

Motivated Reasoning and Political Polarization in Opinions about Extreme Weather and Climate Change

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Abstract

A major challenge in developing climate change solutions is political polarization: those on the left tend to acknowledge the consequences of climate change and support solutions whereas those on the right tend to express skepticism. This chapter reviews research showing that polarization emerges from and is sustained by motivated reasoning, where individuals prioritize adopting partisan positions over accessing and relying upon scientifically accurate information. It further evaluates whether experiencing extreme weather events – a reality occurring with increasing frequency – might limit partisan motivated reasoning and increase efforts to form accurate perceptions about climate change (particularly among those on the right). This might occur since ignoring accurate climate information in the face of extreme weather events has more immediate and concrete consequences. Overall, current findings provide little support for this possibility, although some evidence suggests that believing extreme weather events are causing personal harm (independent of actual experiences of these events) predicts more support for climate solutions that specifically involve adapting to extreme weather.

Solutions to climate change necessarily involve many actors, including international bodies, individual countries, policymakers, media, activists, citizens, and more. A well-known hurdle to achieving such solutions is the *political polarization* of individual citizens in how they view climate change. Those affiliated with conservative parties (e.g., in the U.S., Republicans) clearly express more skepticism about climate change than those affiliated with liberal parties (e.g., in the U.S., Democrats; see Berkebile-Weinberg et al., 2024; Druckman, 2025; Hornsey et al., 2016). Polarized beliefs hinder government policymaking and disrupt coordinated solutions that support collective climate action. As a result, humanity continues to contribute to the problem of climate change and is unable to adapt to its negative effects.

One prominent psychological explanation for polarization on climate change is the occurrence of *motivated reasoning* (Bayes & Druckman, 2021). Citizens have different underlying goals and motives that shape how they seek and process information when forming opinions (Druckman & McGrath, 2019; Molden & Higgins, 2005, 2012). For instance, they may seek to affirm a group identity by agreeing with other members of their political party. Alternatively, they may seek to form attitudes that are accurate as possible. Individuals motivated by partisan group identity will preferentially pay attention to and accept information based on how much their party opposes or supports climate solutions. Meanwhile, individuals motivated by accuracy preferentially pay attention to and accept clear and credible evidence about the likely economic and environmental impact of climate solutions, whatever the position of their political party.

This chapter reviews how theory and research on motivated reasoning helps to explain political polarization of climate-change opinions. We focus on three types of effects that create differences in (a) searches for information about climate change, (b) evaluations of such information, and (c) willingness to update climate change beliefs (see Lodge & Taber, 2013). We also explore how direct experiences of extreme weather influence these effects and the resulting polarization. As extreme weather events become increasingly common and more clearly attributed to climate change (e.g., IPCC, 2021; Seydi et al., 2025), it is important to assess how experiencing such events might shift the motivations that guide people's reasoning about climate change. These experiences could broadly increase motivation to accurately diagnose the problem and potentially reduce polarization (e.g., Constantino et al., 2022). However, they could also increase feelings of threat to partisan positions and bolster the group identity motivations that create polarization (e.g., Usry et al., 2022).

Politically Motivated Reasoning

When seeking, evaluating, and incorporating information during opinion formation, people exert varying levels of effort as directed by a diverse set of goals (Fazio, 2007; Kruglanski, 1989). These goals are generally defined as “cognitive representation[s] of desired endpoint[s] that impact evaluations, emotions and behaviors” (Fishbach & Ferguson, 2007, p. 491). In *motivated reasoning*, people take the actions they perceive to be best suited to bring about their desired endpoint, which alters their processes of reasoning (Kruglanski, 1996; Molden & Higgins, 2012).

A critical part of understanding motivated reasoning is identifying which goals are most common in opinion formation. Although research on climate change opinions has studied multiple goals, two of the most prominent are (a) maintaining *social connection* with valued individuals and groups, and (b) achieving the highest possible *accuracy* about the current state of the world (Bayes & Druckman, 2021). The former is a *directional goal* that involves processing information to support specific desired conclusions (e.g., a match between one's own opinions and the opinions of socially connected others). The latter is a *non-directional goal* that involves processing information independently of specific conclusions and focused instead on broader outcomes (e.g., objective accuracy; see Kunda, 1990; Molden & Higgins, 2005, 2012).

Both directional (e.g., social connection) and non-directional (e.g., accuracy) goals have important effects on opinion formation about climate change (see Bayes et al., 2020). One influential perspective outlined by Lodge and Taber (2013; see also Druckman & McGrath, 2019) describes three primary mechanisms of directional goals: *confirmation biases*, in which people selectively attend to information that coheres with a specific desired conclusion; *prior attitude effects*, in which people evaluate information they encounter based on whether it contradicts or supports a desired conclusion; and *disconfirmation biases*, in which people place greater scrutiny on information that undermines versus confirms a desired conclusion and even actively generate counterarguments. Thus, when motivated by social connection with political parties that possess divergent opinions, these processes all encourage dismissal of alternative viewpoints and greater polarization.

Meanwhile, the primary mechanism of accuracy goals concerns greater effort spent on gathering and evaluating information, as well as the complexity with which this information is integrated (Molden & Higgins, 2012). Thus, when such motivations are prominent, they may mitigate the polarizing influence of directional goals that operate through selective and incomplete evaluation.

Motivated Reasoning about Extreme Weather and Climate Change

Extreme weather events are unexpected severe occurrences outside of historic trends, including heatwaves, tornadoes, droughts, wildfires, and heavy precipitation. These events have been increasing. For instance, the National Oceanic and Atmospheric Administration estimated that in the U.S., 2023 and 2024 had more weather and climate disasters than any prior year (Smith, 2025). Meanwhile, the European Environment Agency reported that 2024 was the hottest year on record in Europe and globally (EEA, 2025). Furthermore, there is much evidence that these increases in extreme weather can be attributed to climate change. As the 2021 Intergovernmental Panel on Climate Change states, it “is an established fact that human-induced greenhouse gas emissions have led to an increased frequency and/or intensity of some weather and climate extremes since pre-industrial time...” (chapter 11; see also NASEM, 2016).

Whether experiencing a rise in extreme weather affects climate change opinions, however, is unclear. Despite overwhelming scientific consensus, there is a sizeable divergence in the opinions of both political elites and the electorate on whether human-induced climate change exists (e.g., Bolsen & Shapiro, 2018; Cook, 2020). In the U.S. and around the world, people who

identify with conservative political parties are dramatically less likely to acknowledge climate change, compared to those who identify with liberal political parties (Hornsey et al., 2016; Berkebile-Weinberg et al., 2024). Therefore, when guided by directional motives for social connection, conservatives' reasoning should reflect skepticism, or even outright denial, of the scientific consensus and stern opposition to climate action. In contrast, liberals' reasoning should reflect high acceptance of the scientific consensus and endorsement of climate action. Regardless of what they might learn on the topic, a desire to see their side "win" any debate about the issue will polarize their attitudes and behaviors along party lines (Groenendyk & Krupnikov, 2021).

Such entrenched directional motivation complicates the potential effects of extreme weather experiences. On the one hand, first-hand experiences with extreme events may lead to the prioritization of non-directional motivations to accurately understand the personal risks of climate change. Once climate change is seen to have concrete and immediate impact, evaluating the true risks, and how to best mitigate them, could become more important. If these accuracy motivations are strong enough, they might override effects of motivations to sustain connections to a party line.

On the other hand, personal threats made salient through direct experiences with extreme weather could also sustain or even further arouse additional directional motivations. Rather than acting to counter political polarization on climate change opinions, experiencing such personal threats might instead (a) reaffirm needs for immediate climate action for Democrats who already endorse such action, or (b) highlight desires to protectively deny the ongoing threat of climate change and its link to extreme weather for Republicans who are already skeptical that climate action is necessary.

Given these divergent hypotheses, the following discussion of polarization in climate-change opinions has two objectives. First, it assesses how directional motivations for social connection contribute to political polarization through confirmation biases, prior-attitude effects, and disconfirmation biases. Second, it reviews available evidence regarding how personal experiences with extreme weather might oppose, sustain, or accentuate directional motivated reasoning.

Confirmation Biases: Gathering Information

Confirmation biases occur when individuals who can choose what information to consume gravitate toward information that confirms their desired conclusion. Concerning climate change, people who already hold skeptical views, identify with political parties that oppose climate action, or hold conservative values that reject climate action are more likely to avoid information that supports climate action and seek out information that undermines the need for such action (Bayes & Druckman, 2021). This creates a "reinforcing spiral" of polarized opinions where people seek out media content that confirms their views, which, in turn, may maintain or strengthen those views and encourage choosing similar media content in the future (Feldman et al., 2014). Therefore, selective information gathering can make supporters of climate action even more supportive and opponents even more opposed.

Evidence suggests that confirmation bias guides media consumption choices. People who initially reported stronger belief certainty about the existence of climate change were significantly less likely to consume conservative TV and radio news, which tends to be skeptical about climate change. Instead, they favored broadcast media, which tends to reflect the mainstream scientific consensus (Feldman et al., 2014). Similar effects appear in people's browsing habits online. In one study, Feldman and Hart (2018) provided participants with headlines for news articles in an imitation Google search and then monitored the articles they chose to click on and how long they spent reading them. When participants could choose between a climate change article and five articles about other topics, conservative Republicans avoided reading about climate change as compared with liberal Democrats. Furthermore, when all articles were about climate change and participants were required to click on at least one, conservative Republicans spent less time reading overall than liberal Democrats and moderate Independents. Finally, although framing climate change as a public-health issue encouraged liberal Democrats to spend more time reading, it had no effect on conservative Republicans. In short, this experiment shows that people whose partisanship or ideology predisposes them against climate change will avoid exposing themselves to climate change news.

Confirmation bias additionally emerges in web searches. Searches from majority-Democratic areas of the United States, like New England, the Mid-Atlantic, and the Pacific are more likely to involve "climate change," whereas those in majority-Republican areas, like the East-South Central and West-South Central, are more likely to involve "global warming." Areas like the West-North Central and the South Atlantic without strong political majorities fall in between (Wang & Jaidka, 2024). This is notable because the term "global warming" is preferred by climate change skeptics, as it does not imply a human cause (Jang & Hart, 2015). As Wang and Jaidka (2024) conclude, "These findings validate confirmation bias in seeking climate information and imply a worrisome phenomenon that people's confirmatory search behavior might limit Web search results and hinder people from receiving cross-cutting information" (15).

Confirmation Biases and Extreme Weather. Several studies document a positive relationship between experiencing high local temperatures and internet searches for information about climate change, suggesting that personal weather experience may attenuate confirmation bias (e.g., Lang, 2014; Choi et al., 2020). Yet, effects may be limited to certain types of information. Analyses of Chinese search-engine data by Li and colleagues (2023) find that searches following high or abnormal temperatures only involved topics about personally adapting to extreme weather, not ways to mitigate climate change. That is, people appear to assess their personal susceptibility to climate change threats and find ways to cope, rather than reduce their contribution to climate change (see also van Valkengoed et al., 2022).

Sisco and colleagues (2021) also find a significant, but small effect of temperature abnormalities on increased internet-search activity about climate change across 46 countries. However, these increases are short-lived, confined to a few days. Similarly, Hart and Leiserowitz (2009) examined the effects of a specific media depiction of a climate disaster, the fictional film

“The Day After Tomorrow.” They found increased internet searches about climate change that lasted from 10 days before the film’s release date to 19 days after.

Effects on engaging with climate-change information via social media are similarly time limited. Examining Twitter posts related to 18 major hurricanes, Torricelli and colleagues (2023) found that discussions about climate change spiked by 80 percent in regions affected by the hurricanes and were significantly more prevalent in affected versus unaffected regions. Yet, they also found a rapid decay in these effects, suggesting that “the heightened public concern and focus towards climate change might be transient in nature” (8-9).

Taken together, these findings suggest that the effects of experiencing extreme weather on information search and engagement are robust but limited in their endurance and breadth of focus. Furthermore, studies that directly explore whether extreme weather reduces directional confirmation biases are rare but find that, in the United States, attention to and discussion of climate change does increase after extreme weather events but is still distinctly less common in areas populated by Republicans versus Democrats (Lang, 2014; Boudet et al., 2020). Therefore, while the question is not settled, there is not strong evidence that experiencing extreme weather events can reduce the effects of directional confirmation biases, although there is little evidence that it exacerbates them, either.

Prior Attitude Effects: Evaluating Information

Prior attitude effects occur when individuals evaluate information that confirms their desired conclusion as stronger and more credible than information that contradicts it. Thus, people with directional motivations to oppose climate action can discount the credibility of sources that advocate for it, such as scientists, and perceive their arguments to be weaker than people who are more supportive of climate action. This feeds into polarization, as even people who do not fall prey to confirmation biases, but rather receive the same information, may still incorporate it into their opinions differently based on their views on climate change.

One prominent debate involving prior attitude effects is whether communicating that over 97 percent of scientists agree climate change is occurring reduces skepticism or alienates skeptics further. Ma and colleagues (2019) find that Republicans and Independents who did not believe in climate change exhibited psychological reactance when seeing a message about the scientific consensus, reporting that they felt manipulated and pressured to change their views. Results in other studies, however, are mixed (cf. Bayes et al., 2020; van der Linden et al. 2023). Similarly, Pasek (2018) finds that partisanship is an important factor in whether people adopt the scientific consensus on climate change in their personal beliefs: while 72% of strong Republicans recognized that scientists believed humans were causing climate change, only 36% held the view themselves.

Druckman and colleagues (2013) offer direct evidence of prior attitude effects in information evaluation. They provided participants with arguments for and against drilling for oil in the United States, with some arguments attributed to Democrats and some to Republicans. When a particular argument, whether for or against drilling, was attributed to Democrats, Republican respondents evaluated it as a weak argument; yet, when the same argument was

attributed to Republicans, they evaluated it as higher quality. Higher evaluations of arguments from one's own versus the opposite party also occurred for Democratic respondents.

Prior Attitude Effects and Extreme Weather. There is some evidence that prior attitude effects also shape how people evaluate the credibility of information about extreme weather events and affect how they interpret these events. By merging GPS smartphone data with 2016 presidential election results in Florida, Long and colleagues (2020) find that residents in Republican-leaning precincts were 10-11 percentage points less likely to follow a 2017 hurricane evacuation advisory than Democratic-leaning ones. This partisan gap, which was not present for hurricanes before 2017, suggests that prior attitude effects may have behavioral consequences for adapting to extreme weather. These effects may also, in turn, shape the provision of information itself as communicators anticipate a loss of credibility. For instance, Hai and Perlman (2022) show that Republican voters punish political officials for linking natural disasters to climate change, viewing these officials as less competent to handle future weather-related events. These studies suggest prior attitude effects influence the way people make sense of extreme weather.

Prior attitude effects also shape people's interpretations of their own experiences with changing, anomalous, or extreme weather. Personal beliefs and partisanship can affect the degree to which such changes are even recalled or noticed (for a review, see Sambrook et al., 2021). Zappalà (2023) shows that, among rural households in Bangladesh, people's interpretations of drought experiences reflect their standing beliefs about droughts, such that those who believe drought events have increased tended to overestimate the number of droughts. Similarly, Shao and colleagues (2020) find that, controlling for actual vulnerability to sea-level change, Republicans who live on the U.S. Gulf of Mexico Coast are significantly more optimistic than Democrats that future sea-level rise is not a threat, with their home ownership behavior seemingly reflecting these beliefs (see Bernstein et al., 2022). Again, it seems that individuals view events through a directionally motivated perceptual lens.

Finally, prior attitude effects can influence attributions of extreme weather to climate change (Ogunbode et al., 2019; for a review, see McClure et al., 2022). For instance, a survey of residents in Pittsburgh, Pennsylvania in the U.S. finds that, even when Democrats and non-Democrats perceived similar changes in flood risks, Democrats more strongly attributed the flooding to climate change (Bruine de Bruin et al., 2014). Similarly, Zanoocco and colleagues (2018) find that, while liberals and conservatives perceived similar levels of harm from extreme weather events, liberals attributed the severity of such events to climate change significantly more than conservatives. Furthermore, even when a hurricane in North Carolina narrowed the partisan gap in perceived climate change threat, such that Republicans who were directly impacted by the hurricane moved closer to Democrats on average, the most engaged and strongly partisan Republican respondents actually grew more skeptical of climate change (Usry et al., 2022).

All of this work suggests that people interpret information about, and experiences with, extreme weather through a directionally motivated lens. Those who identify with skeptical positions on climate change tend to minimize their perceptions of extreme weather,

underestimate the likelihood and threat of such weather, and dismiss possible linkages to climate change, especially when partisan identity is strong. Therefore, as with confirmation biases, the evidence does not suggest that experiencing extreme weather will substantially override prior attitude effects in processing information about climate change. Rather, prior attitude effects may condition how people interpret extreme weather events. Although there is some evidence that experiencing extreme weather can even exacerbate such directionally motivated effects (e.g., Usry et al., 2022), the more consistent finding is simply one of continued, rather than reduced or accentuated, polarization.

Disconfirmation Biases: Updating Beliefs

Disconfirmation biases occur when people not only ignore information that contradicts their preferred or prior conclusion but actively scrutinize it in order to undermine it. Like prior attitude effects, the result is that the information is dismissed to affirm a standing belief; however, active counterarguing may even make these beliefs more extreme, exacerbating polarization. An example comes from Bolsen and colleagues (2014), a study of responses to information about the climate-friendly *U.S. Energy Independence and Security Act of 2007*. Participants randomly received no endorsement of the Act, an endorsement by Democrats, or an endorsement by Republicans. With endorsements from the opposite party, partisans spent more time processing the information, consistent with increased efforts at disconfirmation. Moreover, as a result of these efforts, people opposed the policy when endorsed by the opposite party but supported it when endorsed by their party.¹

A similar finding comes from Zhou (2016), who randomly assigned Republican respondents to one of eight experimental treatment messages advocating for greater governmental action against climate change. The messages came from either a Republican or Democratic former congressperson and referenced economics, national security, moral justice, or natural disasters. None of the messages increased Republicans' support for governmental action and three of the eight messages backfired, leading to significantly less support for government action. Such backlash effects suggest a disconfirmation bias from counterarguing.

However, it is important to note that backlash effects are not particularly common (Bayes et al., 2020; Hornsey, 2021, p. 39). Instead, more critical evaluation of contrary information more often simply leads to dismissal. For instance, when Bolsen and Druckman (2018) exposed individuals to a scientific consensus message about climate change, they found that only high-knowledge Republicans were unmoved, as greater knowledge allowed them to more effectively counterargue a message that challenged their standing beliefs.

Disconfirmation Biases and Extreme Weather. Most research on disconfirmation biases and experiences of extreme weather does not look directly at counterarguing. However, the literature is clear that direct experiences do not always prompt skeptics to update their beliefs (for reviews, see Howe et al., 2019; Howe, 2021; Sambrook et al., 2021). A meta-analysis by Xia and colleagues (2022: 1) concludes that “people’s climate change experiences may not be

¹ The study included additional conditions, including consensus and cross-partisan endorsements as well as an accuracy prompt.

effective in shaping their awareness of climate change, which is likely due to people's attribution style and adaptability." In short, consistent with the work reviewed regarding prior attitude effects, individuals appear to rationalize extreme weather as unrelated to climate change (although see Rüttenauer, 2024).

That said, there is some evidence that *perceptions* of being harmed by extreme weather can change attitudes. For instance, Zanoocco and colleagues (2019) find that higher levels of self-reported personal harm are associated with more support for climate-change mitigation policy, even among conservatives (see also Ogunbode et al., 2020; Chen et al. 2024). They also find that more objective measures of experienced harm, in terms of proximity to or damage suffered by the event, have no effects on this support. Similarly, Andrews and colleagues (2025a) find that it is self-reports about wildfire impacts, rather than physical proximity to the fires, that affect willingness to spend on mitigation measures, although proximity predicts willingness to spend on local adaptation. A meta-analysis further confirms that, to the extent extreme weather events impact beliefs, it is primarily when measures use self-reports rather than actual weather experiences (Xia et al., 2022).

Thus, if extreme weather might reduce directional motivated reasoning when updating beliefs and opinions, people's personal perceptions of the experience and whether they connect it to climate change are critical factors (Constantino et al., 2022; Cologna et al., 2025). Questions still remain concerning thresholds for perceiving direct harm, the processes involved in attributing harm to climate change versus dismissing such links, and whether links between perceived harm and updated beliefs are concentrated among those inclined to believe in climate change (Lyons et al., 2018; Ai et al., 2024). In summary, the literature has not yet clearly identified when extreme weather might reduce polarization by encouraging belief updating, but it also does not suggest that it typically exacerbates disconfirmation biases or leads to backlash.

Conclusion

There is evidence that directional motivations for partisan social connection shape climate change opinion formation through the processes of gathering information, evaluating evidence, and updating beliefs. Moreover, although extreme weather experiences might produce short-term reductions in confirmation biases, they do not enduringly eliminate partisan differences in information search, nor do they robustly counteract prior-attitude effects or disconfirmation biases. Those with climate-skeptical partisan affiliations (a) do not consistently seek out climate change information after experiencing an extreme event, (b) interpret their experiences so as to limit recognizing an event or its connection to climate change, and (c) decline to update their climate-change beliefs afterwards. Thus, while experiencing extreme weather may, in particular circumstances, reduce partisan polarization, it does not broadly activate non-directional accuracy goals. Yet, there is also little evidence that it broadly exacerbates directional motivated reasoning, either.

Because personal experiences lead to inconsistent interpretations and effects, future research about communicating the relationship between extreme weather and climate change should make careful distinctions about the variables under study. For instance, our review shows

that a focus on subjective evaluation of harm from extreme weather may be more important than objective experiences of extreme weather. It also demonstrates the value of segmenting audiences by beliefs, e.g., those who do not believe the weather is becoming more extreme versus those who believe the weather is becoming more extreme but have not attributed it to human-caused climate change. As an illustrative example, some work suggests that support for local adaptation to extreme weather may be more moveable than support for global climate-change mitigation, especially among those with weak prior beliefs and when extreme weather is not explicitly attributed to climate change (e.g., Andrews et al., 2025b; Bayes et al., 2025). Here, a subjective perception of vulnerability to extreme weather may be sufficient to move adaptation attitudes, while moving mitigation attitudes requires an additional attribution of extreme weather to climate change (Ogunbode et al., 2019). Two important avenues for future research, therefore, are exploring the relationship between objective and subjective experiences of extreme weather events, as well as the factors affecting attribution of these events to climate change.

More broadly, we join previous calls for more attention to the psychological processes behind the connection between extreme weather experiences and climate change (see Brügger et al., 2021; Steg, 2023). Our review illustrates the necessity of developing more direct tests of the motivations different circumstances evoke (e.g., social connection, personal protection, or accurate risk-appraisal) before making claims about the role of motivated reasoning in any observed outcomes (see Bayes & Druckman, 2021; Druckman & McGrath, 2019; Molden et al., 2022). Future work would also benefit from over-time designs that directly study opinion change, which is a better approach than cross-sectional comparisons (Rüttenauer, 2024). In conclusion, overcoming polarization, and the barriers it creates for action on climate change, still requires more extensive and nuanced understanding of the motivated reasoning that supports it.

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