Testing The Effect of Information on Discerning the Veracity of News in Real-Time

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Abstract

Despite broad adoption of digital media literacy interventions that provide online users with more information when consuming news, relatively little is known about the effect of this additional information on the discernment of news veracity in real-time. Gaining a comprehensive understanding of how information impacts discernment of news veracity has been hindered by challenges of external and ecological validity. Using a series of pre-registered experiments, we measure this effect in real-time. Access to the full article relative to solely the headline/lede and access to source information improves an individual's ability to correctly discern the veracity of news. We also find that encouraging individuals to search online increases belief in *both* false/misleading and true news. Taken together, we provide a generalizable method for measuring the effect of information on news discernment, as well as crucial evidence for practitioners developing strategies for improving the public's digital media literacy.

1 Introduction

The risks of misinformation have become especially acute during the COVID-19 pandemic[1] and in the context of rising antidemocratic movements (Greenspan 2021; Adair and Napoli 2021). These forces have led scholars, civil society groups, and social media companies to develop novel intervention and mitigation strategies. Among those, perhaps the most common are digital media literacy interventions that seek to provide consumers with more context or information about an article. These interventions are based on the assumption that providing more information will prompt news consumers to rely on cognitive shortcuts and heuristics, which can often be helpful (Gigerenzer and Selten 2002), especially in the case of discerning the veracity of news (Pennycook and Rand 2019a). Although this assumption underlies the design of these digital media literacy interventions, we have yet to establish whether individuals use the cues from additional information to improve their ability to correctly discern news veracity in real-time.

We present results from multiple studies that test if cues from additional textual, source, or external information improve news discernment among news consumers in real-time.[2] By measuring these effects in similar research designs, we can also directly compare the effect size — rather than simply directionality — of different cues. To ascertain whether individuals use cues from additional information, we measure the marginal effect of providing three different types of information on the discernment of news veracity: providing the reader with the entire article rather than solely the headline and lede (textual cues); providing the reader an article with the source rather than without the source (source cues); and encouraging readers to search online for external information beyond the article itself rather than not encouraging online search (external cues). Importantly, our articles are selected and evaluated within 48 hours of publication — the period in which news consumption is mostly likely to take place. Taken together, these experiments capture the effect of three different cues (textual, source, and external) in real-time.

Identifying the effect of textual, source, and external cues have important implications for digital media literacy interventions designed to provide more information to news consumers. For example, a media literacy guide released by Facebook in 2017 advocated for individuals to rely on textual cues by suggesting that news consumers look throughout a news article for specific textual features, such as words written in all caps. The NewsGuard web extension (released in 2018) focuses individual's attention on source cues by providing easy-to-interpret source reliability information when consuming news (Aslett et al. 2022); this strategy has been echoed in Google's "About this result" feature, which provides Wikipedia information

[1] Waves of misinformation about COVID-19 have increased distrust of public health officials, weakened responses to the pandemic, and increased skepticism of the COVID-19 vaccine (Loomba et al. 2021).

[2] The pre-registration of Study 1 can be found here: https:–Link witheld to protect anonymity of study authors–. The pre-registration of Study 2 can be found here: https:–Link witheld to protect anonymity of study authors–. We have provided a blinded copy of both pre-registrations as supplemental documents for reviewers.

about sources natively within search results.[3] In addition to focusing the attention of news consumers on specific information within an article, digital media literacy interventions have also encouraged individuals to utilize information external to the article itself. The United States Surgeon General's Office suggested in 2021 that individuals should search online to help discern the veracity of news.[4] These popular digital media literacy approaches are built on the assumption that additional information improves the ability of individuals to correctly discern the veracity of news, but we have little empirical evidence with which to evaluate these assumptions. The lack of evidence risks introducing interventions that lack efficacy or, worse, introduce unintended consequences.

In a departure from past work, we measured the effect of providing more information on the discernment of news veracity within 24-48 hours of publication. Previous studies have measured the effect of textual and source information (Austin and Dong 1994; Sundar and Nass 2001; Landrum et al. 2017; Berinsky 2017; Kim, P. L. Moravec, and Dennis 2019; Pennycook and Rand 2019b; Jakesch et al. 2019; Dias, Pennycook, and Rand 2020) months after publication, but we develop a new method to measure this effect in the time period when news articles are most likely to be consumed: in the days immediately following publication (Vosoughi, Roy, and Aral 2018). Measuring belief in misinformation well after publication may present different results than if it were measured while a piece of misinformation is being consumed "in the wild." The believability of misinformation — and thus the incentives for actors to produce it — may depend on the context of the general information environment at the time of its publication. Our studies, which source articles and collect evaluations in real-time, leverage the environment with which misinformation was generated to interact, enabling more accurate measurement of levels of belief and effects of interventions.

In addition to the benefit of measuring this effect in real-time, we also remove the researcher from the article selection process. Researchers in previous studies utilized articles that they themselves selected, regardless of their popularity (Allcott and Gentzkow 2017; Bronstein et al. 2019; Clayton et al. 2019; Pennycook and Rand 2020), or they themselves created (Pennycook, Cannon, and Rand 2018; P. Moravec, Minas, and Dennis 2018), potentially introducing sampling biases. Stimulus samples without clear selection criteria have been found to limit the validity and robustness of estimates in previous work measuring news discernment (Clemm von Hohenberg 2020). To ameliorate these potential issues, we remove the researcher from the selection process and ensure that we only select the most popular pieces of true and false/misleading news. Taken together, our methodological innovations allow us to measure the effects of additional pieces of information about popular news articles in real-time.

[3]Once installed, the NewsGuard web extension informs users if a site they are viewing is reliable by providing them with a reliability rating of that site. More information can be found here: https://www.newsguardtech.com.

[4]Specifically the digital media literacy guide asks individuals to: "type the central claim of an article into a search engine to determine if it has been verified by a credible source."

Our experiments produce three important findings. First, we find that access to the full article, rather than just the headline and lede, improves the ability of an individual to correctly discern the veracity of news. To our knowledge, this is the first time this has been tested and shows that individuals use cues from the actual text of an article beyond what they learn from the headline and lede to help them evaluate news. This finding also suggests that studies that rely solely on headlines and ledes may be underestimating people's ability to identify the veracity of news when reading the whole article. Second, we find that source information also improves the ability of an individual to correctly discern the veracity of news. This effect is strongest when respondents receive source cues from the actual news website by traveling to the online domain where the article is located, suggesting that source cues on online websites, such as the quality of the design or the type of advertisements found on the site, may be quite important. Past studies predominantly did not send respondents to the online news website when passing on source cues, so this result may explain why some studies identified no effect of source cues on the discernment of the veracity of news (Dias, Pennycook, and Rand 2020). Finally, we find that being encouraged to search online for additional information increases belief that *both* true *and* false/misleading news articles are true. Worryingly, the effect is of roughly the same magnitude. In addition to contributing to the growing literature on people's ability to discern the veracity of news, these findings provide novel and important evidence for practitioners supporting digital media literacy initiatives to consider.

2 Theory and Hypotheses

In this manuscript, we test whether textual, source, and external cues are utilized by online users to help discern the veracity of news. To this end, we measure the effect of providing three types of information to news consumers directly after publication: (H1) information in the text (relative to information contained solely in the headline and lede); (H2) source information; and (H3) searching online for additional related information beyond the article itself.

2.1 Information in the Text

We begin by investigating the possible effect of cues contained in the text of news articles, as opposed to solely in the headline or lede. News consumers likely use textual content to help them identify the veracity of an online news article through a number of specific cues: the confidence shown in claims (Zhang et al. 2018), quotes from outside experts (Sundar 1998), logical fallacies (Frankena 1939), grammatical errors (Jahanbakhsh et al. 2021), the emotional tone of the text (Zhang et al. 2018), or the claim appearing motivated or biased (Jahanbakhsh et al. 2021). Although these specific cues have been identified as helpful,

no one has measured the aggregate effect of textual cues on the ability of individuals to discern the veracity of news. To do so, we test whether the effect of providing the full text relative to solely the headline/lede improves the discernment of news veracity.

Testing whether textual cues aid the discernment of news veracity has two important implications. First, digital media literacy interventions encourage news consumers to inspect the full text. Understanding whether or not textual cues are helpful in real-time will enable us understand whether this recommendation might be effective. Second, while many online news consumers see news on social media sites natively embedded as a headline/lede, they also have access to the full text of an article by clicking on a link. Recently, there has been an increase in the proportion of news that is consumed solely in headline/lede form on social feeds.[5] Given increased consumption of news in headline/lede format on social media and search engines, it is important to identify if losing these textual cues are impacting the ability of news consumers to correctly discern the veracity of news.[6]

In Study 1, we test the effect of textual information by asking four groups of respondents to evaluate the same news articles in the same 24 hour period, but varied whether they receive the full text of the article. In order to isolate the effect of the textual information, we measured the textual effect with the source and without the source. Varying the presence of source is necessary to measure the textual effect *per se*; for example, the effect of providing the full text may be weak/non-existent when the source is available, because cues from the source of the article might outweigh cues from the text of the article. Therefore, we test the effect of the full-text in two different contexts (source available versus source unavailable); Figure 1 outlines the different variations of text and source information provided to the four different groups of respondents. Each respondent is initially randomly placed in one treatment category and then evaluates articles in that format.

[5]According to Pew, almost 3 in 10 American adults often consumed news on social media sites (People the Press 2019), compared to only 1 in 10 Americans in 2008 (People the Press 2008.) In addition, in 2017 over 60% of Americans stated that their first place to visit for information about politics are online search engines, where news articles are displayed in the headline/lede format (Dutton et al. 2017).

[6]Relatedly, Twitter introduced a feature that appears to sometime prompt users to click through and read an article before sharing a link to it online. Our experiment helps illustrate the potential value of doing so in so far as it impacts currently discerning the veracity of the news article, although the question of whether realizing an article is false makes one less likely to want to share it is another matter entirely and beyond the scope of our work here.

Figure 1: A Table Detailing Study 1

	Headline/Lede	**Full Text**
No Source	Headline/Lede No Source Information (N=1,735) *Article Format 1*	Full Text No Source Information (N=1,919) *Article Format 2*
Source	Headline/Lede Source Information (N=1,752) *Article Format 3*	Full Text Source Information (N=1,868) *Article Format 4*

By comparing the evaluations of the same articles, but with different amounts of information available to the respondent, we can test our pre-registered hypotheses regarding the marginal effect of the full text information in different formats. We pre-registered the following two hypotheses:

H1.1: Respondents who are given the full text of an article to evaluate are more likely to match the veracity assessment of fact-checkers than those who are only given the headline/lede to evaluate (when source information is not present). To test this hypothesis we compare the number of "correct" evaluations of articles in *article format 1* (see Figure 1) to the number of "correct" evaluations of articles in *article format 2* (see Figure 1).

H1.2: Respondents who are given the full text of an article to evaluate are more likely to match the veracity assessment of fact-checkers than those who are only given the headline/lede to evaluate (when source information is present). To test this hypothesis, we compare the number of "correct" evaluations of articles in *article format 3* (See Figure 1) to the number of "correct" evaluations of articles in *article format 4* (See Figure 1).

2.2 Source Information

Second, we turn to source information. Trust in information hinges at least partly on the reliability of its source (Druckman 2022). Source information may affect one's belief that an online news article is

true through two specific cues: reputation of the publisher/domain and the quality of the web design. Traditional media provides cues through authenticity and reputation (Flanagin and Metzger 2000; Althaus and Tewksbury 2000), as well as the professionalism of the design of the website (Fogg et al. 2001; Flanagin and Metzger 2007).[7] These source cues could impact belief in news articles, but in recent years trust in traditional media has eroded (Gottfried and Liedke 2021) and the rise of the Internet has increased consumption of low-quality news online. News consumers desire credible news sources (Pennycook and Rand 2019a), but are individuals more likely to believe news when they know it is coming from mainstream sources?

Answering this question is of both academic and practical importance. Previous academic work on the effect of source information is mixed. Sundar and Nass (2001), Pornpitakpan (2004), Baum and Groeling (2009), Landrum et al. (2017), Berinsky (2017), Swire et al. (2017), and Kim, P. L. Moravec, and Dennis (2019) found that source information affects the perceived veracity of information, but Austin and Dong (1994), Pennycook and Rand (2019b), Jakesch et al. (2019), and Dias, Pennycook, and Rand (2020) found no effect. Testing this effect in real-time will provide a valuable contribution to the academic literature on this question. In addition, a number of digital media literacy interventions emphasize the credibility of sources,[8] but it remains unclear the extent to which individuals utilize source cues (Aslett et al. 2022). To determine if individuals rely on source cues to help them discern the veracity of news in real-time, we measure the effect of providing source information from mainstream and low-quality news sources. A mainstream news source is likely to have a reputation for producing true news stories and the budget for a high-quality, well-maintained website, whereas a low-quality news source likely has either an unknown or negative reputation to most news consumers and less professional web design. Given the lack of pre-existing consensus, we pre-registered four different hypotheses about the effect of source information on belief that a news article is true.

Similar to the first study, we isolate the effect of low-quality and mainstream news source cues by varying whether the full text or the headline/lede is provided (see Figure 1 above). It is possible that the effect of source cues differ by context. For example, the source cue could be strongest when the full article is available, because cues from the professionalism of the design of the website may come across stronger when respondents see the full website rather than solely the headline. Alternatively, a headline/lede contains less textual information, so readers may have to rely more strongly on source cues to make a veracity judgement. By testing the effect of two different source cues (low-quality and mainstream) in these two different formats (full text available versus solely the headline/lede available), we can determine the added source cue effect,

[7] A high quality web-site can convey source credibility through the attractiveness of the website's appearance and a lack of commercial content.

[8] Web extensions, such as NewsGuard, The Factual, Media Bias Fact Check, NoBias, and Newstrition are just a few web extensions created to emphasize source information

if any, gained from sending individuals to the online website where the article is located. As above, Figure 1 outlines the different variations of text and source information provided to the four different groups of respondents.

By comparing evaluations of the same articles, but with different amounts of information available to the respondent, we can test our pre-registered hypotheses regarding the marginal effect of the source information in different formats:

H2.1: Respondents are less likely to rate an article published by a low-quality news source as true when the source information is provided than when it is not provided (only the headline/lede is provided to all respondents). To test the effect of source information from low-quality sources when only the headline and lede is present, we compare the number "true" ratings of articles in *article format 1* to the number "true" ratings of articles in *article format 3* for articles from low quality news sources.

H2.2: Respondents are more likely to rate an article published by a mainstream news source as true when the source information is provided than when it is not provided (only the headline/lede is provided). To test the effect of source information from mainstream sources when only the headline and lede is present, we compare the number "true" ratings of articles in *article format 1* to the number "true" ratings of articles in *article format 3* for articles from mainstream news sources.

H2.3: Respondents are less likely to rate an article published by a lesser-known low-quality news source as true when the source information is provided than when it is not provided (the full text of the article is provided to all respondents). To test the effect of source information from low-quality sources when the full text is present, we compare the number "true" ratings of articles in *article format 2* to the number "true" ratings of articles in *article format 4* for articles from low quality news sources.

H2.4: Respondents are more likely to rate an article published by a mainstream news source as true when the source information is provided than when it is not provided (the full text of the article is provided to all respondents). To test the effect of source information from mainstream sources when the full text is present, we compare the number "true" ratings of articles in *article format 2* to the number "true" ratings of articles in *article format 4* for articles from mainstream news sources.

2.3 Searching for Additional Information

In recent years, a growing body of literature has tested the efficacy of interventions mitigating belief in misinformation (Guess and Munger 2020; Roozenbeek and Van der Linden 2019; Clayton et al. 2019; Pennycook, McPhetres, et al. 2020), but no work has directly tested the impact of using a search engine to evaluate news veracity in real-time. Over the last few decades, users have become increasingly reliant on search engines to fact-check news stories they see online (Dutton et al. 2017),[9] and social media companies,[10] civil society,[11] and government agencies[12] have all encouraged users to research suspect news using online search engines with the goal of reducing belief in misinformation. In view of this increased use and trust of search engines, as well as digital media literacy campaigns advocating for the use of search engines when encountering suspect news, it is critical we understand the effect of online search on veracity discernment.

Online search may be especially problematic for partisans. Previous research has found that partisans seek out news that is ideologically congruent (Iyengar and Hahn 2009; Messing and Westwood 2014). As a result, partisans evaluating ideologically congruent false/misleading article may only seek out ideologically congruent evidence that supports the original false/misleading claim. This selective exposure may also be compounded by recent findings suggesting that individuals may be more likely to find ideologically congruent news when using search engines, such as Google (Robertson, Lazer, and Wilson 2018). Indeed, past research has shown seeking out ideologically congruent information online leads some to adopt inaccurate beliefs (Peterson and Iyengar 2021), but we are unaware of any prior research estimating the effect of searching online on news veracity discernment. It is possible that when searching for information about a true news story, one will come into contact with similar articles that may corroborate the claims in the initial article. This may also be the case for false news articles. Recent qualitative work has found that when searching for information about false stories, individuals can fall into "data voids" (Golebiewski and boyd 2019) where only information from other non-credible sources appear. It is likely that this phenomenon could increase belief in false/misleading stories. This may be especially concerning for those already predisposed to believing misinformation, such as those whose ideological perspective is consistent with the ideological perspective of the original false news article (Allcott and Gentzkow 2017; P. Moravec, Minas, and Dennis 2018).

We set out to measure whether the additional information provided to a reader by online search affects their ability to correctly identify the veracity of the original news article. Given the lack of previous work

[9] More than 50% of internet users state that they check facts they come across at least once a day (Dutton et al. 2017), and search engines have become the most trusted form of news (Berland 2022)

[10] In 2017, Facebook listed a link to ten tips for spotting fake news and one tip asked the readers to "look at other reports. If no other reputable news source is reporting the same story, it may indicate that the story is false." (Constine 2017)

[11] See https://www.wnyc.org/story/breaking-news-consumer-handbook-fake-news-edition/.

[12] In 2021, the United States Surgeon General released "A Community Toolkit for Addressing Health Misinformation" that recommended searching for additional information from credible sources" `https://www.hhs.gov/sites/default/files/health-misinformation-toolkit-english.pdf`

directly measuring the relationship between online search and news discernment, it is important to first determine the direction of the effect, if any. Therefore, our pre-registered hypotheses strictly identify the predicted direction of the online search effect, but not the mechanism. Importantly, we test this effect in real-time, so that individuals engage with the same search engine environment that individuals would likely see "in the wild." We pre-registered and tested three hypotheses:

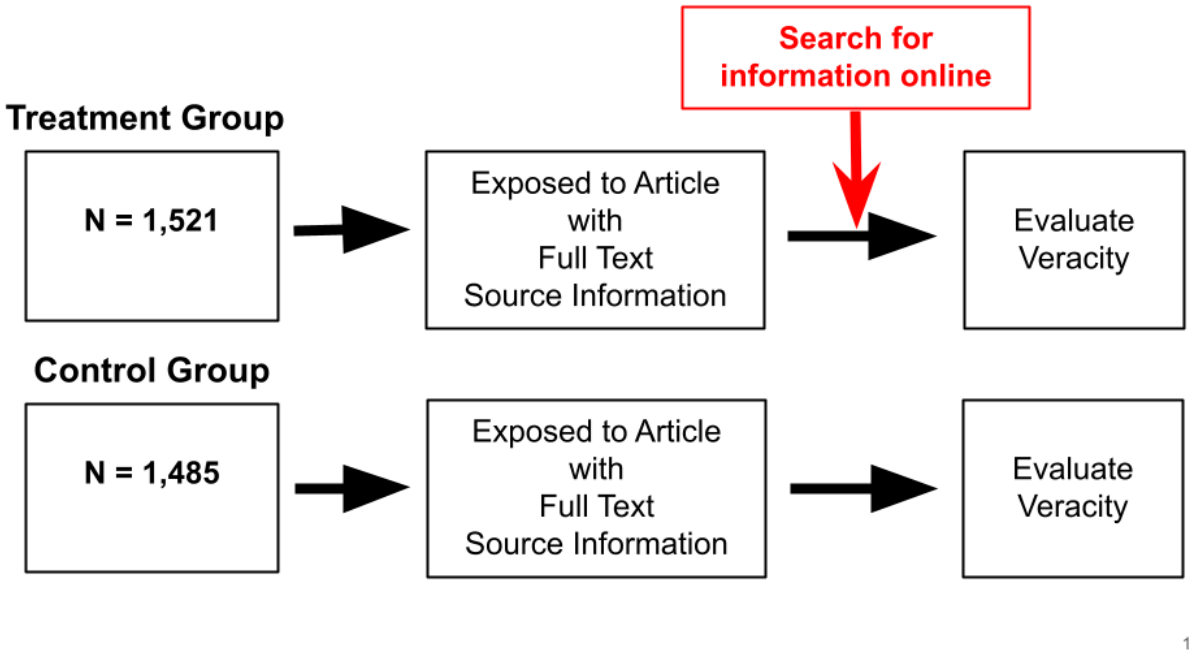
H3.1 Individuals who are asked to search for evidence to help them evaluate a true news article are *more likely to correctly rate the article as true* (i.e., matching the fact-checker assessment) than respondents who are not asked to search for evidence to help them evaluate that same true news article.

H3.2 Individuals who are asked to search for evidence to help them evaluate a false/misleading news article are *less likely to correctly rate the article as false/misleading* (i.e., matching the fact-checker assessment) than those who are not asked to search for evidence to help them evaluate that same false news article.

H3.1 Individuals who are asked to search for evidence to help them evaluate a false/misleading news article are *more likely to rate this story as true* (i.e., incorrectly answer the assessment question) than respondents who are not asked to search for evidence to help them evaluate that same false news article.

We test the effect of searching for additional information online in our second study by asking two groups of respondents to evaluate the same news articles in the same 24 hour period. Those in the control group evaluate an online news article with the full text and source information on the website (*Article Format* 4 in Figure 2), but are not encouraged to search for information. Those in the treatment group evaluate the same articles in the same format and time-frame, but are encouraged to seek out additional information online to help them evaluate the veracity of the article. Study 2 is outlined in Figure 2.

Figure 2



In a step towards identifying a mechanism, we also explore whether partisan selection could explain the search effect on false/misleading articles. We run an exploratory analysis (not pre-registered) that investigates whether the search effect is concentrated among those who are ideologically congruent with the perspective of the misinformation, as previous work would suggest.

3 Sampling and Demographic Characteristics

To test these hypotheses we recruited survey subjects using Qualtrics (an online survey firm). More details about the recruitment strategy, such as balance tables and sampling quotas, can be found in Section S of the Supplementary Materials. In both Study 1 and Study 2, each respondent was asked to evaluate three different popular articles published within the previous 48 hours. A transparent, replicable, and pre-registered article selection process that sources popular false/misleading and true articles from across the ideological spectrum within 24- hours of their publication. A full explanation of this process and rationale for the recruitment strategy can be found in Section S of the Supplementary Materials.

4 Results

We now present the effect of providing respondents with different levels information about a news article on how individuals evaluate the veracity of that article. To do so, we fit an OLS regression model with standard errors clustered at the respondent level to predict either correctly discerning the veracity of a news article (i.e., matching the evaluation of the professional fact-checker) or rating an article as true, depending on the hypothesis we are testing.[13] We control for a number of pre-registered variables: education level, age, gender (male dummy variable), income, and ideology,[14] but also report the results from models that do not condition on these covariates.[15] We also run all analyses using a logistic regression and find similar results.[16] Figure 3 presents the marginal effect of exposure to the additional information associated with the hypothesis in question on correctly discerning the veracity of news[17] and Figure 4 presents the marginal effect of exposure to the additional information on rating an article as true.[18] We also run all analyses in Figures 3, 4, and 5a substituting a 7-point ordinal scale of veracity for the dichotomous measure and all of our findings hold.[19] In each figure in this section the y-axis label denotes, in brackets in the first row, the hypothesis and the type of information for which we are measuring an effect. In the next line of the y-axis label (in braces), we list the type of news articles on which we are testing this effect. In the final line of the y-axis label we state in parentheses the other type(s) of information that are constant across the control and treatment group.[20]

Marginal Effect of Providing Full Text

Using our results from Study 1, we begin by assessing the marginal effect of the full text of the article on discerning the veracity of online news articles in real-time. As Figure 3 shows, we find that providing the full text to respondents improves the discernment of news veracity. When the source is not provided to respondents (H1.1), providing respondents with the full text of the article increases the likelihood a respondent correctly discerns the veracity of an online news article by 0.0895 (a 17% increase given that the likelihood of correctly discerning the veracity of an article without source information and the full text is

[13] For our two dichotomous outcomes, (matching the evaluation of professional fact-checkers or rating an article as true with Yes=1 and No=0), OLS or logistic regressions produce similar results and are both appropriate, although OLS regression is the preferred specification because it provides unbiased, reliable estimates of a variable's average effect (Hellevik 2009; Mood 2010; Baetschmann, Staub, and Winkelmann 2015).

[14] Explanations for how these variables were calculated can be found in Section Q the supplementary materials.

[15] The results from these models can be found in section I in the supplementary materials

[16] The results from these models can be found in section K in the Supplementary Materials

[17] The results from the models that generate these coefficients are presented in section H in the supplementary materials

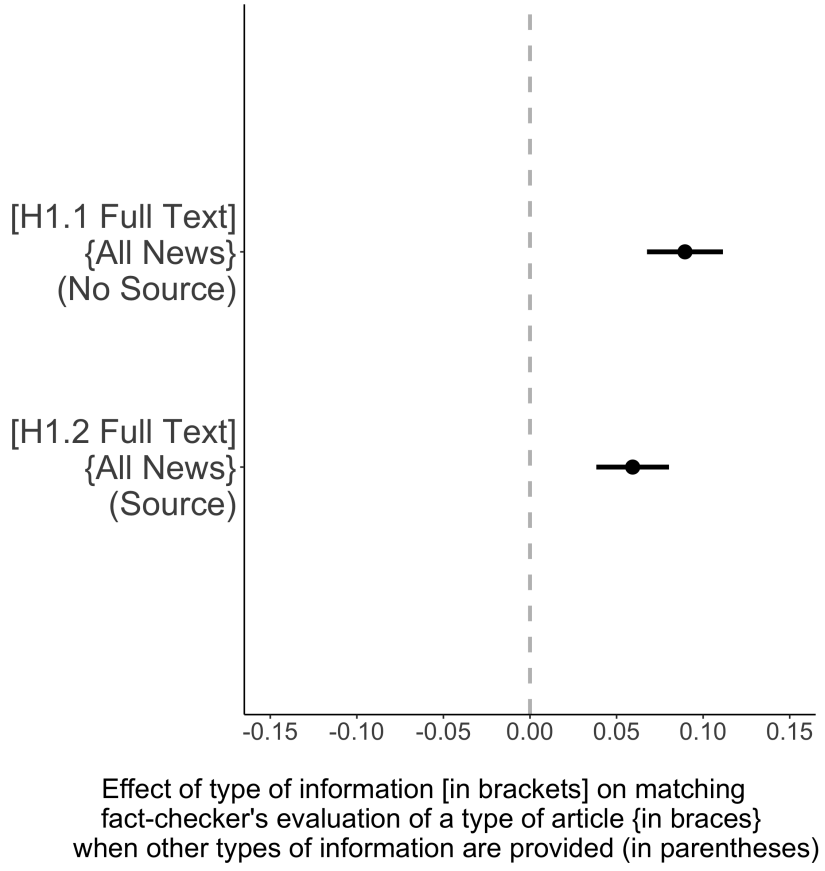
[18] The full results from these models can be found in section H in the supplementary materials

[19] The full results from these models can be found in section J in the supplementary materials

[20] We report adjusted p-values to account for multiple hypothesis testing in section L of the supplementary materials using both the conservative Bonferroni approach and the less conservative false discovery rate method (Benjamini and Hochberg 1995). We find that none of our statistically significant results lose their significance when applying these multiple hypothesis testing corrections.

0.506). When source information is available (H1.2), providing respondents with the full text of the article has a smaller effect and only increases the likelihood of correctly discerning the veracity of an article by 0.059 (an 11% increase given that the likelihood of correctly discerning the veracity of an article with source information, but without the full text, is 0.535). The effect is likely smaller when the source is provided because respondents are confronted with more information and may not be able to properly utilize the specific textual information they are receiving (Lang 2000).

Figure 3: Marginal effects of providing the full text: This figure presents the marginal effect of text information on the likelihood of correctly discerning the veracity of news when the source is not also provided (H1.1) and when the source is provided (H1.2).



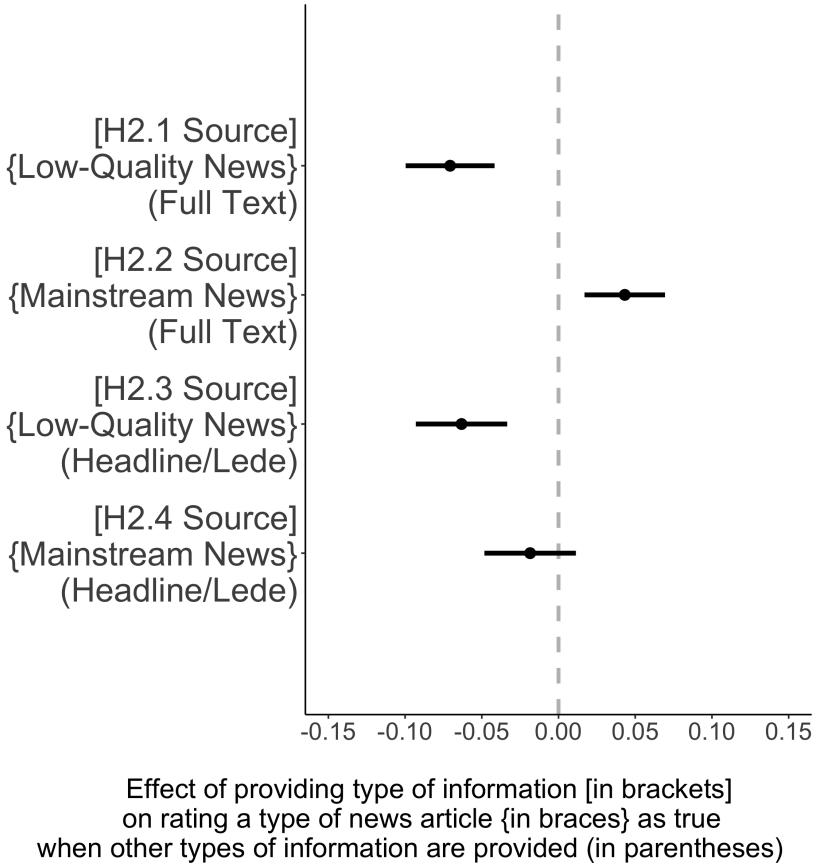
Marginal Effect of Source Information

Similar to the marginal effect of the full text of the article, we also find that source information improves the discernment of news veracity in real-time. Rather than testing the effect of source information on the discernment of news veracity, we focus on the effect of source information on the belief that a news article from mainstream source or a low-quality source is true.[21] Figure 4 shows that, as expected, when the

[21] We pre-registered these hypotheses using this outcome variable, because we did not believe that source will necessarily aid in correctly discerning the veracity of news. Rather, we believed that the credibility of the source will only affect whether individuals rate an article as true regardless of the content of the article.

full text is available to respondents, providing source information for an article from a low-quality source (H2.1) *decreases* the likelihood that one rates that article as true by 0.07 (a 13% decrease in likelihood), but providing source information for an article from a mainstream source (H2.2) *increases* the likelihood that one rates it as true by 0.043 (a 5.8% decrease in likelihood). If we restrict respondents to evaluating solely the headline and lede rather than the full text, Figure 4 shows that source cues from articles from a low-quality sources remain strong. When only the headline and lede is available, the effect of providing source information for an article from a low-quality source (H2.3) decreases the likelihood of rating an article as true by 0.06 (a 13% decrease in likelihood), but we find that the effect of source information of an article from a mainstream source dissipates and is no longer statistically significant (H2.4). These results suggest that source effects are stronger when respondents visit the website and see the full text relative to when they only evaluate the headline and lede of an article. These results suggest that when we eliminate the researcher from article-selection process and run the study in the time period in which individuals are most likely to consume news, source effects are quite strong. They also suggest that the effects may not be as strong when individuals do not get the full source cue on the website (H4). This may explain why previous studies investigating source effects (Austin and Dong 1994; Pennycook and Rand 2019b; Jakesch et al. 2019) did not find any source cue effects. The format in which these source cues are provided matter, and it would appear that the news websites pass on strong source cues that may enhance the source effect.

Figure 4: Marginal effects of providing the source: This figure presents the marginal effect of source information on the likelihood of rating an article from low-quality news sources as true (H2.1 ; H2.3) and the likelihood of rating an article from mainstream news sources as true (H2.2 ; H2.4) when the full text is provided and when only the headline and lede is provided.



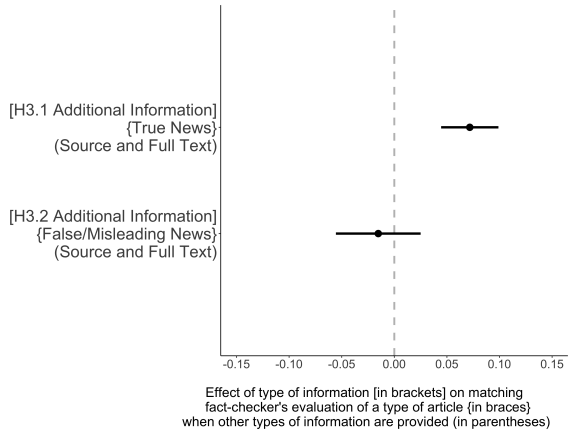
Marginal Effect of Searching for Additional Information

Contrary to the marginal effect of providing the full text of an article or its source, we find that seeking out additional information has a mixed effect on improving respondent's ability to discern the veracity of news in real-time. Figure 5a shows that encouraging respondents to search for information increases the likelihood of rating true articles as true by 0.071 (H3.1) (a 12.6% increase in likelihood), but has no effect on the likelihood of correctly identifying false/misleading news as false/misleading (H3.2). Although this would indicate an improvement relative to not encouraging respondents, Figure 5b shows that encouraging respondents to search for information increases the likelihood of rating false/misleading articles as true by 0.059 (nearly a 19.8% increase in likelihood). Worryingly, the effect of searching for additional information on false/misleading news articles appears almost identical to the effect of searching for additional information on true news articles in real-time.

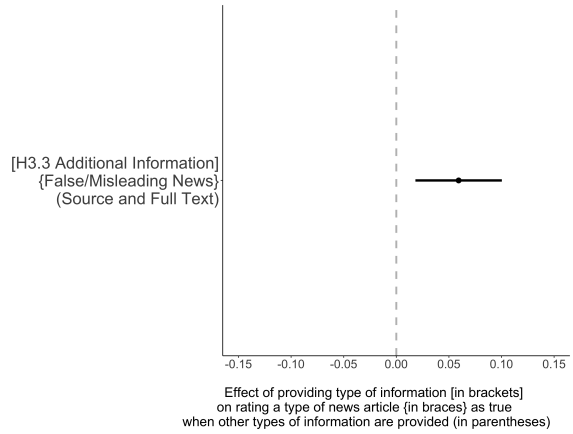
To investigate if the search effect identified in our test of the third hypothesis can be explained by par-

Figure 5: Marginal effects of searching for additional information: Panel A presents the marginal effect of searching for additional information on the likelihood of correctly discerning the veracity of true news (H3.1) and false/misleading news (H3.2). Panel B presents the marginal effect of searching for additional information on the likelihood of rating a false/misleading article as true (H3.3)

(a) Effect of Additional Information on Correctly Identifying the Veracity of the News Articles



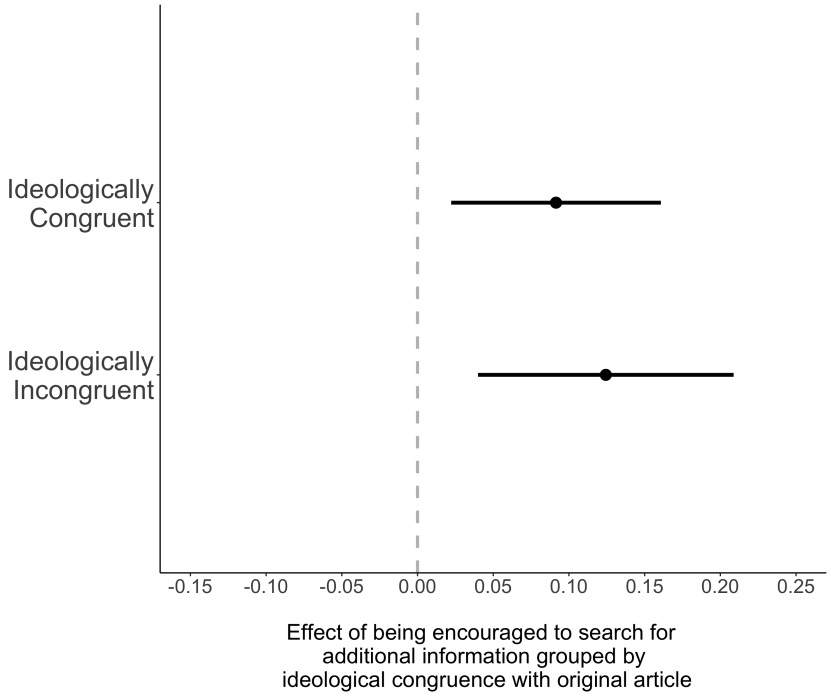
(b) Effect of Additional Information on Rating a News Articles as True



tisans seeking out ideologically congruent information online, we measured the marginal effect of seeking additional information among individuals who were ideologically congruent and ideologically incongruent with the original false/misleading article.[22] We find that the search effect on the likelihood an individual rates a false/misleading article as true is quite similar across ideologically congruent and incongruent individuals. Figure 6 shows that encouraging respondents to search for information increases the likelihood of rating false/misleading articles as true by 0.09 (a 21.2% increase in likelihood) among ideologically congruent respondents. Encouraging respondents to search for information increases the likelihood of rating false/misleading articles as true by 0.12 (a 54.8% increase in likelihood) among ideologically incongruent respondents. If seeking out attitudinally congruent information could explain this effect, we would expect the effect to be much stronger among ideologically congruent individuals relative to ideologically incongruent individuals. Instead, the effect is slightly stronger among ideologically incongruent respondents, although not statistically different from the effect identified among those who were ideologically congruent.

[22]Details about how ideological congruence was tabulated can be found in Section R of the Supplementary Materials.

Figure 6: Marginal effects of searching for additional information: This figure presents the marginal effect of searching for additional information on the likelihood of rating a false/misleading article as true grouped by individuals ideologically congruent and ideologically incongruent with the news article (exploratory analysis).



5 Discussion

We offer new findings about the marginal effect of providing additional information on the discernment of news veracity in real-time. First, we present novel empirical results showing that access to the full text of an article (as opposed to just the headline and lede) improves news veracity discernment. Second, we offer an original contribution to the mixed findings surrounding the effect of source information on news veracity discernment by testing them in different formats (headline only and full text) and in real-time. Third, we find that encouraging individuals to search for information increases the likelihood an individual rates a *true* article as *true*, but it also increases increases the likelihood an individual rates a *false/misleading* article as *true* by a similar magnitude.

The positive effect of textual cues emphasizes the importance of how individuals come into contact with news stories online. Individuals may be more likely to believe misinformation if they are only exposed to the headline/lede of an article rather than the full text. Also, coming into contact with news stories as headlines/ledes with limited source information on social media could leave individuals less able to discern the veracity of news relative to having access to the online article where the full text and source information is clear. In addition, these findings help us assess previous studies that strictly expose respondents to the

headlines/ledes of articles rather than the full article. For example, prior studies that only expose respondents to the headline and ledes of articles are likely underestimating the ability of news consumers to correctly discern the veracity of news relative to when individuals have access to the full article. Although it is likely that most individuals come into contact with news in headline form (Gabielkov et al. 2016), it is important for our scientific understanding of this phenomenon to know that asking individuals to read the full story of articles they are exposed to improves the discernment of news veracity.

Our finding about source information may explain past conflicting results. We find that source information is particularly important when the cue is strong (individuals access the full news story on the news website), whereas it is weaker when the source cue is solely the logo of a publisher. This may explain past mixed results when studies attempt to identify the effect of source information on the veracity news discernment. Past work that did not identify an effect tested only presented source information, such as the name and logo (Austin and Dong 1994; Pennycook and Rand 2019b; Jakesch et al. 2019).

Our finding that online search increases belief in false/ misleading information is particularly concerning given that current digital media literacy guides recommend that individuals search for information when they come into contact with suspect news. It is also notable that in an exploratory analysis (not pre-registered) we do not find that this effect is solely concentrated among individuals who are ideologically congruent with the false article. It is possible that searching for information about a false/misleading news story nudges individuals towards believing it, as online search results may be returning similar articles that corroborate the claims in the initial article. Low-quality sources often re-use false/misleading news stories, and fact-checks about false narratives do not appear until well after publication. Therefore, directly after publication, search engine results for false/misleading news may be filled with other false/misleading stories that 'corroborate' non-credible claims. Assessing whether these speculations are correct is a critical subject for future research and further emphasizes the importance of our real-time study design.

Our findings are enabled by an innovative and transparent survey design that can be used by others to measure the efficacy of interventions designed to reduce belief in or the spread of misinformation (Vraga and Bode 2017; P. Moravec, Minas, and Dennis 2018; Clayton et al. 2019; Guess and Munger 2020) in real-time. Increasing the external and ecological validity of efficacy studies is crucial to testing and identifying interventions that can reduce the harms of online misinformation. To this end, three features of our study design offer contributions to this growing topic of inquiry: measuring discernment in real-time, selecting popular articles without researcher discretion, and maintaining consistent participant recruitment.

Of equal importance, our results have implications for organizations seeking to increase belief in true news and lower belief in false/misleading news. It appears that recommending that individuals travel to the actual online news article can increase news veracity discernment through two conduits: (1) by giving them access

to important textual cues and (2) giving them stronger source cues. Unfortunately, our results also indicate that digital media literacy guides may be contributing to higher belief in false news by recommending that individuals search for additional information online. More generally, this study underscores the importance of evidence-based interventions that are thoroughly tested, rather than intuitively designed.

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Supplementary Materials and Methods: Testing The Effect of Information on Discerning the Veracity of News in Real-Time

Authors' names withheld

Contents

A Partisan Lean of The Source

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

B Pre-Registered Hypotheses

B.1 Text Effect

H1.1 Respondents who are only given the headline and lede in standardized text of an article to evaluate are less likely to match the assessment of fact-checkers than those who are given the whole article in standardized text to evaluate.
H1.2 Respondents who are only given the headline and lede of an article to evaluate (with source information) are less likely to match the assessment of fact-checkers than those who are given the whole article to evaluate (with source information).

B.2 Source Information

H2.1 Respondents who evaluate the full standardized text from articles known for publishing fake news will be more likely to rate this story as true than respondents who evaluate the full article from their website (with the source information).
H2.2 Respondents who evaluate the full standardized text of a mainstream news article will be less likely to rate this story as true than respondents who evaluate the full article from their website (with the source information).
H2.3 Respondents who evaluate the headline and lede in standardized text from an article known for publishing fake news will be more likely to rate this story as true than respondents who evaluate the headline and lede from their website (with the source information).
H2.4 Respondents who evaluate the headline and lede in standardized text from a mainstream news article will be less likely to rate this story as true than respondents who evaluate the headline and lede from their website (with the source information).

B.3 External Information

H3.1 Individuals who are asked to search for evidence to help them evaluate a true news article that is rated true by professional fact checkers will be more likely to rate this story as true (i.e., correctly answer the assessment question) than respondents who are not asked to search for evidence to help them evaluate that same true news article.
H3.2 Individuals who are asked to search for evidence to help them evaluate a fake news article are less likely to match the assessment of fact-checkers than those who are not asked to search for evidence to help them evaluate that same fake news article.
H3.3 Individuals who are asked to search for evidence to help them evaluate a fake news article that is rated misleading/false by professional fact checkers will be more likely to rate this story as true (i.e., incorrectly answer the assessment question) than respondents who are not asked to search for evidence to help them evaluate that same fake news article.

C Hypotheses Not Tested in Paper: Ideologically Congruent Sources

It is also likely that news consumers also judge ideologically congruent news sources as more credible than ideologically incongruent news sources (Kahan et al. 2010; Metzger, Hartsell, and Flanagin 2020). Some work has even found that news consumers may judge biased but ideologically congruent sources as more credible than neutral sources (Vallone, Ross, and Lepper 1985; Clark III and Maass 1988). We test if providing access to source information increases the likelihood that a respondent sharing the ideological lean of a news source rates that news article as true (H2.5; H2.6) and if providing access to source information decreases the likelihood that a respondent sharing the opposite ideological lean of a news source rates that news article as true (H2.7; H2.8).

D Hypotheses Not Tested in Paper: Heterogenous Effects of Searching for Information

By collecting Google Search headlines we also test if the quality of external information one receives when searching for information affects an individual's ability to correctly rate fake news as such (H1.4). Given that individuals engage with external information differently (Britt et al. 2019), we also test if those with higher or lower levels of digital literacy, a characteristic of interest (Guess and Munger 2020), discern the veracity of news differently when they are confronted with external information. Previous work would predict that individuals with a high level of digital literacy are unaffected by low quality external information (H1.5), whereas individuals with a low level of digital literacy are less likely to match the assessment of fact-checkers when asked to access external information (H1.6).

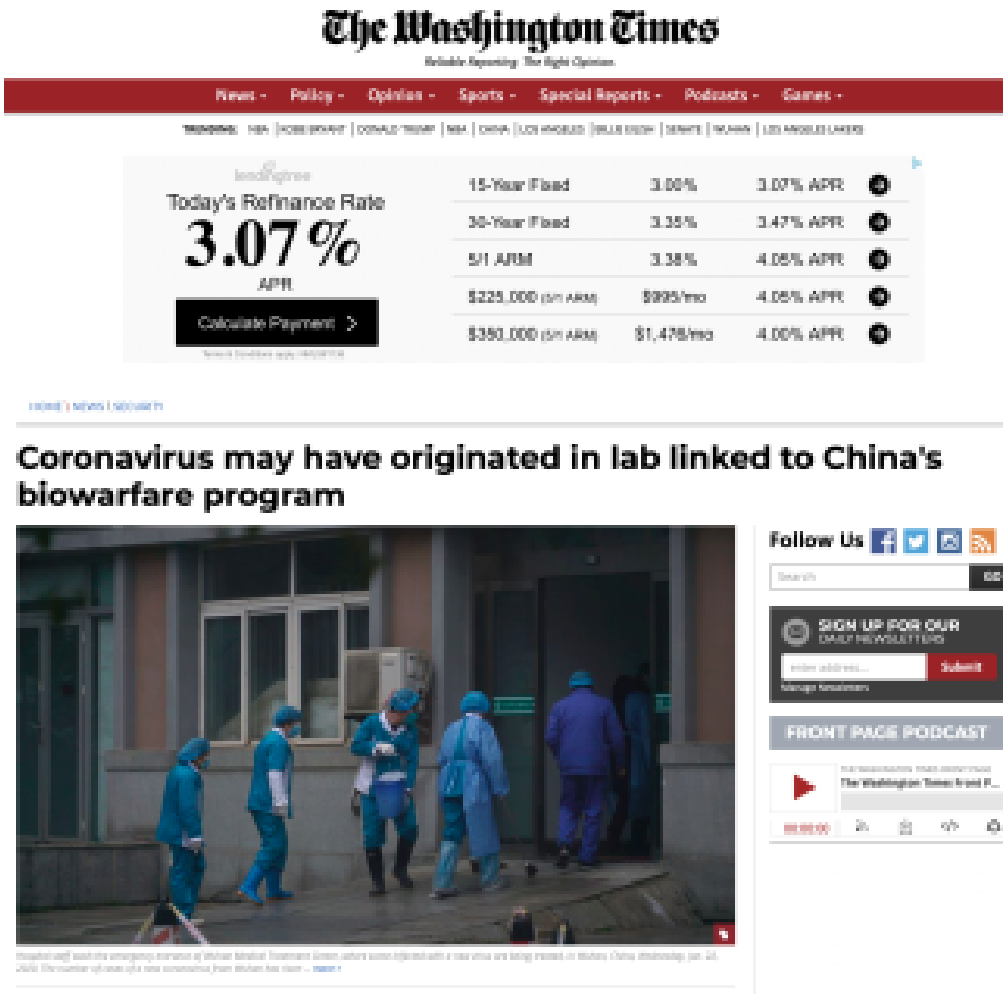
E Examples of Combinations of Information:

E.1 Just the headline and lede of the article in standardized text format without source information

Figure 1

E.2 Just the headline and lede of the article in standardized text format with source information

Figure 2



E.3 The full text of an article in standardized text format

Figure 3

Coronavirus may have originated in lab linked to China's biowarfare program

The deadly animal-borne coronavirus spreading globally may have originated in a laboratory in the city of Wuhan linked to China's covert biological weapons program, said an Israeli biological warfare analyst.

Radio Free Asia last week rebroadcast a Wuhan television report from 2015 showing China's most advanced virus research laboratory, known the Wuhan Institute of Virology. The laboratory is the only declared site in China capable of working with deadly viruses.

Dany Shoham, a former Israeli military intelligence officer who has studied Chinese biological warfare, said the institute is linked to Beijing's covert bio-weapons program.

"Certain laboratories in the institute have probably been engaged, in terms of research and development, in Chinese [biological weapons], at least collaterally, yet not as a principal facility of the Chinese BW alignment," Mr. Shoham told The Washington Times.

Work on biological weapons is conducted as part of dual civilian-military research and is "definitely covert," he said in an email.

Mr. Shoham holds a doctorate in medical microbiology. From 1970 to 1991, he was a senior analyst with Israeli military intelligence for biological and chemical warfare in the Middle East and worldwide. He held the rank of lieutenant colonel.

China has denied having any offensive biological weapons, but a State Department report last year revealed suspicions of covert biological warfare work.

A Chinese Embassy spokesman did not return an email seeking comment.

F Article Selection Process

F.1 Mainstream Sources

Mainstream Liberal News Sites:

- Yahoo News
- The New York Times
- The Huffington Post
- NBC News
- Politico
- CNN
- The Washington Post
- The Guardian
- USA Today
- CBS News

Mainstream Conservative News Sites:[1]

- Fox News
- The New York Post
- Real Clear Politics
- IJR
- The Washington Times
- CNBC
- The Wall Street Journal
- Newsmax
- Townhall

[1]Note that the conservative news group contains only nine websites. The Drudge report did not have a Facebook page, and therefore could not be followed on CrowdTangle. Since there were only ten conservative leaning websites in the top 100 list, we used the only nine that had Facebook pages.

F.2 Low-Quality Sources

Table 1: Low-Quality Conservative Sources

Number	Domain
1	dailywire.com
2	dailycaller.com
3	express.co.uk
4	redstatewatcher.com
5	thepoliticalinsider.com
6	thefederalistpapers.org
7	rightwingnews.com
8	madworldnews.com
9	yournewswire.com
10	uschronicle.com
11	louderwithcrowder.com
12	100percentfedup.com
13	angrypatriotmovement.com
14	ilovemyfreedom.org
15	clashdaily.com
16	joeforamerica.com
17	conservativedailypost.com
18	americasfreedomfighters.com
19	babylonbee.com
20	teaparty.org
21	judicialwatch.org
22	conservativepost.com
23	thegatewaypundit.com
24	infowars.com
25	eaglerising.com
26	en-volve.com
27	wnd.com
28	bb4sp.com
29	concealednation.org
30	theconservativetreehouse.com
31	dcclothesline.com
32	conservativefiringline.com
33	frontpagemag.com
34	endtimeheadlines.org
35	downtrend.com
36	nowtheendbegins.com
37	wearechange.org
38	neonnettle.com
39	powderedwigsociety.com
40	americanjournalreview.com
41	thehornnews.com
42	barenakedislam.com
43	rickwells.us

Table 2: Low-Quality Conservative Sources (Continued)

Number	Domain
44	ahtribune.com
45	ipatriot.com
46	afa.net
47	eutimes.net
48	thepeoplescube.com
49	stateofthenation2012.com
50	fellowshipoftheminds.com
51	trunews.com
52	freerepublic.com
53	mediamass.net
54	endoftheamericandream.com
55	2ndvote.com
56	iotwreport.com
57	puppetstringnews.com
58	dailyheadlines.net
59	thenationalpatriot.com
60	rogue-nation3.com
61	veteransfordonaldtrump.com

Table 3: Low-Quality Liberal Sources

Number	Domain
1	occupydemocrats.com
2	bipartisanreport.com
3	palmerreport.com
4	crooksandliars.com
5	democraticunderground.com
6	halfwaypost.com

Table 4: Low-Quality Unclear Sources

Number	Domain
1	ijr.com
2	anonhq.com
3	inquisitr.com
4	worldtruth.tv
5	collective-evolution.com
6	tribunist.com
7	naturalnews.com
8	worldnewsdailyreport.com
9	trueactivist.com
10	firstpost.com
11	zerohedge.com
12	disclose.tv
13	dailysnark.com
14	postcard.news
15	higherperspectives.com
16	dailypost.ng
17	davidwolfe.com
18	noticias-frescas.com
19	healthnutnews.com
20	beforeitsnews.com
21	truthuncensored.net
22	awarenessact.com
23	duffelblog.com
24	nation.com.pk
25	actualidadpanamericana.com
26	themindunleashed.com
27	huzlers.com
28	dennismichaellynch.com
29	rearfront.com
30	actualite.co
31	activistpost.com
32	newzmagazine.com
33	12minutos.com
34	dailyoccupation.com
35	newsrescue.com
36	the-postillon.com
37	burrardstreetjournal.com
38	empirenews.net
39	medicalkidnap.com
40	friendsofsyria.wordpress.com
41	realnewsrightnow.com
42	adobochronicles.com
43	anonews.co

Table 5: Low-Quality Unclear Sources (Continued)

Number	Domain
44	thenationalmarijuananews.com
45	en.mediamass.net
46	daily-sun.com
47	whatdoesitmean.com
48	therooster.com
49	thelastamericanvagabond.com
50	stillnessinthestorm.com
51	independentminute.com
52	newsbiscuit.com
53	attitude.co.uk
54	onlysimchas.com
55	dailyfeed.news
56	newsjustforyou1.blogspot.com
57	thebreakingnews.co
58	usanewstoday.com

G Articles Evaluated:

G.1 Study 1: Testing The Marginal Effect of External Information

Table 6: Headlines for Articles Chosen from the Low Quality Liberal News Stream in Study I

	Date	Headline	Modal Fact Checker Rating	Topic	Lean of Article
1	11/20/19	Lt. Col. Vindman: 'This Is America...Here, Right Matters'	True	Political/Economy	Liberal
2	11/21/19	Sondland's testimony directly implicates Trump, Pence and Pompeo in Ukraine quid pro quo plot	True	Political/Economy	Liberal
3	12/3/19	The sealed "Indictment A" that Donald Trump needs to worry about more than ever	False/Misleading	Political/Economy	Liberal
4	12/4/19	Devin Nunes Shamelessly Lies When Hannity Asks About Lev Parnas	False/Misleading	Political/Economy	Liberal
5	12/5/19	Trump caught by reporters patting himself on back for insulting Justin Trudeau	True	Political/Economy	Liberal
6	12/9/19	Ex-Intel Slam Trump For Sucking Up To Saudis After Navy Shooting	True	Political/Economy	Liberal
7	12/10/19	Nancy Pelosi knows something we don't	False/Misleading	Political/Economy	Neutral
8	12/11/19	Tucker Carlson's White Power Hour Guest: AOC's District Is The 'Least American'	True	Political/Economy	Liberal
9	1/6/20	Schiff Hammers President & GOP Over Impeachment Trial Obstruction	True	Political/Economy	Liberal
10	1/7/20	Everything is falling apart for Donald Trump in real time	True	Political/Economy	Liberal

Table 7: Headlines for Articles Chosen from the Low Quality Conservative News Stream in Study I

	Date	Headline	Modal Fact Checker Rating	Topic	Lean of Article
1	11/20/19	No Shots Fired! Citizen with a Gun Ends Gunman's Attack at Oklahoma Walmart	False/Misleading	Political/Economy	Conservative
2	11/21/19	Indictment Against Head Of Burisma Reveals 'Hunter Biden Was Receiving Payments From Money Raised Through Criminal Means, Siphoned, Laundered From Ukraine'	False/Misleading	Political/Economy	Conservative
3	12/3/19	Donald Trump SLAMS Corbyn's NHS lies 'We want nothing to do with it!'	False/Misleading	Political/Economy	Neutral
4	12/4/19	In 2018, 86% of Those Arrested for Violent Crime in Los Angeles Were Non-White (5% Were White): the City Is 28% White	False/Misleading	Political/Economy	Conservative
5	12/5/19	DING! DING! DING! First Muslim woman elected to Pennsylvania House of Representatives has been ARRESTED for stealing $500,000 from a charity	True	Political/Economy	Conservative
6	12/9/19	NEVER TRUMPER RICK WILSON SUGGESTS PUTTING ANTI-VAXXERS IN "RE-EDUCATION CAMPS"	True	Political/Economy	Conservative
7	12/10/19	Breaking: Ukrainian Official Reveals Six Criminal Cases Opened In Ukraine Involving The Bidens	False/Misleading	Political/Economy	Conservative
8	12/11/19	Ukraine Advisor Disputes Key Point In Impeachment Testimony — Is This Bad News For Democrats?	False/Misleading	Political/Economy	Conservative
9	1/6/20	NEARLY 200 PEOPLE ARRESTED ACROSS AUSTRALIA FOR DELIBERATELY STARTING BUSHFIRES	False/Misleading	Science	Conservative
10	1/7/20	Iran stampede: '35 dead' and dozens injured after huge crush at Qassem Soleimani funeral	True	Political/Economy	Neutral

Table 8: Headlines for Articles Chosen from the Mainstream Conservative News Stream in Study I

	Date	Headline	Modal Fact Checker Rating	Topic	Lean of Article
1	11/20/19	Key impeachment witness dodges GOP questions to protect whistleblower	True	Political/Economy	Neutral
2	11/21/19	Smollet Claims He Suffered 'Extreme Emotional Distress' in Malicious Prosecution Lawsuit Against Chicago	True	Human Interest	Neutral
3	12/3/19	Marine veteran turned congressional candidate calls Kaepernick a 'national disgrace'	True	Political/Economy	Conservative
4	12/4/19	Devin Nunes slaps CNN with $435 million defamation lawsuit	True	Political/Economy	Neutral
5	12/5/19	Angry Melania Slams Impeachment Witness for Joking About Son	True	Political/Economy	Conservative
6	12/9/19	Walmart apologizes for sweater featuring Santa with cocaine	True	Human Interest	Neutral
7	12/10/19	Joe Biden Claims No One Told Him About Potential Conflict of Interest With Hunter's Job at Burisma	True	Political/Economy	Conservative
8	12/11/19	House Democrats announce articles of impeachment against Trump: Abuse of power, obstruction of Congress	True	Political/Economy	Neutral
9	1/6/20	Ricky Gervais blasts Hollywood figures as unprincipled, ignorant at Golden Globes	True	Human Interest	Neutral
10	1/7/20	Pelosi Says the House Will Vote on a Resolution to Limit Trump's Military Actions Regarding Iran	True	Political/Economy	Neutral

Table 9: Headlines for Articles Chosen from the Mainstream Liberal News Stream in Study I

	Date	Headline	Modal Fact Checker Rating	Topic	Lean of Article
1	11/20/19	Woman Saves Scorched Koala From Bushfire With Shirt Off Her Own Back	True	Science	Neutral
2	11/21/19	Almaas Elman, Somali-Canadian Activist, Is Shot Dead in Mogadishu	True	Political/Economy	Neutral
3	12/3/19	Duncan Hunter To Plead Guilty In Campaign Finance Case He Called 'Witch Hunt'	True	Political/Economy	Neutral
4	12/4/19	Kamala Harris Dropping Out Of Presidential Race	True	Political/Economy	Neutral
5	12/5/19	'He Showed Us Life': Japanese Doctor Who Brought Water to Afghans Is Killed	True	Human Interest	Neutral
6	12/9/19	Caroll Spinney, legendary 'Sesame Street' puppeteer of Big Bird, dies at 85	True	Human Interest	Neutral
7	12/10/19	Megan Rapinoe is Sports Illustrated's Sportsperson of the Year, only the fourth woman chosen alone	True	Human Interest	Neutral
8	12/11/19	Police Chief Tears Into Ted Cruz, McConnell For Caring More About NRA Than Gun Victims	True	Political/Economy	Neutral
9	1/6/20	Mike Pence Slammed After Falsely Linking Qassem Soleimani To 9/11	True	Political/Economy	Liberal
10	1/7/20	Pentagon Rules Out Striking Iranian Cultural Sites, Contradicting Trump	True	Political/Economy	Liberal

Table 10: Headlines for Articles Chosen from the Low Quality Unclear News Stream in Study I

	Date	Headline	Modal Fact Checker Rating	Topic	Lean of Article
1	11/20/19	Pounds lost doesn't mean FAT lost: You CAN lose up to 2 pounds of fat a month – but it takes consistency and patience	False/Misleading	Science	Neutral
2	11/21/19	Ukrainian MP Claims $7.4 Billion Obama-Linked Laundering, Puts Biden Group Take At $16.5 Million	False/Misleading	Political/Economy	Conservative
3	12/3/19	Americans Bought Enough Guns on Black Friday to Arm the Marine Corps – Yet Again!	True	Political/Economy	Unclear
4	12/4/19	Ukrainian Neo-Nazis Help Out at Hong Kong Riots, Pan-Democrats Defend Them	Could Not Determine	Political/Economy	Unclear
5	12/5/19	China Repeats US Must Reduce Tariffs For "Phase One" Trade Deal	True	Political/Economy	Neutral
5	12/9/19	Biden Denies Wrongdoing in Ukraine During Testy Interview	True	Political/Economy	Conservative
7	12/10/19	Stressed to the Max? Deep Sleep Can Rewire the Anxious Brain	True	Science	Neutral
8	12/11/19	Since Feeding the Homeless is Illegal, Activists Carry AR-15s to Give Out Food, Supplies	False/Misleading	Political/Economy	Conservative
9	1/6/20	Senate Republican Eyes Rule Change to Kick Start Trump Impeachment Trial	True	Political/Economy	Neutral
10	1/7/20	Iran Evaluating 13 Retaliation Scenarios To Inflict "Historic Nightmare" On US	True	Political/Economy	Conservative

G.2 Study 2: Testing The Marginal Effect of Full Text And Source Information

Table 11: Headlines for Articles Chosen from the Low Quality Liberal News Stream in Study 2

	Date	Headline	Modal Fact Checker Rating	Topic	Lean of Article
1	1/8/20	Trump bewilders nation by tweeting “all is well” and “so far so good” after Iran’s missile strike	True	Political/Economy	Liberal
2	1/9/20	John Bolton Will Testify If Subpoenaed, So Why Aren’t House Dems Doing That?	No Mode	Political/Economy	Liberal
3	1/13/20	New Trump Approval Poll Released Confirms Massive 2020 Blue Wave	False/Misleading	Political/Economy	Liberal
4	1/14/20	Donald Trump’s GOP Senate allies have just been backed into a no-win corner	No Mode	Political/Economy	Liberal
5	1/15/20	Newly released texts from Giuliani collaborator appear to show them stalking Amb. Yovanovich	True	Political/Economy	Liberal
6	1/21/20	Even C-SPAN Is Cut Off From Covering Senate Impeachment Trial	True	Political/Economy	Liberal
7	1/22/20	Schiff Opening Impeachment Trial Statement To Go Down In History	True	Political/Economy	Liberal
8	1/23/20	Donald Trump just screwed up and blew a gaping hole in his own impeachment trial strategy	No Mode	Political/Economy	Liberal
9	1/27/20	Damning potential John Bolton Ukraine impeachment testimony revealed in early leak of book draft	True	Political/Economy	Liberal
10	1/28/20	Joni Ernst Gives Away The Ballgame On Joe Biden	No Mode	Political/Economy	Liberal

Table 12: Headlines for Articles Chosen from the Low Quality Conservative News Stream in Study 2

	Date	Headline	Modal Fact Checker Rating	Topic	Lean of Article
1	1/8/20	Muslim Teen Accused Of Starting Aussie Grass Fire Laughs As He Leaves Court On Tuesday	False/Misleading	Science	Conservative
2	1/9/20	Third busiest abortion facility in Massachusetts could soon shut its doors	True	Political/Economy	Conservative
3	1/13/20	Why Are Volcanoes All Over The Globe Suddenly Shooting Giant Clouds Of Ash Miles Into The Air?	False/Misleading	Science	Neutral
4	1/14/20	Wisconsin Judge Orders Up to 209,000 Listings Purged from Voter Rolls — Finds 3 in Contempt, Orders Fines for Delay	True	Political/Economy	Conservative
5	1/15/20	Bloomberg Draws Paltry Crowd Of 45 At Heavily Advertised Rally	Could Not Determine	Political/Economy	Conservative
6	1/21/20	Pentagon bans Bible verses on dog tags, while Pres. Trump upholds right to pray in public schools	False/Misleading	Political/Economy	Conservative
7	1/22/20	LEAKED FRENCH INTERNAL INTELLIGENCE REPORT CLAIMS 150 NEIGHBORHOODS 'HELD' BY RADICAL ISLAMISTS	No Mode	Political/Economy	Conservative
8	1/23/20	Coronavirus outbreak: China seals off SECOND major city - 18m people on lockdown	True	Science	Neutral
9	1/27/20	Lawmakers Pushing to Make Michigan a 2nd Amendment Sanctuary STATE	True	Political/Economy	Conservative
10	1/28/20	Holy Moses! More Than 175,000 Tickets Requested To See President Trump In New Jersey — Supporters Line Up 48 Hours Early	False/Misleading	Political/Economy	Conservative

Table 13: Headlines for Articles Chosen from the Mainstream Conservative News Stream in Study I

	Date	Headline	Modal Fact Checker Rating	Topic	Lean of Article
1	1/8/20	Climate Change? Turns Out Two Dozen Arrested for Setting Australia's Fires	False/Misleading	Science	Conservative
2	1/9/20	Cardi B bashes Trump, says she's seeking Nigerian citizenship amid tensions with Iran	True	Political/Economy	Neutral
3	1/13/20	Bill Gates: My $109 billion net worth shows the economy is not fair	True	Political/Economy	Neutral
4	1/14/20	Trump, first lady cheered at national championship game	True	Political/Economy	Neutral
5	1/15/20	President Trump Gets Thunderous Applause at Clemson and LSU National Championship Game	True	Political/Economy	Conservative
6	1/21/20	Virginia's Capitol flooded with gun rights activists for Second Amendment rally	True	Political/Economy	Conservative
7	1/22/20	CDC confirms first US case of coronavirus that has killed 9 in China	True	Science	Neutral
8	1/23/20	Three US firefighters killed in plane crash while battling wildfires in Australia	True	Science	Neutral
9	1/27/20	Coronavirus may have originated in lab linked to China's biowarfare program	No Mode	Science	Neutral
10	1/28/20	Dershowitz calls out House Dems in Trump's Senate impeachment trial after Bolton shock waves	True	Political/Economy	Conservative

Table 14: Headlines for Articles Chosen from the Mainstream Liberal News Stream in Study I

	Date	Headline	Modal Fact Checker Rating	Topic	Lean of Article
1	1/8/20	All is well,' Trump tweets after Iran targets U.S. forces in missile attack in Iraq	True	Political/Economy	Neutral
2	1/9/20	Ruth Bader Ginsburg says she is cancer-free	True	Political/Economy	Neutral
3	1/13/20	Serena Williams wins first title in 3 years — and donates prize money to Australia wildfire relief	True	Human Interest	Neutral
4	1/14/20	The first Obama-backed documentary receives an Oscar nomination	True	Human Interest	Neutral
5	1/15/20	More than 50 injured after Delta jet dumps fuel on L.A. schools during midair emergency	True	Human Interest	Neutral
6	1/21/20	Katie Sowers Is The First Female And Openly Gay Person To Coach In A Super Bowl	True	Human Interest	Neutral
7	1/22/20	Weather service issues alert for falling iguanas as temperatures drop in Florida	True	Science	Neutral
8	1/23/20	Half of Americans don't know 6m Jews were killed in Holocaust, survey says	True	Political/Economy	Neutral
9	1/27/20	Kobe Bryant's Daughter Gianna, 13, Dead Alongside Father in Calabasas Helicopter Crash	True	Human Interest	Neutral
10	1/28/20	Today really hurts': Families, friends remember those who died in Kobe Bryant crash	True	Human Interest	Neutral

Table 15: Headlines for Articles Chosen from the Low Quality Unclear News Stream in Study I

	Date	Headline	Modal Fact Checker Rating	Topic	Lean of Article
1	1/8/20	Key Brain Region Smaller in Birth Control Pill User	True	Science	Neutral
2	1/9/20	The US Military Pollutes More 140 Countries Combined	True	Science	Liberal
3	1/13/20	Alaska man survives three weeks with little food and shelter	True	Human Interest	Neutral
4	1/14/20	Boeing Mocked Lion Air "Idiots" For Requesting Extra Training For 737 MAX	True	Human Interest	Unclear
5	1/15/20	300 Vultures Occupy Border Patrol Tower, Covering It With "Corrosive" Feces & Vomit	True	Human Interest	Neutral
6	1/21/20	PUNISHING ECONOMY: San Fran's Democrat tyrants double down on closed businesses, taxing landlords for leaving stores vacant	False/Misleading	Political/Economy	Conservative
7	1/22/20	Another Supposedly Authentic Photo Of A UFO & The Story Behind It	No Mode	Human Interest	Neutral
8	1/23/20	China Quarantines 3rd City As Wuhan Virus Spreads To Singapore	True	Science	Neutral
9	1/27/20	Nature Science Journal Warned About "Pathogens Escaping" Wuhan Level-4 Biosafety Lab (BSL-4) Before Coronavirus Outbreak	False/Misleading	Science	Unclear
10	1/28/20	Death Tolls Rises to 106 as 1,000 Americans Try to Evacuate From Coronavirus-Infected Wuhan	True	Science	Neutral

H Model Results For Each Individual Hypothesis

Table 16: Measuring Effect of Additional Information on Matching the Fact-Checker's Evaluation

	Dependent variable:			
	(H1.1)	(H1.2)	(H3.1)	(H3.2)
Treatment (Full Text)	0.059***	0.090***		
	(0.011)	(0.011)		
Treatment (Search)			0.059**	−0.015
			(0.021)	(0.021)
Education	−0.001	0.006	−0.007	0.019*
	(0.005)	(0.005)	(0.009)	(0.009)
Age	−0.001	−0.0003	−0.003***	0.002**
	(0.0004)	(0.0004)	(0.001)	(0.001)
Gender (Male)	0.030**	0.048***	0.034	−0.018
	(0.011)	(0.011)	(0.021)	(0.021)
Income	0.009	0.001	−0.004	−0.006
	(0.006)	(0.006)	(0.012)	(0.012)
Ideology	−0.009**	−0.012***	0.018**	−0.034***
	(0.003)	(0.003)	(0.006)	(0.006)
Observations	2275	8910	8764	
R-squared	0.023	0.006	0.012	
Adj. R-squared	0.02	0.005	0.012	
F-Statistic	7.482***	7.599***	15.635***	
Note:				*p<0.05; **p<0.01; ***p<0.001

Table 17: Measuring Effect of Additional Information on Rating an Article as True

	Dependent variable:				
	(H2.1)	(H2.2)	(H2.3)	(H2.4)	(H3.3)
Treatment (Source)	-0.071^{***}	0.043^{**}	-0.063^{***}	-0.018	
	(0.015)	(0.013)	(0.015)	(0.015)	
Treatment (Search)					0.072^{***}
					(0.014)
Education	-0.011	0.005	-0.008	0.010	0.021^{***}
	(0.007)	(0.006)	(0.007)	(0.007)	(0.006)
Age	0.0001	0.0001	-0.001^{*}	-0.001^{*}	-0.0002
	(0.0005)	(0.0004)	(0.001)	(0.001)	(0.0004)
Gender (Male)	0.044^{**}	0.033^{*}	0.057^{***}	0.035^{*}	0.035^{*}
	(0.015)	(0.014)	(0.015)	(0.015)	(0.014)
Income	-0.004	0.006	0.007	-0.001	-0.002
	(0.008)	(0.008)	(0.009)	(0.009)	(0.008)
Ideology	-0.017^{***}	0.002	-0.004	0.014^{**}	-0.028^{***}
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)
Observations	2275	6269	4975	4141	4749
R-squared	0.018	0.021	0.011	0.006	0.01
Adj. R-squared	0.015	0.02	0.009	0.004	0.008
F-Statistic	6.01^{***}	18.978^{***}	7.726^{***}	3.271^{***}	6.543^{***}
Note:					*p<0.05; **p<0.01; ***p<0.001

I Model Results For Each Individual Hypothesis Without Conditioning on Other Covariates

Table 18: Measuring Effect of Additional Information on Matching the Fact-Checker's Evaluation Without Conditioning on Control Variables

	Dependent variable:			
	(H1.1)	(H1.2)	(H3.1)	(H3.2)
Treatment (Full Text)	0.058***	0.087***		
	(0.011)	(0.011)		
Treatment (Search)			0.064**	−0.014
			(0.021)	(0.021)
Observations	2275	8910	8764	
R-squared	0	0.003	0.008	
Adj. R-squared	0	0.003	0.008	
F-Statistic	0.518***	30.473***	67.612***	
Note:				*p<0.05; **p<0.01; ***p<0.001

Table 19: Measuring Effect of Additional Information on Rating an Article as True Without Conditioning on Control Variables

	Dependent variable:				
	(H2.1)	(H2.2)	(H2.3)	(H2.4)	(H3.3)
Treatment (Source)	-0.072^{***}	0.044^{**}	-0.062^{***}	-0.016	
	(0.015)	(0.013)	(0.015)	(0.015)	
Treatment (Search)					0.072^{***}
					(0.014)
Observations	2275	6269	4975	4141	4749
R-squared	0.005	0.005	0.005	0.003	0.004
Adj. R-squared	0.004	0.005	0.005	0.002	0.004
F-Statistic	10.603^{***}	34.468^{***}	25.694^{***}	11.145^{***}	18.334^{***}
Note:					*p<0.05; **p<0.01; ***p<0.001

J Model Results Using Ordinal Scale

Table 20: Measuring Effect of Additional Information on Rating an Article as True (Likert Score)

	Dependent variable:				
	(H2.1)	(H2.2)	(H2.3)	(H2.4)	(H3.3)
Treatment (Source)	-0.296^{***}	0.043^{**}	-0.262^{***}	-0.087	
	(0.050)	(0.013)	(0.051)	(0.053)	
Treatment (Search)					0.160^{*}
					(0.079)
Education	-0.047^{*}	0.005	0.003	0.051^{*}	-0.012
	(0.022)	(0.006)	(0.024)	(0.024)	(0.036)
Age	0.002	0.0001	-0.002	0.002	-0.010^{***}
	(0.002)	(0.0004)	(0.002)	(0.002)	(0.002)
Gender (Male)	0.144^{**}	0.033^{*}	0.129^{*}	0.074	0.025
	(0.050)	(0.014)	(0.052)	(0.053)	(0.079)
Income	-0.031	0.006	0.055	0.014	-0.004
	(0.028)	(0.008)	(0.030)	(0.030)	(0.045)
Ideology	-0.075^{***}	0.002	-0.041^{*}	0.056^{***}	0.117^{***}
	(0.015)	(0.004)	(0.016)	(0.016)	(0.025)
Observations	2275	6269	4975	4141	4749
R-squared	0.022	0.021	0.016	0.006	0.012
Adj. R-squared	0.019	0.02	0.015	0.004	0.01
F-Statistic	7.204^{***}	18.978^{***}	11.84^{***}	3.271^{***}	7.884^{***}
Note:					*p<0.05; **p<0.01; ***p<0.001

K Model Results Using Logistic Regression

Table 21: Measuring Effect of Additional Information on Matching the Fact-Checker's Evaluation - Categorical (Logistic Regression)

	Dependent variable:			
	(H1.1)	(H1.2)	(H3.1)	(H3.2)
Treatment (Full Text)	0.059***	0.364***		
	(0.011)	(0.046)		
Treatment (Search)			0.305***	−0.072
			(0.059)	(0.096)
Education	−0.001	0.023	0.091***	0.085
	(0.005)	(0.021)	(0.027)	(0.044)
Age	−0.001	−0.001	−0.001	0.009**
	(0.0004)	(0.001)	(0.002)	(0.003)
Gender (Male)	0.030**	0.195***	0.148*	−0.082
	(0.011)	(0.046)	(0.060)	(0.097)
Income	0.009	0.004	−0.010	−0.027
	(0.006)	(0.026)	(0.034)	(0.055)
Ideology	−0.009**	−0.051***	−0.121***	−0.159***
	(0.003)	(0.013)	(0.017)	(0.028)
Observations	2275	3809	8764	
R-squared	0.023	0.006	0.012	
Adj. R-squared	0.02	0.005	0.011	
Note:				*p<0.05; **p<0.01; ***p<0.001

L Adjusting for Multiple Hypotheses

Table 22: Unadjusted and Adjusted P-Values Testing Each Hypothesis

	(H1.1)	(H1.2)	(H2.1)	(H2.2)	(H2.3)	(H2.4)	(H3.1)	(H3.2)	(H3.3)
Unadjusted P-Value	0	0	0	0.0013	0	0.2244	0	0.458	0.0047
P-Value (FDR Adjusted)	0	0	0	0.002	0	0.2524	0	0.458	0.006
P-Value (Bonferroni Adjusted)	0	0	0	0.0117	0	1	0	1	0.0423

M Inter-Rater Reliability for Ideological lean of Articles

We determine the partisan lean of the articles by asking four independent coders to determine the partisan perspective of the article (conservative, liberal, neutral and unclear). The partisan lean was determined by taking the modal evaluation of the coders. When there was no modal evaluation, or there was a tie, the evaluation of a graduate student was used as the tiebreaker. Coders were asked to use only the headline and content of the article to make their determination. The following guidance was given to raters for selecting the partisan perspective:

Articles that are clearly written from a partisan perspective should be classified according to whichever direction that is, even if the article is not completely supportive of the political party that shares that ideology. Articles that are clearly advocating for one side of the political spectrum should be classified as leaning that way. Importantly, just because partisans may feel differently about an article, does not mean the article does not have a neutral perspective. For example, "Trump Impeached" may induce very different reactions among liberals and conservatives, but the article could still be neutral so long as it reports on this event objectively. Conversely, "Trump is a Crook" likely has a liberal perspective. Importantly, neutral articles are those where the perspective is balanced and appears to show no bias. Unclear articles are those where the perspective does not appear to be any of the three above or you are unable to make a clear determination. The level of agreement and Fleiss Kappa for these ratings are listed below:

Table 23: Inter-Rater Reliability Statistics for Ideological Perspective of Articles

Coding Task	Group of Articles	Agreement	Fleiss Kappa
Partisan lean of of articles (4 categories)	All Articles	57.14	0.62

N Financial Incentive Experiment

Over ten days during Study I (December 16th, 2019 - February 6th, 2020), 13 different false/misleading articles were evaluated by individuals in our control group (N = 1,250) and those who were given a financial incentive for the correct answer (N = 1,249). We found very little difference in the evaluations of individuals. We display a comparison in the proportion of responses for false/misleading articles and True articles in Figure 4 and Figure 5 respectively.

Figure 4: This figure presents the proportion of evaluations for *false/misleading* articles for those given extra financial incentive and those not given an extra financial incentive.

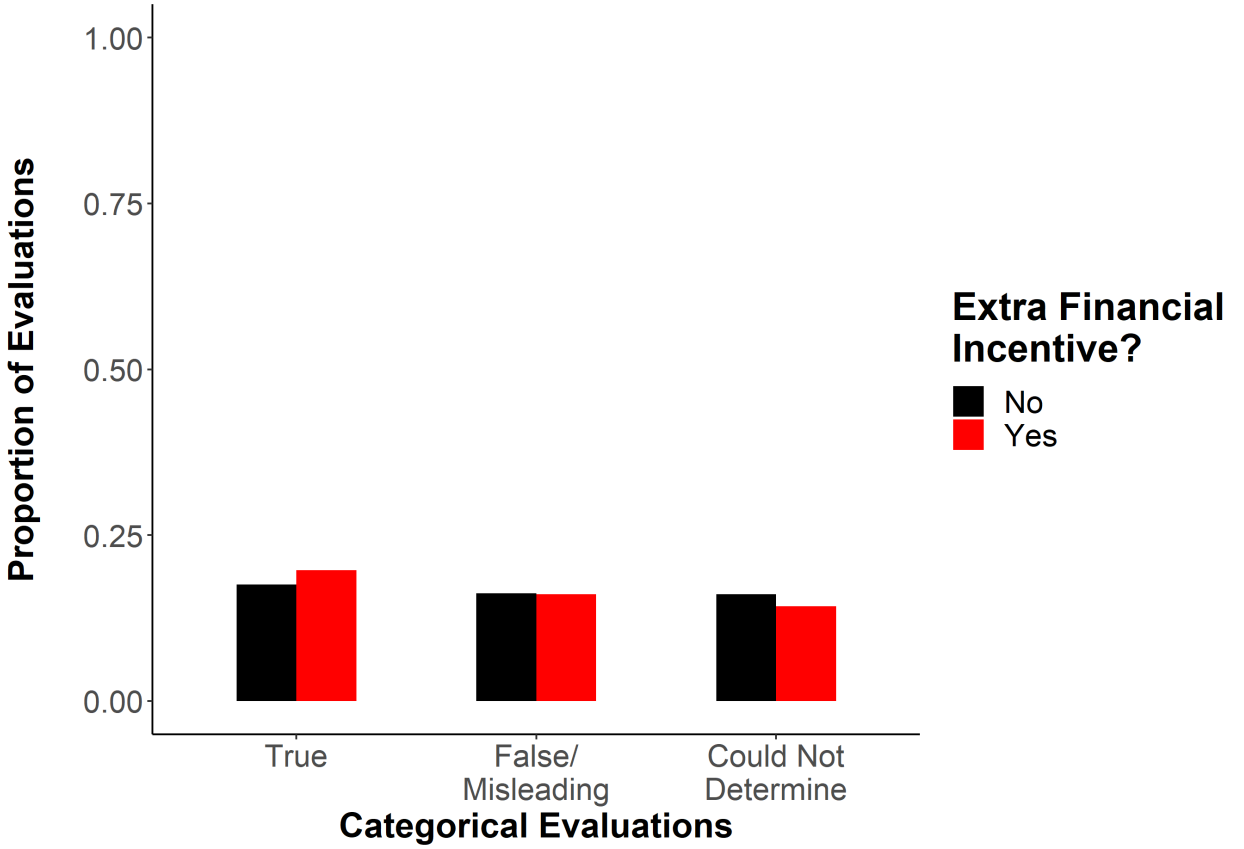
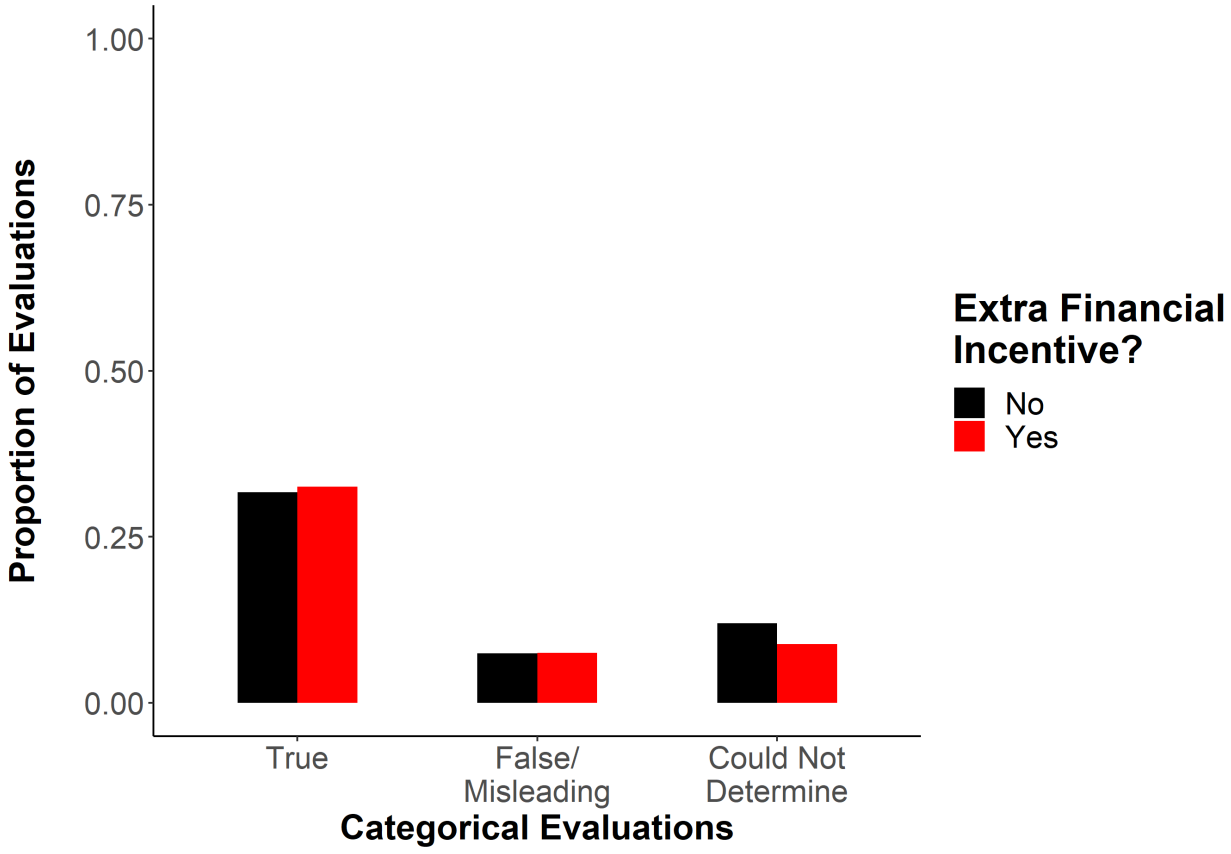


Figure 5: This figure presents the proportion of evaluations for *true* articles for those given extra financial incentive and those not given an extra financial incentive.



O Correlation Between Ordinal and Categorical Measures of Veracity

Table 24: Measuring Correlation Between Evaluating an Article as True on the Ordinal Measure of Perceived Veracity

	Dependent variable:
	(1)
Categorical Measure (True)	2.501***
	(0.014)
Constant	3.585***
	(0.011)
Observations	45433
R-squared	0.527
Adj. R-squared	0.527
F-Statistic	30279.203***
Note:	*p<0.05; **p<0.01; ***p<0.001

P Inter-Rater Reliability for Veracity Evaluations by Professional Fact-Checkers of Articles

Table 25: Inter-Rater Reliability Statistics for Veracity Evaluations of Articles

Coding Task	Group of Articles	Agreement	Fleiss Kappa
Veracity of Article (3 categories)	All Articles in Both Experiments	46.67	0.4

Q Measuring Variables of Interest

Cognitive Reflection: Cognitive Reflection is measured using four questions from a cognitive reflection test used by Thomson and Oppenheimer (2016). Each respondent answers this set of questions once. The variable starts at 0 and one unit is added to the variable for each correct answer (A value of one is assigned to this variable if the respondent has one correct answer; a value of two is assigned to this variable if the respondent has two correct answers, etc.).

Digital Literacy: Digital literacy is measured by asking for respondent's familiarity with the following terms: Phishing; Hashtag; Preference Setting; Wiki; PDF; Malware; RSS; BCC (on email); Tablet; Tagging. We ask them for their familiarity on a five point scale (1 representing no understanding and 5 representing full understanding). The digital literacy score for each respondent is the average of the scores across these categories.

Ideology of respondent: We ask individuals to self-identify their ideology using the following question. The score they receive on the ideological scale is in parentheses next to the answer they give.

Question: Where would you place yourself on this scale?

(A) Extremely Conservative (3)
(B) Conservative (2)
(C) Slightly Conservative (1)
(D) Moderate (0)
(E) Slightly Liberal (-1)
(F) Liberal (-2)
(G) Extremely Liberal (-3)
(H) Haven't Thought Much About it (NA)

Education: We ask individuals to self-identify their highest degree earned and attribute the following numeric value to each answer: No High School education (0); High School Education (1); Associates Degree (2); Bachelors Degree (3); Masters Degree (4); Doctorate Degree

Income: We ask individuals to self-identify their income from last year and attribute the following numeric value to each answer: $0 - $50,000 (0); $50,000 - $100,000 (1); $100,000 - $150,000 (2); $150,000 plus (3)

Familiarity with an Article: For each article we ask the respondent the following question.
Have you seen or heard of this story before?
(A) Yes
(B) No
(C) Not Sure

If a respondent answers "Yes", they are familiar with the story and the variable $Familiarity\_Dummy_{ij}$ is assigned a value of 1. Otherwise it is assigned a zero.

R Detailed Sampling and Demographic Characteristics

With these hypotheses in mind, we next turn to describing our recruiting strategy, how we sample the true and false/misleading articles to be evaluated by our respondents, and the experimental design in the three sections below.

R.1 Recruiting Respondents

Qualtrics recruits individuals through various panels. These panelists are then randomly assigned by Qualtrics, at our instruction, to versions of the survey that implement the various treatment or control conditions outlined in the previous section. Each participant was paid for their participation in either airline miles or direct transfers of money upon completion of our 15-minute survey.[2] An opt-in internet survey administered by Qualtrics is ideal for this task given that existing research has found that experimental results identified using a gold-standard probability sample are often comparable to effects identified using an opt-in online panel (Mullinix et al. 2015).[3] Although some opt-in surveys suffer from a lack of effort among participants, we found that offering higher levels of incentives did not change the answers we received.[4]
In Study 1, we tested the different components of H1 & H2 (the effect of full text vs. just headline and lede and the effect of providing source information or not) by sending out surveys and asking respondents to evaluate articles on ten separate days beginning on January 8, 2020 and ending on February 1, 2020. Over this period, we recruited 7,274 unique respondents who were assigned to the different treatment categories laid out in Figure **??** (Section 2.1). Study 2 tested the effect of searching for additional information online and sent out surveys to evaluate articles on ten separate days beginning on November 21, 2019 and ending on January 7, 2020. Over this period, we recruited 3,006 survey respondents who were assigned to either a treatment or control condition as laid out in Figure **??** (Section 2.3).
The groups of survey respondents were balanced every day in each article group by ideology,[5] gender,[6] age,[7] and education.[8] The full demographic breakdown is presented in Tables 26 and 27 below. We also report difference means between the groups of respondents in Tables 28 and 29 and find very little differences between each group of respondents evaluating articles with different levels of information. The only substantial and statistically significant difference is that respondents evaluating the articles with the most information (full text and the source) are between 3 and 4 years older on average than respondents evaluating the other types of articles. Given that 4 years is less than 0.25 standard deviations of age within the whole sample of respondents and that we control for age in our models, this should not meaningfully impact the inference we can make from the results presented in this paper.

[2]Not all respondents are paid the same amount, as it is up to both the participant and the vendor (Qualtrics) to negotiate terms.

[3]An added advantage of using Qualtrics for our particular study is that online sampling predominately recruits those in whom we are actually most interested: in, frequent users of the internet who are most likely to consume online news. Thus even if our results are less likely to be generalizable to overall population, they are still likely to be generalizable to the population that consumes news online more than other recruiting techniques such as in-person surveys.

[4]In a parallel study that paid respondents additional payments for correct answers to our veracity question, we did not find any difference in responses. Figures displaying these results are located in section J of the supplementary materials.

[5]1/3 self-identify as liberal, 1/3 self-identify as moderate, 1/3 identify as conservative

[6]We use census proportions which approximate to: 1/2 self-identify as male; 1/2 as self-identify as female; a small percentage self-identify as another gender

[7]We use census proportions which approximate to: 1/3 between the age of 18-34; 1/3 between the age of 35-54; 1/3 55 years old and above

[8]1/2 have no high school/ high school degree/partial college; 1/2 have a college degree or more.

Table 26: Summary Statistics for Respondents in Study 1

Article Type	Number of Respondents	Average Age	Proportion with a College Degree or more	Proportion that Self-Identify as Female
Headline - No Source (*Article Format* 1)	1735	44.98	0.51	0.47
Full Article - No Source (*Article Format* 2)	1919	44.72	0.48	0.48
Headline - Source (*Article Format* 3)	1752	44.03	0.48	0.46
Full Article - Source (*Article Format* 4)	1868	48.07	0.48	0.49

Table 27: Summary Statistics for Respondents in Study 2

Article Type	Number of Respondents	Average Age	Proportion with a College Degree or more	Proportion that Self-Identify as Female
Control (not encouraged to search for information)	1521	46.52	0.51	0.49
Treatment (encouraged to search for information)	1485	45.64	0.48	0.46

Table 28: Average Difference Between Groups in Study 1

Groups	Age	Education Level	Gender (Prop. Female)
Article Format 1 and 2	0.27	-0.013	0.05
Article Format 1 and 3	0.9	0.014	0.05
Article Format 2 and 3	0.64	0.027	0
Article Format 2 and 4	3.43^{***}	0.009	-0.04
Article Format 3 and 4	4.07^{***}	0.036^{*}	-0.04

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table 29: Average Difference Between Groups in Study 2

Groups	Age	Education Level	Gender (Prop. Female)
Control and Treatment	0	0	0

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

S Sampling and Demographic Characteristics

S.1 Sampling Articles for Evaluation

Each respondent was asked to evaluate three different popular articles published within the previous 48 hours. Existing studies in this field have tested the effect of additional information, such as guidelines to identify misinformation (Guess, Lerner, et al. 2020), fact-checking labels (Ecker, Lewandowsky, and Tang 2010; Clayton et al. 2019; Pennycook, Bear, et al. 2020) and source information (Sundar and Nass 2001) by asking respondents to evaluate articles that were either (i) months- (or years)-old and already received fact-checker evaluations (Pennycook, Bear, et al. 2020); or (ii) synthetic news articles composed by the researchers themselves (Clayton et al. 2019). Both of these methods risk three clear article selection effects. First, by limiting articles to only those that have been fact-checked, a study may be limiting their sample to only the most sensational and easiest to fact-check news articles. Second, by choosing articles themselves, researchers may allow their own biases dictate what articles are included in the study. Finally, synthetic news articles are likely different than news articles created "in the wild." These selection effects likely introduce limitations for properly quantifying the effect of these additional types of information on news encountered online. These limitations are potentially more pronounced when conducting research on news focused on rapidly-changing events.

To address these concerns, we created a transparent, replicable, and pre-registered article selection process that sources popular false/misleading and true articles from across the ideological spectrum within 24-48 hours of their publication. More specifically, we sourced the most popular article that had been published in the past 24 hours from each of the following "streams" of news that we created: liberal mainstream news domains; conservative mainstream news domains; liberal low-quality news domains; conservative low-quality news domains; and low-quality news domains with no clear political orientation. To generate our streams of mainstream news, we collected the top 100 news sites by U.S. consumption between 2016 and 2019 identified by Microsoft Research's Project Ratio.[9] To classify these websites as liberal or conservative, we used scores of media partisanship from Eady et al. (2020) that assign ideological estimates to websites based on the URL sharing behavior of social media users: websites with a score of below zero were classified as liberal and those above zero were classified as conservative. The top ten websites in each group (liberal or conservative) by consumption were then chosen to create a liberal mainstream and conservative mainstream news feed.[10] For our low quality news sources, we relied on the list of low-quality news sources from Allcott, Gentzkow, and Yu (2019) that were still active at the start of our study in November 2019, which we then subsequently classified into three streams: liberal leaning sources, conservative leaning sources, and those with no clear partisan orientation.[11]

Each day of the study we took the most popular online articles from these five streams (using CrowdTangle for the mainstream sources and RSS feeds for the low-quality ones)[12] that had appeared in the previous 24 hours and sent them to our respondents recruited by Qualtrics. Articles chosen by this algorithm therefore represent the most popular mainstream and low quality news from across the ideological spectrum. This method removed researcher choice from the selection process, overcoming sampling issues that have limited the robustness of previous studies (Clemm von Hohenberg 2020). Collecting and distributing the most popular false/misleading news articles directly after publication is a key innovation that enables us to test the effect of additional types of information from the article on perceived veracity of news *at precisely the time* that readers were likely to encounter these articles on social media (Vosoughi, Roy, and Aral 2018).[13] Every respondent evaluated three articles randomly selected from the five articles being evaluated that day. Each article was assessed by roughly 90 respondents who were required to complete the survey within 24 hours of the moment we selected the articles, which resulted in respondents evaluating articles within 48 hours of the article's publication. No respondent was allowed to take the survey more than once. Respondents evaluated each article using a variety of criteria, the most germane of which was a categorical evaluation question: "What is your assessment of the central claim in the article?" to which respondents could choose

[9] https://www.microsoft.com/en-us/research/project/project-ratio/

[10] The list of the sources in each mainstream stream is provided in Section F of the supplementary materials.

[11] The list of the sources in each low-quality stream is provided in section F of the supplementary materials. Explanation for how the partisanship of these sources were determined is provided in Section A of the supplementary materials.

[12] We used RSS feeds instead of CrowdTangle, because most low-quality sources did not have their own Facebook page

[13] All of the articles used in each study are available in section G of the supplementary materials.

from three responses: (1) True (2) Misleading/False (3) Could Not Determine. To assess the reliability and validity of this measure, we also asked our respondents to rate each article on a 7-point ordinal scale of perceived veracity; we then predicted the rating of an article on a 7-point scale using a dummy variable measuring whether that respondent rated that article as True (categorical response) using a simple linear regression and found that rating an article as true on average increases the veracity scale rating by 2.5 (nearly 1.5 standard deviations of the veracity scale).[14]

While many studies use source quality as a proxy for article quality, not all articles from suspect news sites are actually false (Allcott, Gentzkow, and Yu 2019). Other studies have relied upon professional fact checking organizations such as Snopes or Politifact to identify false/misleading stories from these sources (Clayton et al. 2019, Pennycook, McPhetres, et al. 2020), but this limits past studies to old articles. To overcome this limitation, we instead hired six professional fact checkers from leading national media organizations to assess each article during the same period as respondents.[15] Most articles were evaluated by five fact-checkers, but a few were evaluated by four or six. We use the modal response of the professional fact checkers to determine whether we code an article as true, false/misleading, or 'could not determine.' We are then able to assess the ability of our respondents to identify the veracity of an article by comparing their response to the modal professional fact checker response. For articles used in both studies, we report a Fleiss' Kappa score of 0.400.[16] This level of agreement is slightly higher than other studies that have used professional fact-checkers to rate the veracity of articles using the same categorical scale we use (Allen et al. 2020).

This method does not come without risks. Sourcing articles by popularity rather than their professional fact-checker rating does risk an unequal distribution of true and false/misleading articles. Indeed, when using this method over ten days in Study 1, we selected 36 articles rated as true by professional fact-checkers, 13 articles rated false/misleading, and 1 article rated as could not determine. Over ten days in Study 2, we selected 40 articles rated as true by professional fact-checkers, 8 articles rated false/misleading, and 2 articles rated as could not determine. The low proportion of false/misleading articles suggests researchers using our method in the future will need to source a significant number of articles in order to have enough false/misleading articles in the sample.[red]If the budget is limited, one way to increase the proportion of false/misleading aritcles is to only source articles from low quality news sources, as high quality news source article are almost always rated as true by professional fact checkers. That being said, our study yielded a similar number of false/misleading articles as found in other important studies in the field. For example, much of the recent research in this field only utilizes 12 true news headlines and 12 false/misleading headlines (Dias, Pennycook, and Rand 2020; Pennycook, Bear, et al. 2020); some use even fewer (e.g. 6 (Pennycook and Rand 2020) or 9 (Clayton et al. 2019) false/misleading headlines). For our research purposes, we believed that the benefits of removing the researcher from the article selection process and the improved external validity of running this study in real-time were worth the cost of an unequal distribution of true and false/misleading articles and potentially needing to source more articles to have a large enough sample of false/misleading articles.

[14]Results from this model can be found in Section O of the supplementary materials.

[15]These professional fact-checkers were recruited from a diverse group of reputable publications (no publications from news domains in our list of possible news domains to ensure no conflicts of interest) and paid $10.00 per article.

[16]There was unanimous fact checker agreement on over 45% of the articles used in both studies.

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