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Climate Scientists as Rhetorical Citizens *Public Argumentation in Persuasive Op-Eds*

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ABSTRACT: What persuasive strategies should scientists use when performing rhetorical citizenship in our post-truth, hyper-partisan times? To understand what appeals can be employed by experts seeking to change the minds of opposition audiences in the public sphere, we examine opinion editorials by climate scientists published in “red state” newspapers, that is, regions of the United States that are majority Republican, a political party whose leaders continue to question the reality, cause, and/or significance of global warming.

KEYWORDS: climate crisis, hostile audiences, identification, scientist citizens, values

1. INTRODUCTION

At the time of this writing, the Southern United States is sweltering under a blanket of unprecedented heat and humidity that has already taken many lives (Mascarenhas & Simonson, 2023). The record temperatures coincide with wildfire smoke from Canada that has triggered air quality alerts for nearly a third of the American population (Livingston, 2023). Human-driven climate change has been linked to these events and others around the world, including in Europe, which was recently identified as the fastest warming continent on the planet (World Meteorological Association, 2023). However, despite the immediacy of these conditions to people’s lived experiences, climate change has still not motivated the degree of political action and economic reorganization that climate scientists and climate change activists have advocated for, for decades. Climate change is an exemplar of a wicked problem, but so is its public communication in a moment marked by acute political polarization and distrust of institutional information sources.

Climate scientists are the people with the best understanding of climate change mechanics. As such, they have much to share with the public about their research. We also believe that as citizens with expert knowledge they have an obligation to not only communicate openly in the public sphere about the climate threat but to communicate freely concerning mitigation and adaptation policy proposals. The nature of these dual obligations, to maintain the perception of being an unbiased, credible expert and to advocate for social betterment with that expert knowledge, is often rife with tension, internally and politically. This identity has been coined the scientist citizen (Pietrucci &

Ceccarelli, 2019; Syfert, 2019). Although much is written on the communication by scientists to those within their own community, fewer analyses have been conducted to better understand the mechanics and efficacy of scientist communication to the general public. Fewer still exist that take a rhetorical approach, shedding light on choices made by scientist rhetors to characterize social problems, target audiences, themselves, and lines of argument aimed to influence belief and action. Concerning climate inaction, effective communication now more than ever can be defined by the ability to persuade hostile audiences.

The research presented here is the second leg of a project that examines newspaper op-eds and editorials written by scientist citizens for their potential to communicate with and influence ideologically hostile audiences. The first leg examined guest editorials on COVID-19 vaccination policy written by rhetors with medical and/or scientific expertise (Ceccarelli & Syfert, 2022). The present leg examines opinion editorials by climate scientists, published in prominent newspapers located in politically red or purple states in the United States, that is, states that are majority Republican or lean Republican, the conservative party there. These editorials were selected for close reading because their audience cannot be assumed to already agree with the writers' thesis. The process of selecting texts for close reading was difficult because so few editorials written by those with scientific credentials were directed toward hostile audiences. Climate scientists communicating via editorials did so in much greater quantity through blue state newspapers (that is, newspapers in states that are majority Democrat, the other dominant party in the U.S.) and more left-of-center prestige press such as *The New York Times*. Our focus on communicating across ideological divides, and subsequent analysis of the rhetorical moves to do so effectively, may contribute to the goal of overcoming political polarization and encouraging meaningful climate action.

2. LITERATURE REVIEW

Newspaper opinion editorials have long been a message board to begin and continue discussion within the public sphere on issues of collective interest. Some scientists have identified this form of more direct public communication of their work as an urgent need and have taken it upon themselves to communicate through the op-ed genre. Such a move strays from the more familiar communication of scientific ideas via intermediaries such as journalists and science writers who craft popularizations in articles and books. In writing op-eds, scientists speak more directly to the public, gaining more control over how their research is understood and framed. It also gives these scientist citizens access to audiences that might not otherwise be exposed to current climate research. However, access to new audiences does not guarantee adherence to their theses. Scientists must frame their research carefully to get through to audiences that not only lack knowledge, but also have social or political reasons to reject their claims. For example, Parks and Takahashi (2016), using speech act theory as a framework, found that scientists engaging public audiences via op-eds can advance science communication beyond deficit models through employing personal stories, accessible descriptions of research, and references to history and popular culture.

The move away from a model of science communication that relies solely on removing the knowledge deficits of general audiences can be partly attributed to an increased recognition of how group identity at times influences or even subverts the goal of enhancing comprehension of science. Under this premise, efforts to persuade audiences skeptical to positions of scientific consensus require consideration of rhetorical principles, including audience analysis. In a case study of Christian climate scientists attempting to persuade religious and conservative audiences, Doug Cloud (2016) identified and analyzed three rhetorical moves used when communicating with hostile audiences: a pivot toward shared values, the use of local evidence, and the disparaging of “tree-hugger” environmentalists. Cloud found utility in these moves but also warned of trade-offs in such ways of minimizing difference.

Climate change has been popularly framed as an issue treated differently by liberals and conservatives, and this division has been exacerbated by a decline in trust among political conservatives in the scientific community (Mann & Schleifer, 2020). This decrease in trust has been connected to popular news stories of researchers manipulating data and engaging in other unethical research practices, as allegedly exposed during the Climategate controversy (Nadelson et al., 2014). Distrust in science also can be driven by political, social, and economic actors reacting to whichever science policy issues are most salient to them in public discourse (Nisbet, Cooper, & Garrett, 2014). This link between ideology and trust points to a necessity for scientist rhetors to not only advocate their thesis with rhetorical finesse but to also allay the distrust held by some conservative audiences for researchers engaged in science that assesses the environmental and health impacts of modern society.

The literature on climate science uptake by popular audiences should not be understood as calling out political conservatives as anti-science. Stable conservative identities are found to hold largely positive attitudes towards science and scientific research itself (Mann & Schleifer, 2020). The greater import here is the capacity of political polarization around issues grounded in scientific expertise to depress trust in science on both ends of the ideological spectrum (Nisbet, Cooper, & Garrett, 2014). When considering disturbing arguments made by politically dissonant others, skepticism is a common psychological response.

The scientific community remains one of the most trusted institutions in the United States and retains an important capacity to inform public opinion and policymaking. The epistemological ground of the scientist is highly valued, and because of that, inconvenient claims of fact reported by individual scientists are countered through kneejerk attempts to dismantle that epistemological privilege. Relying too heavily on the elevated positionality of the authoritative scientist can result in arguments interpreted along party lines, or worse, reinforce impressions of self-serving and elitist motivations behind scientists advocating for policies related to climate change (Syfert, 2022). The framing of arguments matters when scientists attempt to bridge this divide and replaster the cracks in their pedestal. One approach that has been suggested is for scientists to focus on economic arguments, war- on- science framing, and the portrayal of scientists as heroes of a national story (Ceccarelli, 2018). These are moves to expose the citizen behind the scientist curtain, to find a sort of common ground. Lynda Olman (Walsh, 2017) suggests greater consideration of stasis doctrine and Toulmin argumentation in climate debates, as these techniques cope with both

facts and values. Through them, the scientist citizen may cultivate phronesis and better persuade through relating climate uncertainties with audience values.

The opinion editorials analyzed here attempt the above rhetorical techniques, among others. Their design to effectively engage ideologically hostile audiences is assessed as they are compared with each other. Op-eds such as the ones examined in this paper represent an underutilized medium for the public communication of climate science, one that requires an acute attention to rhetoric and principles of argumentation that transcend deficit approaches and get scientist citizens closer to meaningful persuasion.

3. ANALYSIS OF FRUMHOFF AND EMANUEL

The first opinion editorial we analyzed was syndicated with the McClatchy News Service (Frumhoff & Emanuel, 2011a) and published in several member newspapers in the United States, including in red states such as Texas (Frumhoff & Emanuel, 2011d) and Montana (Frumhoff & Emanuel, 2011e) and swing states such as Florida (Frumhoff & Emanuel, 2011b) and Ohio (Frumhoff & Emanuel, 2011c). Although the title varies slightly from one to the other, the content is the same in all of them.

It was co-authored by two scientists, Peter Frumhoff and Kerry Emanuel. The first author is an ecologist and Nobel Prize-winning lead author of the 4th Assessment Report of the IPCC. But the author note at the end of the essay does not mention that; it identifies him only by his role as a political activist: “the director of science and policy at the Union of Concerned Scientists.” The second author is identified in the author note as “a professor of atmospheric science” at MIT.

Significantly, those professional identifications do not occur until the end of the op-ed. At the beginning, the authors choose not to establish their ethos with scientific credentials or institutional affiliations. Instead, they introduce themselves as representatives of the two oppositional political parties in the United States: “One of us is a Republican, the other a Democrat.” It is only after marking themselves as partisans who “hold different views on many issues” that they claim their unified identity in the technical sphere: “But as scientists, we share a deep conviction that leaders of both parties must speak to the reality and risks of human-caused climate change and commit themselves to finding bipartisan solutions.” It is this transformation, from people holding conflicting political viewpoints in a two-party system to people sharing a unified scientific conviction, that drives the essay. You can see an example of their technique for turning dualities into a thesis of unification in this very sentence. Reality and risks is an alliterative combination of the known present and the unknown future. To speak and to commit is to connect words and action. The authors make arguments grounded in their positionality as partisans *and* in their authority as scientists. In each case, presumptive dualities are transcended by a singular thesis.

Consider that main claim, that political leaders “must” unite on climate change. This is a public policy claim addressing a procedural stasis with a modal auxiliary verb of necessity: “must.” They repeat this appeal throughout the article. “Republicans skeptical about climate policy should” acknowledge the reality of climate change. “And Democrats must speak out as well.” They conclude the essay with a call to action in the same vein: “It is time for leaders of both parties to take seriously what science tells us we are doing to our

common atmosphere, so we can take up the urgent task of finding solutions on common ground.” Again, the language points to dualities synthesized: common atmosphere and common ground, taking seriously (an attitude) and taking up a task (an action). They transform otherwise antithetical terms into a unified thesis. Representing different political parties, they are unified in demanding that politicians come together, just as the authors have come together, on this issue.

Significantly, although they are speaking here as citizens, what unifies them is not their citizen identities, Republican and Democrat, but their commitment to the science, a commitment that they share *as scientists*. The noun “science” appears multiple times in the essay, as a subject with authority that “tells us” its dire “findings.” Science also appears as something that irresponsible politicians might “misrepresent,” make “misleading statements about,” or fail to “take seriously.” The authors acknowledge that “science is never truly settled,” but they insist (speaking as citizens) that “no responsible leader would wait for 100 percent certainty to respond to a serious threat.” “Scientific” is used by the authors as an adjective to modify “understanding” and “evidence,” indicating solid and reliable knowledge. And “scientists” are characterized as people who not only “share a deep conviction,” but “have known [about this issue] for more than 100 years,” and are “already working to help states and cities prepare for climate change impacts.” This last is noteworthy because it blurs the division between the public and technical spheres: scientists are serving the public good, assisting governmental entities in planning against future harms.

It is this uniting of the authors’ positions as citizens and scientists that is the most interesting thing about this essay. When the opinion editorial was published, science journalist Andrew Revkin (2011a) flagged it for readers of *The New York Times - Dot Earth Blog* and asked for their thoughts. The comments section that followed is unsurprising, drawing arguments from both sides of the political aisle that repeat petulant authority appeals, ad hominem attacks, and charges of fallacious reasoning. But one remark stands out, from Louis Derry (2011), a Professor of Earth and Atmospheric Sciences at Cornell University, who defends Frumhoff and Emanuel as “acting fully appropriately” in advocating “for policy options based on their understanding of critical scientific issues.” The idea “that scientists can only speak about science, and policy makers (politicians) will take those factoids and create responsible policies” is “an illusory scenario,” he writes. “We absolutely need scientists, doctors, engineers, etc. to say ‘I have spent a long time studying this issue, and that leads me to recommend X,’ without having to divorce their opinion from their professional expertise.”

This statement from Derry is the only one in the comments feed that Revkin (2011b) took the time to reply to, offering what amounts to a standard purification move: when scientists “step outside their areas of scientific expertise,” Revkin insists, “it’s vital to shift gears, end a sentence on sea ice, and begin a new one as a citizen.” According to Revkin, not only claims addressing the procedural stasis, but statements addressing the qualitative stasis are out of bounds for scientists speaking *as scientists*: “Judgments about how much warming, or risk of warming, is too much are mainly delineated by values, not data.” It appears that Revkin would have scientists serve as what Roger Pielke Jr. (2007) calls “honest brokers,” sticking to “just the facts, ma’am,” and somehow withdrawing their scientific expertise from all other matters of public argumentation in which they are involved.

This response got Emanuel (2011) to weigh in on the Dot Earth comment thread. Complaining about the “asymmetry inherent” in politicians stepping outside their expertise to make “demonstrably false statements about science” while telling scientists to “sit down and shut up” in public forums, Emanuel says “we are tired of being told this.” The scientist citizen has a special responsibility, he insists: “If experts who discover a problem fail to bring it to the attention of their fellow citizens, they fail society.” The scientist’s duty to society includes sharing knowledge about the existence of global climate change, as well as assessing its significance, and pitching in to mitigate its impacts.

Seeking to serve society by putting aside their partisan differences, Frumhoff and Emanuel are scientist citizens trying to do the right thing. But there is reason to believe their rhetorical strategy is ill advised. They devote most of their opinion editorial to criticizing Republicans who refuse to acknowledge the problem of climate change (Frumhoff & Emanuel, 2011a). This censure is unlikely to change minds, setting up an antagonistic relationship with the very people they are trying to persuade.

The fact that a Republican and a Democrat can model shared conviction and commitment suggests at least the possibility of transcending partisan animus in fraught times by uniting at another level. The analogy they use to begin the article captures this point well. “When it comes to foreign policy, the saying goes that politics stops at the water’s edge. When it comes to climate science, we say that politics should stop at the atmosphere’s edge” (Frumhoff & Emanuel, 2011a). Again, we see these writers use nicely balanced phrasing while rejecting division and pleading for unification. But sadly, the appeal is unlikely to work. The atmosphere’s edge is too amorphous to serve as an effective goad to consubstantiality. Without some scapegoat outside our atmosphere to unite against, this attempt at identification disperses like vapor. What actually unites the two political antagonists who write this op-ed—namely, science—is *not* something that unites them with their target audience. Instead, it divides the authors from that audience.

4. ANALYSIS OF CATANIA AND HAYHOE

The second opinion editorial we selected for analysis does a better job of finding a unifying value to persuade a hostile audience. Rather than unite around science, Ginny Catania and Katharine Hayhoe (2021) build their opinion editorial in a Texas newspaper on appeals to fiscal planning and local identity. Writing in the context of a local energy crisis in February 2021, when “ice, snow and record-breaking cold” “left millions across Texas without electricity, heat or water,” these scientists speak to the same thesis as Frumhoff and Emanuel. They argue that “the state’s leaders need to accept climate science and begin using research” to build a more resilient community (Catania & Hayhoe, 2021). But Catania and Hayhoe are more rhetorically savvy in their arguments. While the word “science” and its derivatives appears 18 times in the op-ed by Frumhoff and Emanuel (2011a), it appears a mere four times in the op-ed by Catania and Hayhoe (2021). The word “science” appears in the Catania and Hayhoe essay’s thesis statement (that the state’s leaders need to accept climate science and begin using research to prepare for the future). The word “scientific” appears twice, once to modify “debate,” the other time to modify “understanding,” implying that science uses argumentation to build knowledge. And the term “scientists” appears only at the very end, when they offer themselves and the 57 other

Texas scientists who co-sign their essay as public servants “to turn Texas into a leader in climate preparedness.” They declare: “Texas’ scientists stand ready to help.” This vision is the same as the one Frumhoff and Emanuel offered: scientists “working to help states and cities prepare for climate change impacts” (Frumhoff & Emanuel, 2011a). But the rationale supplied by Catania and Hayhoe for accepting that help is not that science trumps political partisanship, but that local fiscal planning demands it.

Using present tense auxiliary verbs of certainty (is and are), Catania and Hayhoe (2021) point to the risks of climate change: “rainfall is becoming more intense... Heat waves are getting longer and more severe... coastal communities are becoming even more vulnerable.” They do not specify whether it is science or personal experience common to themselves and their readers that grounds these claims. Instead, they follow this list of ills with a modal verb of necessity (must) and an auxiliary verb of certainty (is) to set out their call to action: “Texas must prepare for these risks. Such planning is critical for the state to remain financially resilient in the face of climate change.”

Note their call for fiscal responsibility here. This is a fundamentally conservative appeal to red state Republicans. Catania and Hayhoe (2021) argue: “Upfront investment in resilient infrastructure saves much more money than a do-nothing approach and avoids much of the hardship created by lack of planning.” Drawing on a source of prudent planning that their audience respects, they point out that “as the U.S. military says, climate change is a threat multiplier.” Establishing that “Texans already face more risks than any other state, with a record-breaking \$124 billion toll from climate and weather events since 1980,” they bemoan the “costs of elevated mortality rates, and declining agricultural and labor productivity.” It just makes good business sense to “build a more resilient Texas.”

Note also their focus on a local Texan identity that connects them with their audience. From the very beginning of the editorial, they mention that “like our fellow Texans, we were also victims of this preventable disaster.” The only time they identify themselves as scientists, it is as “Texas’ scientists,” at the very end, and the signatories to this op-ed-turned-public-letter are all Texas scientists as well. It is that local identity, rather than science, that unifies the authors and their audience behind the thesis that politicians must accept climate change and use science to prepare for its impacts.

These rhetors know what they are doing. In an article written a bit over a year after this op-ed, Hayhoe (2022) explains that when connecting with Texas audiences about climate change, she is careful to remind them that she is “someone who lives in Texas and wants the best for it.” Recognizing the need for identification if persuasion is to work, she says “we need to connect with others on values we share and encourage them to take action too.” It is that rhetorical sensibility that we would urge scientists such as Frumhoff and Emanuel to adopt in their efforts going forward.

5. CONCLUSION

Economic appeals and local identity can unite scientist citizens with otherwise hostile audiences in the public sphere. While we wholeheartedly endorse the position of Frumhoff and Emanuel that scientists have a right, indeed a duty, to communicate the urgency of the climate crisis and advocate for bipartisan action on it, the kind of rhetorically sensitive approach taken by Catania and Hayhoe seems better designed to do that than an approach

that elevates science over politics as a transcendent space for conflict resolution. Insofar as skeptical readers do not identify as scientists, but instead as fiscally conservative citizens of red states, arguments that seek to create a bond with that audience, rather than further divide the authors from that audience, are more likely to be persuasive.

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