Does Fake News Work?

Fake News and Ideological Bias in News Consumption

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Motivation

How does fake news influence people?

We use a unique dataset of household browsing history to measure ideological bias in news consumption before and after seeing fake news

Background

- Social media platforms, especially Facebook, drove significant traffic to fake news sites in 2016 [1, 2]
- Fake news had wide reach with up to 23% of Americans sharing fake news in 2016 [3 ,4, 5]
- A small number of conservatives (~10% of pop.) represented a large share of the visits to fake news sites (~60%) in 2016 [2, 3]
- It's difficult to measure the effect of fake news on the 2016 election, and recall surveys aren't ideal [1]

Methods & Data

comScore data –2016 internet browsing history for 81,417 US households [6]

136 million timestamped visit logs at the domain-level (that we aggregated to the household-month level)

Partisanship, Propaganda, and Disinformation: Online Media and the 2016 U.S. Presidential Election – Berkman-Klein Center for Internet & Society report [7]

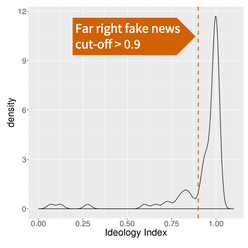
Categorized 964 online news sources based on relative proportion of tweets citing the source by Clinton vs. Trump retweeters: -1.0 (Source is favored by Clinton retweeters) to 1.0 (Source is favored by Trump retweeters)

*Household ideology index$_t$ = **weighted average** of Berkman score for each visited news source by total duration spent on each news source during the month* (similar to methodology used by others [2, 3])

False, Misleading, Clickbait-y, and/or Satirical "News" Sources – Melissa Zimdars et al. [8]

447 fake news sites = "sources that entirely fabricate information, disseminate deceptive content, or grossly distort actual news reports"

Fake news sites with Berkman scores



74 sites overlap with Berkman scores* = 78% of all visits to fake news sites

60 sites have Berkman scores > 0.9 **(Far right fake news)** = 53% of all visits to fake news sites

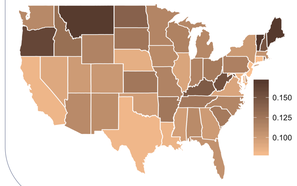
*Removed 74 overlap sites when calculating ideology index to avoid double-counting

Who saw fake news?

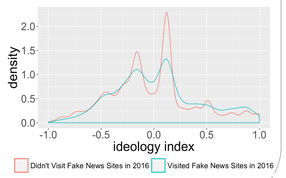
14% of the households in the study visited a fake news site at least once in 2016

Household Income		Race / Ethnicity		Head of Household Age	
< $25K	18%	White	70%	< 25	7%
$25K – $39K	14%	Black	7%	25-44	19%
$40K - $59K	18%	Hispanic	9%	45-59	39%
$60K - $75K	10%	Asian	5%	> 60	35%
$75K - $99K	13%	Other	9%		
> $100K	26%				

% of households visiting fake news sites in 2016



Distribution of household ideology index Jan 2016



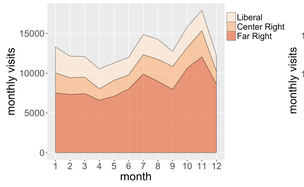
How much fake news was seen?

rank	fake news site	Ideological index	% of all fake news visits
1	conservativetribune.com	0.95	10.2%
2	zerohedge.com	0.81	9.4%
3	infowars.com	0.94	6.9%
4	thepoliticalinsider.com	0.94	3.5%
5	thefederalistpapers.org	1.00	3.4%
6	thegatewaypundit.com	0.98	3.2%
7	madworldnews.com	0.91	3.2%
8	beforeitsnews.com	0.80	3.1%
9	angrypatriotmovement.com	1.00	2.3%
10	americannews.com	0.88	2.3%

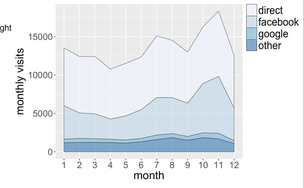
Top 10 fake news sites:

- 48% of all 2016 fake news visits
- 7 are far right fake news (ideology index > .9)

Monthly fake news visits by household ideology



Monthly fake news visits by referring source



3 - 4% of households visited fake news sites each month, with 64% of visits from Far Right households and 32% from Facebook

Does seeing fake news affect future news consumption?

Identification strategy: $Y_{it} = \tau\, D_{it-1} + \beta^T X_{it-1} + \alpha_i + \gamma_t + \varepsilon_{it}$

Y_{it} = Ideology index

D_{it-1} = Treatment (fake news or far right fake news)

X_{it-1}= Covariates (e.g. Last month's ideology index)

α_i = Household FE , dropped in LDV γ_t = Month FE

Table 1

	Outcome variable: Ideology index$_t$			
	FE (1)	LDV (2)	FE (3)	LDV (4)
Visited fake news$_{t-1}$	-0.005	0.011***		
	(0.004)	(0.004)		
Visited far right fake news$_{t-1}$			-0.003	0.037***
			(0.005)	(0.005)
Ideology index$_{t-1}$		0.390***		0.387***
		(0.004)		(0.004)
Visited fake news * Far Right$_{t-1}$	0.043***	0.210***		
	(0.006)	(0.006)		
Visited fake news * Center Right$_{t-1}$	0.013**	0.035***		
	(0.006)	(0.006)		
Visited far right fake news * Far Right$_{t-1}$			0.049***	0.216***
			(0.008)	(0.008)
Visited far right fake news * Center Right$_{t-1}$			0.017**	0.038***
			(0.008)	(0.009)
Household FE	Yes		Yes	
Month FE	Yes	Yes	Yes	Yes
Observations	200,305	200,305	200,305	200,305
Note:				*p<0.1; **p<0.05; ***p<0.01
				Clustered errors by household

Visiting fake news results in **more conservative future news consumption for Far Right households** (top 20% most conservative households with ideology index above 0.22)

Visiting fake news has a **similar but reduced effect on Center Right households** (21% of households with ideology index between 0 and 0.22)

Mixed evidence for visiting fake news having any effect on future news consumption for liberal households

Table 2

	Outcome variable: Ideology index$_t$			
	FE (1)	LDV (2)	FE (3)	LDV (4)
Visited fake news$_{t-1}$	-0.005	-0.003		
	(0.005)	(0.005)		
Visited fake news from Facebook$_{t-1}$	**0.002**	**0.039*** **		
	(0.007)	**(0.008)**		
Visited far right fake news$_{t-1}$			0.001	0.019***
			(0.007)	(0.007)
Visited far right fake news from Facebook$_{t-1}$			**-0.008**	**0.039*** **
			(0.010)	**(0.011)**
Ideology index$_{t-1}$		0.390***		0.387***
		(0.004)		(0.004)
Visited fake news * Far Right$_{t-1}$	0.031***	0.212***		
	(0.008)	(0.008)		
Visited fake news * Center Right$_{t-1}$	0.009	0.024***		
	(0.008)	(0.009)		
Visited fake news from Facebook * Far Right$_{t-1}$	**0.026****	**-0.015**		
	(0.011)	**(0.011)**		
Visited fake news from Facebook * Center Right$_{t-1}$	**0.010**	**0.015**		
	(0.012)	**(0.013)**		
Visited far right fake news * Far Right$_{t-1}$			0.036***	0.243***
			(0.010)	(0.010)
Visited far right fake news * Center Right$_{t-1}$			0.009	0.038***
			(0.011)	(0.012)
Visited far right fake news from Facebook * Far Right$_{t-1}$			**0.026*** **	**-0.054*** **
			(0.014)	**(0.014)**
Visited far right fake news from Facebook * Center Right$_{t-1}$			**0.016**	**-0.007**
			(0.016)	**(0.017)**
Household FE	Yes		Yes	
Month FE	Yes	Yes	Yes	Yes
Observations	200,305	200,305	200,305	200,305
Note:				*p<0.1; **p<0.05; ***p<0.01
				Clustered errors by household

Visiting fake news from Facebook doesn't appear to have any additive effect on future news consumption beyond the baseline effects from fake news

Discussion

Our findings support our hypothesis that exposure to fake news had heterogenous effects:

- Far Right households increased their ideology index by 0.210 in LDV models, equivalent to going from the 80th percentile in ideology index to 89th percentile
- Center Right households had a smaller but still statistically significant increase of .035 in ideology index in LDV models, equivalent to going from 60th percentile in ideology index to 64th percentile
- No consistently significant effect for liberal households

Thus, exposure to fake news has a reinforcement effect on news consumption and may drive polarization by pushing the most conservative viewers further right

Our results suggest that fake news may only **influence individuals who are politically predisposed to accept its primarily right-wing content,** which is in line with other work by Zaller [9] and Jerit and Barabas [10]

We found that exposure to fake news through Facebook had no additive effects, suggesting that social media platforms do not amplify the effect [11]

However, since this study can only observe browser activity at the domain level, it is likely under-estimating how much fake news people saw within Facebook, if they did not click through to an external website

Robustness Checks & Next Steps

We checked our results for robustness: (1) Modified treatment to be cumulative # of visits to fake news sites; (2) Modified treatment to be state-based dummy for ever visited a fake news site; (3) Tested leads as treatment variables; (4) Tested placebo outcome variable: visits to Amazon.com; (5) Ran random effects models; (6) Replicated using an alternate measure for ideology index [11]

Future work

- Add comScore data from 2015 and 2017 to check if results are consistent over time
- Check if Breitbart has similar effects as fake news
- Differentiate multiple vs. single fake news visit effect

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