

MASS MEDIA PRESENTATIONS OF INDIVIDUAL & SOCIETAL-LEVEL SOLUTIONS TO GLOBAL WARMING

Rich Grogan

Department of CARRS

Environmental Science & Policy

Michigan State University

Abstract

Representations of global warming solutions in high circulation newspapers are examined to determine both the scope (individual or social) and type (political, economic, science & technological, behavioral) of solutions offered in this medium. Possible correlations are explored between the newspapers, circulation sizes, and attributed sources within global warming news stories to determine whether patterns among solution scope and type are predictable. Significant results include moderately strong relationships between the sources cited in global warming news stories and both the scope and type of solutions offered. The findings suggest future research on solutions in different time frames, and among lower circulation newspapers.

1. Introduction

This study examines solutions included in global warming news stories in high circulation newspapers in the United States. The principle tasks include determining whether and how many solutions are presented; whether the newspaper in which the story appears influences the solutions included; and whether the types of sources used in newspaper stories that include solutions have any bearing on the type of solution presented, or the scope of solution presented.

Global warming's rise in publicity is a relatively recent phenomenon. In the United States, even previously sceptical leaders have begun to move to take actions on global warming, as evidenced by recent policy suggestions by President Bush (Heilprin, 2007). Additionally, in the world of commerce, many companies are now offering "green" products.

Aside from gains in publicity, global warming also has the potential to impact every person on earth, and given this scope, the topic is frequently addressed in the mass media.

Often global warming stories contain a list of tips or solutions for what must be done to stop or slow global warming. An example is the April 9, 2007 edition of *Time Magazine*, the cover of which read: "The Global Warming Survival Guide: 51 Things You Can Do to Make a Difference." However, some of these articles and presentations only address larger political solutions, such as the need for legislation to address global warming. Still other solutions are individualized, such as recommending that homeowners conserve energy. Many solutions are also economic in nature; such as the suggestion that consumers purchase a particular product because it will conserve energy or reduce emissions (a hybrid car, or low-VOC paint are examples).

Despite prevalence in many forms of media, this study focuses only on high circulation newspapers. Newspapers are the focus because most Americans get their information about global warming from newspapers (Stamm, 2000). Thus, newspapers offer a lens for understanding the solutions currently presented to Americans.

This study is exploratory in nature, and its findings will be used to illuminate a gap in current research on this topic, and to inform future research on global warming solutions in the media.

2. Theoretical Framework

Global warming's presence in the media has been the subject of an active research program by scholars (Boykoff & Boykoff, 2004 & 2007; Antilla, 2005; Stamm, 2000; and Trumbo, 1996) who have primarily focused on representation of the science of global warming. No doubt the impetus behind this scholarship is in part due to the media's role as a source of Americans' global warming news. Stamm (2000) found that most Americans get their global warming news from newspapers. Other scholars (e.g. Corbett & Durfee, 2004) have also found the media to play an important role as a source for global warming news.

Studies that focus on global warming in the media can be categorized along four primary themes: the application of framing and agenda-setting theories to representations of global warming; the impact of journalistic norms on the presentation of global warming issues; inaccuracies in global warming coverage; and issues of both source credibility and source use in global warming stories.

While the studies mentioned above have discussed the role of solutions as part of their focus, none have focused exclusively on types of solutions and how these solutions are presented via the mass media, though Trumbo (1996) proposed that solutions would comprise a greater portion of global warming coverage in the years after 1996.

2.1 Framing & Agenda-Setting Theories

Regarding the first theme, Antilla (2005) highlighted framing as a source of confusion among readers about the science of global warming. Wilkins (1993) found that through decisions of what to include or leave out, the media's values concerning global warming

could be clearly defined. Thus, by extension, and borrowing from Wilkins' language, including or deciding to leave solutions out of stories on the issue of global warming "may help frame public perceptions" (p. 73). Trumbo (1996) related frames and sources (sources will be discussed specifically below), finding that scientists were often associated with frames related to causes of global warming.

2.2 Journalistic Norms

The impact of journalistic norms is a second important theme. Palfreman (2006) blamed the common journalistic practice of balance among sources for creating confusion about the science of global warming. Wilson (2000) dealt tangentially with this issue, ultimately asserting that stories featuring reporters dedicated to environmental reporting produced more accurate global warming stories. Smith (2005) also addressed norms in relation to the use of sources by journalists, blaming, among other things, limited budgets and time constraints for a reliance on too few sources in global warming news stories.

2.3 Accuracy

Inaccuracy plays a supporting role in several studies on global warming in the media. Boykoff & Boykoff (2004 & 2007) in part blamed journalistic norms on inaccuracies in global warming coverage, tying the accuracy and journalistic norms themes (explored above) together. In 2004, Major and Atwood also highlighted inaccuracies in the portrayal of environmental risks.

A 1994 study by Bell illustrates an international approach to global warming in the media. Bell (1994) documented inaccuracies in global warming science in media stories in New Zealand in the 1990s. Also in this tradition, major newspapers in the United Kingdom were the subject of a 2005 study by Carvalho & Burgess, who suggested that global warming coverage changed fundamentally once catastrophic climate events began to occur, due to the media's focus on event-oriented stories.

2.4 Source Use

Previous studies have concentrated on the sources used in news stories on environmental risk, or on sources used in environmental reporting more generally. Lacy & Coulson (2000) illustrated that the media often rely on "...government and corporate officials" (p. 14) for environmental information. Cozma (2006) confirmed these findings six years later.

In addition, Cozma (2006) explored source credibility issues as related to environmental coverage, ultimately suggesting that reader trust could be enhanced through the use of multiple sources; an inference this study is unable to explore due to methodological limitations.

Source use also appears in studies specifically related to global warming. Wilkins (1993) found similar results to those published in 2000 and 2006 (Lacy & Coulson, and Cozma respectively), in that government sources were among those used most often in environmental stories. However, he also noted the prominent inclusion of scientists and what are operationalized here as advocates.

A focus on the evolution of source use emerges as a sub-theme in studies on global warming in the media. Trumbo (1996) noted that politicians were starting to take over as the most prominent source on the topic as early as the "...late 1980s" (p. 277). This assertion is supported by the research of Wilson (2000), who indicated an evolution of source use from scientists, to the use of more "interest groups" and "politicians" (p. 2) as the issue evolved in the press. Smith (2005) argues that scientists have dwindled as sources because of ill will toward media coverage of global warming.

An interesting correlate to source use research in global warming news stories is whether scientists and other experts speak within their relevant area of expertise. Dunwoody & Ryan (1987) found that it is common for scientists to speak outside of their realm of expertise.

2.5 Newspaper Differences

This study, in part, examines differences in the presentation of global warming solutions based on newspaper characteristics, including circulation size and "prestige" newspapers compared to other high circulation newspapers. In this vein, Mazur & Lee (1993) suggest that one of the newspapers in this study's sample, the *The New York Times*, serves as the primary source of environmental news for other newspapers. Other authors, however, have cast a wider net. Trumbo (1996) created his sample out of this tradition: "This study follows the lead of others in selecting the *New York Times*, the *Washington Post*, the *Los Angeles Times*, the *Christian Science Monitor*, and the *Wall Street Journal*" (p. 272). In 2007, Boykoff & Boykoff used similar papers in a "prestige" sample, leaving out only the *Christian Science Monitor*.

In this vein, scholars have attempted to explain differences in global warming coverage among so-called "prestige" newspapers (Boykoff & Boykoff, 2004 & 2007), though they defined differences in terms of discourse; a different focus from this study.

Given the tradition of examining environmental and global warming issues within a specific "prestige" cadre of papers, it is worth both following the tradition of determining differences between these papers, but also asking whether other high circulation newspapers, which ostensibly should have access to a similar resource base (an argument that has appeared in other content analyses, e.g. Lacy & Fico, 1991), also produce differences in coverage.

Finally, this study examines whether differences in the presentation of global warming solutions occur based on differences in circulation size among the newspapers in the sample. While this specific variable has not been examined in the media presentation of global warming literature, it has been used in other journalism research. In particular, a study by Lacy & Fico (1991), noted that: "...even among papers with high circulation numbers, differences may certainly occur" (p. 366).

2.6 Solutions

The themes that recur in media presentations of global warming studies leaves global warming solutions, the subject of this study, unexamined as a central focus. It should be noted, however, that solutions have been given limited attention in prior studies, such as Stamm (2000), and Trumbo (1996).

Given the inclusion of solutions in international policy meetings, and as objects of commerce, it is anecdotally evident that the world's leaders, and many US and international corporations, are paying attention to actions that will prevent global warming. Thus, it is important to understand *what type* of solutions are being presented in the media, and whether *all* of these solutions are in fact left to international leaders, or whether individuals are presented with information that may allow them to participate as well. Tangentially, it is also important to understand the sources providing information about these solutions in order to understand the prominent voices, at least in terms of newspaper coverage, in the presentation of solutions.

3. Research Questions

For clarity, each of the research questions relevant to this study are divided into sub-headline categories. Informed by the literature, rationales are provided for each group of questions.

3.1 Appearance of Solutions

Research Question I

Does the newspaper influence whether solutions are included in global warming news stories?

Research Question II

Does newspaper circulation size influence whether solutions are included in global warming news stories?

3.2 Number of Solutions

Research Questions III, III-A, & III-B

Does the newspaper influence the number of solutions included in global warming news stories?

RQIII-A: Does the newspaper influence the scope of solutions included in global warming news stories?

RQIII-B: Does the newspaper influence the type of solutions included in global warming news stories?

Research Questions IV, IV-A, IV-B, & IV-C

Does newspaper type (prestige versus other high circulation dailies) influence whether solutions are included in global warming news stories?

RQIV-A: Does newspaper type (prestige versus other high circulation dailies) influence the number of solutions included in global warming news stories?

RQIV-B: Does newspaper type (prestige versus other high circulation dailies) influence the scope of solutions included in global warming news stories?

RQIV-C: Does newspaper type (prestige versus other high circulation dailies) influence the type of solutions included in global warming news stories?

Research Questions V, V-A, & V-B

Does newspaper circulation size influence the number of solutions included in global warming news stories?

RQV-A: Does newspaper circulation size influence the scope of solutions included in global warming news stories?

RQV-B: Does newspaper circulation size influence the type of solutions included in global warming news stories?

3.3 Sources Within News Stories

Research Question VI

Does the type of source attributed to a global warming solution in global warming news stories influence the scope of solution(s) presented in the story?

Research Question VII

Does the type of source attributed to a global warming solution in global warming news stories influence the type of solution(s) presented in the story?

3.4 Number of Sources Within News Stories

Research Questions VIII, VIII-A, & VIII-B

Does the number of sources attributed to global warming solutions in global warming news stories influence the number of solution(s) presented in the story?

RQVIII-A: Does the number of sources attributed to global warming solutions in global warming news stories influence the scope of solution(s) presented in the story?

RQVIII-B: Does the number of sources attributed to global warming solutions in global warming news stories influence the type of solution(s) presented in the story?

3.5 Conceptual Definitions

There are several relevant conceptual definitions to this study, including definitions of both sources and solutions, which are defined below. First, regarding sources, previous research indicates that news stories on environmental issues tend to rely heavily on government, and industry or corporate sources (Lacy & Coulson, 2000; Cozma, 2006). For this study, the number of potential sources was expanded in order to capture the voices of activists and politicians, in addition to government and corporate officials, given the focus on multiple types of solutions.

Second, solutions have been examined with less frequency in the global warming literature, though Stamm (2000) offered a useful conceptual definition of solutions: "...anything that could be done to remove causes and/or reduce consequences of the problem" (221). This study amended the Stamm (2000) definition slightly, replacing "the problem" with "global warming," and applied the definition to *individual solutions* (an action that can be done by an individual to remove causes and/or reduce consequences of global warming) and *social solutions* (an action that can be done by a community, local, statewide, national or international body that seeks to remove causes and/or reduce consequences of global warming).

In addition to definitions of individual and social solutions, *solution type* is also important. The intent of *solution type* is to determine whether a solution is economic, behavioral, or technological; or whether the story presents a situation of inaction, whereby the solution presented is to not do anything. Based on above definition of a solution, each of the types of solutions explored in this study can be conceptualized thusly:

Economic: The purchase of a good or service in order to remove causes and/or reduce consequences of global warming; *Behavioral*: Behaving in a particular way in order to remove causes and/or reduce consequences of global warming; *Science & Technological*: Use of a technology-based solution in order to remove causes and/or reduce consequences of global warming; *Political*: Use of a treaty or legislatively-based solution in order to remove causes and/or reduce consequences of global warming; *Inaction*: Doing nothing in order to remove causes and/or reduce consequences of global warming; or, doing nothing

not to remove causes and/or reduce consequences of global warming (because nothing needs to be done).

Operational definitions based on the conceptual definitions outlined above are included in Appendix I.

4. Study Method

4.1 Content Analysis

This study utilizes content analysis for two primary reasons: first, the study is exploratory and attempts to gain an understanding of what solutions are being presented in newspapers; the medium in which most Americans get their global warming information (Stamm, 2000). Second, this study does not intend to make any inferences beyond the manifest content in news stories.

4.2 Sampling

The population of content consists of one year of newspaper articles (601 news stories) from eight high circulation US daily newspapers (*New York Times*, *Wall Street Journal*, *Los Angeles Times*, *Washington Post*, *USA Today*, *Houston Chronicle*, *The Star-Ledger*, and *Boston Globe*). The article dates span October 1, 2006 through September 30, 2007. This time period offered the most current snapshot of the solutions being presented in US newspapers. Other scholars, such as Antilla (2005), have used one year snapshots to examine global warming issues in the media, because it provides a unit of time that can be easily compared to past and future research endeavors. This study examined 250 of these stories, proportionally sampled such that the number of stories from each newspaper in the sample represented the number of stories from each newspaper in the population. From within these strata, a random sample was drawn using a random number generator.

The newspapers in this study were chosen based on a list available from the Newspaper Association of America (NAA: <http://www.newspapermedia.com/>); these included all high circulation papers with over 1 million in “average weekday readership” (2006), that weren’t grouped (i.e. the Detroit Free Press and the Detroit News are grouped into one large circulation figure), and whose content was accessible to the author¹.

4.3 Selection of Data

The data were collected based on search terms from two search engines: LexisNexis Academic (all papers except for the *Wall Street Journal*), and ProQuest (*Wall Street*

¹The New York Post and New York Daily News, though over 1 million in circulation, were not selected to prevent over-representing New York City journalism, and because initial searches yielded too few stories focused on global warming, as defined by the study’s criteria.

Journal). The search terms were: “global warming,” “climate change,” and “climate.” One or more of these terms needed to appear in the headline of the story *and* in the story’s body to include a story.

4.4 Sampling Justification

A sample was chosen as a means of investigating the population because of the length of time required to code each story. The size of the sample, 250, is a large enough portion of the population that sampling error should be kept to a minimum, though error was calculated in the analysis to ensure the significance of the study’s results.

4.5 Data Collection

Unit of Content

The unit of content for this study was news stories in which the terms “global warming,” “climate change,” and / or “climate” appeared in the headline *and* in the body of the story. The focus on news stories is rooted in a study on global warming in the media conducted by Trumbo in 1996. Trumbo defined global warming news stories conceptually: “News stories are defined as content (excluding editorials, opinion columns, letters to the editor and advertisements) containing references to global warming, the greenhouse effect, or climate change” (p. 272). For the purpose of this study, Trumbo’s definition was modified slightly, in that “the greenhouse effect” was removed, and “climate” was added. This is because the terms “global warming” and “climate change” have become much more a part of the public lexicon in the years since 1996 (replacing “the greenhouse effect”). “Climate” was added after an initial search for stories yielded several that included only “climate” in the headline, but which were actually focused on global warming. Additionally, entertainment reviews, such as for movies or books, were excluded due to their focus on art only.

Procedures

As mentioned above, the content was identified through the use of the search terms “global warming,” “climate change,” and “climate,” which appeared in both the headline and body of newspaper stories in the eight US newspapers used in the study.

Coder Training & Reliability

The author and one additional coder completed this study. The second coder was trained in four separate training sessions, where global warming news stories from outside of the sampling frame were coded simultaneously until both coders were in agreement on the operational parameters of the study. A small reliability test was then conducted on stories from outside of the sample, and upon receiving those results, the coders met once more

before independently coding a random sample of 25 stories (10%) from the sample. Scott's Pi and Pearson's r correlations were then conducted to determine variable reliabilities. All of the Scott's Pi values were above 0.75, except for one, the results of which were not included in the final analysis; all correlations exceeded 0.94.

Validity Issues

This study's variables are all informed by peer-reviewed literature, and thus are afforded measurement validity. Similarly, the categories of sources used in this study build upon prior analyses of the primary sources used in environmental journalism stories as outlined by Lacy & Coulson (2000) and Cozma (2006).

However, for all of the precedent for the concepts used in this study, they have not previously been applied exactly as they are here. Thus, understanding what is and is not a solution to global warming relies upon using others' measures and applying them to a slightly different context. It is hoped that in future studies these measures will be strengthened by both this author and others in the field who wish to debate their validity.

Data Analysis

The data collected in this study were analyzed for frequencies, given the exploratory nature of the study. Additionally, both Cramer's V and Pearson's r correlations were used to determine the possible association among the variables in the research questions, depending on appropriateness per the level of measurement of each variable. Additionally, because the study utilized a simple random sample, chi-square values were calculated to ensure statistical significance for the results.

5. Findings

The findings presented below are presented in terms of overall frequencies first, followed by significant findings per each research question.

5.1 Frequencies

Of the 250 stories proportionally sampled, 61.6% contained solutions as defined in this study. One of the study's primary objectives was to determine the number of social solutions and individual solutions presented. The data show that of the solutions in this study, 90.1% were social solutions, thus leaving 9.9% as individual solutions.

Another primary objective was to determine the types of solutions presented. The most frequent type of solution was Political Solutions, which at 50.2% far exceeded Science & Technological solutions, which comprised 25.4% of solutions (see **Table 3, Appendix II** for additional solution type frequencies). Thus, the majority of solutions presented were political solutions and social in scope.

Next, the study examined the source type attributed to each solution. The data indicate that reporters were the most frequent source of solutions (42.2%), with the next closest source type being politicians (20.4%) (see **Table 4, Appendix II** for complete results). Thus, the majority of solutions presented were social in scope, political in type, and were most often presented as solutions by the reporter in the news story.

5.2 Research Questions

Research Question I

Does the newspaper influence whether solutions are included in global warming news stories?

To answer Research Question I, the number of solutions was determined for each newspaper in the study, and the findings, included in **Table 5, Appendix II**, indicate that the *Wall Street Journal* included the most solutions in its global warming news stories, followed closely by the *Boston Globe* and *New York Times*. The *Houston Chronicle* included the fewest solutions in its global warming news stories.

Research Question II

Does newspaper circulation size influence whether solutions are included in global warming news stories?

No significant associations were found between newspaper circulation size and the presence of solutions.

Research Questions III, III-A, & III-B

Does the newspaper influence the number of solutions included in global warming news stories?

The variables newspaper and number of solutions were correlated using Eta, which can accommodate a nominal by interval relationship. The Eta value was .262, such that 26.2% of the variance in number of solutions was explained by the newspaper. No significant associations were found between newspaper and the scope or type of solutions (Research Questions III-A & III-B).

Research Questions IV, IV-A, & IV-B

Does newspaper type (prestige versus other high circulation dailies) influence whether solutions are included in global warming news stories?

No significant associations were found between the type of newspaper (prestige, as defined above, or other high circulation dailies) and the presence of solutions, the number of solutions, the scope, or the type of solutions.

Research Question V, V-A, & V-B

Does newspaper circulation size influence the number of solutions included in global warming news stories?

A Pearson's r correlation ($r = 0.17$, $p < 0.01$) revealed that circulation size was weakly associated with the number of solutions included in global warming news stories, such that as circulation size increased, so did the number of solutions. However, given the low r -value, this is likely an issue that should be addressed in future research, as discussed in more detail below. No significant associations were found between newspaper circulation size and the scope or type of solution (Research Questions V-A & V-B).

Research Question VI

Does the type of source attributed to a global warming solution in global warming news stories influence the scope of solution(s) presented in the story?

A Cramer's V correlation ($V = 0.49$, $p < 0.01$) revealed that the type of source was moderately associated with the scope of solution presented in the story. Most sources offered social solutions most of the time, and advocates and celebrities were the only sources that consistently offered individual solutions (35.3% and 37.5%, respectively, of the solutions they offered were individual). The frequency of solution scope offered by each source is included in **Table 6, Appendix II**.

Research Question VII

Does the type of source attributed to a global warming solution in global warming news stories influence the type of solution(s) presented in the story?

A Cramer's V correlation ($V = 0.35$, $p < 0.05$) revealed that the type of source was moderately associated with the type of solution presented in the story. Complete results of type of solution per the type of source to which the solution was attributed are included in **Table 7, Appendix II**. Generally, reporters, politicians, government, and advocate sources offered primarily political solutions; corporate officials offered both political, and science and technological solutions equally; celebrities primarily offered science and technological solutions; and scientists offered primarily economic solutions.

Research Questions VIII, VIII-A, & VIII-B

Does the number of sources attributed to global warming solutions in global warming news stories influence the number of solution(s) presented in the story?

A Pearson's r correlation ($r = 0.83$, $p < 0.01$) revealed that there was a strong relationship between the number of sources attributed to global warming solutions in global warming news stories and the number of solutions presented in the story, such that as the number of sources increased, so did the number of solutions. No significant associations were found between the number of sources attributed to global warming news stories and the scope and type of solution (Research Questions VIII-A & VIII-B).

6. Interpretation of Results

This study's findings build upon past research by illuminating a previously under-explored aspect of global warming's presentation in news stories: solutions. Scholars, such as Trumbo (1996), speculated that solutions would comprise an increasing portion of news stories in the future, and according to this study, at least for this time frame (1 year), solutions did appear in a majority of newspaper news stories (61.6%) on the topic.

The data indicate that at the time this study was conducted, the *Wall Street Journal*, *Boston Globe*, and *New York Times* were leaders in terms of the presentation of solutions to their readers. Further, readers of global warming news stories in the *Wall Street Journal*, which included the most solutions, were exposed to solutions almost twice as often as the readers of the newspaper that presented the fewest solutions in its global warming news stories, the *Houston Chronicle*. Future research is needed to determine the reasons for these differences, and/or the impact that the presentation of more or fewer solutions may have on readers.

Findings related to the influence of circulation size on the number of solutions should be explored in future research by including a wider range of circulation sizes in the sample. A range extending from 50,000 or 100,000 in circulation, up to and over 1 million would provide more possibility for analysis of this association, and may also illuminate regional differences.

Perhaps the most exciting findings were those showing an association between the type of source to which a solution was attributed and the scope and type of solution presented by that source. What this indicates is that who the media choose to include in global warming news stories may impact what solutions are presented. Thus, if certain sources are excluded, the solutions offered by those sources may also be excluded. Additionally, findings by Lacy & Coulson (2000) and Cozma (2006) indicated that government and corporate officials dominated as environmental sources; however from this data, it is evident that in global warming news stories during this time frame, reporters and politicians appeared more often than either government or corporate officials.

Finally, the strong correlation ($r = 0.83$, $p < 0.01$) between the number of sources and number of solutions is a logical association, but it also indicates that, at least within the confines of a global warming news stories, each source is restricted to offering only a few solutions.

6.1 Future Research

In addition to the suggestions mentioned above, future research based on this study's results should focus on five areas: hypothesis testing of the strong and moderately strong relationships identified; replication to compare the results to previous and future time frames; use of additional methods to analyze the scientific accuracy/efficacy of the solutions presented; use of additional methods to illuminate the impact of solutions on

people's behavior; and exploration of other media to determine if differences exist in the solutions presented based on media type.

Additionally, it may be appropriate to conduct case studies on individual regions that are predicted to be severely impacted by global warming. For example, the *Houston Chronicle's* articles focused largely on adaptation, perhaps due to predictions of negative impacts on Texas from global warming that include water shortages and rising sea levels.

6.2 Limitations

This study's primary limitation was the exclusive use of content analysis, which precludes analysis beyond the manifest content. Thus, insight into the reasons for the presentation of specific solutions, or the inclusion of specific sources, is mere speculation. Additionally, it is impossible to determine the impact of the solutions presented (themselves or the volume of solutions) from this method.

An additional significant limitation was the sample size, which due to time constraints was kept to 250. The author intends to expand the study to include the entire population of 601 stories in order to gain a more complete picture of the phenomena under investigation.

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Appendix I – Operational Definitions

Table 1: Independent Variables

Variable Name	Operational Definition	Categories
Newspaper	The name of the newspaper in which the story being coded appears.	<i>USA Today, Wall Street Journal, New York Times, Washington Post, Los Angeles Times, Houston Chronicle, Star-Ledger, and Boston Globe</i>
Newspaper Circulation	<i>Newspaper circulation</i> is based on “average weekday readership”, according to the Newspaper Association of America (2006).	Continuous variable representing average readership.
Source	The <i>Source</i> of a solution is measured in the categories: <i>Government, Science, Corporate Officials, Advocates, Analysts, Politicians, Reporters, Celebrities, & Other</i> . All are defined at right.	<p><i>Government</i>: A government official in any level of governmental organization (federal, state, local, or international governmental or government-sponsored organization such as the United Nations), including government scientists, but not including elected officials; can also include official documents or press releases from any of the aforementioned governmental organizations.</p> <p><i>Science</i>: Scientists from academic institutions or independent science organizations; can also include peer-reviewed scientific literature.</p> <p><i>Corporate Officials</i>: Representatives from private or public profit-seeking organizations; can also include corporate reports or press releases.</p> <p><i>Advocates</i>: Members of nonprofit organizations or activist organizations that overtly advocate for a particular solution to global warming. Advocacy can be via protest, community activism, or lobbying efforts. Advocacy can be in the form of speech, or documents.</p> <p><i>Analysts</i>: Members of non-governmental organizations (NGOs), nonprofit organizations or “think tanks” that present solutions without overt advocacy; can include reports or press releases from these organizations.</p> <p><i>Politicians</i>: Current elected or campaigning officials from any level of governmental organization (federal, state, or local); can include documents released from the office of a politician.</p> <p><i>Reporters</i>: A reporter qualifies as a source if a solution is not attributed to anyone or any organization; directly or indirectly.</p> <p><i>Celebrities</i>: Celebrities are people who are in the public spotlight because of careers in the entertainment, literature, music, political (former politicians – current politicians are a separate category due to their status as power holders), or sports industries, or because of their status as a “socialite” that is followed by the media. Examples include Al Gore and Brad Pitt.</p> <p><i>Other</i>: A source that does not clearly fall into any of the above categories.</p>
Number of Sources	<i>Number of sources</i> is the total number of sources to which solutions in a global warming news story are attributed.	Continuous variable representing the number of sources.

Table 2: Dependent Variables

Variable Name	Operational Definition	Categories
Solutions Included	<i>Solutions included</i> is whether a potential action, which can in some way mitigate global warming, is included in the story.	Yes / No.
Number of Solutions	<i>Number of solutions</i> is how many potential actions, which can in some way mitigate global warming, are included in the news story.	Continuous variable representing the number of solutions.
Solution Scope	<i>Solution scope</i> is measured in the categories: <i>Individual Solution</i> & <i>Social Solution</i> . Both are defined at right.	<p><i>Individual Solution</i>: A potential action targeted at an individual person, which can in some way mitigate global warming. Examples include purchasing compact fluorescent bulbs, or changing one's transportation habits.</p> <p><i>Social Solution</i>: A potential action that requires legislation, a treaty, or some other community-based, local, statewide, national or international action in order to in some way mitigate global warming.</p>
Solution Type	<i>Solution type</i> is measured in the categories: <i>Economic Solutions</i> , <i>Behavioral Solutions</i> , <i>Science & Technological Solutions</i> , <i>Political Solutions</i> , and <i>Inaction</i> . All are defined at right.	<p><i>Economic solutions</i>: A potential action targeted at an individual or organization (or both or neither) that requires a monetary transaction in order to in some way mitigate global warming.</p> <p><i>Behavioral solutions</i>: A potential action targeted at an individual or organization (or both or neither) that requires a suggestion to behave in a particular way in order to mitigate global warming; but that does not require the purchase of a product. Examples include turning down one's home thermostat, recycling, or driving less. Association of a behavior with some economic benefit would result in categorization of the solution as Economic.</p> <p><i>Science & Technological solutions</i>: A potential action targeted at an individual, organization, or governmental entity (or all three, two, or neither) that requires the use of science or technology as a way to mitigate global warming.</p> <p><i>Political solutions</i>: A potential action targeted at the nation or global community (or both or neither) that requires a change in policy as a way to mitigate global warming. Examples include signing onto the Kyoto Protocol, or advocating for some other national or international treaty.</p> <p><i>Inaction</i>: The news story proposes that nothing is done to mitigate global warming. This is not the same as simply not including a solution.</p>

Appendix II – Tables from Findings

Table 3: Solution Type: Solution types in global warming news stories where solutions are present.

Solution Type	Frequency	
	N	%
Political Solutions	146	50.2%
Science & Technology Solutions	74	25.4%
Economic Solutions	52	17.9%
Behavioral Solutions	19	6.5%
<i>Total</i>	<i>291²</i>	<i>100%</i>

n=250 stories

Table 4: Attributed Source: Sources attributed to a solution in global warming news stories where solutions are present.

Source Type	Frequency	
	N	%
Reporters	175	42.2%
Politicians	85	20.4%
Government	58	13.9%
Advocates	34	8.2%
Corporate Officials	25	6.0%
Celebrities	16	3.8%
Other	10	2.4%
Scientists	7	1.7%
Analysts	6	1.4%
<i>Total</i>	<i>416</i>	<i>100%</i>

n=250 stories

Table 5: Solutions Per Newspaper

Wall Street Journal	85.7%
Boston Globe	81.0%
New York Times	75.0%
USA Today	64.7%
Star-Ledger	59.3%
Los Angeles Times	52.1%
Washington Post	51.3%
Houston Chronicle	45.9%

n=250

² There were a total of 750 possible solutions (3 were allowed for each story under the protocol), and there were a total of 416 solutions in all 250 stories. For Solution Type frequencies, 125 solutions were omitted due to low reliability scores among coders for the last possible coded solution type.

Table 6: Scope of Solution Per Attributed Source Type

	Individual Solution	Social Solution	Total
Reporters	7.4%	92.6%	100%
Politicians	1.2%	98.8%	100%
Government	0%	100%	100%
Advocates	35.3%	64.7%	100%
Corporate Officials	12%	88%	100%
Celebrities	37.5%	62.5%	100%
Scientists	0%	100%	100%
Other	60%	40%	100%

n=250 stories

Table 7: Type of Solution Per Attributed Source Type (highest percentages per source are bold)

	Political Solutions	Science & Technological Solutions	Economic Solutions	Behavioral Solutions	Total
Reporters	50.4%	29.1%	17.1%	3.4%	100%
Politicians	65%	16.7%	16.7%	1.6%	100%
Government	65%	17.5%	17.5%	0%	100%
Advocates	44%	28%	12%	16%	100%
Corporate Officials	30%	30%	25%	15%	100%
Celebrities	10%	40%	30%	20%	100%
Scientists	16.7%	33.3%	50%	0%	100%
Other	12.5%	12.5%	12.5%	62.5%	100%

n=250 stories (291³ solutions)

³ There were a total of 750 possible solutions (3 were allowed for each story under the protocol), and there were a total of 416 solutions in all 250 stories. For Solution Type frequencies, 125 solutions were omitted due to low reliability scores among coders for the last possible coded solution type.