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SEARCHING FOR QUALITY: A DEBATE AMONG JOURNALISTS, SCIENTISTS AND READERS ABOUT THE COVERAGE OF CLIMATE CHANGE IN THE SPANISH MEDIA

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PERSIGUIENDO LA CALIDAD: UN DEBATE ENTRE PERIODISTAS, CIENTÍFICOS Y LECTORES SOBRE LA COBERTURA DEL CAMBIO CLIMÁTICO EN LOS MEDIOS ESPAÑOLES

RESUMEN

El cambio climático no recibe en los medios de comunicación españoles una importancia proporcional a su gravedad. Los periodistas señalan la falta de tiempo y recursos, los científicos critican que la información carece de profundidad y la audiencia manifiesta que al tema se le da un enfoque alejado de sus intereses. Para establecer puntos de mejora, el trabajo analiza las deficiencias a través de un estudio de contenido previo en prensa y televisión, para buscar respuestas por parte de los informadores y los científicos (a través de encuestas anónimas) y de la audiencia (mediante un grupo de discusión dirigido).

Palabras clave

Cambio climático; medios de comunicación; periodistas; científicos; audiencia.

ABSTRACT

Climate change is not given the expected coverage of a subject of such importance in the Spanish media. Scientists argue that it lacks in-depth analysis, something journalists put down to a lack of time and resources, whilst readers complain that the media fails to report on climate issues that directly affect them. In order to identify areas for improvement, this article analyses the shortfalls in coverage through a content analysis of the press and television and the answers provided by journalists and scientists (through anonymous surveys) and readers (via a moderated group discussion).

Key words

Climate change; media; journalists; scientists; readers.

1. Introduction

Coverage of climate change (CC) gained prominence in the media at the beginning of the 20th century. During the 1970s, debates centered on the depletion of the ozone layer, whilst in the 1980s the focus shifted to the threat of global warming (León, 2013, p. 9). In Spain, coverage started a decade later than in other European countries and the United States of America. Lopera (2013, p. 119–138) distinguishes four stages in the coverage of CC in Spanish media: 1900-1960, coverage of CC starts cautiously; 1961-1988, from being a subject of scientific interest, CC becomes the focus of media attention; 1989-1997, interest declines until 2007, when coverage reached record levels due to the visit to Spain by ex vice-president Al Gore, his candidacy for the Prince of Asturias Award for International Cooperation and his winning the Nobel Prize for Peace. However, during subsequent years interest has dwindled (Lopera, 2013: 400–436).

The various studies by Boykoff serve as a starting point for the development of a theoretical framework, in this case, on the coverage of CC in several countries. In 2009, a study was carried out, in which coverage of CC in 40 of the most influential English-language newspapers from 17 countries from five continents from 1987 to 2006 was analysed. Peak interest coincided with certain years, which Fernández Reyes (2010) puts down to various main events: 1989 (the creation of the IPCC[1]); 1990 (the publication of the IPCC's first assessment report); 1992 (the drafting of the United Nation's Framework Convention on CC at the Earth Summit in Rio de Janeiro; 1995 (publication the IPCC's second assessment report); 1997 (the adoption of the Kyoto Protocol); 2001 (publication of the IPCC's third assessment report); 2005

[1] *Intergovernmental Panel on Climate Change*.

(implementation of the Kyoto Protocol and the effects of hurricane Katrina) and 2006 (release of *An Inconvenient Truth*, the documentary about Al Gore's attempt to educate the public on CC, and the publication of the Stern Review on the Economics of Climate Change).

Ward (2008, pp. 1-12) carried out a complete analysis of the reporting of CC via debates between journalists and scientists, on the premise that the sooner their positions aligned, the better they would carry out their role as social commentators. The scientists said they felt frustrated when trying to report their findings. However, the frustration they felt towards the media was exacerbated when the media reported their findings in such a confused manner. The journalists complained of the lack of support from their newsrooms and editors and said that they lack the time and space to address the subject. This, however, does not explain the lack of in-depth analysis of the consequences of CC in the Spanish media, since, as shown by our study, the number of press reports does indeed allow for greater depth.

The reason for this lack of coverage appears to lie in journalistic practices that fail to report both sides of the argument and in choosing the wrong approach when reporting environmental issues, which would suggest a lack of journalists specialised in the field. As pointed out by Mellado and Salinas (2010, p. 48), referring to the case of Spain, "in terms of specialization, only 6.8% of journalists have a graduate degree, either a Master's or doctorate, in addition to their professional qualification".

The coverage of CC has been addressed by numerous studies in various countries using different approaches and methods: content analysis to determine the shortcomings in news coverage and, indirectly, journalistic practices; interviews and surveys both from the readers' perspective, and those focusing on the criticisms

voiced by the scientists. Our work is unique in that it takes into account all these perspectives and uses different methodologies.

In Spain specifically, the study carried out by Meira et al (2013) shows that the 90% of the citizens believe that CC is really hapenning, while just the 36% consider that is one of the most serious problems which the world is now facing. Taking into account this context, the input and novelty of this study, takes a double slope. Firstly it is presented as a wake up call for journalists and media which report about the subject, and for scientists who are studying the problem. Through the sharing of its different views about the report of CC, we intend to get the different positions closer and to make them work reciprocally in order to make the society aware of the importance of the problem and also to increase the low percentage of population who consider it as a challenge which the Planet is facing. The study offers some improvement lines at the time of reporting the CC and carries out proposals which could improve the relationship between scientists and journalists in favour of a better release of Science.

Considering that media are the main via through which citizens are informed about global warming, the current study intends to reveal different ways so that the problem may occupy a remarkable place in the media diary, an appropiate place considering its relevance. The research tries to offer guidelines which may improve the information that arrives at the citizen and, directly, contribute to make the society move and require public policy that promote the decrease of emissions of greenhouse.

2. Current State of Research: Coverage of CC

In order to carry out a wide bibliographic revision about the research of the coverage of CC from media, we have bear in mind foreign and national studies, paying special attention on the published studies from expert authors. The theoretical framework which we are exposing next, covers from selected bibliographic references which include the first appearances of the problem in the media to nowadays, and it takes into account researches related to the following subjects: report of climate change, journalistic rules and values, scientific rigor and report of Science.

2.1. Quality of the coverage about CC

Hansen (1993, pp. 22-50) analyses journalists from the United States and their reporting of three polluted sites in Wisconsin. The research concludes that in order to adequately report CC, more visibility should be given to possible courses of action and the consequences that directly affect the public. Chapman, Kumar, Fraser and Gaver (1997) carried out a content analysis and a series of interviews with journalists and editors from different media outlets from the UK and India to analyse the message they convey on the environment and CC. The study gives evidence about a reality that, as in the previous case, also persists fifteen years later: the media's interest in the environment is cyclical and is not commensurate with the gravity of the situation, and appears to be only related to political matters. These authors explain how the lack of resources negatively affects the quality of coverage, an ever more critical factor

when taking into account the crisis—both in terms of advertising and business model—that is currently affecting Spanish media, regardless of format[2].

The media is the public's main source of environmental information (Allan, Adam and Carter, 2000, p. 200). Other investigations that have analysed errors and inaccuracies found in science news items (Tankard and Ryan, 1974) identify journalists' work methods as one of the causes of misunderstanding CC and emphasise the importance of conveying the concepts adequately. A recent study by Kyun Soo Kim (2011) analyses how certain media blur the boundaries between science and politics, something that, according to the author, makes it difficult for the public to understand scientific findings on global warming. As Hansen (2010: 1) notes, many of these complex scientific terms require a commitment and degree of knowledge on the part of the journalists to explain them in ways that the audience can understand. Most media and journalists, however, are in no position to do so.

Some recent studies as the monitoring carried from 2004 by researchers from the University of Colorado, show that the coverage carried on 51 newspapers around the world has decreased in the last years (McAllister, 2014).

One important feature within the context of research into the reporting of CC is the role of images. Recent studies (Smith and Joffe, 2012) show that the image has a significant role in the cognitive construction of CC, more so indeed than text. Images are fundamental to the social construction of environmental issues as they help

[2] In April 2013 the Spanish Federation of Journalist Associations presented its annual report in which it states that more than 10,000 journalists have lost their jobs and that 70 media outlets have closed since 2008.

readers to better understand the problem. As the authors argue, images have a greater capacity to stir emotions, making them a useful tool in risk communication.

The relation between text and image in news items reporting on CC has been studied by Di Francisco and Young (2011) in a content analysis of two Canadian newspapers. The authors reveal the narrative directions of visual and textual language often are different and, on occasions, contradictory. This is corroborated by a study carried out by Erviti and De Lara a year later about Spanish television news bulletins. The authors highlight the predominance of stock images that have become icons of CC. They state that the text is accompanied by images related to the causes of CC (chimneys and industrialised cities) or the impact of CC (melting of the polar caps, polar bears eating their young); in both cases, however, the photos come from a distant location. "The fact that the effects are felt geographically so far away compounds the belief that it does not affect Spain" (Erviti and De Lara, 2012, p. 1.477).

Baquero and León (2013, p. 122) report that when both scientists and reporters tackle an issue, their treatment of the subject is often disparate. Whilst scientists set out a reasoned argument, using experimentation to give weight to the evidence, the media is mainly concerned with attracting audiences, and stirring emotions and feelings. The difference between both groups is also seen in the information they use: scientists provide detailed data, while mainstream media opts for lighter content, with no extensive presentation or detail. However, both parties have common goals that should allow them to align positions: "Both science and journalism are traditionally sceptical professions. They interrogate and assess the results critically. Their work seeks controversy and the debunking of myths" (Bauer and Bucchi, 2007, p. 46).

Scientists frequently accuse the media of not giving priority to the presentation of complete and accurate information on scientific findings, since the media prefers newsworthy items. They also accuse the media of being sensationalist and of causing alarm (Gorney, 1992). In one study, Goodell (1987) states that the press emphasises the opinions of only a few reputable scientists, with no attempt to present those of a wider range of experts and observers.

While the media is criticised for its lack of precision when dealing with scientific issues, studies on the accuracy of articles fail to offer any guidelines for improvement. Amongst those carried out is one investigation dating from the 1970s that found greater-than-average levels of inaccuracy in science news items (Tankard and Ryan, 1974). Recently, another study focusing on information on CC in the Danish press reports that more than half of articles published between 1997 and 2009 contained some ambiguity or other (Vestergård, 2011, p. 123).

One of the proposals to be put forward in the face of lack of accuracy and depth is that CC should be reported by the media as one of the causes of common local phenomena –for example droughts or floods– instead of as a global issue (Marin A. and Berkes F. 2013, pp. 1-8). The aim is not only to raise readers' awareness, but also educate them as to what action they can take. In order to achieve this, the media should provide information that is credible, relevant and legitimate, while being impartial and respectful (Cash, Borck and Patt, 2006, pp. 465-494). As Davis (2008, p. 427) argues , "public communication was generally framed in very negative ways: it is seen as a difficult, perhaps impossible, task, as well as a dangerous one that requires extreme caution to prevent audiences from misunderstanding or misusing scientific information".

2.2. Some points which affect in the report of CC

CC has gained prominence in reception studies along with related issues such as health and development and sustainability (Seale, 2003; Carpentier and Servaes 2006; Lin 2008; Barker, 2007; Miguel de Bustos, 2006). The approach varies depending on the country in which the research is carried out and on its policy regarding the issue. The public's CC risk perception is closely related with demography, ideology, identity and trust in institutions (O'Connor, Bord, Yanal and Wiefek, 2002). An analysis of newspaper publishers carried out by Fernández Reyes (2010) concludes that, in the case of Spain, the ideological presentation of CC is as follows: liberalism plays down the issue; social democracy and conservatism adopt a reformist posture and the Ecologists, in alarmist tones, advocate a change of system.

Despite scientific consensus on the risks of global warming (Zimmerman, 2008), K.S. Kym (2011) reveals in a study carried out on a sample of 138 university students in the Unites States that CC sceptics look for, above all, information that plays down the danger and, in general terms, consider the media's reporting of CC as biased. The study points to a failure of current journalistic practices to ensure that the American public is better able to understand the issue and a distrust of the reporting of science.

For its part, Díaz Nosty (2009) asserts that the public is right to be concerned over the conflict of interests in news items. Referring to the communication strategy used by certain corporations, whose image has been damaged by the exploitation of natural resources, this author argues: "Some multinationals send messages that contribute to the creation of awareness in the general public of sustainability, but which are publicised with the primary objective of protecting corporations whose activity is not always good for the environment" (Diaz Nosty, 2009).

Despite the shortcomings attributed to the media's coverage of CC, other aspects also play an important role. The prominence of the economic crisis in the news has pushed CC and other issues into the background. According to the ranking of public priorities published by the Pew Research Centre (2012), the environment has fallen 13 points since 2007, lying in last place in the list. Although in general the public does not doubt its importance, the number of people who consider CC to be distant both in time (since they believe that the effects will only be noticed many years from now) and space (because they assume that, for now, only remote locations are affected while their day-to-day lives remain untouched) is still significant (Noguera, 2013, p. 54). "It is not enough for people to know about CC: they need to get involved, be motivated and ready to act" (Lorenzoni, Nicholson-Cole and Whitmarsh, 2007, p. 446). According to Williams (2001), the shortcomings about the communication of CC stem from the complexity of the phenomenon and facilitate the politicization of the issues, giving rise to a situation in which the media is criticised for publishing biased reports.

Some aspects related to the scientific rigor, as the case of the attribution to an specific important source of the information, also influence in the perception of the news by the audience, as Hannigan remarks. The author thinks that "any news which comes from an apparently respectable scientific source" might awake a concern about the subject non-existent until then.

The celebration of international summits and the publication of global reports place the issue in the mass agenda. During this type of conventions, media collect data which help to understand the problem, but they only do it in a timely manner. About the inclusion of specific data in the news related to the CC, it is important to say that

Fernández Reyes' research (2013, pp. 78-98) about the journal El País, where the author shows that the publication of the study and the celebration of the Copenhagen summit, are key dates at the time pf including the specific unit which refers to the CC: 2nd C and that, afterwords, the appearance of this gradation in the news loses importance.

The problem of lack of depth is worsening since, as León and Baquero (2010, p. 122) explain, over the last few decades news reporting has changed style to include more trivial items whose only value is to entertain, thus producing a climate "hostile to certain types of content that are by no means trivial and need an in-depth explanation" (León and Baquero, 2010, p. 126). According to Zelizer, one of the dangers of trivializing content is that entertainment impedes the necessary reflection to raise awareness in readers of the importance of "serious news in the context of the overall media mix" (2009, pp. 153-154).

The degree of sensationalism[3] which impregnates the information is also a factor which must be considered at the time of evaluating how to report about the global warming. In this sense, Herte de Moraes et al (2013, p. 122) wonders:

> *How can we inform the citizens without causing fear? Fear can put into action a denial mechanism in order not to know anything else and go on living as if risks did not exist. Assuming the view of Environmental Journalism, press may adopt new ways of performances and satisfy the*

[3] We mean by sensationalism "any infringement of the notion of social decency, trying to provoke a shock reaction which activates emotion mechanisms" (Bernstein, 1992, pp. 22-28). This research has considered the use of the next concepts: danger, chaos and horror in those cases where that word was exaggerated.

social role of informing the citizens so that this one can participate of the decisions about acts which are going to influence their lives, and so every human being's life.

3. Research Questions

The literature consulted revealed significant shortcomings in the coverage of CC. For example, news does not delve into the causes, only the consequences; the specific terminology is not sufficiently explained or, as our previous studies indicate, in the case of Spanish media, CC does not receive the coverage it deserves.

The premise of this study is that these shortfalls are entrenched within today's journalism as a result of both work dynamics and structural problems that have been present for many years. Furthermore, the current crisis (in terms of both the business model and economic problems) has aggravated these shortcomings.

The aim of this study is to determine the shortfalls in the coverage of CC in the Spanish media, taking into account the different protagonists involved in the communication process: the journalists and media, scientists and public. A cross-comparison of these different points of view has led to achievable and realistic proposals for improvement.

This study tries to contribute to the society in order to receive from the media a quality information about the CC. We consider that just if the citizen is well informed about the subject, he will be aware of its importance and will feel the necessity of requiring the governs measures which mitigate its effects.

4. Methodological Approach

The data obtained from the content analysis and surveys provided numerical information, represented in percentages, in addition to qualitative information obtained from the open questions. The methodology used for the group discussion provided non-quantitative, although equally useful, data capable of reflecting different approaches through moderated debates. It is important to point out that, although the results obtained are different in character, they serve—subject to the limitations inherent in the whole investigation—to cross-analyse the opinions gathered through the diverse methods.

The study was carried out mainly through content analysis (Krippendorff, 1981) of press and television reports. It included all reports containing the terms "climate change", "global warming" and "greenhouse effect", published between 1st July 2005 and 31st June 2006, and 1st January and 31st December 2011, by the three most widely read paid-for Spanish newspapers: El País, El Mundo and ABC. The articles were selected using the specialised search engine *My News*, which allows searching by key words, media and dates. The total of 1,235 reports were gathered.

Regarding the television reports, a weekly sample per month was recorded and analysed between July 2005 and June 2006, and from January to December 2011, including the midday and evening news. The sample comprised 40,714 reports from 1,632 news bulletins from 6 channels, collected over 2 years. In the period July 2005 to June 2006, a total of 15,120 reports from the following channels were collected: TV1, TV2, Antena 3, Tele 5 and Canal+/Cuatro. In 2011, 25,594 reports were

gathered from the same channels and, in addition, La Sexta[4]. This increase in 2011 is not only due to the enlargement of the sample by the inclusion of the two La Sexta News broadcasts, but also due to the longer duration of La1's news programme (a decision taken by the publicly-owned company after the abolition of advertising on the channel in 2010). Of the 40,714 sample reports, only 78 (0.19%) were related to CC: 38 corresponded to the period 2005-2006 and 40 to 2011. A sample of 10% of the press items (120 articles) and 20% of the television bulletins (15 reports), selected at random, were coded by different collaborators with the aim of establishing the intercoder reliability index. The agreed average percentage was found to be 82.5% using the Holsti formula, which is considered acceptable.

In the second part, an anonymous survey was carried out (Fowler, 2009) among journalists who report on environmental issues in different Spanish media outlets, local as well as national. Starting from a database generated *ex profeso*, an online questionnaire was sent to a total of 600 reporters, 121 of who responded.

It has been important to get a wide universe of representativeness, despite the fact that to determine a specific universe was so difficult, as we did not intend to limit the sample to environmental or scientific journalists, but also to include general media journalists who some time cover this kind of subjects. The list of 600 email addresses was made through phone calls to the listing media in the Communication Agenda 2013. They asked for the editor who had covered the subjects related to the environment and they could obtain 600 addresses, and from these ones, after a second reminder, they could get 121 answered questionnaires.

[4] The channel started officially broadcasting 2nd March 2006.

The questionnaire used to request all the journalists' opinions about the CC information contained questions which collected basic information as the type of atmosphere where the reporter worked, if he was specialist in scientific journalism, his studies level... And the specific questions about the subject revolved around: information routines, context and sources, images, quality of information and points that affect the report of the phenomenon.

The survey contained both closed with the aim of gathering quantitative data– and open questions, in order to collect the opinions of professionals working in digital media. Participants were contacted through the Association of Environmental Information Journalists (APIA). The questionnaire was also sent by email to media outlets and press offices that appear on the Communication Agenda 2012. Lastly, it was sent out to the media group that operates under the Twitter hashtag @ComuniCiencia.

The third part consisted of a survey of scientists specialised in environmental sciences. Using a database of 500 specialists, drawn up as for the journalists, an online questionnaire was sent to 525 Spanish scientists and 16 research centres. 80 scientists responded.

The method used to carry out the sample of scientists was similar to the case of journalists. It was also elaborated a phone calls list to universities and research centers, asking about those experts in subjects related to the environment in order to make a list which covered 500 different addresses. Once again, a

new reminder email was sent after de first one and this time, 80 answered questionnaires were obtained.

The questionnaire to scientists included 20 questions about their opinion on CC news, specifically, about these aspects: depht of the problem, extension, the omission of relevant information, the objectivity showed, the inclusion of specific data, the suitable explanation of necessary scientific concepts, the scientist level of sources and methods used.

Finally, a moderated group discussion was carried out (Barbour and Kitzinger, 2001). 12 individuals, of different ages, gender, professional backgrounds and knowledge of environmental issues were invited to participate with the aim of determining the public's perception of how the media reports on CC. The session lasted 1.5 hours and the participants' anonymity was guaranteed. The issues addressed in the session were based, as in the previous cases, on the conclusions drawn from the content analysis.

5. Findings

5.1. Scant presence in the news

The assessment of environmental and CC reports is, generally, negative. Journalists and scientists agree that the main cause of the underrepresentation of news items covering these issues is due to the lack of priority given to them by the media. Scientists[5] are of the opinion that the lack of interest on the part of the media is due to the fact that the media fail to understand the significance of the issue and prioritise

[5] The complete study of the scientists' opinions can be found in Baquero, E. and León, B. (2013). El rigor científico de las informaciones sobre el cambio Climático. In *El periodismo ante el cambio climático: nuevas perspectivas y reto,* 121-136. León, B. (Coord.) Barcelona. UOC.

other issues. Journalists[6], on the other hand, mention the difficulties in content production, the biggest of which is the lack of time, although other factors were also mentioned: a lack of resources; the scarcity of economic and technological means; the difficulty in accessing sources; the difficulty in explaining such a complex issue in more general terms; the lack of accurate data and information; and the relative difficulty of scientific and technical language.

The journalists also added that CC is a complex and abstract issue that is difficult to report on and admitted that one of the other reasons that CC does not receive wider coverage is that there are not enough journalists specialised in this area, which was confirmed by the survey of journalists: 38% have no training in this area and only 22% report exclusively on the subject. The journalists also spoke of the general crisis affecting journalism, which in their opinion is aggravated by the economic crisis and staff layoffs. They describe an environment in which it is difficult for environmental journalists to survive, and stress that they do make an effort to convince their editors of the relevance of the issue and the need to maintain a section dedicated to the environment.

Readers attribute the scarcity of news items on CC to another reason: news coverage of CC is usually associated with a catastrophic event or similar phenomena, but then is not followed up. They were sympathetic of the journalists and also admitted, as did the scientists, that reporting CC is challenging, both for the complexity of the issue and the way in which it is dealt with by the media, "who generally look to entertain and not inform", quoted one of the participants. The group

[6] The complete study of the journalists' opinions can be found in De Lara, A. (2013): Los periodistas ambientales ante el cambio climático, 143-159. In *El periodismo ante el cambio climático: nuevas perspectivas y retos.* León, B. (Coord.). Barcelona. UOC.

were of the opinion that on too many occasions environmental reporting appeared mainly anecdotal and far from the public arena.

5.2. Lack of rigour, depth and continuity

Whilst our study indicates that, in general, the reporting of CC is not sensationalist, it does confirm that reporting is scarce and lacks depth in the majority of cases. The survey of environmental experts reveals that, in addition to considering the coverage of CC scarce, the experts are of the opinion that when it is covered it is done so superficially and that the concepts are not explained adequately. Furthermore, reports on science are politicized and the focus taken depends on the ideology of the media company. They also added that CC has been displaced by the economic crisis. In this respect, it is interesting to reflect on a reply provided by one of the scientists: "The crisis has masked environmental issues in the media without anyone realising that a good part of the current crisis is related to a pervasive loss of natural resources".

The research concludes that in order to adequately report CC, more visibility should be given to possible courses of action and the consequences that directly affect the public. Twenty years later, our research shows that this remains one of the most important demands made by the public in order to improve their understanding of CC. In this sense, the discussion group admitted that it is difficult for the media to establish direct cause-and-effect relations that explain CC in a straightforward manner, which in their opinion is one of the obstacles preventing more extensive in-depth coverage. The majority of the participants agree that: "News on CC is only published, in general, in two situations: when reporting an investigation headed by

scientists and when there is a call for preventative action or to raise awareness. Such reports usually feature NGOs".

This perception is corroborated by the research by Carvalho and Burgess (2005, p. 1.461), who report that CC is not prevalent in the German or French media except at critical moments such as international meetings. Díaz Nosty (2009), referring to coverage of CC in Spain, spoke of intermittent and timely coverage of CC in the media. For the discussion group, the danger of the failing to cover CC in its own right rather than being linked to other events is that it is presented with insufficient context, is always shrouded in negative tones and the causes are not analysed in any detail.

In global terms, the participants in the group discussion were of the opinion that a degree of uncertainty surrounds coverage of CC "because it is not clear how it affects us", explained one of them. The group criticized the media for not providing a complete picture of the phenomenon and agree with the scientists that the issue is too politicized: "It is used as a political weapon when it is, in fact, a scientific issue, but answers are not forthcoming, either from the political and social arena". In this respect, another of the participants added that, on the contrary, there is barely any coverage of the policies surrounding measures to be taken and regulation "perhaps because they do not capture the public's attention". The group called for a greater effort on the part of the scientific community. Two of the participants spoke a "point of no return" that scientists and reporters find themselves in: "Academics make no effort to present the subject clearly to journalists who, in general and for whatever reason, are not specialized in the area".

The journalists acknowledged these shortcomings and explained that coverage of CC does not focus on the causes as it is more newsworthy to centre on its impact, although they were aware that in order to understand the issue the causes also need to be investigated, something that lack of space prevents them from doing. Despite the constant presence of scientific terms, in the majority of cases there is no explanation of the causes or effects of these concepts.

The content analysis[7]revealed that the majority of reports on CC uses archive images that were out of date and unrelated to the news item because, according to the journalists, of the ease of using already existing images when dealing with such a complex subject matter. A further conclusion reached was that human action was not a cause of CC, a view that, according to most of the reporters interviewed (40% to be precise), was due to political issues and, again, the difficulty in portraying the issue, according to 20% of the journalists. Furthermore, 13% believe that the images in which human beings appear as the guilty party are not as striking.

The scientists believe that rather than providing an explanation of the phenomenon, images are chosen for their ability to attract readers and for their impact. For their part, one of the participants in the group discussion pointed out that, in the news, man is portrayed as the guilty party, although somewhat passively: "Mankind has evolved technologically, which entails a level of consumption that, in turn, is part of the problem. "So who", the participant asks, "should be held responsible?"

[7] The complete study of the content analysis results can be found in León, Bienvenido (2013). "La representación del cambio climático en los medios españoles". In *El periodismo ante el cambio climático: nuevas perspectivas y retos*, 9-43. In Bienvenido, L. (Coord.) Barcelona. UOC.

5.3. Treatment of sources

Scientific sources lend legitimacy to news items (Hansen, 1993). This, however, does not prevent news reports being published, both in Spain and elsewhere, with very little evidence, which adds to the opinion that the message on CC is somewhat vague (Taylor, 2002, p. 330). Our study shows that the use of sources is scant: an average of 1.34 sources are used in the press reports and 1.12 in television news items. 42% of the journalists were of the opinion that this scarcity was due to a lack of time, something that makes it harder to provide additional points of view. They also blame the scarcity of suitable sources to tackle the subject and a lack of resources.

The journalists confirm the politicization of information control, both by the media outlet and the presenters. The notable presence of political sources is, according to 36% of journalists, due to the fact that it is easier to report on politicians and leaders because of their accessibility through press conferences, although 16% of reporters attribute the prominence of those holding office to the behaviour of scientific experts, who are reluctant to collaborate with the media.

Nearly all of the scientists were of the opinion that the experts who appear in news items covering CC do not have sufficient voice when compared with others (especially political experts). The content analysis corroborates this: in the case of the press, heads of state appear in 28.4% articles, compared to 24% in which scientists appear. In the case of television, politicians appeared in 28.6%, while scientists appeared in 21.4%.

The analysis of content of the news let us give examples about the politicization of the subject which is referred by the consulted parts. In statements made to the

Spanish journal El País, 24th November 2013, because of the award of the Liberty Medal put by the American President Barack Obama, the Nobel Prize of Chemistry Mario Molina, stated that the Republic Part and the Tea Party, took in the last U.S. administration a negative place about the climate change. According to him, "something absurd that places them, from the point of view of Science, in the age of Astrology. In spite of the fact that in Spain, CC appears in the most electoral programs, we find some unwise statements from politic leaders about the problem. For instance, the published news, 22nd October 2007, titled "Rajoy questions the climate change and says that it cannot become a great world problem. When the parties talk about avoiding the politization of the subject, they are referring to the requirements to the political parties in order not to include the subject in their electoral programs as a claim and, in communications terms, as a corporative responsibility, but the statements and performances are coherent to the exposed purposes and a responsible debate about environment may be promoted.

The scientists also criticize the fact that the media does not present a realistic image of their work: only 16 of the 80 consulted agreed with the image portrayed. Widespread disaffection with the media was perceived: the scientists were frustrated with and critical of the way in which their findings were reported, highlighting the distance between science and the media and the need to align positions.

The experts were critical of the fact that CC sceptics were given greater prominence in media reports and that the wide consensus on the issue in the scientific community is not reflected. Nevertheless, this was not corroborated by the content analysis, which showed that scepticism did not feature prominently. We noticed that there was a degree of contradiction in scientists' perception: while 60 of the 80 scientists

interviewed agreed that those scientists who appear in CC reports are adequately qualified, of these, only 18 expressed satisfaction with the way in which scientific consensus on CC is represented. However, if the majority of scientists who appear in news reports are well qualified, then presumably the consensus should be represented since qualified scientists agree that the problem exists. Therefore, the perceived lack of representation of this consensus appears to be due to an initial impression that does not hold up to closer inspection.

5.4. Proposals

Although the denial of CC did not prevail in the discussion –nor in the content analysis, where scientific consensus was eclipsed –the participants said they did feel uncertainty. In our study, scepticism is felt towards those news items that relate CC with other interests.

The participants in the group discussion were the most forthcoming in suggesting proposals to improve coverage of CC. They unanimously agreed that coverage should be regular and in great depth, and "not only associated with disasters". In other words, they favour coverage that goes beyond the anecdotal and is cross-cutting. "The politicians are the ones who should be working on coming up with solutions and for its part the media, by doing its bit, can help bring this about", explains one of the participants. Another asked: "How much room for manoeuvre do we have?" This question demonstrates a greater need to couple CC with human action. Members of the audience felt that the media should have a grater role in raising awareness and called for more interest to be shown in CC by the media, without being alarmist or

sacrificing accuracy, which is why they believe that CC should be reported by specialised journalists.

The scientists called for the media to make a greater effort to report on the long-term consequences and publish news articles promoting sustainable, traditional practises. In their opinion, it is not made clear that the effect of human activity per se does not bring about CC but appears to be hastening it. They call on the media to make an effort to bring to society's attention the fact that the consequences will affect everybody and to make a greater effort to explain the basic concepts. They stress that global warming is a real phenomenon that is sometimes presented as something imprecise, when in fact inaccuracy and imprecision are the impacts it generates: there should be no doubt whatsoever as to its existence. One of the scientists put forward an interesting proposal: it is possible to harness the uncertainty surrounding impact of CC in order to boost preventative measures. Along the same lines, another called on the media to make a greater effort to make society understand that it is cheaper to invest in preventative measures than repair future effects.

The journalists, for their part, were in favour of maintaining independence, distinguishing business from political interests and upholding impartiality. They also advocated serious, verified, reliable and rigorous reporting, and to not resort to clichés, and to distinguish the relevant from the anecdotal. They are aware that they need to make a greater effort to raise the public's awareness of the CC and its consequences. They also favoured bringing the problem closer to the public, and to connecting CC with people's daily lives by reporting it in layman's terms.

6. Discussion

Journalists, scientists and readers were all of the same opinion when stating the main problems associated with the coverage of CC. Furthermore, the literature consulted revealed that these shortfalls are, in general, similar in different countries and the same as those reported in studies on CC coverage published a decade ago. This demonstrates that no advance has been seen and that these problems are endemic within present-day journalism, along with additional structural and economic problems affecting journalism as a result of the recession. This leads to gaps that not only affect the coverage of CC but also any other issues that, by their nature, require greater economic efforts and resources, rather than being treated as a source of entertainment. Nevertheless, this does not take away from the fact that CC is the single greatest environmental issue faced by society and, as such, society needs to be made aware of the problem. It has been shown that the media is a useful instrument to bring this about since it is the main source of environmental news.

Whilst scientists were critical of journalists, readers were more understanding of the shortfalls in the reporting of CC. However, reporters and experts need to make a greater effort in identifying common ground. Although everything points towards a greater need for journalists specialised in the environment, the reality is that this need is not reflected in the layoffs and closures seen in the media. To cover this shortfall, one solution put forward is to have more experts willing to comment and act as a conduit between journalists and the public. In this respect, the research group SISOB proposed modifying the traditional evaluation of scientific output to include the impact on society of the findings. Quantifying, in academic terms, the dissemination through, for example, the media, of scientific findings would contribute to improving

relations between journalists and scientists by encouraging scientists to take on a greater pedagogical role necessary for the dissemination of complex issues. In this sense, we ask to the university institutions to promote among their researchers the release of knowledge. Therefore, we propose it as an important curricular point to bear in mind.

We are aware of the limitations of the current research, although it does not allow us to stablish a unique and final solution about the lacks at the time of reporting CC, it does permit us to remark the necessity of journalists and scientists to help themselves reciprocally and work in order to eradicate those lacks reflected in the research in which they agree. Both groups coincide that it is necessary for this subject to acquire more importance in the reporting agenda and in the complexity of the issue which needs a deep and strict treatment that currently does not own. In this sense, we propose the drafting of a manual on which journalists and scientists may work, which afterwards may be supported by members of the audience, in which we can deepen in a rigorous and accesible way in the causes and consequences of the phenomenon. A clear and concise report which offers the context and the relevance of the issue with specific local examples in order to make easy the approach of the problem to the citizen. Through this manual, updated periodically and free access, which could be appealed by all Spanish journalists and media, it would be possible to overcome the problems of lack and the difficulty to log in expert sources and it would be possible to grant more importance to the subject.

As mentioned by the three parties consulted, although CC usually has a political slant, this should not be seen as a problem: once consensus has been reached by the scientific community, logically the debate would move on to the political arena, where

solutions need to be found. The problem, however, is that rather than debating potential solutions, the issue of CC is expropriated for vote-winning purposes.

In this context the media can help to mobilise the public into demanding that leaders put in place sustainable policies. In order to do this, the political, business and economic pressures that scientists, readers and journalists condemn need to be overcome. One conclusion reached from the study is the need to for more creativity: it has been clearly shown that the repeated formula used in the message associated with other events and which also resorts to the use of the same images to cause an impact is no longer valid since CC these days finds itself in last place in social priorities.

The media needs to bring the issue closer to the public, not through a pessimistic and repetitive approach but by reporting on feasible courses of action to be taken by the public that promote sustainable awareness. The conclusion drawn is that the media, because of its intrinsic social responsibility, should adopt a much more committed stance toward the issue. In short, in the face of the lack of progress in improving the reporting of CC and the ever increasing lack of interest shown by readers, the media needs to take a more active role, not only in reporting but also in aiming to raise awareness of the consequences of CC that threaten the future of the planet.

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