Polarization and Politicization of Climate Change in Media Discourse: A Comparative Analysis of Italy and the United States

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This study examines how politically driven, often populist narratives that undermine democratic values are used to depict climate change in Italian and American media. The study uses a sample of seventy-one items from eight origins, equally distributed by nation and political affiliation, based on data from Facebook postings that have gotten forty or more comments. The mixed-methods technique includes keyword-in-context research, theme modeling, qualitative content analysis, and keyness analysis. The results reveal significant national and ideological differences. For example, conservative media frequently utilize more politicized and populist themes when discussing climate change. This is especially true in the US, where skepticism is often associated with scientific validity and long-term progress in a divisive argument between "elites vs. the general populace." Italian media outlets take a more specialist approach when reporting on European institutions, politics, and the economy. American progressive media seem to be more politically active than their Italian counterparts, despite the fact that progressive groups in both nations usually concentrate their discussions on scientific and policy concerns. The tendency of conservative American media to take a populist stance and display suspicion of experts could account for this phenomenon. The findings demonstrate how public discourse on climate change is impacted by populist rhetoric and how various democratic frameworks affect the discourse's clarity.

Keywords: Public trust, media discourse, populism, politicization of science, comparative analysis, and climate communication are some of the subjects covered.

Introduction:

Particularly in the US, climate change appears to be a very divisive issue [1]. According to [2], when experts identify uncertainty, it gives other organizations—especially the media—the opportunity to question scientific knowledge, which in turn encourages skepticism among the general public. As a result, there is a gap between the general public and the scientific community.

Partisanship and political polarization seem to be inexorably related. Democrats are more likely than Republicans to support scientific consensus, according to a research by [3]. On the other hand, research by [4][5] shows that conservatives exhibit increased polarization in their comprehension of facts and frequently interpret scientific facts within an ideological framework. Furthermore, the terms "terrorists" and "Nazis" are frequently used by right-wing media to denigrate environmentalists [6]. This discrepancy is maintained by the elite's communications [7].

This division appears to be being exacerbated by populist sentiments, particularly those associated with the elite. Additionally, they undermine Popper's 1945 open society ideas, which support diversity, tolerance, and nonviolent democratic transformation. Authoritarian and populist narratives endanger democratic discourse by depicting political and academic institutions as neoliberal despots at odds with the people. According to [8], right-wing populism is associated with climate inactivity and a propensity to use what-aboutism unless other nations take the initiative, while [9] argues that it is a significant indication of conspiracy theories. According to [10], the belief that such narratives could erode confidence in political and scientific institutions may be the cause of populist Republicans' declining support for climate policies. On the other hand, populist Democrats frequently claim to support inclusive and fair policies. A sense of justice may lessen mistrust of institutions, which is consistent with the populist narrative that the elite have abandoned the public [11]. According to [12], post-political and technocratic narratives that present climate change as a technological rather than an ideological problem have a major impact on modern environmental policy. Although this nonpartisan approach will severely limit freedom of expression and a variety of viewpoints, it may increase efficiency.

Actor-Network Theory (ANT) serves as the foundation for this study's Science and Technology Studies (STS) viewpoint. According to [13], scientific knowledge can serve as a basis for both government and conflict, allowing political authority and scientific organization to live together. This analysis was significantly impacted by [14] description of climate change as a "black box" that includes all combined scientific data. People start to doubt the authenticity of this kind of content when they look at it, which leads to further conversations in which language is essential in creating the actor-network. The study looks at how public opinions are impacted by media portrayals of climate change while taking populist themes into account.

The research questions are as follows:

How much do political goals influence how climate change is portrayed in the media in the two nations?

Research Question 2: How does the bias of the sources affect the language and tone used to explain the essential distinctions between the two nations in such a situation? Do they use populist or anti-elitist language that affects the openness of public discourse?

What topics are most interesting to the media?

The fourth research question concerns how important human agents are portrayed in the media as well as elements related to political disagreement, expert opinions, and institutional trust.

We used a mixed-methods framework in our investigation. While a keyness analysis reveals patterns in political conversation (RQ1 and RQ2), topic modeling emphasizes the key ideas and players (RQ3 and RQ4). The rhetorical and narrative frameworks of the cross-country comparison are examined using a qualitative content analysis (QCA), a keyword-in-context (KWIC) analysis, and topic modeling (RQ2).

The essay is structured as follows: the technique and materials are presented first, then the results, and then a discussion on the broader socio-political implications of those findings.

Materials and Methods:

The emergence of conflicting ideologies can be seen in the US as climate change becomes a divisive topic [3]. The United States and Italy, an EU member whose policy framework is more in line with [12] position, are compared in this study. The media systems of the two nations differ significantly, according to [15]. Italy is completely split, whereas the United States is liberal and pluralistic. The two examples' research sheds light on how media framing, ideological disagreements, and populist rhetoric contribute to the politicization of climate communication.

Four Italian and four US news outlets provided articles for the study. Italian conservative publications include The Post and LiberoQuotidiano; their American counterparts are Breitbart and The Daily Caller. These eight locations were picked due to their broad influence and considerable national significance. Leading magazines and large media corporations use Facebook and other social media platforms to sway public opinion. A total of 25,745 words from 71 pieces—36 from Italy and 35 from the US—were gathered and examined. The resources were split equally between conservatives and progressives, with 17 coming from the US and 18 from Italy. None of them came from the Daily Caller. We used data from Facebook that included news items issued through postings together with original captions of photographs or short videos to study the processes of politicization in content diffusion. To ensure consistent public interaction, every article published in 2023–2024 has at least forty comments. The phrases climate change, ecoterrorism, ecologo, ecoactivism, ecoterrorists, environmentalism, Green Deal, sustainability, and sustainable development were used to create the corpus. These terms were used to extract parts of talks where political friction, populist hyperbole, or disagreement could be more likely to surface, instead of compiling all the climate reports from various sources[16].

Table 1. Corpus and analytical design

Component	Reported information
Period	2023–2024
Source platform	Facebook posts linking news items, photographs or short videos
Engagement threshold	At least 40 comments per selected post
Sample size	71 items: 36 Italy; 35 United States
Corpus size	25,745 words
Methods	Keyness; LDA topic modeling; KWIC; qualitative content analysis
Software	R / quanteda; MAXQDA

The blogs and short videos were archived in.txt format, together with their titles and any pertinent subtitles or subheadings. The Quanteda package [17] was used for data processing, while R [18] was used for file imports. Stop words, including user-defined stop words, and phrases with fewer than five occurrences or fewer than three characters were eliminated during the standard pre-processing.

In order to identify the participants and the narratives underlying the media's polarization of climate debates, we combined various approaches.

In order to identify terms that are much more common in the former, we conducted a keyness analysis of conservative and progressive news sources [19]. This method made it possible to identify a number of terms and ideas for RQ1 and RQ2.

The main players and topics in each nation's debate were then determined using topic modeling (Murel & Kavlakoglu). This approach employed the responses to questions 2 and 3 that contrasted the United States with Italy, with the exception of questions 3 and 4. Lastly, the qualitative portion of the study that served as the foundation for QCA was validated using a keyword in context (KWIC) analysis. We selected specific scientific and political terms and examined them in the context to comprehend how they are portrayed in politically charged media [20]. A thorough comprehension of RQ2 was then made possible by the QCA's robust qualitative examination of the data [21]. A software program called MAXQDA, which employs several methods, was used to assess qualitative data [22]. used at both stages.

The ultimate objective is for several strategies to work well together: Keyness finds lexical differences, topic modeling reveals important topics and contributors, KWIC analysis

gives context for particular phrases, and QCA provides a comprehensive qualitative analysis to support quantitative evaluations.

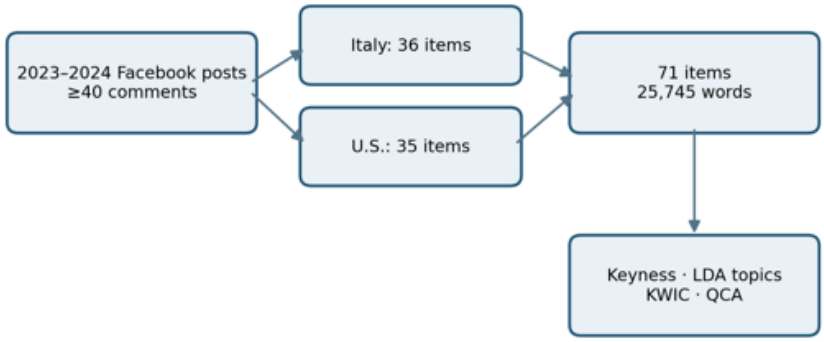


Figure 1. Sampling and analytical workflow

Analysis of Keyness:

A Keynesian analysis that considered the political bias of sources in each nation was used to address RQ1 (the politicization of climate change) and RQ2 (the impact of sources' political bias on their language and rhetoric). The purpose of the survey was to identify the most frequently used terms in each category along with their English and Italian equivalents. It is evident that science and the environment are related to the top fifteen terms in progressive source. Niña, Niño, temperature, dryness, etc.) These phrases imply that the discussion would be focused on scientific facets of climatology and meteorology, particularly as they relate to severe occurrences. Production of energy power. The terms "energy," "production," and "electricity" imply that energy-related issues are also pertinent. The use of terms like "biodiversity," "crab," "animals," and others is another sign that ecological aspects are acknowledged. The Green Party and the 2024 European elections are the only obvious political ties, and they appear to be related to environmental concerns.

Table 2. Italy: reported framing by source orientation

Orientation	Themes identified in manuscript	Illustrative terms or references
Progressive	Meteorology, scientific evidence, biodiversity and energy	Niña, Niño, temperature, biodiversity, electricity
Conservative	Politics, economic transition, institutional policy and technological issues	Meloni, government, capitalism, labor, NRRP, cloud seeding

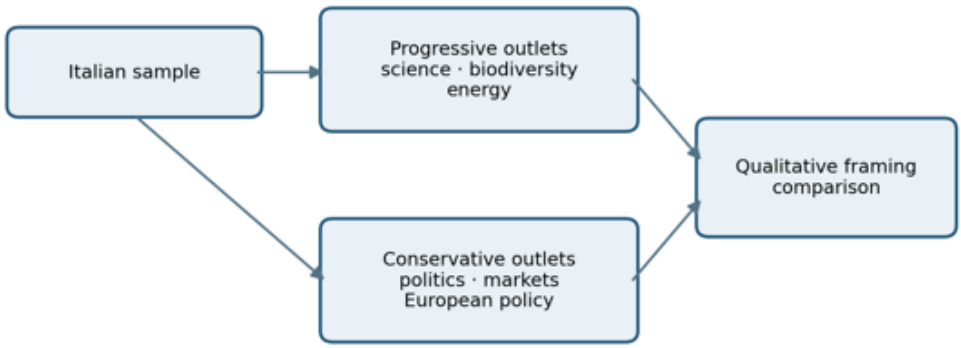


Figure 2. Italian media theme

Conservative Italian media outlets cover political and economic concerns more frequently. Additionally, references to cloud seeding ("nuvole", "semina") allude to the incorporation of technological elements. Meloni, the left, and the government all suggest that political and economic issues may influence how we perceive climate change. The emphasis on the terms "capitalism," "labor," "NRRP" (National Recovery and Resilience Plan), and

"market" suggests that the discussion of climate change is primarily focused on economics. However, it seems to take into account social concerns like "affluence" and "disparities," which may allude to problems with unequal access to resources and environmental laws.

The progressive terms "heat," "ice," "temperatures," "atmosphere," and "carbon" are located on the left side of the graph, which appears to focus primarily on the technical and scientific aspects of climate change. The name "Mann" is most commonly associated with climatologist Michael E. Mann, who was awarded the Nobel Peace Prize in 2007 and co-wrote the IPCC report. It makes reasonable that it would come up in relation to how his libel action against two right-wing bloggers was covered by the media [23]. The terms "scientists" and "E.P.A." suggest that the conversation may touch on other subjects, such as research and scientific inquiry, in addition to defending scientific integrity against politically motivated denials. The mention of "batteries," "vehicles," and "cars" implies that electric mobility and its role in lowering greenhouse gas emissions may be the subject of debate.

The relative significance of conservative and progressive American sources is depicted. The top fifteen terms shown in the graphs are listed below. The horizontal axis displays the Chi2 values.

Conservative American media discourse appears to be centered on right-wing political and economic issues. The words "offshore," "wind," "DOE," and "contracts" together imply that the phrase most likely relates to large wind energy expenditures, particularly in California. "Bezos" and "yacht" may allude to criticisms of affluent elites, while "food" may refer to conversations about sustainable food systems, potentially reflecting concerns about economic and social inequities. There may be a connection between the mention of Federal Reserve Chair Jerome Powell and his claim that elected officials, not the Fed, should determine climate policy [24]. The inclusion of the name "ChatGPT" has led to claims that the tool either merely restates recognized scientific perspectives or advocates environmental policy [25]. The terms "Roman" and "plague" can evoke historical similarities utilized in climate narratives, whereas "painting" most likely alludes to climatic activities through artistic expressions.

These findings together address RQ1 and RQ2, which assert that liberal media in the US and the UK generally emphasize climate change from an environmental and scientific perspective, while conservative media may focus more on political and economic considerations. This event illustrates how various political ideologies impact language and terminology, especially in the United States, supporting the notion that politics shapes climate discourse.

Modeling Subjects:

Using topic modeling on media samples from the US and Italy, we examined the evolution of public sentiment in three domains: (RQ2) the key differences between the two countries under investigation; (RQ3) the main topics covered by the sources; and (RQ4) the important human actors and discourse-shaping elements. A Latent Dirichlet Allocation (LDA) model, a probabilistic method that treats words and documents interchangeably, was created using the "textmodel_lda" function from the quanteda package in R [26]. This method was used to identify the main theme motifs. Ten patients in all were selected for the model's estimation after initial exploratory research. Twenty terms were selected to capture the essential lexical elements for each difficulty level, and the English translations enhanced the Italian results.

The initial theme pertains to meteorological conditions and pollution. The terms "temperatures," "Niña," and "Niño" pertain to emissions and their environmental impact. Although "cars," "traffic," and "pollutants" highlight our apprehensions regarding transportation and air quality, "soil," "waters," and "drought" may emphasize a broader spectrum of ecological deterioration. Europe," "Paris," and "law" denote European legal notions, whereas "study" suggests an empirical foundation.

Topic 2 appears to encompass the technical, political, and social dimensions of the ecological transition. Electricity," "gas," and "nuclear" refer to categories of renewable energy. Labour," "Meloni," "NRRP," and "COP28" are probably linked to both domestic and global political affairs. The European frameworks "France," "Enel," and "emissions" are believed to be linked to national endeavors. The concepts of generation and security might pertain to the controversial actions of the preceding generation.

Topic 3 seems to concentrate predominantly on ecological initiatives, particularly Last Generation endeavors. Public order is frequently employed to contextualize demonstrations, as evidenced by the terminology "paint," "gallery," "Gucci," and "security. Fossil" denotes the persistent resistance against fossil fuels, while "government" can signify formal reactions or activist appeals.

The terms "temperatures," "rains," and "snow" indicate that the primary emphasis of Topic 4 is the weather. Terminology such as "Copernicus" and "preindustrial" is employed to characterize historical climate information. Abnormally arid circumstances are termed "drought. One can perform systematic, evidence-driven historical investigation. Topic 5 could be linked to the social and economic dimensions of sustainable transportation and the ecological shift. Although "railway," "vehicles," and "decarbonization" pertain to mobility, "capitalism," "wealth," and "inequalities" emphasize the societal implications of transition strategies. Although "data" and "report" suggest allusions to particular facts, "politics," "European," and "resources" redirect the conversation toward the European Union.

Topic 6 predominantly focuses on climate research and technological approaches to alleviate its impacts. While "CO2," "emissions," "methane," and "electric" underscore the importance of sustainable transport and alternative energy sources, "pyrolysis" and "costs" reveal the difficulties of energy production from waste and the related economic implications. We will be examining a technology-oriented strategy for tackling climate change.

Topic 7 addresses the preservation of ecosystems and the decline of biodiversity. Certain species must have persevered, as the terms "arthropods," "flora," and "crustaceans" all suggest regions such as the Mediterranean. While "data," "research," and "studies" are typically linked to a scientific framework, "gardens" and "Milan" conjure images of urban greenery. The terms "risk" and "mass" may link environmental activism to biodiversity concerns.

Subject Number 8: European Politics, emphasizing the elections of 2024. It seems that "Farmers" pertains to the demonstrations scheduled throughout Europe in 2024, whereas "Parliament," "parties," and "Greens" reference electoral conflicts focused on ecological matters. The focus is on international perspectives with minimal reference to "government" or "minister.

Topic 9 appears to focus on precipitation and severe weather phenomena, particularly drought, with references to "Sicily" and "farmers" suggesting a vulnerability to geographical factors and effects on agriculture. The terms "Cloud," "seeding," and "Dubai" probably reference an intrigue with atmospheric manipulation techniques.

Topic 10 employs the terms "renewables" and "solar" to juxtapose clean energy against conventional energy sources such as coal. The term "emissions" suggests a link to environmentally conscious transportation and sustainability, whereas "China," "COP28," and "researchers" indicate a worldwide and scientific aspect to the development of environmental regulations.

The Italian media emphasizes foreign and European matters more than domestic issues in its complex and extensive coverage. A significant problem emerges concerning carbon dioxide emissions. The topics of renewable energy and sustainable transportation methods have become urgent concerns. Chapters five, six, seven, nine, and ten are thoroughly saturated with research. Topic 4 alludes succinctly to the EU's Copernicus initiative.

Environmental advocacy is frequently framed through the lens of security issues, unlike research that primarily focuses on its scientific and practical implications.

The outcomes of topic modeling for American media (Topics 1–5). Topic 1, indicated by terms such as "ice," "ocean," and "glaciers," explores the impact of climate change on glaciers and sea levels. The absence of water indicated by "freshwater" implies that the discussion likely pertains to the consequences of ice melting in the Atlantic Ocean from Greenland and Antarctica. References to "space" or "meteorites" imply a focus on satellite surveillance, while references to "scientists," "research," or "gigatons" denote a more scholarly context.

The inclusion of terms such as "Biden," "president," and "campaign" indicates that Topic 2 revolves around political matters and policies, especially in relation to the present Democratic administration. The terms "electric," "vehicles," and "cars" indicate the government's dedication to sustainable transportation; nonetheless, "E.P.A.," "emissions," and "regulations" underscore that climate policy and air quality remain paramount issues. Topic 3 explicitly indicates that climate education is a primary emphasis through the use of terms such as "school," "teachers," and "students. The recurrent application of "science," "scientific," and "study" underscores the significance of scientific understanding in education. Although "ChatGPT" may prove beneficial in debates regarding the compatibility of AI with traditional scientific methods, "Roman" and "plague" might act as historical allusions in discussions surrounding climate change.

In Topic 4, the terms "record" and "temperatures" pertain to meteorological events, whereas "scientists," "Copernicus," and "preindustrial" likely reference historical climate. Terms such as "fossil" and "fuels" may initiate a dialog regarding the environmental impact of tourism, while terms like "travel," "Paris," and "Athens" could associate tourism with climate change.

Topic 5 appears to pertain to the policy formulation aspect of the energy transition; the terms "economic," "political," and "November" likely indicate a connection to the electoral period. References to "DOE," "federal," and "policies" establish a domestic backdrop, whereas references to "Powell," "Europe," and "gas" suggest links to international comparisons, energy costs, and economic strategies. Regarding society and data, the concepts of "report" and "security" imply significant repercussions.

The discourse on subjects numbered 1 to 5 is succeeded by a transition to American media material.

Topic 1 explores the impact of climate change on sea levels and glaciers, as suggested by the terms "ice," "ocean," and "glaciers. The term "freshwater" suggests an absence of water, indicating that the conversation probably pertains to the melting of ice in Greenland and Antarctica and its impact on the Atlantic Ocean. The mention of "space" and "meteorites" implies an emphasis on satellite observation, whereas the terms "scientists," "research," and "gigatons" indicate a scientific environment.

Terms such as "Biden," "president," and "campaign" imply that Topic 2 pertains to politics and policy, especially concerning the Democratic administration. References to "electric," "vehicles," and "cars" indicate a dedication to sustainable transportation in the governmental context, whereas mentions of the "E.P.A.," "emissions," and "regulations" underscore an emphasis on climate policy and air quality.

The concepts of "school," "teachers," and "students" illustrate the emphasis placed on climate education in Topic 3. The recurrent employment of terms such as "science," "scientific," and "study" underscores the significance of scientific knowledge in education. The terms "Roman" and "plague" may serve as historical allusions in conversations regarding climate change, whereas "ChatGPT" could be referenced in dialogs concerning the integration of AI with traditional science.

The terms "temperatures" and "record" in Topic 4 pertain to meteorological events, whereas "scientists," "Copernicus," and "preindustrial" likely allude to climatic history. Allusions to "travel," "Paris," and "Athens" may associate tourism with climate change, whereas mentions of "fossil" and "fuels" imply a discourse on the ecological impacts of travel.

Topic 5 appears to address the policy development facet of the energy transition; the words "economic," "political," and "November" likely pertain to the electoral context. References to "DOE," "federal," and "policies" situate the conversation within a national context, whereas mentions of "Powell," "Europe," and "gas" suggest links between economic strategy, global standards, and energy costs. The terms "report" and "security" imply more profound consequences for society and information.

Qca and Kwic Examination:

To fully understand RQ2 (the differences between the two countries), each segment of the data was analyzed with KWIC and QCA. Subheadings, titles, articles and short video captions were closely reviewed.

We compiled a list of scientific and political terms relevant to each country by means of Keynes and topic modeling assessments. Specifically, we examined the media coverage of these and other terms associated with populism. Relevant terms include: “farmers,” “activists,” “COP28,” “right-wing,” “elite,” “government,” “Meloni,” “market,” “deny/denial/denier,” “politics,” “people,” “research,” “skeptic,” “scientific,” and “science.” Likewise, “activist,” “Bezos,” “Biden,” “celebrity,” “conservative,” “Democrat,” “denial*/denier*/deny,” “DOE,” “elite,” “E.P.A./EPA,” “Europe/European,” “expert,” “globalist,” “left,” “liberal,” “Mann,” “people,” “politics,” “populism,” “president,” “protester*,” “Republican,” “research,” “right,” “science*,” “scientist*,” “skeptic*,” “sovereign*,” “studies,” and “Trump” are all relevant. In this context, the words "farmers," "activists," "COP28," "right-wing," "elite," "government," "Meloni," "market," "deny/denial/denier," "politics," "people," "research," "skeptic," "scientific," and "science" are all applicable, as well as "activist," "Bezos," "Biden," "celebrity," "conservative," "Democrat," "denial*/denier*/deny," "DOE," "elite," "E.P.A./EPA," "Europe/European," "expert," "globalist," "left," "liberal," "Mann," "people," "politics," "populism," "president," "protester*," "Republican," "research," "right," "science*," "scientist*," "skeptic*," "sovereign*," "studies," and "Trump.

A ten-word buffer was added to the beginning and end of each term to provide full context for each evaluation.

Using the “Keyword in Context” function, MAXQDA found 323 correlations in the Italian material. The final dataset comprised 116 associations after the removal of 202 extraneous components (56 from progressive sources and 60 from conservative sources). After removing 332 duplicates manually, the final U.S. dataset contained 190 associations, 71 from conservative sources and 119 from progressive sources. MAXQDA first produced 526 associations.

Table 3. Cross-national KWIC/QCA summary

Reported measure	**Italy**	**United States**
Initial KWIC associations	323	526
Final associations after cleaning	116	190
Political Behavior code applications	73	129
Science and Expertise code applications	53	108
Social Behavior code applications	56	39

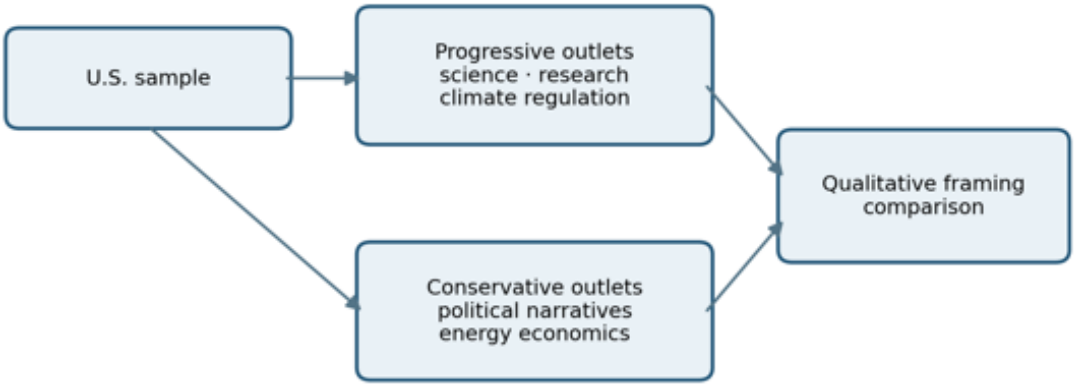


Figure 3. U.S. media themes

Each country was coded by individuals using MAXQDA. The revised Italian KWIC dataset was added to perform this research. The three major themes used to develop the criteria were "Political Behavior", "Science and Expertise" and "Social Behavior. After careful analysis each was split inductively. The four categories that constituted "Political Behavior" were "De) politicization of Climate Issues," "European and International Politics," "Ideological Narratives," and "Partisanship and Political Conflict. These "Science and Expertise" sections included topics such as "Data and Research," "Skepticism toward Science/Climate Doubt," "Severe Weather Phenomena," and "Sustainable Technologies and Renewable Energy. The category "Social Behavior" consisted of the topics "Economic Dimensions," "Public Opinion," and "Activism and Collective Action.

These codes can be used simultaneously in the same association to address all imaginable dimensions. The most frequent macro-category was "Political Behavior" with 73 coded segments. In the "Political Behavior" category, "Ideological Narratives" (27 entries) and "De) politicization of Climate Issues" (21 entries) were the most frequent. Conversely, "European and International Politics" (12) and "Partisanship and Political Conflict" (13) were relatively rare. The program with the second highest number of segments was "Science and Expertise", with a total of 53 segments. "Social Behavior" consisted of 56 segments. Instead of the "Data and Research" (19) and "Sustainable Technologies and Clean Energy" (25) of Science and Expertise, "Social Behavior" focuses primarily on Activism and Collective Action (32).

Ideology classified 75 items as liberal and 107 as conservative. Conservative media had a strong impact on "Political Behavior" concerning the "(De) politicization of Climate Issues" (17) (52) and "Ideological Narratives" (24). Media initiatives in "Data and Research" (16), "Science and Technology" (34) and "Sustainable Technologies and Clean Energy" (13) programs. Considering the uncertainty of scientific discoveries and the lack of mentions of "Extreme Weather Events" in the analyzed content, it can be assumed that there were no explicit denialist implications.

The quantitative evaluations generally seem to confirm these findings. Keynes' findings indicate that conservative sources prioritize political issues over scientific and technological progress. This indicates that, given the popularity of "Political Behavior. "A full investigation will be necessary to find out the reasons for the different treatment of these two groups."The conservative media focus on two key themes: "De-Politicization of Science" (17) and "Ideological Narratives" (24). "European and International Politics" (8) is more valued than "Ideological Narratives" (3) and "De) politicization of Climate Issues" (4) in progressive outlets when talking about EU environmental policy. The link between partisanship and either outlook appears to be weak (7 and 6).

Progressive media like "Science and Expertise. Data and Research" (16) are fond of empirical proof, while conservative outlets prefer "Sustainable Technologies and Clean

Energy" (12). Many people have different views over these topics. The results of the topic modeling are consistent with the depiction of energy and technological issues as particularly relevant in Italian discourse by the progressive media. The issue of "Social Behavior" particularly "Activism and Collective Action" (21) is mainly dealt with by the liberal media. The emphasis on "Ideological Narratives" suggests that activism is framed in a security or ideological perspective. Sometimes activism will be taken up by progressive journals (11). "Economic Dimensions" (12 vs. 4) is picking up steam in conservative media platforms, while "Public Opinion" remains in the margins (3 vs. 5).

When we imported the cleaned KWIC file into MAXQDA for classification we could change it to American content. For the purpose of consistency, the same macro-categories and subcodes of the Italian study were used in this context, but the category "Presidential Climate Regulations" was substituted for "European and International Politics" so as to better capture the features of American climate politics. Some parts of the evaluation could be coded in a universal way, as in the Italian exam.

Applications of code for American content were two hundred seventy-six from liberal and conservative factions, respectively. The most common macro-category was Political Behavior which was associated with 129 macro-categories. The "Social Behavior" category was limited to 39 segments, lagging behind the "Science and Expertise" category of 108 segments. Within the context of "Political Behavior," the subcodes "Ideological Narratives" (22) and "Presidential Climate Regulations" (27) were much less frequent than the more frequent "De) politicization of Climate Issues" (48 occurrences) and "Partisanship and Political Conflict" (32 occurrences). The "Distrust in Science/Climate Skepticism" category had twenty-two entries, seven in "Extreme Weather Events," forty-four in "Data and Research," and thirty-five in "Sustainable Technologies and Clean Energy "Activism and Collective Action" (16) and "Social Behavior" (16) are strongly linked at the primary level.

Within the context of "Political Behavior", progressive organizations filed 79 requests for codes.33 of these were related to the "(De)politicization of Climate Issues", 6 to "Ideological Narratives", 26 to "Partisanship and Political Conflict" and 14 to "Presidential Climate Regulations". The problem affected a total of seventy-nine code applications. "Science and Expertise" received a total of 79 points, broken down as follows: 35 points for "Data and Research," 14 points for "Distrust in Science/Climate Skepticism," 7 points for "Extreme Weather Events," and 23 points for "Sustainable Technologies and Clean Energy. Twenty-two citations concerning "Social Behavior" were counted cumulatively in the course materials, six in "Activism and Collective Action," ten in "Economic Dimensions," and six in "Public Opinion. The largest portion of conservative literature fell in the category of "Political Behavior" (50). The categories were: "[De)politicization of Climate Issues", "Ideological Narratives", "Partisanship and Political Conflict", and "Presidential Climate Regulations. "Social Behavior" received a total of seventeen references, ten from "Activism and Collective Action," three from "Economic Dimensions," and four from "Public Opinion. Twelve of the 29 references were related to "Science and Expertise". Examples include "Sustainable Technologies and Clean Energy", "Distrust in Science/Climate Skepticism" and "Data and Research. None of the events were categorized as "Extreme Weather Events."

The quantitative results seem to confirm these findings. The number of associations and encoded segments has gone up, which is contrary to the keyness analysis that showed progressive sources were more focused on scientific topics. The articles "De)politicization of Climate Issues" (33) and "Partisanship and Political Conflict" (26) are often cited to show how "Political Behavior" fits with "Science and Expertise." The citations are generally a protection of scientific credibility against politically inspired criticism.

In contrast, conservative media platforms focus on "Political Behavior" (50), particularly through the "(De)politicization of Climate Issues" (15) and "Ideological

Narratives" (16). The lack of "Data and Research" (9) and "Science and Expertise" (29), as well as the lack of "Extreme Weather Events" (29), indicate a transition from a scientific discourse to a political and ideological discourse. The keyness test results support this hypothesis and suggest that the terms "Roman" and "plague" likely refer to historical examples used to support claims about climate change.

Progressive discourses privilege "Data and Research" (35), while conservative ideologies privilege "Sustainable Technologies and Clean Energy" (12). This indicates that they are concern with the economic and political dimensions of the green transition. Concerns about environmental food production and 'Ideological Narratives' suggest that conservative discussions about environmental technology are likely to be intrinsically tied to wider political and economic worries.

Finally, conservative media in both Italy and the United States are more biased toward conservative agendas than progressive ones. However, the two situations differ on many fundamental points. In Italy the liberal media do not focus on political discussion but on presenting climate change from an institutional and evidence-based perspective, highlighting scientific data and European environmental legislation.

Operations are different in the US. Progressive media outlets often adopt a politically biased perspective on climate change deniers. This could imply that skepticism is more heavily linked to political affiliation, considering that climate change is viewed as a more controversial political matter in the US, than a consensus in science.

In Italy sustainable innovation is often linked to the European Union (EU), while in the United States it is mainly linked to presidential directives. This shows that the green transition is a political project that is seen to be influenced by authorities.

In Italy, especially in conservative circles, this link has an economic dimension given the clear attention to market effects. The right-wing American media cover economics, but don't go into the weeds. A growing polarization could be indicated by the tendency for political disputes to drown out constructive or alternative economic views.

These differentiations are connected to the ideological relevance of American media, while in the Italian discourse they seem to be mainly connected to environmental movements. In the Italian media, activism is predominantly portrayed in a political context, while in the American media, it is portrayed as incidental. Quantitative analyzes show that Italian discourse is more varied, more extensive, and less subject to political constraints than American discourse.

Analyzing Climate Conflicts using Ant Analysis:

In order to examine how the relevant media construct stories about climate change, the results are evaluated through the lens of actor-network theory. The results show that conservative media outlets, especially in the US, have a big influence on the reexamination of the issue, which supports [14] theory that climate change is a mysterious phenomenon. In addition to promoting alternative viewpoints on climate change, these platforms also question long-held scientific assumptions.

It would be helpful to place climate research in a broader political and economic framework, since political interpretations seem to play a significant role. Because of concerns about a potential bias toward politically motivated narratives caused by the limited application of science-related codes, the QCA appears to promote this tendency.

[27] justificatory logics networks framework offers an alternate view by illustrating the potential participant-logic relationships in topic modeling.

Numerous justifications are advanced by Italian authorities. Topic 1 primarily focuses on data and pollutants from an institutional and scientific perspective, while references to the European Union, the Paris Agreement, and legislative frameworks indicate a political orientation toward governance. Topic 2, which delves into energy source cost-benefit analyzes,

appears to combine labor- and activism-related social justice elements with economic-political and technological ones. In Topic 3, we see activism, through the intersection of social justice and political delegitimization, as a threat to the legitimacy of institutions.

Discussed more appropriately an explanation grounded in science and institutions that places an emphasis on empirical data and weather forecasts. Topic 5 integrates economic-political, social equity, and technological arguments with an emphasis on decarbonization, inequality, and market dynamics.

Topic 6 seems to combine scientific, technical, and economic aspects with an emphasis on research, reducing emissions, and financial ramifications. With its emphasis on the upcoming European elections and the Green Party's role, Topic 8 gives the impression of being primarily political and could portray climate change as a collective political responsibility. In conclusion, the scientific and technological ideas presented in Topics 9 and 10 typically have something to do with renewable resources, cloud seeding, meteorological data, and possible consequences for farming.

Italian speech frequently incorporates arguments based on science, technology, and economics and politics.

The American cohort reveals a different pattern. Unlike Topic 3, which seems to be centered around climate education within existing institutions, Topic 1 showcases an emphasis on data and observation through scientific-institutional reasoning. Topic 2 appears to merge political and technical arguments about climate regulation and the Biden administration, drawing attention to the politicized US climate discourse and the connection between sustainable innovation and presidential policy.

Once again, Topic 4 emphasizes scientific discoveries while incorporating economic factors like fossil fuel use and tourism. Topic 5 seems to cover a lot of ground with its explanations. Politics seems to be the go-to topic when discussing the federal government and the 2024 elections; this could mean that climate legislation is considered a divisive issue with multiple political agendas at play. A geopolitical element may be implied by mentioning Europe, even though comparing renewable energy sources with fossil fuels raises economic cost-benefit analyzes. Concerns regarding the social impact of climate policies are present, but there also appears to be a social justice dimension.

Topics 6 and 7 primarily address the technical and financial components of renewable energy sources. Topic 8 may reflect the debate over the veracity of science, despite its seeming scientific-institutional nature. It would appear that Topic 9 brings together scientific and technological aspects of farming and emissions. Finally, Topic 10 could have a political basis that includes critiques of the powerful and aspects of social justice, especially in relation to sustainable food programs.

American discourse often incorporates scientific, technical, and economic-political arguments, with the addition of criticism from political elites.

Conversation:

Ultimately, we endeavor to tackle the research inquiries.

The keyness analysis indicates that the media's politicization of climate change is more pronounced in the United States compared to Italy (RQ1). Referencing the DOE and EPA concerning Biden's climate initiatives may suggest a strong correlation between political partisanship and climate dialog. Political dialog arises in Italy, yet it predominantly frames climate change as a matter of institutional and economic strategy.

The keyness analysis uncovers notable discursive characteristics among various political affiliations concerning the impact of media sources' political bias on their language and rhetoric (RQ2) and the emergence of populist narratives that may obstruct the tenets of an open society. Conservative media platforms appear to emphasize political and economic matters, frequently associated with the green transition, while progressive media platforms

tend to highlight scientific considerations. [13] perspective on the ideological politicization of research appears to correspond with these inclinations.

According to the findings of [3], which indicate that Democrats align more closely with scientific consensus than Republicans, the QCA and topic modeling reveal that conservative media in both nations exhibit greater politicization. Nevertheless, American progressive media seem to exhibit greater political involvement than their Italian equivalents, potentially due to the stronger correlation between partisanship and climate skepticism in the United States, aligning with the phenomenon of factual belief polarization [4][5]. Consequently, to combat denialist assaults, progressive media might employ explicit political narratives. European Union policy development and empirical data appear to hold greater significance in Italian progressive discourse.

A notable distinction lies in the manner in which conservative media outlets depict sustainable technologies. These matters are often addressed within political-institutional structures in both nations (presidential orders in the US and the EU in Italy). While American media recognize these elements, they appear to prioritize political narratives that may suppress alternative perspectives, in contrast to Italian media, which tend to focus on market dynamics and economic consequences. [11] suggest that sustainable technology may be associated with affluent elites, thereby intertwining it with overarching political and economic objectives, emphasizing the dichotomy between elites and the general populace.

American topics (2, 5, 6, and 7) generally underscore political contexts, while Italian topics (2, 3, 5, 6, 9, and 10) appear to prioritize practical and technological dimensions. Topics 4 and 7 in Italy predominantly focus on empirical and meteorological dimensions, whereas the U.S. sample prioritizes theoretical investigations (Topics 1, 3, 4, 8, and 9). Activism is often contextualized within political and security paradigms in both nations, aligning with [6] assertion that right-wing rhetoric characterizes environmentalists as perilous. It seems to be more coincidental and assumes a class dimension in the United States, occasionally associated with elite disapproval—a characteristic absent in the Italian group. This distinction is evident in topic modeling: the Italian examination features a specific topic on activism (Topic 3), with only cursory mentions in Topics 2 and 7, whereas in the U.S., Topic 10 merges elite scrutiny of sustainable food investments with activism. The latter subject appears to be unique to the American cohort, in conjunction with formal climate education (Topic 3).

The narrative of climate history seems to unfold in a unique context. As observed in Topic 4, pertaining to the EU's Copernicus initiative and its methodical examination of climate trends, it predominantly manifests through institutional and data-oriented viewpoints in Italy. This appears to align with the Italian inclination to employ empirical and policy-oriented narratives to analyze climate matters. In the United States, historical climate comparisons are occasionally employed to downplay or rationalize contemporary climate change by portraying it as cyclical rather than predominantly anthropogenic. The significant level of politicization in the United States, where climate change is often debated in ideological terms rather than empirical evidence, may be elucidated by this disparity.

The depiction of climate policymaking in the two scenarios reinforces this interpretation. It seems to be affected by partisan politics in the United States and closely associated with the environmental policy of the Democratic administration. References regarding Biden, the EPA, and the Department of Energy (Topics 2 and 5) underscore the significance of elite indicators by framing climate policy as an element of federal governance and political competition [7]. This configuration embodies [28] concept of co-production between science and politics, as well as [2] perspective that ambiguity may jeopardize scientific authority. The arguments of deniers, including those related to Mann's lawsuit, may be regarded as elements of these controversies, aligning with the diminished backing for climate

initiatives due to eroded confidence in scientific and institutional authority associated with populist rhetoric [10].

Conversely, as indicated by mentions of the EU and COP28, the scrutinized Italian media seem to frame climate policymaking predominantly within European and global contexts, with minimal focus on national politics. Topic 8 examines the European elections and the influence of Green Parties, whereas Topic 2 references GiorgiaMeloni in relation to the economic and social ramifications of European climate policies and renewable energy. The American sample, conversely, primarily illustrates climate policymaking as a federal issue separate from global frameworks. This, along with the previously articulated ideological perspective on sustainable technology observed in the conservative sources analyzed, seems to align with [8] inclination toward climatic inaction. Conversely, the Italian narrative appears to align more closely with [12] characterization of a managerial and technocratic methodology in climate governance, as climate change is predominantly articulated through institutional and policy-oriented viewpoints rather than through political strife.

The primary concerns highlighted in media reports in both scenarios are elucidated through topic analysis (RQ3). Scientific and technological viewpoints are interlinked with economic and political matters, especially in discussions regarding fossil fuels, renewable energy, and the formulation of climate policy. Both samples exhibit activism; however, in the United States, it seems to be more incidental and associated with critiques of the elite. Moreover, topic modeling provides revelations regarding RQ4, which pertains to the key human agents and elements in media discourse. Evident denialist perspectives are conspicuously peripheral within the Italian group, whereas the predominant human participants consist of national and European officials, scientists, and activists. The discourse's economic and technological impetus is illustrated by components like fossil fuels, renewable energy sources, electric vehicles, climate regulations, and market dynamics. The primary human participants in the American group consist of researchers, advocates, politicians, and institutional figures (including President Biden and the DOE), as well as affluent individuals like Bezos, who appear to be referenced concerning elitist critique. Climate policy, carbon emissions, fossil fuel usage, alternative energy sources, economic considerations, and clean technologies like electric and wind energy constitute the primary elements[29].

The functions of these organizations in national climate discussions are encapsulated, which emphasizes their connections to political strife, scientific credibility, and institutional confidence.

According to the analyzes, Italian media discourse encompasses a wider array of climate-related subjects and is less politically charged than American media discourse. In both instances, conservative outlets seem to support a political narrative that prioritizes the economic and cost-effectiveness aspects of sustainable technology. Unlike its overtly political counterpart in the US, which mirrors connections to the Democratic administration and contests scientific authority [2], this methodology appears more technocratic in Italy, aligning with [12] concept of depoliticized governance. These trends seem to support [28] co-productions theory, which highlights the mutual influence of political and scientific knowledge.

Political identities, the formulation of policies, and the legitimacy of scientific knowledge intersect and are perpetually redefined in climate communication, illustrating the impact of polarization on climate action politics and the public's understanding of science. This is exemplified by the differentiation between technocratic and populist perspectives. This study seeks to illuminate the various manifestations of fragility in democratic governments within the United States and Italy. A widespread decline in trust in political entities and scientific understanding is evident, particularly highlighted by the partisan divide regarding climate science in the United States. Conversely, Italian climate communication

adopts a more managerial and technical demeanor, appearing less influenced by political factors. There might be a propensity to assign climate-related responsibilities to specialists, potentially constraining public discourse.

This research contends that the politicization of science can be influenced by media dynamics, particular cultural and political contexts, and populist narratives through a comparative analysis of these two cases. The dynamics at play may render science a contentious topic, jeopardizing democratic dialog and the successful enforcement of climate policies by exacerbating political polarization and hindering collective efforts. Enhanced comprehension of these dynamics could elevate public confidence in scientific and policymaking institutions, as well as facilitate the development of more effective climate change communication strategies. Therefore, it is imperative that both science and the media refrain from transforming into political battlegrounds and focus on disseminating factual information.

Upholding and advocating for a shared comprehension of pluralism and democratic dialog that form the foundation of free societies can coexist with endorsing inclusive, transparent, and open decision-making procedures.

Concluding Remarks:

The Italian and American media outlets that were examined took different stances on climate-related matters due to their disparate media and political environments. While the latter adopt a more political stance, the former adopt a more technocratic one. Public engagement with climate change and, more crucially, scientific communication are shaped by these processes, which also have an impact on societal and individual attitudes toward the problem. Media practices must take a more impartial and less divisive stance in light of the pressing need to address climate change and the possibility that political conflict could hinder or restrict the implementation of environmental laws. In line with the principles of an open society, such a strategy could promote greater public involvement in policymaking and decision-making processes, facilitate democratic discourse among various social groups, and make scientific evidence more accessible to audiences without specialized knowledge.

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