

Trends in Reports on Climate Change in 2009-2011 in the Korean Press Based on Daily Newspapers' Ownership Structure

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Objectives: The mass media play a crucial role in risk communication regarding climate change. The aim of this study was to investigate the trend in journalistic reports on climate change in the daily newspapers of Korea.

Methods: We selected 9 daily newspapers in Korea, which according to the ABC Association, represented 77% of newspaper circulation, out of a total of 44 Korean daily newspapers. The collected articles were from 2009 to 2011. All of the articles were sorted into the following 8 categories: greenhouse gas, climate change conventions, sea level rise, Intergovernmental Panel on Climate Change synthesis reports, expected damage and effect, use of fossil fuels, global warming, and mitigation or adaptation. A chi-squared test was done on the articles, which were counted and classified into cause, effect, and measurement of climate change according to the newspaper's majority or minority ownership structure.

Results: From the 9 selected newspapers, the number of articles on climate change by month was greatest in December 2009. Generally, the articles vague about climate change (lack of precise data, negative or skeptical tone, and improper use of terminology) were much more common than the articles presenting accurate knowledge. A statistical difference was found based on ownership structure: the majority-owned newspapers addressed the cause of climate change, while the minority-owned newspapers referred more to climate change measurement.

Conclusions: Our investigation revealed that generally Korean daily newspapers did not deliver accurate information about climate change. The coverage of the newspapers showed significant differences according to the ownership structure.

Key words: Press report, Climate change, Daily newspaper, Ownership, Risk communication

Received: November 20, 2012 Accepted: February 13, 2013

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INTRODUCTION

Climate change is also known as 'global warming' or anthropogenic climate change [1]. Climate change is one of the globally shared environmental issues and one of the major topics affecting national policy. Proper risk management of climate change is required. For risk management, it is necessary to communicate among stakeholders, which are governments, non-governmental organizations, research communities, busi-

nesses, and the public [2]. The mass media plays a crucial role in conveying information to stakeholders needed for risk communication [3].

Media coverage has helped to shape public perception and has affected how science is translated into policy (most notably in regard to the environment), new technologies, and risks [4]. The role of the mass media is to provide the public with accurate scientific information so that they can influence policy-makers to make the proper decisions. Among the mass media, newspapers and television stations are the most influential [3]. However, the mass media is affected by various factors such as pressure from carbon-based industries, the influence of skepticism, and journalistic norms. Several non-Korean studies have addressed the way that the mass media is affected by pressure, influence and journalistic norms in its coverage of climate change [1,5,6]. One Korean study also addressed the coverage of environmental issues, such as the health impact of Asian Dust in Korea, in the press of the Republic of Korea [7].

Newspapers are considered to be useful in augmenting television as a medium of communication because they reach a large audience, can be read at any time, have a format that allows for providing more precise information, and can maintain the attention of their audience [3]. One study examined the difference in the number of articles of major daily newspapers in the US and the UK covering climate change. The UK daily newspapers increased coverage by more than 25 times over 20 years; by contrast, there was only a threefold increase in the US [1]. Moreover, cultural preoccupation with free markets and economic growth could motivate an attitude of denial toward anthropogenic climate change [1]. The stockholder structures of Korea's big 3 daily newspaper companies are essentially made up of the individual owner and owner's family, while the stockholders of 2 other major newspaper companies include many minority shareholders and citizens [8]. The former tends to emphasize the ideology of the free market or economic growth more than the latter. One previous report characterized the news in Korea according to its political tone, as either conservative and progressive [9]. However, only three newspapers were examined and the criterion for classifying the newspapers as conservative or progressive was arbitrary.

From 2008, the Korean government has made green growth a national policy. Therefore, assessing the factors that influence the coverage of daily newspapers during the period in which the government made green growth a national policy is needed. This is primarily a descriptive study to determine the study

framework prior to analyzing the effects of pressure, influence, and norms within mass media societies on climate change. To assess the factors that apply pressure to newspaper coverage, analyzing most of the major Korean daily newspapers according to the stockholder type is a more objective than according to the political tone.

METHODS

The following 9 daily newspapers that were selected from among the 44 daily newspapers of Korea: *Chosun Ilbo*, *Dong-A Ilbo*, *Hankook Ilbo*, *Hangyoreh Shinmun*, *Joongang Daily*, *Korea Economic Daily*, *Kukmin Ilbo*, *Kyunghyang Shinmun*, and *Maeil Business News*. According to the ABC Association, these 9 newspapers represented 77% of the total daily newspaper circulation (8 942 979) [8]. Each newspaper company has its online homepage. The 35 newspapers that were excluded dealt primarily with regional issues, had a specific purpose, or were targeted to specific groups. Also, internet newspapers were excluded because these were not always written by professional journalists [10].

The articles dealing with climate change during the period from January 1, 2009 to December 31, 2011 were collected. We selected these 3 years of newspapers (2009, 2010, and 2011) because the South Korean government mandated a low carbon green growth policy during these years. This government moulded climate change as green growth; thus examining how coverage changed after that time would be valuable. The number of articles in each month was identified to determine whether the articles were influenced by seasonal variations in weather or special events such as international conventions. In every daily newspaper, the words in the articles were searched based on the Intergovernmental Panel on Climate Change (IPCC) synthesis report of 2007, including the Korean-language terms for carbon dioxide, global warming, out-of-oil energy measures, abnormal climate, meteorological disaster, and conventions on climate change. The Boolean logical 'or' was used for the search terms. A complete enumeration survey was used to study the articles. When identifying the titles and the contents of the articles, articles unrelated to climate change were excluded. The input time was assumed to be the time of reporting. The articles were crosschecked by two investigators.

A study on the media coverage of conflicts, by Galtung and Ruge [11], identified 12 filters of selection, called "news factors."

In this report, among the 12 filters, we investigated frequency, clarity and negativism. In terms of frequency, the total number of articles was counted and the changes in the articles were examined by year. Additionally for comparing the previous study [9] the number of articles on climate change by the *Chosun Ilbo*, *Joongang Daily*, and *Hangyoreh Shinmun* was evaluated. The news factor called "clarity" refers to content with accurate information. "Negativism" means a negative or skeptical tone, which is based on uncertainty of prediction equations when using simulation of further climate change and myriads of complex influential in overall earth systems [12,13]. Climate change skeptics argue that it would cost so much money to correct climate change that we should prioritize other goals such as economic development.

The nine newspapers were divided into two groups according to their ownership structures: the newspapers owned by majority stockholders and the newspapers owned by minority stockholders. The newspapers owned by majority stockholders were defined as those owned by less than 100 stockholders and by monopolistic ownership families, while the newspapers owned by minority stockholders were defined as those owned by 100 or more stockholders [14]. The newspapers owned by majority stockholders were found to be the *Chosun Ilbo*, *Dong-A Ilbo*, *Joongang Daily*, *Korea Economic Daily*, *Kukmin Ilbo*, *Hankook Ilbo*, and *Maeil Business News*, and the newspapers owned by minority stockholders were the *Hangyoreh Shinmun* and *Kyunghyang Shinmun*. We reviewed every article in the newspapers. Based on categories identified in a review of the IPCC synthesis report on anthropogenic global warming, three researchers sorted the articles into the following eight categories: greenhouse gas, climate change conventions, sea level rise, IPCC synthesis report, expected damage and effects, use of fossil fuels, global warming, and mitigation or adaptation. The articles were then classified into those containing accurate and vague. "Accurate" was defined as penetrating analysis about the topic, for example, presentation of the types of greenhouse gases or the contents of a climate change convention. The articles were regarded as having vague based on any of the following criteria: the report did not mention any of the eight categories; even if there was a mention of any of those categories, it suggest improper use of climate change; the article had negative or skeptical tone. All of the articles were classified into three topics: cause (greenhouse gases, global warming, etc.), effect (abnormal climate, meteorological disaster, etc.), and measurement (mitigation or adap-

tation, convention on climate change, etc.) of the climate change. When the articles were addressed more than two topics, they were classified according to their main topic. For assessing the different coverage according to the majority or minority ownership stakeholder type, the chi-squared test was used for analysis. The level of significance was $p < 0.05$.

RESULTS

The changes in the articles in Korea published in 2009 to 2011 were analyzed (Figure 1). In December 2009, when the Copenhagen Climate Change Convention was held, the number of articles was the highest at 254 articles. In the other months, in broad outline, the number of articles remained steady. The number of articles by month was less than 50 articles and did not vary markedly by month.

The articles that provided the public with precise data were assessed (Table 1). The results show that the number of the nine newspapers' articles by year was 746 in 2009, 353 in 2010, and 258 in 2011, for a total of 1329 articles. The number of articles was greatest in 2009, with about 3 times more than in 2011. Generally, the articles presenting vague information or no content about climate change were by far greater in number than the articles presenting accurate data. The percentage of accurate articles was 26%, 25%, and 25%, respectively, in each year, and the percentage of vague or no data articles was 74%, 75%, and 75%, respectively. The number of accurate articles about greenhouse gases and global warming was greater than the number of vague or no content articles in general. In the year 2009, the number of accurate articles referring to the climate change convention was eight times greater than in 2011. By year, the percentage of accurate articles referring to greenhouse gases was decreasing. On the other hand, the percentage of accurate articles referring to global warming was

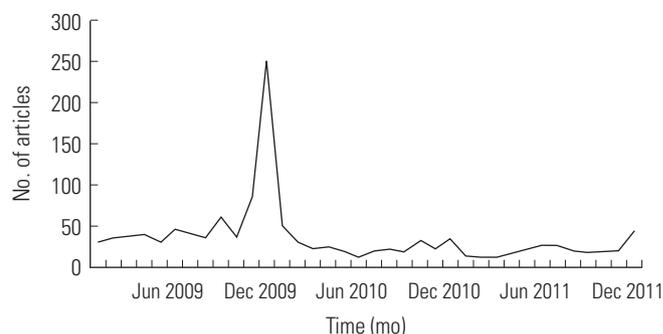


Figure 1. Monthly change in the number of articles from the nine newspapers (2009 to 2011).

Table 1. Number of articles in nine newspapers according to accuracy of climate change information (2009-2011)

Categories	2009 (746) ¹		2010 (325)		2011 (258)	
	Accurate	Vague ²	Accurate	Vague	Accurate	Vague
Greenhouse gases	433	313	166	159	125	133
Climate change conventions	392	354	67	258	39	219
Sea level rise	43	703	4	321	15	243
IPCC synthesis report	74	672	38	287	17	241
Expected damage, effects	71	675	47	278	53	205
Use of fossil fuels	51	695	24	301	19	239
Global warming	360	386	200	125	174	84
Mitigation or adaptation	139	607	99	226	71	187
Total	1563/5968 (26%)	4405/5968 (74%)	645/2600 (25%)	1955/2600 (75%)	513/2064 (25%)	1551/2064 (75%)

IPCC, Intergovernmental Panel on Climate Change.

¹The total number of articles is shown in parentheses.

²“Vague” includes the articles used improper terminology of the above categories, the article did not refer to precise data, or the article had a negative or skeptical tone.

Table 2. The difference in coverage between newspapers owned by majority stockholders and newspapers owned by minority stockholders

Topics	Cause	Effect	Measurement	χ^2 -value (p-value)
Majority stockholders	600 (59%)	92 (9%)	37 (31%)	64.2
Minority stockholders	136 (38%)	24 (7%)	198 (55%)	(<0.001)

The newspapers owned by majority stockholders were the *Chosun Ilbo*, *Dong-A Ilbo*, *Joongang Daily*, *Hankook Ilbo*, *Korea Economic Daily*, *Kukmin Ilbo*, and *Maeil Business News* and the newspapers owned by minority stockholders were *Hangyoreh Shinmun* and *Kyunghyang Shinmun*. The article search words were classified into causes (greenhouse gases, global warming, etc.), effects (abnormal climate, meteorological disasters, etc.) and measures taken to address climate change (mitigation or adaptation, climate change conventions).

increasing.

The number of articles was calculated according to the newspaper ownership type (Table 2). There was a highly significant difference in “cause” and “measurement” between the newspapers owned by majority stockholders and the newspapers owned by minority stockholders ($p < 0.001$). The newspapers with majority stockholders mainly reported the causes of climate change (600 articles, 59% of total articles). The newspapers with minority stockholders covered measurements for dealing with climate change (198 articles, 55% of total articles). Both newspapers dealt relatively less frequently with the effects of climate change.

DISCUSSION

The aim of this study was to assess whether newspapers de-

livered exact information to the public after the implementation of the government’s low carbon green growth policy. The result showed that there was different coverage according to the ownership structure of the newspaper company. The newspapers owned by majority stockholders mainly reported the causes of climate change, and the newspapers owned by minority stockholders mostly covered the measures for dealing with climate change. The majority owned papers tended to report facts that are already known, the causes of climate change. The minority owned papers criticized the Four Major River restoration project which is one of the government’s green growth policies. The *Hangyoreh Shinmun* criticized the government’s green growth policy during this period. Neither newspaper company covered the effects of climate change as extensively. Furthermore, the articles with a negative or skeptical tone were normally published by newspapers owned by majority stockholders, while the *Hangyoreh Shinmun* did not have any articles with a negative or skeptical tone. This implies a failure of the newspapers to provoke communication on the risks of climate change.

Generally, roughly a quarter of the total articles were classified as “accurate.” The articles with vague or no data were by far more common than the accurate articles. Global warming is becoming a global issue and becoming more important as time passes. Therefore, references to global warming are increasing. However, the attention on the greenhouse effect is decreasing because it is more clear than before that the greenhouse effect causes global warming, thereby making it unnecessary to mention it. Nevertheless, the newspapers reported a

fact that was already known but did not report any new facts. This shows that the Korean newspapers are not properly warning the public nor playing their proper role in mitigating climate change.

Attention to global warming exploded in 2004. This era was the time of preparation for the ratification of the Kyoto Protocol [9]. The number of articles in the nine newspapers was greatest on December 2009, at 254 articles. The total number of articles was small compared to the number of the 4 major newspapers in the US and the 3 major newspapers in the UK in 2006 (about 750 in the US and about 2000 in the UK) [1]. In December 2009, the UN Secretary General, Ban Ki-Moon, who is Korean, took the lead at the Copenhagen climate change conference. Regardless of whether it was assessed as successful or unsuccessful, the Copenhagen climate change convention brought attention to climate change in the mass media both in South Korea and elsewhere [9]. Since the Copenhagen Climate Change Convention was held in December 2009, the number of articles dropped markedly from 254 to less than 50 (Figure 1). It seemed that Korean daily newspapers dealt the articles of climate change with one-off articles.

To compare our findings with those of the previous study [9] of 3 newspapers, the *Chosun Ilbo* had 71 articles in 2008 and 71 more in 2009 (the data was not shown on these articles). In the previous study, however, the number of climate change articles identified in the *Chosun Ilbo* in 2008 was much larger, at 407. The number of articles was quite different between the two studies because there was a difference in the search words. The previous study had the search term 'climate change' and included every article that had the phrase 'climate change' regardless of the content. In contrast, our search terms was more specific, and we excluded articles unrelated to climate change.

This study primarily aimed to describe and examine differences in the reporting tendencies between different kinds of Korean daily newspapers based on the ownership structure. A further study should be performed to examine an association between media coverage behavior (pressure, influence, and norms) and ownership structure and also to investigate how the mass media addresses public health issues related to climate change.

In conclusion, our investigation revealed that there was a difference in conveying information between the newspapers with majority and minority ownership structures. The majority mainly addressed the causes of climate change and the minority addressed the measures taken to deal with climate

change.

ACKNOWLEDGEMENTS

This research was supported by 2011 research grants from Chung-Ang University.

CONFLICT OF INTEREST

The authors have no conflicts of interest with the material presented in this paper.

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