POLICY REPORT

APRIL 2025

# Socioeconomic, Informational, and Attitudinal Predictors of Misinformation Belief: Survey Evidence from Four Countries

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*Ponder the Improbable* since 1996

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## Executive Summary

We explore the individual-level predictors of misinformation belief through surveys featuring 30 misinformation stories in four countries: Spain, Portugal, the United States, and India. Greater reliance on social media is consistently associated with misinformation belief in all countries. Further analyses reveal that this relationship is driven by different subsets of individuals across countries. For instance, in a hyper-polarised country (United States), this relationship is strongest among respondents with high levels of political interest. Overall, our results uncover several consistent predictors of misinformation belief while also highlighting the need for targeted interventions (e.g., around social media use).

# Introduction

Which citizens are most vulnerable to misinformation? Using surveys, we investigate the predictors of misinformation belief featuring 30 misinformation stories in four countries: Spain, Portugal, the United States, and India.[1] Understanding the predictors of misperceptions is especially important. While much scholarly and public attention has been paid to fact-checking, consumption of fact checks in the real world is low and uneven across ideological groups (Guess et al. 2018, Robertson et al. 2020).[2] Most misinformation which citizens are exposed to largely remains uncorrected. Developing policy solutions to the misinformation problem requires us to first understand who is at greatest risk. This study seeks to address this question.

Our comparative study of Spain, Portugal, the US, and India - countries with different socioeconomic characteristics, political systems, and information environments - offers a more holistic understanding of misinformation belief and its correlates. The main findings from the surveys conducted in these four countries indicate that the drivers of misinformation belief are largely consistent across countries; at the same time, our findings on social media use suggest the need for targeted interventions tailored to specific population subgroups within each nation. This article expands on the findings from these four countries and considers their implications for Singapore.

# Who is Vulnerable to Misinformation?

Existing research concerning vulnerabilities to misinformation focuses on variables associated with individuals' motivation, ability, and opportunity to evaluate political news.[3] For instance, past studies point to the importance of political interest, political knowledge, education, and information sources. Many such studies use these concepts (e.g., political interest, awareness or expertise, and political or cognitive sophistication) interchangeably, partly due to the close-knit relationship between political knowledge and "other aspects of citizenship".[4] Delli Carpini and Scott Keeter (1996), who see political knowledge as a "distinct concept," define the term as "the range of factual[5]

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[1] Throughout, we use the terms "misinformation belief" and "misperceptions" interchangeably.

[2] Alexander Guess, Brendan Nyhan, and Jason Reifler, "Selective Exposure to Misinformation: Evidence from the consumption of fake news during the 2016 U.S. presidential campaign," Unpublished paper. Craig T. Robertson, Rachel Reczek Mourão, and Emily Thorson, "Who Uses Fact-Checking Sites? The Impact of Demographics, Political Antecedents, and Media Use on Fact-Checking Site Awareness, Attitudes, and Behavior," *The International Journal of Press/Politics*, *25*(2), 2020, 217-237, https://doi.org/10.1177/1940161219898055.

[3] This approach is based on Delli Carpini and Keeter's (1996) seminal study of political knowledge. See Michael X. Delli Carpini and Scott Keeter, "What Americans Know about Politics and Why It Matters", New Haven: Yale University Press, 1996.

[4] Delli Carpini and Scott Keeter, "What Americans Know about Politics and Why It Matters", New Haven: Yale University Press, 1996, p. 10.

[5] Carpini and Keeter (1996) acknowledge that it is tricky to establish facts on many issues. Nonetheless, they argue that there are issues that emerge as facts with "reasonable assurance" (e.g., how federal governments define poverty, what percentage of the American public currently lives below the federally defined poverty line", etc.). See Caprini and Keeter, 1996, p. 11.

information about politics that is stored in long-term memory".[6] In addition to the terminological ambiguity, empirical findings in this area are far from consistent and may vary significantly depending on patterns of media use,[7] elite rhetoric,[8] and other factors. For instance, Humprecht et al. (2020) document cross-national differences in self-reported exposure to misinformation, noting that countries with high news media distrust, populist rhetoric, polarised political conflict, and high social media news consumption have higher overall levels of perceived exposure.[9] Whether these differences extend to the predictors of misperceptions, however, remains unclear.

Other studies explore the relationship between political knowledge and use of different news sources (i.e., traditional versus social media). Some of these studies have found a link between knowledge and traditional news consumption.[10] There are also studies that suggest that political knowledge does not increase with the use of social media for news consumption, and moving from traditional to social media "fails to compensate for political learning that comes from news consumption via traditional news platforms".[11] Most of the past research exploring the predictors of misinformation focus on single issues or countries (see Jerit and Zhao 2020 for a review); however, multi-country studies have been slowly emerging in the past couple of years.[12]

Building on the extant literature, we conducted online surveys in four countries to assess respondents' average belief in randomly selected misinformation stories that were circulating in their country. These stories, which were taken from the websites of professional fact-checking organisations, covered politics, economics, health, and other issues (see Appendix B for a full list). We developed one or two-paragraph versions of each story. While no set of stories can perfectly represent the universe of misinformation in a given country, our stories are diverse and accurately reflect the type of misinformation respondents are likely to encounter.

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[6] Carpini and Keeter, 1996, p. 10.
[7] Michela Del Vicario, Alessandro Bessi, Fabiana Zollo, Fabio Petroni, Antonio Scala, Guido Caldarelli, H. Eugene Stanley, and Walter Quattrociocchi, "The Spreading of Misinformation Online", *Proceedings of the National Academy of Sciences*, *113* (3), 2016, p. 554–559, doi:10.1073/pnas.1517441113.
[8] Brendan Nyhan, "Facts and myths about misperceptions", *Journal of Economic Perspectives*, 34(3), 2020, p. 220-236, https://www.jstor.org/stable/26923548.
[9] Edda Humprecht, Frank Esser, and Peter Van Aelst, "Resilience to online disinformation: A framework for cross-national comparative research", *The international journal of press/politics*, *25*(3), 2020, p. 493-516, https://doi.org/10.1177/1940161219900.
[10] Liu, Shen, Eveland, & Dylko, 2013 and Moy, McCluskey, McCoy, & Spratt, 2004 as cited in Edson 241
[11] Park (2017) and Shehata and Strömbäck (2018) as cited in Edson C. Tandoc, James Lee, Matthew Chew, Fan Xi Tan, and Zhang Hao Goh, "Falling for fake news: the role of political bias and cognitive ability", Asian Journal of Communication, 31:4, p. 241, DOI: 10.1080/01292986.2021.1941149
[12] Jennifer Jerit and Yangzi Zhao, "Political misinformation," *Annual Review of Political Science*, 23, 2020, p. 77-94, **https://doi.org/10.1146/annurev-polisci-050718-032814**. One exception is recent multi-country studies of corrections (e.g., Porter et al. 2023). However, as discussed, our focus here is on the factors associated with misinformation belief, not the effectiveness of corrections. See Ethan Porter, Yamil Velez, and Thomas J. Wood, "Correcting COVID-19 vaccine misinformation in 10 countries", *Royal Society Open Science*, 10(3):221097, 2023, doi: 10.1098/rsos.221097.

We concentrated on respondents' *average belief in misinformation* across all evaluated stories—the outcome of interest in our analyses below. Regarding predictors, we included several variables related to motivation, ability, and opportunity.[13] We focused on Spain, Portugal, the US, and India because they vary in important ways, namely elite populism, mass populism, and political institutions. These four countries may also differ in their resilience to misinformation. Humprecht et al. 2020 examine structural factors of media systems (e.g., polarisation, patterns of trust in news) and place Spain and Portugal in a cluster of countries exhibiting low resilience to online misinformation.[14] The US emerges as a cluster of its own, underscoring its exceptional position within countries with low resilience. In India, social media use has grown exponentially since 2014 (cf. Akbar et al., 2022; Al-Zaman, 2021).[15] Not only have politicians and parties leveraged social media to communicate with voters and shape public opinion, it has also become a main source of news and thus also a channel for misinformation, stirring violent outbreaks in the process.[16]

## Findings

The surveys conducted with respondents from Spain, Portugal, India, and the US revealed three main findings. First, there is a substantial variance on the predisposition to believe conspiracy theories and overall levels of misinformation belief across countries. Second, the predictors of misperceptions are mostly consistent across the four countries, with people who are younger, less educated, less politically knowledgeable, and more reliant on social media for political news demonstrating higher levels of belief in misinformation. Third, greater reliance on social media (rather than traditional media) to read and share news is consistently associated with higher belief in misinformation.

Each of these findings are unpacked in the sub-sections below. More information about our surveys can be found in the appendices. Appendix A provides details on the methodology of the study, Appendix B includes a list of misinformation stories used in each country, Appendix C contains question wordings, and Appendix D presents additional statistical results.

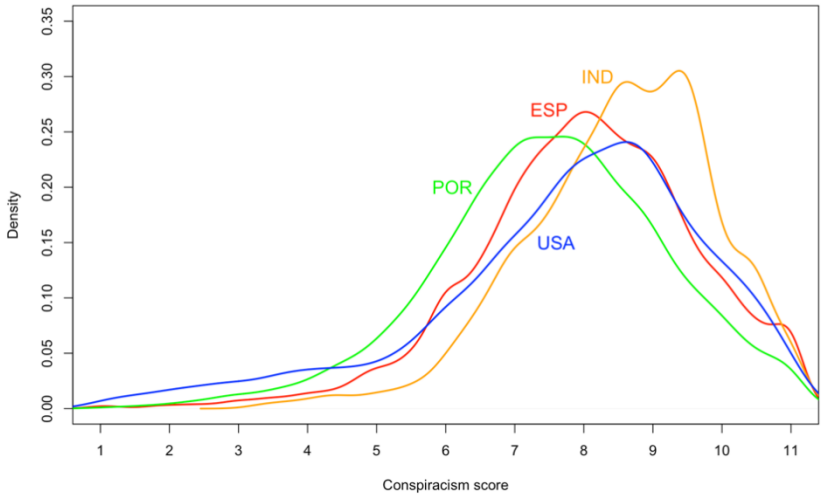
### *Finding 1: Predisposition to believe conspiratory theories and overall levels of misinformation belief vary substantially across countries.*

The four countries we focused on in this study vary on important dimensions, including predisposition to believe conspiracy theories (measured with a five-item scale from

[13] Carpini and Keeter, 1996.
[14] Humprecht et al, 2020.
[15] Syeda Zainab Akbar, Anmol Panda, and Joyojeet Pal, "Political hazard: Misinformation in the 2019 Indian general election campaign," *South Asian history and culture*, *13*(3), 2022, p. 399-417, https://doi.org/10.1080/19472498.2022.2095596; M. S. Al-Zaman, "Social media fake news in India," *Asian Journal for Public Opinion Research*, *9*(1), 2021, p. 25-47, https://doi.org/10.15206/ajpor.2021.9.1.25
[16] M. S. Al-Zaman, "Social media fake news in India," *Asian Journal for Public Opinion Research*, *9*(1), 2021, p. 25-47, https://doi.org/10.15206/ajpor.2021.9.1.25

Bruder et al. 2013)[17] and overall levels of misinformation belief (measured in our surveys).[18] Figure 1a shows the distribution of conspiratorial predispositions in each country.

*Figure 1a. Conspiratorial predispositions by country*



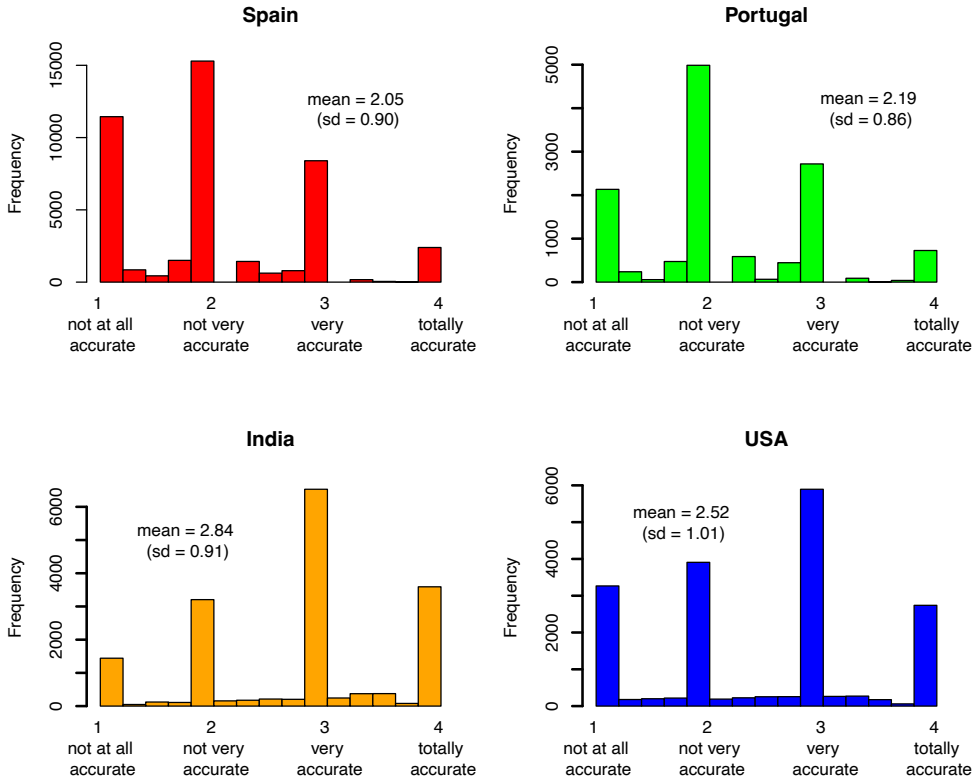

As shown in Figure 1a, conspiratorial predispositions differ significantly across countries, with the highest levels in India (8.52 out of 11) followed by Spain (8.00), the US (7.75), and Portugal (7.50; all pairwise comparisons significant at p<.001).[19] India stands out not only as the most conspiratorial sample on average, but for a relatively few number of respondents at the low/moderate ends of the conspiratorial scale. The other three countries, by contrast, appear more normally distributed.

[17] Markus Bruder, Patrick Haffke, Nick Neave, Neda Nouripanah, and Roland Imhoff, "Measuring individual differences in generic beliefs in conspiracy theories across cultures: Conspiracy Mentality Questionnaire," *Frontiers in Psychology*, 4, article 225, 2013, https://doi.org/10.3389/fpsyg.2013.00225.

[18] This study measured predisposition to conspiracy theories with a five-item scale from Bruder et al. 2013. Bruder et al. (2013) define conspiracy with reference to Moscovici (1987). Accordingly, conspiracy suggests "that members of a confession, party, or ethnicity […] are united by an indissoluble secret bond. The object of such an alliance is to foment upheaval in society, pervert societal values, aggravate crises, promote defeat, and so on". Building on this, with reference to Swami et al., Bruder et al. sees conspiracy mentality as "general propensity to subscribe to theories blaming a conspiracy of ill-intending individuals or groups for important societal phenomena or, in more abstract terms, the tendency to subscribe to 'general conspiracist beliefs'". See Moscovici (1987, p. 154) and Swami et al. (2010) in Bruder et al., 2013, p. 2. Misinformation, on the other hand, refers to false information and is not the same with conspiracy.

[19] Comparisons are significant at p<.001 using both t-tests and nonparametric Kolmogorv-Smirnov tests.

*Figure 1b. Average misinformation belief by country*




Examining the overall levels of misinformation belief in Figure 1b, we again see significant country differences. Misinformation belief is highest in India (2.84 out of 4), which comes closest to "very accurate" on our four-point response scale. India is followed by the US (2.52), Portugal (2.19), and Spain (2.06; all pairwise comparisons significant at p<.001).[20] Overall, the four countries differ significantly in terms of both conspiratorial tendencies and average levels of belief in misinformation. We will next look at the predictors of misinformation belief, examining the extent to which these predictors vary across our diverse set of countries.

[20] These comparisons are again significant at p<.001 using both t-tests and Kolmogorv-Smirnov tests.

***Finding 2: The predictors of misperceptions are largely, though not uniformly, consistent across countries. Respondents who are younger, less educated, less politically knowledgeable, and more reliant on social media for political news demonstrate higher levels of belief in misinformation stories.***

*Table 1. Regression models predicting average belief in misinformation stories*

| | *Outcome = average belief in false claims* | | | |
|---|---|---|---|---|
| | **Study 1 (Spain)** | **Study 2 (Portugal)** | **Study 3 (USA)** | **Study 4 (India)** |
| News from social media (share) | 0.08*** | 0.07*** | 0.13*** | 0.04* |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| Undergraduate degree | -0.03** | -0.11*** | 0.12*** | -0.15*** |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| Political knowledge | -0.17*** | -0.16*** | -0.19*** | NA |
| | (0.02) | (0.04) | (0.02) | |
| Political Interest | -0.05*** | -0.05* | 0.04** | -0.08*** |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| Trust in media | 0.02 | 0.003 | 0.19*** | 0.21*** |
| | (0.01) | (0.02) | (0.02) | (0.02) |
| Conspiratorial predispositions | 0.08*** | 0.20*** | 0.42*** | 0.20*** |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| Left-right ideology | 0.01 | -0.01 | 0.065*** | NA |
| | (0.01) | (0.02) | (0.01) | |
| Age | -0.08*** | -0.05* | -0.07*** | -0.17*** |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| Female | -0.01 | 0.01 | -0.05*** | -0.03 |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| Constant | 0.06*** | 0.14*** | 0.01 | -0.04* |
| | (0.01) | (0.03) | (0.01) | (0.02) |
| *Political parties* | *Yes* | *Yes* | *Yes* | *Yes* |
| *Number of false claims included* | *8* | *5* | *8* | *9* |
| N | 8278 | 3027 | 2989 | 2579 |

*Note: Cell entries are standardised OLS coefficients with standard errors in parentheses. DV is average belief in false claims presented, which is measured 1-4 with higher values indicating more belief in false claims. Significance codes: '***' 0.001 '**' 0.01 '*' 0.05.*

Table 1 presents a series of models predicting average misinformation belief based on socioeconomic, informational, and attitudinal factors.[21] As noted, several variables are consistently associated with misinformation belief across countries:

[21] These are standardised regression coefficients. The specification is the same across countries with the exception of India, where political knowledge and left/right ideology were not measured. Research suggest that education is a good proxy for political knowledge (Le and Nguyen 2021); we consulted country experts who suggested that this relationship should be particularly strong in India. Left/right ideology is not frequently measured in India, as it is not a salient dimension of political conflict. See J. Minh Le and Minh Nguyen, "Education and political engagement", *International Journal of Education Development*, 85, 2021, https://doi.org/10.1016/j.ijedudev.2021.102441.

reliance on social media for news (all four countries), lower levels of political knowledge (all four), age (all four), and lacking a university degree (three out of four). However, we also observe some interesting cross-national differences. For instance, political interest and formal education are negatively associated with misinformation belief in Spain, Portugal, and India, but positively associated with belief in the US. This may suggest that the drivers of misinformation belief are distinct in highly polarised countries.

We operationalise social media use as a share of respondents' overall political information diet and treat the resulting variable as a proxy for likely exposure to misinformation. However, the persuasiveness of misinformation will also depend on individuals' motivation and ability to scrutinise factual claims about politics. We consider several related variables – including educational attainment, political knowledge, and political interest – which are often correlated and used interchangeably as proxies for "political sophistication." Yet, evidence of the relationship between these variables and factual beliefs is mixed. One the one hand, higher cognitive abilities could promote biased interpretation of information through a process of motivated reasoning.[22] On the other hand, cognitive resources could better equip citizens to scrutinise dubious factual claims they encounter on social media or elsewhere.[23] As mentioned, we examine the relationship between these variables and misinformation belief across a wide range of stories in four countries.

***Finding 3: Greater reliance on social media (rather than traditional media) to read and share news is consistently associated with higher belief in misinformation.***

Several studies have documented a positive association between social media use and belief in certain false claims.[24] However, given the diverse set of countries considered in this study, the consistent relationship between social media use and misinformation belief is particularly striking. We explore this relationship further by comparing predicted levels of misinformation belief across countries (using the models in Table 1). Specifically, we calculate predicted levels of misinformation belief for a "typical" respondent in each country with varying levels of reliance on social media for political news: low (share=0.2), moderate, and high.[25] The results are presented in Figure 2. In each country, marginal increases in social media use are associated with significant

[22] Charles S. Taber and Milton Lodge, "Motivated Skepticism in the Evaluation of Political Belief", *American Journal of Political Science*, *50*(3), 2006, p. 755-769, https://doi.org/10.1111/j.1540-5907.2006.00214.x. Dan M. Kahan, "Ideology, motivated reasoning, and cognitive reflection," *Judgement and Decision Making*, 8(4), 2013, p. 407-424, https://journal.sjdm.org/13/13313/jdm13313.pdf.

[23] Gordon Pennycook and David G. Rand, "Lazy, not biased: Susceptibility to partisan fake news is better explained by lack of reasoning than by motivated reasoning", *Cognition*, 188, 2019, p. 39-50, https://doi.org/10.1016/j.cognition.2018.06.011; Federico Vegetti and Matteo Mancosu, "The impact of political sophistication and motivated reasoning on misinformation" *Political Communication*, 37(5), 2020, p. 678-695, https://doi.org/10.1080/10584609.2020.1744778.

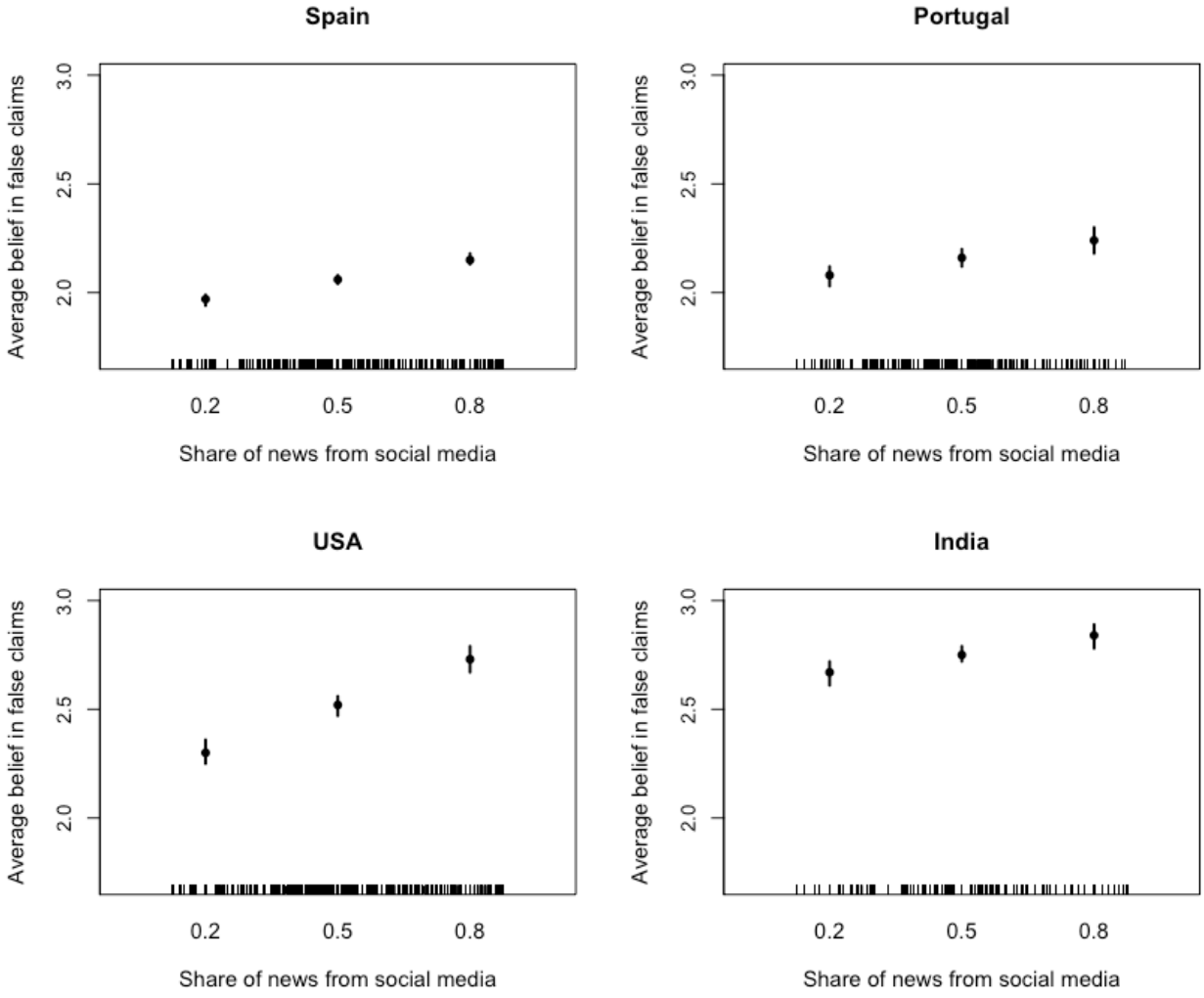
[24] See for example Dominik A. Stecula, Ozan Kuru, and Kathleen Hall Jamieson, "How Trust in Experts and Media Use Affect Acceptance of Common Anti-Vaccination Claims" *Harvard Kennedy School (HKS) Misinformation Review*, 2020, https://doi.org/10.37016/mr-2020-007.

[25] Predicted probabilities were calculated as linear combinations from the regression results in Table 1. We set continuous variables (e.g., left/right ideology) at their medians and categorical variables at their modes; partisan variables are set to 0.

jumps in average misinformation belief (all within-country comparisons significant at p<.05 or less).

*Figure 2. Predicted levels of misinformation belief by level of social media use*

*Points are predicted levels of misinformation belief. Error bars contain 95% confidence intervals.*




***Finding 4: The relationship between social media use and misinformation belief is driven by different subsets of people across countries.***

We also examine whether the relationship between social media use and misinformation belief is stronger for different types of individuals. To do so, we estimated separate models that interact social media use with education, political interest, and conspiratorial predispositions, respectively (see Appendix D). Figure 3a presents results for education. In three countries (Spain, the US, India), the relationship between social media use and misinformation belief is larger for respondents with university degrees.

*Figure 3a. Relationship between social media use and misinformation belief across levels of education*

*Estimates calculated from interaction models in Appendix D. Error bars contain 95% confidence intervals.*

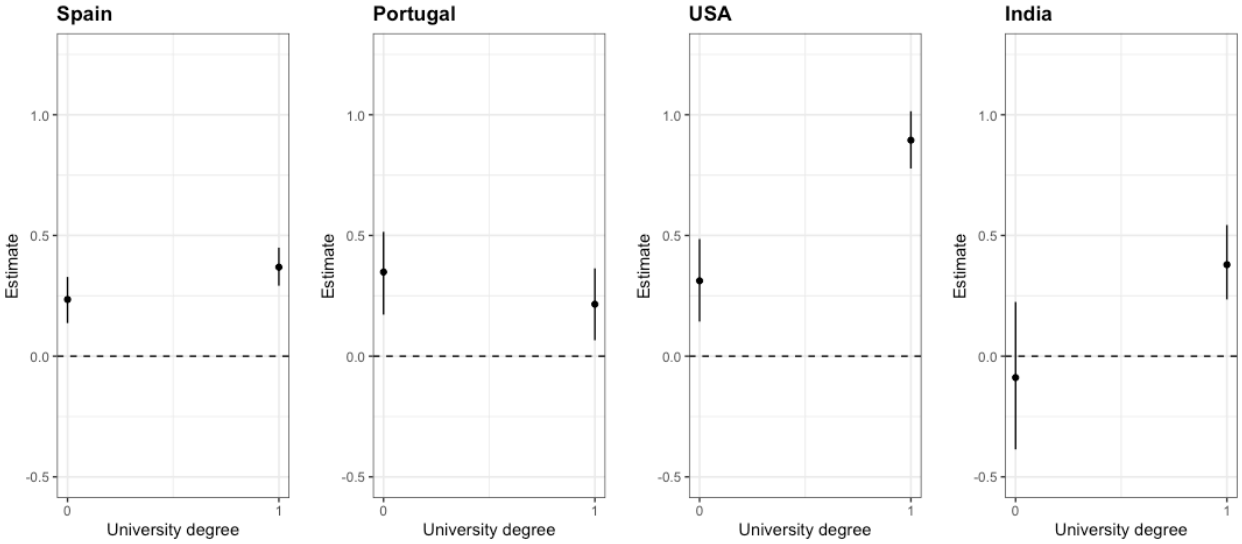
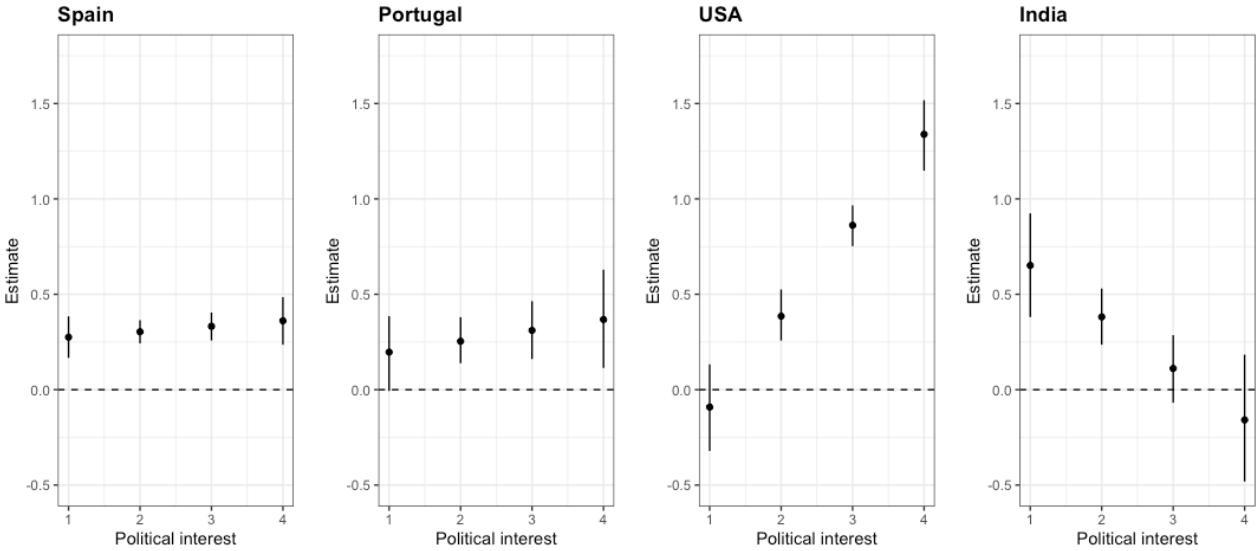



Figure 3b presents the results for levels of political interest. In Spain and Portugal, we see that the relationship between social media use and misinformation belief is relatively constant across low and high interest respondents. In the US and India, however, we see substantial variation. In the US, this relationship becomes stronger with levels of political interest. In India, on the other hand, the relationship becomes weaker with levels of political interest.

*Figure 3b. Relationship between social media use and misinformation belief across levels of political interest*

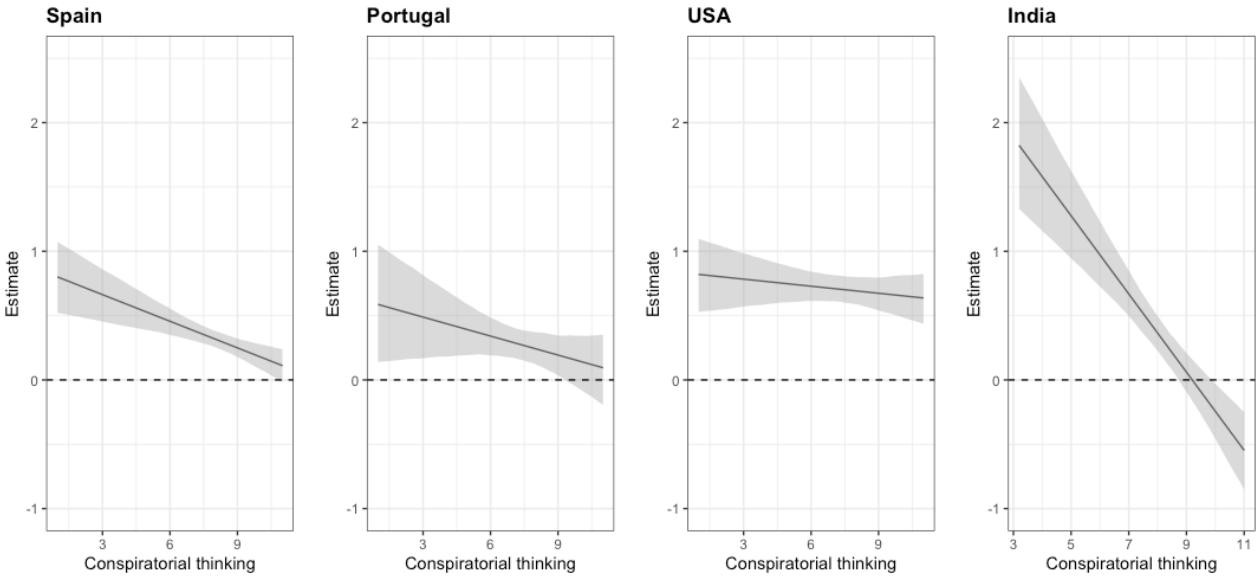
*Estimates calculated from interaction models in Appendix D. Error bars contain 95% confidence intervals.*



Finally, we examine the relationship between social media use and misinformation belief across levels of conspiracism. In all countries, this relationship is driven by respondents with low to moderate levels of underlying conspiracism. This suggests the troubling possibility that social media may increase belief in misinformation even among people with low baseline tendency to believe conspiratorial claims.

*Figure 3c. Relationship between social media use and misinformation belief across levels of conspiracism*

*Estimates calculated from interaction models in Appendix D. Error bars contain 95% confidence intervals.*




## What Do These Findings Mean?

In this study we find that the predictors of misinformation belief are largely (though not uniformly) consistent across countries, with younger, less educated, less politically knowledgeable respondents, as well as heavy social media users, most susceptible to misinformation. Our results reveal that greater reliance on social media is consistently associated with higher average belief in misinformation. In all four countries, marginal increases in social media use are associated with significant jumps in overall misinformation belief.

Our results point to cross-country differences in characteristics of misinformed individuals when it comes to educational attainment and political interest. Most notably, the US stands out as the single case in which university degree holders and those higher in political interest demonstrate higher overall belief in misinformation, while in three countries, Spain, India, and the US, the relationship between social media use and misinformation belief is larger for respondents with university degrees. Moreover, in additional analyses we find that in the US, the relationship between social media use and misinformation belief increases with levels of political interest. By

contrast, the findings on political knowledge are consistent across countries, with more knowledgeable citizens less likely to be misinformed.

Our findings show that many countries need to consider adapting policies against misinformation that target young, less educated and less politically informed people. Our findings also suggest the need to adapt measures that boost political knowledge among younger citizens and foster healthy news consumption habits. On the other hand, as the US findings on education and political interest demonstrate, policymakers should identify country-specific dynamics before committing to blanket countermeasures. Additionally, the finding on social media use and vulnerability to misinformation suggest the need for targeted interventions suitable to specific subgroups of the population in different countries. This is all the more necessary against the platformisation of news and dependence of many on social media for news across countries. Social media companies should also reconsider how they position traditional media outlets as information sources within their platforms, and how they can curb younger – and other – people's access to politically charged misinformation.

## What Are the Lessons for Singapore?

Past research into misinformation in Singapore offers both findings that are consistent with those reported here and findings that conflict with those revealed in this study. This pattern suggests that some policy approaches may be suitable across countries while others require context-specific development and testing before implementation.

Focusing first on age, a 2018 IPSOS study in Singapore found that respondents age 15 to 24 were likely to fall for false information.[26] In 2021, the Institute of Policy Studies found Singaporeans who are "older" and "live in public housing" (among others) to be more vulnerable to misinformation.[27] Consistent with the IPSOS study, our study found younger participants to be more vulnerable to misinformation. The differences in findings on age within Singapore raise questions about potential differences in belief in misinformation across subjects (e.g., political versus health misinformation), and about what sets middle-aged respondents apart from the younger and older cohorts that are identified as more vulnerable to misinformation. For instance, future studies could further investigate age and belief in misinformation question against the faultlines in Singapore, as there could be age-based differences in approaches to issues concerning race, religion, immigration, and others that are identified as Singapore's faultlines in a 2019 IPS working paper.[28] Future research may seek to better understand potential reasons for these age differences, including whether there is differential

[26] "The Susceptibility of Singaporeans Towards Fake News," IPSOS, 28 September 2018, https://www.ipsos.com/en-sg/susceptibility-singaporeans-towards-fake-news.
[27] Carol Soon and Shawn Goh, "Singaporeans' Susceptibility to False Information," IPS Exchange Series, no 19, July 2021, p. 6, https://lkyspp.nus.edu.sg/docs/default-source/ips/ips-exchange-series-19.pdf
[28] Mathew Mathews, Malvin Tay, and Shanthini Selvarajan, "Faultlines in Singapore: Public Opinion on Their Realities, Management and Consequences," IPS Working Papers, no. 37, 2019, https://lkyspp.nus.edu.sg/docs/default-source/ips/working-paper-37_faultlines-in-singapore_public-opinion-on-their-realities-management-and-consequences_final.pdf

attention to politics, which may make middle age people more knowledgeable on political issues and better able to evaluate information.

The aforementioned 2021 IPS study also suggested that Singaporeans who "have higher trust in local online-only news sites or blogs", "exhibit greater confirmation bias in information-seeking and processing", "have lower levels of self-efficacy in discerning between real and false information", "have lower digital literacy", and are more vulnerable to misinformation.[29] Somewhat fittingly, in a 2021 study, Tandoc and colleagues found a positive relationship between social media news use and belief in misinformation and a negative relationship between traditional news use and belief in misinformation.[30] Their study also revealed that there is a negative relationship between cognitive ability and belief in misinformation and a significantly positive correlation between political bias (operationalised as "anti-government sentiment") and belief in misinformation.[31] These findings mostly align with the findings of our study.

Our study found that those who are less educated, less politically knowledgeable, and who are heavy social media users are more prone to fall for misinformation. In our studies, in three countries (Spain, India, and the US) the relationship between social media use and misinformation belief is more significant among those with university degrees. Taking this together with Tandoc and colleagues' finding on the correlation between political bias and belief in misinformation raises questions about the relationships between education level, cognitive ability, and motivated reasoning. While higher levels of education do not necessarily inoculate people against misinformation, could they lead to a stronger hold on political beliefs and biases and result in motivated reasoning? As shared in the previous section, the findings concerning such questions are mixed. While some studies suggest that higher cognitive abilities could lead to biased information evaluation through motivated reasoning,[32] others argue that cognitive resources could arm people with the skills to better examine information accuracy.[33] On the other hand, in all countries we examined, political knowledge is associated with less vulnerability to misinformation,

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[29] Carol Soon and Shawn Goh, "Singaporeans' Susceptibility to False Information," IPS Exchange Series, no 19, July 2021, p. 6, https://lkyspp.nus.edu.sg/docs/default-source/ips/ips-exchange-series-19.pdf

[30] Edson C. Tandoc, James Lee, Matthew Chew, Fan Xi Tan, and Zhang Hao Goh, "Falling for fake news: the role of political bias and cognitive ability," *Asian Journal of Communication*, 31:4, 2021, p. 246, DOI: 10.1080/01292986.2021.1941149.

[31] Edson C. Tandoc, James Lee, Matthew Chew, Fan Xi Tan, and Zhang Hao Goh, "Falling for fake news: the role of political bias and cognitive ability," *Asian Journal of Communication*, 31:4, 2021, p. 245, 246, DOI: 10.1080/01292986.2021.1941149.

[32] Charles S. Taber and Milton Lodge, "Motivated Skepticism in the Evaluation of Political Belief," *American Journal of Political Science*, *50*(3), 2006, p. 755-769, https://doi.org/10.1111/j.1540-5907.2006.00214.x; Dan M. Kahan, "Ideology, motivated reasoning, and cognitive reflection," *Judgement and Decision Making*, 8(4), 2013, p. 407-424, https://journal.sjdm.org/13/13313/jdm13313.pdf.

[33] Gordon Pennycook and David G. Rand, "Lazy, not biased: Susceptibility to partisan fake news is better explained by lack of reasoning than by motivated reasoning," *Cognition*, 188, 2019, p. 39-50, https://doi.org/10.1016/j.cognition.2018.06.011; Federico Vegetti and Matteo Mancosu, "The impact of political sophistication and motivated reasoning on misinformation," *Political Communication*, 37(5), 2020, p. 678-695, https://doi.org/10.1080/10584609.2020.1744778.

suggesting that civic education and related initiatives may be an effective response to the misinformation problem.

Singapore has multiple initiatives in place to counter misinformation, including those concerning media literacy. While these initiatives are important and should continue, efforts should also be made to encourage people to embrace healthy news consumption habits and tailor programmes to boost people's political knowledge. According to the 2024 Reuters Institute Digital News Report on Singapore, trust in news stands at 47 per cent in Singapore with traditional media brands such as Channel News Asia (74 per cent) and The Straits Times (73 per cent) receiving high level of trust from participants.[34] The media organisations should adhere to high standards in delivering accurate, unbiased information and seek to sustain populations trust in traditional media outlets.

Singapore has Character and Citizenship Education (CCE) for school going children, which delivers information on various subjects, including those concerning Singaporean identity and global political events.[35] While CCE contributes to political knowledge-building efforts, it has recently come under fire for content on the Israel-Hamas conflict, demonstrating the need to handle issues that could create polarisation in the society delicately.[36] Nonetheless, although these concerns signal the need to examine the content and delivery of political topics, CCE is an avenue to equip different age groups with political knowledge and discuss significant global political events. Revisiting the political knowledge definition of Carpini and Keeter (1996), CCE can put more emphasis on "factual" knowledge of Singapore politics (see footnote 4) while providing a space to deliberate more contentious political issues that may appeal to the faultlines in society in a conscious and comprehensive way that focuses on established facts while allowing space for the interaction of different perspectives on the issue. The initiatives to boost political knowledge, especially those focused on the fundamentals of the country's political system and democracy, should not be limited to CCE and reach different audience groups with the help of trusted state and non-state actors, including media and civil society.

Beyond Singapore, our results highlight the need to understand which populations are at greatest risk from reliance on social media for political news. At the same time, there is much more to learn about the relationship between media use and misinformation susceptibility and whether this relationship varies across countries. To that end, future research should use experimental or panel designs to offer direct causal evidence of the impact of social media use on misinformation belief.

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[34] Edson C. Tandoc Jr and Matthew Chew, "Singapore," *Reuters Institute Digital News Report*, 17 June 2024, https://reutersinstitute.politics.ox.ac.uk/digital-news-report/2024/singapore.
[35] "What Is Character and Citizenship Education and What Do Students Learn?," *Ministry of Education*, 27 September 2024, https://www.moe.gov.sg/news/edtalks/what-is-character-and-citizenship-education-and-what-do-students-learn.
[36] Ayush Das, "From Textbooks to Tolerance: Perspectives on Singapore's CCE Curriculum on the Role of Education in Democracy," *LSE Blog*, 2 April 2024, https://blogs.lse.ac.uk/lseupr/2024/04/02/from-textbooks-to-tolerance-perspectives-on-singapores-cce-curriculum-on-the-role-of-education-in-democracy/; Elisha Tushara, "Israel-Hamas conflict not the only emotive topic students will encounter: Chan Chun Sing," *Straits Times*, 2 April 2024, https://www.straitstimes.com/singapore/politics/israel-hamas-conflict-not-the-only-emotive-topic-that-can-be-addressed-in-cce-lessons-chan-chun-sing.

## Acknowledgements

The authors would like to thank the following organisations for the funding(s) of this study:

- Association of Professional Schools of International Affairs for the grant that supported the data collection efforts from India and the US, Foundation Observatorio Social de “la Caixa” (Call Febrero - March 2019) for the survey in Spain, and the data generation fund of the School of Politics, Economics & Global Affairs (IE University, Spain) for funding the survey in Portugal.

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# Appendix A: Methodology

The survey data analysed in this article were collected as part of a larger experimental project focused on populism and misinformation. As part of that project, we conducted survey experiments in Spain (2019-20), Portugal (2020-21), the United States (2021), and India (2021). The surveys (Spain N=8714, Portugal N=3210, the United States N=3025, and India N=2817) measured respondents' average belief in several randomly selected misinformation stories circulating in their country. Respondents in Spain and Portugal were recruited by Netquest, an ISO-certified online panel. Respondents in the US and India were recruited from Amazon's Mechanical Turk.[37] For each country, we recruited the maximum number of respondents possible under our budget.

## Appendix B: Misinformation Stories

This appendix lists the misinformation stories used in each country.

In all studies, respondents first saw a true story about climate change, which is not included in our analyses. They were then randomly assigned to read a series of short blurbs based on misinformation stories circulating in their country. The full text of each story is available on request. We provide an example blurb and the dependent variable (same format for all stories) below.

| Country | Stories |
|---|---|
| Spain | Story 1: All respondents received climate change story (true)<br><br>[Order of stories 2-5 randomised]<br>Story 2: Random assignment to one of the following science-related stories:<br>Genetically modified foods are unsafe<br>Vaccines increase risk of autism<br>Story 3: Random assignment to one of the following public policy stories:<br>Replace language classes with religion<br>Mandatory Islamic studies in public schools<br>Story 4: Random assignment to one of the following political stories:<br>Left-wing parties' secret pact<br>Right-wing parties' secret pact<br>Story 5: Random assignment to one of the following conspiracy theories:<br>Medical patent holders restricting supply<br>NATO secret aerial fumigations conspiracy |
| Portugal | Story 1: All respondents receive climate change story (true)<br><br>[Order of stories 2-4 randomised] |

[37] Adam J. Berinsky, Gregory A. Huber, and Gabriel S. Lenz, "Evaluating Online Labor Markets for Experimental Research: Amazon.com's Mechanical Turk,"*Political Analysis*, 20, 2012, p. 351-368, doi:10.1093/pan/mpr057.

| | |
|---|---|
| | Story 2: Random assignment to one of the following science-related stories:<br>Genetically modified foods are unsafe<br>Vaccines increase risk of autism<br>Story 3: Random assignment to one of the following political stories:<br>Left-wing parties' secret pact<br>Right-wing parties' secret pact<br>Story 4: All respondents received medical patent holders story |
| USA | Story 1: All respondents received climate change story (true)<br><br>[Order of stories 2-6 randomised]<br>Stories 2 and 3: Random assignment to TWO of the following science-related stories:<br>Genetically modified foods are unsafe<br>Vaccines increase risk of autism<br>COVID vaccine serious side effects<br>Coronavirus testing swabs plant substances in the brain<br>Story 4: Random assignment to one of the following political stories:<br>Democrat-congenial false claim about voting laws<br>Republican-congenial false claim about voting laws<br>Stories 5 and 6: All respondents received (order randomised):<br>Medical patent holders restricting supply<br>International elites releasing COVID variants |
| India | Story 1: All respondents received climate change story (true)<br><br>[Order of stories 2-6 randomised]<br>Stories 2 and 3: Random assignment to TWO of the following science-related stories:<br>Vaccines increase risk of autism<br>COVID vaccine serious side effects<br>Coronavirus testing swabs plant substances in the brain<br>Story 4: Random assignment to one of the following public policy stories:<br>State of Rajasthan passed new law establishing penalties for blocking mosque/madrasa construction<br>Islamic studies an optional subject on UPSC exam<br>Story 5: Random assignment to one of the following conspiracy theories:<br>Medical patent holders restricting supply<br>Hospitals restricting supply of oxygen tanks<br>Story 6: Random assignment to one of the following conspiracy theories:<br>International elites releasing COVID variants<br>Government paying rent in MPs' private homes |

This is a sample misinformation story from India:

VOTERS DEMAND ANSWERS AFTER REPORT CLAIMS CENTRAL GOVERNMENT PAYING RENT OF MP'S FLAT

News has transpired that the Central Government is paying a monthly rent of Rs. 2 lakhs for MP Chidambaram's rented flat in Delhi's Jor Bagh area, since 2014. In response, voters in Chidambaram's constituency are demanding answers from his aides and the Central Government. As one voter said in a recent interview, this episode shows how ordinary citizens are betrayed on a daily basis by the ruling class using their power to enrich themselves, not looking after the people, which is what they should work for.

The dependent variable was measured as follows:

As far as you know, how accurate is the statement that the government pays the rent of the private home of Rajya Sabha MP Chidambaram?

-Totally accurate [4]
-Very accurate [3]
-Not very accurate [2]
-Not at all accurate [1]

# Appendix C: Measurement

Dependent variable

See Appendix B.

Key predictors

*Social media use*

How often do you use the following media to find or share news about politics?

[Spain: Facebook, Twitter, Instagram, Traditional media (newspapers, radio, etc.)
[Portugal: Facebook, Twitter, Instagram, Traditional media (newspapers, radio, etc.)
[India: Facebook, Twitter, Instagram, TikTok, Traditional media (newspapers, radio, etc.)
[USA: Facebook, Twitter, Instagram, TikTok, Traditional media (newspapers, radio, etc.)

-More than once a day [7]
-Once a day [6]
-Once every few days [5]
-Once a week [4]
-Once a month [3]
-Less than once a month [2]
-Never [1]

We calculated our “share of news from social media” variable as:

average response across all social media platforms / (average response across all social media platforms + response to “traditional media”).

The result is a variable that ranges from [0,1] with higher values indicating greater reliance on social media for political news.

*Political knowledge*

Number of correct answers to factual questions about politics (6 in Spain, 5 in Portugal, 5 in USA).

*Political interest*

How interested are you in politics?

-Not interested [1]
-A little interested [2]
-Quite interested [3]
-Very interested [4]

*Conspiratorial predispositions (Bruder et al. 2013)*

Next we are interested in your opinion about how things work and are managed in the world and in [Spain/Portugal/the United States/India]. Please read each of the following statements and use the respective rating scale to indicate how likely it is in your opinion that the statement is true. Remember that there are no “objectively” right or wrong answers and that we are interested in your personal opinion.

[Order of statements randomised]

I think there are many very important things happening in the world, of which the public is never informed.

I think that politicians generally do not tell us the real reasons for their decisions.

I believe that government agencies currently monitor all citizens.

I believe that events that superficially appear unconnected are often the result of secret activities.

I think there are secret organizations that greatly influence political decisions.

-0% - not true at all [1]
-10% - extremely unlikely [2]
-20% - very unlikely [3]

-30% - unlikely [4]
-40% - unlikely [5]
-50% - undecided [6]
-60% - somewhat likely [7]
-70% - probable [8]
-80% - very likely [9]
-90% - extremely likely [10]
-100% - true [11]

Overall “conspiratorial predispositions” score calculated as average response across these five items (NAs omitted).

*Left-right ideology*

*Spain:*
When talking about politics, the expressions left and right are normally used. On this scale there are a series of points that go from left to right. At what point would you place yourself?

-1 – LEFT
-2
-3
-4
-5
-6
-7
-8
-9
-10 - RIGHT

*Portugal:*
When talking about politics, the expressions left and right are normally used. On this scale there are a series of points that go from left to right. At what point would you place yourself?

-1 – LEFT
-2
-3
-4
-5
-6
-7
-8
-9
-10 - RIGHT

*USA:*

When it comes to politics, would you describe yourself as liberal, conservative, or neither liberal nor conservative?

-Very liberal [1]
-Liberal [2]
-Slightly liberal [3]
-Moderate; middle of the road [4]
-Slightly conservative [5]
-Conservative [6]
-Very conservative [7]

*Trust in media*

Below, we've listed several people and institutions. Using a scale from 0 to 10, where 0 represents "no confidence" and 10 represents "complete confidence," please tell us how much confidence do you have in…

The press

-0 (no confidence)
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10 (total confidence)

# Appendix D: Additional Statistical Results

Appendix Table A1 shows the full model results for Table 1, including the country-specific party dummies that are omitted in the main text.

***Appendix Table A1.*** *Regression models predicting average belief in fake news stories*

| | *DV = belief in false claims (pooled)* | | | |
|---|---|---|---|---|
| | Study 1 (Spain) | Study 2 (Portugal) | Study 3 (USA) | Study 4 (India) |
| Social Media News Use (Share) | 0.08*** | 0.07*** | 0.13*** | 0.04* |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| University degree | -0.03** | -0.11*** | 0.12*** | -0.15*** |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| Political knowledge | -0.17*** | -0.16*** | -0.19*** | NA |
| | (0.02) | (0.04) | (0.02) | |
| Political Interest | -0.05*** | -0.05* | 0.04** | -0.08*** |
| | (0.01) | (0.02) | (0.01) | (0.02) |

| | | | | |
|---|---|---|---|---|
| Conspiratorial thinking | 0.08*** | 0.20*** | 0.42*** | 0.20*** |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| Left-right ideology | 0.01 | -0.01 | 0.065*** | NA |
| | (0.01) | (0.02) | (0.01) | |
| Age | -0.08*** | -0.05* | -0.07*** | -0.17*** |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| Female | -0.01 | 0.01 | -0.05*** | -0.03 |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| Vox voter | 0.03** | - | - | - |
| | (0.01) | | | |
| PP voter | 0.01 | - | - | - |
| | (0.01) | | | |
| Ciudadanos voter | -0.02* | - | - | - |
| | (0.01) | | | |
| PSOE voter | 0.00 | - | - | - |
| | (0.01) | | | |
| Podemos voter | -0.00 | - | - | - |
| | (0.01) | | | |
| PSD voter | - | 0.02 | - | - |
| | | (0.02) | | |
| PS voter | - | 0.01 | - | - |
| | | (0.02) | | |
| CDU voter | - | 0.01 | - | - |
| | | (0.02) | | |
| BE voter | - | -0.01 | - | - |
| | | (0.02) | | |
| CHEGA voter | - | -0.00 | - | - |
| | | (0.02) | | |
| BJP voter | - | - | - | 0.09*** |
| | | | | (0.02) |
| INC voter | - | - | - | 0.04* |
| | | | | (0.02) |
| Dem identifier | - | - | 0.11*** | - |
| | | | (0.02) | |
| Republican identifier | - | - | 0.12*** | - |
| | | | (0.02) | |
| Constant | 0.06*** | 0.14*** | 0.01 | -0.04* |
| | (0.01) | (0.03) | (0.01) | (0.02) |
| Number of fake news included | 7 | 5 | 8 | 9 |
| N | 8278 | 3027 | 2989 | 2579 |

*Note: Cell entries are standardised OLS coefficients with standard errors in parentheses. DV is average belief in false claims presented, which is measured 1-4 with higher values indicating more belief in false claims. Significance codes: '***' 0.001 '**' 0.01 '*' 0.05..*

***Appendix Table A2.*** *Regression models with interaction between social media use and education*

| | ***Outcome = average belief in false claims*** | | | |
|---|---|---|---|---|
| | **Study 1 (Spain)** | **Study 2 (Portugal)** | **Study 3 (USA)** | **Study 4 (India)** |
| News from social media | 0.24*** | 0.35*** | 0.31*** | -0.09 |

| | | | | |
|---|---|---|---|---|
| (share) | (0.04) | (0.09) | (0.09) | (0.16) |
| University degree | -0.11*** | -0.08 | -0.05 | -0.50*** |
| | (0.03) | (0.05) | (0.002) | (0.09) |
| SM share * university degree | 0.14* | -0.14 | 0.59*** | 0.47*** |
| | (0.06) | (0.12) | (0.11) | (0.17) |
| Constant | 2.19*** | 1.93*** | 0.77*** | 2.38*** |
| | (0.05) | (0.09) | (0.07) | (0.10) |
| *Political parties* | *Yes* | *Yes* | *Yes* | *Yes* |
| *Additional controls (same as Table A1)* | *Yes* | *Yes* | *Yes* | *Yes* |
| *Number of false claims included* | *7* | *5* | *8* | *9* |
| N | 8278 | 3027 | 2989 | 2579 |

*Note: Cell entries are OLS coefficients with standard errors in parentheses. DV is average belief in false claims presented, which is measured 1-4 with higher values indicating more belief in false claims. Significance codes: '***' 0.001 '**' 0.01 '*' 0.05.*

***Appendix Table A3.*** *Regression models with interaction between social media use and political interest*

| | ***Outcome = average belief in false claims*** | | | |
|---|---|---|---|---|
| | **Study 1 (Spain)** | **Study 2 (Portugal)** | **Study 3 (USA)** | **Study 4 (India)** |
| News from social media (share) | 0.24*** (0.09) | 0.14 (0.16) | -0.58*** (0.18) | 0.93*** (0.23) |
| Political interest | -0.05** (0.02) | -0.06 (0.03) | -0.19*** (0.03) | 0.06 (0.003) |
| SM share * political interest | 0.03 (0.03) | 0.06 (0.07) | 0.48*** (0.06) | -0.27*** (0.09) |
| Constant | 2.19*** (0.06) | 2.03*** (0.11) | 1.21*** (0.10) | 1.89*** (0.13) |
| *Political parties* | *Yes* | *Yes* | *Yes* | *Yes* |
| *Additional controls (same as Table A1)* | *Yes* | *Yes* | *Yes* | *Yes* |
| *Number of false claims included* | *7* | *5* | *8* | *9* |
| N | 8278 | 3027 | 2989 | 2579 |

*Note: Cell entries are OLS coefficients with standard errors in parentheses. DV is average belief in false claims presented, which is measured 1-4 with higher values indicating more belief in false claims. Significance codes: '***' 0.001 '**' 0.01 '*' 0.05.*

***Appendix Table A4.*** *Regression models with interaction between social media use and conspiratorial predispositions*

| | ***Outcome = average belief in false claims*** | | | |
|---|---|---|---|---|
| | **Study 1 (Spain)** | **Study 2 (Portugal)** | **Study 3 (USA)** | **Study 4 (India)** |
| News from social media (share) | 0.09*** (0.02) | 0.64* (0.26) | 0.83*** (0.17) | 2.78*** (0.39) |

| | | | | |
|---|---|---|---|---|
| Conspiratorial predispositions | 0.07*** (0.01) | 0.10*** (0.02) | 0.17*** (0.01) | 0.25*** (0.02) |
| SM share * predispositions | 0.07*** (0.02) | -0.05 (0.03) | -0.02 (0.02) | -0.30*** (0.05) |
| Constant | 1.89*** (0.09) | 1.80*** (0.15) | 0.51*** (0.09) | 0.98*** (0.21) |
| *Political parties* | *Yes* | *Yes* | *Yes* | *Yes* |
| *Additional controls (same as Table A1)* | *Yes* | *Yes* | *Yes* | *Yes* |
| *Number of false claims included* | *7* | *5* | *8* | *9* |
| N | 8278 | 3027 | 2989 | 2579 |

*Note: Cell entries are OLS coefficients with standard errors in parentheses. DV is average belief in false claims presented, which is measured 1-4 with higher values indicating more belief in false claims. Significance codes: '***' 0.001 '**' 0.01 '*' 0.05.*