

Climate Change Literature Within the Field of Communication in the Disinformation Era: A Comprehensive Analysis of Thirty Years of Progress

Felipe Núñez ^{1*} Carlos Elías ²

¹ Postdoctoral Researcher, Media Research, Communication and Media Studies Department, Universidad Carlos III de Madrid, Spain

² Professor, Journalism, Science & Society, Communication and Media Studies Department, Universidad Carlos III de Madrid, Spain

* Corresponding Author: fnunez@hum.uc3m.es

Citation: Núñez, F., & Elías, C. (2026). Climate Change Literature Within the Field of Communication: A Comprehensive Analysis of Thirty Years of Progress. *Review of Communication Research*, 14, 180–197. <https://doi.org/10.52152/RCR.V14.12>

ARTICLE INFO

Received: 30 Mar 2026

Accepted: 28 May 2026

ABSTRACT

Interest in climate communication has increased significantly in recent decades. Despite the existence of various reviews on this topic, there is still no work that focuses exclusively on the field of communication studies. Therefore, this article aims to explore how communication research has addressed climate change. Through a systematic review of the literature in communication journals indexed in Scopus and Web of Science (N = 1621), this study offers an understanding of the evolution of publications and scientific activity in this area. On the one hand, the main journals, authors and literature are analysed through a bibliometric analysis, and a critical synthesis of the most relevant findings is presented. On the other hand, the conceptual structure of the field is investigated using a temporal analysis of keywords and a thematic analysis through the Bibliometrix package. The results indicate that the field is fundamentally quantitative, with a focus on Western countries and a predominance of framing theory as a central theme. However, the thematic analysis also reveals an uneven development, as while framing dominates as a motor theme, phenomena such as misinformation are still emerging and topics such as selective exposure and public perception remain isolated from the field's central debates. These gaps suggest directions for future research.

Keywords: Systematic Review, Climate Change, Global Warming, Media Research, Science Communication.

INTRODUCTION

Interest in environmental communication has increased significantly in recent decades (Eise et al., 2020; Hansen, 2011). This growing focus has seen an increase in the number of publications (Akerlof et al., 2022; Comfort & Park, 2018), but also with the consolidation of institutional structures in the field of communication studies, such as the creation of working groups and the launch of specialised journals (Cox & Depoe, 2022; Senecah, 2007).

Faced with the large volume of publications on communication research and the environment, some academics have carried out literature reviews with the aim of systematizing this knowledge. The first bibliometric review on this issue showed an increase in research on environmental communication since the early 1990s (Pleasant et al., 2002). Subsequent work confirmed this growth, showing that, with the turn of the millennium, research in this area moved from studying risk in general terms to a more specific focus on the problem of climate change (Akerlof et al., 2022; Comfort & Park, 2018).

Unlike other environmental and scientific issues, which can vary in scale and urgency, climate change

communication faces the particular challenge of conveying the severity and immediacy of the climate crisis through an interdisciplinary approach (McCright et al., 2013). Intrinsically, climate change requires a comprehensive understanding spanning multiple disciplines due to the complexity and breadth of its impacts (Burroughs, 2007).

This premise has led several authors to carry out interdisciplinary reviews of communication research on climate change, thus providing a well-defined configuration of the evolution and scientific dynamics of this topic. The usual strategy in the literature selection procedure in existing reviews has been, in various variants, to use as search terms the combination of words such as 'climate change' and 'communication' (Agin & Karlsson, 2021; Asmi et al., 2019; Dhaher & Gümüş, 2022; Guenther, Joerges, et al., 2023; Okoliko & de Wit, 2020; Schäfer & Schlichting, 2014). This has made it possible to not limit the results to a specific area of study, yielding more interdisciplinary results. However, these search criteria have reduced the results to the particular field of communication studies, constraining this discipline to a limited set of terms.

While we have extensive knowledge about the interdisciplinary dynamics of climate communication from existing reviews, work on how communication research in particular has addressed the climate issue is scarce (Eise et al., 2020). This study aims to complement the set of previous literature reviews focusing on this specific aspect.

LITERATURE REVIEW

Other scholars have conducted systematic reviews of the literature on communication studies and climate change before us (Table 1). Generally, with the aim of quantitatively studying both the evolution and impact of publications and the structure of scientific activity in the area (Agin & Karlsson, 2021; Asmi et al., 2019; Chen et al., 2022; Eise et al., 2020; Pearce et al., 2019; Runhaar et al., 2018; Schäfer & Schlichting, 2014). Not all reviews have followed this format. There are also those reviews that have focused primarily on the content of publications, based on the narrative integration of the main findings (Anderson, 2009; Carvalho, 2010; Moser, 2010; Olausson & Berglez, 2014). However, the reviews that have taken this second route are inherently subjective in terms of selecting sources, since they lack a review protocol that justifies inclusion of the latter in the corpus under study and, consequently, cannot effectively compare results.

Although the reviews that follow a systematic procedure differ in their selection criteria and analysis periods, there seems to be a consensus on the growing prominence and consolidation of the field, particularly since 2008, when the literature on communication and climate change grew substantially (Agin & Karlsson, 2021; Chen et al., 2022). However, we also see that this rapid development has differed depending on the country, with greater attention to Europe and North America, primarily the United States. In contrast, the areas that are precisely most vulnerable to the effects of climate change have been less analysed (Agin & Karlsson, 2021; Eise et al., 2020; Schäfer & Schlichting, 2014). To alleviate this inequality, countries that have traditionally been left out of these studies are beginning to build their own discourse in climate communication (Chen et al., 2022), and some reviews have focused on examining the particular research of these traditionally ignored territories (Okoliko & de Wit, 2020).

Regarding the general structure of scientific activity on climate communication, the journals *Environmental Communication* and *Public Understanding of Science* stand out as the most productive in the area (Agin & Karlsson, 2021). Researcher Anthony Leiserowitz seems to be the most prominent figure in the literature on climate communication (Asmi et al., 2019; Chen et al., 2022).

On a theoretical level, framing theory seems to prevail (Agin & Karlsson, 2021; Dhaher & Gümüş, 2022; Hansen, 2011), although it seems that many articles simply lack a theoretical framework (Dhaher & Gümüş, 2022). However, in terms of methodology, there seems to be a wide range of approaches (Eise et al., 2020; Schäfer & Schlichting, 2014), although the most common methods seem to be the different forms of content analysis (Agin & Karlsson, 2021).

The media and journalistic actors are the most common object of study, followed by the general public (Agin & Karlsson, 2021; Dhaher & Gümüş, 2022). Research has focused primarily on print media, with less attention to radio and television (Schäfer & Schlichting, 2014). Digital media is also represented, with a bias towards the study of platforms, particularly Twitter (Agin & Karlsson, 2021; Pearce et al., 2019).

In terms of topics, the literature has focused on public knowledge and beliefs about climate change, with a particular focus on the factors that influence the acquisition of knowledge and belief in the veracity of climate change (Cagle & Tillery, 2015; Chen et al., 2022; Eise et al., 2020). This trend has highlighted the importance of

understanding how public participation and knowledge acquisition can be influenced, but has left public action issues focused on adaptation and mitigation, as well as the analysis of government communication, in the background (Eise et al., 2020; Runhaar et al., 2018). Specifically, the review by Runhaar et al. (2018) focuses on integrating the scarce and fragmented empirical knowledge on effective climate adaptation.

Therefore, climate communication research is characterized by being a field of growing evolution. However, this evolution is geographically uneven. This field stands out for its interest in the media and the public. There is a prevailing focus on public knowledge and beliefs about climate change. However, there is less attention to issues of public action and government communication.

To our knowledge, all the reviews we have found have adopted a perspective not limited to the field of communication. Only the work of Jessica Eise and collaborators (2020) has established selection criteria that limit the reviewed documents to the specific area of communication studies to highlight trends within the field, the geographical origins of the studies, the method and the object of study. However, this review only used the search term “climate change” and as a parameter for selecting journals it used only those journals integrated into the American National Communication Association. As a result, the resulting corpus was limited to 160 articles.

The purpose of this study is to conduct a broader empirical examination than previous work on how the communication field has addressed the issue of climate change, using academic articles indexed in peer-reviewed communication journals as evidence from the field. The aim of this study is to characterise the dynamics of this scientific activity, identifying the most relevant authors, journals and documents and showing the most significant conceptual characteristics. To guide the structure of the research, we have posed the following questions:

RQ1: How has interest in climate change evolved in the field of communication studies?

RQ2: What are the most influential journals, researchers and publications in the field of climate change communication?

RQ3: What are the main bibliographical references of studies on climate change in communication?

RQ4: What are the topics of interest related to climate change in communication?

Table 1. Previous Reviews on Communication and Climate Change

Review	N	Period	Database	Objective of the Analysis	Key Limitations
(Schäfer & Schlichting, 2014)	133	1990s-2013	WoS along with the corpus of other reviews	Literature containing terms related to the phenomenon of climate change (climate change, global warming, greenhouse effect) along with different types of media (media, press, news, internet, web, online, television, radio broadcast, movie, film, cinema). In addition, it includes literature from the corpus of other reviews.	The search strategy combines climate terms with broad media descriptors (media, press, news, internet, television, radio, film, cinema), which risks capturing literature from fields beyond communication research. Partly relies on other reviews' corpora, potentially replicating their selection biases.
(Cagle & Tillery, 2015)	47	1990s-2014	Academic Search Premier	Literature on communication research and climate change in social sciences, risk analysis, and STEM journals that could support research in technical communication. The method used to locate the included journals is semi-systematic.	Very small N (47) limits representativeness. Semi-systematic selection reduces replicability. Restricts the communication field to STEM-adjacent and technical communication journals, excluding core communication outlets.
(Runhaar et al., 2018)	87	2004-2016	Scopus	Literature reporting on empirical analysis of climate adaptation practices.	Small N (87) and narrow focus on climate adaptation practices excludes the bulk of communication research on climate change, including media coverage, public understanding and science communication.

Review	N	Period	Database	Objective of the Analysis	Key Limitations
(Asmi et al., 2019)	1408	2000-2017	WoS (only SSCI)	Indexed literature in social sciences containing the term “climate change communication”	Restricted to WoS SSCI, systematically underrepresenting non-Western and non-English scholarship. The search term “climate change communication” as a fixed phrase likely excludes a substantial portion of relevant literature that does not use this exact formulation.
(Pearce et al., 2019)	35	2005-2017	Scopus, Google Scholar	Literature on social media and climate change. The documents were selected based on a combination of climate change or global warming and terms linked to specific social media and digital platforms.	Very small N (35) severely limits representativeness. Temporally restricted to 2005–2017, missing the rapid growth of social media research after 2018. Scope limited to social media platforms, leaving out the broader communication field.
(Eise et al., 2020)	160	Until Feb. 2019	National Communication Association	Literature on climate change in communication journals collected by the American National Communication Association.	Restricted to NCA-affiliated journals, introducing a strong U.S.-centric institutional bias. Small N (160) reflects this constraint. Uses only one search term (“climate change”), excluding global warming literature.
(Okoliko & de Wit, 2020)	48	1990-2019	WoS, Scopus, HER, SHE, AJS, EBSCOhost	Literature presenting empirical examinations of climate change communication in the African context	Geographically focused on the African context; findings are not intended to be generalizable beyond this regional scope.
(Agin & Karlsson, 2021)	407	1950-2018	WoS, Manual search	Literature on climate change or global warming that appears alongside terms related to communication. The results were supplemented with a manual search.	Despite the largest temporal coverage (1950–2018), reliance on WoS alone introduces geographic and linguistic biases. The manual supplementary search, while valuable, introduces subjectivity in source selection.
(Chen et al., 2022)	1175	2000-2021	WoS	Literature on scientific communication of climate change	WoS-only database restricts geographic and linguistic coverage. The focus on “scientific communication of climate change” narrows the scope, excluding research on political communication, entertainment media and digital platforms.
(Dhaher & Gümüş, 2022)	428	1985-2022 1915-2022	WoS (SCI and SSCI), CNKI	English and Chinese literature referring to “climate change communication.”	The search term “climate change communication” as a fixed phrase likely excludes a substantial portion of relevant literature that does not use this exact formulation.
(GuentherJ oerges, et al., 2023)	275	1996-2021	WoS, EBSCO	Specific literature on climate change and framing theory	Thematically restricted to framing theory, making it unsuitable as a general map of the field. Cannot account for the theoretical diversity — or lack thereof — of climate communication research as a whole.

METHODOLOGY

Systematic reviews are structured literature reviews with clearly defined inclusion and exclusion criteria.

Unlike a traditional review, a systematic review explicitly states a development protocol, whereby the researcher identifies and brings together relevant previous studies to answer a predefined research question (Gough et al., 2012, p. 7). It is crucial to clearly state the reasons behind these selection and analysis criteria in order to ensure transparency that ultimately seeks to demonstrate that the researcher's procedures for evaluating previous findings are rigorous and well-founded, limiting selection biases and favouring a more faithful representation of the field of study.

In order to build a representative corpus that will help us address the proposed research questions, we have chosen to include articles published in academic journals indexed in the area of communication within the two main bibliographic reference databases worldwide: Scopus and Web of Science. The boundaries of the communication field are thus defined operationally through the indexing criteria of these databases, which classify journals into subject categories based on their editorial scope and peer review standards. This approach avoids imposing an a priori theoretical definition of the discipline and instead relies on the consensus of the academic community as reflected in database classification. We have limited ourselves to articles from scientific and academic journals because they set the agenda for the field of research and have gone through the peer review process. In addition, the indexing system of the selected databases delimits the research that belongs to the area of communication. On the other hand, the use of Scopus and Web of Science ensures that the search is as exhaustive as possible and the results obtained are the most relevant within the academic circuit. Furthermore, since both databases do not contain exactly the same bibliographic references, their combination provides complementary results (Zhu & Liu, 2020).

We have chosen to include the two most frequent concepts to refer to an environmental change produced by human action: global warming and climate change (Fill & Penz, 2018, p. 279). According to Hermine Penz, both terms are used interchangeably in the research literature, although since the 2000s the allusion to climate change began to be used preferentially. However, although they are often used as equivalent concepts, they do not imply the same thing. Global warming implies a trend of increasing average global temperatures, while climate change refers to a change in global or regional weather patterns (Lineman et al., 2015).

It should be noted that related terms such as 'carbon footprint,' 'energy transition,' 'climate crisis,' or 'climate justice' were deliberately excluded from the search equation. While these concepts are adjacent to the phenomenon under study, their inclusion would have broadened the corpus beyond its intended scope — the communication of climate change as a scientific and societal issue — and would have introduced thematic heterogeneity that complicates systematic comparison. We acknowledge that this decision may exclude a portion of the literature that engages with the climate issue under alternative framings and encourage future studies to examine these complementary streams.

Therefore, we have built the search equation by referring to these two concepts, and we have parameterized it into title, abstract and keywords. We have not restricted our search to certain publication dates, languages or countries of origin. In this way, we have obtained all the documents that contained global warming or climate change in at least one of these three fields. Within this group, we compiled those articles published in academic journals indexed in the area of communication, both in Scopus as in the main collection of Web of Science. Since the last search was carried out in May 2024, the time limit was set at 2023, which represents the last full year available to obtain a representative sample of the updated scientific literature on the subject. The full results of each search are presented in **Table 2**.

Table 2. Articles on Climate Change or Global Warming in Communications Media	
Database	Number of Items
Scopus	1169
Web of Science	1223
Total	2392
Duplicates	771
Total (no duplicates)	1621

The bibliometric metadata obtained on the articles selected in both databases have been downloaded in BibTeX format and analysed with the R programming language through the Bibliometrix package, an open source tool for quantitative research in bibliometrics (Aria & Cuccurullo, 2017). Once the data was imported, the final result, after eliminating duplicates, was 1,621 documents that met the selection criteria detailed above.

RESULTS

The analysis of documents with Bibliometrix served to synthesize the findings of past research systematically, transparently and reproducibly on climate change and global warming in the field of communication studies. In particular, the results achieved in this process were the following:

Temporal Distribution

The results of this search covered a period from 1994, the first year in which there are records in the consulted databases, up to 2023 inclusive (**Figure 1**). Looking at the evolution of the number of articles per year, we can see that, until the late 2000s, climate change in communication studies received little attention from academics. However, since then, this area has experienced rapid growth in research.

This increase in the number of publications around 2008 has been mentioned in previous reviews (Chen et al., 2022; Comfort & Park, 2018). In terms of environmental communication in general, the review by Comfort and Park underscored a turning point in the dynamics of publications during this period and linked the trend with the appearance of the magazine in 2007 *Environmental Communication* (Comfort & Park, 2018). Denghang Chen and collaborators (2022) argue that in terms of climate change, that this watershed is attributed, on the one hand, to the acceptance of the anthropogenic environmental crisis that has led social scientists to explore ways to promote environmentally friendly behaviour. On the other, these authors offer an explanation based on the social construction of science: due to the existence of this environmental problem, more and more countries and organisations are showing greater concern, which has prompted researchers to pay attention to the communication of climate change.

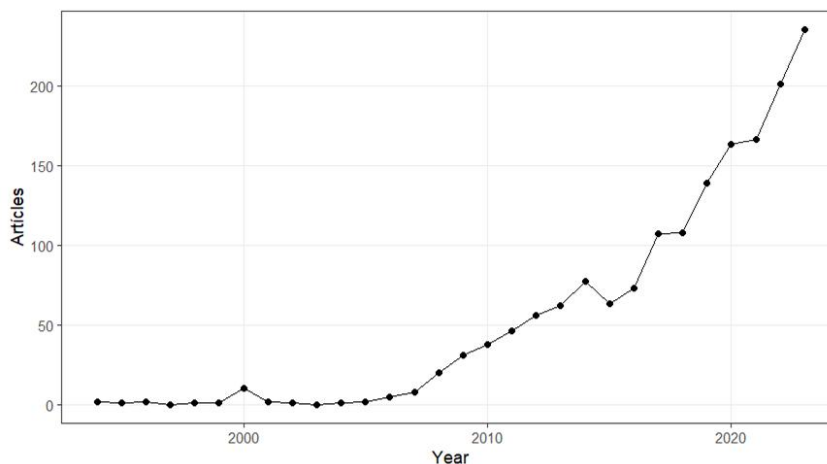


Figure 1. Evolution Over Time of Annual Publications on Climate Change or Global Warming in Communications Media

If the above data is compared with the evolution of the total scientific production of those articles that refer to climate change or global warming in Web of Science and Scopus, without filtering by a particular area of knowledge, we can see that the trend is very similar to what occurs in the field of communications (**Figure 2**). The reasons for this evolution are therefore related to a cross-cutting interest in climate change, regardless of the area of knowledge.

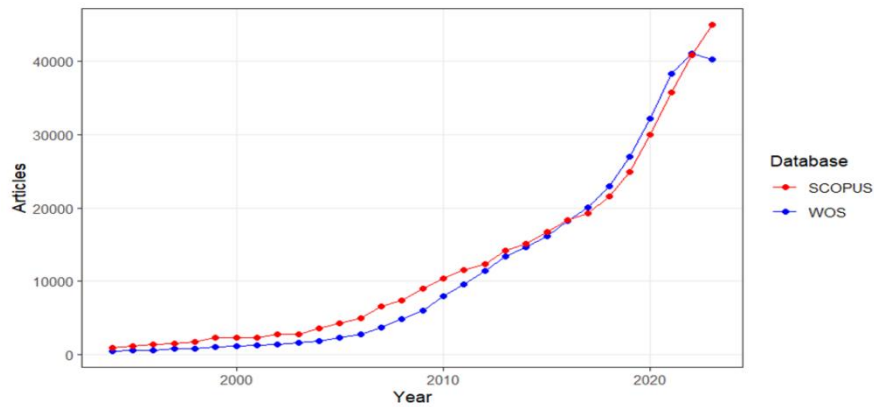


Figure 2. Evolution Over Time of Annual Publications on Climate Change or Global Warming Without Filtering By Area

Contextually, this watershed coincides with a popularization of the climate issue (Beattie et al., 2011), with mainstream content such as *An Inconvenient Truth* (2006), the award-winning educational documentary about the climate emergency. The protagonist of this film, Al Gore, along with the Intergovernmental Panel on Climate Change (IPCC), won the Nobel Peace Prize in 2007 for his work in disseminating knowledge about climate change.

In our understanding, the explosion in the number of scientific publications on climate change since 2008 reflects an epistemic turning point in global awareness of the anthropogenic environmental crisis, which can be seen beyond the academic sphere. The rise in this interest could be explained by a combination of the factors mentioned above; that is, by the connection between a cross-cutting interest in the climate issue, the consolidation of specific publication channels dedicated exclusively to this topic, the incentive from institutions and the popularization of the phenomenon.

Main Journals

The articles that make up the corpus are distributed in 281 journals indexed in communication in Web of Science as in Scopus. To identify the most relevant journals, we have applied Bradford's law, a bibliometric principle that allows us to estimate the degree of relevance of the journals that operate in an area of knowledge. According to the promoter of this model, Samuel Bradford, journals with a greater number of publications on a topic tend to establish a higher quality space in that area of knowledge. Thus, Bradford established that the number of journals in an academic discipline that contain a significant number of articles on a specific topic is inversely proportional to the number of journals that contain an increasing number of those articles. (Bradford, 1985). In other words, a small number of journals, which Bradford places in Zone 1, concentrate the majority of articles on a topic, while an increasing number of journals (Zone 2, Zone 3, etc.) will contain decreasing proportions of those articles. Applying this method to our corpus, four journals have been identified in Zone 1: *Environmental Communication* (268), *Public Understanding of Science* (145), *Science Communication* (79) and *Frontiers in Communication* (53). This means that these journals are particularly relevant and representative within academic research on climate change in the field of communications media.

Environmental Communication is linked to the International Environmental Communication Association and, of the four, is the most focussed on environmental issues. Its emergence in 2007 formally called for greater presence for this kind of academic research created by its rapid development in recent decades (Pleasant et al., 2002). Despite being a relatively new journal, its production represents 16.5% of the total publications in the corpus, leading the ranking. Next we find *Public Understanding of Science* and *Science Communication*, which occupy second and third place respectively, and their productions represent approximately 9% and 5% of the total. Neither journal includes climate change as its exclusive field of interest, they tackle science in general and have similar objectives. Nevertheless, *Public Understanding of Science* is interested in a wide range of processes on the interrelation between science and the public, which do not necessarily involve the field of communication studies, while *Science Communication* places communication at the heart of its research. Finally, we discovered the journal *Frontiers in Communication*, representing 3.2% of the total corpus. Of the four featured journals, this is the most generalist. Although it does not focus exclusively on science and the environment, it does have a specific section dedicated to these topics.

Main Authors and Collaboration Structure

There is a clear trend for authors to collaborate and co-author articles of communication research and climate

change. Although 34% of the articles are written by a single author, the majority (66%) are co-authored, with an average of 2.37 authors per article, a figure in line with the proportion of authors in social sciences and communication (Henriksen, 2016; Santos et al., 2023; Thelwall & Maflahi, 2022).

Within the corpus, 2,853 authors are identified, of which 2,358, 82%, appear in only one article and 281, 9.8%, appear in only two articles. Therefore, 214 authors, representing 8.2% of the total, authored more than two articles. This high percentage of one-off authors implies a high turnover in the field of study, which could be due to the diversity of perspectives and disciplines that converge in the study of climate change. On the other hand, a list of the authors with the highest number of publications can be seen in **Figure 3**.

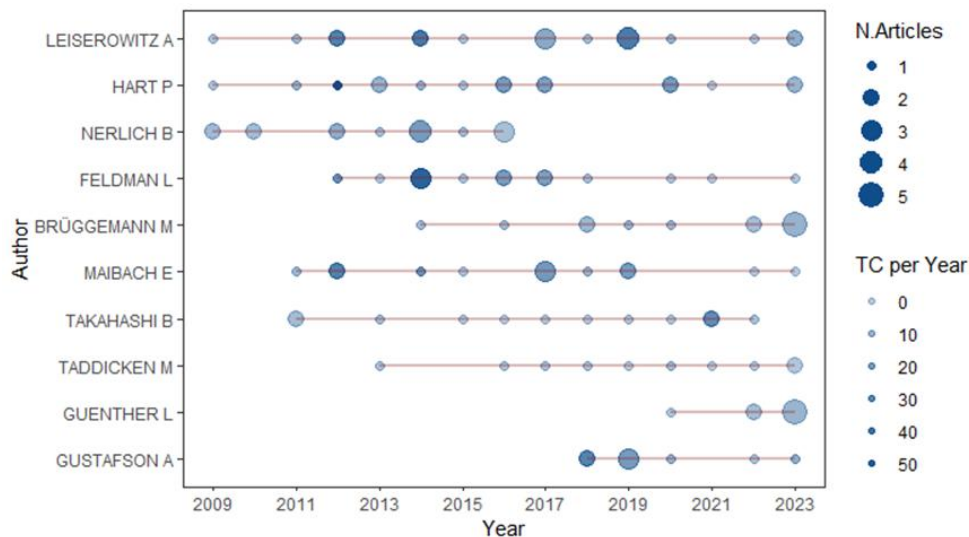


Figure 3. Production of the Ten Authors with the Most Publications Over Time

Beyond the quantitative ranking of authors, a closer reading of their contributions reveals distinct intellectual traditions within the field. The cluster around Leiserowitz, Hart, Feldman and Maibach can be broadly characterised as a psychographic tradition — associated with Yale's Program on Climate Change Communication — which prioritises audience segmentation, attitudinal measurement and experimental designs to understand how publics process climate information. A second cluster, centred around Brüggemann and Guenther at the University of Hamburg, represents a media sociology tradition, foregrounding journalistic practices, media framing and the comparative analysis of climate coverage across national contexts. A third, more dispersed group including Nerlich applies critical discourse analysis, attending to the linguistic and ideological dimensions of climate representation in media texts. These intellectual lineages reflect not merely methodological preferences, but deeper assumptions about what climate communication research is for and what questions it should prioritise.

An analysis of the collaboration network between the main authors (**Figure 4**) shows the configuration of academic relationships and the most relevant nodes of the discipline. In this case, the co-authorship relationships show a main group formed precisely by the authors with the most publications. In particular, Anthony Leiserowitz stands out significantly, indicating his centrality and influence within the network. Associated with him are researchers such as Philip Hart, Lauren Feldman, Edward Maibach and Abel Gustafson, all of them among the ten authors with the highest number of publications. As lines of research, this group of authors uses a quantitative methodology to study issues related to media impact, journalistic coverage, behaviour and attitudes towards climate change, and the politicization of this phenomenon in the United States.

Among the most relevant results of this cluster, the link between climate and political polarization stands out. Views on climate change and climate mitigation have become a key identity marker for American Republicans and Democrats. This means political partisans employ motivated reasoning when exposed to climate change messages, moderating the effects of the information according to their ideological predispositions (Hart & Nisbet, 2012). On the one hand, studies of media coverage have revealed increasingly politicized representations (Chinn et al., 2020) and patterns of ideological bias in how the media reports on climate change (Feldman et al., 2017). Specifically, the results point to how conservative media tend to downplay threats from climate change and try to highlight the inefficiency of measures to combat it, while non-conservative media present it in a more urgent and realistic way (Feldman et al., 2012). As a result, this differential coverage results in the consumption of conservative media

reducing certainty about global warming and support for mitigation policies, while the consumption of non-conservative media has the opposite effect (Carman et al., 2022; Feldman et al., 2014, 2017; Feldman & Hart, 2016; Hmielowski et al., 2014).

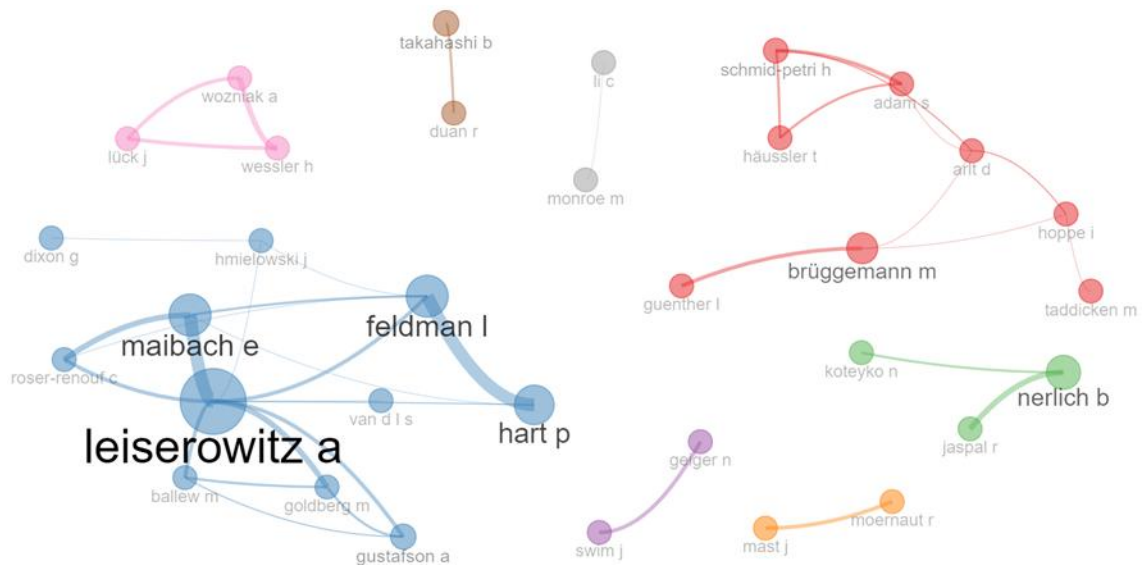


Figure 4. Collaboration Network of the Main Authors

NB. The methodology used to build the collaboration network between authors is based on normalization by association to measure the strength of co-authorships based on the 50 authors with the most collaborations. The Walktrap algorithm was used for community detection, removing isolated nodes to improve graph clarity.

The network structure shows other prominent authors, such as Brigitte Nerlich and Michael Brüggemann, located in distinct groups with independent connections. Nerlich, currently Emeritus Professor of Science, Language and Society at the University of Nottingham, has focused her research on various areas of study related to communication and media representations of climate change through critical discourse analysis. The result of her work, in collaboration with other authors, reveals how the language of the media (Jaspal et al., 2016; Jaspal & Nerlich, 2014; Nerlich & Jaspal, 2012) and the strategic discourses of certainty and uncertainty in science (Collins & Nerlich, 2016a, 2016b) shape public understanding of climate change, influencing both public perception and policy decisions.

On the other hand, Brüggemann, a professor at the University of Hamburg, has focused his research on media coverage of climate change and its evolution, as well as the different approaches used (Brüggemann & Engesser, 2014; Engesser & Brüggemann, 2016; Guenther et al., 2022; Guenther, Joerges, et al., 2023). His work, in collaboration with other influential authors such as Lars Guenther, demonstrates that media coverage of climate change tends to be temporally, socially and geographically distant (Guenther, Meyer, et al., 2023; Guenther & Brüggemann, 2023).

These three intellectual traditions — the audience-centred approach of the Yale cluster, the media sociology perspective of the Hamburg group, and the critical discourse analysis represented by Nerlich and collaborators — coexist within the field, pointing to a productive theoretical pluralism, though also to the risk of parallel conversations that rarely cross-fertilise.

Most Cited Articles and References

To see what literature with the greatest impact in the area, we have taken as a criterion the number of citations provided by the analysed databases. The most cited articles reflect the various facets of contemporary climate communication and show at least two main lines of research: on the one hand, the construction and presentation of information and, on the other, the understanding and taking of action by the public.

An important strand of research focuses on how information and frameworks are constructed and presented in news coverage of climate change. Along these lines, Craig Trumbo's seminal article (1996) provides a revealing empirical content analysis. Trumbo shows that scientists tend to associate themselves with frames that highlight the problems and causes of climate change, while politicians are more closely tied to frameworks that emphasize judgements and solutions. This study also shows a decline in the use of scientists as news sources as the topic

becomes more politicised.

For their part, the work of Weingart and collaborators (2000) complements this perspective by suggesting the existence of discursive dynamics specific to the scientific, political and media spheres. Her research, which analyses communication about global warming in Germany between 1975 and 1995, uses discourse analysis methodology to explore how perceptions of climate change evolved over time and how the issue became a priority on the German political agenda. The study highlights that each sphere has its own rules and discursive practices, which influence the way climate change is communicated and understood.

Along the same lines, Anabela Carvalho (2007) examines the influence of ideological cultures on media discourse on scientific knowledge of climate change. Through an examination of British news, Carvalho argues that the discursive (re)construction of scientific claims in the media is strongly intertwined with ideological views. Thus, the legitimisation system implemented by the particular ideologies of each media outlet acts as a crucial selection device to determine what is considered scientific news, what are the relevant facts and who are the authorised actors for such scientific matters. Also in this trajectory is Feldman's article (2012) that studies differential coverage from a comparative perspective between conservative and non-conservative media in America, an issue that has already been mentioned above.

Another line of research focuses on the public's understanding of the climate phenomenon and its adoption of action, particularly in relation to new technologies Bord et al. (2000) study public understanding of climate change, while Hart and Nisbet (2012) analyse feedback effects in scientific communication. This latest article highlights how motivated reasoning and identity cues can polarise opinions on mitigation policies. In relation to public action, Segerberg and Bennett (2011) research the role of Twitter in the organisation of climate protests, showing how digital platforms facilitate the mobilisation and coordination of collective actions. Añón Higón et al. (2017) offer a global perspective on how information and communications technologies (ICT) can promote environmental sustainability. O'Neill and Nicholson-Cole (2009) explore how visual representations can foster positive engagement with climate change, countering fear and apathy. Bennett and Segerberg (2011) also analyse how digital media personalise collective action, an aspect relevant not only in climate protests but also in global economic ones.

Table 3. Articles in the Corpus with the Most Citations

Author	Title	Citations
O' Neill & Nicholson-Cole, 2009	“ Fear Won't Do It ” : Promoting Positive Engagement With Climate Change Through Visual and Iconic Representations	774
Hart & Nisbet, 2012	Boomerang Effects in Science Communication: How Motivated Reasoning and Identity Cues Amplify Opinion Polarization About Climate Mitigation Policies	724
Carvalho, 2007	Ideological cultures and media discourses on scientific knowledge: re-reading news on climate change	507
Segerberg & Bennett, 2011	Social Media and the Organization of Collective Action: Using Twitter to Explore the Ecologies of Two Climate Change Protests	454
Weingart et al., 2000	Risks of communication: discourses on climate change in science, politics, and the mass media	443
Bord et al., 2000	In what sense does the public need to understand global climate change?	417
Añón Higón et al., 2017	ICT and environmental sustainability: A global perspective	366
Bennett & Segerberg, 2011	Digital Media and the Personalization of Collective Action: Social technology and the organization of protests against the global economic crisis	353
Feldman et al., 2012	Climate on Cable: The Nature and Impact of Global Warming Coverage on Fox News, CNN, and MSNBC	326
Trumbo, 1996	Constructing climate change: claims and frames in US news coverage of an environmental issue	321

Furthermore, we have analysed the references of all the articles in the corpus to identify the literature that is most frequently referred to in publications on climate change communication (Table 4). We detected that, for the most part, the most referenced articles are those that deal with the concepts of framing (Entman, 1993; Nisbet, 2009), information balance (Boykoff & Boykoff, 2004, 2007) and ideological polarisation (Hulme, 2009). These articles have been instrumental in the development of the field of climate change communication, providing

theoretical frameworks, methodologies and empirical data that have helped to understand how climate change is communicated.

Maxwell Boykoff and Jules Boykoff have researched how journalistic norms, such as balance and impartiality, influence media coverage of climate change in the United States. False balance has been seen as a journalistic practice in which, precisely following journalistic procedure, two sides of a debate are presented as if they were equally valid, even when the scientific consensus overwhelmingly favours one position. In such a context, these practices can distort public perception of the scientific consensus and hinder effective political action in the face of this global problem (Boykoff & Boykoff, 2004, 2007).

Table 4. Most Cited References in the Articles of the Corpus

Author	Title	Citations
(Boykoff & Boykoff, 2004)	Balance as bias: global warming and the US prestige press	146
(Entman, 1993)	Framing: Toward Clarification of a Fractured Paradigm	119
(Carvalho, 2007)	Ideological cultures and media discourses on scientific knowledge: re-reading news on climate change	113
(Nisbet, 2009)	Communicating Climate Change: Why Frames Matter for Public Engagement	112
(Boykoff & Boykoff, 2007)	Climate change and journalistic norms: A case-study of US mass-media coverage	101
(Carvalho & Burgess, 2005)	Cultural Circuits of Climate Change in U.K. Broadsheet Newspapers, 1985 – 2003	78
(Boykoff, 2011)	Who Speaks for the Climate?: Making Sense of Media Reporting on Climate Change	68
(Schmidt et al., 2013)	Media attention for climate change around the world: A comparative analysis of newspaper coverage in 27 countries	63
(Hulme, 2009)	Why We Disagree about Climate Change: Understanding Controversy, Inaction and Opportunity	60
(Gamson & Modigliani, 1989)	Media Discourse and Public Opinion on Nuclear Power: A Constructionist Approach	57

Thematic and Conceptual Structure

The evolution of the keywords in the corpus reveals interesting trends in the frequency and timing of their use, as well as apparent significant shifts in emerging approaches and concepts (Figure 5). The term "climate change" emerges as central and predominant, to the detriment of previous terms such as "global warming." Likewise, "climate communication" and "climate change communication" are more relevant than "environmental communication." This phenomenon reflects a greater awareness and focus on global climate impact, evidenced also by the more recent emergence of terms such as "sustainable development" and "anthropocene," which underline a concern for the role of human activity on the environment. At the same time, the evolution of media has seen a shift towards digital environments, where social media, particularly Twitter, have gained prominence over the study of traditional media such as newspapers.

Furthermore, the growing relevance of concepts such as "public engagement", "activism" and "climate activism" reflects a change in public attitude towards greater involvement and direct mobilization. This shift can be interpreted as a response to the perceived inadequacy of government policies and institutional actions to address climate change, motivating individuals and groups to take on more active roles in promoting sustainable solutions and lobbying for political and corporate change. And consequently, greater attention from academia to understand and explain this phenomenon.

Furthermore, the emergence of "Covid-19" in the analysis from 2021 onwards highlights how global events can temporarily redirect academic focus. The pandemic has reshaped priorities, but it has also shown the interconnection between public health and the environment, reinforcing the need for holistic approaches in managing global crises

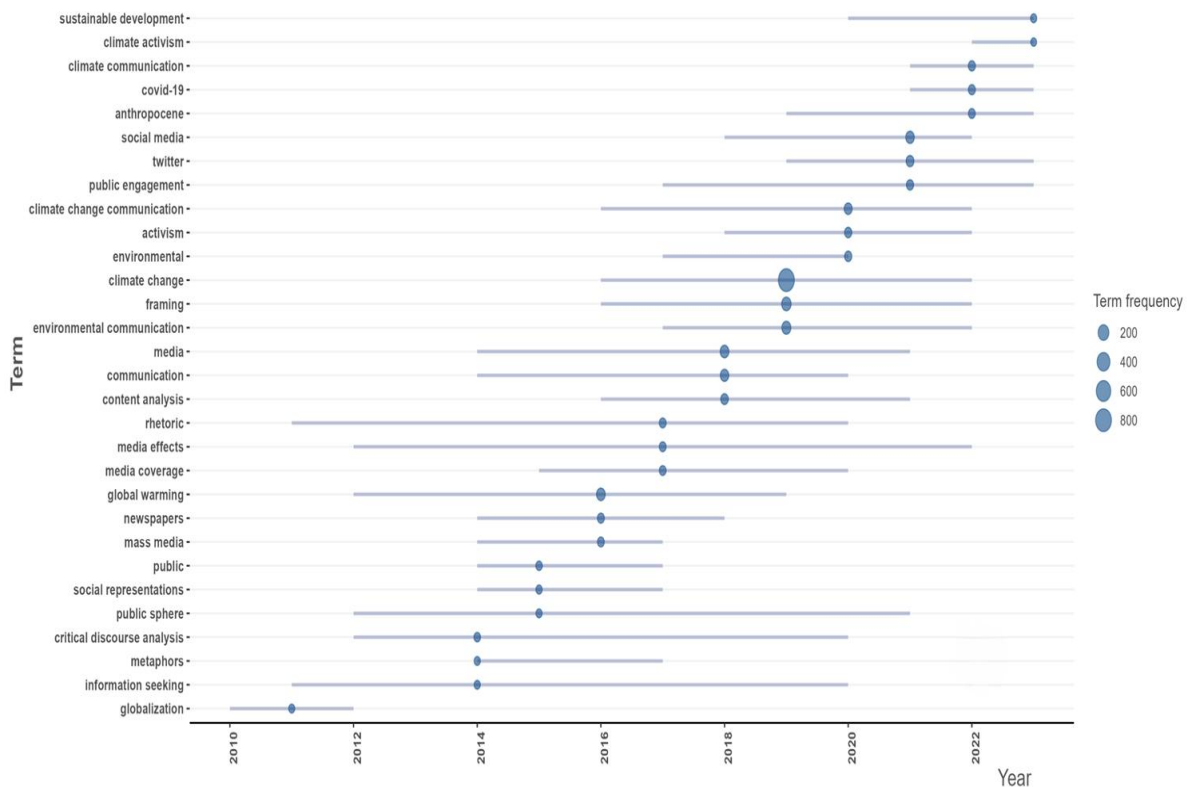


Figure 5. Evolution in the Use of Keywords

To present a thematic classification of these terms, we have developed, based on Bibliometrix, a diagram that organises keywords into four groups (Aria et al., 2020). The basic idea behind this map (**Figure 6**) is to represent the relationship between terms that frequently appear together in the literature. This is achieved by a co-occurrence matrix where each cell outside the main diagonal indicates the similarity between two terms in how many times they appear together in publications. These matrices are interpreted as undirected weighted networks, and through community detection algorithms, such as the simple hub algorithm, highly connected groups of terms representing specific research topics are identified. The results are visualised in a thematic diagram, where the X axis indicates the relevance of the topic in the entire collection of articles, while the Y axis reflects the degree of development of the topic.

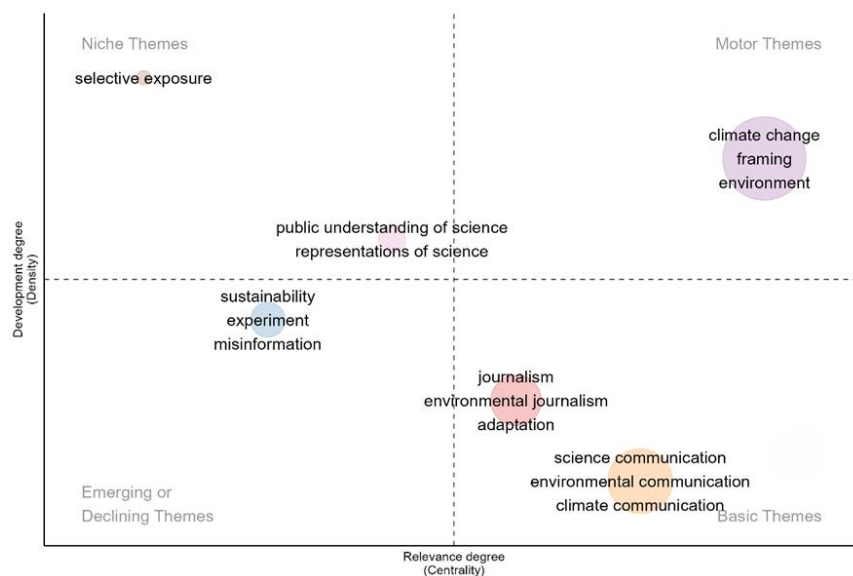


Figure 6. Thematic Map

The graph allows us to identify four thematic typologies, according to their location in the quadrants:

(1) Motor themes, located in the upper right quadrant, which implies high development and importance. In this quadrant we find a cluster that represents central terms such as climate change and environment. The emergence of the concept of “framing” in this group is explained by its importance in the study of how climate change is presented and perceived in the media and in public opinion. Its presence is consistent with the fact that one of the most recurrent citations is the article by Robert Entman, which is an argument about how communication studies could serve to synthesize the disparate uses of the concept of frame (Entman, 1993), and confirms a finding observed in previous reviews that had a different methodology and sample (Agin & Karlsson, 2021; Dhaher & Gümüş, 2022; Hansen, 2011).

(2) Basic and transversal themes, located in the lower right-hand quadrant, indicating that they are important for the domain and cross various research areas. This group includes two thematic clusters that refer to the journalistic profession and specific communication on climate change. This connection is in line with observations from previous reviews that have noted that environmental communication is frequently intertwined with scientific communication, which addresses the flow of information from scientists to audiences and vice versa, with the media as the conduits (Comfort & Park, 2018).

(3) Emerging or declining themes, which are located in the lower left-hand quadrant, underdeveloped due to their recent incorporation or because they are out of the spotlight. In this case, we find three emerging concepts: sustainability, experiments and misinformation. The idea of sustainability has become mainstream in recent years with the rise in public awareness of the need for sustainable practices and the interest of academics to understand and promote this trend. The concept of experiment shows how this area of communication is adhering to this research method. And finally, the emergence of ‘misinformation’ is explained by the increase in disinformation and the academic interest in this phenomenon in recent years.

(4) Niche topics, located in the upper left quadrant, well developed internally, but with limited external relevance to the field. Two thematic groups are located along this line. The first refers to the idea of selective exposure, which expresses how people selectively expose themselves to information consistent with their prior beliefs. The second group is dedicated to understanding how climate change is perceived by the public. The persistence of these topics in the niche quadrant — well developed internally but disconnected from the field's central debates — warrants critical reflection.

After three decades of research, one might expect that foundational questions about how audiences select, process and evaluate climate information would have migrated to motor theme status. Their continued marginalization may suggest that the sub-communities working on these issues have developed self-referential research cultures that do not dialogue with the broader field, or that the field as a whole has not yet successfully integrated audience-centred perspectives into its theoretical mainstream. Either way, the fact that selective exposure and public perception remain peripheral after 30 years points to a structural gap that future research should seek to address.

CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

This study offers a systematic and reproducible map of how communication research has addressed climate change over the last three decades, identifying the main journals, authors, theoretical frameworks and thematic trends within the field. The results confirm the growing consolidation of climate change as a research topic in communication studies, while also revealing structural patterns that deserve critical attention: a predominance of quantitative methods, a concentration around framing theory as the dominant theoretical framework, and a persistent geographic bias towards Western contexts.

While we acknowledge that this is a limited sample due to the exclusion of books related to environmental communication, it provides us with a picture of the peer-reviewed literature in academic journals. Since there are numerous academic reviews of environmental communication in books, a future study could review this research as a complement to the present study.

Taking into account the transversality of a topic such as climate change (Agin & Karlsson, 2021) and the complexity of the field of communications (Craig, 1999), we accept as a possible limitation that the findings, including systematic reviews, are distributed across multiple research areas and disciplinary traditions. This implies that there could be enriching results that fall outside the search criteria we have proposed.

Addressing the Western-centric bias of the field requires more than increasing the geographical coverage of future studies; it demands a theoretical recalibration. Framing theory — the dominant paradigm in this corpus — was largely developed in the context of pluralist, liberal democratic media systems. Its application to non-Western political contexts, where state-media relations, collective identity and risk perception operate under different structural logics, requires critical adaptation rather than direct transplant. Similarly, concepts such as selective exposure or public engagement with climate change may need to be reconceptualised when applied to media environments characterised by restricted press freedom, oral communication cultures or communal rather than individualist models of public discourse. Future research should engage with postcolonial communication frameworks and the growing body of climate communication scholarship emerging from Latin America, Sub-Saharan Africa, and South and Southeast Asia. Concretely, a Global South Research Agenda for climate communication could prioritise three directions: the development of context-sensitive theoretical frameworks that do not assume Western media structures; the inclusion of non-English-language sources in systematic reviews; and North-South collaborative research designs that avoid reproducing extractive knowledge dynamics.

FUNDING

This study is part of the project "Pseudoscience, conspiracy theories, fake news and media literacy in health communication - HEALTHCOMM", funded by the Ministry of Science, Innovation and Universities, Government of Spain, grant ID PID2022-142755OB-I00 (2023 - 2027).

REFERENCES

- Agin, S., & Karlsson, M. (2021). Mapping the Field of Climate Change Communication 1993–2018: Geographically Biased, Theoretically Narrow, and Methodologically Limited. *Environmental Communication*, 15(4), 431–446. <https://doi.org/10.1080/17524032.2021.1902363>
- Akerlof, K. L., Timm, K. M. F., Rowan, K. E., Olds, J. L., & Hathaway, J. (2022). The Growth and Disciplinary Convergence of Environmental Communication: A Bibliometric Analysis of the Field (1970–2019). *Frontiers in Environmental Science*, 9, 814599. <https://doi.org/10.3389/fenvs.2021.814599>
- Anderson, A. (2009). Media, Politics and Climate Change: Towards a New Research Agenda. *Sociology Compass*, 3(2), 166–182. <https://doi.org/10.1111/j.1751-9020.2008.00188.x>
- Añón Higón, D., Gholami, R., & Shirazi, F. (2017). ICT and environmental sustainability: A global perspective. *Telematics and Informatics*, 34(4), 85–95. <https://doi.org/10.1016/j.tele.2017.01.001>
- Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Aria, M., Misuraca, M., & Spano, M. (2020). Mapping the Evolution of Social Research and Data Science on 30 Years of Social Indicators Research. *Social Indicators Research*, 149(3), 803–831. <https://doi.org/10.1007/s11205-020-02281-3>
- Asmi, F., Anwar, M. A., Zhou, R., Wang, D., & Sajjad, A. (2019). Social aspects of ‘climate change communication’ in the 21 st century: A bibliometric view. *Journal of Environmental Planning and Management*, 62(14), 2393–2417. <https://doi.org/10.1080/09640568.2018.1541171>
- Beattie, G., Sale, L., & McGuire, L. (2011). An inconvenient truth? Can a film really affect psychological mood and our explicit attitudes towards climate change? *Semiotica*, 2011(187). <https://doi.org/10.1515/semi.2011.066>
- Bennett, W. L., & Segerberg, A. (2011). Digital Media and the Personalization of Collective Action: Social technology and the organization of protests against the global economic crisis. *Information, Communication & Society*, 14(6), 770–799. <https://doi.org/10.1080/1369118X.2011.579141>
- Bord, R. J., O'Connor, R. E., & Fisher, A. (2000). In what sense does the public need to understand global climate change? *Public Understanding of Science*, 9(3), 205–218. <https://doi.org/10.1088/0963-6625/9/3/301>
- Boykoff, M. T. (2011). *Who Speaks for the Climate?: Making Sense of Media Reporting on Climate Change* (1st ed.). Cambridge University Press. <https://doi.org/10.1017/CBO9780511978586>
- Boykoff, M. T., & Boykoff, J. M. (2004). Balance as bias: Global warming and the US prestige press. *Global Environmental Change*, 14(2), 125–136. <https://doi.org/10.1016/j.gloenvcha.2003.10.001>
- Boykoff, M. T., & Boykoff, J. M. (2007). Climate change and journalistic norms: A case-study of US mass-media coverage. *Geoforum*, 38(6), 1190–1204. <https://doi.org/10.1016/j.geoforum.2007.01.008>
- Bradford, H. (1985). Sources of information on specific subjects. *Journal of Information Science*, 10(4), 176–180. <https://doi.org/10.1177/016555158501000407>
- Brüggemann, M., & Engesser, S. (2014). Between Consensus and Denial: Climate Journalists as Interpretive Community. *Science Communication*, 36(4), 399–427. <https://doi.org/10.1177/1075547014533662>
- Burroughs, W. J. (2007). *Climate change: A multidisciplinary approach* (2nd ed). Cambridge University Press.
- Cagle, L. E., & Tillery, D. (2015). Climate Change Research Across Disciplines: The Value and Uses of Multidisciplinary Research Reviews for Technical Communication. *Technical Communication Quarterly*, 24(2), 147–163. <https://doi.org/10.1080/10572252.2015.1001296>
- Carman, J. P., Lacroix, K., Goldberg, M. H., Rosenthal, S., Gustafson, A., Howe, P., Marlon, J., & Leiserowitz, A. (2022). Measuring Americans’ Support for Adapting to ‘Climate Change’ or ‘Extreme Weather.’ *Environmental Communication*, 16(5), 577–588. <https://doi.org/10.1080/17524032.2022.2087709>
- Carvalho, A. (2007). Ideological cultures and media discourses on scientific knowledge: Re-reading news on climate change. *Public Understanding of Science*, 16(2), 223–243. <https://doi.org/10.1177/0963662506066775>
- Carvalho, A. (2010). Media(ted)discourses and climate change: A focus on political subjectivity and (dis)engagement. *WIREs Climate Change*, 1(2), 172–179. <https://doi.org/10.1002/wcc.13>
- Carvalho, A., & Burgess, J. (2005). Cultural Circuits of Climate Change in U.K. Broadsheet Newspapers, 1985–2003. *Risk Analysis*, 25(6), 1457–1469. <https://doi.org/10.1111/j.1539-6924.2005.00692.x>
- Chen, D., Guo, Y., Wang, C., Xu, Y., & Zhang, H. (2022). Dispersion and Disparity: Bibliometric and Visualized Analysis of Research on Climate Change Science Communication. *International Journal of Environmental Research and Public Health*, 19(23), 15766. <https://doi.org/10.3390/ijerph192315766>

- Chinn, S., Hart, P. S., & Soroka, S. (2020). Politicization and Polarization in Climate Change News Content, 1985–2017. *Science Communication*, 42(1), 112–129. <https://doi.org/10.1177/1075547019900290>
- Collins, L. C., & Nerlich, B. (2016a). How certain is ‘certain’? Exploring how the English-language media reported the use of calibrated language in the Intergovernmental Panel on Climate Change’s Fifth Assessment Report. *Public Understanding of Science*, 25(6), 656–673. <https://doi.org/10.1177/0963662515579626>
- Collins, L. C., & Nerlich, B. (2016b). Uncertainty discourses in the context of climate change: A corpus-assisted analysis of UK national newspaper articles. *Communications*, 41(3). <https://doi.org/10.1515/commun-2016-0009>
- Comfort, S. E., & Park, Y. E. (2018). On the Field of Environmental Communication: A Systematic Review of the Peer-Reviewed Literature. *Environmental Communication*, 12(7), 862–875. <https://doi.org/10.1080/17524032.2018.1514315>
- Cox, R., & Depoe, S. (2022). Emergence and growth of the field of environmental communication. In R. Cox & A. Hansen (Eds.), *The Routledge Handbook of Environment and Communication* (2nd Edition, pp. 13–32). Routledge.
- Craig, R. T. (1999). Communication Theory as a Field. *Communication Theory*, 9(2), 119–161. <https://doi.org/10.1111/j.1468-2885.1999.tb00355.x>
- Dhaher, C. N. D., & Gümüş, A. (2022). Lessons from Media-Centered Climate Change Literature. *Sustainability*, 14(3), 1404. <https://doi.org/10.3390/su14031404>
- Eise, J., Lambert, N. J., Adekunle, T., Eversole, K., Eise, L., Murphy, M., & Sprouse, L. (2020). Climate Change Communication Research: A Systematic Review. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3683832>
- Engesser, S., & Brüggemann, M. (2016). Mapping the minds of the mediators: The cognitive frames of climate journalists from five countries. *Public Understanding of Science*, 25(7), 825–841. <https://doi.org/10.1177/0963662515583621>
- Entman, R. M. (1993). Framing: Toward Clarification of a Fractured Paradigm. *Journal of Communication*, 43(4), 51–58. <https://doi.org/10.1111/j.1460-2466.1993.tb01304.x>
- Feldman, L., & Hart, P. S. (2016). Using Political Efficacy Messages to Increase Climate Activism: The Mediating Role of Emotions. *Science Communication*, 38(1), 99–127. <https://doi.org/10.1177/1075547015617941>
- Feldman, L., Hart, P. S., & Milosevic, T. (2017). Polarizing news? Representations of threat and efficacy in leading US newspapers’ coverage of climate change. *Public Understanding of Science*, 26(4), 481–497. <https://doi.org/10.1177/0963662515595348>
- Feldman, L., Maibach, E. W., Roser-Renouf, C., & Leiserowitz, A. (2012). Climate on Cable: The Nature and Impact of Global Warming Coverage on Fox News, CNN, and MSNBC. *The International Journal of Press/Politics*, 17(1), 3–31. <https://doi.org/10.1177/1940161211425410>
- Feldman, L., Myers, T. A., Hmielowski, J. D., & Leiserowitz, A. (2014). The Mutual Reinforcement of Media Selectivity and Effects: Testing the Reinforcing Spirals Framework in the Context of Global Warming. *Journal of Communication*, 64(4), 590–611. <https://doi.org/10.1111/jcom.12108>
- Fill, A., & Penz, H. (Eds.). (2018). *The Routledge handbook of ecolinguistics*. Routledge.
- Gamson, W. A., & Modigliani, A. (1989). Media Discourse and Public Opinion on Nuclear Power: A Constructionist Approach. *American Journal of Sociology*, 95(1), 1–37. <https://doi.org/10.1086/229213>
- Gough, D., Oliver, S., & Thomas, J. (Eds.). (2012). *An introduction to systematic reviews*. SAGE.
- Guenther, L., & Brüggemann, M. (2023). Not here, not now, not me: How distant are climate futures represented in journalistic reporting across four countries? *Journal of Science Communication*, 22(05). <https://doi.org/10.22323/2.22050201>
- Guenther, L., Brüggemann, M., & Elkobros, S. (2022). From Global Doom to Sustainable Solutions: International News Magazines’ Multimodal Framing of our Future with Climate Change. *Journalism Studies*, 23(1), 131–148. <https://doi.org/10.1080/1461670X.2021.2007162>
- Guenther, L., Joerges, S., Mahl, D., & Brüggemann, M. (2023). Framing as a Bridging Concept for Climate Change Communication: A Systematic Review Based on 25 Years of Literature. In *Communication Research*. SAGE PUBLICATIONS INC. <https://doi.org/10.1177/00936502221137165>
- Guenther, L., Meyer, H., Kleinen-von Königsłow, K., & Brüggemann, M. (2023). A Distant Threat? The Framing of Climate Futures Across Four Countries. *Environmental Communication*, 17(7), 775–793. <https://doi.org/10.1080/17524032.2023.2253500>
- Hansen, A. (2011). Communication, media and environment: Towards reconnecting research on the production, content and social implications of environmental communication. *International Communication Gazette*, 73(1–2),

7–25. <https://doi.org/10.1177/1748048510386739>

Hart, P. S., & Nisbet, E. C. (2012). Boomerang Effects in Science Communication: How Motivated Reasoning and Identity Cues Amplify Opinion Polarization About Climate Mitigation Policies. *Communication Research*, 39(6), 701–723. <https://doi.org/10.1177/0093650211416646>

Henriksen, D. (2016). The rise in co-authorship in the social sciences (1980–2013). *Scientometrics*, 107(2), 455–476. <https://doi.org/10.1007/s11192-016-1849-x>

Hmielowski, J. D., Feldman, L., Myers, T. A., Leiserowitz, A., & Maibach, E. (2014). An attack on science? Media use, trust in scientists, and perceptions of global warming. *Public Understanding of Science*, 23(7), 866–883. <https://doi.org/10.1177/0963662513480091>

Hulme, M. (2009). *Why We Disagree about Climate Change: Understanding Controversy, Inaction and Opportunity* (1st ed.). Cambridge University Press. <https://doi.org/10.1017/CBO9780511841200>

Jaspal, R., & Nerlich, B. (2014). Fracking in the UK press: Threat dynamics in an unfolding debate. *Public Understanding of Science*, 23(3), 348–363. <https://doi.org/10.1177/0963662513498835>

Jaspal, R., Nerlich, B., & Van Vuuren, K. (2016). Embracing and resisting climate identities in the Australian press: Sceptics, scientists and politics. *Public Understanding of Science*, 25(7), 807–824. <https://doi.org/10.1177/0963662515584287>

Lineman, M., Do, Y., Kim, J. Y., & Joo, G.-J. (2015). Talking about Climate Change and Global Warming. *PLOS ONE*, 10(9), e0138996. <https://doi.org/10.1371/journal.pone.0138996>

McCright, A. M., O'Shea, B. W., Sweeder, R. D., Urquhart, G. R., & Zeleke, A. (2013). Promoting interdisciplinarity through climate change education. *Nature Climate Change*, 3(8), 713–716. <https://doi.org/10.1038/nclimate1844>

Moser, S. C. (2010). Communicating climate change: History, challenges, process and future directions. *WIREs Climate Change*, 1(1), 31–53. <https://doi.org/10.1002/wcc.11>

Nerlich, B., & Jaspal, R. (2012). Metaphors We Die By? Geoengineering, Metaphors, and the Argument From Catastrophe. *Metaphor and Symbol*, 27(2), 131–147. <https://doi.org/10.1080/10926488.2012.665795>

Nisbet, M. C. (2009). Communicating Climate Change: Why Frames Matter for Public Engagement. *Environment: Science and Policy for Sustainable Development*, 51(2), 12–23. <https://doi.org/10.3200/ENV.51.2.12-23>

Okoliko, D. A., & de Wit, M. P. (2020). Media(ted) Climate Change in Africa and Public Engagement: A Systematic Review of Relevant Literature. In *African Journalism Studies* (Vol. 41, Issue 1, pp. 65–83). ROUTLEDGE JOURNALS, TAYLOR & FRANCIS LTD. <https://doi.org/10.1080/23743670.2020.1770114>

Olausson, U., & Berglez, P. (2014). Media and Climate Change: Four Long-standing Research Challenges Revisited. *Environmental Communication*, 8(2), 249–265. <https://doi.org/10.1080/17524032.2014.906483>

O'Neill, S., & Nicholson-Cole, S. (2009). “Fear Won’t Do It”: Promoting Positive Engagement With Climate Change Through Visual and Iconic Representations. *Science Communication*, 30(3), 355–379. <https://doi.org/10.1177/1075547008329201>

Pearce, W., Niederer, S., Özkula, S. M., & Sánchez Querubín, N. (2019). The social media life of climate change: Platforms, publics, and future imaginaries. *WIREs Climate Change*, 10(2), e569. <https://doi.org/10.1002/wcc.569>

Pleasant, A., Good, J., Shanahan, J., & Cohen, B. (2002). The literature of environmental communication. *Public Understanding of Science*, 11(2), 197–205. <https://doi.org/10.1088/0963-6625/11/2/306>

Runhaar, H., Wilk, B., Persson, Å., Uittenbroek, C., & Wamsler, C. (2018). Mainstreaming climate adaptation: Taking stock about “what works” from empirical research worldwide. *Regional Environmental Change*, 18(4), 1201–1210. <https://doi.org/10.1007/s10113-017-1259-5>

Santos, E. A. D., Peroni, S., & Mucheroni, M. L. (2023). An analysis of citing and referencing habits across all scholarly disciplines: Approaches and trends in bibliographic referencing and citing practices. *Journal of Documentation*, 79(7), 196–224. <https://doi.org/10.1108/JD-10-2022-0234>

Schäfer, M. S., & Schlichting, I. (2014). Media Representations of Climate Change: A Meta-Analysis of the Research Field. *Environmental Communication*, 8(2), 142–160. <https://doi.org/10.1080/17524032.2014.914050>

Schmidt, A., Ivanova, A., & Schäfer, M. S. (2013). Media attention for climate change around the world: A comparative analysis of newspaper coverage in 27 countries. *Global Environmental Change*, 23(5), 1233–1248. <https://doi.org/10.1016/j.gloenvcha.2013.07.020>

Segerberg, A., & Bennett, W. L. (2011). Social Media and the Organization of Collective Action: Using Twitter to Explore the Ecologies of Two Climate Change Protests. *The Communication Review*, 14(3), 197–215. <https://doi.org/10.1080/10714421.2011.597250>

Senecah, S. L. (2007). Impetus, Mission, and Future of the Environmental Communication Commission/Division:

- Are We Still on Track? Were We Ever? *Environmental Communication*, 1(1), 21–33. <https://doi.org/10.1080/17524030701334045>
- Thelwall, M., & Maflahi, N. (2022). Research coauthorship 1900–2020: Continuous, universal, and ongoing expansion. *Quantitative Science Studies*, 3(2), 331–344. https://doi.org/10.1162/qss_a_00188
- Trumbo, C. (1996). Constructing climate change: Claims and frames in US news coverage of an environmental issue. *Public Understanding of Science*, 5(3), 269–283. <https://doi.org/10.1088/0963-6625/5/3/006>
- Weingart, P., Engels, A., & Pansegrau, P. (2000). Risks of communication: Discourses on climate change in science, politics, and the mass media. *Public Understanding of Science*, 9(3), 261–283. <https://doi.org/10.1088/0963-6625/9/3/304>
- Zhu, J., & Liu, W. (2020). A tale of two databases: The use of Web of Science and Scopus in academic papers. *Scientometrics*, 123(1), 321–335. <https://doi.org/10.1007/s11192-020-03387-8>