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The Circulation of Climate Change Denial Online: Rhetorical and Networking Strategies on Facebook

Emma Frances Bloomfield

University of Nevada, Las Vegas, emma.bloomfield@unlv.edu

Denise Tillery

University of Nevada, Las Vegas, denise.tillery@unlv.edu

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The Circulation of Climate Change Denial Online: Rhetorical and Networking Strategies on Facebook

Abstract

This study uses a topical, rhetorical analysis of the 25 most popular posts on the Facebook pages for Watts Up With That and the Global Warming Policy Forum to examine how climate change denial circulates online. These groups adopt the appearance of credibility through reposting and hyperlinking, thus establishing a supportive, networked space among other skeptical sites, while distancing readers from original sources of scientific information. Page visitors used a variety of rhetorical strategies to echo the posts' main themes and to discredit alternative viewpoints. Differences between the *topoi* and rhetorical strategies on the two pages show that the climate change denial community is multifaceted and makes use of social media affordances to craft the appearance of legitimacy. This project contributes to our knowledge of how scientific information is co-opted, manipulated, and circulated in online spaces and how online features shape environmental discourse practices.

Keywords: climate denial rhetoric, rhetoric of science, digital rhetoric, social media, networks

The Internet is simultaneously portrayed as a democratizing technology that enables the flourishing of the public sphere and as a tool that leads to isolation, polarization, and echo chambers (e.g., Papacharissi, 2002; van Dijck, 2013; Zappen, 2005). Increasingly, new media technologies are playing an important role in scientific and environmental communication (e.g., Adams & Gynnild, 2013; Elgesem, Steskal, & Diakopoulos, 2015; Haider, 2016; Walter, Brüggemann, & Engesser, 2018). The ways in which discourse circulates has taken on a new dimension: an electronic, networked form. Of interest to this study is how the Internet and social media serve as platforms for the dissemination of climate change denial and for the construction of virtual denialist identities. There are many explanations for the continued presence of climate change denial and we propose that the circulation of scientific information on social media is a contributor. On Facebook, climate change deniers circulate information among themselves and push that information to others. The Internet enables supportive environments where skeptical perspectives are communally validated and reinforced (Bloomfield, 2018; Matthews, 2015; Walter et al., 2018). The Internet is thus a new rhetorical landscape for the promotion and circulation of (not-so) scientific information, particularly on environmental topics.

We selected two prominent Facebook denial groups to analyze the rhetorical and networking strategies of digital climate denial communication. The Watts Up With That (WUWT) Facebook page is based on the blog by the same name run by Anthony Watts and has, at the time of this writing, 11,846 likes and 11,323 followers. On the main blog site, Watts (2013) argues that it is his "duty to make known what I see as the untold story of the climate debate from the climate skeptic side" (para. 4). The second page, The Global Warming Policy Forum (GWPF), is a research group from the United Kingdom that argues that people have been exposed to

“misinformation” about climate change and that climate science “is not yet settled” (Global Warming Policy Forum, 2014, paras. 9, 8). At the time of writing, the GWPf Facebook page has 7,425 likes and 7,609 followers. As is typical of social media data, these numbers do not capture the total number of visitors to the page, nor the number of users who agree with the groups’ beliefs. In fact, there are a small number of posts on both pages that demonstrate a belief in anthropogenic climate change and debate active users.

These Facebook pages represent just two of the many social media communities that promote scientific and environmental skepticism. Previous scholars have examined how scientists and the public use the Internet as a platform for sharing scientific information (e.g., Cagle & Tillery, 2018; Lee, VanDyke, & Cummins, 2018; Luzón, 2017). Other work has focused on the circulation and reception of climate change information in website comments. Walter et al. (2018) concluded that user comments function as echo chambers, particularly in more conservative-leaning publications, while Collins and Nerlich (2015) found a tendency for some commenters to engage in reciprocal dialog. Dunlap and McCright (2010) made note of how climate denial information “zooms” through online spaces via the “climate denial blogosphere,” where it then gets picked up and re-circulated by conservative media (p. 253). Sharman (2014) mapped this network of climate denial blogs, finding that they attempt to shift expertise from mainstream science and position themselves as credible scientific resources. Building on Sharman’s (2014) work, Elgesem et al. (2015) analyzed almost 1500 blogs using probabilistic topic modeling, finding that climate change science is one of the most salient topics in both skeptical and accepting climate blog communities. Matthews (2015) analyzed a smaller set of comments on a single skeptical climate blog and concluded that climate denial blogs were a factor in many skeptics’ “conversions” from belief to skepticism, which reaffirms the importance of these blogs as avenues of persuasion in the rhetorical landscape of climate science. Much of this work uses large-scale, quantitative approaches to map the digital landscape and provides evidence that the Internet has solidified into a “public battleground” over climate science, where deniers strategically engage new media to bring visibility and awareness to their perspectives (Kaiser, 2017, p. 1661). The denial community’s visibility and proliferation are particularly important if we consider that digital environments provide a “commitment of the word to space” and thus enable climate denialist beliefs and identities to leave a “residue” accessible on a global scale (Ong, 2002, pp. 7, 11).

Our study expands on previous work by focusing on a smaller dataset and incorporating actor-network theory, argumentation, and topical analysis to analyze how scientific information moves through networks and is received and reinterpreted by climate denier communities. Previous theorists have applied Latour’s (1996) theories to online science communication. Cagle and Tillery (2018), for example, studied hyperlinks as one of “social media’s affordances” in the spreading of information from a National Oceanic and Atmospheric Administration press release (p. 131). Kotevko, Jaspal, and Nerlich (2013) argued that it is important for scholars of digital science communication to analyze both the content of online discourse and its function. Our current study builds upon previous projects by analyzing how online discourse, including hyperlinks, post reactions, and community regulations, promotes skepticism of and responds to pro-climate arguments. To analyze these features, we trace the hyperlinking activities of the

two Facebook groups to locate source material, confederate groups, and the rhetorical labor done by unique social media features.

Topical analysis allows us to examine commonly recurring rhetorical strategies used by Facebook page visitors. Fahnestock (1986) argued that when people go through the process of “scientific accommodation,” they are making celebratory claims as to the value and importance of scientific information (p. 333). We argue that in these skeptical Facebook groups, there is a similar process of accommodation in terms of sharing scientific information, but the “epideictic” processes are largely made to belittle, deride, and condemn that information (Fahnestock, 1986, p. 333). For example, community posts use metaphors of religious fervor and hysteria to modify the appropriate interpretations of scientific findings and encourage the praising of skeptical viewpoints. In considering identity formation as the act of distinguishing oneself from others (Lake, 1997), climate skeptics’ arguments serve to both amplify their message and legitimize their existence against an oppositional mainstream scientific community. In tracking frequent *topoi*, arguments, and rhetorical strategies, and showing how those *topoi* intersect with networked practices, we provide a holistic view of the discursive practices climate deniers use to sustain their presence and membership online.

Method

We selected these two groups for analysis because of how active their Facebook pages were and to get an American (WUWT) and international (GWPF) scope of online climate denial. WUWT has been labeled a “central node” in the climate denial blogosphere (Sharman, 2014, p. 164) and the GWPF is a prominent UK denial group started by climate denier Lord Nigel Lawson after the ClimateGate email controversy (Davies & Goldenberg, 2009). Our dataset includes the groups’ public content, including their histories, links, posts, and data regarding post reactions collected through Bird Song Analytics. We chose to focus on two elements: themes and rhetorical strategies within the posts, comments, and link content and the mechanisms used for sharing information. To limit the scope of the analysis to a manageable amount of discourse, we evaluated the 25 official posts in the groups’ histories that had the highest levels of engagement, defined as having the most reactions and comments.

We focused on both the content and mechanisms for sharing to illuminate an important feature of the Internet: that content is often secondary to the channels through which it passes. A powerful message is meaningless online unless it gets views, clicks, shares, and links. While previous studies of climate change denial online have made use of computational and quantitative content measurements (e.g., Koteyko et al., 2013), we employ a topical analysis to probe the common rhetorical strategies most evident in our data set. Topical analysis relies on identifying recurring *topoi* and evaluating how they are used to “shape and reshape arguments as they progress” (Ross, 2017, p. 10). Our study draws from methods developed by Walsh (2013) and Cagle and Tillery (2018), where we first identify recurring themes in the data and then sort those themes into topic areas to evaluate how those topics respond to posted content. Tillery (2017; 2018) has argued that common topics do ideological work, as they offer the audience a set of assumptions or narratives that rely on the audience’s ideological

assumptions. This approach is complemented by paying critical attention to how word choices and labels that deniers use craft an antagonistic, and sometimes hostile, worldview (Burke, 1966). While there are common *topoi*, rhetorical choices, and approaches to strategic information-sharing between WUWT and the GWPF, each group engages unique *topoi* that allow them to create distinctive identities contra mainstream environmental discourse.

We also consider the links and other affordances to be actants in the network of climate change information through actor-network theory (ANT). ANT enables a focus on the circulation and activity of both texts and things, because ANT is “not about traced networks, but about a network-tracing activity” (Latour, 1996, pp. 375, 378). In more recent remarks, Latour (2011) argues, “Whenever an action is conceived as networky, it has to pay the full prize of its extension. . . . It can be interrupted. It is fully dependent on its material conditions (p. 802). The strength of climate denial networks thus emerges from its uninterrupted circulation through supportive echo chambers. Besel (2011) expanded on ANT by offering that the “entire network,” not just the relationships between actors in a network, is an “inventional resource” (p. 122). We thus consider how climate denial groups have rhetorical strength because they link to other groups and because they collectively function as an argument against belief in climate science through their presence, membership, and flourishing. Through employing specific *topoi* and information-sharing strategies, we argue that WUWT and the GWPF work as part of the digital constellation of climate denial to enable the flow of incomplete information and misrepresentations of scientific findings. These practices foster a denialist identity while disrupting the network of science communication intended by the electronic distribution of published scientific research.

Analysis

The first section of our analysis focuses on the external communication of the groups, how they link to other sites, and how they establish themselves in a network of supportive and competing scientific messages. The second section emphasizes the internal communication on the Facebook pages.

Networked Space

Through the use of hyperlinks, both WUWT and the GWPF connect their Facebook pages to their group’s main blog site. Considering that people often turn to social media to engage in environmental discourse (Arlt, Hoppe, Schmitt, Silva-Schmidt, & Brüggemann, 2018), the groups’ presence on Facebook can be seen as a strategy to leverage the networking affordances of social media to drive traffic to their main pages. We can consider links a type of “reputational marker,” where their presence makes credible post content by visually connecting it to a source (Niederer, 2013, p. 85). However, both groups’ source material is often a blog post on the main page that regurgitates the information posted on the Facebook page. The appearance of credibility is performative and lack the substance of an external, authoritative reference. Instead, the groups create a mostly insular community with the same information recirculating and taking on the appearance of truth through its repetition and the

presence of hyperlinks. Cagle and Tillery (2018) argued that hyperlinks perform communicative work that enables their users “to no longer even think about that work” (p. 138). While it may be tempting to assume that people are exploring links and verifying information, it is likely, based on evidence in the comments, that the links serve as stand-ins for that labor, which leads to a lack of reflexivity about the content. In this sense, hyperlinks perform rhetorical labor by existing as a marker of sourcing and citing, even if they are not actively followed and verified. Vealey and Lane (2018) argued that referencing practices are a performative amassing of “allies that aid in mobilizing credibility,” indicating that network actants not only connect to one another but also aggregate together as supporters of the same rhetorical activities and identity (p. 62).

After being linked back to their main page, the sites often provided further links to outside sources with the same content published by other denial groups. Used in this way, the hyperlinks function as “traces of group formation” in the linking of like-minded communities (Niederer, 2013, p. 85). Although rare, at times the groups link to articles from “mainstream” media that the groups wanted to criticize or refute. This finding aligns with previous research that suggests that while climate change-accepting blog communities frequently link to skeptical sites, skeptical communities often create inclusive networks that only occasionally create ties with non-allied sites (Elgesem et al., 2015). Through the inclusion of multiple, hyperlinked steps, these groups worked to lengthen the virtual space between the Facebook page and the original information. Used in this way, hyperlinks do not create identification with those linked sources, but division with the alternative source of information and may even disrupt the reach of the original scientific publication, but still maintain the site’s appearance of credible citing practices (Burke, 1969). This practice extends the group’s attention, but not membership, to an out-group, labeled through the critical commentary on the link’s subject matter. Lake (1997) conceptualized identity as a “dialectical site” where the self is constituted through an argument between opposing forces and tensions. Through the virtual meeting of skeptical commentary and mainstream environmental sources, a dialectical site forms in virtual space. Hyperlinks thus serve as the meeting place of oppositional tensions through which climate skeptics perform their antagonistic view of environmentalism, creating clear divisions between what is celebrated and what is denigrated while distancing their community from pro-environmental framings.

Watts Up With That. Of WUWT’s top 25 posts, one was an announcement about the future of the page and 24 were links to the WUWT main blog page. Of those 24 links, 18 were commentary pieces by Watts about a scientific publication and 6 were posts by guest bloggers, sometimes copied verbatim from other skeptical blogs such as “Energy Matters”. Eric Worrall, a *Breitbart* contributor who writes about politics and the environment, was by far the most frequent WUWT guest poster. These 25 posts alone had over 1,200 comments (approximately 50 comments per post). Each linked site contained repetitive information from the original, providing evidence that the same commentaries are being posted across multiple outlets. This strategy may serve to populate search results with skeptical interpretations if a reader did decide to do further research. Linking these blogs and websites provides the appearance of corroborated and supported information while conferring expertise onto names repeated as

authoritative sources. For example, a popular WUWT Facebook post about astronaut Walter Cunningham making statements denying climate change linked to a guest blog entry by Worrall (2014) on the WUWT main site, which itself was a direct copy of an article written by Craig Bannister at *Conservative News Service*, which quoted extensively from the Heartland Institute's website that hosted the original video of Cunningham's comments. In this chained space, the same information circulated via social media, blogs, news sites, and organizational websites, working together to make Cunningham's comments a prominent news story and to amplify a climate denial narrative in relation to his comments.

To get to any external source from the WUWT Facebook group, visitors first had to go through the WUWT main blog. Likely a strategy to increase visits to Watts's site and thus increase advertising revenue, this also served as a gatekeeping technique where subsequently-viewed information was filtered through the originating pages' perspective. In some WUWT blog posts, links to the original articles or videos inserted from YouTube were broken or unavailable, blocking interested people from exploring or verifying the original information (whether intentional or not). Occasionally, external sources were not linked to, but their content was embedded in confederate sites. For example, a WUWT Facebook post about Bill Nye the Science Guy links back to the WUWT site, which links to a *Breitbart* article by Pam Key, which embeds a video of Nye's original interview. Instead of linking to the source page on MSNBC, Key's article embeds the video, providing the "source" of the information without directing readers to the original hosting location nor MSNBC's original framing of the interview. WUWT thus controls the "terministic screen" through which Nye's comments are to be interpreted, deflecting pro-environmental framings (Burke, 1966, p. 45). While the MSNBC heading, visible on the bottom of the video, frames the interview as Nye responding to a recent Trump tweet about climate change, the *Breitbart* article reframes the video by describing it as a call from Nye to levy taxes on "climate change-denying states" (Key, 2017) and the WUWT article raises the stakes by describing the video as a "declar[ation] of economic war on climate skeptics" (Worrall, 2017). These posts are made one day apart, providing evidence for the fast pace in which networked climate denial sites circulate and reframe content.

WUWT Facebook page links serve to create a networked echo chamber where readers can confirm their suspicions of science through carefully curated and framed content links, guest posts, and embedded videos. These strategies traced a clear line around an in-group of confederate sites created the appearance of a powerful skeptical community successfully undermining scientific information as a unified network (Besel, 2011) and weakens the chain of links to the original scientific publications. Furthermore, the WUWT community portrays itself as unique and isolated against the "alien and threatening" forces of mainstream science (Lake, 1997, p. 66), a rhetorical move that is likely to discourage productive deliberation with those who think differently.

Global Warming Policy Forum. The GWPF account posts links only to its main blog site, which is reposted from a variety of sources. Most of the content originates from British or American conservative media outlets, including the *National Post*, the *Spectator*, and the *New American*, or conservative-leaning editorials from moderate outlets, such as John Stossel

writing for *The New York Times*. Conservative blogs, such as polarbearsience.com, are also important sources of content, and play a particularly important role in circulating what purports to be peer-reviewed science. This series of links means that Facebook users are at least two clicks away from the original text, and if peer-reviewed scientific research is discussed, users must pursue three or more links (through GWPF.com, to the original, then to the scientific study under discussion) to access the original information. It is clear from posted comments that most visitors do not often follow the series of links to the source material.

Several high-interaction posts were editorials or reposts that, evidently dishonestly, misrepresented peer-reviewed scientific publications. Examples of such misleading posts include “the climate change doomsday just got canceled,” two reposts from Polar Bear Science, and one link to a *Bioscience* editorial. “The climate change doomsday just got canceled,” linked through the GWPF main site to an editorial in the *Investor’s Business Daily*, received 334 reactions, 26 comments, and 370 shares. This article claims that “the scientists involved in the Nature study found that the planet is less sensitive to changes in CO₂ levels than had been previously believed. That means projected temperature increases are too high” (*Investor’s Business Daily*, 2018). Although the link to the *Nature* study is present in this quoted selection, the editorial is clearly misleading, as the actual study focused on unknowns in “equilibrium climate sensitivity,” and posited a new estimate of 2.8 degrees Celsius, which is within the Intergovernmental Panel on Climate Change’s (IPCC) posited range of between 1.5 and 4.5 degrees (Cox, Huntingford, & Williamson, 2018). The editorial focused on the highest estimates and claimed this study contradicted them rather than adding refinements to estimates. This editorial contributes to a belief that climate change science is unsettled and that mainstream media are biased against skeptical perspectives.

Similarly, the two stories that received the 6th and 7th highest levels of engagement are misrepresentations of scientific information with regard to the health of the polar bear population. One of these posts is a link with the headline, “Polar bear experts who falsely predicted that roughly 17,300 polar bears would be dead by now (given sea ice conditions since 2007) have realized their failure has not only kicked their own credibility to the curb, it has taken with it the reputations of their climate change colleagues.” The external link post on thegwpf.com goes to the blog polarbearsience.com, hosted by Crockford (2018). Like many of the circular references in WUWT posts, this article mostly links to other polarbearsience.com posts and its three-item reference list features two articles authored by Crockford.

The second post also discusses Crockford’s science with the headline, “The purpose of the attack on Dr Susan Crockford is not to communicate. It is to excommunicate.” This title suggests cult-like behavior from climate scientists, while the original linked “Climate Scepticism” headline, “Climate scientists harassing women (asexually of course) again -- Matt Lauer Meet Michael Mann,” argues that Crockford is specifically targeted because of her gender (Fuller, 2017). This blog post has several links back to polarbearsience.com, including a link to a page with Crockford’s publications, in an attempt to represent her as a neutral scientist and her attackers as biased. The post is a response to a *Bioscience* article on blogs and climate change

denial (Harvey et al., 2018), and while the *Bioscience* article is discussed and debated, it is not linked to, nor is a complete citation provided.

As with WUWT, the citations form a relatively small but noisy echo chamber that encourages users to believe they are receiving unbiased, up-to-date scientific information while in fact the resources shared are either filtered through biased frames or are based on entirely misleading intermediary editorializing. But, the fact that so many of the science-based postings received such high engagement suggests that this community values the appearance of objectivity and being aware of “scientific facts” that ordinary environmentalists are either unaware of or unable to process because they are “duped” by experts with nefarious motives.

Rhetorical Strategies

Little work has been done to examine the voices of climate skeptics in online spaces (Matthews, 2015). When studies do examine their rhetoric, they often involve prompting skeptics about why they are skeptical instead of examining natural discourse (Capstick & Pidgeon, 2014; Matthews, 2015). We instead focus on the naturally-occurring rhetorical traits and argument strategies used by WUWT and the GWPF. In this section, we document prominent themes such as linking of climate change to political ideologies, labeling climate change a scam or hoax, condemning environmentalists’ apocalyptic rhetoric, and praising the increase of carbon dioxide as beneficial to the Earth. These rhetorical features are not wholly unexpected, as previous studies have linked climate denial and conservatism (e.g., Jacques, Dunlap, & Freeman, 2008) and have uncovered patterns of climate deniers accusing environmentalists of being “hysterical fools” (Killingsworth & Palmer, 1995, p. 1) and alarmists, both labels which can stall productive environmental deliberation (Bloomfield & Lake, 2015, p. 384). The following sections analyze the presence of these traits, topics, and strategies and how those rhetorical features converge and diverge between WUWT and the GWMP members.

Watts Up With That. For WUWT community members, climate change was inextricable from alarmism and liberal ideologies. These associations are reflected in the community’s use of creative portmanteaus that cleave their identity from environmentalism. For example, one commenter referred to climate science as “climastrology” and climate scientists were called “warmunists” and “climatistas.” These terms construct member-exclusive vocabularies that reinforce the otherness of out-groups (Lake, 1997). Environmentalists were frequently compared to infamous political leaders such as Hitler, Goebbels, Pol Pot, Mao, and Stalin. Climate scientists were called “watermelons” (a term that appeared in 16 other comments in the data pool), because they are “green on the outside, Chairman Mao RED on the inside.” One commenter elaborated on the use of the watermelons slur by noting that environmentalists are “nothing but communists in a thin disguise” who hide their “red” intentions with a green exterior. When an authority figure agreed with environmentalism, they were immediately discounted by the WUWT community and were subjected to insults and mockery. Many of these posts used humor, parody, and word play to insult environmentalists, such as popular target Bill Nye. In response to one post, commenters called Nye “a science project that went wrong,” a “fascist in a bow tie,” and “Bill Nye The Crackpot Guy.” Commenters positioned Nye

as part of environmental alarmism by calling him “paranoid” and “demented.” One commenter wrote, “The end is nye,” emphasizing the common trope of environmentalists as doomsday prophets (Bloomfield & Lake, 2015).

There were a few instances where people who challenged the group’s values commented on WUWT posts. When those conversations erupted, there was intense backlash from community members who ganged up on that individual. One WUWT member responded to a comment supporting the IPCC’s graphs by noting that the original commenter was “a paid shill for progressive groups.” Another WUWT dissenter was accused of “wishy washy word smithing [sic].” At the time this research was performed, the original dissenting comments had been deleted (either by the WUWT administrator or the commenter themselves), but the discursive remnants of the back-and-forth remain with only the climate skeptical side visible.

Some WUWT Facebook page members went farther than simply insulting others and engaged in direct threats of violence. On a post about Nye, one commenter asked him to “give me a shot at tying your bow tie. It’s not tight enough!” While this may appear to be a harmless joke, it is important to note that the commenter chose to type and submit written record of a threat to choke Nye because of his environmental beliefs. Other commenters were less subtle: “I gots [sic] about \$0.03 worth of brass jacketed lead the fool can have.” Specific threats of gun violence appeared again in the comments of a WUWT post responding to a Gawker article calling for legal punishments for climate deniers. A WUWT commenter wrote, “Come and try, greenie. Bring lots of ammo and body bags,” and another warned, “I can do a head shot at 500 yards. Better send your best.” On this same post, one commenter, who appeared to be one of the few active women on the page, wrote, “if they want to depopulate the world lets [sic] start with them,” which combines threats of violence with the common misperception that environmentalists advocated for decreasing the world’s population. On another post, a commenter encouraged “head shots” for all “Progressive Zombies.” While threats of violence were less frequent than jokes and insults, they emerged quite regularly across the top 25 WUWT posts, receiving encouragement and positive responses from other members (through likes, loves, and laughing reactions). Their consistent presence points toward a potentially dangerous implication of the WUWT community: the normalization of violence towards environmentalists and those the community perceives to be enemies. Specific threats of gun violence may also resonate in the community as an identity marker for American conservatives that value gun culture. Through these posts, climate skeptics not only wish to separate themselves from environmentalists, but also frame their interactions with environmentalists as a war where violence and aggression are appropriate rhetorical responses.

The WUWT Facebook page portrays environmentalist perspectives as ludicrous and disingenuous, but lauds the skeptical community as the more scientific, logical, and reasonable. WUWT commenters consistently appeal to scientific standards of logic and empiricism, co-opting scientific values to use against environmentalism (Ceccarelli, 2011). For example, one commenter drew a definitional boundary: “You can’t be a scientist if you are not a skeptic.” Another commenter described climate science as “extremely interpretive and emotional,” while “ideal” science should be “logic-based.” Many WUWT commenters accused science of

being unscientific and manipulating data to fit their beliefs. One commenter passionately declared, “science IS NOT about what we want. Science is about WHAT THE DATA SAYS!” Climate scientists were accused of maliciously “sequester[ing] data that contradicts their worldview” and purposefully “choos[ing] to misguidedly push untruths” on the public. For WUWT commenters, climate scientists cannot be trusted because they exclusively interpret the data to support climate change and are closed off to other perspectives. Commenters also referred to specific scientific controversies such as Michael Mann’s hockey stick graph and ClimateGate. One commenter wrote, “I’m sorry but, after Climate Gate, I don’t trust anything they say.” These descriptions further divide the skeptical community from mainstream science, reinforcing WUWT’s underdog position and their skepticism of climate scientists’ intentions. When a link from the WUWT Facebook page to the WUWT main page was temporarily broken, one commenter accused “climate crazies” of “messing up [their] links.” Similar cries of tampering, notably, do not surface when links to mainstream scientific sources are broken or missing.

For WUWT members, the Facebook page provided a supportive community in which they could critique, undermine, insult, and even threaten climate scientists as accomplices to a manipulative conspiracy. The information re-posted and hyperlinked from the WUWT website serves as fodder for their passionate and aggressive engagement with mainstream perspectives on climate change.

Global Warming Policy Forum. One of the most prominent themes occurring in the GWPF Facebook page content is the notion that anthropogenic climate change is a scam, perpetuated either by climate scientists or by the wealthy, described by one commenter as unspecified “millionaires and billionaires.” The pathway by which the wealthy could use climate change alarm to further enrich themselves is generally not specified, but the post with the most total reactions in the dataset reads, “Britain has given £274 million to a controversial climate change organisation without knowing where the money goes.” This post, with by far the biggest engagement, including 1158 total reactions, 668 comments, and 786 shares, was a link (through the GWPF website) to a *Times UK* article with same headline (Kennedy, 2016). The topic of money appears even on posts not specifically related to money. For example, a post claiming that a *Nature* article “finds that all those global warming doomsday scenarios aren’t credible,” refers to the “scam” of global warming and claim that “the ones at the top (the liberal millionaires and billionaires) keep pushing this climate doom scenario” to keep “lining their pockets.” Comments were rarely detailed beyond making vague claims to environmentalism’s profitability, but its ubiquity suggests that the topic resonates with GWPF members, in part because it aligns with a general suspicion of “elites” who hold power and drive policy through mysterious means. This *topos*, an exhortation to “follow the money,” is identified by Tillery (2018) as a common argument used to undermine scientific claims. Many of the comments on this post criticize the sending of resources abroad or express concern about “pensioners” at risk of hypothermia, a common theme in posts made during cold weather. This post about Britain giving money to an international organization no doubt excited further interaction because of suspicions about a “New World Order,” a term that occurred specifically four times in the dataset, in addition to two references to a “one world order.”

Another monetary topic that appears in the GWPF data set is the argument that environmentalists are harming low-income people, either in Britain or in the developing world. For example, one commenter on a story critical of Greenpeace claims, “In the UK, energy poverty is an ever increasing problem. Perhaps Greenpeace would be better explaining to those on low incomes / retired, why their electricity cost has doubled in the last 10 years.” This theme is also illustrated by a post titled, “Our most viewed video of 2017: Dinesh D'Souza schools college student on how climate change policies harm the poor.” These posts take on a more humanistic approach that foregrounds consideration for economically disadvantaged people that contrasts with the angrier, more hostile tone in the comments on WUWT.

There are notable overlaps with the users on WUWT including the seeming commitment to scientific standards, or more generally to logic and reason. These *topoi* frequently appear alongside the “alarmist” *topos*, such as the link titled, “The climate doomsday just got canceled.” Although a reader who traces the link back to the study as described above will see the study does not support the headline, most of the comments suggest site visitors read only the headline or at most the post on the main site. At least one commenter traced down the article under discussion and made a correction, stating “they do say avg temps will rise 3.4 instead of 4.5 as previously predicted. Still rising, still will cause problems.” This comment received 26 direct replies, including suggestions to “calm down” and counter-arguments that plants use CO₂, that water vapor is a more significant greenhouse gas than CO₂, and that atmospheric CO₂ has been higher in the Earth’s history. These refutations may be technically correct: water vapor is a greenhouse gas, although increased water vapor also leads to clouds and precipitation, which have cooling effects; CO₂ has indeed been higher than 400 ppm in the past, but that was well before humans existed; and plants, of course, use CO₂.

But, more significant than the content of these isolated facts is that together they work to cast doubt on the dissenting commenter, and by extension the original source material, using appeals to scientific facts. This strategy simultaneously demonstrates the commitment to an appearance of objectivity or rationalism and the ways that climate change denial arguments are persuasive. Isolated lines of argument, including the claim that “CO₂ has been higher in the past,” is severed from its context (that “past” was 3.6 million years ago, well before humans evolved) and is used as a response to an argument about global warming in a way that allows the speaker to seem educated, rational, and calm in response to alarmist claims while shifting the burden of proof onto the dissenting commenter. This appeal to scientific standards and the presence of comments that appear, at first blush, to be accurate responses serve to hide the core argument in the dissenter’s comment that climate change is occurring, is problematic for society, and is supported by the source material.

This is not to suggest that all the posters on the GWPF Facebook page are calm and rational; plenty of posts resort to name-calling including “libtards” (which occurs four times in the data set, in addition to the presence of terms such as “libs” or “liberals” modified with “dumb” or synonyms), accusations about environmentalism’s “New World Order,” and attributions of fascism and Nazism. While “communism” is used as an insult, it only occurs four times, in

contrast to the prominent presence of Nazi or Nazism (17 instances) and fascism (47 instances). This association of environmentalists or “greens” with the far right seems to be a defining feature of the community, revealing a distinction between British and American global warming denialism (which associates environmentalism with leftist and progressive ideologies), along with the groups’ differing use of humanism and violence as inventional resources.

Implications

One of the most significant findings in this research is the repeated misrepresentations of peer-reviewed scientific research enabled through hyperlinks and blogging. The WUWT and the GWPF blogs and Facebook pages are highly involved in framing peer-reviewed scientific research to fit their narrative of the climate change hoax and in curating misrepresentations from other sources to heighten their legitimacy. Although the set of outside sources is relatively small, the high level of interaction on these types of posts is alarming, demonstrating how scientific misinformation is circulating with few, if any, opportunities for correction or critical commentary. While in some cases commenters in the Facebook group will attempt to address misrepresentations, they are typically shouted down, ignored, or deleted. By far the more common occurrences are agreement with and expansion on the presented information, often appealing to claims that environmentalists are manipulative, conspiratorial, and unscientific.

These Facebook pages act as echo chambers, and, as studies suggest, few members of these groups would likely be open to persuasion on climate change based purely on scientific information (Cagle & Tillery, 2015). But, this study points out a larger danger than the existence of an inclusive, extremist community by noting the circulation of misrepresentations and threats on these fora. For example, these communities share features with the GamerGate controversy, which showed how a small group of highly engaged and motivated social media users could intensify a story so that it is picked up and circulated in mainstream media. Trice and Potts (2018) describe GamerGate’s deployment of a network of media platforms as a “supraplatform,” which they define as “a system of interconnected platforms where the higher level platform reshapes the rhetorical purpose and context of the component parts” (para. 1). Both GamerGate discourse and our groups’ content demonstrate how arguments can begin to circulate in small circles, but quickly expand beyond the original community to enter public consciousness and awareness. The frequent mention of controversies such as ClimateGate, which appeared on both WUWT and the GWPF’s Facebook pages, indicates that this incident was an early and successful assault in the longer-term conflict of information warfare. Other rhetorical features that we identify contribute to the circulation of argumentative resources that shuts down conversations about the credibility of scientific organizations and legitimizes a skeptical identity.

While the GWPF did not have the repeated presence of aggression, WUWT engaged in it as a common practice. Zappen (2005) argued that digital communication often results in “flaming,” defined as “the hostile expression of strong emotions” (p. 321). Even in groups that portray themselves as scientific and rational, online members still engage their emotional sides, coloring the circulation of scientific information. At the least, these practices challenge

argument standards for public spaces to be reasonable, rational, and deliberative (Goodnight, 2012). The discourse present on these two groups' pages supports arguments that the Internet can be detrimental to a vibrant, active public while simultaneously providing new outlets for the dissemination of accurate and credible scientific information. If the solution to climate change relies on our communicative potential to tackle it, then these sites are roadblocks towards that progress.

Scholars interested in how digital rhetoric and affordances intervene in climate change discourse and specifically how they are being used to foster and foment climate denial should take note of both the similarities and the differences present between established skeptical groups. Recognizing similarities can help us map patterns of engagement and locate frequent *topoi*. Recognizing differences can enable an appreciation for the multifaceted, complex, and nuanced opposition that climate science still faces online. As shown through our analysis, while WUWT and the GWPF's rhetorical strategies in response to posts have some prominent differences, they share *topoi* such as a professed commitment to rationality and the linking of the environment to politics, as well as network strategies that engage the Internet's affordances in reshaping and modeling a virtual environment that serves their needs. A primary concern for the promotion and spread of scientific information is to combat these strategies. But, the vigorous curation of misinformation is not being met with equal enthusiasm from environmentalists, climate scientists, nor climate advocates to identify and eliminate it. While it is beyond the scope of this project to offer suggestions for addressing these groups, this study adds to our understanding of how climate denial is spread online and the variety of rhetorical strategies, *topoi*, and vocabulary to which virtual climate skeptics turn. It is important to continue research into how both networked and rhetorical strategies carve out space for denial to be written, read, posted, and commented on, creating visual and material residues of climate denial that can be consumed and circulated around the globe.

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