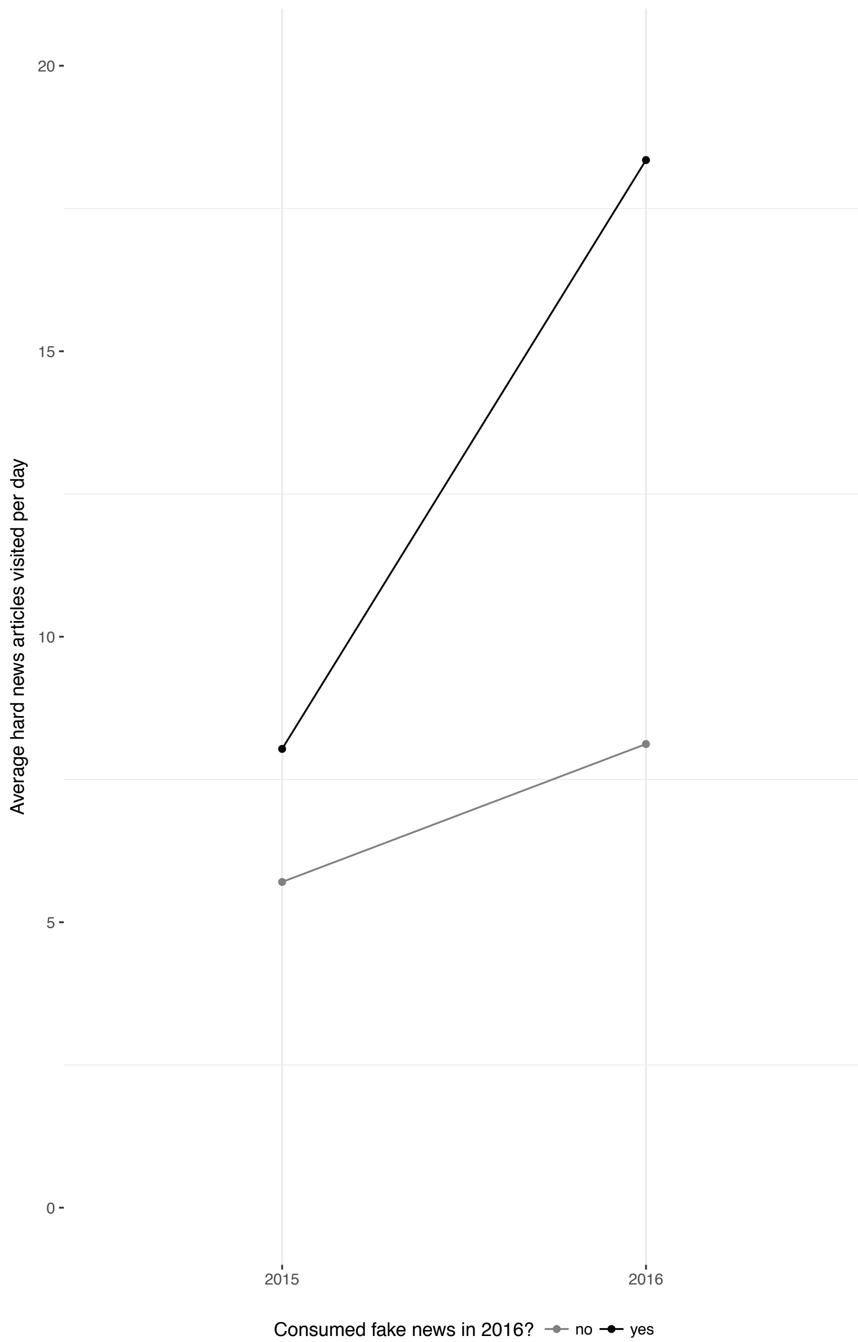
[10] We additionally exclude from the hard news category any domains classified as fake news by the authors using data from Allcott and Gentzkow (2017) as well as the websites of Amazon, Twitter, and YouTube, which may contain political news content but are not primarily news publishers and thus not the main focus of this analysis.

Table S14: Fake news consumption by hard news consumption levels

	Pro-Trump fake news		Pro-Clinton fake news	
	Binary	Count	Binary	Count
Trump supporter	0.073*	1.709	-0.029*	-0.358**
	(0.030)	(1.855)	(0.013)	(0.124)
Hard news consumption: Tercile 2	0.104**	0.556	0.144**	0.638*
	(0.033)	(0.718)	(0.042)	(0.249)
Hard news consumption: Tercile 3	0.261**	1.892	0.173**	1.721**
	(0.043)	(1.331)	(0.033)	(0.379)
Trump supporter × Tercile 2	0.270**	14.037*	-0.127**	-0.608*
	(0.059)	(5.635)	(0.047)	(0.263)
Trump supporter × Tercile 3	0.214**	22.976**	-0.119**	-1.611**
	(0.066)	(4.975)	(0.036)	(0.362)
Political interest	0.045**	2.332*	0.017	0.271**
	(0.017)	(1.183)	(0.010)	(0.080)
College	-0.031	-3.090	0.006	-0.211
	(0.028)	(1.586)	(0.020)	(0.173)
Female	0.063*	4.806	0.029	0.314
	(0.026)	(2.584)	(0.020)	(0.162)
Nonwhite	-0.055	4.603	-0.039	-0.470**
	(0.035)	(4.777)	(0.024)	(0.174)
Age 30–44	-0.034	-0.397	0.054*	0.429*
	(0.046)	(1.472)	(0.024)	(0.187)
Age 45–59	0.039	1.317	0.085**	0.860**
	(0.049)	(1.509)	(0.023)	(0.237)
Age 60+	0.076	6.897*	0.111**	0.656**
	(0.046)	(2.876)	(0.024)	(0.150)
Constant	-0.140	-14.219	-0.114*	-1.211**
	(0.076)	(7.895)	(0.047)	(0.382)
Trump supporter + Trump × T2	0.343**	15.745*	-0.156**	-0.966**
	(0.054)	(7.161)	(0.042)	(0.254)
Trump supporter + Trump × T3	0.287**	24.685**	-0.149**	-1.969**
	(0.061)	(4.795)	(0.035)	(0.384)
R^2	0.25	0.08	0.12	0.05
N	2167	2167	2167	2167

* $p < 0.05$, ** $p < .01$ (two-sided); OLS models with survey weights. Online traffic statistics for the October 7–November 14, 2016 period among YouGov Pulse panel members with survey weights applied. Respondents supported Hillary Clinton or Donald Trump in the 2016 general election (reference category for the Trump supporter indicator is Clinton support). Political interest is a self-reported measure on a scale from 4 (people who say they pay attention to what's going on in government and politics "most of the time") to 1 (those who pay attention "hardly at all").

Figure S8: Change in hard news consumption: Early 2015 versus the 2016 campaign



Online traffic statistics of hard news consumption in 2015 (February 27–March 19) and 2016 (October 7–November 14, 2016) among YouGov Pulse panel members who appear in both datasets. Hard news consumption is measured as visits to the sites whose topical focus was classified by Bakshy, Messing, and Adamic (2015) as hard news, excluding any domains classified as fake news by the authors using data from Allcott and Gentzkow (2017) as well as Amazon, Twitter, and YouTube, which may contain political news content but are not primarily news publishers and thus not the main focus of this analysis.

We find that news consumption increased substantially among both groups as the 2016 election approached, but the pattern differed between groups. Among respondents who did not visit an article from a fake news website in our 2016 sample period, hard news consumption increased from an average of 5.7 articles per day to 8.1 per day. However, consumption increased even more among fake news consumers, going from 8.0 articles per day in 2015 to 18.3 per day in 2016. The differential increase we observe in hard news consumption from 2015 to 2016 among fake news consumers is statistically significant in a difference-in-differences-style analysis that controls for a number of demographic and political covariates, in addition to the total number of web page visits (see Table S15). We cannot establish that this relationship is causal, but our results are inconsistent with a simple hypothesis that fake news crowds out hard news consumption.

Table S15: Hard news consumption 2015–2016

	(1)	(2)	(3)
Fake news reader (2016)	48.945	46.133	−18.204
	(47.790)	(56.044)	(54.795)
2016 sample	196.906***	197.994***	197.994***
	(41.254)	(41.968)	(42.020)
Fake news × 2016	349.949*	348.860*	348.860*
	(139.550)	(141.193)	(141.370)
Trump supporter		−158.131*	−145.068*
		(75.914)	(61.928)
Political knowledge		20.149	7.607
		(18.079)	(14.452)
Political interest		46.179	96.524**
		(35.716)	(32.236)
College graduate		21.649	36.561
		(72.680)	(61.651)
Female		−60.762	−64.153
		(63.112)	(53.232)
Nonwhite		−27.634	−131.613*
		(72.167)	(64.613)
Age 30-44		179.086	−17.624
		(97.479)	(80.443)
Age 45-59		85.059	39.171
		(88.804)	(70.441)
Age 60+		101.264	63.895
		(89.599)	(68.809)
Total page visits			0.023***
			(0.004)
Constant	119.805***	−142.223	−413.318**
	(19.627)	(142.905)	(135.694)
R^2	0.103	0.152	0.296
N	414	412	412

* $p < 0.05$, ** $p < .01$, *** $p < .001$ (two-sided); OLS models with standard errors clustered by respondent. Respondents are YouGov Pulse panel members who took part in February/March 2015 and October/November 2016 surveys and supported Hillary Clinton or Donald Trump in the 2016 general election (reference category for the Trump supporter indicator is Clinton support). Political knowledge is measured as the number of correct answers on an eight-question scale. Political interest is a self-reported measure on a scale from 4 (people who say they pay attention to what's going on in government and politics "most of the time") to 1 (those who pay attention "hardly at all").

Survey Questionnaire

[The relevant portions of the stimuli administered to respondents are provided below. Other portions that are not directly relevant to this study will be reported in a future manuscript.]

This research project is being conducted by (redacted for peer review). It is a study to learn more about public opinion on issues in the news. Your participation is voluntary. Participation involves completion of a short survey as well as the anonymous tracking data on your online website visits which you have already agreed to as part of your YouGov Pulse participation. You may choose to not answer any or all questions. The researchers will not store information that could identify you with your survey responses. Identifying information will not be used in any presentation or publication written about this project. You must be age 18 or older to participate. Questions about this project may be directed to (redacted for peer review).
If you agree to participate in this survey, click "I agree" below.
-I agree to participate
-I do not agree to participate

Who will you vote for in the election for President in November?
-Hillary Clinton (Democrat)
-Donald Trump (Republican)
-Gary Johnson (Libertarian)
-Jill Stein (Green)
-Other
-Not sure
-Probably won't vote

We'd like to know if you are working now, temporarily laid off, or are you unemployed, retired, permanently disabled, a homemaker, a student, or what?
-Working now
-Temporarily laid off
-Unemployed
-Retired
-Permanently disabled
-Homemaker
-Student
-Other

What do you think is the most important problem facing this country? [randomize order]
-Immigration
-Foreign trade/trade deficit
-Economy and jobs
-Health care
-National security and terrorism
-Federal deficit
-Crime
-Taxes
-Education
-Don't know

-Other

When it comes to politics, would you describe yourself as liberal, conservative, or neither liberal nor conservative?
-Very liberal
-Somewhat liberal
-Slightly liberal
-Moderate; middle of the road
-Slightly conservative
-Somewhat conservative
-Very conservative

Generally speaking, do you usually think of yourself as a Republican, a Democrat, an independent, or what?
-Republican
-Democrat
-Independent
-Something else

(If Democrat) Would you call yourself a strong Democrat or a not very strong Democrat?
-Strong Democrat
-Not very strong Democrat

(If Republican) Would you call yourself a strong Republican or a not very strong Republican?
-Strong Republican
-Not very strong Republican

(If neither Democrat nor Republican) Do you think of yourself as closer to the Republican Party or to the Democratic Party?
-Closer to the Republican Party
-Closer to the Democratic Party
-Neither

[omitted article choice task]

We would like to get your feelings toward some of our political leaders and other people who are in the news these days using something we call the feeling thermometer. Ratings between 50 degrees and 100 degrees mean that you feel favorable and warm toward the person. Ratings between 0 degrees and 50 degrees mean that you don't feel favorable toward the person and that you don't care too much for that person. You would rate the person at the 50 degree mark if you don't feel particularly warm or cold toward the person. If we come to a person whose name you don't recognize, you don't need to rate that person.(randomize order)
-Barack Obama
-Hillary Clinton
-Donald Trump
-Democratic Party
-Republican Party
-PolitiFact

-FactCheck.org

There are many different activities related to the campaign and the elections that a person might do on the Internet. Below is a list of things you may or may not have done online in the months leading up to the November (2016) elections. Please indicate whether or not you have done each of these activities [Yes/No].
-Used the Internet to research or fact-check claims made during the campaign
-Took part in an online discussion about political issues or the campaign
-Looked for information online about candidates' voting records or positions on the issues
-Watched video online about the candidates or the election

(If yes to fact-checking item) Which of the following did you do to research or fact-check claims made during the campaign? Please indicate all that apply. [randomize order of options]
-Visited a fact-checking website such as PolitiFact.com, FactCheck.org, or the Washington Post Fact Checker
-Visited a candidate website
-Visited a blog or opinion website
-Visited a news website

Are you familiar with the fact-checking movement in journalism, which includes websites such as PolitiFact, Factcheck.org, and the Washington Post Fact Checker? (Fact-checking is a new development in journalism that seeks to hold politicians accountable when they make false or misleading statements.)
-Yes
-No

(If Yes familiar with fact-checking) How familiar are you with fact-checking in journalism at websites such as PolitiFact?
-Very familiar
-Somewhat familiar
-Slightly familiar
-Slightly unfamiliar
-Somewhat unfamiliar
-Very unfamiliar

(If Yes familiar with fact-checking) In general, how favorable or unfavorable is your overall opinion of the fact-checking movement in journalism?
-Very favorable
-Somewhat favorable
-Slightly favorable
-Slightly unfavorable
-Somewhat unfavorable
-Very unfavorable

How often do you pay attention to what's going on in government and politics?
-Most of the time
-Some of the time
-Only now and then

-Hardly at all
-Don’t know

Now we have a set of questions concerning various public figures. We want to see how much information about them gets out to the public from television, newspapers and the like. Please indicate if you think that the following statements are true or false. If you don't know, please select "Don't know." (randomize order) [Respondents have three choice options: "True", "False", "Don't know." Correct answer in brackets]

-David Cameron is the current Prime Minister of the United Kingdom. [False]
-The term of office for a Member of the United States Senate is four years. [False]
-The Republican Party holds a majority of seats in the US House of Representatives. [True]
-The Republican Party holds a majority of seats in the US Senate. [True]
-Overriding a presidential veto requires a three-quarters vote of the US Senate and House of Representatives. [False]
-John Kerry is the current US Secretary of State. [True]
-Antonin Scalia is the current Chief Justice of the US Supreme Court. [False]
-China has the largest economy in the world. [False]

[omitted article choice task]

[omitted information exposure experiment]

[omitted experimental outcome measures]

It is essential for the validity of this study that we know whether participants looked up any information online during the study. Did you make an effort to look up information during the study? Please be honest; you will not be penalized in any way if you did.
-Yes, I looked up information
-No, I did not look up information

[omitted comments request and debrief]

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