Responding to Climate Change Skepticism and the Ideological Divide

JESSICA M. SANTOS

School of Natural Resources and Environment, University of Michigan,
Ann Arbor, MI 48109 & Climate Central, Princeton, NJ

IRINA FEYGINA

Climate Central, Princeton, NJ

ABSTRACT

Climate change is an increasingly politicized issue in the United States, with many members of the American public, especially those who identify as politically conservative, skeptical about this dangerous phenomenon. A host of social and psychological processes have been investigated in an attempt to understand skepticism and resistance to responding to the threat of climate change, including motivated reasoning, system justification theory, social dominance orientation, belief in a just world, the cultural cognition thesis, and solution aversion. In this article, we review recent research into these processes and their implications for understanding the political divide in responding to climate change. We also highlight efforts to test communications interventions aimed at ameliorating these processes underlying climate change skepticism, including framing and scientific consensus. This literature review may be informative for climate change focused communicators, policymakers, practitioners, and academics who directly or indirectly interact with the

public, or who design communication campaigns, policy, initiatives, or programs for the public.

Introduction

Climate change is a pressing challenge, with the potential to cause dramatic sea level rise, a higher frequency of extreme weather events, worldwide temperature increases, and climatic instability (IPCC 2013). These changes may disrupt societal functioning through increasing global migration, conflict, and disease, while endangering worldwide food systems (Burrows and Kinney 2016; FAO 2008; Haines et al. 2006). With 2016 as the hottest year on record, and 16 of the 17 hottest years on record occurring during this century (Copernicus 2017; World Meteorological Organization 2016), the need for mitigation is immediate and dire. The United Nations Framework Convention on Climate Change organized the Conference of Parties (COP) with the goal of reducing greenhouse gas emissions globally, which began meeting annually in 1995 ("Background on the UNFCCC: The international response to climate change"). The climate change agreement developed at the 2015 Conference of Parties (COP) 21 was lauded as "the world's greatest diplomatic success" for its ability to compromise across diverse needs and interests (Harvey 2015), yet was criticized for failing to limit the power of fossil fuel industries or address the needs of developing nations adversely impacted by climate change (i.e. Odendahl 2016). The implementation of this accord, as well as the development of more powerful and impactful agreements, relies on support from governments and individuals across the globe. And, considering that the US is the second largest global emitter of greenhouse gases (Boden, Marland, and Andres 2015), passing effective climate policy to curb American emissions as soon as possible is crucial.

Yet the American public and political elite are far from being convinced of the reality and threat of climate change, or being unilaterally committed to addressing it. While a recent review of over 11,000 scientific articles found that 97 percent concur that climate change is caused by human activities (Cook et al. 2013), many individuals in the US do not believe that climate change is occurring, or that it is anthropogenic. In a 2016 survey, 11 percent of respondents were "doubtful" that climate change is occurring and another 10 percent were "dismissive" of the phenomenon (Roser-Renouf et al. 2016). In an analysis of 35 US national, state, or regional surveys conducted between 2010-2015, 10–15 percent of respondents did not believe that climate change was occurring at all, while 30–40 percent believed it

is due to natural causes (Hamilton et al. 2015). Skepticism is also prevalent in other developed nations, including Australia and Norway (Tranter and Booth 2015).

Importantly, climate skepticism differs across the ideological spectrum, with greater prevalence among those who identify as politically conservative (McCright & Dunlap 2010). The conservative climate change skepticism movement has posed a formidable impediment to lifestyle changes that are key to decreasing carbon emissions (Dietz et al. 2009), and without nationwide support and engagement, the government has failed to develop and commit to climate policy that is far-reaching enough to quickly and dramatically reduce the country's greenhouse gas emissions (McCright & Dunlap 2010).

What are the psychological roots of climate change skepticism, and how can we account for its relationship with political ideology? In this review, we explore the processes underlying responses to climate change, and examine how these contribute to a relationship between skepticism and political ideology. We begin with an exploration of motivated reasoning, then review recent social science findings (primarily published between 2012–present) on the psychological underpinnings of skepticism, and discuss communication interventions (when available). We then examine the link between political ideology and skepticism. Finally, we review findings about communicating the scientific consensus on climate change, and offer a list of best practices for communication efforts to ameliorate climate skepticism and increase support for efforts to mitigate climate change and adapt to its impact.

Motivated Reasoning

How can we make sense of skepticism in response to an urgent threat that may destroy civilization as we know it? Central to understanding climate skepticism is the psychological process of *motivated reasoning*—the unconscious process of making conclusions, developing preferences, or making decisions in ways that are influenced by, and often aim to align with, an individual's needs, goals, beliefs, and desires (Kunda 1990). Motivated reasoning affects information processing and can result in ignoring, discounting, misunderstanding, or biasing information that conflicts with existing beliefs and attitudes, or to strengthening these despite the inconsistent nature of the information (Redlawsk 2002). Motivated reasoning serves to protect and maintain an individual's beliefs, attitudes, worldviews, and perception of self (i.e. Dunning 1999; Lewandowsky and Oberauer 2016; Taber and Lodge 2006).

In the domain of political decision-making, motivated reasoning is at play when

voters support a policy if it is endorsed by their political party (Peterson et al. 2013), even if they would otherwise oppose it (Bolsen, Druckman, and Cook 2014). Similarly, presenting voters with negative information about their preferred candidate gives rise to stronger, rather than weaker, support (Redlawsk 2002). Individuals of both political parties are affected by motivated reasoning (e.g. Kahan 2013; Leeper and Slothuus 2014; Taber and Lodge 2006).

Motivated reasoning is also at play in how people process and respond to scientific information about climate change. Conservative individuals who follow science news are less likely than their liberal counterparts to support climate change mitigation policy (Hart, Nisbet, and Myers 2015), while individuals who are motivated to reject scientific results due to partisanship are more likely to do so if they are educated and scientifically literate (Lewandowsky and Oberauer 2016). These findings suggest that presenting people with information about climate change are by no means sufficient to convince them of its reality, and that these effects are not ameliorated, but rather exacerbated, by education.

Motivated reasoning underlies many mechanisms that contribute to climate change skepticism, discussed next.

Psychological Dynamics of Climate Change Skepticism

We offer below an overview of key psychological processes that contribute to climate change skepticism as a means to defend core beliefs, attitudes, and identities. Each process affects people's ability to engage with and respond to information about climate change through motivated reasoning. We explore interventions for environmental communication and policymaking in the context of each process.

Belief in a Just World

Belief in a Just World (BJW) refers to an implicit conviction that the world is intrinsically fair and stable, and that each person receives what they deserve (Lerner and Miller 1978). BJW develops as an adaptive mechanism to help individuals cope with life's stresses, and serves the need to see the world as a just, safe, and secure place (Hafer and Begue 2005). BJW contributes to well-being (Furnham 2003) and can even motivate individuals to ameliorate injustice (Hafer and Rubel 2015). However, it can have adverse consequences, such as blaming victims for negative outcomes outside of their control (Furnham 2003; Lerner and Miller 1978).

BJW contributes to climate change skepticism. Dire messages about climate change threaten perceptions of the world as a just and orderly place and motivates defensive skepticism and resistance to preventing climate change—such as by reducing individuals' carbon footprints (Feinberg and Willer 2011). However, BJW not only motivates defensive responses, but can also engender actions that contribute to increasing justice. For example, just world beliefs are related to taking greater responsibility for responding to climate change, which may stem from a greater desire to remedy injustice, and lower rates of negative affect (such as sadness) about climate change (Clayton, Koehn, and Grover 2013).

Potential Communication Interventions

These results suggest that communicators should resist fear-based messaging about climate change, insofar as these may increase skepticism and decrease willingness to make beneficial lifestyle changes (Feinberg and Willer 2011). Fear-based appeals may be too overwhelming and threatening, challenge just world beliefs, and trigger motivated denial, while an approach that is less distressing may elicit greater motivation to protect justice. Climate change information paired with a frame that empowers individuals to take action is likely to give rise to a more receptive response to calls for learning about, mitigating, and adapting to climate change.

System Justification Theory

System justification arises from a psychological need to maintain positive attitudes and confidence in the existing social order and status quo, and manifests as a motivated tendency to defend existing socioeconomic structures and practices, as well as resistance to societal change. It is experienced by most individuals, including those who do not benefit from the current socioeconomic systems (Jost, Banaji, and Nosek 2004), and can result in rationalizing and upholding realities that are detrimental to individuals, and to the groups and institutions they inhabit. System justification tendencies are strongly related to an endorsement of political conservativism both in the US and internationally (Jost et al. 2003).

System justification tendencies are a strong predictor of climate change skepticism because of the threat that climate change, and the solutions needed to ameliorate it, pose to the established system (Feygina, Jost, and Goldsmith 2010; Fritsche et al. 2012; Jost 2015; Jylhä and Akrami 2015). System justification is related to a greater tendency to deny that environmental problems exist, less favorable attitudes about the environment, and lower likelihood of engaging in behaviors that

would prevent further damage to the environment (Feygina, Goldsmith, and Jost 2010). These processes are facilitated by motivated information processing. For example, participants presented with information about climate change misremember the threat to be less serious if they are predisposed to justify the economic system (Hennes et al. 2016). Similarly, feeling dependent on a system or government, which increases the motive to experience trust and confidence toward it, leads to greater avoidance of learning information that is negative or threatening to the system—such as environmental solutions (Shepherd and Kay 2012).

System justification tendencies impede environmental progress and goal setting (Feygina, Goldsmith, and Jost 2010) and obstruct climate change policy support and lifestyle changes toward sustainability. People satisfy their short-term desire for confidence and security in the system rather than confronting and addressing systemic problems that are detrimental in the long-term.

Potential Communication Interventions

Importantly, the effects of system justification on climate change inaction can be ameliorated through communication that addresses people's need to rationalize and maintain the existing social order. Messages that frame pro-environmental action as patriotic and consistent with defending the status quo and societal well-being give rise to greater intentions and actions to protect the environment among those who report a stronger system justification motive (Feygina, Goldsmith, and Jost 2010). Emphasizing the strength of the economic system and its ability to confront the threat of climate change are also promising approaches (Hennes et al. 2016).

Social Dominance Orientation

Social dominance orientation (SDO) refers to a personality tendency whereby an individual desires their in-group to "dominate or be superior to" out-groups (Pratto et al. 1994, p. 742). A consequence of SDO is a preference for ideologies supportive of group-based hierarchies (Pratto et al. 1994; Pratto et al. 2013), which contributes to prejudice, as well as support for maintaining inequality (i.e. Duckitt 2006; Pratto et al. 2000; Whitley 1999).

SDO is linked to climate change denial insofar as both stem from a justification of societal hierarchies (Häkkinen and Akrami 2014; Jylhä and Akrami 2015). Moreover, the desire for dominance associated with SDO extends to a desire for human dominion over nature (Milfont et al. 2013). Anti-egalitarianism, a facet of

social dominance, has been associated with climate change denial and lower likelihood of making a personal sacrifice to better the environment (Stanley et al. 2016), as well as less concern about negatively impacting low-income foreign groups with an environmentally-damaging or polluting industry if the industry benefited their in-group (Jackson et al. 2013). Gender differences in SDO also contribute to the gender gap in climate change skepticism and environmental responses (Jylhä et al. 2016; Milfont et al. 2013).

Potential Communication Interventions

Unfortunately, research has not focused on attenuating the effect of social dominance tendencies on climate change skepticism. Environmental communicators and policymakers may be able to appeal to social dominance tendencies by emphasizing the opportunities for American economic and political dominance through leading on mitigating and adapting to climate change. As renewable energy is the fastest growing global source of electricity generation (International Energy Agency 2016), the possibility of competing and winning in this market may appeal to individuals with aspirations toward US global dominance.

Cultural Cognition

The cultural cognition thesis posits that individual risk perceptions, beliefs, and behaviors are profoundly influenced by, and align with, the cultural groups to which an individual belongs and that are closely tied to their identity, such as political ideology, race, and religious affiliation (Kahan, Jenkins-Smith, and Braman 2011). The powerful influence enables individuals to live in harmony with their cultural groups, protect individual identities and worldviews while maintaining social standing, and act in ways that benefit society and enhance collective risk response (Kahan, Jenkins-Smith, and Braman 2011). However, when cultural groups hold contradictory beliefs about risks, cultural cognition results in a polarized public response to socially charged issues like vaccines, gun control, and climate change (Kahan et al. 2007; Kahan et al. 2010; Kahan et al. 2011; Kahan, Jenkins-Smith, and Braman 2011).

From a cultural cognition perspective, climate change skepticism stems from a commitment to cultural groups and their beliefs about risk, which may override scientific knowledge or personal numeracy—as evidenced by the greatest cultural polarization around climate change found among those with higher scientific numeracy (Kahan et al. 2012).

Potential Communication and Policy Interventions

Cultural cognition findings have implications for efforts to increase public concern and dialogue about climate change through messaging that complements the worldviews of those who may oppose climate change. Communication and policy approaches are typically most successful when the message or expert is perceived as sharing the worldviews of the audience (Kahan, Jenkins-Smith, Braman 2011; Kahan et al. 2015). For example, including a geoengineering policy proposal when exposing participants to information about climate change gives rise to less polarized climate responses and greater concern, insofar as geoengineering is consistent with a worldview that human ingenuity and technological advancement can solve societal problems (Kahan et al. 2015). Similarly, informing participants about geoengineering efforts increases concern about the risk of climate change (Fairbrother 2016; Merk, Pönitzsch, and Rehdanz 2016). These results indicate the importance of incorporating policy supportive of audience worldviews into climate communication.

The psychological processes reviewed above—*belief in a just world*, *system justification*, *social dominance orientation*, and *cultural cognition*—motivate climate change skepticism as a means to protect beliefs, attitudes, and identities. Given how deeply rooted and powerful these drives are, it is highly unlikely that information or education about climate change only will be sufficient to overcome climate skepticism. Rather, the effects of these powerful motives need to be addressed, and communication and policy need to be reframed to draw on and work with these motives, rather than against them.

Moreover, these processes are key to understanding the roots of the political polarization on climate change. In the next section we examine the relationship of these motives to political ideology.

Political Ideology and Climate Change Skepticism

Political orientation (both party identification and political ideology) is a powerful predictor of climate change beliefs and concern (Marquart-Pyatt et al. 2014). People who identify as Republican are significantly less likely to believe that climate change is occurring or that its cause is anthropogenic (Hamilton and Saito 2015). People who report being politically conservative are less likely to believe in climate change, be concerned about the environment, or act pro-environmentally (Gifford and Nilsson 2014; Liu, Vedlitz, and Shi 2014; Milfont et al. 2015). Conservatives report greater distrust of scientists (Hamilton,

Hartter, and Saito 2015), which is exacerbated by conservative media exposure (Hmielowski et al. 2013).

While political ideology is a major predictor of climate change beliefs, demographic variables, such as gender and race, also play a role. Overall, women have consistently been found to have stronger environmental attitudes and greater climate change concern than men (e.g. Joireman and Liu 2014; Milfont and Sibley 2016). Racial differences are more complex. While non-white individuals accept climate change at about the same rate as white individuals, they are less likely to be affected by political ideology (Schuldt and Pearson, 2016). These demographic variables interact with ideology in predicting climate skepticism. Most notably, conservative white males are more likely to deny the existence of climate change than any other group (McCright and Dunlap 2011) and to worry less about environmental problems (McCright and Dunlap 2013). This "conservative white male effect" and the similar "conservative male effect" have also been documented in Brazil, Sweden, and New Zealand (Jylhä et al. 2016; Milfont et al. 2015).

Political conservatism correlates strongly with each of the underpinnings of climate change discussed above. Across a diverse array of studies, conservatives report stronger beliefs in a just world, greater system justification, a more pronounced tendency toward social dominance orientation, and a greater alignment with cultural groups that question the existence of climate change. These tendencies, in turn, give rise to greater resistance to acknowledging and responding to the realities of climate change, as a means to protecting the status quo, the established societal hierarchy, a perception of the world as a fair, just, and beneficial place, and of one's own position and commitment to one's groups (Feygina, Jost, and Goldsmith 2010; Feygina 2013; Grina et al. 2016; Häkkinen and Akrami 2014; Pratto et al. 2000; Pratto et al. 2013; Wilson and Sibley 2013). In other words, climate skepticism serves deeply seated motives to protect people's beliefs and commitments, and these are particularly pronounced among conservatives, who report a stronger commitment to established social and economic systems.

Moreover, climate change is perceived as a threat to conservative worldviews insofar as the free market and industrialization, which conservatives strongly support, are among the main contributors to climate change. For example, research shows that skepticism is driven by an attempt to protect extant industrial and corporate interests, which would be affected by responses to the threat of climate change (Anti-Reflexivity Thesis; McCright & Dunlap 2010). As an illustration, conservative respondents report a lower likelihood of purchasing an energy efficient product if it is framed as reducing carbon emissions (Dietz, Leshko, and McCright, 2013). Similarly, distrust of science and scientists may be due, in part, to conservatives

interpreting scientific findings as being contradictory to their ideology; research has found that liberals react similarly to dissonant scientific messaging (Nisbet, Cooper, and Garrett 2015). The distrust is aimed at "impact scientists," who assess environmental and public impacts of economic production, while "production scientists," who research new technology and advancements that support economic production, are more trusted (McCright et al. 2013).

Another important example is "solution aversion," whereby opposition to proposed climate change solutions gives rise to a tendency to disbelieve climate science; this motivated process serves to protect existing individual political and climate change attitudes (Campbell and Kay 2014). Twitter communication pertaining to climate change posted before, during, and after Hurricane Sandy makes evident three major discourses: oppositions to climate-related taxation, renewable energy, and perceived governmental abuse of power (Jacques and Knox 2016). Notably, each of these discourses focus on a policy or approach which contradicts conservative positions, and are not primarily focused on the rejection of climate science itself.

Potential Communication and Policy Interventions

These findings suggest that communication should highlight policy opportunities that reflect a diversity of political ideals, including support for a free-market economy or reduction of government spending. For example, in an intervention presenting information to conservatives about climate change paired with a free-market policy solution, there was more than a 30 percent shift in agreement with climate science (Campbell and Kay 2014). This demonstrates considerable promise that emphasizing alternative solutions amenable to conservative beliefs could reduce the overall rejection of climate science in conservative individuals.

In addition, many governments in conservative states have been successful at passing renewable energy and energy efficiency policies by framing them as potential avenues to reduce public taxes or increase government efficiency (Hess, Mai, and Brown 2016). Therefore, whenever possible, policymakers and communicators should reframe proposed policies in ways that complement the ideals conservatives support.

Communicating the Scientific Consensus on Climate Change

While the above discussion suggests that the most effective approach to climate communication is creating messages congruent with the ideological and cultural

worldviews of those who may be skeptical, rather than providing them with additional information about climate change, there appears to be an important exception pertaining to communicating the scientific consensus on climate change. This approach emphasizes the scientific consensus as a means to greater acceptance of the existence of climate change, and has emerged as a strategy of interest for policymakers and communicators due to the public's general ignorance of the existence of this consensus.

Perceptions of scientific disagreement are related to lower support for environmental policy (Aklin and Urpelainen 2014). Yet the vast majority of people, as many as nine out of ten, are not aware that more than 90 percent of climate scientists have concluded that human-caused global warming is occurring (Leiserowitz et al. 2016). Awareness is impacted by ideology: roughly three-fourths of Democrats, compared to only one-third of Republicans, agree that there is a scientific consensus about climate change (Dunlap, McCright, and Yarosh 2016). In addition, perceived scientific consensus is correlated with accepting climate science (Lewandowsky, Gignac, and Vaughan 2012).

Importantly, communicating the scientific consensus on climate change contributes to greater climate change acceptance across party lines (i.e. Lewandowsky, Gignac, and Vaughan 2012; Myers et al. 2015; van der Linden et al. 2015). Using short, simple messages, paired with a pie chart showing scientific consensus, is the most persuasive approach (van der Linden et al. 2014). However, Kahan (2015) warns that communicating climate consensus can insult skeptics by indirectly suggesting they may be unintelligent for disagreeing with a majority of scientists and lead to greater polarization on the topic. Therefore these messages should be carefully crafted not to demean their audiences.

Best Practices for Neutralizing Climate Skepticism

Based on the findings reviewed above and their implications for approaches to build acceptance of climate change, we have compiled a list of "Best Practices" to consider while conducting informational or educational campaigns or developing climate policy or programming.

1. People may be skeptical of climate change in response to their need to *believe in a just world* and maintain their view of the world is inherently fair and stable. Fear-based messaging is particularly threatening to just

world beliefs. Instead, using an empowering frame when communicating climate change may motivate people to engage in mitigation.

2. People may be skeptical of climate change because it threatens a deeply seated need to protect existing socioeconomic structures, through a process of *system justification*. Frame climate change responses as a means to protect the system and maintain important facets of the status quo to harness system justification motives toward engagement. In addition, affirm the strength of the country's economic system and its ability to successfully tackle climate change.

3. People with a *social dominance orientation* may be skeptical of climate change because they believe that humans should have dominion over nature. Frame communication and policies as opportunities to lead and succeed, such as by investing in renewable energy to secure a competitive and prosperous foothold in the global energy market.

4. People may be skeptical because their identities are tied to cultural groups which are collectively skeptical of climate change, through a process of *cultural cognition*. Frame climate change policy and communication to complement the worldviews of these individuals and groups, for example by emphasizing technological ingenuity as a potential means to climate solutions.

5. People may be skeptical of climate change because policy proposals for climate solutions threaten beliefs stemming from their *political ideology*, such as increasing government regulation of markets. This *solution aversion* can be addressed by highlighting proposals that are amenable to a variety of political beliefs, such as ones supportive of free-market economy, or that complement both liberal and conservative beliefs, such as by discussing how energy efficiency would save public taxpayers' money.

6. People may be skeptical of climate change because they are unaware that nearly all scientists agree that it is occurring. Emphasize the scientific consensus on climate change by using short, concise messaging paired with simple graphic illustrations.

7. When preparing to speak to the public about climate change, ask yourself: Do I understand the motives and worldviews that drive my audience members' responses to climate change, and does my communication successfully acknowledge, address, ameliorate, or even harness these motives toward acknowledging and engaging with climate change, rather than experiencing threat and disengaging through skepticism and denial?

Conclusion

This article summarizes research on psychological dynamics underlying responses to climate change and examines the relationship between ideology and climate change skepticism. We focus on communication and policy approaches to ameliorate motives that drive skepticism and support decision-making to address climate change. Many of these approaches attempt to bridge climate change knowledge and policy support with conservative worldviews. These interventions are particularly relevant as the American public grows ever more polarized in line with their political platforms on climate change (Dunlap, McCright, and Yarosh 2016), and the need for meaningful policy to mitigate and adapt to climate change on the local, state, and federal levels grows more dire. We hope that the findings reviewed here offer insight into the roots and dynamics of climate skepticism and suggest practical communication approaches to address skepticism, increase engagement with and concern about climate change, and motivate people to support climate policy and make lifestyle changes that will respond to this imminent threat.

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