

Reporting Summary

Nature Research wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Research policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a Confirmed

- ☐ ☒ The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement
- ☐ ☒ A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
- ☐ ☒ The statistical test(s) used AND whether they are one- or two-sided
Only common tests should be described solely by name; describe more complex techniques in the Methods section.
- ☐ ☒ A description of all covariates tested
- ☐ ☒ A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
- ☐ ☒ A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
- ☐ ☒ For null hypothesis testing, the test statistic (e.g. F , t , r) with confidence intervals, effect sizes, degrees of freedom and P value noted
Give P values as exact values whenever suitable.
- ☒ ☐ For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
- ☐ ☒ For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
- ☐ ☒ Estimates of effect sizes (e.g. Cohen's d , Pearson's r), indicating how they were calculated

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection

Data collection was completed using Qualtrics survey software. Data collection and intervention implementation for Study 7 was done in Python 3.6. Matlab version R2018b was used for fitting the limited attention utility model to the data.

Data analysis

Data analysis was done in R 4.0.2 and Stata 16.1.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Research [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A list of figures that have associated raw data
- A description of any restrictions on data availability

Data and materials for Studies 1 through 6 are available at <https://osf.io/p6u8k/>. Due to privacy concerns, data from Study 7 are available upon request.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☒ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see [nature.com/documents/nr-reporting-summary-flat.pdf](https://www.nature.com/documents/nr-reporting-summary-flat.pdf)

Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	Study designs are outlined in the Methods section. Studies 1-6 involve presenting people with true and false news headlines (in a Facebook format) and asking them if they would consider sharing them on social media (and, in some cases, whether they believe the headlines to be accurate). Study design for Study 7 involved messaging Twitter users with an accuracy prompt and tracking their subsequent Twitter behavior.
Research sample	Studies 1-6 involved participants from Amazon's Mechanical Turk and Lucid. The former is not nationally representative; the latter is quote-matched to be representative based on age, gender, ethnicity, and region. Study 7 involved Twitter users and was not representative. Our survey samples are "convenience samples". However, given that our focus is on social media behavior, recruiting participants who complete online studies is a good fit. Demographics for the samples can be found in our Methods.
Sampling strategy	Sample sizes for Studies 1-6 were based on previous studies of this nature and the maximum amount of money that we wished to spend on the studies, given that we had no basis for an a priori estimated effect size (and such power analyses are often arbitrary anyway; http://datacolada.org/4). Study 3 involved following users on Twitter, and to comply with Twitter, our subject pool was the individuals who followed back our accounts.
Data collection	Data for Studies 1-6 was collected using online survey software (Qualtrics), which completed the randomization into separate experimental conditions. Study 7 data was taken from Twitter.
Timing	Study 1: August 13, 2019. Study 2: January 9-13, 2020. Study 3: October 4-6, 2017. Study 4: November 28-30, 2017. Study 5: May 1, 2019. Study 6: August 24, 2017. Study 7: 4/20/2018-4/27/2018 (Wave 1), 9/12/2018-9/14/2018 (Wave 2) and 1/28/2019-2/08/2019 (Wave 3).
Data exclusions	Participants in Studies 3-6 were excluded if they did not use social media or had no interest in sharing political content. Study 3 involved a variety of exclusions that are explained in detail in the supplementary document (e.g., those who didn't tweet links to the websites on our fact-checking rating list were excluded as they did not provide any data). This was preregistered. See Methods for inclusion criteria for Study 7.
Non-participation	Dropout was low in Studies 1-6. Study 1: 1.5% of the full sample. Study 2: 0%. Study 3: 5.7%. Study 4: 5.5%. Study 5: 7.5%. Study 6: 2.4%. Dropout was not possible in Study 7.
Randomization	For Studies 1-6, randomization was completed using Qualtrics survey software. For Study 7, a randomization schedule was computed to assign participants to experimental conditions while accounting for the blocking procedure. Then the Direct Messages were sent out through the Twitter API using this randomization schedule.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☐	☒ Human research participants
☒	☐ Clinical data
☐	☐ Dual use research of concern

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Human research participants

Policy information about [studies involving human research participants](#)

Population characteristics	See above.
Recruitment	Participants in Studies 1-6 were recruited online via Amazon's Mechanical Turk and Lucid for Academics. Study 7 participants were selected via previous engagement with low-quality news sources. Regarding self-selection bias: For our survey experiments, participants have to decide to complete the survey. This is, of course, true for any survey study run that involves participant consent. In the Twitter experiment, only those who "followed back" our bots were included in the study; nonetheless, we randomized our treatment within this group and therefore our causal inference is maintained.
Ethics oversight	We had research clearance from Yale Human Subjects Committee (Studies 3, 4, 6, 7), MIT Committee on the Use of Humans as Experimental Subjects (Study 2, 7), and the University of Regina Research Ethics board (Studies 1, 5). Participants in Studies 3, 4, and 6 were not given consent forms because the Yale IRB had a consent form exception for online studies. Consent was not obtained for Study 7, consistent with our approved ethics protocols (see supplementary materials, Section 4 for further explanation).

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Dual use research of concern

Policy information about [dual use research of concern](#)

Hazards

Could the accidental, deliberate or reckless misuse of agents or technologies generated in the work, or the application of information presented in the manuscript, pose a threat to:

No	Yes
☒	☐ Public health
☒	☐ National security
☒	☐ Crops and/or livestock
☒	☐ Ecosystems
☒	☐ Any other significant area

Experiments of concern

Does the work involve any of these experiments of concern:

No	Yes
☒	☐ Demonstrate how to render a vaccine ineffective
☒	☐ Confer resistance to therapeutically useful antibiotics or antiviral agents
☒	☐ Enhance the virulence of a pathogen or render a nonpathogen virulent
☒	☐ Increase transmissibility of a pathogen
☒	☐ Alter the host range of a pathogen
☒	☐ Enable evasion of diagnostic/detection modalities
☒	☐ Enable the weaponization of a biological agent or toxin
☒	☐ Any other potentially harmful combination of experiments and agents