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Searching for climate change consensus in broadsheet newspapers. Editorial policy and public opinion

Abstract

The premise behind this paper is that, in order to reach social consensus on climate change, there must be consensus on the media first. This research study focuses on the search for consensus values in the editorial discourses of five proven influential broadsheet newspapers in their context and internationally, such as *The Guardian*, *Le Monde*, *El País*, *Frankfurter Allgemeine Zeitung* and *The New York Times*. These newspapers have published 535 opinion editorials on climate change over a 14-year period: from the Kyoto Summit in 1997 to the Durban Climate Change Conference in 2011. The methodology involves both frames and quantitative analyses. This research aims to detect the main actors and factors that influence editorial discourse, as politics and economic sources are most likely to be predominant (H₁), and draw lines of possible consensus among the different media analysed (H₂). The analysis shows how the political and economic connotations in editorial discourses were sometimes to the detriment of scientific and expert discourse, and the differences among countries. However, the research also underscores essential positions in common, such as the acceptance of climate change and its anthropogenic origin, or the criticism of the states' inability to reach joint solutions to the problem.

Keywords

Climate change, scientific and social consensus, political communication, editorial values.

1. Introduction

The scientific consensus on climate change exists. The Intergovernmental Panel on Climate Change has established in its most recent reports (4th Report in 2007 and 5th Report in 2014) the predictions of the last decades: human action is the leading cause of climate change. Scientific consensus already permeates the political discourse, as politicians can hardly ignore what is becoming a tangible reality, except for some groups linked to climate sceptics. As president of the United States—a country that refused to sign the Kyoto Protocol at first—

Barack Obama took a significant step forward in this respect in his last term in office and drew up a plan to reduce pollutant emissions from power stations (August 2015). Even the Catholic Church, in the first encyclical of Pope Francis: *Laudato sí* (2015) encourages correcting the model of economic growth and fighting against climate change. Most recently, the Paris Conference (COP21), held in December 2015, reached an agreement ratified by 195 participating countries, whose primary aim was to keep the global temperature rise this century “well below” 2 degrees Celsius and to limit the temperature increase even further to 1.5 degrees Celsius above pre-industrial levels. However, the denialist Donald Trump policy on climate change is threatening these advances. In November 2012, Trump tweeted: “The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive”. In August 2017, as President, he decided to combat the threat of global warming by forbidding the use of the term, which was first introduced in 1975 by scientist Wallace S. Broecker (1975, p. 460). The current situation requires greater media activity to alert the public opinion about the problem.

Despite progress in other areas, the main perception of climate change in the media is still questioned, as the message conveyed remains very much associated with political and economic constraints. This is an issue many authors have advised about and is identified in this study. The study conducted by Carvalho and Burguess (2005, p. 1985) revealing how the press is closely linked to political power regarding the environmental issue is worthy of highlight in this respect. The political manipulation of the reality constructed by the media contributes to holding back a social consensus.

In this scenario, it is critical to ascertain whether scientific consensus on climate change—considering this consensus as the acceptance of the scientific agreements of the IPCC Reports—can be transferred to the media or, at least, if there are coincident positions or common views that can encourage such transfer. The media plays a crucial role in the interaction between science, politics and public opinion (Boykoff, 2008, p. 11), and the achievement of a social consensus. Moreover, the problems surrounding climate change should be addressed more profoundly in the media, for being a useful instrument to raise social awareness and the first step towards taking action (Arcila *et al.*, 2015). This study, therefore, focuses on analysing the editorial discourses of five broadsheet newspapers: *The Guardian*, *Le Monde*, *El País*, *Frankfurter Allgemeine Zeitung* and *The New York Times*. These newspapers represent a necessary research area to correctly measure the importance the media give to climate change and fight for a solution to this problem.

2. Theoretical framework

There are grounds to believe that the public acquires almost all their scientific knowledge through the media (Nelkin, 1987) and that the media is a powerful tool to attract attention on specific issues and suggest topics to consider or even influence how people feel about matters (Lang & Lang 1981; McCombs, 2006). Specifically, the media can sway what people perceive as important (Dearing & Rogers, 1996), so that, in the search for a social consensus, the importance attributed by the media to a particular topic will be decisive for individuals (Noelle-Neumann, 1974), e.g. the importance attributed to climate change. Therefore, to reach a social consensus on climate change, there must be a consensus on the media first. Their messages should not be contradictory or confusing because, as McCombs (2012) said, “People highly exposed to one medium of communication also tend to be highly exposed to other media” (p. 7).

The influence of the media in shaping public opinion and raising awareness of a problem is undeniable (Rice, 2007; Nisbet, 2007). An evident example is the situation arising from the climate change denial campaigns in the US. McCright and Dunlap (2003, p. 348) and

Pooley (2010) argue that these campaigns, many of which developed through the media, have played a crucial role in blocking legislation in the US and contributed towards this country being perceived as an obstacle to international environmental policies. These campaigns, among other factors, explain the social resistance to a problem that has traditionally been invisible (Marx *et al.* 2007, p. 47; Monbiot, 2007) or confusingly presented in the media. Even today, some studies indicate that only 52 % of US citizens are concerned about climate change (Yale University, 2015). Political communication seems vital because it helps individuals to connect their predispositions to specific policies (Linde, 2017, p. 543).

While the media played an unclear role, scientific consensus reached a unanimous position over the last few years. Doran and Zimmermann (2009) demonstrated this evolution through their studies, after a period of criticism of other authors' research, especially of Oreskes (2004, p. 1686), whose analysis of 928 research abstracts was criticised for overstating the consensus and not capturing the full diversity of scientific opinion. A new quantification by Zimmerman (2008) evidenced the existence of such consensus. However, during those years, a contrast appeared between the growing scientific consensus and the image of controversy and uncertainty generated by the media due to excessive focus on climate sceptics (Antilla, 2005, p. 338). Messages characterised by argumentative confrontation, a lack of commitment and circumscribed to the spectacle of nature, very different to the clearest vision of scientific consensus (Díaz Nosty, 2009, p. 99) were also broadcast. Unfortunately, ambiguous, wrong and even sometimes contradictory arguments often caused more uncertainty than certainty (McCright *et al.*, 2003; Carvalho, 2007, p. 223; Boykoff, 2008).

The confrontation detected in the media might have been one of the reasons for IPCC experts to recommend the imposition of scientific consensus over the isolated opinions of climate sceptics on the media through their 4th Report (2007). They considered it essential to prevent these opinions from acquiring the same importance as the dominant scientific reference in media audiences, since ignoring or undervaluing scientific consensus entails the risk of conditioning, confusing and misinforming the public (Shanahan & Nisbet, 2002). Mike Shanahan (2007) stated that, when "scientific uncertainty" is enhanced, the view of those who do not want to change their approach is reinforced, whereas the emphasis of "national security" could bring those same individuals to action.

Communication is an integral element of human development (Hamelink, 2003, p. 121; Filho, 2006), hence the importance and need to learn about the intricacies of the process between the discovery of a finding by a scientific source and the broadcast of such discovery by the media. Many studies highlight the severe shortcomings detected in the construction of messages regarding climate change, especially those that subordinate scientific findings to political events (Boykoff & Roberts, 2007).

Other essential deficiencies must also be stressed in this research study, such as the shortage of expert sources (Rice, 2007; Nisbet, 2007) and a large number of marginal sources outside the scientific consensus (Weaver, 2003, p. 91; Ward, 2008). Both can be found in the construction of the editorial discourse, as confirmed by the data of this study.

These shortcomings in the construction of the message, together with the printed media's link to political power regarding the environmental issue, question the effectiveness of the media in contributing to a proper disclosure of the climate change problem and seeking social consensus. Therefore, the main aim of this research is to ascertain the editorial position of the media analysed herein. The hypothesis is that the scientific evidence has not yet managed to put an end to an editorial discourse influenced by economic and political lobbies. This position was also reported in other research (Carvalho & Burgess, 2005, p. 1985; McKewon, 2012; Blanco-Castilla *et al.*, 2013, p. 420).

2.1. Editorial Influence

Editorials have not been the subject matter of many studies despite the vital role they play in defining the discourse and setting priorities on the public agenda (McCombs, 1997, p. 433). Moreover, most studies are set in their structure (Bolívar, 1994; Tirkkonen-Condit, 1996; Hawes & Thomas, 1996), their content (Hackett & Zhao, 1994; Van Dijk, 1996; Le, 2002, p. 373) or in the information sources that support their argumentation, even when these sources are considered key players in the structure in terms of position and influence.

This study agrees with Charaudeau (1997) in that the urgency of editorials requires selecting the most appropriate sources to endow the text with authority, to the extent that the mere presence of outside sources, without any criterion, does not provide authority or credibility per se. Moreover, in editorials, the use of outside sources has proven to support the subjective opinion of the media, thus reinforcing the chosen approach and the main points of argumentation (Le, 2010, p. 239).

Research must, therefore, deepen into the relationship between press and power, mainly in what concerns political and economic power (Firmstone, 2008, p. 212) and into how this relationship influences the construction of the press message. Habel (2012, p. 257) states that the media focus their editorials depending on politicians' ideological position, a conclusion also reached by Day & Golan (2005, p. 61) in their study based on the *The New York Times* and *The Washington Post* editorials.

Advancing into the editorial knowledge is also important because it is the only place in the newspaper where the institutional opinion of the media is officially presented and identified in its own format: "The editorial defines the ideology and hierarchies of newspapers, reveals their level of tolerance and exposes them to their readers with the risks involved in taking sides" (León Gross & Blanco-Castilla, 2009, p. 602).

McCombs (2006) reminds us that it is precisely editors and directors who draw our attention and influence our perception of the most critical issues. However, there is a threat that the editorial bias might be extrapolated to the news, as the appropriate separation between information and opinion is vulnerable here (Druckman & Parkin, 2005, p. 1030; Kahn & Kenney, 2002, p. 381). Moreover, the ideology of each information source is often a differentiating factor between climate change discourses and, as McKewon (2012) states, this is especially the case in the denialism promoted by the media "supporting the core values of right-wing politics" and "opposing the supervision of industry and regulations".

Back in 2009, Boykoff already advised that climate change was the most strongly politicised scientific issue of the new millennium and, as a consequence, opinion editorials are the perfect stand for polarisation to take part and induce biased dynamics. The media consensus is, therefore, necessary. Its influence would help in the fight against climate change, significantly enhancing it with joint editorial practices in times of environmental crisis or uncertainty regarding the climate change problem. It is not a utopia. There are important precedents in matters considered of general interest, involving four newspapers subject matter of this analysis. For instance, a joint editorial experience took place with the publication of the WikiLeaks papers among *El País*, *The New York Times*, *The Guardian* and *Le Monde*.

There are also relevant precedents regarding climate change: the largest joint editorial display occurred after the Copenhagen Conference. On 7 December 2009, 56 newspapers in 45 countries and 20 languages took the unprecedented step of speaking with one voice through a joint editorial. *The Guardian* drafted the text involving more than a month of consultations with editors from more than 20 different newspapers. Three of these newspapers are part of this study: *The Guardian*, *El País* and *Le Monde*.

At the information level, there is also a prominent recent example. Twenty-five news organisations from all over the world, led by *El País* and *The Guardian*, and with the

participation of *Le Monde* and *Frankfurter Allgemeine* created a new network for editors to help cover the climate change. The World Editors Network coordinated this project aimed at improving the information spread about this problem given the UN Climate Conference (COP21).

The last two examples prove that the media, albeit with some shortcomings, contributed towards spreading the word of the climate change problem and showed some concern on the issue. By analysing their editorial discourse and identifying their constraints, the potential points of convergence and common grounds, there was more to learn more about the potential to walk with one voice to an unequivocal position of the ongoing fight against climate change. Bord *et al.* (2000, p. 205) emphasise that accurate knowledge is required for translating public concern for climate change into practical action. This would facilitate social consensus being the main social pressure tool against political power.

3. Research strategy: framing and quantitative analysis

This research is based on the analysis of editorial values from five newspapers with a proven influence in their environment and even internationally. The chronological study began at the Kyoto Summit in December 1997, which triggered a high presence of contents related to climate change in the media. The research covers until December 2011, when the United Nations Climate Change Conference (COP17) was held in Durban, South Africa, from 28 November to 11 December 2011 to establish a new treaty to limit carbon emissions. This extended period of analysis coincides with the last major economic crisis, which captured most of the media's attention to the detriment of other contents. The chosen newspapers were selected based on two important criteria: a) their influence in their countries of origin, due to their broadcast both in their paper and online versions, and b) the joint editorial practice of several of these newspapers, which allowed reinforcing the hypothesis of the existence of consensus values that might raise a collective voice on climate change.

Frames are crucial elements for the combined methodology used in this research, even when relevant quantitative aspects have also been considered in the analysis cards. The analysis cards aim to: a) detect potential interference (of political and economic powers, mainly) in the editorial values by identifying the main actors that influence the discourse, as there are reasons to believe that politics and economic sources are predominant (H_1), and b) draw lines of possible consensus among the different media analysed (H_2).

The definition of frames given by Gitlin (1980) is considered relevant here: "principles of selection, emphasis and presentation composed of little tacit theories about what exists, what happens and what matters". As Tuchman (1978) states, different text elements serve to underscore some ideas and conceal others. Framing involves selecting some ideas or aspects of a perceived reality and making them more salient so that their analysis shows the influence that the transfer of information and opinion has on human consciousness. According to Entman:

Framing essentially involves selection and salience. To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described. Frames, then, define problems—determine what a causal agent is doing with what costs and benefits, usually measured in terms of shared cultural values; diagnose causes—identify the forces creating the problem; make moral judgements—evaluate causal agents and their effects; and suggest remedies—offer and justify treatments for the problem and predict their likely effects. (original emphasis) (Entman, 1993, p. 55)

We have developed a text-based analysis, where frames have been coded manually. This methodological strategy identified the editorial importance of climate change in the analysed media and unveiled the hidden intention of presenting an argumentation linked to political and economic interests, mainly at the expense of scientific argumentation. Within the categories studied, the analysis yielded highly significant results regarding the credibility given to the actual existence of climate change, the importance given to scientific messages and the ability to find consensus values.

A frame links two concepts. After exposure to this linkage, the intended audience should be able to accept the connection between the concepts. Reframing the relevance of the climate change can generate the level of public engagement required for policy action. Successfully reframing climate change means remaining true to the underlying science of the issue, while applying research from communication and other fields to adapt messages to the existing attitudes, values, and perceptions of different audiences, making the complex policy debate understandable, relevant, and personally meaningful. Messages need to be fitted to a specific medium and audience to break through the communication barriers of human nature, political polarisation and media fragmentation. Messages should contain carefully researched metaphors, allusions, and examples that trigger a new way of valuing climate change. If individuals are presented with an ambiguous or uncertain situation to consider, the different ways in which a message is presented or framed can result in very different responses, depending on the terminology used to describe the problem or the visual context provided in the text. (Nisbet, 2009, p. 12).

The cards designed for this analysis include quantitative analysis variables, which are critical to ascertain the degree of interest in the problem and to describe the main actors and sources involved. Krippendorff (1990 and 2004) considered the content analysis as an objective, systematic and quantitative description technique, whose effectiveness in analysing media content has been sufficiently proven. The analysis includes measuring the credibility given to the scientific approach to the climate change. Climate change has been observed to become a more central topic the editorials both if it has a protagonist or a secondary role. One of the primary variables considered are the sources cited in the text. The sources that support the editorial (economic, political, scientific...) have been identified. All quantitative measures are contextualised for each country, considering the leading political party in the government and the moment they were published.

The sample was selected by using the following words as key locators: “climate change”, “global warming” and “greenhouse effect”. It is worth noting that *Frankfurter Allgemeine* has no “editorials”. Instead, it has a team of prestigious firms, each of which is related to a topic and fully identified with the newspaper’s opinion. The authors of this research thought it would be interesting to add the editorial line of a newspaper that is openly liberal, thus contrary to state intervention in the economy. The sample was made up of 535 editorials that faced the climate change problem, whether as a central or collateral subject. From these, 39 were published in *Le Monde*, 73 in *El País*, 74 in *Frankfurter Allgemeine*, 170 in *The New York Times* and 179 in *The Guardian*.

4. Results

With regards to quantitative results from the editorial analysis (table 1), the most significant analysis is the one that shows the degree of credibility that each newspaper gives to climate change, according to whether it accepts the scientific consensus on the topic or not. Data show a clear stance on the certainty of climate change, which has been reinforced in the last few years, almost unanimously: 94.2 % of editorials accept climate change and focus on human action as the leading cause. Two newspapers maintain a firm stand on this subject: both *The Guardian* and *Le Monde* believe that climate change is real and evidenced in 100 %

of their editorials without exception. The most significant differences come from German and Spanish newspapers. At *El País*, the denial of climate change accounted for 10.9% of their editorials, although it is aligned with scientific consensus in 72.6%. At *Frankfurter Allgemeine*, mainly until 2003, the denial option accounted for 8.1%. In the *NYT*, this percentage dropped to 2.9%.

Table 1. Acceptance of Climate Change

Newspapers	Total Editorials	Negation	Neutrality	Acceptance
<i>El País</i>	73	8	12	53
<i>Frankfurter Allgemeine</i>	74	6		68
<i>Le Monde</i>	39			39
<i>New York Times</i>	170	5		165
<i>The Guardian</i>	179			179
Global Data	535	19	12	504

Another important aspect of the research is the degree of interest of each newspaper on climate change, based on the number of editorials published and how they address the problem, i.e. whether as a central or collateral subject (table 2). In this vein, the leading newspaper is *The Guardian*, with 179 texts, followed by *The New York Times*, with 170. The other newspapers do not reach a hundred editorials on the topic. A particularly striking case is *Le Monde*, which only published 39, although all of them on the front page, which gives both the editorial and the climate change problem more visibility.

The problem is addressed as a central issue in 69.5% of the analysed texts and is used as an argument for related issues in the remaining 30.5%. Specifically, *Le Monde* gives greater centrality to the problem, along with *El País* and *The Guardian*.

Table 2. Climate Change focus on the editorial discourse

Newspapers	Total Editorials	Collateral issue (%)	Main focus (%)
<i>El País</i>	73	15 (20.5)	58 (79.5)
<i>Frankfurter Allgemeine</i>	74	33 (44.5)	41 (55.5)
<i>Le Monde</i>	39	3 (8.0)	36 (92.0)
<i>New York Times</i>	170	75 (44.2)	95 (55.8)
<i>The Guardian</i>	179	37 (20.7)	142 (79.3)
Global Data	535	173 (30.5)	362 (69.5)

Frame analysis has focused on the newspapers that can help the most to establish a consensus on the editorial policy. As a consequence, this research has deepened into the study of their attitude towards the government policy, the intrusion of political and economic factors in the construction of their arguments and the search for solutions,

mainly. Results showed considerable differences among newspapers, but also outstanding common features.

It is noteworthy that one of the most widely used frameworks (all the frames used in this research can be observed in table 3) refers to the critical attitude of these newspapers towards the government policy on climate change—regarding different affairs but with a critical underlying attitude—whose average value reached 16.3%. This attitude is most common in *Le Monde* and *El País* newspapers. Whereas the former represents 25.2% of the total, the latter reaches 19%. As for the remaining newspapers, this value, while still relevant, is relegated to fourth or fifth place. Specifically, the *Frankfurter Allgemeine* newspaper was the least combative with the government action (10.19%).

Table 3. Most used frames on the editorial discourse (in %)

Frames	<i>El País</i>	<i>Le Monde</i>	<i>The Guardian</i>	<i>Frankfurter Allgemeine</i>	<i>New York Times</i>	Average Values
Criticises the attitude of governments	19.0	25.2	15.63	10.19	11.5	16.3
Disagreement between political agents on CC	13.6	13.5	15.94	17.2	17.6	15.5
Showing ecologic consequences on CC	9.0	12.6	11.25	7.64	16.2	11.3
CC as an argument for economic policy	3.0	0.9	23.44	19.11	5.0	11.3
Actions of governments and companies vs. CC	13.60	13.5	9.38	2.55	15.3	10.8
Provide measures to fight against CC	5.49	8.1	10.63	7.01	13.8	9.0
Showing economic consequences on CC		4.5	23.44	8.92	6.4	8.2
Analysing a disaster as a CC consequence	3.7	3.6	0.94	1.91	0.6	2.15

Further on this critical attitude, the biggest concern of the media was found to be the disagreement between politicians and, in particular, the refusal to take joint measures to combat climate change. This is the second average value (15.5%) and one of the most represented frames in all the newspapers. In their editorial speech, they unequivocally criticise politicians' inability to reach common ground. They do so almost unanimously, with only 4% difference between the one that criticises the most and the one that does so the least.

The New York Times repeats this frame the most (17.60%), although there are two clearly-distinct stages in the discourse of this newspaper: A first stage, until 2008, where they blamed the insistence of President Bush to deny climate change and not act on it due to a lack of agreement, even when Democrats asked him to act; and the second stage, from

November 2008, when Barack Obama was elected president of the United States. In this case, the disagreement becomes global and evident in its editorial speech, with emphasis on the struggle between the two axes formed by the US and Europe on the one hand and China and India (sometimes also Brazil) on the other.

The *Frankfurter Allgemeine* stands closely behind (17.20 %) due to its interest in geopolitics, summit analyses regarding the role of Germany (and Europe) and the blocks formed in the negotiations. *The Guardian* remains in third place with 15.94 %, while *El País* (13.6 %) and *Le Monde* (13.5 %) show very similar figures. They are not overly convincing, however, when it comes to defending, in a specific way, joint actions to be taken. In this case, the two English newspapers show a greater global awareness. *The New York Times* repeats this topic the most on its front page (13.8 %) and does not stick to the government level, but involves companies and social partners, too. *The Guardian* follows with 10.63 %. *El País* stands at the other end with 5.49 %.

The media interest in the environmental consequences of climate change is another important factor that can shed light on the editorial policy. In this respect, *The New York Times* pays most attention to this (16.2 %), doubling other newspapers. It is particularly concerned about the melting of the poles, especially in the Arctic, and species in danger of extinction or already extinct, like the Canadian maple, officially extinct from 2010. In like manner, it presents heat waves as a result of climate change and warns that these phenomena will increase if the problem is not solved.

At the other end of the spectrum is the *Frankfurter Allgemeine* (7.64 %). The front page of the German journal barely pays any attention at all to the environmental consequences and even shows a clear trend to downplay natural phenomena and their connection to climate change in the early years. However, when data is about the economic consequences of climate change, the interest of this newspaper grows (8.92 %) and does so, even more, when climate change is put forward as an argument of economic policy (up to 19.11 %). In *The Guardian*, the data referred to the economic impact is especially relevant (23.44 %).

Overall, the editorial policies of the media analysed do not associate natural disasters with climate change, as this is one of the least represented arguments: the average value is only 2.15 %. They are a bit more active in providing measures to combat climate change (9 %), but not enough, and not based on solvent scientific opinions.

4.1. The Use of Sources

One of the aims of this study is to identify the sources that support media's editorials, due to the importance given to scientific sources as elements for consensus value (table 4). However, the presence of sources is not equally significant in each of these media. There is a clear division between Mediterranean newspapers, where the average number of sources is 0.35, which means that one-third of the editorials on climate change is not supported by any source, compared to the 2 average sources in the three Anglo-Saxon newspapers.

Regarding the most used sources in the editorial discourse, the analysis shows that these are the political ones, as 41.1 % of them belong to the political field, followed by economy, which involves 25.1 % of them. Thus, political and economic sources represent 66.2 % of the sources, which translates into an explicit domain of the editorial discourse of these newspapers. As an exception, *Le Monde* is the only one in which scientific sources are equivalent in number to political sources. *El País* stands out as the one using the least political sources.

Anglo-Saxon newspapers show very similar data when compared to each other, even when the percentage of sources used was significantly higher. In all three, the political sources are the most used sources, especially in the case of *The New York Times*, which reports 49.6 %. *The New York Times* is followed, in order, by the *Frankfurter Allgemeine*, with

39% and *The Guardian* with 38.5%. In the second place for sources, the three daily newspapers opt for economy, outstanding the *Frankfurter Allgemeine*, with 31.2%. Another coincidence is that scientific sources are relegated to third place in importance, and finally, environmentalists are the least valued in the editorial discourse. One curious case is the German journal, which quotes them the most (11.3%), but many of these references are negative.

Table 4. Type of sources used on editorial discourse

Newspapers	Total	Politicians (%)	Economists	Scientists	Ecologists
<i>El País</i>	23	2 (8.6)	1 (4.3)	18 (78.9)	2 (8.6)
<i>Frankfurter A</i>	143	55 (39.0)	44 (31.2)	26 (18.4)	18 (11.3)
<i>Le Monde</i>	17	7 (41.1)	2 (12.0)	7 (41.1)	1 (5.7)
<i>New York Times</i>	302	150 (49.6)	64 (21.2)	62 (20.5)	26 (8.5)
<i>The Guardian</i>	353	136 (38.5)	99 (28.1)	82 (23.3)	36 (10.2)
Global Data	838	350 (41.1)	210 (25.5)	195 (23.3)	83 (5.8)

Once the type of sources and their hierarchy has been ascertained, the next step was to discover how many editorials had at least one scientific source (table 5). All newspapers present a very low threshold, below 50%. The one that comes closest to this threshold is *The Guardian*, which has at least one scientific source in 45.9% of its editorials on climate change, followed by *The New York Times* (36.5%), *Frankfurter Allgemeine* (35.2%), *El País* (24.7%) and, in the last place, *Le Monde*, with only 17.9%.

The quality and adequacy of the scientific sources used are also relevant (table 5). Each newspaper has very different features, especially with regards to quoting sources. At *El País*, most references are considered of low quality, as they overuse the term “expert” (11 out of 18, that is 61.1%), without adequately quoting any name or origin. The reference to public bodies—of which the IPCC is the most quoted—stands in the second place with 33.3%.

At the other end of the spectrum is *The New York Times*. More than half of the references to experts and scientists are correctly identified and refer to a public organisation (53.2%). The most quoted is the United States Environmental Protection Agency. *Frankfurter Allgemeine* also stands out for adequately citing experts from public bodies.

Meanwhile, *The Guardian* has most scientific references and greatest diversity with a total of 82 of which 39% correspond to individual scientists like Nicholas Stern, the economist behind a report that will be later known by his name, commissioned by the Blair government. The second most represented category is grouped under the term “experts” (24.3%) and is considered as the lowest quality in this study. The third place is for public institutions with the IPCC as their main expert source cited.

Table 5. Expert sources quotes and description

Newspapers	Non-identified experts (%)	Individual scientist	Public Body	Private Body	University	Global Data
<i>El País</i>	11 (61.1)	1 (5.6)	6 (33.3)			18
<i>Frankfurter A.</i>		5 (71.4)	2 (28.6)			7
<i>Le Monde</i>	7 (26.9)	7 (26.9)	10 (38.4)	1 (3.8)	1 (3.8)	26
<i>New York Times</i>	4 (6.4)	9 (14.5)	33 (53.2)	14 (22.5)	2 (3.2)	62
<i>The Guardian</i>	20 (24.3)	32 (39.0)	15 (18.2)	6 (7.3)	9 (10.9)	82

4.2 Differences between Mediterranean and Anglo-Saxon media

The five newspapers have a critical attitude towards their governments regarding the implemented environmental policy and the inability to find solutions together. An important fact is that most editorial activity occurs when the governing parties are progressive and active in their environmental policies. On the contrary, when the governing parties are conservative, the editorial presence on climate change is dramatically reduced, reaching levels like *Le Monde*, with only 39 editorials published in 14 years. The apathy of conservative parties towards this matter and the shortage of news might explain this result.

These newspapers are more interested in political disagreement on climate change and the lack of solutions from states than the specific measures that could be implemented. They do not discuss measures nor opt for any particular one. Only in the last years of the study, a small inclination towards renewable energy was perceived. In any case, this is a little-represented frame that gives away that the media focus more on political polarisation than on finding solutions. Unlike the two English newspapers, which show a greater global awareness, the *Frankfurter Allgemeine* sticks to its liberal ideological line of defence of non-state intervention and in favour of fighting climate change through private initiative.

The analysis of the sources used by these newspapers shows that politicians are the most represented in the editorial discourse, except for *Le Monde*, where political and expert scientific sources are similar in number, and *El País*. Consequently, the presence of scientific sources, considered as the best-qualified voice addressing the climate change problem, has a very low threshold face, less than 50% in the five newspapers. In general, a greater presence of expert opinions is found in the Anglo-Saxon media than in the Mediterranean media. *The Guardian*, *New York Times* and *Frankfurter Allgemeine* all exceed 35%, while *El País* and *Le Monde* are below 25%. The low presence of expert sources as a discursive resource indicates that journals prefer the pure ideological discourse, in line with their editorial standard.

A more detailed snapshot of the five newspapers in the use of expert sources shows a clear division between Anglo-Saxon and Mediterranean influence, although quantity and quality do not always go hand in hand. In this regard, *The Guardian* is the paper that registers the most references (82), but nearly a quarter of them are of meagre quality and keep quoting the so-called "experts", without further detail. This makes *The New York Times* feature the best discourse with regards to these sources, with a clear prevalence of public organisations. There are only four references to "the experts" (6.4%). Private companies and scientific experts from scientific organisations represent 22.6% of the total. On the other hand, the *Frankfurter Allgemeine* also bases its expert sources on public organisations (38.4%), mainly by using IPCC reports, but the percentage of unidentified sources is also very high: the references to "the experts" reached 26.9%.

However, the situation of the two Mediterranean newspapers regarding the proper use of expert and high-quality sources is even worse, with fewer registered sources of lower quality: For example, in the case of *El País*, the sources identified as “experts” account for 61.1 % of the total, while *Le Monde* reported only seven quality expert sources in 39 editorials. The latter is the newspaper whose discourse is the least supported by qualified opinions.

5. Discussion

The research results support the conclusion that the editorial interest of the analysed media on climate change is scarce and insufficient in relation to the dimension and social interest of the problem. Starting from the fact that the total number of editorials published by the five newspapers in the fourteen years studied exceeds 25,000 texts (one editorial per day on average), this means that only 2 % of editorials addressed the problem of climate change in almost 15 years. Moreover, in 30 % of cases, climate change is collaterally addressed. The value of centrality is lower in the *Frankfurter Allgemeine* and *The New York Times*, with 55.4 % and 55.88 %, respectively. These daily newspapers are concerned with specific atmospheric phenomena—heat waves, tornadoes, etc.—and they only evoke, in passing, the possibility that climate change might cause them. In the other newspapers, the value of centrality of the problem is greater, especially in *Le Monde*, which gives climate change the central role in 92.3 % of its texts.

This study supports previous research (Carvalho & Burguess, 2005; McKewon, 2012; Piñuel, J.L. *et al.*, 2012; Blanco-Castilla, *et al.*, 2013), in the sense that the editorial discourse of the media on climate change is still profoundly influenced by the interests of economic and political lobbies, which are more concerned with political polarisation than with encouraging or demanding solutions to the problem. The five newspapers analysed in this study maintain a short-term editorial approach that depends on the governing party at the time and which is inconsistent, and with no firm commitments or defined objectives, as required by the urgency of taking effective measures against the problem. The fact that the English newspapers, *New York Times* and *The Guardian*, report greater global awareness of the problem compared to their colleagues is not enough, as their editorial routines are still erratic and deficient. Improving the quality of the arguments is crucial, because these two newspapers, like the other three, enjoy great editorial influence at the political level and act as a reference for other media in their context.

Political polarisation is based mainly on an editorial discourse in which the message is dominated by the opinion and position of sources located above the political and economic spheres, according to Nisbet (2007). Newspapers commonly use these sources at the expense of the authoritative voice of expert sources on the problem of climate change (H₁). The lack of scientific and quality expert sources in the editorial discourse (only 23.3 %), which are aware of the problem and its origin, the consequences and possible solutions, prevent the media from abandoning the political polarisation that domains their editorial opinion, in order to focus on demanding solutions from the governments.

These two aspects—the low presence of scientific sources and political polarisation—are negative values hindering progress, since the data show that the media is still far from relying on qualified scientific sources to dominate the editorial discourse on climate change in broadsheet newspapers.

However, this study has found some critical elements of consensus that may pave the way for the media to champion a more professional, committed and unanimous editorial discourse on climate change. The principal common value is that the five newspapers analysed accept the scientific consensus on climate change and do so explicitly based on the 5th IPCC Report. It is a necessary starting point to undertake clear editorial policies supporting the fight against climate change (H₂), as Nisbet affirms (2009, p. 12).

The second important common element is that the five newspapers disagree with the political answer given to climate change, and openly criticise the inability of governments and politicians to reach joint agreements that help deal with the problem. These media strongly condemn politicians' lack of global understanding, as it precludes effective action. However, and this would be a negative fact, the analysis shows the lack of knowledge of the possible solutions, which are neither defended nor even addressed in any sense. Research shows that the analysed newspapers do not play an active role in solving the problem: they observe and criticise but are not involved in the action, let alone in the measures to be taken. In any case, the media consensus that is needed on climate change as a previous step to reach a social consensus might not be a utopia after all. It has an essential ally in the use of proper sources, accordingly with IPCC reports, as these sources would help to identify consensus values to face non-expert or biased sources that promote disagreement. Experts need to be defended, as they are the key source in editorial opinions since they provide arguments based on verifiable data rather than mere political or economic lectures.

Should the most influential media agree to support editorial opinions with quality sources, at least two significant effects would be achieved: firstly, the political and economic interests that now dominate the message of climate change would be relegated to background and, secondly, a joint discourse would emerge with a clear focus on the seriousness of the problem and the need for urgent, effective solutions. When extrapolated to public opinion, this would allow for a strong social consensus on the issue of climate change.

The problem of climate change and the search for a social consensus require the media to abandon their preference for political and economic discourses in favour of an editorial discourse supported by quality expert sources. The dominant presence of qualified voices would allow the media to move towards a unitary discourse that would unequivocally contribute to fighting against climate change, thus avoiding ambiguous positions that mislead society. While the problem of climate change cannot be solved by science alone but requires important social, political and economic transformations, an authoritative voice will help focus the debate in the media.

References

- Antilla, L. (2005). Climate of scepticism: US newspaper coverage of the science of climate change. *Global Environmental Change* 15, 338–352.
- Arcila-Calderón, C., Mercado, M.T., Piñuel-Raigada, J.L. & Suárez-Sucre, E. (2015). Media coverage of climate change in Spanish-speaking online media. *Convergencia Revista de Ciencias Sociales*, núm. 68. Universidad Autónoma del Estado de México. Retrieved from www.scielo.org.mx/pdf/conver/v22n68/1405-1435-conver-22-68-00071.pdf
- Blanco-Castilla, E., Quesada, M., & Teruel Rodríguez, L. (2013). From Kyoto to Durban. Mass media editorial position about climate change. *Revista Latina de Comunicación Social* 68, 420-435. Retrieved from www.revistalatinacs.org/068/paper/983_Malaga/17_Blancoen.html
- Bolívar, A. (1994). The structure of newspapers editorials. In M. Coulthard (Ed.) *Advances in Written Text Analysis* (pp. 276–294). London: Routledge.
- 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. Retrieved from <http://journals.sagepub.com/doi/pdf/10.1088/0963-6625/9/3/301>
- Boykoff, M.T. & Roberts, J.T. (2007). Media coverage of climate change: current trends, strengths, weaknesses. *Human Development Report 2007/2008*,

- Fighting climate change: Human solidarity in divided world, Occasional Paper*, 2007/3. Retrieved from http://site.iugaza.edu.ps/tissa/files/2010/02/Media_Coverage_of_Climate_Change.pdf
- Boykoff, M.T. (2008). Media and scientific communication: a case of climate change. *Geological Society*, London, Special Publications, 305, 11–18. Retrieved from <http://www.eci.ox.ac.uk/publications/downloads/boykoff08-media-communication.pdf>
- Broecker, W.S. (1975). Climate Change: Are We on the Brink of a Pronounced Global Warming? *Science* 189 (4201), 460–463. Retrieved from https://sites.fas.harvard.edu/~eps5/writing_assignment/CLIMATE_BKGD/broecker_science_1975.pdf
- Carvalho, A. (2007). Ideological cultures and media discourse on scientific knowledge: re-reading news on climate change, *Public Understanding of Science* 16 (2), 223–243. Retrieved from <http://journals.sagepub.com/doi/pdf/10.1177/0963662506066775>
- Carvalho, A. & Burgess, J. (2005). Cultural Circuits of Climate Change in U.K. Broadsheet Newspapers, 1985–2003, *Risk Analysis* 25 (6), 1457–1469. Retrieved from https://www.academia.edu/20526483/Cultural_circuits_of_climate_change_in_U.K_broadsheet_newspapers_1985-2003
- Charaudeau, P. (1997). *Le discours d'information médiatique. La construction du miroir social*. Paris: Nathan. Collection Médias-Recherches.
- Day, A.G. & Golan, G. (2007). Source and content diversity in Op-Ed Pages: assessing editorial strategies in *The New York Times* and the *Washington Post*, *Journalism Studies* 6 (1), 61–71. Retrieved from <https://www.tandfonline.com/doi/abs/10.1080/1461670052000328212>
- Díaz Nosty, B. (2009). Cambio climático, consenso científico y construcción mediática. Los paradigmas de la comunicación para la sostenibilidad. (Climatic change, scientific consensus and mediatic construction. The paradigm of the communication for the sustainable development). *Revista Latina de Comunicación Social* 64, 99–119. Retrieved from http://www.ull.es/publicaciones/latina/09/art/09_808_15_climatico/Bernardo_Diaz_Nosty.html
- Doran, P.T. & Zimmerman, M.K. (2009). *Examining the Scientific Consensus on Climate Change*, *Eos Trans. AGU* 90 (3), 22–23.
- Druckman, J. N. & Parkin, M. (2005). The Impact of Media Bias: How Editorial Slant Affects Voters. *The Journal of Politics*, 67, 4, 1030–1049. Retrieved from <https://www.journals.uchicago.edu/doi/10.1111/j.1468-2508.2005.00349.x>
- Entman, R. M., (1993). Framing: toward clarification of a fractured paradigm. *Journal of Communication* 43(4), 51–58. Retrieved from: <https://www.unc.edu/~fbaum/teaching/articles/J-Communication-1993-Entman.pdf>
- Filho, W.L. (Ed) (2006). *Innovation, Education and Communication for Sustainable Development*. Frankfurt: Peter Lang.
- Firmstone, J. (2008). The editorial production process and editorial values as influences on the opinions of de British press towards Europe, *Journalism Practice* 2 (2), 212–229. Retrieved from <http://dx.doi.org/10.1080/1751278080199937>
- Francisco I. Vaticano II. Laudato si. May 24 of 2015. Retrieved from <https://www.w2.vatican.va/content/francesco/es/encyclicals/index.html>
- Gitlin, T. (1980). *The Whole World is Watching*. Berkeley, CA: University of California Press.
- Habel, P.D. (2012). Following the Opinion Leaders? The Dynamics of Influence Among Media Opinion, the Public, and Politicians. *Political Communication* 2 (3), 257–277. Retrieved from <http://dx.doi.org/10.1080/10584609.2012.694986>

- Hackett, R. A. & Zhao, Y. (1994). Challenging a master narrative: peace protest and opinion/editorial discourse in the US press during the Gulf War. *Discourse & Society* 5 (4), 509–541.
- Hamelink, C.J. (2003). Human Rights for the Information Society. B. Girard & S. O’ Siochrú (Eds.) *Communicating in an Information Society* (pp.121–163). Geneve (Switzerland): UN Research Institute for Social Development. Retrieved from http://comunica.org/com_rights/hamelink.pdf
- Hawes, T. & Thomas, S. (1996). Rhetorical uses of theme in newspaper editorials. *World Englishes* 15 (2), 159–170. Retrieved from <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-971X.1996.tb00102.x>
- IPCC. IV Reports (2007). Retrieved from https://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_sp.pdf
- IPCC. V Reports (2014). Retrieved from https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full.pdf
- Kahn, K. F. & Kenney, P.J. (2002). The Slant of the News: How Editorial Endorsements Influence Campaign Coverage and Citizens' Views of Candidates. *The American Political Science Review* 96 (2), 381–394. Retrieved from <https://seminariodeinvestigadoresuptns.files.wordpress.com/2014/11/kahn-kenney-2002.pdf>
- Krippendorff, K. (1990). *Metodología del análisis de contenido. Teoría y Práctica*. (Content analysis methodology. Theory and practice) Barcelona: Paidós Ibérica.
- Krippendorff, K. (2004). *Content analysis. An introduction to its methodology*. Thousand Oaks (California, EEUU): Sage.
- Lang, G. E., & Lang, K. (1981). Mass communication and public opinion: Strategies for research. In M. Rosenberg & R. H. Turner (eds.), *Social psychology: Sociological perspectives* (pp. 653–682). New York: Basic Books.
- Le, E. (2002). Human rights discourse and international relations: Le Monde’s editorials on Russia. *Discourse & Society* 13 (3), 373–408. Retrieved from <http://journals.sagepub.com/doi/abs/10.1177/0957926502013003055>
- Le, E. (2010). *Editorials and the Power of Media – Interweaving of socio-cultural identities*. Series: Discourse Approaches to Politics, Society and Culture. Amsterdam, Philadelphia: John Benjamins.
- León-Gross, T. & Blanco-Castilla, E. (2009). Editorial identity in the Spanish national press: Interrelation with the news agenda. *Revista Latina de Comunicación Social* 64, 602–611. Retrieved from http://www.revistalatinacs.org/09/art/49_848_UMA/58Blancoen.html
- Linde, S. (2017). Political communication and public support for climate mitigation policies: a country-comparative perspective. *Climate Policy* 18 (5), 543–555. Retrieved from <https://www.tandfonline.com/doi/abs/10.1080/14693062.2017.1327840>
- Marx, S.M., Weber, E.U., Orlove, B.S., Leiserowitx,a., Krantz, D.H., Roncoli, C. & Phillips, J.. (2007). Communication and mental processes: Experiential and analytic processing of uncertain climate information. *Global Environmental Change* 17 (1), 47–57. Retrieved from <http://www.theurbanclimatologist.com/uploads/4/4/2/5/44250401/marxetal2007communicationmentalprocesses.pdf>
- McCombs, M. (1997). Building consensus: the news media’s agenda-setting roles. *Political Communication* 14: 433–443. Retrieved from <https://www.tandfonline.com/doi/abs/10.1080/105846097199236>
- McCombs, M. (2006). *Estableciendo la agenda (Agenda-setting)*. Barcelona: Paidós.
- McCombs, M. (2012). Civic Osmosis: The Social Impact of Media. *Comunicación y Sociedad* 25 (1), 7–14. Retrieved from https://www.unav.es/fcom/communication-society/en/articulo.php?art_id=403

- McCright, A., Dunlap, R. (2003). Defeating Kyoto: The conservative movements impact on U.S. climate change policy, *Social Problems* 50 (3), 348–373. Retrieved from https://stephenschneider.stanford.edu/Publications/PDF_Papers/McCrightDunlap2003.pdf
- McKewon, E. (2012). Talking Points AMMO, *Journalism Studies* 13 (2), 277–297. Retrieved from <https://www.tandfonline.com/doi/full/10.1080/1461670X.2011.646403?scroll=top&needAccess=true>
- Monbiot, G. (2007). *Heat: how to stop the planet burning*. London: Penguin.
- Nelkin, D. (1987). *Selling Science: How the press covers science and technology*. W.H. Freeman Press.
- Noelle-Neumann, E. (1974): The Spiral of Silence. A Theory of Public Opinion, in *Journal of Communication* 24(2), 43–51.
- Nisbet, M.C. (2007). A ‘Two Step Flow of Popularization’ for Climate Change: Recruiting Opinion-Leaders for Science, in *CSI [Committee for Skeptical Inquiry]*. Retrieved from https://www.csicop.org/specialarticles/show/a_two_step_flow_of_popularization_for_climate_change
- Nisbet, M. C. (2009). Communicating climate change: Why frames matter for public engagement. *Environment: Science and policy for sustainable development* 51(2), 12–23. Retrieved from <https://www.tandfonline.com/doi/abs/10.3200/ENVT.51.2.12-23>
- Oreskes, N. (2004). Beyond the Ivory Tower. The Scientific Consensus on Climate Change, *Science* 306 (5702), 1686. <https://doi.org/10.1126/science.1103618>
- Piñuel, J.L., et al. (2012). *Comunicación, controversias e incertidumbres frente al consenso científico acerca del cambio climático*. La Laguna: Sociedad Latina de Comunicación Social. Cuadernos Artesanos. Retrieved from <http://www.revistalatinacs.org/067/cuadernos/30a.pdf>
- Pooley, E. (2010). *The Climate War: true believers, power brokers, and the fight to save the earth*. New York, Hyperion.
- Rice, R.E. (2007). Media’s Limits Influence Environmental Issues. *93106*, vol. 17, nº 15, UCA, Santa Barbara. Retrieved from <http://www.ia.ucsb.edu/93106/2007/April16/media.html>
- Shanahan, J. & Nisbet, M.C. (2002). Media coverage of climate change and global warming. *Technical report for the Goddard Space Flight Center (NASA)*. Ithaca, NY, Dept. of Communication, Cornell University.
- Shanahan, M. (2007). Talking about revolutions: Climate Change and the media, *International Institute for Environment and Development*. Retrieved from <http://pubs.iied.org/pdfs/17029IIED.pdf>
- Tirkkonen-Condit, S. (1996). Explicitness vs. implicitness of argumentation: an intercultural comparison. *Multilingua* 15 (3), 257–273.
- Tuchman, G. (1978). *Making news: A Study in the Construction of Reality*. The Free Press: New York.
- Van Dijk, T. A. (1996). Opinions and ideologies in editorials. *14th International Symposium of Critical Discourse Analysis: Language, Social Life and Critical Thought*, Athens.
- Weaver, A. (2003). The science of climate change. *Geoscience Canada*, vol. 30, nº 3, 91–109.
- Ward, B. (2008): *Communicating on Climate Change: An essential Resource for Journalists, Scientists and Educators*. Narragansett: Metcalf Institute.
- Yale Climate Opinión Maps (2015) (Yale University). Retrieved from <https://www.environment.yale.edu/poe/v2014/>
- Zimmerman, M.K. (2008). *The consensus on the consensus: An opinion survey of Earth scientists on global climate change*. Chicago: University of Illinois.