

Del *Protocolo de Kioto* a la *Cumbre de Copenhague*: cobertura del Cambio Global en la prensa española e internacional

From Kyoto Protocol to Copenhagen Summit: Press Coverage of Global Change at Spanish and International newspapers

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Resumen

Este artículo analiza la evolución del tratamiento del Cambio Global en los periódicos de mayor tirada en España haciendo una comparativa con los diarios principales de Chile, Brasil y China. El objetivo se centra en proporcionar una visión cronológica de los términos más

Abstract

This paper analyses the evolution of Global Change treatment at the largest circulation newspapers of Spain and compares it with the mainstream press of Chile, Brazil and China. We focus on providing a chronological overview of the most used terms to refer «Global

utilizados para referirse a «Cambio Global» y comparar las diferentes tendencias desde el nacimiento del Protocolo de Kioto en 1997 hasta la Cumbre de Copenhague de finales de 2009. La presentación del Cuarto Informe del IPCC (AR4) en 2007 supuso un antes y un después en la cobertura del cambio climático en la prensa. Este informe de síntesis estaba dirigido a los actores políticos y motivó un mayor protagonismo de la esfera política en la prensa con respecto a la científica. En España este hecho adquirió una importancia significativa, dado que dicho Informe se aprobó en Valencia en noviembre de 2007, suscitando una cobertura más amplia del evento, hecho que permite observar cómo el impacto local gana posiciones al global en la prensa escrita. Posteriormente, con la Cumbre de Copenhague, la cobertura del cambio climático alcanzó su máximo, observándose una tendencia decreciente a partir de este momento. El papel de la prensa se convierte en un elemento esencial para generar conciencia pública sobre el Cambio Global, aunque en determinadas ocasiones, el abuso de algunas fuentes de información y una excesiva politización del discurso sobre «Cambio Climático» pueden ocasionar un efecto contrario en el público, propiciando el desinterés sobre la temática cuando no se presentan soluciones de adaptación y mitigación al Cambio Global.

Palabras clave: Cambio climático, calentamiento global, cambio global, cobertura de prensa, comunicación, España, Brasil, China, Chile.

Change» and to compare different trends since the release of the Kyoto Protocol in 1997 to the Copenhagen Summit at the end of 2009. The presentation of IPCC Fourth Assessment (AR4) in 2007 was decisive to the global press coverage of «Climate Change». This synthesis report targeted to policy makers instigated a major attention of the politic sphere at the press over the scientific field regarding «Climate Change». At the Spanish scene this fact acquired a significant importance as this Report was approved in Valencia in November of 2007, implying a wider coverage of the event which permitted to observe how the local impact gained positions to the global impact at the printed press. In addition, the role of the press discourses become essential to generate public awareness about Global Change, but in some occasions the abuse of some information sources and the politicization of «Climate Change» can cause the contrary effect in to the public when no solutions are given to adapt and mitigate «Climate Change».

Keywords: *Climate change, global warming, global change, press coverage, communication, Spain, Brazil, China, Chile.*

1. Introduction

In the last decade, the number of published news related to «Climate Change» at the press has experienced a marked increase, both at Spanish (Calero y Vilches, 2008) and at International level (Carvalho and Burgess, 2005; Boykoff and Boykoff, 2004; Boykoff, 2007; Kenix, 2008; Russill and Nyssa, 2009; Groffman *et al.*, 2010; Koteyko *et al.*, 2010).

As in Spain the studies related to the treatment of «Climate Change» at the media are scarce and there are not current works which analyse the last trends, it is necessary to release new studies which analyse the evolution of the treatment that «Climate Change» is experiencing at the media and, the influence that these media exert over public opinion.

Due to the concern established over «Global Change» (Duarte, 2007), in particular to «Climate Change», which is promoting the development of adaptation and mitigation plans through several Administration's scales (Weingart, 2000; Boykoff, 2008; Magallón, 2008) and also at the private scale, it is important to study the integration of this fact on the social sphere and to know what treatment it is receiving. Moreover, the correct use of the terminology results wide relevant to not confuse the public opinion. For this reason it is important to study the treatment that the media and the Public Administration are given to the term «Climate Change» or «Global Change», and to verify if it is being used in an effective mode (Boykoff and Boykoff, 2004). In this way, it is also interesting to analyse the social reaction generated after receiving that information (Corbett and Durfee, 2004; Carvalho and Burgess, 2005; Calero *et al.*, 2008; Nisbet and Myers, 2007). For this purpose it is necessary to investigate which are the main sources of information to the public, how are they valued, which are the public preferences and if that information is promoting a social change (Nerlich *et al.*, 2010; O'Brien and Wolf, 2010; Pardo, 2007).

1.1. *From the Global situation to the Spanish case*

«Global Change» treatment at the media, including traditional print press and new digital media (Koteyko *et al.*, 2010), has not been studying in depth at the Spanish context. According to the wide importance that

this fact is acquiring at the international context, as we have observed from other literature, it is important to investigate the evolution and trends of «Global Change» in Spain as there are still too many questions to settle regarding this.

To know the international context represent a decisive factor to determine which is the place occupied by Spanish press in such context. Several studies have been developed at English spoken countries, as EE. UU. (Boykoff and Boykoff, Boykoff, 2004), United Kingdom (Carvalho and Burgess, 2005) or New Zealand (Kenix, 2008). However, if we try to find literature from non English spoken countries, overall from developing countries, what we find is scarce literature regarding this issue. To know what treatment of «Climate Change» is giving the mass media at countries like China or Brazil, where Green House Gases (GHG) Emissions are continuously increasing, this information would be significant to define the global context that involve us.

As we know from previous studies at different countries over science communication and over «Climate Change» in particular (Carvalho and Burgess, 2005; Boykoff and Boykoff, 2004; Boykoff, 2007; Kenix, 2008; Russill and Nyssa, 2009), the media acquires an important role at the dissemination of scientific knowledge to the public opinion (Boykoff and Boykoff, 2004). Despite the wide scientific consensus regarding the anthropogenic origin of «Climate Warming» (D. James Baker in Boykoff and Boykoff, 2004; Duarte, 2007), journalistic norms of balance can generate a bias at public opinion as they try to give the same coverage to both sides of «Climate Change»; those which trust the anthropogenic origin and those sceptics, although this point of view hardly have scientific support (Boykoff and Boykoff, 2004). Our purpose is to investigate if these balance norms are also applied at Spanish press.

On the other hand, the alarmism or catastrophism becomes an everyday instrument of the media to catch the public attention and to generate social alarm (Russill and Nyssa, 2009). This alarmism differs from the view presented at scientific literature and, in many cases exaggerates the associated risk to «Climate Change», emphasizing the sensibility and not the real needs of the society (Hulme, 2009; Duarte, 2008) regarding adaptation and mitigation to «Climate Change». The abuse of the «sensibility tool», instead of motivate de public action, implies in many cases a contrary effect of social inactivity to «Climate Change» (Antilla, 2005). For this reason it is necessary to know what treatment is given by the press to «Climate Change» issue, and therefore establish communication guidelines which, beyond to manage a social reaction

ephemeral based on social tension, would be able to motivate society to participate from an issue which result of vital importance either at social, political, economical and environmental level (Krugman, 2010).

Several studies point out that there is a wide gap between scientists and journalists (Boykoff and Boykoff, 2004). Although every time is more frequent to find science getting closer to the media, it is necessary to eliminate barriers between scientists and journalists for the benefit of public opinion (Corbett and Durfee, 2004). The relation between both, scientists and communicators, must be fluent to avoid controversies.

The treatment given by the press to the uncertainty generated around «Climate Change» (Krugman, 2010) results of great importance since finally it would be reflect at the social, political or economical attitude of the different bodies (Weingart, 2000). As «Climate Change» has a broad uncertainty associated, the way to disseminate the information, the context and the content result determinant. In several occasions, the decision makers use this information making it susceptible to acquire a high scope (Inglehart, 1977; Nerlich *et al.*, 2010). According to Boykoff and Boykoff (2004) «as the general public obtain the majority of their scientific knowledge through the mass media, it is crucial to study the representation of global warming at the media». For this reason, as a significant part of the global population attributes «Climate Change» to external natural forces more than to the result of the human activity, the conception of human beings as a part of their environment, able to influence and modify it, result of vital importance to some ways of interpreting the world (O'Brien and Wolf, 2010) and therefore result of great importance the world interpretation given by the media, as such interpretation will reach the public opinion.

At the time, it is necessary to know if the press is providing information about the mitigation and adaptation measures to «Climate Change» that could be developed by the society. In the last ten years the information volume of «Climate Change» has significantly increased, and for this reason it is interesting to know the course followed by that information and if a specific language or norms are applied by the time of disseminate these concepts. «Using more precise terminology (and defining easily misunderstood terms) is a vital ingredient to clear, memorable, and impactful communication» (The psychology of Climate Change Communication, 2009, CRED).

1.2. Are the media contributing to «Global Change» adaptation of the population?

To promote the social action with mitigation and adaptation tools to «Climate Change» making them accessible to the people, tools and measures which also regard the socio-cultural singularities of each region, is what finally could encourage the social action obtaining optimal results (Pardo, 2007). In the last years it has been noted a change on the press referring to social action, where a higher implication of the public was searched. This changes help to a better understanding of the problem and also could contribute to a values change which involve an effective and faster adaptation of the society (O'Brien and Wolf, 2010). According to the importance of this fact, it is essential to analyse and compare the evolution and new trends experienced at the Spanish and International press context.

2. Methods

This study investigates the Spanish press coverage of «Global Change» between 1997 and 2009 through the combination of quantitative and qualitative methods. To accomplish our purpose, we analyse the different trends around terminology related to «Global Change» in Spanish large circulation press and in some international newspapers chosen at random. The starting date of the study period, 1997, was selected because this was the year of birth of Kyoto Protocol. We decided to not include year 2010 cause data was not complete and this fact would bias our analysis.

2.1. Quantitative analysis of the sample

Our study is based, on the one hand, in data obtained from different web searching engines of the most read newspapers in Spain: *El País*, *El Mundo*, *ABC* and *La Vanguardia*. On the other hand, the study is based in data obtained from web searching engines of three newspapers from different parts of the world chosen to compare trends with Spanish's newspapers. These newspapers are *Folha de S.Paulo* from Brazil, *El Mercurio* from Chile

and *Chinadaily* from China. Besides their popularity and large circulation (see Table 1), these newspapers were selected because they were easy accessible at the Internet and their searching engines let us made an advanced search by years. Also, the origin countries of international newspapers were chosen because there was not much literature written about them and we considered that Brazil and China are two nations very relevant nowadays concerning «Climate Change». Only the newspaper *El Mundo* did not show data before 2000, because it was necessary to have a subscription to have access to that information. In spite of this, we considered its inclusion on the study because we found that data between 1997 and 2000 showed at the others newspapers of study did not give relevant information for our study. Moreover, the international newspaper *Chinadaily* and *El Mercurio* did not let us to accede to information prior to the year 2000.

Table 1.
Newspapers Circulation 2009

NEWSPAPERS	CIRCULATION (AVERAGE DISTRIBUTION PER DAY)
El País	391,815
El Mundo	300,030
ABC	256,651
La Vanguardia	200,291
Chinadaily	200,000
Folha de S. Paulo	299,427
El Mercurio	—

* Source: OJD for Spanish newspapers, ICV for Brazilian newspaper and *Chinadaily.com.cn* for Chinese newspaper. No data available for Chilean newspaper *El Mercurio*.

All the processes we explain below were applied for all the newspapers of the study:

We started our search from a selection of seven searching parameters to compile our sample: «Cambio Global», «Cambio Climático», «Calentamiento Global», «Calentamiento Climático», «Cumbre del Clima», «Convención del Clima» and IPCC (Intergovernmental Panel for Climate Change) for Spanish language newspapers; «Global change», «Climate Change», «Global Warming», «Climate Warming», «Climate Summit», «Climate Convention», «IPCC» for English language newspaper (*Chinadaily*); and «Mudanças Globais», «Mudanças Climáticas», «Aquecimento Global», «Aquecimento

Climático», «Conferência do Clima», «Convenção do Clima» and «IPCC» for Portuguese language newspaper (*Folha de S.Paulo*). At the newspaper *El País* and the newspaper *El Mercurio* it was not possible to analyze the term «Global Change» owed to their searching engines which included all the contexts where the words «Global» and «Change» appeared and it did not let us to discriminate between terms just referred to «Climate Change» from those referred to other contexts. In this way the information obtained was not accurate and we had to check new by new to find out which of them contained the term «Global Change» on the «Climate Change» context and not political or economical context as it was normally used. Finally we decided to not include this term.

The objective of this search was to obtain the number of news published where each parameter appeared at least once. Then we made a *Boolean search* of each parameter to take out all the news which included the parameter «Climate Change» thereby we obtained the net number of news for each parameter or at least the number of news which include any of the study parameters except «Climate Change». The reason why we exclude «Climate Change» was owed to it was the most used parameter, and almost all the news containing information about «Global Warming», «Global Change», «Climate Warming», «Climate Summit», «IPCC» or «Climate Convention» also contained the term «Climate Change». However, to study trends on the uses of each parameter along the period of study, we used the gross number of news obtained for each parameter, even if the parameter «Climate Change» also appeared on the same new where other parameter did. The aim was to obtain the number of items where the study parameter at least appeared once on the articles.

Once we got the gross and net number of news for each parameter, we calculated the percentage of the total news published for each parameter on each newspaper from 1997 to 2009. Then we calculated the average of publications related to our study parameters. As the amount of news started to show a marked increase at the second half of the study period, we divided it in two periods: 1997-2003 and 2004-2009. To obtain information about trends of news publications and to compare them, we calculated the average of news published for these two periods from the summation of total news published from 1997 to 2003 and next making the same from 2004 to 2009.

We also calculated the median to obtain anomalous values. All the values over the median were defined as anomalous. As we did before to calculate the average without biasing the sample, we also calculated the median for the two study periods, to obtain significant information related to some event that justify those anomalous values.

As we also wondered about the relation between Spanish press trend with the World press trends (in this case we used data from Brasil, China and Chile), we calculated the correlation between them. We used the correlation R2 method to get accurate data on the relation between World press trends and Spanish press trends.

2.2. Qualitative analysis of the sample

From the total sample obtained of the selection parameters, 14498 news were obtained from Spanish newspapers and 10153 news from International newspapers. As the amount of news obtained from the quantitative analysis was very high and it was not possible to analyze it in a whole, we made a sub-sample to complete qualitative analysis. We chose the Spanish newspapers¹ with higher circulation, *El País* and *El Mundo*, as we considered there were the most representative and both with different ideologies, the first with left-wing views and the second more liberal and centre-right-wing views. We selected a representative sample taken randomly by using random numbers of the 20% of news published for the years 2007 and 2009. The reason why we selected these dates was owed to the fact that they were the most representative from the study period after calculating the median for the two study periods (1997-2003 and 2004-2009). We selected the highest values observed for the second period, as the newspaper *El Mundo* did not show complete data for the first period of study. Moreover, we only analyzed news which contained the parameter «Climate Change» as we observed that almost all news of the sample included this parameter. In this way we managed to reduce the sample without biasing it. Once we selected and worked the sample, we proceeded to analyze each selected new in depth.

1. We did not include the International press as the searching engines of *Chinadaily* and *El Mercurio* did not let us to analyze new by new in depth.

For our analysis we designed a table to collect the data obtained from each new. The purpose was to make a descriptive analysis of each new through defining some variables which helped us to obtain detailed information about trends and events occurred during the study period. In this case we defined 27 variables: *date of publication, newspaper, searching parameter, topic, headline, subheading, location (front page yes or not), pages (society, science, international, national, opinion, etc.), genre (information, interpretative or opinion), subgenre (information, new, article, report, interview, editorial, column, comment, letters to the editor and comic strip), picture (yes or not), picture related to «global change» (yes or not), quotation's origin, source (scientific article, press agency, experts, etc.), author's name, author occupation (scientist, politician or journalist), origin (Spain or World), ideology (positive, negative, neutral), ideology details, alarmism (yes or not), alarmism details, type of repercussion (global, regional, national, local), type of impact (social, environmental, economical, political), scientific evidence (yes or not), key words, chronological relation to an event, and use of the word «global change» (yes or not). See Appendix I.*

After compile all this data, we obtained information about which were the most used terms to refers «Global Change», which way to present the information was the most common, what were the sources most used, what ideology was presented in the majority of the news analyzed, identifying if there was alarmism on the news that could influence to the users, what was the scope of the information, and if there was chronological relation to an specific event that influenced the increase of the number of news published. In short, mapping out what was the image that the media press projected onto the public about the «global change problems» during the study period.

3. Results

3.1. Increase trend in «Climate Change» coverage

After analyze the sample we observed some significant trends along the study period (1997-2009). There was a significant increase in the number of news published from 1997 to 2009 (Figura 1). Although *El País* and *El Mundo* are the newspapers which more news published, the same trend was observed in all newspapers.

The highest peak was observed in 2007 at the majority of the Spanish language newspapers (Figura 1) except in *El Mundo* where even there were found a high number of news by that date, the highest peak for this newspaper was observed in 2009. What we observed was that this broad amount of news coincided in time with the IPCC Summit celebrated in Valencia in November of 2007, where the Fourth Assessment (AR4) was approved and also with XIII Conference of the Parties (COP) from the United Nation Framework Convention on Climate Change (UNFCCC) celebrated in Bali in December 2007, where the IPCC Fourth Assessment (AR4) was presented. Against what it was expected, in 2009 we observed a peak but was lower than the one observed in 2007 for Spanish newspapers, except at *El Mundo* where we found that highest coverage clashed with the Copenhagen Summit.

The trend observed at *El Mundo* was the same as the trend observed at the newspapers from the others countries of study. The highest peak was observed in 2009 when Copenhagen Summit occurred although the difference was not very marked between 2007 and 2009 at international newspapers.

It is important to stress the peak observed in 2001, at the first period of study (1997-2003), in almost all newspapers, except at *Folha de S. Paulo* and *Chinadaily* where the highest peaks were observed in 1997 and 2003 respectively. It coincided with the presentation of IPCC «Third Assessment (TAR)», where the scientific bases of Climate Change were explained and also «Effects, Adaptation, Vulnerability and Mitigation» as well as several scientific questions useful for the design of policies. Moreover it also coincided with the VII Conference of the Parties (COP) from the United Nation Framework Convention on Climate Change (UNFCCC) celebrated in two different places: Bonn in Germany and Marrakech in Morocco. Although there is a Convention on Climate Change every year, 2001 was important because major conclusions were reached about international emissions trading (Marrakech Accords, 2001).

Referring to the used terms, the most used parameter at Spanish newspapers of study was «Climate Change», followed of the parameter «Global Warming» (Appendix III). Nevertheless the observed trend at International newspapers was slightly different (Figura 2). At *Folha de S. Paulo* newspaper we found the parameter «Global Warming» (52.3%) in front with a considerable distance from the use of «Climate Change» (25.1%). In general, at international newspapers we found a higher use of the term «Global Warming»

(35.3% at *Chinadaily* and 30.06% at *El Mercurio*) comparing to Spanish press (14.6% at *El País*; 19.3% at *El Mundo*; 17.2% at *ABC* and 17.4% at *La Vanguardia*), although the most used parameter was «Climate Change» (60.2% at *Chinadaily*; 39.1% at *El Mercurio*; 48.05% at *El País*; 70.9% at *El Mundo*; 73.9% at *ABC* and *La Vanguardia*).

Fig. 1.

Number of articles published at Spanish's newspaper per year

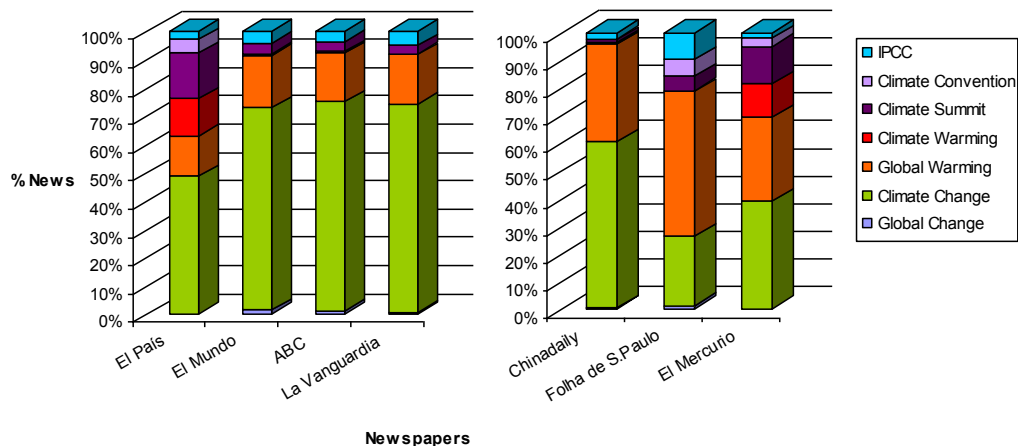


Articles are related to our study parameters «Global change, Climate Change, Global Warming, Climate Warming, Climate Summit, Climate Convention, IPCC» («Cambio Global, Cambio Climático, Calentamiento Global, Calentamiento Climático, Cumbre del Clima, Convención del Clima, IPCC»). Please note that we originally have searched all the parameters in Spanish at the Spanish's spoken newspapers searching engines. Same was done for the Portuguese spoken newspaper.

According to the use of the parameter «Global Change» its use was not very extended in press. *El Mundo* was the newspaper where the term «Global change» appeared more times comparing to the rest of newspapers but this data was not very significant. The term reached its maximum in 2008 with a total of 17 appearances (1.81%). *El País* and *El Mercurio* newspapers did not produce result by using the search term «Global Change» as it appeared in several contexts out of the «Climate Change» context. Related to these two newspapers, they were outstanding at the rest because they showed a wide use of the different parameters which was not seen at the others newspapers of study.

Fig. 2.

Percentage of new s per parameter* appeared at Spanish newspapers (1997-2009)



* (Global change, Climate Change, Global Warming, Climate Warming, Climate Summit, Climate Convention, IPCC). Please note that at the newspapers *El País* and *El Mercurio* the parameter «Global Change» was not included.

Concerning to the evolution of average news published during the study period (1997-2009) we found significant information (Figura 3). As we expected, there was a wide difference between the first and the second period of study. The average of news published at the first period was over 95 per year for Spanish newspapers and 73 for International newspapers, while the average of news for the second period was over 451 and 479 per year for Spanish and International newspapers respectively. It showed a very significant average increase of 374.8% and 552.5% of news published for Spanish and International newspapers respectively between the two periods of study (1997-2003 and 2004-2009).

Fig. 3.

Evolution of the average of news published between 1997-2003 and 2004-2009 per newspaper

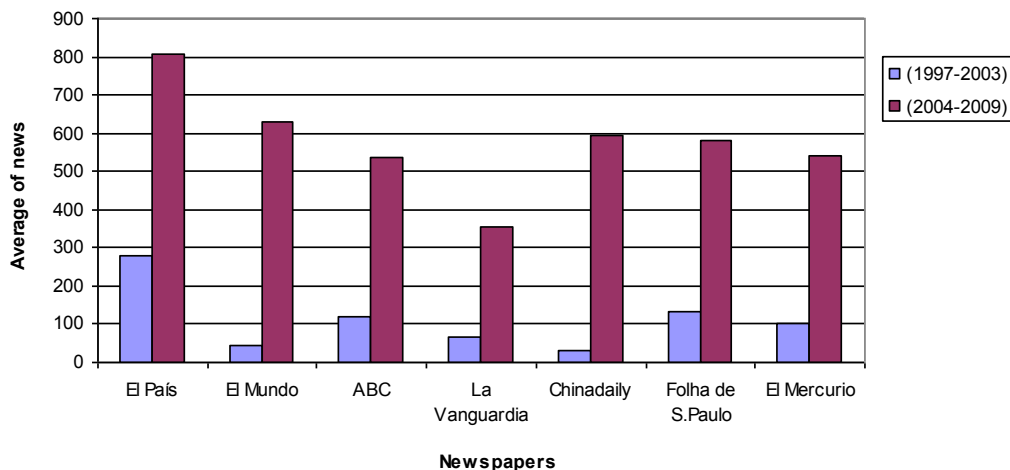


Table 2.

Qualitative Analysis data. Analysis of the news appeared at El País and El Mundo Newspapers in November 2007 (%)

PAGES (%)	SCIENCE	SOCIAL	OPINION	SPAIN	INTERNATIONAL	OTHERS
El País*	–	54.5	24.2	9.09	3.03	9.09
El Mundo**	60	–	–	8.6	–	31.2
Genre (%)	Information	Interpretative	Opinion			
El País*	51.5	21.2	27.3			
El Mundo**	86	11	3			
Subgenre (%)	New	Article	Column	Report	Editorial	Others
El País *	45.45	15.15	3.03	21.21	6.06	9,09
El Mundo**	82.9	2.86	–	11.4	–	2.86
Picture (%)	Yes	No				
El País •	35.3	64.7				
El Mundo**	66	34				
Global Change	Yes	No				
Picture (%)						
El País *	15.15	84.85				
El Mundo**	14	86				

PAGES (%)	SCIENCE	SOCIAL	OPINION	SPAIN	INTERNATIONAL	OTHERS
Quotations (%) El País ^a	Scientists/ Experts 28.57	Politicians 50	NGO 7.14	Private Companies 7.14	Others 7.14	
El Mundo ^o	36	36	15	5.1	7.7	
Source (%) El País* El Mundo**	El País 100	El Mundo -49	EFE -31	Agencies -20		
Author (%)	Journalist	Expert	Other			
El País*	84.85	3.03	12.12			
El Mundo**	97	2.9	-			

Origin (%) El País •	Spain 88	World 22		
El Mundo**	83	17		
Ideology (%) El País *	Positive 30.3	Negative 60.6	Neutral 9.09	
El Mundo**	54.3	40	5.71	
Ideology Details (%) El País •	Positive: Solutions to Climate Change 24	Positive: public awareness 4	Negative: political critics and protest 36	Negative: Climate Change consequences 36
El Mundo †	26.5	29.4	17.6	26.5
Alarmism- Catastrophism (%) El País *	Yes 24.24	No 75.76		
El Mundo**	25.7	74.3		
Repercussion (%) El País *	Regional 6.06	National 60.6	European 3.03	Global 30.3
El Mundo**	5.71	42.9	5.71	45.7
Impact (%)	Political	Economical	Social	Environmental
El País •	48	14	12	26
El Mundo/	27.03	10.81	37.84	24.32
Scientific Evidence (%) El País*	Yes 45.5	No 54.5		
El Mundo**	57	43		

* n = 33 ; ** n = 35; † n = 34; ^a n = 28; ^o n = 39; • n = 25; ‡ n = 42; / n = 37.

Total sample: *El País* (n = 58) *El Mundo* (n = 52); Note: 43.10% and 20.73% of the news analysed at *El País* and *El Mundo* respectively were considered as not relevant (the term «Climate Change» only appeared but was not developed).

To calculate the correlation between the different newspapers of study we used the correlation R² method. We found the highest correlation between *Chinadaily* and *Folha de S.Paulo* (0.98). Overall the correlations were very high, but we found that *El Mundo* was the Spanish newspaper which got the greatest correlation with the International newspaper *Chinadaily* and *Folha de S.Paulo*. Also the International newspapers got high correlation between them, including *El Mercurio*. Referring to Spanish newspapers, we found the highest correlation between *El País* and *La Vanguardia* (0.97). The lowest value was found between *El Mundo* and *ABC* (0.7), both Spanish newspapers,

but it was not significant because the correlation values obtained were high in general.

3.2. Treatment of «Global Change» at Spanish press

The analysis of the highest circulation Spanish newspapers, *El País* and *El Mundo*, provided significant results² (see Table 2). The main difference observed was that *El Mundo* contained a *Science* section which included all news related to «Climate Change» (60%) while *El País* does not and, the majority of news related to «Climate Change» was included at *Society* pages (54.5%).

Another important difference observed was referred to news genre. At *El Mundo* most of news were classified as *Information* (86%) but at *El País*, although the majority of news were *Information* (51.5%), there was a significant percentage of news classified as *Interpretative* and *Opinion* genre (48.5%), like reports or interviews, while at *El Mundo* this percentage was hardly significant (13.9%). This fact was related also to the sources used to obtain the information. We observed that *El Mundo* made a wide use of Press Agencies to get information (51%) which explained the high number of news as subgenre, while *El País* hardly made use of external sources, including more reports, interviews and opinion articles as subgenre. In this way, differences found between the author's backgrounds are explained, where at *El Mundo* there were more authors with journalistic background (97%) than at *El País* (84%). In addition, at *El Mundo* (57%) we found more news with scientific evidence than at *El País* (45.5%).

The dominant ideology observed at *El País* was negative (60.6%) against the positive ideology dominant at *El Mundo* (54.3%). We defined as positive the news which presented solutions and public awareness related to «Climate Change» and we defined as negative all those news which included consequences of «Climate Change, political critics and protest». Moreover we found the same number of quotes from politicians (36%) and experts or scientist (36%) at *El Mundo* while at *El País* the number of quotes

2. Data analyzed corresponds to the month of November of 2007, as this was the month were the highest peak of news was observed for the first time at Spanish newspaper and we considered it the most representative to explain our results.

from politicians (50%) was higher comparing to experts (28.5%). It is important to highlight that the origin of the majority of news was Spain (more than 80% for both newspapers.) On the other hand, there were found differences referring to the scope of the news, at *El Mundo* global scope was slightly higher (45.7%) than national scope (42.9%). At *El País* national scope (60.6%) was dominant over global (30.3%). Also there were found differences on the impact of the news, while at *El País* the political impact was the highest (48%) comparing to social (12%), environmental (26%) or economical (14%), at *El Mundo* the social impact was the highest observed (37.8%) comparing to political (27.3%), environmental (24.3%) or economical (19.8%). In both newspapers was observed that the 51% of news were associated chronologically to a singular event.

Concerning to the alarmism level presented at the analyzed news, data showed low levels of alarm, around 25% for both newspapers. We classified as alarmism those articles which included terms as *disaster*, *catastrophe*, *uncertainty*, *fear*, *apocalyptic*, *alarm*, *threat*, *irreversible*, *destruction*, *horrific* and *suicide*.

We also observed that *El Mundo* included more articles with images (66%), although only 14% were related to «Climate Change», than *El País* (35%) which despite of having fewer images the percentage of them related to «Climate Change» (15%) was higher than at *El Mundo*.

To obtain the most used terms to refer «Global Change» we used Wordle³ tool. Main terms obtained were: *climate change*, *global warming*, *Kioto Protocol*, *Green House Gases Emissions*, etc. (see Appendix IV).

4. Discussion

«Global Change» treatment at Spanish and International press has experienced a significant evolution since Kyoto Protocol was born. The increase trend observed on the press coverage of «Climate Change» was clearly marked since the came into force of Kyoto Protocol in February of 2005, after Russia ratified it on November 2004. This general trend was observed equally at Spanish press and at International press but the

3. <http://www.wordle.net/>.

abrupt transition came at 2007, when IPCC Fourth Assessment (AR4) was presented. Comparing to other studies we confirmed that this brusque rise was also observed at English language press (Boykoff, 2008; Groffman *et al.*, 2010) from all over the world. The fact which better explain this marked rise was the presentation of the IPCC Fourth Assessment (AR4) on the XIII Conference of the Parties (COP) from the United Nation Framework Convention on Climate Change (UNFCCC) celebrated in Bali in December 2007. The synthesis Report (AR4) was considered the most important among others Reports because it was targeted to the policy makers (Climate Change 2007: Mitigation of Climate Change), showed an economical vision of the phenomena and also presented the increasing trend of the extreme climatic events through the future projections, an alarming fact which caught the press attention (Magallón, 2008). This fact generated high political expectation around it, as Climate Change mitigation was included formally at the international political agenda at the Spanish sphere (Weingart *et al.*, 2000), and therefore it entailed high media coverage of the event. Moreover, the Nobel Peace Prize received previously to the presentation of the Report, the 12th of October, granted credibility and expectation to the event in Bali, and could be considered as a value added tool for the IPCC to gain widespread acceptance at social sphere (Hulme, 2009).

In Boykoff (2008) we found the key factors which generated the favourable climate to reach the highest coverage of «Climate Change» in 2007; the release of the film documentary *An Inconvenient Truth*, presented by US politician Al Gore in 2006, which caused a high lasting effect on public opinion and also became the fourth highest-grossing film documentary of all time (Hulme, 2009) and, the presentation of the Stern Review in 2006 which presented the economic cost of «Climate Change» mitigation, impacts and adaptation (Boykoff, 2008).

Although the increased trend was generalized in all study press, there were found significant differences between Spanish and International press by the end of the study period. While the increase trend was observed also in 2009 at International press, at Spanish press it started to decline in 2008 and did not experiment an increase regarding the Copenhagen Summit in December of 2009, except at *El Mundo* newspaper. On the contrary, International newspapers of study, *Chinadaily*, *Folha de S.Paulo* and *El Mercurio*, followed the increase trend in 2009 justified by the relevance of the Climate

Summit celebrated in Copenhagen at the end of 2009. Then, what happened to Spanish press increase trend? Attending to William's affirmation (William, 2000 in Russil and Nyssa, 2009) about the lost of interest from the media when the problem treated does not present precise solutions and therefore coverage experiences a decrease, we could find an explanation to our question. Copenhagen Summit was presented as an event where policymakers did not reach a common agreement. On the other hand, the fact which more weight presented to explain this situation was the physical distance with the Summit location. As in 2007 one of the IPCC Summit took place in Valencia in November 2007, where the Fourth Assessment (AR4) was approved, the Spanish coverage of the event experience a very significant increase, mainly owed to the proximity of the scenario. According to Magallón (2008), local information it is more important and have more impact on the public than the global information.

It is important to highlight the circulation differences observed between the newspapers of study. Although the majority of them follow similar numbers of diffusion, there was a wide difference between them if we attend to the population numbers. Spanish press gave a greater coverage to Climate Change than Chinese and Brazilian press. While in Spain there are nearly 47 million inhabitants⁴, in China there are more than 1,300 million people⁵ but the circulation was lower in China, reaching only 200,000 against more than 300,000 of *El País* and *El Mundo*, the highest circulation newspapers of Spain. Same was observed in Brazil, which have hardly 200 million inhabitants but the circulation reached for the newspaper considered as the most readed in Brazil, *Folha de S.Paulo*, did not reach the 300,000 items (Weber, 2007). In Kenix's (2008) study, developed in New Zealand, the largest circulation newspaper reached over 530,000 people over a population of only 4 million people. This fact give us an idea over the low circulation rates observed at China and Brazil newspapers, which talks to a minuscule percentage of the population (Weber, 2007).

At the press discourse, «Climate Change» was the most used term in general, followed of «Global Warming». *Al Gore* phenomena after the release of the film documentary *An Inconvenient Truth* seems to be the fact which also influenced on the increased use of the term «Global Warming» (Appendix II)

4. Data obtained from the Spanish National Statistic Institute 2010.

5. Data obtained from cpir.org.cn.

from the end of 2006, although it is seem to be a consensus on the generalized use of «Climate Change» on the press which enforce its use over «Global Warming» term.

4.1. *The Spanish case*

Press agencies, private companies and scientific groups as sources to obtain information acquire an important role on «Climate Change» communication as a tools to provide detailed information to the journalist and also to provide quality pictures that catch to public attention (Magallón, 2008). However, it is important to be careful with this information as most of the times have a hidden interest behind (Elías, 2009). Abusing of press releases from scientific publications or journals, or scientific groups as the NASA which always provides high quality images, or even energy companies⁶ providing detailed and innovative information presenting their activity as «environmental friendly», could project an image of «Climate Change» charged of private interest against the public interest (Boykoff, 2008).

In the case of Spanish press we observed that *El Mundo* newspaper, made a wide use of press agencies and external sources to obtain information while *El País* newspaper hardly made use of external sources. Therefore the interpretative and opinion information genres were more used at *El País*, giving a more critical view and also showing the ideology of the newspaper through its editorials several times. On the contrary, as *El Mundo* made a wide use of external agencies to get information, thereby its ideology was less critical and this fact left more space for news with scientific and business interests, projecting a positive image with a hidden intention for the private benefit (Elías, 2009), although it is important to clarify that this was not a common practical at the newspaper.

Against other studies (Russill and Nyssa, 2009; Weingart *et al.*, 2000), in this study we did not find an alarmist stream at the Spanish press discourse.

6. At *El Mundo* we found different examples, one of them was the launch of a videogame which simulated the life at the most sustainable city of the cyber world and which was sponsored by British Petroleum, one of the most contaminants companies of the world (*El Mundo*, November 2007).

Although the alarm was used in some news⁷, the journalists did not make an abuse of it. However we found a slightly dominant negative ideology at *El País*, the newspaper of largest circulation of Spain, and a significant percentage of negative ideology also at *El Mundo*. Both newspapers used the journalistic norm of balance, as we found in Boykoff's study (2004), with the aim of giving the same coverage to both ideologies, positive and negative, in an attempt for neutrality presenting both sides with equal attention. But this journalistic norm becomes a form of information bias when refers to «Climate Change». Communicating only the damaging effects of «Climate Change» reflects a negative view to the public. On the contrary, communicating solutions, concrete actions against «Climate Change» and promote awareness campaigns projects a positive view (Weingart *et al.*, 2000). At the Spanish scene, the politicization of «Climate change» provides to politicians a wide place into the media press, and left scientists and experts at the second place. The problem associated to this fact was the negative image associated to politicians (Dalton and Weldon, 2005). In the one hand, political critics and protests were the most common context observed at the news where politician were the main actors (Carvalho, 2006). On the other hand, news which presented solutions to «Climate Change» and promoted public awareness included the discourse of scientist and experts. Therefore we observed that politicians projected a negative image and scientist a positive image which also had an impact in the society higher than the politicians.

As Carvalho (2005) affirmed, the coverage of climate change has been strongly linked to the political agenda. We found a clear example which supports Carvalho's theory in this study, where all the peaks observed on the study period were related to political events more than climatic events (Groffman, 2010; Hulme, 2009; Boykoff, 2008). In Groffman (2010) words «unfortunately, most off the times, more attention is given to policy controversy than to scientific consensus».

7. Greenpeace described openly its strategy of «Creating alarm to promote social reaction» (*El Mundo*, November 2007).

5. Conclusion

The came in to force of the Kioto Protocol in 2005 meant a significant change at the coverage of «Climate Change» all over the World press. As it is shown in this article, the increase trend observed over the last ten years has been associated chronologically to important events regarding «Climate Change», the majority of them with politicians and scientists as the main actors but, lately with scientists aside. The politicization of «Climate Change» has implied an increase on the coverage (Boykoff, 2008) but also a change on the «Climate Change» discourse oftenly related to politic sphere.

As politicians involve criticism and project a negative image into the public, oftenly because their lack of credibility (Dalton and Weldon, 2005) more attention should be given to scientist as opinion leaders regarding «Climate Change». As Carvalho (2006) said, once more science is asked to «come out to the street».

To show the problem it is not enough. The public is waiting for solutions and concrete actions to adapt and mitigate «Global Change». At the relation media-politicians-scientist it is important to have in mind this fact, which generate a positive impact in the public and also is a call to action with high acceptance. Nevertheless it is important to not forget that «things are not always what they seem at first», and sometimes behind the scientific evidence there is a private interest which hinder the public interest. Likewise, it is important to pay attention to local action which gain force against global action, as we observed at the Spanish case how the coverage of «Climate Change» experienced a marked increase when the Climate Summit took place in that country.

Overall, it is important to emphasize the importance of improve and increase the coverage of «Global Change» at the most populated countries of the world, where the coverage still is scarce. As we observed in China and Brazil, both playing a very important role at «Global Change» context, one referring to the high increase of GHG emissions owed to its recent industrialization and the other to the wide deforestation suffered from the last years, this scarce coverage become a worrying fact regarding the public awareness about the urgent need to adapt and mitigate «Global Change».

Although the digital media are gaining field to traditional media, nowadays most learning about climate change and other environmental problems still takes place via traditional print media (Hulme, 2009) and for this reason it is important to keep investigating on the press and its influence on the public awareness of the issue «Global Change».

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