

Online Appendix

The Fake News Effect: Experimentally Identifying Motivated Reasoning Using Trust in News

Michael Thaler

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C Additional Theoretical Results

C.1 Inferring Motives from Beliefs

Agents may have different beliefs because these beliefs reflect past instances of motivated reasoning. In this subsection, we consider motives that depend on the state θ_q and an econometrician who observes motivated-reasoning agents' updating process, inferring whether their motive function is increasing or decreasing in θ_q . When motives are unobservable, an experimenter can learn about agents' motives by looking at their initial beliefs μ_{iq} . Conceptually, an agent's error in beliefs can be partly explained by motivated reasoning, and therefore the direction of the error predicts the direction of the motive function. Two agents who motivatedly reason in different directions, and each who receive a signal drawn from the same distribution, will hold different median beliefs: A motivated reasoner with an increasing motive function will be more likely to hold a belief that $\mu_{iq} > \theta_q$, and a motivated reasoner with a decreasing motive function will be more likely to hold a belief that $\mu_{iq} < \theta_q$. This implies that an agent who believes $\mu_{iq} > \theta_q$ is more likely to have an increasing motive function than is an agent who believes $\mu_{iq} < \theta_q$.

When the two agents then make news assessments using the structure above, agents will trust news that *reinforces* the error in their beliefs more than news that *mitigates* the error. This occurs even though signals are designed exactly so that their interpretation is distinct from μ_{iq} .

More formally, there is a state $\theta_q \in \mathbb{R}$. Consider a Bayesian (she) and a motivated reasoner (he) with the same prior $\theta_q \sim F_{\theta_q}$ and who receive a public signal $z_q \sim F_{z_q}(\cdot)$. We now assume that motivated reasoners have heterogeneous motive functions $m_{iq}(\theta'_q)$ that are strictly monotonic in θ'_q . Specifically, $m_{iq}(\theta'_q)$ is drawn from a distribution $F_{mq}(m_q(\cdot))$ with the properties that: $\frac{\partial m_{iq}(\cdot)}{\partial \theta_q}$ exists, either $\frac{\partial m_{iq}(\cdot)}{\partial \theta_q} > 0$ for all θ_q or $\frac{\partial m_{iq}(\cdot)}{\partial \theta_q} < 0$ for all θ_q , and that $\mathbb{P}\left(\frac{\partial m_{iq}(\cdot)}{\partial \theta_q} > 0 \text{ for all } \theta_q\right) \in (0, 1)$.

The econometrician observes the distributions $F_{z_q}(\cdot)$ and $F_{mq}(m_q(\cdot))$, as well as the states θ_q and reported medians μ_{iq} , but not the realizations z_q or $m_{iq}(\theta'_q)$. We also assume that z_q leads the Bayesian's posterior median μ_{Bq} to take values close to θ_q with positive probability, but that there is no point mass at exactly θ_q . That is, for all $\delta > 0$, there exists some $\delta' > 0$ such that $\mathbb{P}(|\mu_{Bq} - \theta_q| < \delta) > \delta'$, while $\mathbb{P}_{Bq}(\mu_{Bq} = \theta_q) = 0$.

Without loss of generality, consider what the econometrician infers about a motivated reasoner who has a strictly increasing $m_{iq}(\theta'_q)$. Since the log-likelihood of the motive is strictly increasing, his posterior distribution first-order stochastically dominates the Bayesian's posterior distribution. In addition, for every such motive function, there exists a $\delta > 0$ such that for all signals leading to the Bayesian having a posterior median $\mu_{Bq} \in (\theta_q - \delta, \theta_q)$, the motivated reasoner has posterior median $\mu_{iq} > \theta_q$. Since there is a probability of at least $\delta' > 0$ of such a signal, this high- θ_q -motivated reasoner is *strictly* more likely than the Bayesian to state a median belief that is greater than θ_q . By the same argument, a low- θ_q motivated reasoner is strictly less likely than the Bayesian to state a median that is less than θ_q .

If some people have monotonically-increasing motives and others have monotonically-decreasing motives, then the econometrician will believe that:

$$\mathbb{P}_{\text{econometrician}}(m_{iq}(\theta_q) \text{ increasing} \mid \mu_{iq} > \theta_q) > \mathbb{P}_{\text{econometrician}}(m_{iq}(\theta_q) \text{ increasing} \mid \mu_{iq} < \theta_q).$$

Recall that message G_{iq} says that $\theta_q > \mu_{iq}$ and that message L_{iq} says $\theta_q < \mu_{iq}$. Then, for the econometrician, $\mathbb{E}[a(G_{iq}), \mu_{iq} > \theta_q] > \mathbb{E}[a(G_{iq}), \mu_{iq} < \theta_q]$ and $\mathbb{E}[a(L_{iq}), \mu_{iq} > \theta_q] < \mathbb{E}[a(L_{iq}), \mu_{iq} < \theta_q]$ when motives are heterogeneous. Since G_{iq} and L_{iq} are equally likely by construction, this means that agents trust the source of *error-reinforcing* messages more than the source of *error-mitigating* messages on questions when motivated reasoning plays a role.

Using this signal structure, error-mitigating messages come from *True News* and

error-reinforcing messages come from *Fake News*. Therefore, agents give higher assessments to Fake News than True News, with and without controls for observable party preference:

Proposition 2 (Motivated reasoning leads to over-trusting Fake News)

Suppose that agents motivatedly reason with a strictly monotonic motive as above.

Then:

- $a(\text{Fake News}_{iq}) > a(\text{True News}_{iq})$.
- $a(\text{Fake News}_{iq}; \text{Pro-Party news}_{iq}) \geq a(\text{True News}_{iq}; \text{Pro-Party news}_{iq})$.
- $a(\text{Fake News}_{iq}; \text{Anti-Party news}_{iq}) \geq a(\text{True News}_{iq}; \text{Anti-Party news}_{iq})$.

Suppose also that the sign of the slope of the motive function is heterogeneous within party. That is, the probability of an agent having $\frac{\partial m_{iq}(\theta_q)}{\partial \theta_q} > 0$ is strictly between 0 and 1, conditional on the agent’s party. Then:

- $a(\text{Fake News}_{iq}; \text{Pro-Party news}_{iq}) > a(\text{True News}_{iq}; \text{Pro-Party news}_{iq})$.
- $a(\text{Fake News}_{iq}; \text{Anti-Party news}_{iq}) > a(\text{True News}_{iq}; \text{Anti-Party news}_{iq})$.

The stark result that motivated reasoners will trust Fake News more than True News is particular to the unformativeness of the messages. However, the prediction that agents will trust Fake News more than a *Bayesian* will is quite general, only relying on unobservable inputs into current beliefs. This prediction only holds for motivated states, psychologically differentiating this theory from unmotivated explanations of over-trusting Fake News (such as confirmation bias). Practically, it suggests that excessive trust in disinformation is more prominent when people hold motivated beliefs.

C.2 Motivated Reasoning and Overprecision

Under further functional form assumptions, the model of motivated reasoning also predicts that agents will overestimate the probability that the answers to the questions are within a subjective confidence interval: *overprecision*. Unlike other determinants of overprecision, this will be because of miscalibrated beliefs due to motivated reasoning, and we do not assume a general bias towards overly-narrow confidence intervals. Unlike the previous subsection, we now assume that Nature draws θ_q from $\mathcal{N}(\mu_{q0}, 1/\tau_{q0}^2)$ independently across q , and that Nature gives agents a noisy public signal $z_q = \theta_q + \epsilon_{qz}$, where $\epsilon_{qz} \sim \mathcal{N}(0, 1/\tau_{qz}^2)$.

Slightly abusing notation, we assume also that motivated reasoners have motives linear in θ_q : $m_{iq}(\theta_q) = m_{iq} \cdot \theta_q$.³⁴ In the political context, $|m_{iq}|$ can be thought of as political partisanship. Finally, we additionally assume that the prior probability of True News is p and is constant for all agents.

After observing z_q (but before playing the game in Section 2.1), a Bayesian forms the posterior:

$$f_{Bq}(\theta'_q|z_q) = \mathcal{N}\left(\frac{\tau_{q0}\mu_{q0} + \tau_{qz}z_q}{\tau_{q0} + \tau_{qz}}, \tau_{q0} + \tau_{qz}\right),$$

and a motivated reasoner forms the posterior:

$$f_{iq}(\theta'_q|z_q) = \mathcal{N}\left(\frac{\tau_{q0}\mu_{q0} + \tau_{qz}z_q + \varphi \cdot m_{iq}}{\tau_{q0} + \tau_{qz}}, \tau_{q0} + \tau_{qz}\right).$$

Notably, the two agents have the same posterior variance, but the motivated reasoner's distribution is miscalibrated. Consider their $(1 - Q)/2$ -quantile and $(1 + Q)/2$ -quantile beliefs, and call this the Q -confidence interval. Then:

Proposition 3 (Motivated reasoning and overprecision)

Suppose that a motivated reasoner has normally-distributed priors and receives a signal normally distributed with mean equal to θ_q , as above. When $\varphi > 0$, the probability that his Q -confidence interval contains θ_q is equal to Q for $m_{iq} = 0$ and strictly decreases in $|m_{iq}|$.

Since Bayesian updating is equivalent to motivated reasoning with $m_{iq} = 0$, Bayesians will appear to be appropriately precise and motivated reasoners will appear overprecise due to their miscalibrated confidence intervals. They will be both be appropriately precise on neutral topics, where $m_{iq} = 0$. Note that the direction of the bias relies both on linear motives and the normal-normal functional form.³⁵

In the context of politics, I posit that partisanship is a proxy for $|m_{iq}|$ on politicized questions. On such questions, the probability that agents' Q -confidence interval

³⁴We also keep the assumption of constant φ but note that there are many reasons to believe that φ ought to depend on z_q . With normally-distributed signals, one way that φ could depend on z_q is through its precision. For instance, $\varphi(z_q, \tau_{qz}) = \min\{\varphi_c \tau_{qz}, \bar{\varphi}\}$. Using this form, the susceptibility of two weak signals is equal to the sum of their precisions, but there is a maximum level of susceptibility.

³⁵For instance, suppose that the state space contains two values and a Bayesian infers from a signal that either one value has a $(1 + Q)/2$ likelihood of occurring or the other value has a $(1 - Q)/2$ likelihood of occurring. Then, her confidence interval would contain one point, and a motivated reasoner may have a confidence interval that contains both points.

contains θ_q will then be decreasing in their partisanship.

D Replication

I preregistered a replication for the findings from this paper. I ran this in conjunction with a debiasing treatment; the replication tests whether the control group from that sample satisfies the hypotheses from this experiment. This section reports all replication results that were specified in the pre-analysis plan at <https://doi.org/10.1257/rct.4401>.

There are a few differences between the replication sample and the original sample. The replication was conducted approximately one year later, on July 8-9, 2019. The replication questions included additional topics and variants of the original questions.³⁶ There were no neutral questions.

The sample includes 1,050 subjects recruited from Amazon’s Mechanical Turk platform that passed pre-specified comprehension checks that are akin to those in the original experiment. There are 982 subjects who are either Pro-Rep or Pro-Dem in the replication sample, and these subjects give 5,314 news veracity assessments on politicized topics.

D.1 Primary Outcomes

The most important primary outcome results are all strongly replicated. As seen in the first column of Table 8, subjects give statistically significantly higher assessments to Pro-Party news than to Anti-Party news ($p < 0.001$).³⁷ The second column shows that this gap is increasing in partisanship ($p = 0.004$).

The next-most important primary outcome results are strongly replicated. Table 8 shows that subjects give statistically significantly higher assessments to Fake News than to True News. This holds both when Pro-Party / Anti-Party news is not

³⁶In particular, two new politicized topics were added: Wage Growth and Healthcare. On six of the politicized topics, subjects received slightly different versions of the original question.

³⁷The coefficient is smaller in the replication, due in large part to the new added questions. On the questions with the exact same wording as the original study, the treatment effect is 7.1 percentage points (s.e. 1.2 percentage points). On other politicized questions, the treatment effect is 3.5 percentage points (s.e. 1.0 percentage points). Of the original questions, the effects on the following topics were significant at $p < 0.05$ in the predicted direction: Climate Change, Race, Refugees, Gun Laws, Party Performance, Own Performance. The effects on the following topics were not significant at $p < 0.05$: Obama and Crime, Gender, Media.

controlled for (column 3) and when Pro-Party / Anti-Party news is controlled for (column 4); both results are statistically significant at $p < 0.001$.

The main alternative measure of motivated reasoning is suggestively replicated. As seen in the first column of Table 9, results suggest that subjects are more likely to update in the direction of the Pro-Party message compared to the Anti-Party message ($p = 0.034$).³⁸ The third column shows that, as in Section 4.4, this difference vanishes once the news veracity assessment measure is controlled for.

D.2 Secondary Outcomes

The underperformance result (not discussed in the main text) is strongly replicated. Subjects score 66.3 points (s.e. 0.4 points) on politicized news assessments and 65.5 points (s.e. 1.6 points) on performance news assessments on average. Both of these are statistically significantly lower than 75 points, the score that subjects would receive if they had answered “5/10 chance the message came from True News” ($p < 0.001$).

The result that subjects’ confidence intervals are overprecise is strongly replicated. On politicized topics, subjects’ 50 percent confidence intervals contain the correct answer 44.1 percent of the time (s.e. 0.8 percent); this is statistically significantly different from 50 percent ($p < 0.001$). As seen in Table 10, the result that this measure of overprecision is increasing in partisanship is suggestive ($p = 0.064$).

The two polarization results are replicated. On politicized topics, Table 9 shows that subjects are statistically significantly more likely to follow Polarizing news than anti-Polarizing news ($p < 0.001$).³⁹ Subjects also state initial medians that are more likely to be in the Pro-Party direction ($p < 0.001$).

D.3 Untested Replications

I did not pre-register replication tests for performance-driven motivated reasoning (or anything involving neutral topics) given the limited sample size. Results, however, are broadly similar to those in the main experiment. Subjects assess Pro-Performance news to be 8.0 percentage points higher than Anti-Performance news (s.e. 2.6 per-

³⁸As with the main effect, the coefficient is smaller in the replication, due in large part to the new questions. On the questions with the exact same wording as the original study, the treatment effect is 5.7 percentage points (s.e. 2.6 percentage points). On other politicized questions, the treatment effect is 2.0 percentage points (s.e. 2.6 percentage points).

³⁹As in Section 4.4, this difference vanishes once the news assessment measure is controlled for.

centage points; $p = 0.003$). Demographic heterogeneity, robustness exercises, and minor results were also not tested. Further work can test whether these results also replicate with a larger sample.

Replication Tables

Table 8: The Effect of News Direction and Actual Veracity on Perceived Veracity: Replication

	(1)	(2)	(3)	(4)
Pro-Party News	0.053 (0.008)	0.012 (0.016)		0.046 (0.008)
Partisanship x Pro-Party		0.085 (0.029)		
True News			-0.043 (0.008)	-0.033 (0.008)
Question FE	Yes	Yes	Yes	Yes
Round FE	Yes	Yes	Yes	Yes
Subject FE	Yes	Yes	Yes	Yes
Observations	5286	5286	5286	5286
R^2	0.32	0.33	0.31	0.32
Mean	0.581	0.581	0.581	0.581

Standard errors in parentheses

Notes: OLS, errors clustered at subject level. Only Pro-Party / Anti-Party news observations. Partisanship is the absolute difference between ratings of the Republican and Democratic parties. In column (2), Partisanship is also interacted with round and question FE.

Table 9: Changing Guess to Follow Message: Replication

	(1)	(2)	(3)	(4)	(5)	(6)
Pro-Party News	0.038 (0.018)		0.032 (0.018)	-0.020 (0.016)		-0.021 (0.016)
Polarizing News		0.065 (0.016)	0.062 (0.016)		0.010 (0.015)	0.012 (0.015)
P(True)				1.108 (0.050)	1.100 (0.049)	1.105 (0.050)
Question FE	Yes	Yes	Yes	Yes	Yes	Yes
Round FE	Yes	Yes	Yes	Yes	Yes	Yes
Subject FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5286	5286	5286	5286	5286	5286
R^2	0.34	0.34	0.34	0.47	0.47	0.48
Mean	0.657	0.657	0.657	0.657	0.657	0.657

Standard errors in parentheses

Notes: OLS, errors clustered at subject level. Only Pro-Party / Anti-Party news observations. Polarizing News: tells subjects that, compared to their initial guess, the answer is in the opposite direction from the population mean. Dependent variable is 1 if subjects change their guess upwards when the message says “Greater Than” or downwards when the message says “Less Than,” -1 if they change it in the opposite direction, and 0 if they do not change it.

Table 10: Overprecision and Partisanship: Replication

	(1)	(2)
Partisanship	0.055	0.056
	(0.030)	(0.030)
Subject controls	No	Yes
Observations	5314	5314
R^2	0.00	0.01
Mean	0.061	0.061

Standard errors in parentheses

Notes: OLS, errors clustered at subject level. Only politicized topics included. Partisanship is the absolute difference between ratings of the Republican and Democratic parties. Subject controls are race, gender, age, log(income), education, religion, and whether home state voted for Trump or Clinton in 2016.

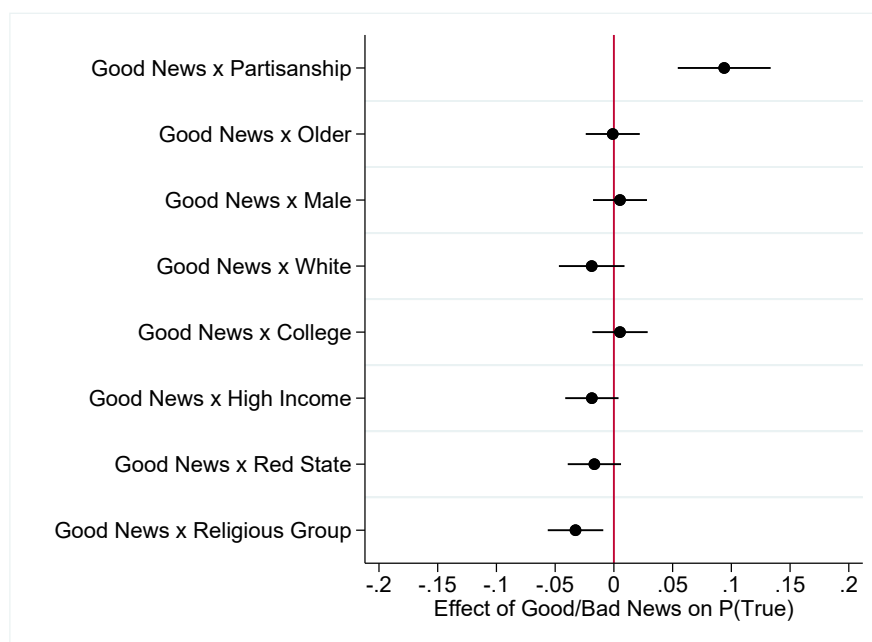
E Online Appendix: Further Heterogeneity and Robustness Analyses

This section presents results on heterogeneity in magnitude of motivated reasoning and additional robustness checks for the main results in Table 2. Results are similar for each randomization arm, if I include subjects who fail comprehension checks, and if the dependent variable is the logit probability of news veracity assessments.

Heterogeneity in Magnitude

Figure 8 plots the coefficients from the regression of news assessments on the interaction of whether the news was “good” or “bad” and partisanship, as well as on binarized observable demographics. We see that the effect of non-political demographics are small, and most are statistically insignificantly different from zero.

Figure 8: Heterogeneity in the Magnitude of Motivated Reasoning



Notes: This figure plots the relative treatment effect of seeing Pro-Party / Performance news versus Anti-Party / Performance news on subjects’ news assessments by partisanship and demographics. These are OLS regression coefficients, errors clustered at subject level. FE included for subject, round number, and topic. Partisanship is from 0 to 1: $\text{abs}(\text{Republican Party rating} - \text{Democratic Party rating})$. Older: above the median age in the experiment. High income: above median income in the experiment. Red State: state voted for Trump in 2016. Religious: subject affiliates with any religion.

Main Results by Randomization Group

We consider Table 2 for each randomization group. Recall that subjects either give a second guess or see a WTP page, and subjects are either given a prior $P(\text{True}) = 0.5$ or are not. Neither arm affects the main results or the average news veracity assessment substantially.

Table 11: Motivated Reasoning and Perceived Truthfulness of News: Second-Guess Group

	(1)	(2)	(3)	(4)	(5)	(6)
Pro-Party News	0.090	0.092	0.041	0.031		0.081
	(0.009)	(0.009)	(0.018)	(0.009)		(0.009)
Partisanship x Pro-Party			0.107			
			(0.034)			
Anti-Party News				-0.057		
				(0.010)		
True News					-0.061	-0.035
					(0.009)	(0.009)
Question FE	Yes	Yes	Yes	No	Yes	Yes
Round FE	Yes	Yes	Yes	Yes	Yes	Yes
Subject FE	No	Yes	Yes	Yes	Yes	Yes
Subject controls	Yes	No	No	No	No	No
Neutral News	No	No	No	Yes	No	No
Observations	4085	4085	4085	5455	4085	4085
R^2	0.05	0.24	0.25	0.20	0.23	0.25
Mean	0.578	0.578	0.578	0.581	0.578	0.578

Standard errors in parentheses

Notes: OLS, errors clustered at subject level. Neutral News indicates that Pro-Party / Anti-Party news assessments are compared to assessments on Neutral topics. These classifications are defined in Table 1. Controls: race, gender, log(income), years of education, religion, and state. Partisanship is the absolute difference between ratings of the Republican and Democratic parties. In column (3), Partisanship is also interacted with round and question FE. Observations only for Second-Guess group.

Table 12: Motivated Reasoning and Perceived Truthfulness of News: Willingness-to-Pay Group

	(1)	(2)	(3)	(4)	(5)	(6)
Pro-Party News	0.094 (0.009)	0.085 (0.009)	0.042 (0.017)	0.043 (0.009)		0.074 (0.009)
Partisanship x Pro-Party			0.087 (0.029)			
Anti-Party News				-0.039 (0.009)		
True News					-0.056 (0.009)	-0.032 (0.009)
Question FE	Yes	Yes	Yes	No	Yes	Yes
Round FE	Yes	Yes	Yes	Yes	Yes	Yes
Subject FE	No	Yes	Yes	Yes	Yes	Yes
Subject controls	Yes	No	No	No	No	No
Neutral News	No	No	No	Yes	No	No
Observations	3817	3817	3817	5097	3817	3817
R^2	0.04	0.25	0.26	0.22	0.24	0.26
Mean	0.570	0.570	0.570	0.569	0.570	0.570

Standard errors in parentheses

Notes: OLS, errors clustered at subject level. Neutral News indicates that Pro-Party / Anti-Party news assessments are compared to assessments on Neutral topics. These classifications are defined in Table 1. Controls: race, gender, log(income), years of education, religion, and state. Partisanship is the absolute difference between ratings of the Republican and Democratic parties. In column (3), Partisanship is also interacted with round and question FE. Observations only for Willingness-to-Pay group.

Table 13: Motivated Reasoning and Perceived Truthfulness of News: Given 50-50 Prior

	(1)	(2)	(3)	(4)	(5)	(6)
Pro-Party News	0.091 (0.011)	0.088 (0.010)	0.067 (0.020)	0.046 (0.011)		0.078 (0.011)
Partisanship x Pro-Party			0.049 (0.035)			
Anti-Party News				-0.040 (0.012)		
True News					-0.056 (0.011)	-0.029 (0.011)
Question FE	Yes	Yes	Yes	No	Yes	Yes
Round FE	Yes	Yes	Yes	Yes	Yes	Yes
Subject FE	No	Yes	Yes	Yes	Yes	Yes
Subject controls	Yes	No	No	No	No	No
Neutral News	No	No	No	Yes	No	No
Observations	2674	2674	2674	3568	2674	2674
R^2	0.05	0.27	0.28	0.22	0.25	0.27
Mean	0.573	0.573	0.573	0.572	0.573	0.573

Standard errors in parentheses

Notes: OLS, errors clustered at subject level. Neutral News indicates that Pro-Party / Anti-Party news assessments are compared to assessments on Neutral topics. These classifications are defined in Table 1. Controls: race, gender, log(income), years of education, religion, and state. Partisanship is the absolute difference between ratings of the Republican and Democratic parties. In column (3), Partisanship is also interacted with round and question FE. Observations only if Given 50-50 Prior.

Table 14: Motivated Reasoning and Perceived Truthfulness of News: Not Given 50-50 Prior

	(1)	(2)	(3)	(4)	(5)	(6)
Pro-Party News	0.093 (0.008)	0.088 (0.008)	0.025 (0.015)	0.033 (0.008)		0.077 (0.008)
Partisanship x Pro-Party Anti-Party News			0.131 (0.027)		-0.052 (0.008)	
True News					-0.061 (0.007)	-0.037 (0.007)
Question FE	Yes	Yes	Yes	No	Yes	Yes
Round FE	Yes	Yes	Yes	Yes	Yes	Yes
Subject FE	No	Yes	Yes	Yes	Yes	Yes
Subject controls	Yes	No	No	No	No	No
Neutral News	No	No	No	Yes	No	No
Observations	5228	5228	5228	6984	5228	5228
R^2	0.05	0.24	0.24	0.20	0.22	0.24
Mean	0.575	0.575	0.575	0.577	0.575	0.575

Standard errors in parentheses

Notes: OLS, errors clustered at subject level. Neutral News indicates that Pro-Party / Anti-Party news assessments are compared to assessments on Neutral topics. These classifications are defined in Table 1. Controls: race, gender, log(income), years of education, religion, and state. Partisanship is the absolute difference between ratings of the Republican and Democratic parties. In column (3), Partisanship is also interacted with round and question FE. Observations only for Not Given 50-50 Prior.

Results Without Comprehension Checks

The main results do not include subjects who fail attention and comprehension checks. As such, 313 of 1300 subjects are removed from the analysis. This table repeats the analysis without removing subjects; results do not significantly change.

Table 15: Motivated Reasoning and Perceived Truthfulness of News: Including Subjects Who Fail Comprehension

	(1)	(2)	(3)	(4)	(5)	(6)
Pro-Party News	0.076	0.071	0.027	0.031		0.064
	(0.005)	(0.005)	(0.010)	(0.005)		(0.005)
Partisanship x Pro-Party			0.097			
			(0.018)			
Anti-Party News				-0.038		
				(0.006)		
True News					-0.043	-0.026
					(0.005)	(0.005)
Question FE	Yes	Yes	Yes	No	Yes	Yes
Round FE	Yes	Yes	Yes	Yes	Yes	Yes
Subject FE	No	Yes	Yes	Yes	Yes	Yes
Subject controls	Yes	No	No	No	No	No
Neutral News	No	No	No	Yes	No	No
Observations	10478	10478	10478	13991	10478	10478
R^2	0.03	0.30	0.31	0.27	0.29	0.30
Mean	0.561	0.561	0.561	0.562	0.561	0.561

Standard errors in parentheses

Notes: OLS, errors clustered at subject level. Neutral News indicates that Pro-Party / Anti-Party news assessments are compared to assessments on Neutral topics. These classifications are defined in Table 1. Controls: race, gender, log(income), years of education, religion, and state. Partisanship is the absolute difference between ratings of the Republican and Democratic parties. In column (3), Partisanship is also interacted with round and question FE. Observations *include* subjects who failed comprehension checks.

Results Using Logit Veracity Assessments

The model suggests that the relevant dependent variable is $\text{logit}(P(\text{True}))$ instead of $P(\text{True})$. Table 16 is the same as Table 2 but with this new dependent variable. Technically, since $\text{logit}(0)$ and $\text{logit}(1)$ are undefined, they are replaced here with $\text{logit}(0.025)$ and $\text{logit}(0.975)$.⁴⁰

Table 16: Motivated Reasoning and Perceived Truthfulness of News: Logit Veracity Assessments

	(1)	(2)	(3)	(4)	(5)	(6)
Pro-Party News	0.473	0.453	0.206	0.173		0.396
	(0.033)	(0.033)	(0.065)	(0.034)		(0.034)
Partisanship x Pro-Party			0.515			
			(0.117)			
Anti-Party News				-0.263		
				(0.037)		
True News					-0.306	-0.178
					(0.032)	(0.032)
Question FE	Yes	Yes	Yes	No	Yes	Yes
Round FE	Yes	Yes	Yes	Yes	Yes	Yes
Subject FE	No	Yes	Yes	Yes	Yes	Yes
Subject controls	Yes	No	No	No	No	No
Neutral News	No	No	No	Yes	No	No
Observations	7902	7902	7902	10552	7902	7902
R^2	0.04	0.25	0.25	0.21	0.23	0.25
Mean	0.374	0.374	0.374	0.383	0.374	0.374

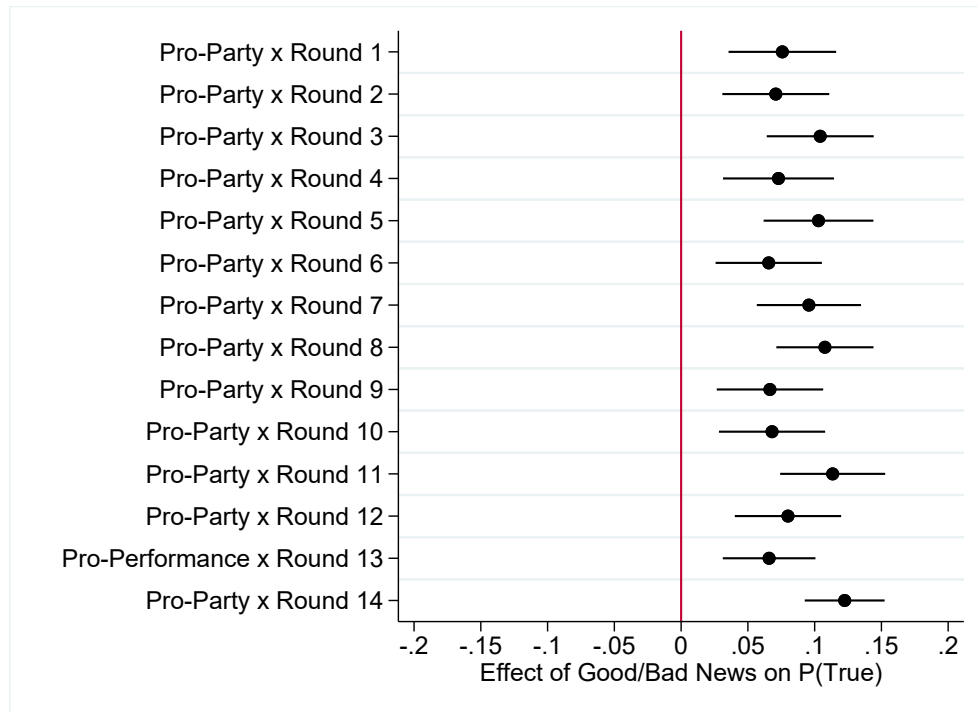
Standard errors in parentheses

Notes: Dependent variable is $\text{logit}(P(\text{True}))$. OLS, errors clustered at subject level.

Neutral News indicates that Pro-Party / Anti-Party news assessments are compared to assessments on Neutral topics. These classifications are defined in Table 1. Controls: race, gender, $\log(\text{income})$, years of education, religion, and state. Partisanship is the absolute difference between ratings of the Republican and Democratic parties. In column (3), Partisanship is also interacted with round and question FE.

⁴⁰Subjects choose $P(\text{True}) = 0$ to maximize expected earnings if and only if they believe $P(\text{True}) \in [0, 0.05]$. 0.025 is the midpoint of this range. Results are similar if 0.05 is chosen or if these observations are removed.

Figure 9: Round-by-Round Effects of News Direction on Perceived Veracity



Notes: OLS regression coefficients, errors clustered at subject level. FE included for subject, round number, and topic. Pro-Party (vs. Anti-Party) and Pro-Performance (vs. Anti-Performance) news is defined in Table 1. Performance news is only seen in Round 13. Error bars correspond to 95 percent confidence intervals.

F Study Materials: Experiment Flow and Pages

F.1 Flow of Experiment

Subjects see a series of pages in the following order:

- Introduction and Consent
- Demographics and Current Events Quiz
- Opinions
- Instructions for Question Pages
- Question 1
- Instructions for News Assessment Pages
- News Assessment 1
- Question 2, News Assessment 2, . . . , Question 14, News Assessment 14
- Feedback
- Results and Payment

Screenshots for each of the pages are in the following subsection. Red boxes are not shown to subjects and are included for illustration purposes only. Results pages here are cut off after three questions, but all results are shown to subjects. Choices on the Demographics page and statements on the Opinions page are randomly ordered.

Subjects in the Willingness-To-Pay group see the News Valuation page between Question 12 and News Assessment 12. They see the black bar page if their elicited valuation is lower than the random number.

Subjects in the Second Guess group see the version of the News Assessment page with the message “After seeing this message and assessing its truthfulness, what is your guess of the answer to the original question?”

F.2 Screenshots of Study Materials

Introduction

You are invited to participate in this online study on political attitudes. This is a research project being conducted by Michael Thaler, a PhD student in economics at Harvard University.

Your participation in this survey is entirely voluntary. You may refuse to take part in the research or exit the survey at any time without penalty.

If you choose to be in the study, you will complete a series of questions related to issues affecting the United States today. The study should take approximately 20 minutes to complete, but you may take up to 45 minutes. You will have a chance to earn a bonus of \$10.00 in addition to your participation earnings.

Your specific answers will not be shared with anyone, and for the purpose of privacy please do not include your name or other personally identifiable information in your responses. Please make sure to mark your Amazon Profile as private if you do not want it to be accessible via your Mechanical Turk Worker ID.

If you have any questions or concerns, please contact Michael Thaler at michaelthaler@g.harvard.edu.

You may print or save a copy of this information sheet for your own records. **Please do not press the back button, refresh, or leave the page at any time or else you might have a server error; if this happens, you will not be able to reenter the study or earn your payment.**

If you wish to participate in the study, please indicate below that you have read the instructions and enter your Mechanical Turk Worker ID for payment.

What is your MTurk Worker ID number? This is required for payment.

I have read the above information and would like to participate in the study.

Next

Demographic Information and Current Events Quiz

It is important for this study that you answer these questions honestly.

Your earnings and bonus are not affected by your answers to these questions.

What is your age?

What is your gender?

- Male
- Female
- Other / Prefer not to answer

What is your race/ethnicity?

- Hispanic or Latino
- Asian
- White
- American Indian
- Black or African American
- Two or more of these
- Other / Prefer not to answer

What is the highest level of education you have completed?

- Did not graduate high school
- High school graduate or GED
- Began college, no degree
- Associate's degree
- Bachelor's degree
- Postgraduate or professional degree

What religious group do you consider yourself affiliated with?

- Mainline Protestant
- Historically black Protestant
- Evangelical Protestant
- Catholic
- Other Christian
- Jewish
- Muslim
- Other religion or faith
- Atheist
- Agnostic
- Unaffiliated

Which US state or territory do you currently live in?

What was your total household income before taxes during the past 12 months?

- Less than \$20,000
- \$20,000 to \$29,999
- \$30,000 to \$39,999
- \$40,000 to \$49,999
- \$50,000 to \$69,999
- \$70,000 to \$99,999
- \$100,000 to \$149,999
- \$150,000 or more

In politics today, do you consider yourself a Republican, a Democrat, or an Independent?

- Democrat
- Republican
- Independent

Where do you see yourself on the liberal/conservative spectrum?

- Extremely liberal
- Liberal
- Slightly liberal
- Moderate
- Slightly conservative
- Conservative
- Extremely conservative

Please rate how you feel about the Republican Party using a scale of 0 to 100. The higher the number, the more favorable you feel toward the Republican Party.



Please rate how you feel about the Democratic Party using a scale of 0 to 100. The higher the number, the more favorable you feel toward the Democratic Party.



Who is the current President of France?

- Theresa May
- Charles de Gaulle
- Emmanuel Macron
- Marine Le Pen
- Justin Trudeau

Who won the recent special election in Alabama for the U.S. Senate?

- Doug Jones
- Roy Moore
- Richard Shelby
- Luther Strange
- Thad Cochran

Who was Hillary Clinton's running mate in the 2016 presidential election?

- Martin O'Malley
- Jim Webb
- Joe Biden
- Bernie Sanders
- Tim Kaine

Who is the most recently-appointed Supreme Court Justice?

- Merrick Garland
- Anthony Kennedy
- John Roberts
- Stephen Breyer
- Neil Gorsuch

Next

Instructions for Question Pages

Throughout this study, you will see several types of pages, including 14 Question pages.

On each of the Question pages, you will be asked to guess the answer to a factual question; each question has a correct numerical answer. In addition to your guaranteed HIT payment, you will have a chance to win an additional bonus of \$10.00 based on your guesses to these questions and questions on other pages. At least one question is an "attention check" for which the correct answer will be obvious.

You will also be asked to provide an upper bound and lower bound for your guess. You should choose these bounds in a way such that you think the answer has a 50% chance of falling between your bounds. The more confident you are, the smaller the difference should be between your upper and lower bound.

The details of the point system used to determine your chance of winning the prize are a bit complicated, but explained below if you are interested. **What is important to know is that the way your earnings are determined ensures that your chances of winning the bonus are maximized by carefully and honestly answering these questions.**

At the end of the study, the points you receive on all choices you make will be averaged, and this will determine the chance (out of 1000) that you win the bonus. For example, if you earn 90 points on average, you will have a 90 out of 1000 chance of winning the bonus.

Your final score, whether you won the prize, and a list of correct answers and sources will be provided at the end of the study.

You will see a Question page on the next screen.

Point system for your guess:

You will receive between 0 and 100 points for each guess you give. The closer your guess is to the correct answer, the more likely it is that you'll win the prize.

If you guess the answer correctly, you will receive 100 points (the maximum) for that question.

If your guess is more than 100 away from the answer, you will receive 0 points for that question.

If your guess is less than 100 away from the answer, you will receive points equal to 100 minus the distance from your guess to the correct answer.

It is in your best interest to guess an answer that is in the "middle" of what you believe is likely. For example, if you think the answer is equally likely to be 10, 40, and 60, you should guess 40.

Point system for your bounds:

*If the answer is **above** your **upper** bound, you will receive points equal to 100 minus 3 times the distance from your guess to the correct answer.*

*If the answer is **below** your **upper** bound, you will receive points equal to 100 minus the distance from your guess to the correct answer.*

*If the answer is **above** your **lower** bound, you will receive points equal to 100 minus the distance from your guess to the correct answer.*

*If the answer is **below** your **lower** bound, you will receive points equal to 100 minus 3 times the distance from your guess to the correct answer.*

You cannot earn negative points. All negative point values will be rounded up to zero.

It is in your best interest to choose a lower bound such that you think it's 3 times more likely to be above the bound than below it, and an upper bound such that it's 3 times more likely to be below the bound than above it. For example, if you think the answer is equally likely to be any number from 100 to 200, you should set a lower bound of 125 and an upper bound of 175.

Question

Question 1 of 14: Crime Under Obama

Some people believe that the Obama administration was too soft on crime and that violent crime increased during his presidency, while others believe that President Obama's pushes towards criminal justice reform and reducing incarceration did not increase violent crime.

This question asks how murder and manslaughter rates changed during the Obama administration. In 2008 (before Obama became president), the murder and manslaughter rate was 54 per million Americans.

In 2016 (at the end of Obama's presidency), what was the per-million murder and manslaughter rate?

My guess:

My lower bound:

My upper bound:

Please choose your bounds so that you think there's a 50% chance that the answer is between the bounds.

Next

Figure 10: Crime Under Obama question page.

Instructions for News Assessment Pages

After most Question pages, you will see a News Assessment page.

There has been a growing debate about the accuracy of news sources, with both the left and the right accusing each other's primary media of spreading "Fake News." News sources like CNN and Fox News have reported extensively on topics such as crime, global warming, and gun laws; some give factual information, while others may distort the truth or lie outright. This part of the study is testing whether people can recognize Fake News and True News.

On each News Assessment page, you will see the previous Question page and be given a message related to your previous guess from either a True News source or Fake News source. In addition to your guaranteed HIT payment, you will have a chance to win an additional bonus of \$10.00 based on your answers to these questions and questions on other pages. The message will say either "The answer is *greater than* your previous guess" or "The answer is **less than** your previous guess."

The True News source will *always* tell you the truth, while the Fake News source will *never* tell the truth.

If the answer truly is greater than your previous guess, True News will tell you "The answer is *greater than* your previous guess" and Fake News will tell you "The answer is *less than* your previous guess."

If the answer truly is less than your previous guess, True News will tell you "The answer is *less than* your previous guess" and Fake News will tell you "The answer is *greater than* your previous guess."

Whether you get your message from True News or Fake News is random; different messages may come from different sources. Seeing Fake News on one page does not affect the chances of seeing Fake News on any other page.

After each question, you will assess whether you think it is more likely that the source is True News or Fake News on a scale of 0/10 to 10/10, and your assessment will determine how many points you will earn for that page.

The details of the point system to determine your chance of winning the prize are a bit complicated, but explained below if you are interested. **What is important to know is that the way your earnings are determined ensures that your chances of winning the bonus are maximized by carefully and honestly answering these questions.**

Your final score, whether you won the prize, and a list of correct answers and sources will be provided at the end of the study.

You will see a News Assessment page on the next screen.

Point system:

Your estimate	Points earned if the source is True News	Points earned if the source is Fake News
<i>0/10 chance it's True News; 10/10 chance it's Fake News</i>	<i>0 points</i>	<i>100 points</i>
<i>1/10 chance it's True News; 9/10 chance it's Fake News</i>	<i>19 points</i>	<i>99 points</i>
<i>2/10 chance it's True News; 8/10 chance it's Fake News</i>	<i>36 points</i>	<i>96 points</i>
<i>3/10 chance it's True News; 7/10 chance it's Fake News</i>	<i>51 points</i>	<i>91 points</i>
<i>4/10 chance it's True News; 6/10 chance it's Fake News</i>	<i>64 points</i>	<i>84 points</i>
<i>5/10 chance it's True News; 5/10 chance it's Fake News</i>	<i>75 points</i>	<i>75 points</i>
<i>6/10 chance it's True News; 4/10 chance it's Fake News</i>	<i>84 points</i>	<i>64 points</i>
<i>7/10 chance it's True News; 3/10 chance it's Fake News</i>	<i>91 points</i>	<i>51 points</i>
<i>8/10 chance it's True News; 2/10 chance it's Fake News</i>	<i>96 points</i>	<i>36 points</i>
<i>9/10 chance it's True News; 1/10 chance it's Fake News</i>	<i>99 points</i>	<i>19 points</i>
<i>10/10 chance it's True News; 0/10 chance it's Fake News</i>	<i>100 points</i>	<i>0 points</i>

For instance, if you estimate a 7/10 chance of True News, then for that round you will earn 91 points if the source is True News and 51 points if the source is Fake News.

At the end of the study, the points you receive on all choices you make will be averaged, and this will determine the chance (out of 1000) that you win the bonus. For example, if you earn 90 points on average, you will have a 90 out of 1000 chance of winning the bonus.

News Assessment

Original question 1 of 14: Crime Under Obama

Some people believe that the Obama administration was too soft on crime and that violent crime increased during his presidency, while others believe that President Obama's pushes towards criminal justice reform and reducing incarceration did not increase violent crime.

This question asks how murder and manslaughter rates changed during the Obama administration. In 2008 (before Obama became president), the murder and manslaughter rate was 54 per million Americans.

In 2016 (at the end of Obama's presidency), what was the per-million murder and manslaughter rate?

Message:

The answer is **less than** your previous guess of **57.0**.

Do you think this information is from True News or Fake News?

- 0/10 chance it's True News; 10/10 chance it's Fake News
- 1/10 chance it's True News; 9/10 chance it's Fake News
- 2/10 chance it's True News; 8/10 chance it's Fake News
- 3/10 chance it's True News; 7/10 chance it's Fake News
- 4/10 chance it's True News; 6/10 chance it's Fake News
- 5/10 chance it's True News; 5/10 chance it's Fake News
- 6/10 chance it's True News; 4/10 chance it's Fake News
- 7/10 chance it's True News; 3/10 chance it's Fake News
- 8/10 chance it's True News; 2/10 chance it's Fake News
- 9/10 chance it's True News; 1/10 chance it's Fake News
- 10/10 chance it's True News; 0/10 chance it's Fake News

Figure 11: Crime Under Obama news assessment page.

News Assessment

Original question 1 of 14: Crime Under Obama

Some people believe that the Obama administration was too soft on crime and that violent crime increased during his presidency, while others believe that President Obama's pushes towards criminal justice reform and reducing incarceration did not increase violent crime.

This question asks how murder and manslaughter rates changed during the Obama administration. In 2008 (before Obama became president), the murder and manslaughter rate was 54 per million Americans.

In 2016 (at the end of Obama's presidency), what was the per-million murder and manslaughter rate?

Message:

The answer is **less than** your previous guess of **57.0**.

Do you think this information is from True News or Fake News?

- 0/10 chance it's True News; 10/10 chance it's Fake News
- 1/10 chance it's True News; 9/10 chance it's Fake News
- 2/10 chance it's True News; 8/10 chance it's Fake News
- 3/10 chance it's True News; 7/10 chance it's Fake News
- 4/10 chance it's True News; 6/10 chance it's Fake News
- 5/10 chance it's True News; 5/10 chance it's Fake News
- 6/10 chance it's True News; 4/10 chance it's Fake News
- 7/10 chance it's True News; 3/10 chance it's Fake News
- 8/10 chance it's True News; 2/10 chance it's Fake News
- 9/10 chance it's True News; 1/10 chance it's Fake News
- 10/10 chance it's True News; 0/10 chance it's Fake News

After seeing this message and assessing its truthfulness, what is your guess of the answer to the original question?

Figure 12: Crime Under Obama news assessment page: Second Guess question.

News Valuation

On the previous News Assessment pages you were given messages that said that the correct answer was either "greater than" or "less than" your guess, and you were then asked to guess how likely it was that this message came from a True News versus Fake News source.

This section is designed to assess how useful you think those messages are. On this page you will decide whether to see the message or whether to receive additional points and see a screen with a black bar as in the following example:

Original question 12: Gender and Math Grades

In the United States, men are more likely to enter into mathematics and math-related fields. Some people attribute this to gender differences in interest in or ability in math, while others attribute it to other factors like gender discrimination.

This question asks whether high school boys and girls differ substantially in how well they do in math classes. A major testing service analyzed data on high school seniors and compared the average GPA for male and female students in various subjects.

Male students averaged a 3.04 GPA (out of 4.00) in math classes. What GPA did female students average in math classes?

(Please guess between 0.00 and 4.00.)

Message:

The answer is your previous guess of **3.1**.

Do you think this information is from True News or Fake News?

- 0/10 chance it's True News; 10/10 chance it's Fake News
- 1/10 chance it's True News; 9/10 chance it's Fake News
- 2/10 chance it's True News; 8/10 chance it's Fake News
- 3/10 chance it's True News; 7/10 chance it's Fake News
- 4/10 chance it's True News; 6/10 chance it's Fake News
- 5/10 chance it's True News; 5/10 chance it's Fake News
- 6/10 chance it's True News; 4/10 chance it's Fake News
- 7/10 chance it's True News; 3/10 chance it's Fake News
- 8/10 chance it's True News; 2/10 chance it's Fake News
- 9/10 chance it's True News; 1/10 chance it's Fake News
- 10/10 chance it's True News; 0/10 chance it's Fake News

To determine whether you receive the message or the black bar, you will write down a "valuation" at the bottom of this page. The more that you think the message helps you, the higher your valuation should be.

(If you would prefer to see the message instead of the black bar, you should submit a valuation between 0 and 25 points, where a larger valuation indicates a stronger preference for the message.)

(If you would prefer to see the black bar instead of the message, you should submit a valuation between -25 and 0 points, where a more negative valuation indicates a stronger preference for the black bar.)

The details of the procedure to determine whether you receive the message or the black bar is a bit complicated, but explained below. **What is important to know is that the way your earnings are determined ensures that your chances of winning the bonus are maximized by honestly answering this question.**

Valuation of message (in points):

Point and message procedure given your valuation:

A computer will randomly select a number between -25 and 25 with all numbers being equally likely.

If this number is greater than your valuation in points, this number will be added to the points you earn on the next News Assessment page, but you will receive the black bar instead of the message (as above).

If this number is less than your valuation in points, you will earn the standard amount of points on the next News Assessment page, and you will receive either the "greater than" or the "less than" message (as in previous pages).

News Assessment

Original question 12 of 14: Gender and Math Grades

In the United States, men are more likely to enter into mathematics and math-related fields. Some people attribute this to gender differences in interest in or ability in math, while others attribute it to other factors like gender discrimination.

This question asks whether high school boys and girls differ substantially in how well they do in math classes. A major testing service analyzed data on high school seniors and compared the average GPA for male and female students in various subjects.

Male students averaged a 3.04 GPA (out of 4.00) in math classes. What GPA did female students average in math classes?

(Please guess between 0.00 and 4.00.)

Message:

The answer is ██████████ your previous guess of **3.1**.

Do you think this information is from True News or Fake News?

- 0/10 chance it's True News; 10/10 chance it's Fake News
- 1/10 chance it's True News; 9/10 chance it's Fake News
- 2/10 chance it's True News; 8/10 chance it's Fake News
- 3/10 chance it's True News; 7/10 chance it's Fake News
- 4/10 chance it's True News; 6/10 chance it's Fake News
- 5/10 chance it's True News; 5/10 chance it's Fake News
- 6/10 chance it's True News; 4/10 chance it's Fake News
- 7/10 chance it's True News; 3/10 chance it's Fake News
- 8/10 chance it's True News; 2/10 chance it's Fake News
- 9/10 chance it's True News; 1/10 chance it's Fake News
- 10/10 chance it's True News; 0/10 chance it's Fake News

Next

Results: Click the Finish button at the bottom of this page to complete the HIT

Sorry, you did not win the bonus. Your additional bonus was \$0.00.

You earned 80.32 points on average across all questions in this study. For questions, solutions, points and whether information was from True News or Fake News, see the tables below.

Question	Correct answer	Your initial guess	Message said	Was the News Real or Fake	Your likelihood of this being True News	Points you earned for your likelihood
In a study, researchers sent fictitious resumes to respond to thousands of help-wanted ads in newspapers. The resumes sent had identical skills and education, but the researchers gave half of the (fake) applicants stereotypically White names such as Emily Walsh and Greg Baker, and gave the other half of the applicants stereotypically Black names such as Lakisha Washington and Jamal Jones. 9.65 percent of the applicants with White-sounding names received a call back. What percent of the applicants with Black-sounding names received a call back? (Please guess between 0 and 100.)	6.45	3.0	The answer is less than your previous guess.	Fake News	9/10	19.0
What is the year right now? This is not a trick question and the first sentence is irrelevant; this is a comprehension check to make sure you are paying attention. For this question, your lower and upper bounds should be equal to your guess if you know what year it currently is.	2018.0	2018.0	The answer is equal to your previous guess.	True News	10/10	100.0
How many degrees West is this geographic center? (Please guess between 0 and 180. The continental U.S. lies in the Western Hemisphere, which ranges from 0 degrees West to 180 degrees West.)	98.583	90.0	The answer is less than your previous guess.	Fake News	5/10	75.0

Question	Correct answer	Your guess	Your lower bound	Your upper bound	Points you earned for your guess and bounds	Source
In a study, researchers sent fictitious resumes to respond to thousands of help-wanted ads in newspapers. The resumes sent had identical skills and education, but the researchers gave half of the (fake) applicants stereotypically White names such as Emily Walsh and Greg Baker, and gave the other half of the applicants stereotypically Black names such as Lakisha Washington and Jamal Jones. 9.65 percent of the applicants with White-sounding names received a call back. What percent of the applicants with Black-sounding names received a call back? (Please guess between 0 and 100.)	6.45	3.0	3.0	3.0	94.25	http://bit.ly/labor-market-discrimination
What is the year right now? This is not a trick question and the first sentence is irrelevant; this is a comprehension check to make sure you are paying attention. For this question, your lower and upper bounds should be equal to your guess if you know what year it currently is.	2018.0	2018.0	2018.0	2018.0	100.0	http://bit.ly/what-year-is-it
How many degrees West is this geographic center? (Please guess between 0 and 180. The continental U.S. lies in the Western Hemisphere, which ranges from 0 degrees West to 180 degrees West.)	98.583	90.0	80.0	100.0	90.47	http://bit.ly/center-of-the-us