



Research Note

Conservatives are less accurate than liberals at recognizing false climate statements, and disinformation makes conservatives less discerning: Evidence from 12 countries

Competing hypotheses exist on how conservative political ideology is associated with susceptibility to misinformation. We performed a secondary analysis of responses from 1,721 participants from twelve countries in a study that investigated the effects of climate disinformation and six psychological interventions to protect participants against such disinformation. Participants were randomized to receiving twenty real climate disinformation statements or to a passive control condition. All participants then evaluated a separate set of true and false climate-related statements in support of or aiming to delay climate action in a truth discernment task. We found that conservative political ideology is selectively associated with increased misidentification of false statements aiming to delay climate action as true. These findings can be explained as a combination of expressive responding, partisanship bias, and motivated reasoning.

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Research questions

- How does political ideology influence people's discernment of true and false statements about climate change and climate mitigation action?
- How does exposure to climate disinformation influence the impact of political ideology on truth discernment of true and false statements about climate change and climate mitigation actions?

Research note summary

- We performed a secondary analysis of a data set (Spampatti, Hahnel et al., 2023) to study the effects of political ideology on climate truth discernment.
- There was strong evidence that participants with conservative political ideology selectively misidentify more false statements aiming to delay climate action as true.

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- There was suggestive evidence that climate disinformation selectively lowered conservative participants' discernment of true statements supporting climate action.
- These findings challenge current hypotheses about motivated reasoning and bias-of-the-right and seem to reflect a combination of expressive responding and partisanship bias with (motivated) reasoning.

Implications

Despite the scientific consensus and the urgency of implementing climate change mitigation actions to limit loss of ecosystems, natural disasters, and forced migration (Pörtner et al., 2022; Romanello et al., 2023), climate objectives are not being reached (Richardson et al., 2023; Stoddard et al., 2021). Disinformation about climate science and action, spread by vested interests, is a main cause of this inertia (Hornsey & Lewandowsky, 2022; Oreskes & Conway, 2010; Pörtner et al., 2022).

Conservative political ideology is a prominent risk factor for susceptibility to misinformation and to skepticism about climate science (Ecker et al., 2022; Hornsey et al., 2018; van Bavel et al., 2021). Non-experimental evidence shows that people who endorse a conservative ideology are more frequently exposed to false information about climate change (Falkenberg et al., 2022), are more skeptical of climate change (Hornsey et al., 2018), and share misinformation more often (Guess et al., 2019; Nikolov et al., 2019). Conservatives may furthermore be resistant to behavioral interventions against misinformation (Pretus et al., 2023; Rathje et al., 2022).

Different hypotheses have been proposed to describe the mechanisms behind conservatives' misinformation susceptibility (Borukhson et al., 2022). Overall, these hypotheses refer to two dimensions of information that can affect the ability to discriminate between true and false information (i.e., truth discernment): 1) being true or false, and 2) being congruent or incongruent with a person's political ideology. Crucially, each hypothesis leads to different predictions of how political ideology may influence truth discernment (see Figure 1 in Appendix B):

- a. *Motivated reasoning hypothesis*: People preferentially process information congruent with their own political ideology (Druckman & McGrath, 2019; Kunda, 1990). This suggests that conservatives (liberals) are more likely to rate statements congruent with their conservative (liberal) ideology as true and are more likely to rate statements incongruent with their ideology as false. In this perspective, climate misinformation "fits" conservatives' pre-existing belief network better (Hornsey et al., 2018; Jylhä & Akrami, 2015), and thus climate misinformation enjoys less epistemic scrutiny during information processing.
- b. *Expressive responding hypothesis*: People agree with information that reflects the positions expressed in their political environment (Jerit & Zhao, 2020; Ross & Levy, 2023). This suggests that conservatives (liberals) are more likely to rate false (true) statements congruent with their ideology as true because such statements are more present in their information ecosystem (Falkenberg et al., 2022).
- c. *Partisanship bias hypothesis*: Whereas expressive responding predicts that people will agree with any political position prevalent in their political environment, the partisanship bias hypothesis propounds that people interpret information in a biased manner if it is aligned with a cherished ideological worldview or has been internalized into the identity of the political ingroup. As climate skepticism became internalized in conservative political ideology and identity (Doell et al., 2021), conservatives may be more likely to agree with climate misinformation as it now reflects their ideology and political identity (van Bavel et al., 2021). The partisanship bias thus suggests that conservatives are more likely to rate false statements congruent with their ideology as true than liberals.

- d. *Bias of the right hypothesis*: People who endorse a conservative ideology might be more susceptible to misinformation (Baron & Jost, 2019). This could be due to conservatives' political views more strongly affecting truth discernment (Jost et al., 2018) while being less aware of this influence (Geers et al., 2024). This suggests that conservatives are more likely to rate (both ideologically congruent and ideologically incongruent) false statements as true than liberals.
- e. *Lazy reasoning hypothesis*: Misinformation susceptibility is primarily driven by lack of careful reasoning when encountering information (Pennycook & Rand, 2019). This suggests that conservatives and liberals are equally likely to rate both ideologically congruent and ideologically incongruent statements as true.

To understand how political ideology influences truth discernment of climate information and misinformation, we conducted a secondary analysis of a cross-cultural study on susceptibility to climate misinformation (Spampatti, Hahnel et al., 2023). In the original study, 1,721 participants from the United States, Canada, the United Kingdom, Ireland, Australia, New Zealand, Singapore, Philippines, India, Pakistan, Nigeria, and South Africa had to discern whether twenty statements about climate change were true or false (climate truth discernment task; see Methods). The statements were distributed on two dimensions: 1) true and false statements about climate change and climate mitigation action (see Table 1), and 2) statements congruent with conservative ideology—i.e., delaying climate action (Lamb et al., 2020)—and statements incongruent with a conservative ideology—i.e., supporting climate action (Berkebile-Weinberg, Goldwert, et al., 2024; Hornsey et al., 2018). We measured how each dimension (true/false, ideologically congruent/incongruent, and their interaction) interacts with political ideology when people discern the veracity of climate statements and compared the results to the predictions of the different hypotheses.

Simulated data for the predictions made by each hypothesis

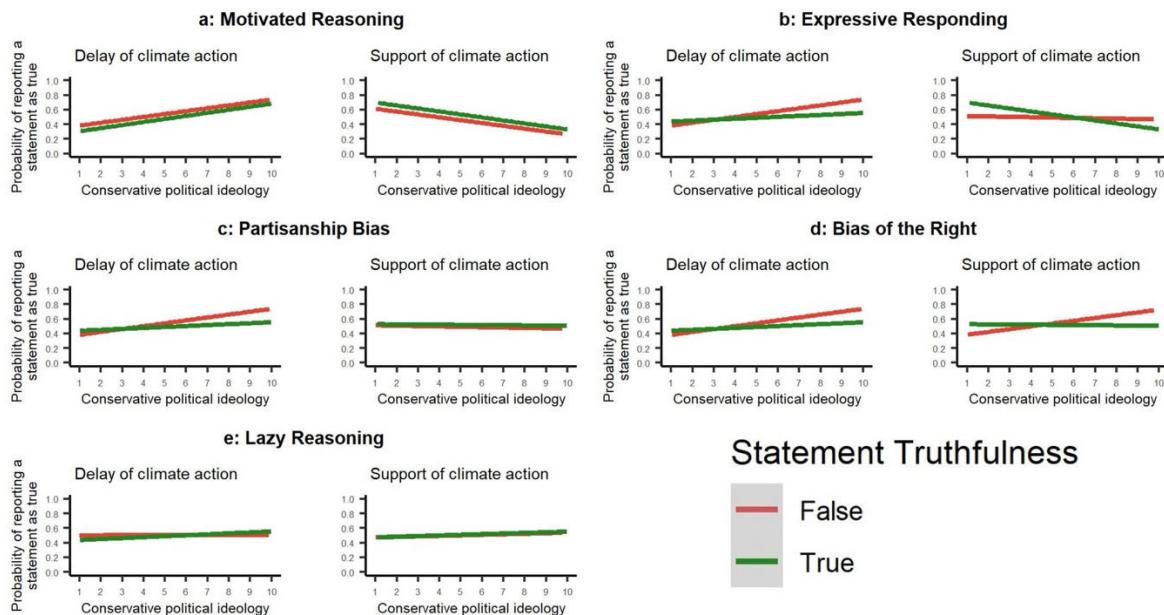


Figure 1. Visual representation of the predictions made by the different hypotheses. Simulated correlations (code in the OSF repository). Full scale images in Appendix B. The x-axis represents political ideology, with increasing numbers representing a more conservative political ideology. The y-axis represents the average probability of reporting a statement to be true. The red lines represent truth ratings for false climate statements; the green lines represent truth ratings for true climate statements. None of the hypotheses specifies the relationship between political ideology and truth discernment computationally (see Guest & Martin, 2021; cf. Borukhson et al., 2022), thus data were simulated with $r = 0.5$ (to indicate a predicted relationship between political ideology and truth discernment) or $r = 0.1$ linear correlations (to indicate no predicted relationship).

Conservatives were worse at recognizing false statements aiming to delay climate action as false (see Figure 2). The more conservative the participants, the more likely they were to evaluate these false, but ideologically congruent, statements to be true. The effect of political ideology did not extend to evaluating true statements supporting climate action as false more often. Among the simulations, these findings best overlapped with the visualization of the partisanship bias hypothesis (see Figure 1c and Figure 2): More conservative participants were more closely aligned to false, ideologically congruent statements about climate change. The categorization of true, ideologically incongruent statements was not impeded and was quite high, as in previous findings (Pennycook et al., 2023). Alternatively, the data depicted in Figure 2 also matched the expressive responding simulation (see Figure 1b). Congruent with this hypothesis, conservative participants who received no disinformation (i.e., passive control condition) may have recognized *both* the false information aiming to delay climate action *and* the true information in support of climate action as true because they are both present in their information environment (Effrosynidis et al., 2022; Falkenberg et al., 2022; Flamino et al., 2023; Lamb et al., 2020). The findings do not suggest that conservatives are more susceptible to disinformation (Baron & Jost, 2019), nor that people engage in motivated reasoning (Kunda, 1990), as evidenced by the largely non-overlapping slopes of the simulations (see Figure 1a–d) and the actual data (see Figure 2).

After reading twenty climate disinformation statements before completing the truth discernment task, conservative participants became more likely to also report true statements supporting climate action as false (see Figure 3). This evidence was suggestive, as the p-value was between 0.05 and 0.005 (Benjamin et al., 2018). In other words, processing disinformation stimulated conservative participants to engage in reasoning and accept false statements delaying climate action while rejecting true statements supporting climate action. This reasoning was not fully motivated: If it were, truth ratings about ideologically congruent false statements arguing for delay (i.e., ideologically congruent) should have been increasingly impaired (Kunda, 1990).

Overall, the findings suggest that conservatives can accurately recognize and categorize true information supporting climate action but inaccurately categorize ideologically congruent but false statements. Their truth ratings of true information supporting climate action is only impaired if they are exposed to climate disinformation. Comparing these findings with the literature-derived hypotheses (i.e., visually comparing the slopes from Figure 1 with the slopes from Figures 2 and 3) showcases how truth discernment of climate statements is best explained by a mix of expressive responding (see Figure 1b), motivated reasoning (see Figure 1a), and partisanship bias (see Figure 1c).

Both findings also have practical implications. Although recent work calls to boost true information (e.g., Acerbi et al., 2022), our results suggest that this strategy may suffer from a ceiling effect in the climate domain because people across the ideological spectrum recognize true information supporting climate action. Instead, conservatives misidentify misinformation delaying climate action as true more and their recognition of true information supporting climate action is more affected by disinformation. Redirecting conservatives from their information environment where false information delaying climate action is more prevalent (Falkenberg et al., 2022) towards accurate climate communicators may reduce exposure to and belief in this type of misinformation (van Bavel et al., 2021). Fighting disinformation also remains important but requires the development of better interventions, tested against validated stimuli (Spampatti, Brosch et al., 2023) and tailored to conservative audiences (Pretus et al., 2023).

Findings

Finding 1: Conservatives are selectively susceptible to false statements arguing for the delay of climate action.

We analyzed data from the passive control condition with a multilevel model, with the sum of statements categorized as true as the dependent variable (following Maertens et al., 2023; see Table 1 in Appendix B) predicted by political ideology, true and false statements (factor), statements supporting or delaying climate action (factor), and their interactions. The model also contained a random intercept per participant, a random intercept per country, and age and gender as covariates. The results were replicated using signal detection theory (see Appendix D).

Crucially, the three-way interaction between political ideology and the two dimensions of climate statements was significant, $F(1, 2604) = 9.1016$, $p < .001$. Simple slopes within the four types of climate statements show that the more conservative participants were, the more frequently they evaluated false statements delaying climate action as being true, F -ratio = 20.176, $p < .001$ (see Figure 2). Political ideology did not influence evaluating true statements delaying climate action (F -ratio = 0.400, $p = .53$), false statements supporting climate action (F -ratio = 1.739, $p = .19$), nor true statements supporting climate action (F -ratio = 1.664, $p = .20$). Equivalence tests (Lakens, 2017) confirmed that the associations between political ideology and truth ratings of true statements supporting climate action, $z(868) = 2.0684$, $p = .02$, $r = -0.03$, 90% CI[-0.09, 0.03], and delaying climate action, $z(868) = 2.7686$, $p = .003$, $r = -0.006$, 90% CI[-0.06, 0.05]; and false of statements supporting climate action, $z(868) = 2.1773$, $p = .015$, $r = -0.03$, 90% CI[-0.08, 0.03], were small enough to be practically meaningless (significantly smaller than $r = 0.1$).

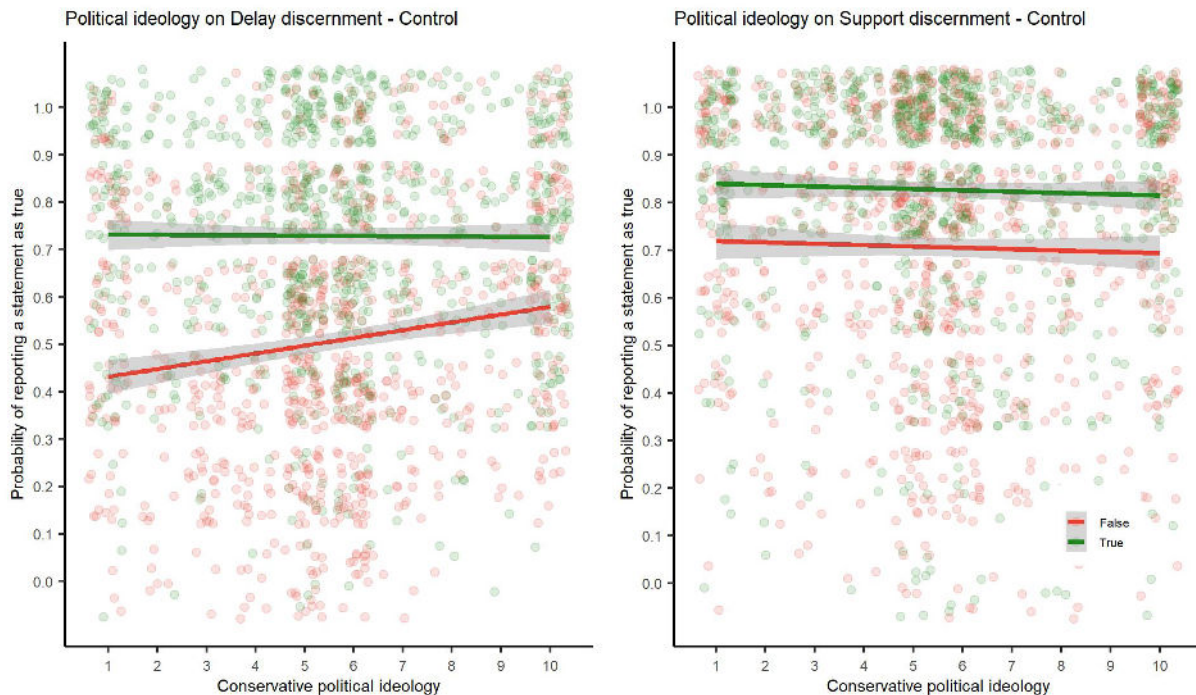


Figure 2. Results for the truth discernment task, passive control condition. The right panel represents truth discernment performance for statements supporting climate action (i.e., incongruent with a conservative political ideology). The left panel represents truth discernment performance for statements delaying climate action (i.e., congruent with a conservative political ideology). The x-axis represents political ideology, with increasing numbers representing a more conservative political ideology. The y-axis represents the average probability of reporting a statement to be true. The red lines represent the truth ratings for false climate statements; the green lines represent the truth ratings for true climate statements.

Finding 2: Climate disinformation only hampers conservatives' ability to accurately evaluate true statements supporting climate action.

We analyzed data from the disinformation condition with the same multilevel model as the passive control condition (see Table 2 in Appendix B).² The three-way interaction between political ideology and the dimensions of climate information was not significant, $F(1, 2559) = 9.1016, p = .08$. Upon visual inspection of the data and because three-way interactions are frequently underpowered (Baranger et al., 2023), we directly tested the association between political ideology and true statements supporting climate action. This revealed a significant negative correlation, $z(853) = -4.1087, p < .001, r = -0.14, 95\% \text{ CI}[-0.21, -0.07]$: more conservative participants were more likely to evaluate true statements supporting climate action as false. The association between political ideology and false statements delaying climate action was also significant, $z(853) = 4.9128, p < .001, r = 0.17, 95\% \text{ CI}[0.10, 0.23]$, and an equivalence test suggested that this association was practically the same between the two experimental conditions ($z = 0.0908, \Delta r = -0.01, p = .03$). Equivalence tests confirmed that the association between political ideology and number of true statements about climate delay rated as true, $z(853) = 2.3461, p = .009, r = -0.02, 90\% \text{ CI}[-0.08, 0.04]$, and false statements supporting climate action rated as true, $z(868) = 1.6271, p = .052, r = -0.04, 90\% \text{ CI}[-0.10, 0.01]$, was small enough to be practically meaningless in the disinformation condition.

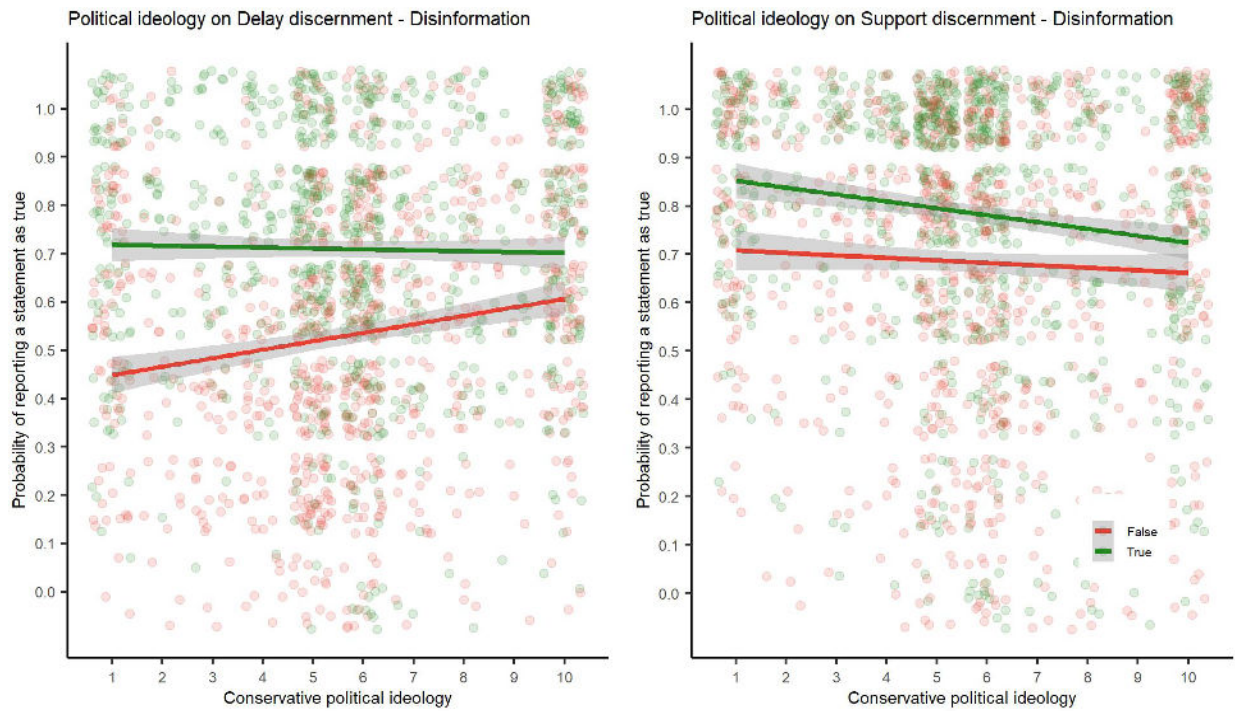


Figure 3. Results for the truth discernment task, disinformation condition. The right panel represents truth discernment performance for statements supporting climate action (i.e., incongruent with a conservative political ideology). The left panel represents truth discernment performance for statements delaying climate action (i.e., congruent with a conservative political ideology). The x-axis represents political ideology, with increasing numbers representing a more conservative political ideology. The y-axis represents the average probability of reporting a statement to be true. The red lines represent the truth ratings for false climate statements; the green lines represent the truth ratings for true climate statements.

² We analyzed the two conditions separately to avoid testing the significance of and interpreting a four-way interaction.

Methods

The experimental methods are described in full in Spampatti, Hahnel et al. (2023; open materials are available at <https://osf.io/m58zx>). After consenting, participants reported their demographics (gender, age, education), completed an individual differences measure (Cognitive Reflection Task Version 2; Thomson & Oppenheimer, 2016), and responded to a question about their political ideology in a single item with a 10-point scale presented in a random order. The single item stated: “Conservative/Right and Liberal/Left are terms that are frequently used to describe somebody’s political ideology. Please indicate in the following scale how you would place yourself in terms of your political ideology. 10-point scale: 1 = Extreme liberalism/left to 10 = Extreme conservatism/right.” A “two-strikes-you’re out” attention check (“Please select ‘3’ to make sure you are paying attention”) first triggered a warning and a time penalty, then was presented a second time to screen out inattentive participants ($n = 10$). The remaining participants were randomly allocated to one of eight conditions, two of which are of current interest: the passive control condition and the disinformation condition. In the disinformation condition, participants received twenty real climate disinformation statements (in randomized order, as a screenshot of an anonymous post with a 2s time lock), taken from a validated set of climate disinformation statements (Spampatti, Brosch, et al., 2023; see Table 2 in Appendix A).

Participants then responded to the climate change perceptions scale (van Valkengoed et al., 2021) and completed the Work for Environmental Protection Task (Lange & Dewitte, 2021), two dependent variables not of interest for this article, and the climate-related truth discernment task, inspired by a domain-general truth discernment task (Maertens et al., 2023). Participants categorized 20 climate-related statements as false or real (“Please categorize the following statements as either ‘False Statement’ or ‘Real Statement’”; binary choice: [Real]; [False], item and response order randomized). All statements of the truth discernment task were generated with an AI tool (ChatGPT, Version 4), fact checked, and unanimously selected by the authors. The statements were equally divided between true and false headlines and between supporting or delaying climate science and action (see Table 1). The survey duration was 28 minutes.

Table 1. List of statements of the climate truth discernment task.

	Supporting climate action	Delaying climate action
True statements	Earth's average temperature continues to rise, setting new record highs each decade.	Projections of regional impacts of climate change are subject to uncertainty.
	Human activities, such as burning fossil fuels, are the main cause of climate change.	Transportation sector transition to electric vehicles can cost billions in infrastructure upgrades.
	Climate change is leading to more intense and frequent natural disasters.	Brazil missing Paris Agreement targets with deforestation and agricultural expansion driving up emissions.
	The transportation sector is a significant contributor to greenhouse gas emissions.	China's continued construction of coal-fired power plants threatens progress on climate goals.
	Rising seas could displace hundreds of millions of people by the end of the century.	Developing countries require \$40 billion annually to mitigate climate change.
False statements	Climate change will cause the extinction of up to 75% of all species on Earth.	Extreme weather: Natural variability, not human activity, is the main driver of extreme weather events.

	Global temperatures may rise by up to 20°C by the end of the century, potentially resulting in widespread drought and famine due to climate change.	The climate challenge can be addressed through innovation and technology advancements in fossil fuels.
	The Earth may enter a period of ‘runaway warming’ that cannot be stopped, which could lead to the collapse of civilization due to climate change.	Carbon dioxide is not a pollutant, but a benefit to the environment.
	Germany leads the way in renewable energy, with nearly 65% of electricity generated from renewables.	Catastrophic consequences of global warming are inevitable and unavoidable.
	Climate catastrophe: Entire cities to be submerged by rising seas within decades.	Renewable energy is costly and inefficient, and should not be subsidized.

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Competing interests

The authors state no conflict of interest.

Ethics

The study has been approved by the ethical commission of the University of Geneva. Participants explicitly provided informed consent. Participants were asked to self-identify in terms of their gender; options given were “male,” “female,” “non-binary/other,” “prefer not to disclose” (defined by the investigator). Gender self-identification was collected as it is a moderator for beliefs about climate change (Hornsey et al., 2016).

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Data availability

Data can be retrieved from the parent article (Spampatti, Hahnel et al., 2023) and the R code necessary to reproduce our results are available on the Harvard Dataverse at <https://doi.org/10.7910/DVN/NMFRU9>.

Appendix A: Supplementary stimuli information

Table A1. Fact-checks for each false statement in the climate truth discernment task.

	Statement	Fact-check
Supporting climate action	Climate change will cause the extinction of up to 75% of all species on Earth.	As of 2023, the projections with very high greenhouse-gases emissions and a degree of warming above 4°C predict an extinction rate of 50% (<i>medium confidence</i> , IPCC AR6 WG2, 2023, p. 13, Statement B.4.1.).
	Global temperatures may rise by up to 20°C by the end of the century, potentially resulting in widespread drought and famine due to climate change.	As of 2023, the projected very high greenhouse-gases emission scenario in the IPCC report estimates a warming of 4.4°C [3.3°C–5.7°C] by 2100 (IPCC AR6 Synthesis Report, 2023, p. 33).
	The Earth may enter a period of 'runaway warming' that cannot be stopped, which could lead to the collapse of civilization due to climate change.	According to the IPCC Expert Meeting on the Science to Address UNFCCC Article 2 including Key Vulnerabilities in 2004, “a “runaway greenhouse effect” —analogous to Venus—appears to have virtually no chance of being induced by anthropogenic activities.” (IPCC, 2004, Annex C ; see also Hansen et al., 2013 ; Goldblatt et al., 2013). The only mention of runaway warming in the 2021 IPCC report affirms that there is evidence that in no scenario does permafrost thawing lead to runaway warming through increasing concentration of greenhouses gases (e.g., carbon dioxide, methane, water vapor) in the atmosphere (IPCC AR6 WG1, p. 773).
	Germany leads the way in renewable energy, with nearly 65% of electricity generated from renewables.	As of 2022, 21.26% of electricity is generated from renewables in Germany (Our World in Data, 2024).
	Climate catastrophe: Entire cities to be submerged by rising seas within decades.	As of 2023, global mean sea level is projected to rise about 2 m by 2100—cities will therefore not be submerged within decades (IPCC AR6 Synthesis Report, 2023, p. 43).
Delaying climate action	Extreme weather: Natural variability, not human activity, is the main driver of extreme weather events.	According to multiple IPCC reports, human activities have unequivocally caused global warming. Furthermore, “ <i>Human-caused climate change is already affecting many weather and climate extremes in every region across the globe.</i> ” (IPCC AR6 Synthesis Report, 2023, p. 6).
	The climate challenge can be addressed through innovation and technology advancements in fossil fuels.	Fossil fuel use and expansion is at odds with the warming targets defined in the Paris Agreement (Green et al., 2024). In this regard, fossil fuels are net causes and never solutions to the climate crisis. The current technological advancements in curtailing greenhouse gasses emissions (such as carbon capture and storage and/or carbon dioxide removal) are by definition curtailment measures to the pollution of fossil fuels.

Carbon dioxide is not a pollutant, but a benefit to the environment.	“Although it has some very important and beneficial effects, CO₂ meets the legal and encyclopedic definitions of a "pollutant", and human CO₂ emissions pose a threat to public health and welfare.” (https://skepticalscience.com/co2-pollutant-advanced.htm) The USA Environmental Protection Agency defined CO₂ and related greenhouse gases as having the possibility to “endanger public health and endanger public welfare” (EPA, 2009; see also NOAA, 2022; NIH, 2024); the Supreme Court of the USA ruled that CO₂ is an air pollutant (<i>Massachusetts v. EPA</i>, 549 U.S. 497, 2007) and the British National Atmospheric Emission Inventory defines CO₂ as a greenhouse gas pollutant (https://naei.beis.gov.uk/overview/pollutants?pollutant_id=2).
Catastrophic consequences of global warming are inevitable and unavoidable.	As of 2024, there are multiple climate change mitigation pathways with increasing levels of climate ambition that will maintain Earth under different critical thresholds of degrees of warming (Rogelj et al., in press).
Renewable energy is costly and inefficient, and should not be subsidized.	Costs of energy production by renewable energy sources has been steadily falling in the past decades (Our World in Data, 2024) and are now cheaper than fossil fuel production (IRENA, 2021 ; Roser, 2020).

Table A2. The twenty climate disinformation statements.

Coding	Disinformation tweet
Disinformation about climate science	As more wind and solar are added they raise electricity prices and destabilize electric grids. Because they are part-time unreliable weather dependent sources. We want full-time electricity. Not part-time like third world countries. All for silly expensive net zero. CA pays more.
	The current exceptional warming and cooling your seeing is due to the location of the Jet Stream. It's become very wavy due to the lack of Solar Energy going into the Oceans and nothing to do with Man Made CO2.
	Today's 'global warming' is estimated to be an otherwise unmeasurable 0.4°C (0.72°F) over the 1979-2000 average... despite 50% of all manmade emissions. No 2022 weather event was unprecedented or can be blamed on CO2 emissions.
	This is a portrait of climate fraud, posturing as the saviours of the world. They are a breed of crooks, getting rich by ripping off gullible western nations. The UN led climate hoax has been running since 1988. They want us to believe a pack of lies about earth's climate.
	Too often, academic reports on climate use highly skewed data that seem to have been carefully selected to support aggressive environmental regulations. One recent and much-cited Lancet report appears deliberately deceptive.
	The climate hoax devised by the UN, supported by rich elitists is endorsed by our treacherous leaders is an attack on freedoms & rights. Climate cultism is a form of global self hatred. It aims to punish western nations by transferring huge reparations to the developing world.
	Top NASA Climate Modeler Admits Predictions Are “Mathematically Impossible.”

	Lots of links of studies of the Medieval Warm Period that climate science deniers (alarmists) want to pretend did not exist. Because there is no explanation for natural warming during this time. Studies point out temp was warmer back then, than now.
	According to global warming theory the poles should warm significantly if carbon dioxide is driving temperatures Just the opposite is occurring in the southern hemisphere.
	The evidence for manmade climate change is so thin they cannot debate it. They hide behind the lie of consensus. There is no room for consensus in science. The basis is a provable hypothesis. There is not a single peer reviewed study that proves manmade CO2 is causing warming.
Disinformation about climate action	At Climate Summit, Elites Chow Down on Gourmet Meats While Telling Us to Eat Bugs.
	FACT CHECK Results of the Biden administration's extreme climate agenda cutting emissions by 44% by 2030. Annual Jobs Lost: 1.2 MILLION. Lost Economic Growth: \$7.7 TRILLION. Increase in Electric Bills: 23% Increase in Gas Prices: 2\$ PER YEAR.
	The war on 'fossil fuels' is absurd considering the vast fields of coal/oil/gas everywhere on earth. The mantle is brimming over with it. A United Nations bid for control, cash & power has led to an energy crisis that looms as the biggest self-inflicted disaster in human history.
	Death and privation caused by the lack of affordable energy caused by Green Energy policies will not affect the Elites at all. They want us to eat bugs, do a lot less as they carry on with their lives just as they are doing now. Climate scamsters. They should lead by example.
	You are lying. Fossil fuels gave us cheap energy for decades so billions live longer healthier happier lives. Many technologies like carbon capture, filters fuel additives etc reduces emissions. Banning fossil fuels is creating fuel poverty and harming people.
	Energy literacy starts with the knowledge that renewable energy is only intermittent electricity generated from unreliable breezes and sunshine, as wind turbines and solar panels cannot manufacture anything for the 8 billion on this planet.
	Imagine sacrificing 500 high-paying coal jobs, ranging up to \$60,000/yr, for the climate hoax. Even if you believe in the hoax, global emissions are up 5% from pre-pandemic levels -- 90% because of China. Emissions from a single mine are insignificant.
	Europe's transition to renewable energy and net zero carbon is not working, except to make life hard on average European citizens.
	Willfully-blind ignorance about the consequences of [the rush to green policies – deep recessions, broken societies and millions more going hungry – doesn't make them any less immoral. The road to hell is paved with good intentions. Bingo.
	Solar and wind are far more expensive than established reliable stable secure electricity from pure hydro coal gas nuclear. That's why your shift to unreliable, unstable, expensive solar and wind; is devastating families; and exporting manufacturing jobs.

Note: In order to avoid climate change countermovement actors from understanding the net persuasive appeal of each disinformation statement, identifying numbers of each statement will differ from the identifying numbers in the data once collected. Correct matching will only be known to authors.

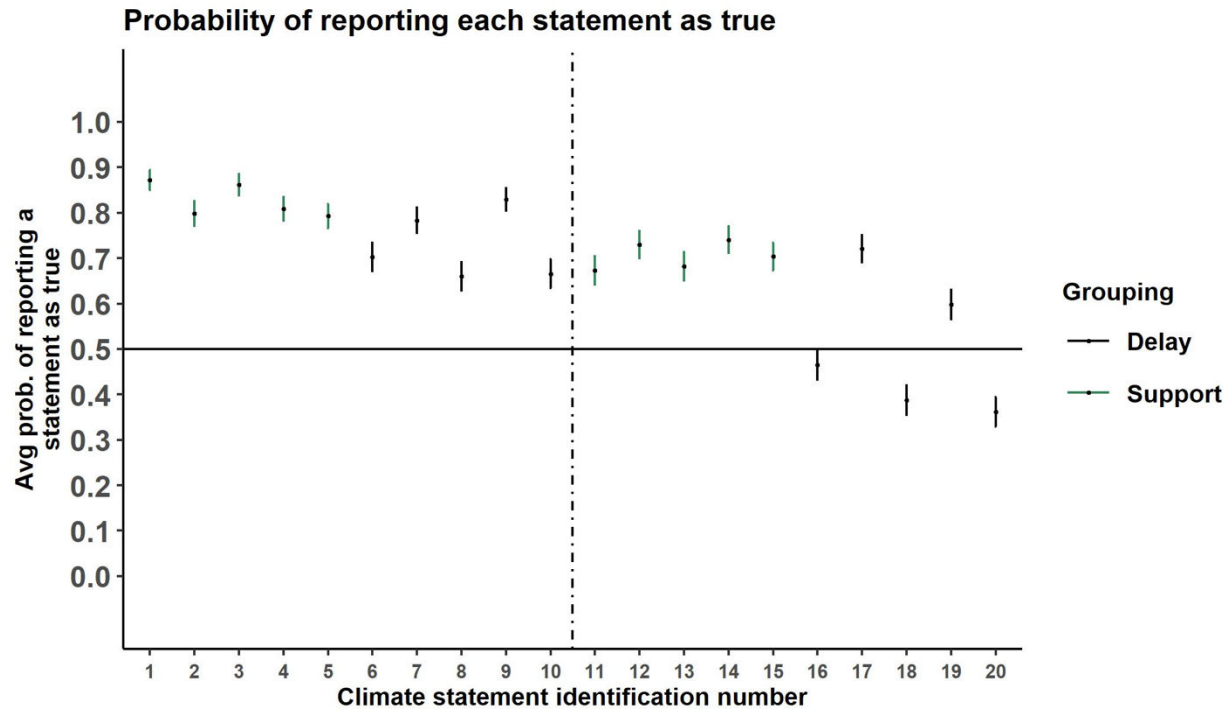


Figure A1. Mean probability of each statement of the truth discernment task to be reported as true. The vertical line is a visual aid to distinguish true and false statements: The first ten statements are true information about climate action; the last ten statements are false information about climate action.

Appendix B: Literature-derived hypotheses

a: Motivated Reasoning

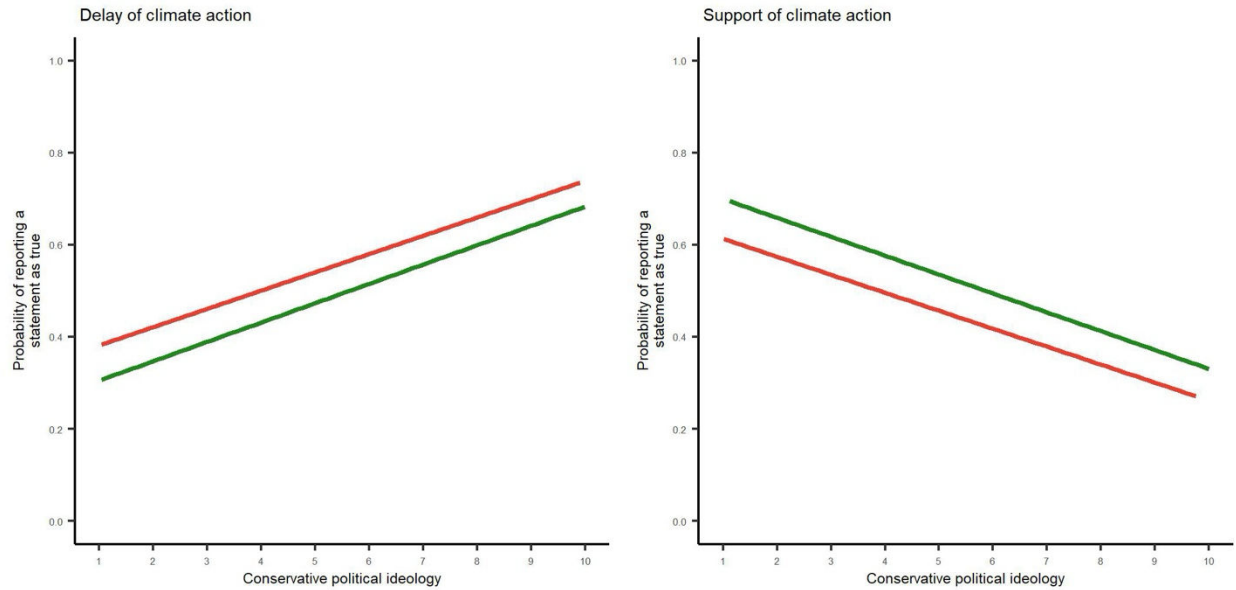


Figure B1. Mean probability of each statement of the truth discernment task to be reported as true according to the motivated reasoning hypothesis. Simulated data.

b: Expressive Responding

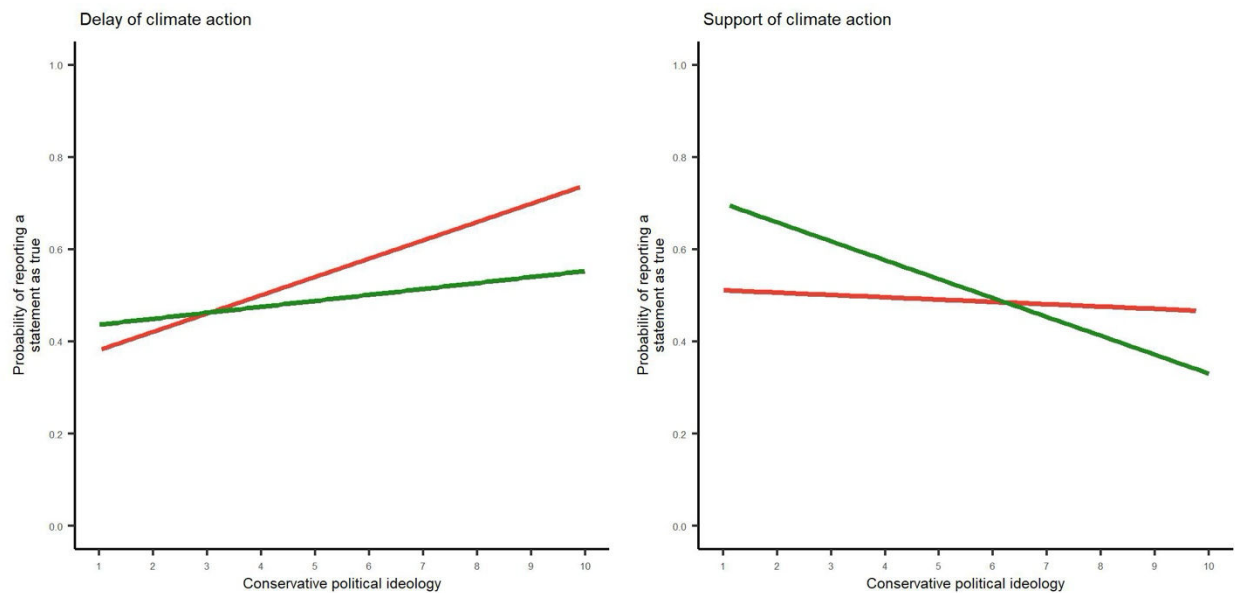


Figure B2. Mean probability of each statement of the truth discernment task to be reported as true according to the expressive responding hypothesis. Simulated data.

c: Partisanship Bias

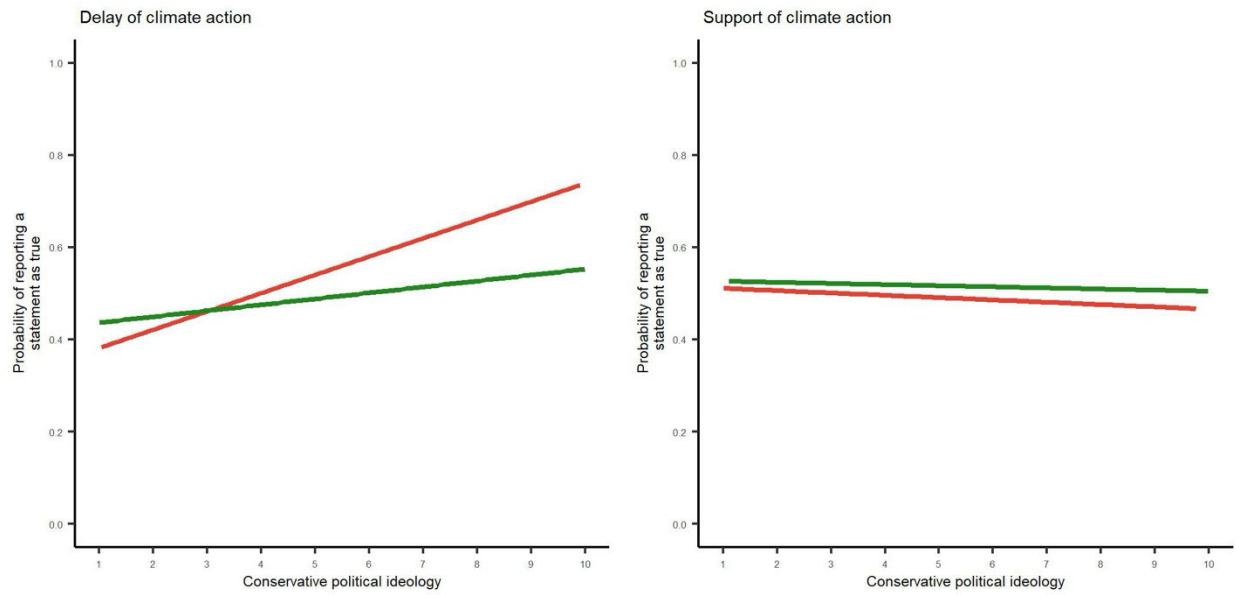


Figure B3. Mean probability of each statement of the truth discernment task to be reported as true according to the partisanship bias hypothesis. Simulated data.

d: Bias of the Right

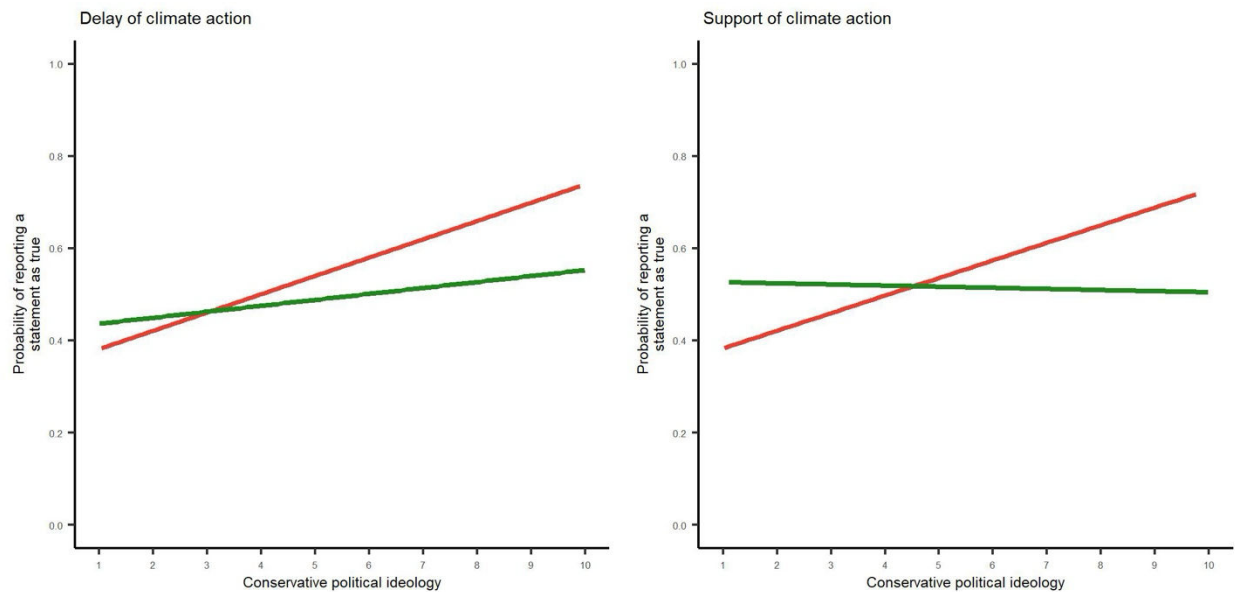


Figure B4. Mean probability of each statement of the truth discernment task to be reported as true according to the bias of the right hypothesis. Simulated data.

e: Lazy Reasoning

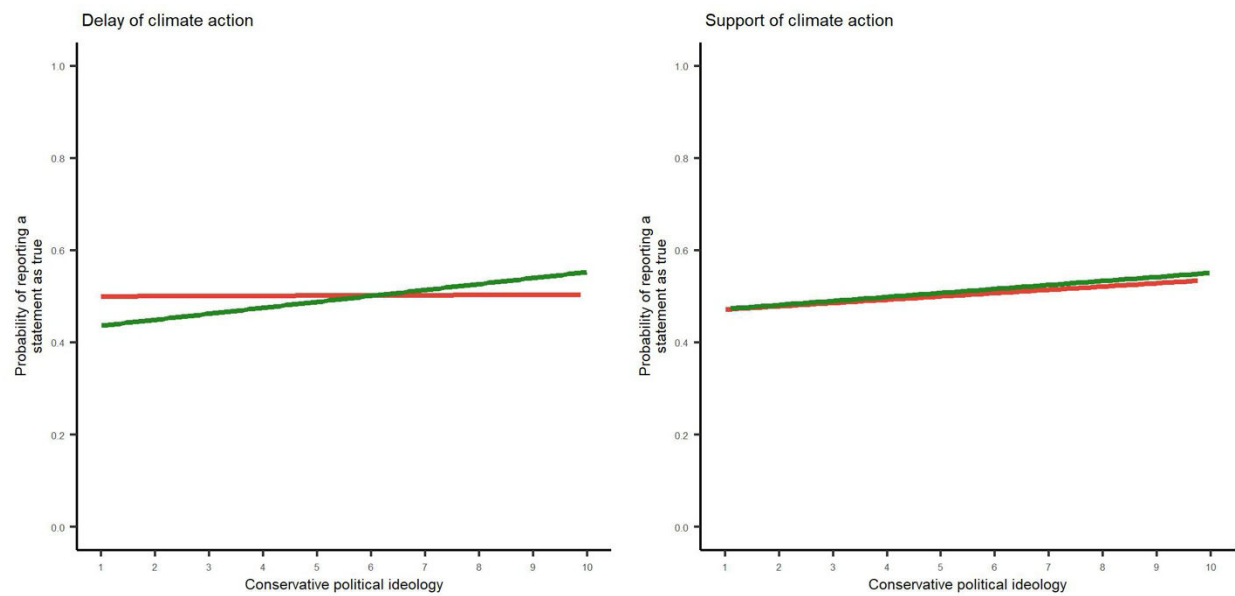


Figure B5. Mean probability of each statement of the truth discernment task to be reported as true according to the lazy reasoning hypothesis. Simulated data.

Appendix C: Statistical modeling

Table C1. Multilevel model for climate truth discernment performance, passive control condition.

Predictor	Estimate	SE	t-value	95% Confidence Intervals		p
				Lower	Upper	
Intercept	2.22	0.16	14.043	1.91	2.52	< .001
Age	-0.003	0.002	0.434	-0.01	0.001	.15
Gender	F-value(3, 859.96):		0.2438			.86
Political ideology	0.07	0.02	4.492	0.04	0.11	< .001
True/False	F-value(2, 2604):		155.653			< .001
Delay/Support	F-value(2, 2604):		142.202			< .001
Political ideology * True/False	F-value(1, 2604):		8.8978			.003
Political ideology * Delay/Support	F-value(1, 2604):		14.3356			< .001
True/False * Delay/Support	F-value(1, 2604):		31.4556			< .001
Political ideology * True/False * Delay/Support	F-value(1, 2604):		9.1016			.003

Note: Random intercept effects (variance $\pm$ standard deviation): Participant (0.42 ± 0.65); Country (0.06 ± 0.23); Residual (1.22 ± 1.11).

Table C2. Multilevel model for climate truth discernment performance, disinformation condition.

Predictor	Estimate	SE	t-value	95% Confidence Intervals		p
				Lower	Upper	
Intercept	2.41	0.15	15.707	1.91	2.52	< .001
Age	-0.007	0.002	-3.314	-0.01	0.001	< .001
Gender	F-value(3, 850.04):		1.4806			.22
Political ideology	0.09	0.02	4.796	0.04	0.11	< .001
True/False	F-value(2, 2559):		138.710			< .001
Delay/Support	F-value(2, 2559):		130.455			< .001

Political ideology * True/False	<i>F</i> -value(1, 2559):	22.6978	< .001
Political ideology * Delay/ Support	<i>F</i> -value(1, 2559):	34.1681	< .001
True/False * Delay/Support	<i>F</i> -value(1, 2559):	13.0440	< .001
Political ideology * True/False * Delay/Support	<i>F</i> -value(1, 2559):	9.1016	.08

Note: Random intercept effects (variance $\pm$ standard deviation): Participant (0.52 $\pm$ 0.72); Country (0.02 $\pm$ 0.13); Residual (1.34 $\pm$ 1.16).

We decomposed the influence of political ideology within each of the four types of climate statements with simple slopes. This analysis revealed that the more conservative participants were, the significantly more the number of false statements delaying climate action (F -ratio = 22.997, $p < .001$) and the significantly less number of true statements supporting climate action (F -ratio = 17.314, $p < .001$) they reported to be true (see Figure 2). The influence of political ideology did not extend to true statements delaying climate action (F -ratio = 0.475, $p = .49$), nor false statements supporting climate action (F -ratio=2.566, $p=.11$).

Appendix D: Signal detection theory supplementary analysis

We applied signal detection theory to more robustly scrutinize participants' truth discernment ability. Signal Detection Theory posits that successful stimulus detection is dependent on people's discernment ability to recognize true and false information and their overall response bias towards reporting all (dis)information as true or as false. Of note, Signal Detection Theory has been recently applied to model people's performance in truth discernment tasks (e.g., Batailler et al., 2022). In Signal Detection Theory terminology, the discriminatory ability is defined as d' (dprime) and is calculated from the normally distributed hit rate minus the false alarm rate in truth discernment tasks. The response bias is defined as c' (cbias) and is calculated as: $-1 * (\text{hit rate} - \text{false alarm}) / 2$.

Table D1. Multilevel model for climate truth discriminatory ability (d'), passive control condition.

Predictor	Estimate	SE	t-value	95% Confidence Intervals		p
				Lower	Upper	
Intercept	0.42	0.10	3.978	0.21	0.62	< .001
Age	0.01	0.001	6.523	0.006	0.011	< .001
Gender	F-value(3, 861.92):		0.2381			.87
Political ideology	-0.04	0.01	-3.100	-0.07	-0.02	.006
Delay/Support	F-value(1, 867.98):		32.8347			< .001
Political ideology * Delay/Support	F-value(1, 867.98):		9.9344			.002

Note: Random intercept effects (variance $\pm$ standard deviation): Participant (0.24 ± 0.49); Country (0.01 ± 0.08); Political ideology (0.01 ± 0.08); Residual (0.54 ± 0.74).

We decomposed the influence of political ideology on truth discrimination ability within each statement type (delay of climate action and support of climate action) with simple slopes. This analysis revealed that the more conservative participants were, the worse their ability to discriminate between true and false statements delaying climate action (F -ratio = 8.246, $p = .009$; see Figure D1, panel a). This is equivalent to a zero-order correlation of $r = -.14$, $z(868) = -6.9495$, $p < .001$, 95% CI[-0.20, -0.07]. The influence of political ideology did not extend to discrimination ability about statements supporting climate action (F -ratio = 0.09, $p = .93$). Equivalence tests (Lakens, 2017) confirmed that the associations between political ideology and truth discriminatory ability of statements supporting climate action was small enough to be practically meaningless—i.e., significantly smaller than $r = 0.1$; $z(868) = 2.855$, $p = .002$, $r = -0.003$, 90% CI[-0.06, 0.05].

Table D2. Multilevel model for climate truth discriminatory ability (d'), disinformation condition.

Predictor	Estimate	SE	t-value	95% Confidence Intervals		p
				Lower	Upper	
Intercept	0.55	0.12	4.638	0.32	0.79	< .001

Age	0.005	0.001	3.375	0.002	0.008	< .001
Gender	<i>F</i> -value(3, 845.1):		1.1191			.34
Political ideology	-0.05	0.02	-3.082	-0.08	-0.02	.007
Delay/Support	<i>F</i> -value(1, 853.01):		13.6013			< .001
Political ideology *	<i>F</i> -value(1, 853.01):		3.1024			.08
Delay/Support						

Note: Random intercept effects (variance $\pm$ standard deviation): Participant (0.04 ± 0.21); Country (0.00 ± 0.00); Political ideology (0.01 ± 0.12); Residual (0.54 ± 0.73).

As for the main analyses, we calculated the correlation between political ideology and truth discriminatory ability for statements delaying climate action and statements supporting climate action. This analysis suggested that the more a participant espoused a conservative ideology, the worse their truth discriminatory ability was about statements supporting climate action, $z(853) = -5.6247$, $p < .001$, $r = -0.09$, 95% CI[-0.16, -0.03]; and about statements delaying climate action, $z(853) = -7.3258$, $p < .001$, $r = -0.15$, 95% CI[-0.21, -0.07].

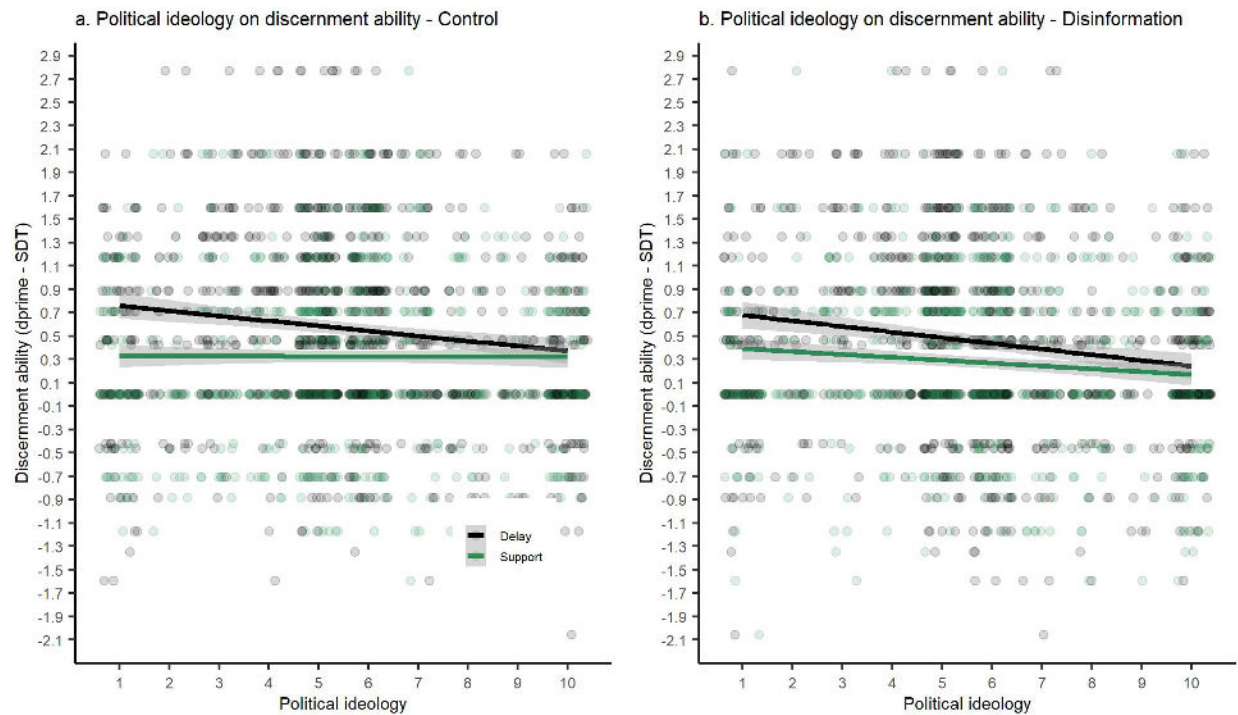


Figure D1. Results for the truth discernment task, Signal Detection Theory supplementary analysis. The panel a. on the left side represents the truth discrimination ability (d') of participants in the passive control condition. The panel b. on the right side represents the truth discrimination ability (d') of participants in the disinformation condition. The x-axis represents political ideology, with increasing numbers representing a more conservative political ideology. The y-axis represents the discrimination ability (d') calculated through Signal Detection Theory. The black lines represent the truth discrimination ability for climate statements that argue for the delay of climate action; the green lines represent the truth discrimination ability for climate statements supporting climate action.

Appendix E: Statistical modeling without Statement 18

A reviewer of the paper argued that item 18 of the climate truth discernment task, “Carbon dioxide is not a pollutant but a benefit for the environment,” might be more difficult to categorize as being strictly true or false, thus we repeat the main analyses from Appendixes C and D here without statement 18. All original analyses were replicated.

Crucially, the three-way interaction between political ideology and the two dimensions of climate statements was significant, $F(1, 2604) = 7.2542, p < .001$ (see Table E1). Simple slopes within the four types of climate statements show that the more conservative participants were, the more false statements delaying climate action they evaluated as being true (F -ratio = 15.075, $p < .001$). Political ideology neither influenced evaluating true statements delaying climate action (F -ratio = 0.381, $p = .54$) nor false statements supporting climate action (F -ratio = 1.776, $p = .18$) nor true statements supporting climate action (F -ratio = 1.696, $p = .19$). Follow-up equivalence tests were not conducted for the associations between political ideology and truth ratings of true statements supporting climate of delaying climate action and false of statements supporting climate action, as the statements were unchanged from the main analyses.

Table E1. Multilevel model for climate truth discernment performance, passive control condition.

Predictor	Estimate	SE	t-value	95% Confidence Intervals		p
				Lower	Upper	
Intercept	1.87	0.15	12.225	1.57	2.17	< .001
Age	-0.002	0.002	-1.156	-0.007	0.002	.25
Gender	F -value(3, 859.91):		0.2120			.89
Political ideology	0.06	0.02	3.883	0.03	0.09	< .001
True/False	F -value(2, 2604):		228.0319			< .001
Delay/Support	F -value(2, 2604):		210.7428			< .001
Political ideology * True/False	F -value(1, 2604):		7.0618			.008
Political ideology * Delay/Support	F -value(1, 2604):		12.3066			< .001
True/False * Delay/Support	F -value(1, 2604):		61.2818			< .001
Political ideology * True/False * Delay/Support	F -value(1, 2604):		7.2542			.007

Note: Random intercept effects (variance $\pm$ standard deviation): Participant (0.42 ± 0.65); Country (0.06 ± 0.24); Residual (1.09 ± 1.04).

The three-way interaction between political ideology and the dimensions of climate information was not significant, $F(1, 2559) = 1.0493$, $p = .31$ (see Table E2). The association between political ideology and false statements delaying climate action was significant, $z(853) = 4.2835$, $p < .001$, $r = 0.16$, 95% CI[0.8, 0.21]. An equivalence test suggested that the difference of this association between the two conditions was practically meaningless ($z = -0.0888$, $\Delta r = -0.01$, $p = .033$).

Table E2. Multilevel model for climate truth discernment performance, disinformation condition.

Predictor	Estimate	SE	t-value	95% Confidence Intervals		p
				Lower	Upper	
Intercept	2.21	0.15	14.134	1.83	2.42	< .001
Age	-0.008	0.002	-3.185	-1.218	-0.003	.002
Gender	<i>F</i> -value(3, 849.45):		1.4906			.22
Political ideology	0.06	0.02	3.608	0.03	0.10	< .001
True/False	<i>F</i> -value(2, 2559):		194.5094			< .001
Delay/Support	<i>F</i> -value(2, 2559):		184.1970			< .001
Political ideology * True/False	<i>F</i> -value(1, 2559):		17.7850			< .001
Political ideology * Delay/Support	<i>F</i> -value(1, 2559):		28.6855			< .001
True/False * Delay/Support	<i>F</i> -value(1, 2559):		28.5827			< .001
Political ideology * True/False * Delay/Support	<i>F</i> -value(1, 2559):		1.0493			.31

Note: Random intercept effects (variance $\pm$ standard deviation): Participant (0.52 ± 0.72); Country (0.02 ± 0.14); Residual (1.21 ± 1.10).

We decomposed the influence of political ideology within each of the four types of climate statements with simple slopes. This analysis revealed that the more conservative participants were, the more the number of false statements delaying climate action (F -ratio=13.015, $p < .003$) they reported to be true and the fewer number of true statements supporting climate action (F -ratio = 18.908, $p < .001$) they reported to be true. In other words, conservative ideology was associated with misidentifying false statements delaying climate action as true and true statements supporting climate action as false.

As in Appendix D, we applied signal detection theory to more robustly scrutinize participants' truth discernment ability.

Table E3. Multilevel model for climate truth discriminatory ability (d'), passive control condition.

Predictor	Estimate	SE	t-value	95% Confidence Intervals		p
				Lower	Upper	
Intercept	0.35	0.10	3.600	0.16	0.54	< .001
Age	0.009	0.001	6.495	0.16	0.01	< .001
Gender	F-value(3, 861.92):		0.1493			.93
Political ideology	-0.04	0.01	-3.450	-0.06	-0.02	.005
Delay/Support	F-value(1, 867.98):		113.1316			< .001
Political ideology *	F-value(1, 867.98):		46.8433			< .001
Delay/Support						

Note: Random intercept effects (variance $\pm$ standard deviation): Participant (0.24 ± 0.49); Country (0.01 ± 0.08); Political ideology (0.01 ± 0.08); Residual (0.11 ± 0.33).

We decomposed the influence of political ideology on truth discrimination ability within each statement type (delay of climate action and support of climate action) with simple slopes. This analysis revealed that the more conservative participants were, the worse their ability to discriminate between true and false statements about delaying climate action (F -ratio=11.901, $p < .001$). This is equivalent to a zero-order correlation of $r = -.13$, $z(868) = -3.9398$, $p < .001$, 95% CI[-0.20, -0.07]. The influence of political ideology did not extend to discrimination ability about statements supporting climate action (F -ratio = 0.008, $p = .93$). Equivalence tests (Lakens, 2017) confirmed that the associations between political ideology and truth discriminatory ability of statements supporting climate action was small enough to be practically meaningless (i.e., significantly smaller than $r = 0.1$; $z(868) = 2.855$, $p = .002$, $r = -0.003$, 90% CI[-0.06, 0.05].

Table E4. Multilevel model for climate truth discriminatory ability (d'), disinformation condition.

Predictor	Estimate	SE	t-value	95% Confidence Intervals		p
				Lower	Upper	
Intercept	0.44	0.12	3.842	0.22	0.66	< .001
Age	0.005	0.001	3.468	0.002	0.008	< .001
Gender	F-value(3, 845.1):		1.0547			.37
Political ideology	-0.05	0.02	-2.973	-0.08	-0.02	.009
Delay/Support	F-value(1, 853.01):		6.7271			.012
Political ideology *	F-value(1, 853.01):		2.1561			.14
Delay/Support						

Note: Random intercept effects (variance $\pm$ standard deviation): Participant (0.04 ± 0.20); Country (0.001 ± 0.03); Political ideology (0.01 ± 0.11); Residual (0.55 ± 0.74).

As for the main analyses, we calculated the correlation between political ideology and truth discriminatory ability for statements delaying climate action and statements supporting climate action. This analysis suggested that the more a participant espoused a conservative ideology, the worse their truth discriminatory ability about statements delaying climate action was, $z(853) = -6.9496$, $p < .001$, $r = -0.13$, 95% CI[-0.20, -0.07]).