A Platform Penalty for News?

How Social Media Context Can Alter Information Credibility Online

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Abstract

Growing concern about dubious information online threatens the credibility of legitimate news. We examine two possible mechanisms for this effect on social media. First, people might view all news on social media as less credible. Second, questionable information elsewhere in a news feed might discredit legitimate news coverage. Findings from a preregistered experiment confirm that people see information on Facebook as less credible than identical information on news websites, though the effect is small, suggesting that observational data overstates this platform penalty. Prior exposure to low (versus high) credibility information on Facebook also reduces engagement with a target article, but not its perceived credibility. However, exploratory analyses show that the effects of prior exposure to low credibility information vary depending on the plausibility of the target article, decreasing the credibility of a less plausible article (a spillover effect) but increasing the credibility of a more plausible one (a contrast effect).

Keywords: social media, news consumption, news credibility, Facebook

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We thank the Dartmouth Center for the Advancement of Learning for generous funding support.

Individuals increasingly consume online news from social media platforms rather than from news websites (e.g., Shearer and Gottfried 2017). These platforms are different from news websites because they display information from various providers and consumers in a single location and socialize the media consumption process (Messing and Westwood 2014). In particular, social media reduces the role of traditional media gatekeepers that decide which stories will be covered and what information is released to the news audience (White 1950). Consumers of news content must instead make frequent judgments about the accuracy and credibility of information themselves (Westerman, Spence, and Van Der Heide 2014).

Concerns continue to grow about the credibility of news content shared on these platforms. In particular, concerns about the dissemination of untrustworthy content on Facebook and other social media platforms before the 2016 election (e.g., Allcott and Gentzkow 2017; Guess, Nyhan, and Reifler 2020) may contribute to distrust of the information that people encounter online. For instance, only 37% of U.S. adults express at least some trust in the information they get from social media compared to 85% for local news organizations and 72% for national news organizations (Barthel and Mitchell 2017). However, these statistics do not isolate the effects of the platforms themselves on how people assess the credibility of information online. Individuals could have different types of news in mind when asked about social media and mainstream outlets, leaving unclear what effect encountering news on a social media platform has on judgments of its credibility (Dafoe, Zhang, and Caughey 2018).

We therefore seek to determine how consuming news via social media affects the perceived credibility of information that people encounter online, focusing on two contextual factors: perceptions of the general credibility of the information people see on a platform and effects from the credibility of other information that appears nearby in a news feed, which we call "spillover" effects. First, judgments of news article headlines on social media may reflect the credibility of the *platform* as a source, not just the outlet that published the article. Such source credibility effects are frequently observed in the persuasion literature (e.g., Pornpitakpan 2004) and are also likely to occur online, where the perceived credibility of outlets varies widely (e.g., Pennycook and Rand

2019). However, less is known about the extent to which social media platforms themselves serve as a source cue. If platforms are widely seen as a source of untrustworthy information, people may question the validity of even real news stories that appear on them. Second, social media feeds like the Facebook News Feed may expose people to information of dubious validity, potentially causing people to express skepticism toward genuine news coverage that appears in the same feed context. The conditions under which these sorts of spillover effects occur have previously been analyzed in other domains but have not been widely studied in social media (e.g., Herr, Sherman, and Fazio 1983; Schwarz and Bless 2007).

In this study, we asked participants to assess the credibility of real news articles of unknown validity in the preview format commonly found on social media. However, some were randomly assigned to view an article preview from a website while others instead saw a preview image as it would appear on Facebook, the most widely used social media platform (Shearer and Gottfried 2017) (all image stimuli are provided in the Online Appendix). This comparison allows us to assess the contextual effects of appearing on the Facebook platform on news credibility. Other respondents were randomly assigned to see identical news articles in a simulated Facebook News Feed environment below one of the three articles: a placebo post about the weather, an article preview that was manipulated to have low credibility, or one that was manipulated to have high credibility. This design allows us to assess whether contextual exposure to low credibility articles in social media feeds undermines the credibility of other news articles.

Our results indicate that people find news article previews to be somewhat less credible and are less likely to say they would read the full article when they encounter it on Facebook rather than directly from a news website. Importantly, however, these effect sizes are small in size. The platform source thus itself cannot account for the gulf between trust in mainstream news and news from social media reported in observational survey data (Barthel and Mitchell 2017). At the same time, even a small decrease in the perceived credibility of *the exact same* information is concerning. As news consumption continues to shift to social media, Americans' news trust might only further diminish at a time when it is already very low, threatening a core mechanism by which citizens

become informed about politics and democracy.

We also find mixed evidence for spillover effects from high or low credibility article in a news feed. News feed exposure to a low (versus high) credibility article reduced intention to read other articles, send them to a friend, or share them on Facebook — important changes in behavioral intentions for article engagement — but did not alter the perceived credibility of those later articles. However, an exploratory analysis suggests that the effects of a low credibility article (compared to the placebo) varied depending on the plausibility of the two target articles that participants evaluated: it decreased the perceived credibility of an article that respondents in the control condition evaluated as less credible (evidence of a spillover effect) but increased the credibility of a different article that was seen as more credible by participants in the control condition. This pattern of spillover and contrast effects, while unexpected, is consistent with other research (Schwarz and Bles 1992; Thorson 2018) and clarifies that news articles with lower credibility are more vulnerable to negative spillover effects from untrustworthy content on social media platforms.

Theory

We consider two specific mechanisms by which social media platform contexts can affect the perceived credibility of news. First, people may treat the platform itself as the source of the information (rather than the outlet that published the article) and make inferences about its validity on that basis. Previous academic literature has explored the effect of different types of news sources on perceived information credibility, but the implications of these findings for perceptions of news on social media have not been adequately considered. For instance, Flanagin and Metzger (2000) found that newspapers were considered more credible than the Internet, television, radio, and other print sources, but that the Internet was no less credible than others in the latter group. Over time, as social media has become a more important source of information, these perceptions have shown some signs of change, with the public now rating information from social media as less trustworthy than that from local and national news organizations (e.g., Barthel and Mitchell 2017).

The format in which news appears on social media complicates how source effects might operate. It is well understood that cognitive heuristics like source cues often influence judgments about information credibility (Pornpitakpan 2004; Sundar, Knobloch-Westerwick, and Hastall 2007; Metzger, Flanagin, and Medders 2010). For an article on social media, however, the "source" is less clear — it could be the news organization that wrote the article or the platform on which the article appears (e.g., Facebook). In this way, the perceived credibility of a platform can still affect how users view an article that appears on a news feed even if we hold the news organization that published the article constant. Given the public's relative distrust of social media information (Barthel and Mitchell 2017) and Facebook's reputation for containing dubious information, we should expect negative social media platform effects similar to those observed in other countries (Karlsen and Aalberg Forthcoming). Indeed, Schmierbach and Oeldorf-Hirsch (2012) found that stories posted on *The New York Times* website were seen as more credible than those posted on the newspaper's Twitter account. Yet it is unclear if this platform effect extends to news articles from unknown sources — an important distinction from prior work that makes our study more relevant to the phenomenon of untrustworthy news websites. Further, by considering Facebook rather than Twitter, we assess platform effects on a much more widely used social media service (Shearer and Gottfried 2017).

We therefore hypothesize the following:[1]

> H1: A news article presented on Facebook will be perceived as less credible than the same article presented on a media organization's website.

Second, the presence of low credibility information on social media may cause respondents to distrust other news and information they encounter on the platforms. Such contextual effects can occur when an unrelated stimulus affects judgments or attitudes toward another object or individual by making a consideration or category more accessible or eliciting an affective state. These effects can take the form of either assimilation effects or contrast effects (Herr, Sherman, and Fazio 1983).

[1] All hypotheses were preregistered with Evidence in Governance and Politics (EGAP) prior to data collection (the preregistration is provided in Online Appendix C).

Assimilation effects, referred to here as spillover effects, are "when judgments and behavior come to reflect the information or behavioral implications of activated concepts"—caused by the prior unrelated stimulus—while contrast effects take place when a prime has the opposite effect on a target (Huntsinger 2014).

We expect spillover effects to be strongest on social media when assessing the effects of realistic low- and high-credibility primes on judgments of news articles of uncertain validity. For instance, Herr, Sherman, and Fazio (1983) found assimilation effects were more common for moderate primes and ambiguous stimuli (though they observed contrast effects for unambiguous target stimuli regardless of prime extremity and for ambiguous stimuli when the prime was extreme). Bohner, Ruder, and Erb (2002) similarly found that spillover effects were probable when the message content was ambiguous, but contrast effects were more likely when messages violated prior expectations. Low-credibility primes might similarly lead subjects to view surrounding information as more dubious and thus cause spillover effects.

These spillover effects are likely to carry over to judgments of information credibility for news media articles. For instance, Baumgartner and Wirth (2012) found that affective states induced by a news article influence how subsequent articles are processed and which information is learned. However, no previous studies have considered the effect of the credibility of a news article on the processing and perceived credibility of subsequent news articles in a social media news feed—an important research question given that individuals frequently process numerous news items sequentially on social media platforms like Facebook.

We therefore expect that the credibility of a news article will affect how people perceive the credibility of a subsequent article. We specifically offer the following hypothesis:

> H2: A news article presented on Facebook will be perceived as less credible if it is preceded by a low credibility article rather than a high credibility article.

Finally, we also seek to answer three preregistered research questions for which we had weaker theoretical expectations:

RQ1: Does the manipulation of the credibility of an adjacent article on a platform affect respondents' self-reported likelihood of reading an unrelated article, sending it to a friend, indicating you like it on Facebook, or sharing on Facebook?

RQ2: Do the effects of the platform manipulation (H1) and the within-feed credibility manipulation (H2) on our primary outcome variables vary by respondents' social media usage?

RQ3: Does exposure to low credibility articles on social media diminish feelings of epistemic political efficacy (EPE)?

Methods

Participants

The study, which was approved by the Dartmouth College Committee for the Protection of Human Subjects (STUDY00031025), was conducted from May 8–9, 2018 among participants on Amazon Mechanical Turk. We excluded Turk workers who did not consent to the survey, those under the age of 18, those who took part in a previous pilot study, and additional responses from workers who tried to take it more than once. A total of 3,008 individuals took the survey on Qualtrics. As with other MTurk samples, our respondents are better educated (56% college educated), whiter (80%), younger (median age group of 25–34), and left-leaning (58% Democrat) than the general population. Despite this limitation, prior studies show a close similarity between treatment effects found on nationally representative and MTurk samples (e.g., Coppock 2019; Mullinix et al. 2015).[2]

Experimental design and procedure

After consenting to participate, participants answered a series of demographic questions followed by questions about their use and perceptions of news and social media as well as questions about

[2]The distribution of participant demographics by condition is provided in Online Appendix B; these characteristics did not vary significantly across the experimental conditions.

their political orientation (Online Appendix A contains the the full instrument). Participants were then randomly assigned with equal probability to one of five experimental conditions (Table 1).

Table 1: Experimental conditions

Condition	N
Online news website	594
Facebook platform	584
Facebook feed: Placebo	626
Facebook feed: Low credibility	582
Facebook feed: High credibility	622

The first two conditions allow us to test the platform effect (H1). In the first condition, participants were shown previews of two target news articles as they would appear on an online news website (we will describe these articles in more detail later). In the second condition, participants were shown Facebook previews of the same target news articles as if they were posted by the news organizations' accounts. These simulated posts were shown without any additional News Feed content. We chose Facebook because it was the most popular social media platform at the time of the study (Shearer and Gottfried 2017). We assume that the credibility of news would be perceived similarly on other platforms (e.g., Twitter) but discuss the need for research to test this assumption in the conclusion.

To test the spillover effect (H2), other respondents were instead randomly assigned to simulated Facebook News Feeds that included either a placebo article, a low credibility article, or a high credibility article that would precede each of the two target articles. Each respondent remained in the same treatment group for the two target articles that they read. The placebo articles were about the weather. The topics for the credibility prime articles were a KKK flyer that was published in a local newspaper in Virginia and a vote to allow alcohol sales at 6 a.m. in Kansas. In order to vary the credibility of these articles, we manipulated their source and content while holding the topic fixed. We drew on Pennycook and Rand (2019)'s research to identify sources that were seen as high credibility (Newsweek and Bloomberg) or low credibility (News Examiner and Civic Tribune) across partisan lines. To maintain external validity, we used real news for the content of

these articles. We chose these specific topics (a KKK flyer and alcohol sales vote) because they were obscure but surprising and interesting — precisely the kind of unfamiliar news and information that people might encounter on social media.[3]

In each condition, respondents rated the perceived credibility of news article previews because individuals frequently encounter news in this format on social media platforms. Specifically, each respondent was exposed to previews of two target news articles in each condition—one reporting on the mayoral candidacy of a WWE wrestler named Kane and the other describing a man who was imprisoned for stealing fajitas. As Online Appendix A illustrates, the previews were formatted in a manner that mirrors the way people encounter news on social media in the real world (i.e., with limited visual and textual content that mirrors what people see when they scroll through their news feeds). To avoid pretreatment effects and other confounding factors, we selected real, but little-known, news articles on topics that were not highly polarized and attributed them to low-circulation newspapers —*The Post and Courier* for the wrestler article and *The Morning Call* for the fajita article. We also independently randomized whether individuals in each condition saw the wrestler or fajita theft article first to account for any article order effects. In total, subjects in the first two conditions see two articles while subjects in the last three conditions see four.

After previews of each target article were displayed to participants, subjects rated how credible they found each of the two articles according to four metrics measured on four-point scales: perceived accuracy, bias, credibility, and trustworthiness. They also self-reported their likelihood to read the full article, send the article to a friend, and to "like" and share the story on Facebook. After the experimental manipulation was complete, each respondent answered three epistemic political efficacy questions about their confidence in their ability to discern the truth about politics (Pingree 2011). Survey takers were then asked two manipulation check questions and debriefed (those who were assigned to the credibility manipulation were also asked to rate the credibility of the KKK and

[3]The original articles were modified to fit the desired tone and length by credibility type. We also randomized whether participants were assigned to see the KKK or Kansas article first. See Online Appendix A for full details.

Kansas articles using the same questions asked for the target articles).[4]

Measures

Per our preregistration, we tested whether the four measures of article credibility scaled together. The accuracy, trustworthy, and credibility measures were highly correlated with each other (Cronbach's $\alpha = 0.92$) and were combined into a simple average (each was measured on a 1–4 scale), which serves as our primary outcome. We excluded the bias measure because it reduced the reliability of the scale. For RQ1, we asked participants how likely they were to read the full article, send it to a friend, and to "like" and share the story on Facebook (for those who previously indicated using it) on four-point Likert scales. For RQ2, we assessed overall Facebook use and Facebook News Feed use specifically on two pre-treatment seven-point scales that we converted into a tercile measure (low, middle, and high use). Finally, we used a three-question battery about respondents' confidence in their ability to discern the truth about politics on four-point scales and averaged their responses to create a measure of epistemic political efficacy (Cronbach's $\alpha = 0.83$) for RQ3.

Results

We estimated a series of ordinary least squares (OLS) regression models with robust standard errors that were preregistered on EGAP. All models include article order fixed effects. Article question fixed effects are also included when pooling results across the two target articles. Our primary outcome variable is the average of perceived article accuracy, credibility, and trustworthiness described above, which we refer to as article credibility.[5]

[4]There was a minor error in the instrument. The first response option for "How biased would you expect the article on the Kansas law to be?" was "Not at all credible" instead of "Not at all biased." This question is not relevant to the main analysis.

[5]All deviations are labeled below; full replication data and code will be made available online after publication. Online Appendix C contains the entire preregistration document. Per the preregistration, Online Appendix B shows robustness of results when using ordered probit models (for ordered dependent variables) and when using respondent random effects. We also confirm that treatment effects pool across stimuli and question order, as there are no differences in treatment effects by question order, between versions of the low and high credibility articles, and between versions of the placebo content (results available upon request).

Prior to discussing results, we note that our post-treatment manipulation checks indicate that subjects were highly attentive to the stimuli and that the credibility manipulation had the intended effect. Nearly all respondents correctly recalled that WWE wrestler Kane was entering politics rather than another profession. Fewer remembered that the sentence for the fajitas theft was 50 years (64%); this was a much harder recall question, but a sizable majority still correctly answer it. Respondents assigned to the high credibility condition also rated both manipulated articles (Kansas and KKK ones) as having significantly higher credibility than those in the low credibility condition ($p < .005$ for both articles; see Online Appendix B).

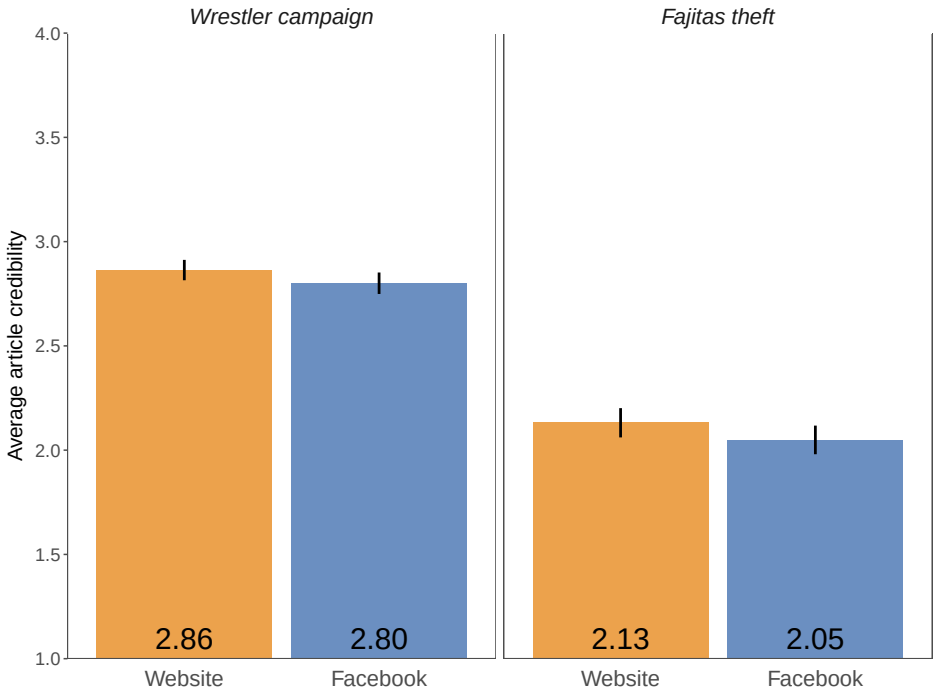
Platform effects

We first present results for H1, which predicts that news articles will be seen as less credible when viewed on Facebook instead of a media organization website. Figure 1 shows mean credibility ratings for both target articles when they appear on either a news website or the Facebook platform. The pattern of ratings is consistent with our hypothesis. The two target articles differ in their baseline (i.e., news website condition) levels of average credibility (2.86 for the wrestler's mayoral campaign versus 2.13 for the fajitas theft on a 1–4 Likert scale), but both are rated as slightly less credible when they appear on Facebook (2.80 and 2.05, respectively).

Table 2 displays regression model results for testing H1 that include question and order fixed effects. Consistent with our expectations, appearing on a social media platform rather than a news website has a significant negative effect on perceived article credibility (β = -0.07; $p < .05$), reducing it by 0.09 standard deviations in our preregistered specification (model 1). When we separately estimate effects for the two target articles in an exploratory analysis (models 2 and 3), the platform effect is no longer significant at the $p < .05$ level, but the direction and magnitudes are largely consistent.[6] We conclude that the evidence generally supports our expectation that people treat the same information as less credible when it appears on social media. Consistent with our theory,

[6]Table B3 in Online Appendix B shows that we cannot reject the null hypothesis of no difference in treatment effects in a pooled model including an interaction effect.

Figure 1: Platform effects by target article



Mean article credibility rating among respondents assigned to view an article preview ostensibly from a news website or Facebook (with 95% confidence intervals). Left panel: wrestler campaign article; right panel: fajitas theft article. See Online Appendix A for question wording and stimulus materials.

people make inferences about the validity of news media content based on the platform on which they encounter it.

Table 2: Platform effects on article credibility

	Both articles (1)	Wrestler campaign (2)	Fajitas theft (3)
Facebook platform	-0.073*	-0.065	-0.081
	(0.034)	(0.036)	(0.050)
Constant (news website baseline)	2.878***	2.966***	2.049***
	(0.030)	(0.030)	(0.044)
Question fixed effects	Yes	No	No
Order fixed effects	Yes	Yes	Yes
N (responses)	2355	1177	1178

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS models with robust standard errors (clustered by respondent in the pooled model). Outcome is average of perceived accuracy, credibility, and trustworthiness of the article/s. Column 2 shows effects for only the wrestler campaign article, column 3 shows effects for only the fajitas theft article, and column 1 shows effects pooling across both articles.

Per RQ1, we ask whether article engagement or sharing behavior is affected by encountering it on Facebook rather than a news website. The results, which are reported in Table 3, indicate that respondents were less likely to report that they would read the article if it appeared on Facebook ($p < .01$), but their intentions to send the article to a friend, "like" it, or share it on Facebook were not measurably changed. The fajitas story drove the disinclination to read the article if it appeared on Facebook (see Online Appendix Table B4). Social media context does not appear to affect engagement or sharing behavior.

Spillover effects

We now turn to our second preregistered hypothesis, which predicts that news articles on Facebook will be seen as less credible if preceded by a low credibility article rather than a high credibility one. Figure 2 shows average credibility ratings by target article (wrestler campaign and fajitas theft) and by condition in the credibility manipulation (which varied whether a low credibility article, a high

Table 3: Platform effects on article engagement

	Read full article (1)	Send to friend (2)	"Like" on Facebook (3)	Share on Facebook (4)
Facebook platform	-0.122**	-0.058	-0.010	-0.020
	(0.046)	(0.044)	(0.044)	(0.041)
Constant (news website baseline)	2.201***	1.670***	1.615***	1.470***
	(0.042)	(0.041)	(0.041)	(0.039)
Question fixed effects	Yes	Yes	Yes	Yes
Order fixed effects	Yes	Yes	Yes	Yes
N (responses)	2356	2356	2356	2356

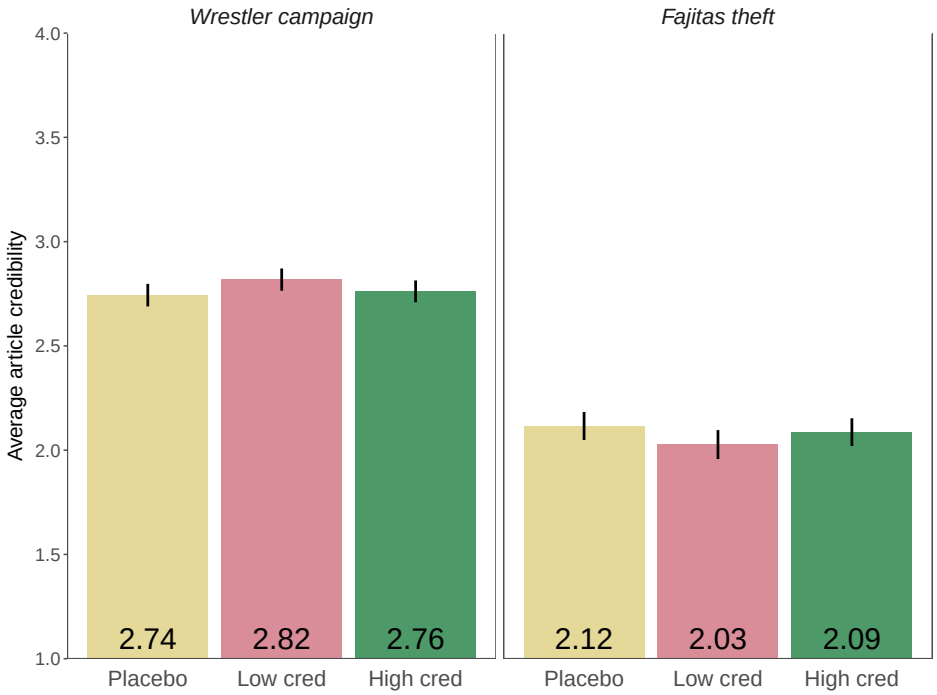
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS models with robust standard errors clustered by respondent. Table columns correspond to effects for likelihood of reading the full article (column 1), sending it to a friend (2), liking the article on Facebook (3), and sharing the story on Facebook (4).

credibility article, or a placebo article appeared prior to the target article in a simulated Facebook News Feed). At first glance, we observe little meaningful differences by context. Subjects rate articles similarly after exposure to a low or high credibility prime.

Table 4 contains regression results estimating of the effects of a low or high credibility article prime on target article credibility relative to the placebo condition. As in Table 2, we report a pre-registered pooled analysis (model 1) as well as exploratory models estimated separately for each target article (models 2 and 3). We also include a "Low − high credibility" row that directly compares outcomes in the high and low credibility conditions. Contrary to H2, we find no evidence that exposure to a low (versus high) credibility article affects the perceived credibility of a subsequent target article. This result holds in the pooled analysis as well as for each target article separately. Per the discussion above, manipulation checks suggest these null results are unlikely to be due to respondent inattention.

However, we do observe some indication of possible spillover effects on article credibility when examining treatment effects relative to the placebo condition for each target article. We first note that the wrestler article was seen as more credible than the fajitas article by respondents in the placebo condition (0.63 points on a four-point scale, $p < .005$; see Table B10 in the Online Ap-

Figure 2: Context effects by target article



Mean article credibility rating among respondents assigned to view a simulated Facebook News Feed that also includes a placebo article or a low or high credibility treatment article (with 95% confidence intervals). Left panel: wrestler campaign article; right panel: fajitas theft article. See Online Appendix A for question wording and stimulus materials.

Table 4: Spillover effects on article credibility

	Both articles (1)	Wrestler campaign (2)	Fajitas theft (3)
Low credibility prime	-0.006	0.073	-0.085
	(0.035)	(0.039)	(0.049)
High credibility prime	-0.004	0.018	-0.026
	(0.034)	(0.038)	(0.048)
Constant (placebo baseline)	2.789***	2.814***	2.068***
	(0.030)	(0.032)	(0.039)
Low − high credibility	-0.002	0.055	-0.059
	(0.034)	(0.038)	(0.049)
Question fixed effects	Yes	No	No
Order fixed effects	Yes	Yes	Yes
N (responses)	3658	1829	1829

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS models with robust standard errors (clustered by respondent in the pooled model). Outcome is average of perceived accuracy, credibility, and trustworthiness of the article/s. Column 2 shows effects for only the wrestler campaign article, column 3 shows effects for only the fajitas theft article, and column 1 shows effects pooling across both articles.

pendix). While the high credibility treatments had little effect on the perceived credibility of either target article, the low credibility treatment further reduced the perceived credibility of the less credible fajitas article by 0.085 points, which is marginally significant ($p < .10$). Results for the more credible wrestler article are instead consistent with a contrast effect. Respondents first exposed to the low credibility treatment actually rated the wrestler article as 0.073 points *more* credible compared to the placebo, which is again marginally significant ($p < .10$). As Table B10 indicates, we can reject the null hypothesis of no difference by article in these low credibility treatment effects ($p < .005$), which differ by 0.19 standard deviations on our outcome scale.

We interpret this finding as evidence that low credibility information on social media is more likely to cause spillover effects for *less plausible* articles (like the fajitas article) and more likely to cause contrast effects for *more plausible* articles (e.g., the wrestler article). These results provide some support for the idea that low credibility information in a social media feed can damage the credibility of nearby news content.

Turning our attention back to RQ1 and our preregistered analysis plan, we observe patterns consistent with our original spillover hypothesis when evaluating intended article engagement in low vs. high credibility prime conditions. Results in Table 5 indicate that respondents were less likely to read the full article, send it to a friend, or share it on Facebook if it was preceded by a low (as opposed to high) credibility article in a news feed ($p < .05$ in each case). The difference for liking the article on Facebook did not reach significance but was also negative in sign and had a similar magnitude. Overall, the credibility manipulation had strong and largely consistent effects on engagement intentions. As we expected, proximity to a low-credibility article in a social media feed generally reduced intended engagement.[7]

Table 5: Spillover effects on article engagement

	Read full article (1)	Send to friend (2)	"Like" on Facebook (3)	Share on Facebook (4)
Low credibility prime	0.011	0.028	0.009	-0.023
	(0.045)	(0.041)	(0.040)	(0.038)
High credibility prime	0.115*	0.123***	0.071	0.065
	(0.045)	(0.042)	(0.040)	(0.040)
Constant (placebo baseline)	2.076***	1.576***	1.569***	1.447***
	(0.040)	(0.035)	(0.035)	(0.033)
Low − high credibility	-0.105*	-0.095*	-0.063	-0.088*
	(0.045)	(0.043)	(0.041)	(0.047)
Question fixed effects	Yes	Yes	Yes	Yes
Order fixed effects	Yes	Yes	Yes	Yes
N (responses)	3657	3658	3657	3657

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS models with robust standard errors clustered by respondent. Table columns correspond to effects for likelihood of reading the full article (column 1), sending it to a friend (2), liking the article on Facebook (3), and sharing the story on Facebook (4).

Finally, RQ2 and RQ3 receive no support. We find no evidence that the hypothesized platform or spillover effects vary by Facebook usage (RQ2) or that they affect respondents' feelings of epistemic

[7]Unlike the results for H2, credibility effects on article engagement were largely consistent across target articles. The only exception was the likelihood of sharing the article after exposure to the low credibility article, which decreased marginally more for the fajitas article than the wrestler article ($p < .10$; see Table B11).

political efficacy (RQ3). See Tables B6 and B13 (RQ2) and Table B15 (RQ3) in Online Appendix B for full results.

Conclusion

Our study offers several important insights into how the mass public perceives news on social media by considering two contextual factors that affect how users appraise the credibility of news online.

First, we investigated the effect of viewing a news article preview on either a social media platform (Facebook) or a news website on perceptions of credibility. We found that exposure on the Facebook platform modestly decreased the perceived credibility of news articles, a finding that is consistent with our hypothesized mechanism that replicates and extends prior research (Schmierbach and Oeldorf-Hirsch 2012). We also found that participants were less likely to say they would read a full article that appeared on Facebook (versus a news website), though they did not report other differences in intended engagement.

This platform penalty on news credibility has important implications for understanding how source effects operate in the era of social media. Despite its reputation, seeing news on Facebook does not have the massive effects on credibility perceptions that other data might suggest (Barthel and Mitchell 2017); the trust gap in news between social media and mainstream outlets becomes much smaller when we hold the information and the news source constant. On the other hand, a negative Facebook effect occurs even for *the exact same information* — a finding which suggests that the shift of news consumption to social media could decrease Americans' trust in news at a time when it is already very low.

Second, we examined whether high or low credibility articles affected the perceived credibility of subsequent articles as viewed on a Facebook News Feed. Contrary to expectations, an effect only emerged for the low credibility prime with one target article: viewing a low credibility article first decreased the perceived credibility of a subsequent article about a massive fajitas theft but increased the credibility of an article about a WWE wrestler's mayoral campaign, a difference that we attribute

to the varying baseline credibility levels of the two articles. We interpret this exploratory finding as evidence that low credibility articles can increase the perceived credibility of a target article like the mayoral campaign article that is seen as credible (a contrast effect), but decrease the credibility of a less plausible article like the one reporting on a fajitas theft (spillover). This finding, though unexpected, is consistent with other research. Thorson (2018) finds, for instance, that the presence of dubious online information can positively affect views toward a credible source. Conversely, when a target article is not seen as credible, exposure to a low credibility article ought to further decrease the perceived credibility of that target article (a spillover effect). Indeed, Schwarz and Bles (1992) find that unfamiliar primes elicit a spillover effect while primes that are less ambiguous lead to contrast effects.

We also found spillover effects on article engagement. Respondents were more likely to say they would read the full article, send it to a friend, or share it on Facebook in the high credibility feed condition compared to the low credibility one. These results suggest that low quality content can have negative spillover effects on engagement with genuine news articles of unknown validity.

These results have several limitations that should be addressed in future research. First, seeing one low or high credibility article in a simulated Facebook News Feed might not adequately approximate the high or low credibility dosages that individuals actually receive on Facebook; exposing respondents to more articles could create a stronger treatment while still maintaining realism. Similarly, although articles from high credibility sources were viewed as significantly more credible than articles from low credibility sources, the difference was not substantively large (see Online Appendix Table B2) — future work should pre-test credibility manipulations to maximize these differences.

Second, future work should check whether the platform effect we observe generalizes to other social media services such as YouTube, Instagram, and Reddit (Shearer and Gottfried 2017). Another limitation is our reliance on participants from Mechanical Turk. Replications with a more demographically representative sample in the U.S. and samples outside the U.S. would be desirable. It would also be valuable to test for heterogeneous treatment effects using demographic correlates of

online news trust highlighted by prior studies (e.g., Warner-Soderholm et al. 2018). Fourth, incorporating prominent elements of a real Facebook News Feed such as interactivity, "likes," comments, and social endorsements (Chung 2017; Messing and Westwood 2014) will yield better external validity. Finally, future research should replicate the study with other target articles—to ensure results are not specific to the idiosyncratic ones we chose—and also vary other elements like topic salience, familiarity, and partisan cues.

Nonetheless, this study provides important evidence that social media source cues and contextual effects in news feeds can influence perceived article credibility and intended engagement. As more Americans get their news via platforms such as Facebook, it is vital to understand how they decide which information to trust and to prevent the prevalence of low-quality content on social media from increasing distrust of mainstream news coverage and information sources that they also encounter on those platforms.

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Online Appendix A: Experimental instrument

This study is being conducted by Brendan Nyhan, a professor at Dartmouth College. We ask for your attention for a few minutes and we thank you for your attention and your responses. Your participation is voluntary and you may decline the survey or withdraw at any time. No information that identifies you will be collected or retained by the researchers. However, any online interaction carries some risk of being accessed. Do you consent to participate in the survey?
-Yes
-No

[Demographics]

We will first ask you a series of demographic questions. Please answer honestly.

How old are you?
-Under 18
-18 - 24
-25 - 34
-35 - 44
-45 - 54
-55 - 64
-65 - 74
-75 - 84
-85 or older

What is your gender?
-Male
-Female
-Other

In what state do you currently reside?
-Alabama
-Alaska
-Arizona
-Arkansas
-California
-Colorado
-Connecticut
-Delaware
-District of Columbia
-Florida
-Georgia
-Hawaii
-Idaho
-Illinois
-Indiana

-Iowa
-Kansas
-Kentucky
-Louisiana
-Maine
-Maryland
-Massachusetts
-Michigan
-Minnesota
-Mississippi
-Missouri
-Montana
-Nebraska
-Nevada
-New Hampshire
-New Jersey
-New Mexico
-New York
-North Carolina
-North Dakota
-Ohio
-Oklahoma
-Oregon
-Pennsylvania
-Rhode Island
-South Carolina
-South Dakota
-Tennessee
-Texas
-Utah
-Vermont
-Virginia
-Washington
-West Virginia
-Wisconsin
-Wyoming
-Puerto Rico
-I do not reside in the United States

What is the highest degree or level of school you have completed?
-Did not graduate from high school
-High school diploma or the equivalent (GED)
-Some college
-Associate's degree
-Bachelor's degree

-Master's degree
-Professional or doctorate degree

Are you of Hispanic, Latino, or Spanish origin?
-Yes
-No

Please check one or more categories below to indicate what race(s) you consider yourself to be.
-White
-Black or African American
-American Indian or Alaska Native
-Asian/Pacific Islander
-Multi-racial
-Other

Generally, how interested are you in politics?
-Extremely interested
-Very interested
-Somewhat interested
-Not very interested
-Not at all interested

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

[If Democrat is selected]
Would you call yourself a strong Democrat or a not very strong Democrat?
-Strong Democrat
-Not very strong Democrat

[If Republican is selected]
Would you call yourself a strong Republican or not a very strong Republican?
-Strong Republican
-Not very strong Republican

[If Democrat or Republican is not selected]
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

Do you approve or disapprove of the way Donald Trump is handling his job as President?

-Strongly approve
-Somewhat approve
-Somewhat disapprove
-Strongly disapprove

We hear a lot of talk these days about liberals and conservatives. Here is a seven-point scale on which the political views that people might hold are arranged from extremely liberal to extremely conservative. Where would you place yourself on this scale, or have you not thought much about this?
-Extremely liberal
-Liberal
-Slightly liberal
-Moderate; middle of the road
-Slightly conservative
-Conservative
-Extremely conservative
-Haven't thought much about this

[News and social media usage]

How frequently do you use Facebook?
-Almost constantly
-Several times per day
-A few times a week
-Once a week
-A few times a month
-Once a month or less often
-Never

[If Never is not selected]
How frequently do you read your Facebook News Feed?
-Almost constantly
-Several times per day
-A few times a week
-Once a week
-A few times a month
-Once a month or less often
-Never

How frequently do you consume news from an online news website (excluding social media like Facebook, Twitter, etc.)?
-Almost constantly
-Several times per day
-A few times a week
-Once a week

-A few times a month
-Once a month or less often
-Never

In general, how much trust and confidence do you have in the mass media — such as newspapers, TV, and radio — when it comes to reporting the news fully, accurately, and fairly?
-A great deal
-A moderate amount
-Not much
-Not at all

In general, how much trust and confidence do you have in the information you see on Facebook when it comes to reporting the news fully, accurately, and fairly?
-A great deal
-A moderate amount
-Not much
-Not at all

[Political knowledge]

The next set of questions helps us learn what types of information are commonly known to the public. Please answer these questions on your own without asking anyone or looking up the answers. Many people don't know the answers to these questions, but we'd be grateful if you would please answer every question even if you're not sure what the right answer is. It is important to us that you do NOT use outside sources like the Internet to search for the correct answer. Will you answer the following questions without help from outside sources?
-Yes
-No

For how many years is a United States Senator elected - that is, how many years are there in one full term of office for a U.S. Senator?
-Two years
-Four years
-Six years
-Eight years
-None of these
-Don't know

How many times can an individual be elected President of the United States under current laws?
-Once
-Twice
-Four times
-Unlimited number of terms
-Don't know

How many U.S. Senators are there from each state?

-One
-Two
-Four
-Depends on which state
-Don’t know

Who is currently the Prime Minister of the United Kingdom?
-Richard Branson
-Nick Clegg
-David Cameron
-Theresa May
-Margaret Thatcher
-Don’t know

For how many years is a member of the United States House of Representatives elected - that is, how many years are there in one full term of office for a U.S. House member?
-Two years
-Four years
-Six years
-Eight years
-For life
-Don’t know

[randomizations: condition (website-only, Facebook-only, placebo article in feed, low credibility article in feed, high credibility article in feed), target article order (Kane or fajitas article preview first), placebo article order (Arizona or New York weather preview first), and low/high credibility article order (KKK or Kansas article preview first)]

[Website-only block (randomized): Kane]

We will now ask you to read an article preview. Please read it and answer the questions afterward.

If the following page is initially blank, please wait a few seconds for the image to load.

The Post and Courier

Glenn Jacobs, WWE's Kane, stepping into political ring

By Mike Mooneyham Special to The Post and Courier

With a WWE Hall of Famer in the White House and a fellow honoree seeking the top job in the nation's fourth-largest city, another WWE superstar is looking to make his mark in East Tennessee.

[Website-only block (randomized): Fajitas]

We will now ask you to read an article preview. Please read it and answer the questions afterward.

If the following page is initially blank, please wait a few seconds for the image to load.

THE MORNING CALL SUBSCRIBE

News / Nation/World

Man sentenced to 50 years for $1.2M theft of fajitas

A Texas man has been sentenced to 50 years in prison for stealing $1.2 million worth of fajitas over nine years.

[Facebook-only block (randomized): Kane]

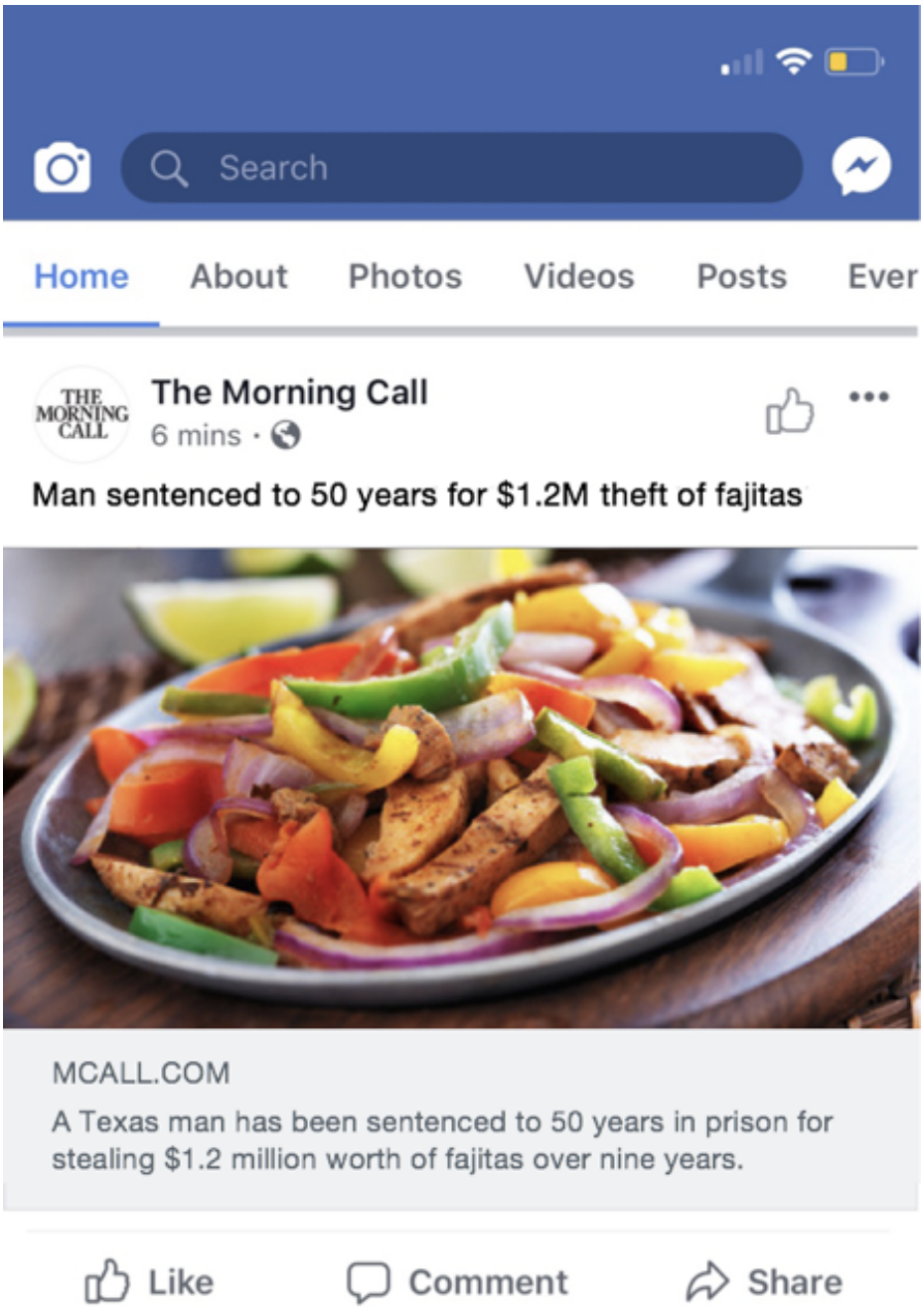
We will now ask you to read an article preview. Please read it and answer the questions afterward.

If the following page is initially blank, please wait a few seconds for the image to load.

[Facebook-only block (randomized): Fajitas]

We will now ask you to read an article preview. Please read it and answer the questions afterward.

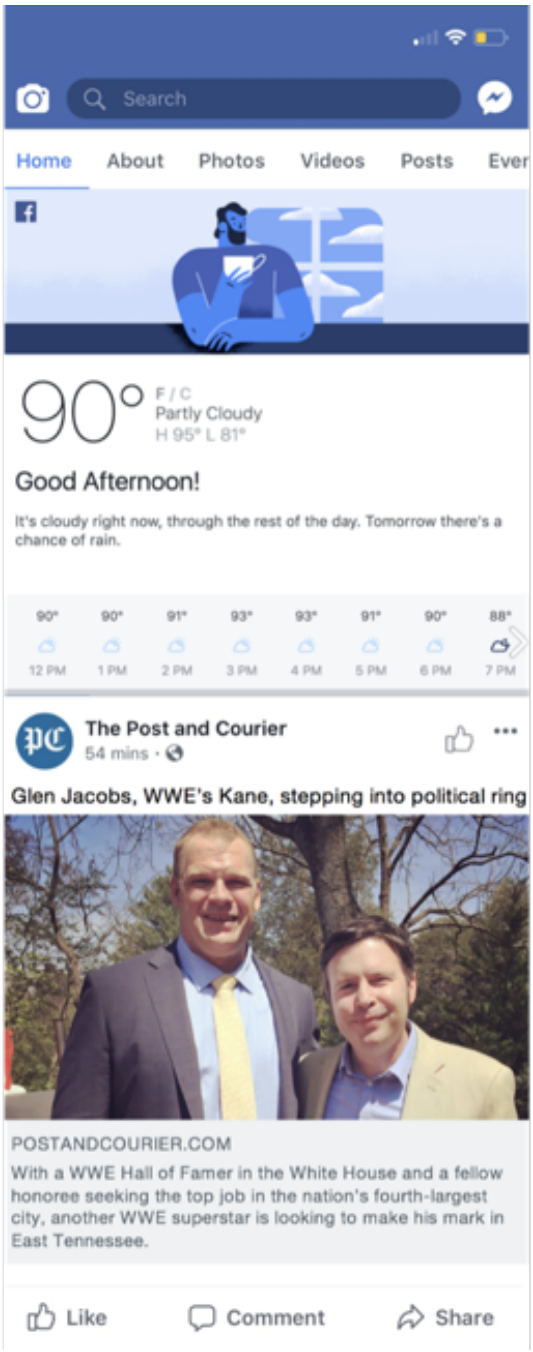
If the following page is initially blank, please wait a few seconds for the image to load.



[Placebo article block (randomized): NY weather/Kane]

We will now ask you to read a Facebook News Feed. Please read it and answer the questions afterward.

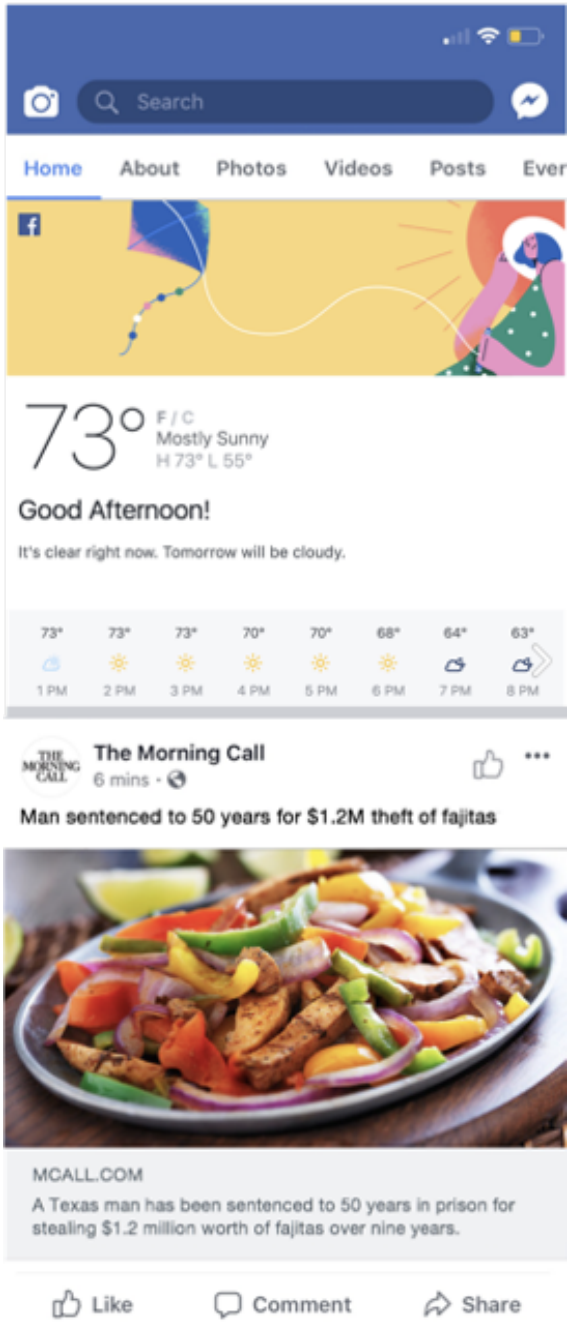
If the following page is initially blank, please wait a few seconds for the image to load.



[Placebo article block (randomized): AZ weather/Fajitas]

We will now ask you to read a Facebook News Feed. Please read it and answer the questions afterward.

If the following page is initially blank, please wait a few seconds for the image to load.



[Placebo article block (randomized): AZ weather/Kane]

We will now ask you to read a Facebook News Feed. Please read it and answer the questions afterward.

If the following page is initially blank, please wait a few seconds for the image to load.

[Placebo article block (randomized): NY weather/Fajitas]

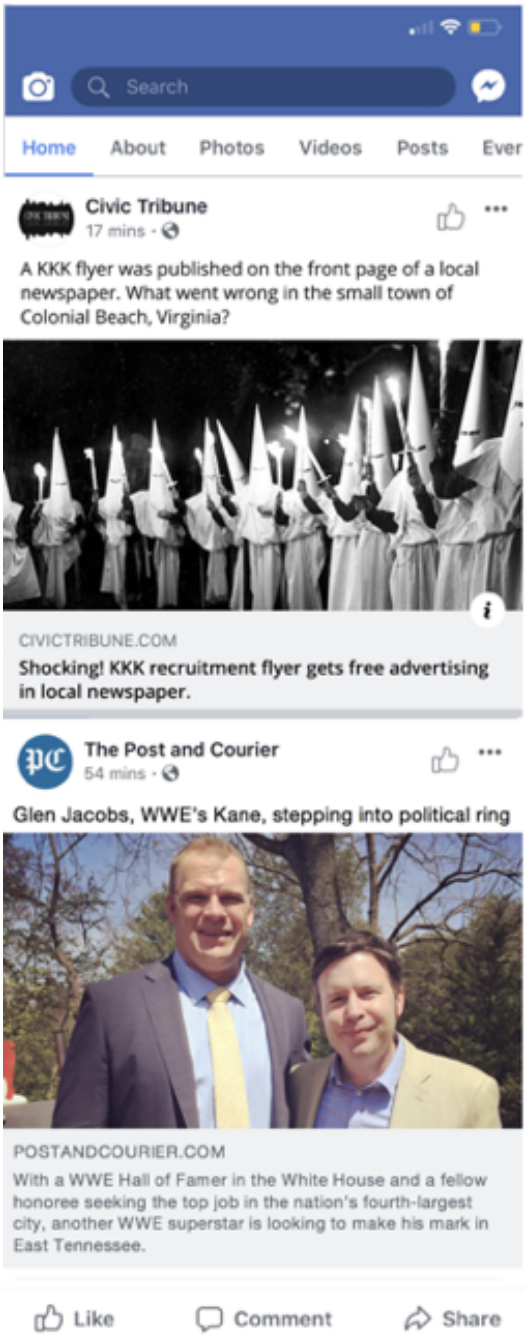
We will now ask you to read a Facebook News Feed. Please read it and answer the questions afterward.

If the following page is initially blank, please wait a few seconds for the image to load.

[Low credibility article block (randomized): KKK/Kane]

We will now ask you to read a Facebook News Feed. Please read it and answer the questions afterward.

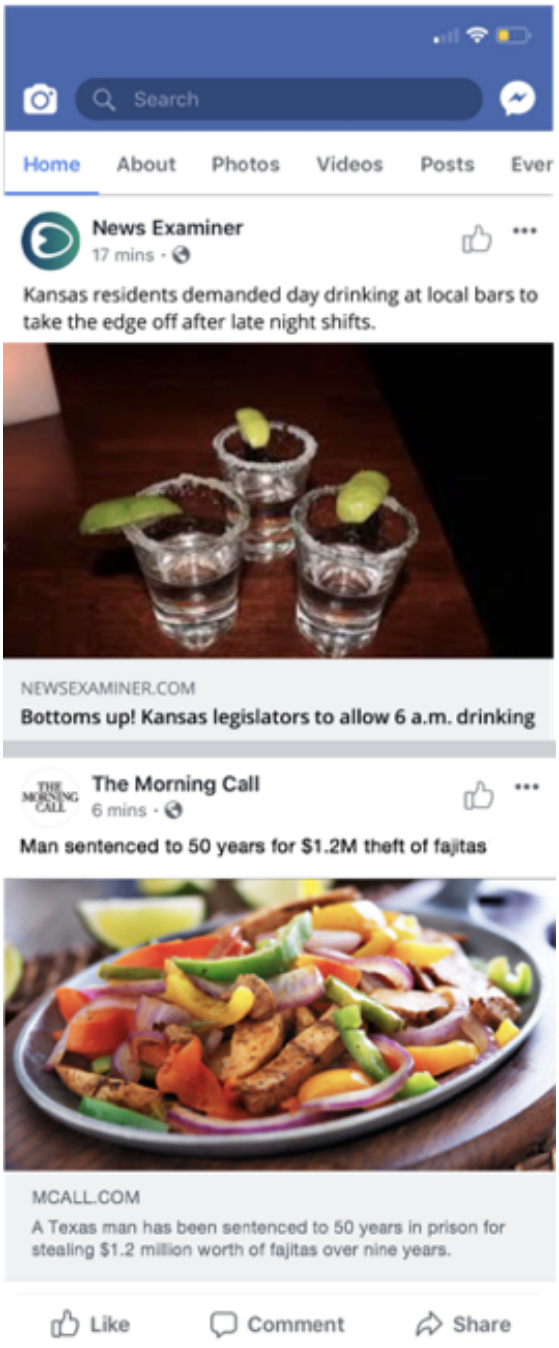
If the following page is initially blank, please wait a few seconds for the image to load.



[Low credibility article block (randomized): Kansas/Fajitas]

We will now ask you to read a Facebook News Feed. Please read it and answer the questions afterward.

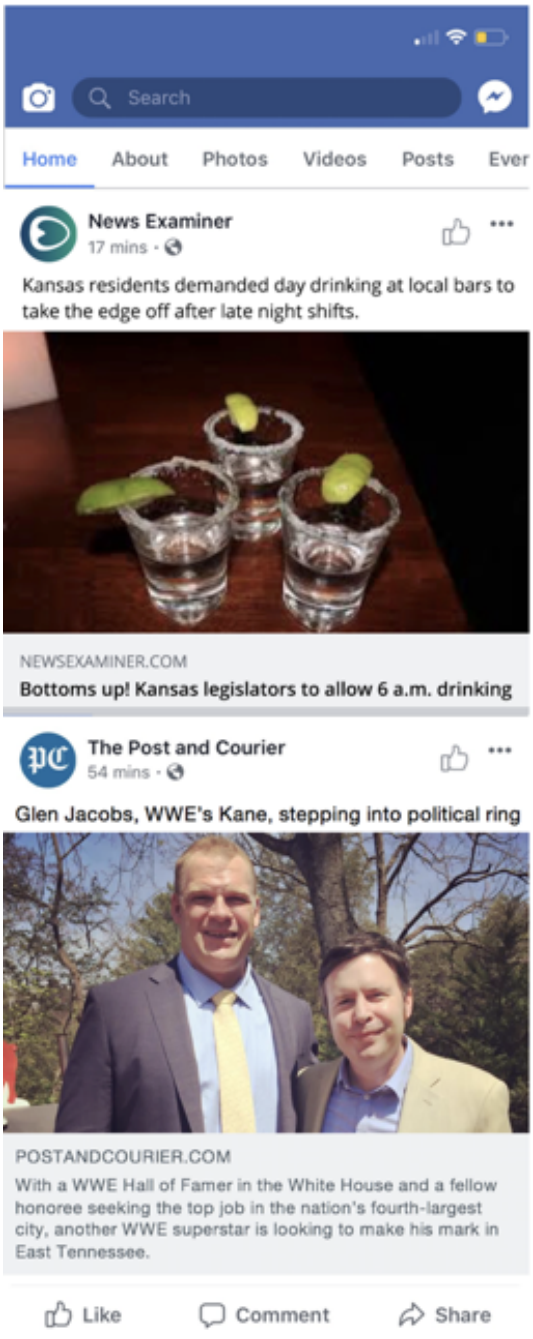
If the following page is initially blank, please wait a few seconds for the image to load.



[Low credibility article block (randomized): Kansas/Kane]

We will now ask you to read a Facebook News Feed. Please read it carefully and answer the questions afterward.

If the following page is initially blank, please wait a few seconds for the image to load.



[Low credibility article block (randomized): KKK/Fajitas]

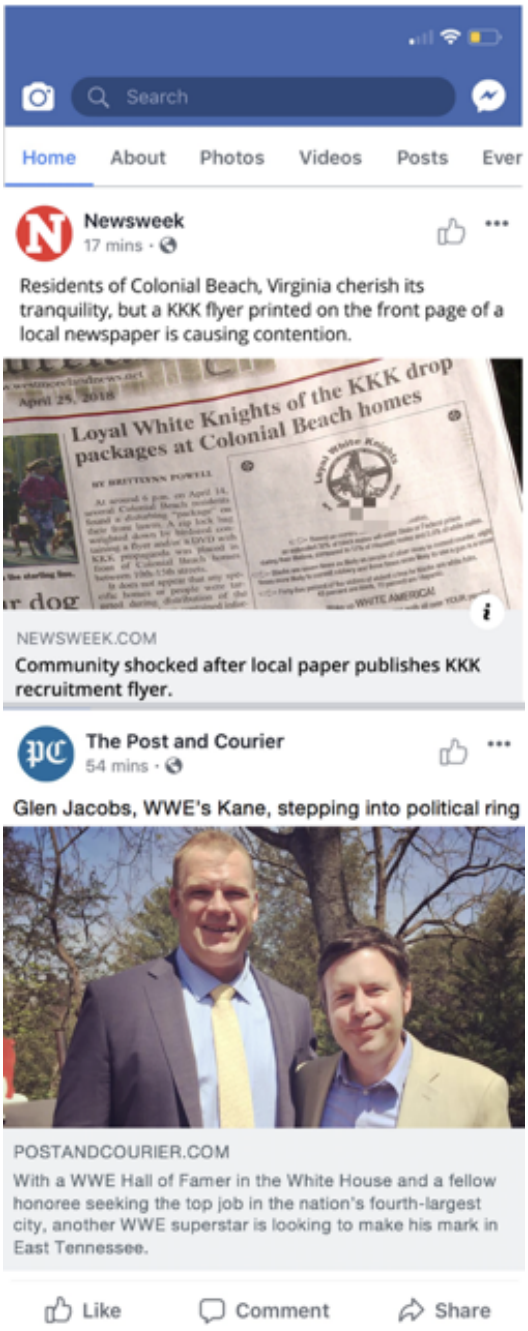
We will now ask you to read a Facebook News Feed. Please read it carefully and answer the questions afterward.

If the following page is initially blank, please wait a few seconds for the image to load.

[High credibility article block (randomized): KKK/Kane]

We will now ask you to read a Facebook News Feed. Please read it carefully and answer the questions afterward.

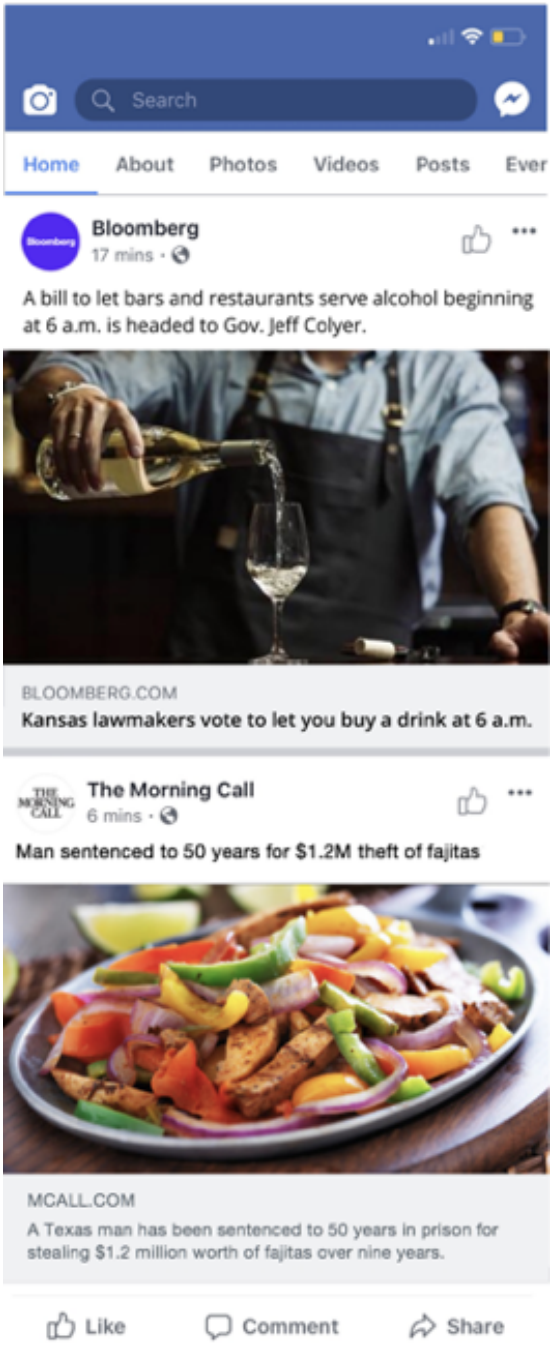
If the following page is initially blank, please wait a few seconds for the image to load.



[High credibility article block (randomized): Kansas/Fajitas]

We will now ask you to read a Facebook News Feed. Please read it carefully and answer the questions afterward.

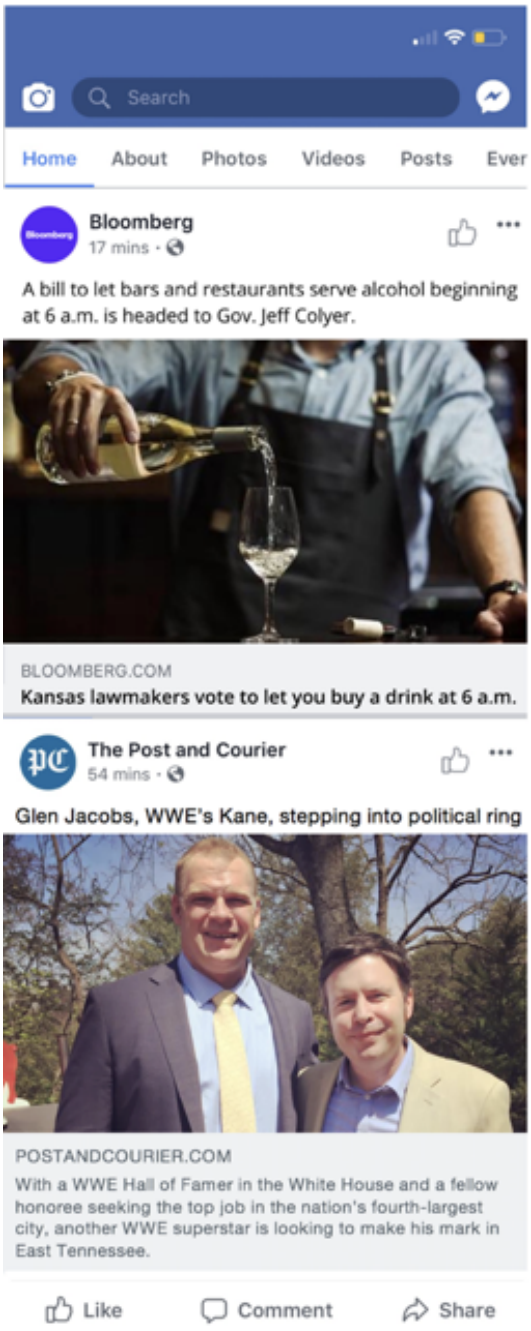
If the following page is initially blank, please wait a few seconds for the image to load.



[High credibility article block (randomized): Kansas/Kane]

We will now ask you to read a Facebook News Feed. Please read it carefully and answer the questions afterward.

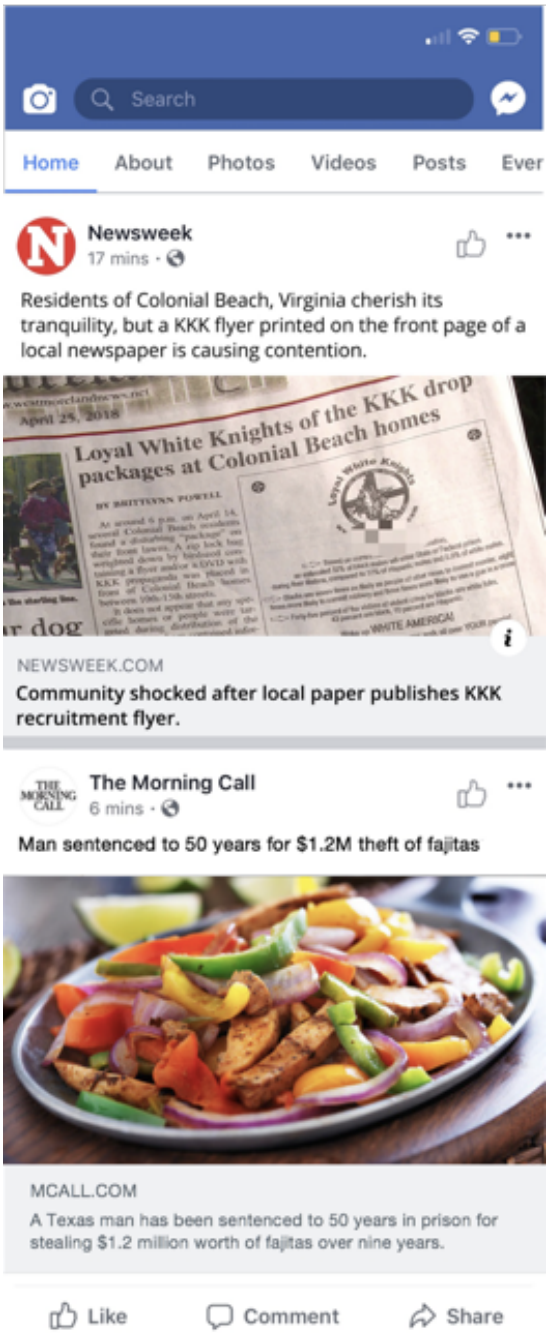
If the following page is initially blank, please wait a few seconds for the image to load.



[High credibility article block (randomized): KKK/Fajitas]

We will now ask you to read a Facebook News Feed. Please read it carefully and answer the questions afterward.

If the following page is initially blank, please wait a few seconds for the image to load.



[Kane outcome variables (shown after exposure to Kane article preview)]

How accurate would you expect the article on the WWE wrestler running for mayor to be?
-Not at all accurate
-Not very accurate
-Somewhat accurate
-Very accurate

How trustworthy would you expect the article on the WWE wrestler running for mayor to be?
-Not at all trustworthy
-Not very trustworthy
-Somewhat trustworthy
-Very trustworthy

How credible would you expect the article on the WWE wrestler running for mayor to be?
-Not at all credible
-Not very credible
-Somewhat credible
-Very credible

How biased would you expect the article on the WWE wrestler running for mayor to be?
-Not at all biased
-Not very biased
-Somewhat biased
-Very biased

How likely is it that you would choose to read the article about the WWE wrestler running for mayor?
-Not at all likely
-Not very likely
-Somewhat likely
-Very likely

How likely is it that you would choose to send the article about the WWE wrestler running for mayor to a friend?
-Not at all likely
-Not very likely
-Somewhat likely
-Very likely

[If How frequently do you use Facebook? != Never or How frequently do you read your Facebook News Feed? != Never]
How likely would you be to “like” the article about the WWE wrestler running for mayor if it appeared in your Facebook News Feed?
-Not at all likely
-Not very likely

-Somewhat likely
-Very likely

[If How frequently do you use Facebook? != Never or How frequently do you read your Facebook News Feed? != Never]
How likely would you be to "share" the article about the WWE wrestler running for mayor if it appeared in your Facebook News Feed?
-Not at all likely
-Not very likely
-Somewhat likely
-Very likely

[Fajitas outcome variables (shown after exposure to fajitas article preview)]

How accurate would you expect the article on the fajitas theft to be?
-Not at all accurate
-Not very accurate
-Somewhat accurate
-Very accurate

How trustworthy would you expect the article on the fajitas theft to be?
-Not at all trustworthy
-Not very trustworthy
-Somewhat trustworthy
-Very trustworthy

How credible would you expect the article on the fajitas theft to be?
-Not at all credible
-Not very credible
-Somewhat credible
-Very credible

How biased would you expect the article on the fajitas theft to be?
-Not at all biased
-Not very biased
-Somewhat biased
-Very biased

How likely is it that you would choose to read the article about the fajitas theft?
-Not at all likely
-Not very likely
-Somewhat likely
-Very likely

How likely is it that you would choose to send the article about the fajitas theft to a friend?
-Not at all likely

-Not very likely
-Somewhat likely
-Very likely

[If How frequently do you use Facebook? != Never or How frequently do you read your Facebook News Feed? != Never]
How likely would you be to "like" the article about the fajitas theft if it appeared in your Facebook News Feed?
-Not at all likely
-Not very likely
-Somewhat likely
-Very likely

[If How frequently do you use Facebook? != Never or How frequently do you read your Facebook News Feed? != Never]
How likely would you be to "share" the article about the fajitas theft if it appeared in your Facebook News Feed?
-Not at all likely
-Not very likely
-Somewhat likely
-Very likely

[Epistemic political efficacy]

Please indicate whether you agree or disagree with the following statements.

I feel confident that I can find the truth about political issues.
-Strongly agree
-Somewhat agree
-Somewhat disagree
-Strongly disagree

If I wanted to, I could figure out the facts behind most political disputes.
-Strongly agree
-Somewhat agree
-Somewhat disagree
-Strongly disagree

There are objective facts behind most political disputes, and if you try hard enough you can find them.
-Strongly agree
-Somewhat agree
-Somewhat disagree
-Strongly disagree

[Attention checks on target articles]

Please answer these questions on your own without looking up the answers. (You will be compensated regardless of your answer.)

According to the headline that was shown to you in a previous question, the WWE star Kane is seeking a job in what field?
-Business
-Politics
-Broadcasting
-Philanthropy

According to the headline that was shown to you in a previous question, how long was someone recently sentenced to prison for stealing fajitas?
-5 months
-15 months
-5 years
-50 years

[KKK article credibility (if seen by respondents)]

How accurate would you expect the article on the KKK flyer to be?
-Not at all accurate
-Not very accurate
-Somewhat accurate
-Very accurate

How trustworthy would you expect the article on the KKK flyer to be?
-Not at all trustworthy
-Not very trustworthy
-Somewhat trustworthy
-Very trustworthy

How credible would you expect the article on the KKK flyer to be?
-Not at all credible
-Not very credible
-Somewhat credible
-Very credible

How biased would you expect the article on the KKK flyer to be?
-Not at all biased
-Not very biased
-Somewhat biased
-Very biased

[Kansas article credibility (if seen by respondents)]

How accurate would you expect the article on the Kansas law to be?

-Not at all accurate
-Not very accurate
-Somewhat accurate
-Very accurate

How trustworthy would you expect the article on the Kansas law to be?
-Not at all trustworthy
-Not very trustworthy
-Somewhat trustworthy
-Very trustworthy

How credible would you expect the article on the Kansas law to be?
-Not at all credible
-Not very credible
-Somewhat credible
-Very credible

How biased would you expect the article on the Kansas law to be?
-Not at all biased
-Not very biased
-Somewhat biased
-Very biased

Have you read any of the articles or visited any of the websites shown in this study before? Please be honest; you will still be paid and will not be penalized in any way if you did.
-Yes
-No
-I'm not sure

[If Yes is selected]
Please briefly summarize which articles from this study that you had seen before and/or which websites you had previously visited.

[textbox]

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 still be paid and you will not be penalized in any way if you did.
-Yes, I looked up information
-No, I did not look up information

We sometimes find people don't always take surveys seriously, instead providing humorous, or insincere responses to questions. How often do you do this?
-Never
-Rarely
-Some of the time

-Most of the time
-Always

Do you have any comments on the survey? Please let us know about any problems you had or aspects of the survey that were confusing.

[textbox]

Thank you for answering these questions. The purpose of this study was to examine the believability of news depending on the news source and platform. After answering a series of demographic and news consumption questions, participants viewed a variety of true stories. Some of the sources of these stories were changed for research purposes but all of them were obtained from existing websites. After the treatment, participants were asked a series of survey questions about the bias, credibility, and trustworthiness of the news sources they were exposed to. Thank you again for your participation. Please do not share any information about the nature of this study with other potential participants. This research is not intended to support or oppose any political candidate, office, or news source. This research has no affiliation and has received no financial support from any political candidate, campaign, or news affiliate. Should you have any questions about this study, please contact Brendan Nyhan at nyhan@dartmouth.edu.

Online Appendix B: Additional results

B.1 Miscellaneous

Table B1: Mean demographic values by treatment group

Demographic	1	2	3	4	5	p-value
Female	51%	51%	51%	50%	53%	0.91
White	81%	79%	81%	79%	79%	0.63
Age 35 or younger	57%	58%	57%	54%	58%	0.53
College degree	58%	53%	55%	57%	55%	0.39
Democrat (w/leaners)	59%	56%	56%	58%	60%	0.46
Total respondents	594	584	626	582	622	–

The column labelled "Experimental Condition" 1 refers to the "Online news website" treatment, 2 refers to "Facebook platform," 3 refers to "Facebook feed: Placebo," 4 refers to "Facebook feed: Low credibility," and 5 refers to "Facebook feed: High credibility" (see Table 1 in the main text for these references). p-values are calculated using a χ^2 test of the association between experimental condition and the demographic characteristic in question.

Table B2: Credibility manipulation effects (high vs. low) on credibility of KKK and Kansas articles (manipulation check)

	KKK (1)	Kansas (2)
High credibility prime	0.311***	0.246***
	(0.046)	(0.042)
Constant (low credibility prime)	2.264***	2.517***
	(0.033)	(0.032)
N (responses)	1204	1204

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS models with robust standard errors. Outcome is average of perceived accuracy, credibility, and trustworthiness of each article. Column 1 shows effects for the KKK article and column 2 shows effects for the Kansas article.

B.2 Platform Effects

Table B3: Platform effects on credibility conditional on target article

	Credibility (1)
Facebook platform	-0.063
	(0.036)
Fajitas article	-0.732***
	(0.039)
Facebook platform × fajitas article	-0.019
	(0.055)
Constant (news website baseline)	2.874***
	(0.030)
Order fixed effects	Yes
N (responses)	2355

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS model with robust standard errors clustered by respondent. Outcome is average of perceived article accuracy, credibility, and trustworthiness.

Table B4: Platform effects on reading full article conditional on target article

	Read full article (1)
Facebook platform	-0.036
	(0.057)
Fajitas article	0.185***
	(0.053)
Facebook platform × fajitas article	-0.171*
	(0.074)
Constant (news website baseline)	2.159***
	(0.046)
Order fixed effects	Yes
N (responses)	2356

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS models with robust standard errors clustered by respondent. Outcome is likelihood of reading the full article.

Table B5: Platform effects on article engagement (ordered probit)

	Read full article (1)	Send to friend (2)	"Like" on Facebook (3)	Share on Facebook (4)
Facebook platform	-0.132**	-0.085	-0.016	-0.021
	(0.049)	(0.055)	(0.058)	(0.060)
Question fixed effects	Yes	Yes	Yes	Yes
Order fixed effects	Yes	Yes	Yes	Yes
N (responses)	2356	2356	2356	2356

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). Ordered probit models with robust standard errors clustered by respondent (cutpoints omitted). Table columns correspond to effects for likelihood of reading the full article (column 1), sending it to a friend (2), liking the article on Facebook (3), and sharing the story on Facebook (4).

Table B6: Platform effects on credibility conditional on Facebook use

	Credibility (1)
Facebook platform	-0.129
	(0.068)
Low Facebook use	-0.061
	(0.067)
High Facebook use	-0.049
	(0.060)
Facebook platform × low Facebook use	0.019
	(0.090)
Facebook platform × high Facebook use	0.117
	(0.086)
Constant	2.920***
	(0.053)
Question fixed effects	Yes
Order fixed effects	Yes
N (responses)	2355

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS model with robust standard errors clustered by respondent. Outcome is average of perceived article accuracy, credibility, and trustworthiness.

Table B7: Platform effects on credibility conditional on Facebook usage (continuous)

	Credibility (1)
Facebook platform	-0.226*
	(0.097)
Facebook usage	0.000
	(0.014)
Facebook platform × Facebook usage	0.033
	(0.019)
Constant	2.878***
	(0.076)
Question fixed effects	Yes
Order fixed effects	Yes
N (responses)	2355

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS model with robust standard errors clustered by respondent. Outcome is average of perceived article accuracy, credibility, and trustworthiness.

Table B8: Platform effects on article credibility (random effects)

	Credibility (1)
Facebook platform	-0.073*
	(0.034)
Constant (news website baseline)	2.879***
	(0.033)
Question fixed effects	Yes
Order fixed effects	Yes
N (responses)	2355

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). Random effects OLS models. Outcome is average of perceived accuracy, credibility, and trustworthiness of the article/s. Column 1 shows effects pooling across the wrestler campaign and fajitas theft articles.

Table B9: Platform effects on article engagement (random effects)

	Read full article (1)	Send to friend (2)	"Like" on Facebook (3)	Share on Facebook (4)
Facebook platform	-0.122**	-0.058	-0.010	-0.020
	(0.046)	(0.044)	(0.044)	(0.041)
Constant (placebo baseline)	2.201***	1.670***	1.615***	1.470***
	(0.044)	(0.042)	(0.041)	(0.039)
Question fixed effects	Yes	Yes	Yes	Yes
Order fixed effects	Yes	Yes	Yes	Yes
N (responses)	2356	2356	2356	2356

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). Random effects OLS models. Table columns correspond to effects for likelihood of reading the full article (column 1), sending it to a friend (2), liking the article on Facebook (3), and sharing the story on Facebook (4). Each column shows effects pooling across the wrestler campaign and fajitas theft articles.

B.3 Spillover Effects

Table B10: Spillover effects on credibility conditional on target article

	Credibility (1)
Low credibility	0.075
	(0.039)
Fajitas article	-0.628***
	(0.037)
Low credibility × fajitas article	-0.163***
	(0.053)
High credibility	0.019
	(0.038)
High credibility × fajitas article	-0.047
	(0.053)
Constant (placebo baseline)	2.755***
	(0.031)
Order fixed effects	Yes
N (responses)	3658

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS model with robust standard errors clustered by respondent. Outcome is average of perceived article accuracy, credibility, and trustworthiness.

Table B11: Spillover effects on sharing article conditional on target article

	Share on Facebook (1)
Low credibility	0.024
	(0.045)
Fajitas article	0.049
	(0.034)
Low credibility × fajitas article	-0.094*
	(0.048)
High credibility	0.072
	(0.045)
High credibility × fajitas article	-0.015
	(0.048)
Constant (placebo baseline)	1.429***
	(0.036)
Low − high credibility (wrestler)	-0.049
	(0.047)
Low − high credibility (fajitas)	-0.127**
	(0.046)
Order fixed effects	Yes
N (responses)	3657

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS model with robust standard errors clustered by respondent. Outcome is likelihood of sharing the story on Facebook. The "Low − high credibility (wrestler)" and "Low − high credibility (fajitas)" differences are significantly different from one another at $p < .10$ level.

Table B12: Spillover effects on article engagement (ordered probit)

	Read full article (1)	Send to friend (2)	"Like" on Facebook (3)	Share on Facebook (4)
Low credibility	0.014	0.046	0.011	-0.036
	(0.049)	(0.057)	(0.060)	(0.061)
High credibility	0.121*	0.172***	0.104	0.091
	(0.049)	(0.055)	(0.057)	(0.060)
Low − high credibility	-0.106*	-0.126*	-0.093	-0.127*
	(0.049)	(0.055)	(0.059)	(0.062)
Question fixed effects	Yes	Yes	Yes	Yes
Order fixed effects	Yes	Yes	Yes	Yes
N (responses)	3657	3658	3657	3657

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). Ordered probit models with robust standard errors clustered by respondent (cutpoints omitted). Table columns correspond to effects for likelihood of reading the full article (column 1), sending it to a friend (2), liking the article on Facebook (3), and sharing the story on Facebook (4).

Table B13: Spillover effects on credibility conditional on Facebook use

	Credibility (1)
Low credibility	-0.064
	(0.064)
High credibility	-0.108
	(0.061)
Low Facebook use	-0.236***
	(0.063)
High Facebook use	-0.006
	(0.060)
Low credibility × low Facebook use	0.137
	(0.092)
Low credibility × high Facebook use	0.028
	(0.084)
High credibility × low Facebook use	0.149
	(0.087)
High credibility × high Facebook use	0.133
	(0.081)
Constant	2.507***
	(0.045)
Question fixed effects	Yes
Order fixed effects	Yes
N (responses)	3658

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS models with robust standard errors clustered by respondent. Outcome is average of perceived accuracy, credibility, and trustworthiness of the article.

Table B14: Spillover effects on credibility conditional on Facebook usage (continuous)

	Credibility (1)
Low credibility	0.147
	(0.100)
High credibility	0.066
	(0.094)
Facebook usage	0.066***
	(0.013)
Low credibility × Facebook usage	-0.033
	(0.020)
High credibility × Facebook usage	-0.016
	(0.019)
Constant	2.125***
	(0.066)
Question fixed effects	Yes
Order fixed effects	Yes
N (responses)	3658

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS models with robust standard errors clustered by respondent. Outcome is average of perceived accuracy, credibility, and trustworthiness of the article.

Table B15: Spillover effects on epistemic political efficacy

	EPE
	(1)
Low credibility prime	0.001
	(0.037)
High credibility prime	0.052
	(0.036)
Constant (placebo baseline)	2.959***
	(0.030)
Low − high credibility	-0.051
	(0.037)
Question fixed effects	No
Order fixed effects	Yes
N (responses)	1830

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). OLS model with robust standard errors clustered by respondent. Outcome is average of three epistemic political efficacy questions about respondents' confidence in their ability to discern the truth about politics.

Table B16: Spillover effects on article credibility (random effects)

	Both articles
	(1)
Low credibility prime	-0.006
	(0.035)
High credibility prime	-0.004
	(0.034)
Constant (placebo baseline)	2.789***
	(0.030)
Low − high credibility	-0.002
	(0.035)
Question fixed effects	Yes
Order fixed effects	Yes
N (responses)	3658

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). Random effects OLS models. Outcome is average of perceived accuracy, credibility, and trustworthiness of the article/s. Column 1 shows effects pooling across the wrestler campaign and fajitas theft articles.

Table B17: Spillover effects on article engagement (random effects)

	Read full article (1)	Send to friend (2)	"Like" on Facebook (3)	Share on Facebook (4)
Low credibility	0.011	0.028	0.009	-0.023
	(0.045)	(0.042)	(0.041)	(0.040)
High credibility	0.115**	0.123***	0.072	0.065
	(0.045)	(0.041)	(0.040)	(0.039)
Constant (placebo baseline)	2.076***	1.576***	1.569***	1.446***
	(0.040)	(0.036)	(0.035)	(0.034)
Low − high credibility	-0.105*	-0.095*	-0.063	-0.088*
	(0.045)	(0.042)	(0.041)	(0.040)
Question fixed effects	Yes	Yes	Yes	Yes
Order fixed effects	Yes	Yes	Yes	Yes
N (responses)	3657	3658	3657	3657

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$ (two-sided). Random effects OLS models. Table columns correspond to effects for likelihood of reading the full article (column 1), sending it to a friend (2), liking the article on Facebook (3), and sharing the story on Facebook (4). Each column shows effects pooling across the wrestler campaign and fajitas theft articles.

Online Appendix C: EGAP preregistration

Title of project:

Social Media Effects on News Credibility

Authors:

Brendan Nyhan (with 14 undergraduate co-authors)

Acknowledgements:

We gratefully acknowledge support from the Dartmouth Center for the Advancement of Learning.

Is one of the study authors a university faculty member?

Yes

Is this registration prospective or retrospective?

Registration prior to researcher analysis of outcome data Is this an experimental study? (with random assignment of units to different conditions)

Yes

Date of start of study 5/8/2018

Should this study be gated? (discouraged)

Yes until 11/8/2019

Was this design presented at an EGAP meeting?

No

Is there a pre-analysis plan associated with this registration?

Yes (see below)

Background and explanation of rationale

Many Americans get political news through social media. However, these platforms do not vet the content that appears on them for accuracy and credibility in the same way that news media sites do. We would like to know if content from social media sites is seen as less credible and if users' concerns about content on social media are triggered when they see other clearly disreputable content. We expect that presenting dubious content will remind people of the controversy over low-quality content on Facebook that began after the 2016 election. As a result, we expect that people will be more distrustful (either subconsciously or consciously) when they are subsequently read

another article.

What are the hypotheses to be tested/quantities of interest to be estimated?

We plan to test the following hypotheses.

Hypotheses:

H1: Platform effect – News articles seen on Facebook will be perceived as less credible than those which are not on Facebook.

H2: Within-platform credibility spillovers – Seeing a low credibility article on a social media platform will reduce the perceived credibility of other articles on that platform relative to seeing a high credibility article.

We also plan to explore the following research question for which we do not have strong theoretical expectations:

RQ1: Does the manipulation of the credibility of an adjacent article on a platform affect respondents' self-reported likelihood of reading an unrelated article, sending it to a friend, indicating you like it on Facebook, or sharing on Facebook?

RQ2: Do the effects of the platform manipulation (H1) and the within-feed credibility manipulation (H2) on our primary outcome variables vary by respondents' social media usage?

RQ3: Does exposure to low credibility articles on social media diminish feelings of epistemic political efficacy (EPE)?

How will these hypotheses be tested?

Eligibility and exclusion criteria for participants

Participants will be U.S. residents age 18 or over are recruited from Amazon Mechanical Turk. We exclude Turk participants who previously took part in our pilot studies from our sample, but otherwise all U.S. adult Turkers with HIT approval rates over 95% are eligible. Overall, the sample size will be about n = 3000 participants.

Randomization approach

We will use a between-subjects design in which respondents are randomly assigned to one of five conditions by the Qualtrics online survey platform (p=1/5 for each):
-Target article, no platform
-Target article, platform (Facebook)
-Target article, platform + feed with placebo article
-Target article, platform + feed with low credibility article
-Target article, platform + feed with high credibility article

We also randomize target article order (we ask about two) and which manipulated article precedes the target article.

Data collection and blinding

Respondents are anonymous to us – we collect data on the Qualtrics online survey platform and only observe the Turk IDs of our participants.

Primary and secondary outcome measures

Our primary outcome measures are ratings of the target article's perceived accuracy, trustworthiness, bias, and credibility on a four-point scale. We will then measure whether these items form a reliable scale. If they items all scale together or if all but one item do, we will use a simple average for the qualifying items. If the items do not scale together, we will treat each as a separate outcome variable.

Each outcome measure below includes a blank space where we incorporated a summary description of the relevant item.

How accurate would you expect the article on __ to be?
Not at all accurate (1)
Not very accurate (2)
Somewhat accurate (3)
Very accurate (4)

How trustworthy would you expect the article on __ to be? Not at all trustworthy (1)
Not very trustworthy (2)
Somewhat trustworthy (3)
Very trustworthy (4)

How credible would you expect the article on __ to be?
Not at all credible (1)
Not very credible (2)
Somewhat credible (3)
Very credible (4)

How biased would you expect the article on __ to be?
Not at all biased (1)
Not very biased (2)
Somewhat biased (3)
Very biased (4)

We will also consider other ways in people interact with articles after being exposed to them on social media as separate secondary outcome measures:

How likely is it that you would choose to read the article about __?

Not at all likely (1)
Not very likely (2)
Somewhat likely (3)
Very likely (4)

How likely is it that you would choose to send the article about __ to a friend?
Not at all likely (1)
Not very likely (2)
Somewhat likely (3)
Very likely (4)

How likely would you be to "like" the article about __ if it appeared in your Facebook News Feed? [asked only of respondents who indicate they use Facebook and read their News Feed]
Not at all likely (1)
Not very likely (2)
Somewhat likely (3)
Very likely (4)

How likely would you be to "share" the article about __ if it appeared in your Facebook News Feed? [asked only of respondents who indicate they use Facebook and read their News Feed]
Not at all likely (1)
Not very likely (2)
Somewhat likely (3)
Very likely (4)

Finally, we use epistemic political efficacy as a secondary outcome measure. We intend to use respondents' average scores on this battery if the scale is reliable and the items scale together. Otherwise we will analyze these outcomes independently.

I feel confident that I can find the truth about political issues. Strongly agree (4)
Somewhat agree (3)
Somewhat disagree (2)
Strongly disagree (1)

If I wanted to, I could figure out the facts behind most political disputes. Strongly agree (4)
Somewhat agree (3)
Somewhat disagree (2)
Strongly disagree (1)

There are objective facts behind most political disputes, and if you try hard enough you can find them. Strongly agree (4)
Somewhat agree (3)
Somewhat disagree (2)
Strongly disagree (1)

Statistical analyses

If our outcome measures pool (see below), results will be estimated as stacked question-level data using OLS with target article fixed effects and robust standard errors clustered by respondent. These results will be verified for robustness using appropriate GLM estimators and by using respondent random effects (respondent fixed effects cannot be estimated due to multicollinearity). Unless otherwise noted, all experimental treatment effects will be estimated as intent to treat effects.

If the effects of key explanatory variables differ significantly depending on the target article, we will present separate models in the main text for expositional clarity and present interactive models in an appendix. We will estimate marginal effects as appropriate when interaction terms are included in our models.

Our primary analysis will consider the effects of our treatments.

Define `target_cred` as our composite outcome measure of perceived article credibility, platform as a variable that takes the value of 1 if the target article appears on Facebook and takes the value of 0 otherwise, and feed as a variable that takes the value of 1 if the target article appears as part of a simulated news feed and takes the value of 0 otherwise

We then estimate the following:

```
reg target_cred platform if feed==0, robust [H1]
```

To test H2, we use the indicators `low_cred` and `high_cred` for those conditions:

```
reg target_cred low_cred high_cred if feed==1, robust
lincom high_cred-low_cred [H2]
```

To test RQ1, we estimate identical models to those above for our secondary platform outcome measures (read, send, like, share):

```
foreach var of varlist read send like share {
reg ‘var’ platform if feed==0, robust [RQ1]
reg ‘var’ low_cred high_cred if feed==1, robust [RQ1]
}
```

To test RQ2, we estimate the following:

```
reg target_cred platform##low_social platform##high_social
lincom platform#low_social-platform#high_social [RQ2]
\en\vskip 12pt
\begin{verbatim}
reg target_cred low_cred##low_social##high_social high_cred##low_social##hi
(low_social#high_cred-low_social#high_cred)-(high_social#high_cred-high_soci
```

where `low_social` and `high_social` are the top and bottom terciles on a measure of social media usage that is the average of questions measuring self-reported frequencies of general Facebook use and News Feed reading specifically.

Finally, we test RQ3 using the standard models for H2 described above but with our EPE measure as the outcome variable:

```
reg EPE low_cred high_cred if feed==1, robust
lincom high_cred-low_cred [RQ3]
```

We will also measure respondent attention by computing scores on post-treatment questions testing recall of our target articles (means by condition and overall).

Finally, we will validate our low versus high credibility manipulation by asking respondents directly about them. Specifically, each of the manipulated articles will be tested using the same format above among those who saw them:

```
reg y high_cred, robust
```

where y=our scale of article credibility (constructed as described above) or individual questions about article credibility if the items don't scale together.

In all cases above, we will assess our assumption that our treatment effects pool across stimuli and question order by testing whether there is no difference in treatment effects by question order, between versions of the low and high credibility articles, and between versions of the placebo content. If any of these assumptions are violated, we will estimate more elaborate models with additional interaction terms as appropriate, though we may include these more complex models in an appendix and report separate models in the main text for expositional purposes. We otherwise average over randomized factors that are not included in our models.

Notes:
-We will compute and report appropriate auxiliary quantities from our models to test the hypotheses of interest, including marginal effects appropriate to test the hypotheses of interest from the models including interaction terms, treatment effects by subgroup, and differences in marginal effects between subgroups.
-In some cases, we may present treatment effects estimated on different subsets of the data for expositional clarity. If so, we will verify that we can reject the null of no difference in treatment effects in a more complex interactive model reported in an appendix when possible.
-For interaction terms, scales, and moderators, if results are consistent using a median/tercile split or indicators rather than a continuous scale, we may present the latter in the main text for ease of exposition and include the continuous scale results in an appendix. We will also use tercile indicators to test whether a linearity assumption holds for any interactions with continuous moderators per Hainmueller et al (N.d.) and replace any continuous interactions in our models with them if it does not.
-Don't know responses will be considered missing data for the factual belief outcome measures.
-We will compute and report summary statistics for our samples. We will also collect and may report response timing data as a proxy for respondent attention.
-The order of hypotheses and analyses in the final manuscript may be altered for expositional clarity.
-Where applicable, regression results for binary dependent variables will be verified for robustness using probit. Regression results for individual ordered dependent variables will be verified for robustness using ordered probit.
-We may estimate the experimental models described above with a standard set of covariates (indicators for gender, age groups, non-white respondents, respondents with a four-year college degree,

and scores on a standard political knowledge scale) if including those has a substantively important effect on the precision of our treatment effect estimates. In that case, however, both models will be reported.
-Participants' political knowledge will be assessed with a standard five-question battery that test participant knowledge of U.S. electoral rules and awareness of current political figures. Partisanship is measured on a standard seven-point scale administered via branching questions.

Country USA

Sample Size (# of Units) 3000

Was a power analysis conducted prior to data collection?

No

Has this research received Institutional Review Board (IRB) or ethics committee approval?

Yes

IRB Number

Dartmouth CPHS STUDY00031025

Date of IRB Approval

April 20, 2018

Will the intervention be implemented by the researcher or a third party? If a third party, please provide the name.

Qualtrics online survey platform

Did any of the research team receive remuneration from the implementing agency for taking part in this research?

N/A

If relevant, is there an advance agreement with the implementation group that all results can be published?

N/A

JEL classification(s)

Certification

By submitting this form and accompanying documents with EGAP, I confirm that I have rights to put this information in the public domain and I understand that this information will remain on the

EGAP registry in perpetuity, regardless of whether the research is subsequently implemented or not.
-Agree