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Climate Change in the Changing Climate of News Media: A Comparative Analysis of Mainstream Media and Blog Coverage of Climate Change in the United States and the People's Republic of China, 2005-2008

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CLIMATE CHANGE IN THE CHANGING CLIMATE OF NEWS MEDIA:
A COMPARATIVE ANALYSIS OF MAINSTREAM MEDIA AND
BLOG COVERAGE OF CLIMATE CHANGE IN THE
UNITED STATES AND THE PEOPLE'S REPUBLIC OF CHINA, 2005-2008

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A Dissertation

Submitted in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy

School of Journalism in the College of Mass Communication and Media Arts
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DISSERTATION APPROVAL

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A Dissertation Submitted in Partial
Fulfillment of the Requirements
for the Degree of
Doctor of Philosophy
in the Field of Mass Communication

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Dr. Dennis T. Lowry, Chair

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July 13, 2009

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AN ABSTRACT OF THE DISSERTATION OF

Lei Xie, for the Doctor of Philosophy degree in Mass Communication, presented on July 13, 2009, at Southern Illinois University Carbondale.

TITLE: CLIMATE CHANGE IN THE CHANGING CLIMATE OF NEWS MEDIA: A COMPARATIVE ANALYSIS OF MAINSTREAM MEDIA AND BLOG COVERAGE OF CLIMATE CHANGE IN THE UNITED STATES AND THE PEOPLE'S REPUBLIC OF CHINA, 2005-2008

MAJOR PROFESSOR: Dr. Dennis T. Lowry

The social construction of climate change has been an enduring interest to media scholars. Extensive research has been done to explore how the mass media portrayed climate change and how the influence of their representations contributed to the social reality of climate change. However, most research focused on the news media in the United States and other developed countries and ignored China—the second largest greenhouse gases emitter in the world. This oversight has led to a sociological map of global climate change with the one of the biggest puzzle pieces missing. In addition, traditional news media were in the spotlight of most literature while little attention was turned to blogs—a rising power in the public discourse.

This study expands the understanding of the social construction of climate change by bridging two gaps—the cross-national gap and the cross-media gap—by examining how the news media and the blogosphere in the United States and China—the top two greenhouse gases emitters—framed this arguably the most daunting challenge of the 21st

century. Following framing theorists' call for using defragmented frame typologies, the design of this frame analysis derived from five traditions of research of media framing and the social construction of climate change: (1) "episodic vs. thematic" framing, (2) micro-issue salience, (3) audience-based frames, (4) attribution of responsibility and (5) skepticism towards climate change.

A purposive sample using multi-stage probability sampling techniques was comprised of 638 articles from three prestige U.S. newspapers (New York Times, USA Today, and Washington Post), two official Chinese newspapers (People's Daily and China Daily), and the American and Chinese blogospheres. The results delineated distinct characteristics of media framing that mirrored the social reality of climate change in both countries. Moreover, bloggers of both countries showed varying degrees of divergence from the news media, contradicting the argument that the blogosphere has been normalized by traditional news sources.

Most importantly, this study synthesized its results with earlier literature and developed the B (Bloggers' understanding) – M (Media portrayals) – S (Skepticism) theoretical model that holds great explanatory power to harmonize inconsistent knowledge about the social construction of climate change, thus opening a new research avenue and significantly advancing our understanding in this area.

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My parents, two most respectful people in my life, have been supporting me both spiritually and financially and never hesitated to encourage me to be my best. My daughter, Catherine Xie, is a blessing and has taught me many things about the meaning of life that I regretfully ignored and would never learn otherwise.

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CHAPTER 1

INTRODUCTION

We have learned from scientific research that the earth underwent several drastic climate changes in prehistoric times, and that such changes invariably resulted in radical shifts in flora and fauna. As recorded global temperatures have kept climbing since the 1980s (Emanuel, 2007), we are forced to answer the question of how we should react to the change to keep our civilization sustainable.

An Overview of Climate Change as a Scientific and Social Issue

The Intergovernmental Panel on Climate Change (IPCC) defines climate change as “a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer” (IPCC, 2007, p. 30). The issue involves four fundamental questions, which attest to how both the scientific understanding and the public perception of climate change have progressed over the years.

The first question is whether or not the global climate is getting warmer. In 1988, many scientists remained skeptical when James Hansen, the director of NASA’s Goddard Institute for Space Studies, claimed that background climate variability failed to explain strong global warming signals observed in the past years. The controversial argument generated much research in this area and much public debate as well. Skeptical scientists maintained that limited historical climate data available at that time and the underdeveloped computer simulation technologies were not able to support Hansen’s viewpoint. In the public sphere, the controversy had a lot to do with the politicization of the issue and partisanship, with environmental extremists and conservative groups at each end of the spectrum (Emanuel,

2007). There is an emerging consensus in the U.S. Congress that the debate about the uncertainty of climbing temperature is now over (House of Representatives, 2007a, 2007b). According to the IPCC (2007), eleven of the years between 1995 and 2006 “rank among the twelve warmest years in the instrumental record of global surface temperature since 1850” (p. 30). Mounting evidence ranging from widespread snow and ice melting to rising average sea level has made global warming “unequivocal” (IPCC, 2007).

Then come the “so-what” questions: What will the consequences of the warming be and how will they affect human beings? Other than threatened Arctic lives, a cascade of chain reactions including flooding, rainforest fires, and new diseases could pose serious threats to humankind (Lean, 2005). Several climate studies have found significant correlations between certain extreme weather conditions and rising global temperatures (IPCC, 2007). There are, however, studies reminding us that social factors also contribute to the spikes in severe weather damage. Pielke, Gratz, Landsea, Collins, Suanders, and Musulin (2008), for example, suggested that according their study, the causal relationship between global warming and increasing damage caused by hurricanes in the United States is problematic. They studied 105 years of hurricane activities in the U.S. and concluded that although further analysis of the relationship between climate factors and societal trends needs to be explored by follow-up studies, greater population, infrastructure, and wealth on the U.S. coastlines also contributed substantially to the surging economic damages from hurricanes (Pielke et al., 2008). Climate change skeptics tend to stress the positive side of climate change and the limited impact thereof, arguing that there were several obvious advantages of global warming, such as less energy bill in the winter and plant growth promoted by more carbon dioxide (McManus, 2003).

The third question seems even more scientifically debatable than the second: how much do human activities, mainly those resulting in greenhouse gas emissions, account for climate change? By computer simulation, many studies conducted in recent years suggest that the observed rising temperature over the last 50 years is “very likely” due to the observed increase in man-made (anthropogenic) green house gas concentrations (IPCC, 2007, p. 39). The United Nations Framework Convention on Climate Change (UNFCCC) takes the IPCC’s conclusion one step further by attributing global warming to an excess of heat-trapping gas, first and foremost carbon dioxide, methane and nitrous oxide produced primarily by humans (UNFCCC, 2008). Some scientists, however, seemed hesitant to believe in anthropogenic climate change. An open letter signed by sixty accredited climate scientists questioned with great suspicion the reliability and predictive power of climate computer modeling technologies available now and argued that because of the extreme complexity of the earth’s climate system, it is still impossible to distinguish human impact from natural noises. At the end of the letter, they pledged that the Canadian government revisit the science of global warming and take a more cautious approach to follow the Kyoto Protocol (Canada.com, 2006).

Disagreement on the causes of climate change boils down to the difficulty in answering the fourth question: what should be done to counteract the warming, to what extent, and how soon? The United Nations has been playing a pivotal role in campaigning for international collaboration to reduce greenhouse gas emissions. Under the 1997 Kyoto Protocol initiated by the United Nations Framework Convention on Climate Change (UNFCCC), 37 developed countries and the European Community have committed to reducing their emissions by an average of 5 percent by 2012 against 1990 levels (UNFCCC,

2008). Support for this approach, nonetheless, is far from unanimous because the energy generation methods that produce most greenhouse gases are the cornerstone of the global economy. Therefore, there would be immediate economic setbacks if conventional energy production practices were refrained or halted. Additionally, research on alternative energy sources can be very costly, and it must compete with other social and political priorities for resources. Most of all, all the earth-saving strategies would turn void if natural variations were indeed the primary reason for global warming, as some scientists have argued. Is it worth taking the risk? To environmentalists, saving mankind is atop any other priorities and makes the risk well worth taking, but to skeptics who do not believe in anthropogenic warming, adaptation, rather than mitigation, may be a wiser choice as we develop ways to adapt to the warming climate without sacrificing the economy.

The Mass Media's Role in Climate Change

The four questions progressively gravitate from mere scientific inquiries toward social and political ones, and the discussion of these questions has been largely carried and fostered by the mass media. Regardless of technical and political polemics, the media's representation of the issue has always been a critical part of the issue and has been continuously shaping public opinion and policy-making (House of Representatives, 2007b). Rather than a mere conduit between the scientific arena and the public sphere, the media function more like a morphing machine that transforms messages across audiences, governments, scientists, politicians, and relevant industrial sectors, all of which simultaneously attempt to influence the transformation based on their own interests. Several challenges in the media's coverage have emerged as the socio-economical and political aspects of climate change become indispensable for understanding not only the changing climate itself, but also the intensity

behind the debate.

There seems to be an intriguing discrepancy between media coverage and public opinion. The amount of the U.S. news media coverage on climate change fluctuated but generally followed a growing trend from 1995 to 2006 (Boykoff, 2007b). In an earlier study, a similar trend was found in the New York Times in the U.S. as well as Le Monde in France in both the frequencies of such news stories and story length (Brossard, Shanahan, & McComas, 2004). Despite the increasingly heavy emphasis found in the news coverage, the American public's concern about global warming seems to have settled over the years. Gallup compared surveys conducted from 1989 through 2006 and found that public concern ebbed and flowed with less than significant margins and remained relatively stable over the years. About 63% of the respondents said they worried about "greenhouse effect" or global warming in 1989; the number in 2006 is almost the same—62% (Gallup, 2006). About 35% was highly worried about global warming in 1990, and the number went up merely two percent 18 years later in 2008 (Gallup, 2008b). Global warming was ranked the eighth most concerned environmental issues in 2006, giving ways to problems such as water and air pollution (Gallup, 2006). Another Gallup survey tried to find out why global warming was not perceived as one of the most serious threats to humans and why it failed to translate political momentum into policy-making (Gallup, 2007b). While Americans express concerns about global warming, they also believe that it is a somewhat distant threat and will not immediately impact their lives as pollution does (Gallup, 2007b).

The politicization of global warming is well illustrated by the fact that political partisanship much more eloquently explains opinion variability than does any other demographic factor. Polls have shown that there are significance differences between

Democrats and Republicans in answering the four critical questions on climate change discussed earlier. Democrats are much more likely than Republicans to say that (1) global warming has already begun, (2) there will be extreme climate conditions caused by global warming, (3) human activities contribute significantly to climate change, and (4) drastic measures must be taken to mitigate the problem (Gallup, 2007a, 2007b; Pew Research Center, 2008). The polarization is widening: a recent poll discovered that Republicans are increasingly skeptical toward global warming (Pew Research Center, 2008).

Many concerned researchers worry that the discrepancy between the attentive news media and the seemingly insulated public has to do with agenda-driven research and problematic diffusion of scientific knowledge. The Union of Concerned Scientists (2007a) accused the Bush Administration of manipulating research results and exaggerating the level of uncertainty in global warming science. The accusation comes from a survey distributed to more than 1,600 climate scientists working at seven federal agencies and the National Center for Atmospheric Research (NCAR). The results indicated broad and substantial political interference in the respondents' work. Seventy-three percent of all respondents reported inappropriate interference with climate science research in the past five years, and nearly half perceived or personally experienced pressure to avoid expressions such as "climate change" or "global warming." Forty-three percent of the scientists perceived or personally experienced changes or edits to documents by non-scientists in ways that compromise accuracy. Furthermore, 52% said that their communication with the media was frequently monitored by their agency's public affairs officials, while 39% perceived or personally experienced fear of retaliation for openly expressing concerns about climate change outside their agency (Union of Concerned Scientists, 2007b). A similar study done by the

Government Accountability Project, a leading whistleblower protection organization in the United States, found no direct political interference with climate change research. However, the study concluded that certain government practices covertly impeded the communication between climate scientists and the public and restricted the flow of politically-inconvenient scientific findings (Maassarani, 2007).

The government is not the only entity being scrutinized and criticized. According to the Union of Concerned Scientists, ExxonMobil gave nearly \$16 million between 1998 and 2005 to 43 advocacy organizations that seek to confuse the public on global warming science. The company used a wide array of tactics to manipulate the public's understanding of climate change; the tactics included (1) using apparently independent organizations to question even the most indisputable research findings that confirm climate change, (2) promoting scientific spokespeople who misrepresent scientific findings to reinforce the idea that global warming is highly debatable even to climate experts, (3) attempting to shift the focus away from policy-making for climate change, and (4) using its extraordinary access to the Bush administration to block federal policies and shape government communications on global warming (Union of Concerned Scientists, 2007a, p. 1). ExxonMobil has employed exactly the same strategies that the tobacco industry used decades ago and that the strategies have worked remarkably well (Union of Concerned Scientists, 2007a), because manipulated science, a tactic that has long been embraced by the public relations and advertising industry, works as powerfully as, if not more persuasively than, truthful science does in influencing public opinion (Rampton & Sauber, 2002).

Criticism toward the media representation of climate change came also from academia. A number of studies (Antilla, 2005; Boykoff, 2006, 2007a, 2007b; Boykoff & Boykoff, 2004)

pointed out that the U.S. media confused the public by focusing on disagreements among climate scientists and ignoring the convergent scientific consensus on anthropogenic climate change. This “informational bias” criticism (Boykoff & Boykoff, 2004, p. 126) consequently gave rise to political actions that attributed the unmoved political opinion to distorted portrayals of climate science and pushed the news media to offer less space to skeptical voices.

The U.S. Congress held a hearing in 2007 entitled “Shaping the message, distorting the science: Media strategies to influence science policy” in which climate scientists, communication scholars, and independent researchers presented evidence picturing how media messages were distorted directly and indirectly by political and economic interests to make the public believe that global warming bears significant uncertainty and poses no imminent threat. Rebuttals to the accusations were also presented in the hearing, which stressed on the lack of solid evidence for direct governmental inference and ExxonMobil’s financial contribution to accredited climate research programs (House of Representatives, 2007a).

Focus of the Study and Its Significance

Media scholars have closely monitored media representation of the issue and its effects on various audiences. The mystery of the increasing media coverage and the unmoved public opinion can be largely explained by the U.S. media’s framing of the issue—despite an emergent consensus favoring human activities’ major role in climate change, the media have consistently framed the topic as scientifically controversial (Boykoff, 2006, 2007a, 2007b). Because people learn about environmental issues extensively from the mass media (Lacy, Rife, & Varouhakis, 2007), the “fair and balanced” reporting approach may

have helped cultivate the perception that even the scientists themselves are not sure about global warming. This hypothesis is supported by Corbett and Durfee's (2004) experiment, which shows that the audience's cognition of climate uncertainty can be effectively influenced by news framing.

Despite media scholars' endeavors to keep track of news media's coverage of global warming, the scope of the examinations rarely goes beyond the United States' mainstream media. The limited view unfortunately fails to provide an understanding of the global issue at a global level. Even though a few studies introduced European countries' reportage on climate change and compared their representation to the U.S. counterpart (Boykoff, 2007a; Brossard et al., 2004; Carvalho & Burgess, 2005), we still know little about how the topic is represented in a diversity of cultures, especially by some of the developing countries whose green house gases emissions have skyrocketed due to booming economy and escalating consumption of energy. China, for example, is the second largest greenhouse gas emitter after the United States (Ecofys, 2006); its emissions have grown by about 80% by since 1990 and are projected to continue rising quickly and surpassing those of the United States as early as 2009 (Pew Center on Global Climate Change, 2007). Deeply concerned with its environmental problems, China is by far the largest source of Clean Development Mechanism (CDM) generator under the Kyoto Protocol, because of its active participation in seeking environment-friendly energy sources and reducing green house gas emissions (Pew Center on Global Climate Change, 2007). If the United States' highest emission and its unparalleled economic and political influence justify the academic works devoted to the media's coverage of climate change, China's second highest emission and its economic and political resurrection should, by the same token, be able to justify a sizable volume of

research on a similar subject. There is, nonetheless, almost nothing to justify. Research on Chinese media's climate change coverage is scarce. Content availability and language barriers to Western scholars may understandably explain the lack of literature, but China's distinctive media-government relationship makes in-depth examinations of climate change coverage an exciting exploration. Different from the Western ideal that the mass media are supposed to be a platform for the marketplace of ideas, most Chinese news media are under extensive state control. Due to the Chinese media's traditional conformity to the government and their indispensable role of justifying past and future public policies, one would expect that the climate change coverage in China would mirror the political moves of the government, which are often an excellent indicator of how the would-be number one green house emitter will cope with climate change.

Another critical dimension overlooked by the current body of literature is the emerging influence of blogging in public discourse. In recent years, the seemingly simplistic way of posting information in reverse chronological order on the Internet has revolutionized personal publishing, changed the landscape of journalism, and profoundly challenged journalistic conventions. Because with little training and cost, almost anyone with an Internet connection can publish information that can be accessed universally, the convenience, instantaneity, and effectiveness of blogging have made it a global phenomenon. Putting aside elite media outlets, what do we know about the understanding of climate change of millions, if not billions, of bloggers in the U.S. and China? More importantly, what role does blogging play in both reflecting and influencing public understanding of climate change? Scholars and journalists' reflections are ambivalent. As Placing, Ward, Peat, and Teixeira (2005) argued, blogs can be an innovative tool for science education, but problems arise when an abundance

of “layman” science blogs dominate the blogosphere, many of which have been distributing imprecise scientific information on global warming (DiPeso, 2006). Ladle, Jepson, and Whittaker (2005) also found 30 blogs’ inaccurate presentation of environmental issues due probably to the bloggers’ partisanship, lack of scientific training, and environmental scientists ignorance of blogs’ educational potential. The researchers suggested that scientists should “actively engage in blogging to increase the presence of informed opinions.” The endeavor would help improve the already challenged dissemination of knowledge as well as blog’s less than credible image.

Not surprisingly, blogging quickly became fashionable in China. There were more than 72 million blogs in China by November 2007; blogging and reading blogs are among the most popular online activities for Chinese online surfers (Chinese Internet Network Information Center, 2008b). Although blogs have less perceived credibility compared with wired news, they have become an important source of information and an unprecedented way for grassroots to reclaim their voices (Chinese Internet Network Information Center, 2007) in the traditionally totalitarian society. Blogging’s role of pushing the limit of free speech in China manifests itself in several confrontations between bloggers and the government (Pan, 2006). Given the great diversity of topics covered by Chinese bloggers (Chinese Internet Network Information Center, 2007), it is difficult not to be curious about how the Chinese bloggers write about climate change and how different their representations are from official news. Do they buy into what the traditional news media say about climate change? Do they tend to report or advocate? Does their writing indicate similar partisanship found in the United States or are other factor more dominant? How does their writing compare to their U.S. counterpart? What does the comparison say about the ways bloggers in both countries

view climate change? What can their writing tell us about the relationship between blog and mainstream media and the relationship between bloggers and the government? These are part of the unknown territories that this study will explore.

This dissertation, by using frame analysis, aims to bridge three gaps in understanding cross-media portrayals of climate change from a cross-cultural standpoint. First, this study, by bringing China into the analysis, will draw a vivid picture of how the media of the two largest greenhouse gases emitters represent climate change, a critical issue closely related to their economic developments and future competition. The examination echoes Brossard et al.'s (2004) call for “cross-cultural comparisons to integrate the potential effects of cultural differences” in how their media cover the topic. As earlier literature indicates, global climate change is not only scientific, but also cultural and political. Political and economic agendas differ from country to country, resulting in varying journalistic practices. The differences make a cross-cultural approach well-suited for climate change communication research.

Second, in addition to the cross-cultural dimension, the blogosphere will be cross-compared with the mainstream media in both cultures. As a problematic and yet promising medium for disseminating and debating climate change related messages, blogs remain under-studied by media researchers regarding how empirically they play these roles. Comparisons between blogs and mainstream media would contribute significantly to tracking their interactions, a prolonged research interest that has been avidly pursued by a number of studies since the inception of blogging but without consistent conclusions (Delwiche, 2003; Halavais, 2002b; Reynolds, 2005; Wall, 2006).

The third dimension is temporal. A timeframe of four consecutive years—2005 to 2008—allows this study to capture longitudinal dynamics, overt and covert, of the coverage,

such as fluctuations in frame prevalence and frame shift. In contrast to earlier studies that adopted a longitudinal design, four consecutive years do not seem to be a wide span, but there are compelling reasons for this selection. Several important events happened in this time period that catalyzed the public debate on climate change. As a step back from the Bush Administration's unwillingness to ratify the Kyoto Protocol, the U.S. government in 2005 expressed a desire for practical commitments to reduce without damaging the country's economy. The move signals the United States' re-engagement in the global effort to reduce green house gas emissions. The documentary "An Inconvenient Truth" presented by former Vice President Al Gore, which is credited for raising further awareness of global warming internationally and at the same time criticized for propagating global panics, won the 2006 Academy Award for Documentary Feature; thanks largely to the film, Gore and the IPCC also won the Nobel Peace Prize the next year. The success and controversies of the film once again put global warming under the media spotlight. Other than the heated news coverage, the development of blogging itself needs to be considered for the timeframe definition. Year 2004 is considered a watershed in the history of blogging in the United States, due mainly to the 2004 Presidential campaign in which the news agencies and candidates began using blogs as a tool for outreach and opinion forming while independent bloggers wrote extensively on the campaign, forming alternate news sources. Scrutinizing messages from the mainstream media also emerged as another distinctive role of blogging, attested by bloggers' meticulous deconstruction of Dan Rather's investigation on George W. Bush' military record and subsequent resignation of the anchor. Not until 2004 did blogging gain such popularity as a powerful force with the potential to alter the directions of public discourse. Also, a fundamental change took place inside the U.S. news media in 2005: significantly less was

covered on scientific disagreement regarding climate change compared with earlier years, largely dismissing the “informational bias” criticism raised by media scholars (Boykoff, 2007a). However, is it an ongoing trend or a part of natural fluctuation? An update is needed to monitor whether the tendency strengthened or weakened in the years after.

Of a significant theoretical concern are the inconsistencies between what scholars have found and suggested and where the social reality of climate change is going. If, for example, the media started to give much more credence to the scientific consensus in 2005 (Boykoff, 2007a), why did the public not only remain unmoved (Gallup, 2008a) but also increasingly believe in exaggeration of the seriousness of climate change in the U.S. media (Gallup, 2009)? Why did the gap of political partisanship on climate change continue to widen (Pew Research Center, 2008)? Besides scientific understanding, what are the other dimensions of the social construction of climate change? This study, by synthesizing its findings with earlier literature, will provide a theoretical model that explains these mysteries.

To recap, this study is expected to make a substantial contribution to knowledge in the following ways:

1. It deals with an extremely important scientific, political, and cultural issue, one that has been shaping how humans live, think, produce, and develop in significant ways.
2. It spans the cultural and linguistic divide by analyzing relevant content from two of the world’s largest economic powerhouses and greenhouse gases emitters, the United States and China.
3. It spans the old media/new media divide by analyzing both institutionally-controlled traditional media and audience-generated blogs. Following the ongoing academic interest in media-blog relationship, this study will show how bloggers differed from professional

journalists in representing climate change and how they responded to the media portrayals.

4. It probes how climate change coverage in the news media and blogs in both countries has reflected distinct characteristics of the social reality of climate change in both cultures.

5. It uses a longitudinal research design pertaining to a particularly key period in the history of the climate change controversy.

6. Acknowledging the complexity of the social construction of climate change, it employs frame analysis to examine sophisticated framing patterns in media messages and uncover how the uses of frames have provided interpretive cues to audiences, who depend primarily on the media to understand the issue.

7. A B (Bloggers' understanding) – M (Media portrayals) – S (Skepticism) model is developed to (a) reveal how various dimensions of the social construction of climate change interact and (b) synthesize the inconsistent knowledge in this arena within one integrative model.

Because of the above seven points, the present study will go where no other study has gone before, and will answer questions and fill in gaps in the research literature that are vital if policy makers and communication scholars are to have a more complete understanding of this important topic. It will look at media messages that center on climate change from 2005 through 2008 from the following sources: (1) three prestige newspapers in the U.S. (The New York Times, USA Today, and the Washington Post) and two in China (the China Daily, and the People's Daily) and (2) blog posts in both countries. A purposive sample using probability sampling techniques will be used. A rigorously tailored and tested analytical framework will be used to analyze these messages.

The analytical framework derives from five traditions in research of media framing and the social construction of climate change: (1) “episodic vs. thematic” (E v. T) framing (Iyengar, 1989, 1990, 1991), (2) micro-issue salience (Entman, 1993), (3) audience-based frames (Semetko & Valkenburg, 2000), (4) attribution of responsibility (Iyengar, 1989, 1991; Semetko & Valkenburg, 2000), and (5) skepticism towards climate change (Boykoff, 2006, 2007b; Boykoff & Boykoff, 2004; Brossard et al., 2004; Jones, 2006). Additionally, this study looks at the interactions between E v. T. framing and attribution of responsibility, opening a new avenue in frame research—frame interactions—to unearth the ways frames working at different conceptual levels within stories interact with each other and formulate varying degrees of persuasive power.

Before we advance to the next chapter, there are a few important assumptions of this study that need clarification. First, neither pro- nor con-global warming arguments raised by climate scientists is completely unassailable. The scientific approach to truth is not a process of finding more truth, but one of eliminating more non-truth, for scientific truth can only be approached infinitely but not fully reached. Second, this study makes no attempt to tap into the scientific debate on climate change, and therefore it should not and cannot discuss the existence, or the absence, or the anthropogenic side of global warming; it focuses instead on the media’s representations of the issue as well as their political, social, and cultural implications through a comparative approach. Third, scientific research needs to remain intact and guarded against political and financial interests. Any effort of using distorted scientific information to manipulate public opinion is unethical and runs afoul of the spirit of science.

Chapter 2 is an extensive review of both the theoretical and methodological

dimensions of news framing. Chapter 3 examines the social construction of climate change with a specific focus on the media coverage of climate change in the U.S. and other countries. Chapter 4 looks at blogs' relationship with conventional journalism, the development of blogging in China and its social implications, and the role that blogs might have played in environmental activism in China. Chapter 5 lists the research questions and hypotheses and explains their connections with traditions in framing research. Chapter 6 details the analytical framework of this study including types of frames, measures, sampling methods, reliabilities and validities, and a description of the pilot study. Chapter 7 answers the research questions and tests the hypotheses by presenting the results generated by appropriate statistical procedures. Chapter 8 synthesizes major findings, elaborates them within the context of past literature, explicates theoretical and practical implications, discusses limitations, and points out directions for future research.

CHAPTER 2

FRAMING THEORY AND RESEARCH:

DECODING THE SOCIAL CONSTRUCTION OF REALITY

This chapter reviews framing theory and frame analysis in both theoretical and methodological terms. Tracing the philosophical origin of framing theory, the chapter also demonstrates the landscape of framing research by making conceptual connections among various avenues in media frame and framing effects research. Later in this chapter, the methodological challenges of frame analysis are discussed, and ways to deal with these challenges are reviewed.

Origin and Definitions

As one of the renowned theories in mass communication research (Bryant & Miron, 2004), framing theory in a media context is in fact behind a long tradition of philosophical inquiry that runs through human history: where is the line between reality and knowledge? In other words, what is real and how does one know?

As Berger and Luckmann (1989) said, reality and knowledge are socially relative. What is “real” to one person may not be “real” to another, and the disparity may attribute to social variability on different scales—cultural, organizational, or individual. In the 1920s, German philosopher Max Scheler invented “sociology of knowledge” as an umbrella term to describe a discipline that is “concerned with the relationship between human thought and the social context within which it arises” (Berger & Luckmann, 1989, p. 4). Since then, a number of philosophers and sociologists, including Karl Mannheim, Robert Merton, George Herbert Mead, Alfred Schutz, and Werner Stark, have contributed to this field.

Goffman (1974) is credited with using the term “frame” for the first time in a

sociological context, but his definition is much broader than what “frame” means in media studies. He wrote:

I assume that the definitions of a situation are built up in accordance with principles of organization which govern events—at least social ones—and our subjective involvement in them; frame is the word I use to refer to such of these basic elements as I am able to identify. That is my definition of frame. My phrase frame analysis is a slogan to refer to the examination in these terms of the organization of experience. (p. 10-11)

This definition holds several important points. Goffman’s (1974) use of “subjective involvement” implicitly acknowledges the existence of objective reality, which is independent from mental and perceptual subjectivity, and he stressed that social events have their own structures and orders, temporal, spatial, or socially contextual. His “frame analysis” is particularly interested in how human subjectivity is interwoven with those structures to constitute what we know as “reality.” The agglomeration of subjectivity and objectivity is conceptualized by media scholars as a process called “schemata of interpretation,” to describe how journalists consciously or subconsciously employ their values, beliefs, and perspectives to report and interpret news events, and also how readers receive news stories in a similar manner.

Tuchman’s (1978) study on news production in the 1970s was one of the early successful endeavors to bring the idea of “framing” from philosophical and sociological realms to mass communication research. She used participatory observation to track professional practices in four newsrooms and interviewed with print and television journalists to find out how news topics were selected and framed. She found news

particularly important in the social construction of reality because reporters constantly imposed meanings to news events to give stories certain frames that could be readily understood and accepted by readers. She further argued that news organizations both circulate and shape knowledge and ideology. Even though journalistic objectivity may seem to contradict news bias, other journalism conventions create a more systematic bias when certain fractions of an issue eventually go into news and help to form what audiences know as “reality.” Source selection, for example, is an example of such practice. Tuchman (1978) found that reporters she studied preferred to go to centralized sources, such as politicians, for information and never resorted to social movement leaders at a grass-root level. Equally importantly, the questions that the reporters asked their sources were influenced by journalism conventions and often were somewhat formulaic. Other constraints also exist to constitute news frames. Reporters need to use a set of strategic rituals and techniques to protect themselves from internal and external risks including criticism from editors and libel lawsuits. News, Tuchman concluded, is a window on the world that perpetually defines and redefines, constitutes and reconstitutes social phenomena (p. 184).

Tuchman (1978) painted a vivid picture of how news was framed, but to generalize her findings to the construction of reality at large, she would have also examined how news frames were received by audiences, or how framing influences thinking. In other words, how can we assert that news framing contributes significantly to the social construction of reality if readers are indifferent toward news frames? Sadly, many frame analyses later on incorrectly hold axiom that audiences passively conform to news frames. As Entman (1993) pointed out, “the presence of frames in the texts, as detected by researchers, does not guarantee their influence in audience thinking” (p. 53). This problem has given rise to a rich

body of framing effects research. One of the most widely cited examples of such studies is an experiment conducted by Kahneman and Tversky (2000) in which the subjects' decision-making was significantly influenced by how options were framed.

Entman's (1993) synthesis of framing research is a response to the criticism that fragmentation was prevalent in this research tradition. Critics said that frame and framing were loosely defined conceptually, and a lack of commonly followed research paradigm had resulted in inconsistency and poor comparability across framing studies. In response, Entman made several contributions to the field in this article. First, he defined framing and articulated four functional roles of frame. Framing is to "select some aspect of a perceived reality and make them more salient in a communication text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described" (p. 52). He postulated that framing permeates communication process: the communicator (journalists), the text (news stories), the receiver, and the culture.

Landscape of Framing Research

As framing is a complex process by which "people come to describe, explain, or otherwise account for the world in which they live" (Gergen, 1985, pp. 3-4), framing research itself needs a structure capable of categorizing and focusing on different parts of the process. Scheufele (1999) called this structure a "metatheoretical perspective," which involves categorizing framing research "by key input, processes, or outcomes" (p. 104).

He further divided frames into "media frames" and "individual (audience) frames." A media frame is a contextual organizing idea that bestows meanings on a news story. The frame serves two purposes: (1) to allow journalists quickly to identify and classify information, and (2) to enable them effectively to package the information in a way that can

be easily understood by the audience. The second purpose bears particular significance, because, as Gitlin (1980) argued, “what makes the world beyond direct experience look natural is a media frame” (p. 6). Individual frames are preexisting ideas that audiences use to process information. In the audience’s mind, individual frames serve as labeled file folders that news content goes into (Scheufele, 1999).

Although earlier research distinguished between media and individual frames (Entman, 1991; Gitlin, 1980), Scheufele went beyond the dichotomous classification by employing a research-oriented perspective and illustrating how the two types of frames work as dependent or independent variables to form a typology of framing research. The typology is embodied by a four-cell matrix that is divided by two variables: types of frames (media vs. individual) and types of variables (independent vs. dependent). Later in the article, he showed a process model of framing research categorized by input, process, and outcome. The input-process-outcome framework that Scheufele used to visualize his “meta-theoretical perspective” is in line with the “centrality model of communication content” proposed by Riffe, Lacy, and Fico (2005) in which “antecedent conditions,” “content,” and “effect” are interrelated cornerstones of communication research. To show these models in unison, Figure 1 is a hybrid model of framing research paradigm that combines Scheufele’s (1999) work with Riffe, Lacy, and Fico’s (2005) “centrality model.” The following paragraphs will elaborate this model.

A considerable portion of framing literature is inspired by Tuchman’s (1978) work and has explored how media frames (MF) may be influenced as a dependent variable by antecedent conditions such as social norms and values, organizational pressures and constraints, pressure of interest groups, journalistic routines, and ideological or political orientation of journalists. Donsbach (1981) focused on journalists’ perceived responsibility

and social impact and discussed how these perceptions relate to their daily practices. Shoemaker and Reese (1996) paid close attention at a more collective level—organizational framing factors, such as newsroom practices and routines. Other scholars wrote extensively at a societal platform. Politically, for example, ideological thinking such as “cold war” impacted on the way international news coverage in the U.S. was framed from 1973 through 1995 (Norris, 1995). Economically, commercialization of news media has made media owners effective “gatekeepers” who may prefer certain news frames that do not violate corporate interests than others that do (Herman, 1992).

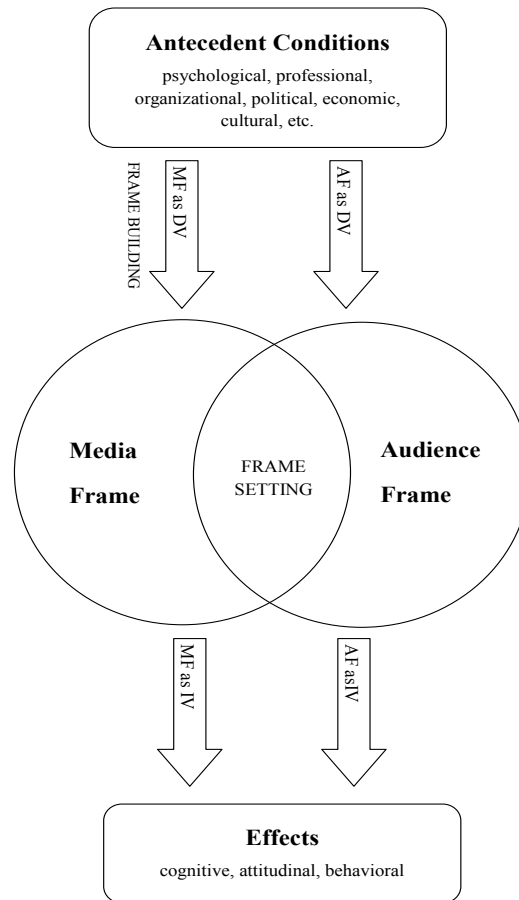


Figure 1. *A hybrid model of framing research paradigm based on Scheufele (1999) and Riffe, Lacy, and Fico (2005).*

Antecedent conditions and media frames in combination influence how audiences understand news. To examine the interaction of the three key variables in framing research requires working with both media text and audience. Iyengar's (1989, 1990, 1991) line of research is such an example in which he employed content analysis, survey, and field experiment, to show the how audience frames are formed. Two types of media frames were differentiated: episodic frame and thematic frame. The episodic frame focuses on concrete events or particular cases to illustrate issues, whereas the thematic frame places stories in some general context (Iyengar, 1991). Essentially, an episodic report simulates a "case study," while a thematic report creates "talking points." He hypothesized that news framing significantly influences how audiences attribute responsibility, given that attribution of responsibility is a dimension of audience frames. Five issues were examined: crime, terrorism, poverty, unemployment, and racial inequality. He found that the degrees to which media frames affect audience frames vary based upon the issue under study. For example, unemployment, an issue being manipulated and framed as highly salient by the researcher, provoked little or no individual attribution of responsibility. This example suggests that no matter how the media portray the issue of unemployment, the audience is much more likely to attribute responsibility to society or government at large than to individuals. Under the issue of crime, however, audience attribution of responsibility is more likely to be influenced by media frames. Iyengar (1989) also took into account antecedent conditions such as ideological and political orientations and found them relevant to attribution of responsibility to varying degrees depending on the issues as well. He concluded as follows:

In sum, Americans are subject to considerable media influence when they consider questions of responsibility for social and political issues... When a single news frame

predominates, as is clearly the case with poverty, crime and terrorism, journalistic practice takes on considerable political significance. (Iyengar, 1990, p. 9)

Similar to the way that Iyengar considered audience frames as a product of both internal and external influences (media frames, political orientation, socio-economic status, etc), results of other studies also point out the sophisticated composition of audience frames. An hypodermic effect of media frames is undoubtedly erroneous because audiences are capable of introducing their critical and interpretive thoughts, and even in some cases, drawing opinions completely contrary to the media's framing (Huang, 1995; Price, Tewksbury, & Powers, 1997).

Audience frames have been investigated as independent variables that can lead to individual or collective actions (Babb, 1996; Johnston, 1991; Snow & Benford, 1988; Snow, Rochford, Worden, & Benford, 1986). This body of literature almost exclusively takes a qualitative and critical approach, partly because it attempts to establish individual frames of social issues as a propellant for social movement on which quantitative measures are difficult to apply. Snow, Rochford, Worden, and Benford (1986) looked at framing as a dynamic process instead of a static concept. They coined the term "frame alignment" to describe the linkage of individual and SMO [social movement organization] interpretive orientations, such that some set of individual interests, values and beliefs and SMO activities, goals, and ideology are congruent and complementary. They argued that the more individual frames and SMO frames are "aligned," the greater social movement participation might be created. The authors stressed the importance of seeing frame alignment not only as a "necessary condition for participation," but an "interactional and ongoing accomplishment" (p. 464).

Frame Analysis

Most media frame analyses are analytical works of news content that define, identify, and compare different frames and elaborate their implications. Conceptual definitions of the term “frame” are ubiquitous in the literature on social construction of reality and have migrated from philosophy and sociology to a media context. Gitlin (1980) defined frames as “persistent patterns of cognition, interpretation, and presentation of selection, emphasis and exclusion by which symbol-handlers routinely organize discourse” (p. 7). Gamson and Modigliani (1989) regarded a news frame as a “interpretative package” or “a central organizing idea” that helps make sense of relevant events (p. 3). Cappella and Jamieson (1997), focusing on the cognitive aspect of frames, argued that frames activate knowledge, stimulate cultural moral and values, and create context. Entman’s (1993) functional definition of frames derives from Gamson (1992) and differs from most others in that it is a step toward an operational definition of frames that provide researchers with cues that may help them form frame categories for analysis. He referred to frames as selected aspects of reality that were made more salient in a communicating text. They define problems, diagnose causes, make moral judgments, and suggest remedies (p.52).

Even though conceptual definitions of frames seem difficult to improve (Koenig, 2004), their operational definitions have been criticized for lacking consistency, compatibility, and comparability, all of which eventually lead to a fractured body of research that begs for core knowledge (Entman, 1993; Scheufele, 1999, 2000). The popularity of framing research, especially in the 1980s, has generated a long list of frames that defies a systematic structure, making frame analysis a widely adopted but ill-defined approach (Benford, 1997). Entman (1993) was amongst the first who called for a framing “research

paradigm”—“a theory that informs most scholarship on the operation and outcomes of any particular system of thought and action” (p. 57). He attributed the fragmentation of frames largely to (1) mistakenly confusing simple negative or positive terms with frame salience and (2) failing to identify dominant frames picked up by most audiences. This critique suggests that sensible frames need to be bridged to and tested against the audience’s schemata instead of the researcher’s.

Cappella and Jamieson (1997) offered more specific criteria that a news frame needs to meet, some of which are reminiscent of construct validation since frames, covert or overt, are essentially constructs. First, a frame must have identifiable conceptual and linguistic characteristics. Researchers need to look at rhetorical devices that manifest certain frames. Second, it must be commonly observed in journalistic practice. Aberrations beyond professional and organizational routines usually contribute little to the construction of social reality and invariably result in poor external validity. Third, it must be possible to distinguish a frame reliably from other frames. This criterion in fact underscores the importance of establishing discriminate validity between dissimilar frames. Fourth, a frame must be recognized by others, namely audiences, in lieu of a mere figment of a researcher’s imagination. This is to establish content validity and ensure that the frame measure encompasses all facets of what it is meant to measure. Echoing the fourth criterion, Reese’s (2001) argued that that frames are essentially “persistent over time” and “socially shared” principles that symbolically organize the social world (p. 11).

Two methods have been used for frame identification: inductive and deductive. The inductive approach objects the idea of using predefined news frames but instead let frames emerge from the content “on the fly.” There are distinct advantages and drawbacks of this

grounded approach. It assumes sophisticated interaction among variables and requires the researcher to gain deep understanding of the texts under examination. Its flexibility makes frames “naturally” to emerge from the content rather than imposing *a priori* defined frames that may or may not fit the text. Researchers read and re-read the data to discover and refine frames and their interactions with other variables so as to compose a text-specific theory with significant explanatory power. Such extensive reading, however, usually does not allow a substantial sample size. Therefore, studies using this method have been criticized for limited generalizability due to small sample size, and because of its text-specific nature, frames induced from such research are hardly replicable (Hertog & McLeod, 2001). Another challenge of this approach is that the detailed reading is often so researcher-oriented that it largely depends on speculations of how audiences might perceive the text. Disconnected from how frames work in the real world, the grounded method may have just added to the long laundry list of scattered frames rather than consolidating it.

Contrary to the inductive approach, the deductive approach uses an analytical framework comprised of pre-defined frames to scrutinize rhetorical cues in the text that match those frames. Scholars have developed lists of textual elements and rhetorical devices to be examined under their analytical radar. Entman (1993, p. 52) suggested that frames can be identified by “the presence or absence of certain keywords, stock, phrases, stereotyped images, sources of information and sentences that provide thematically reinforcing clusters of facts or judgments.” Tankard (2001, p. 101) provided a detailed checklist of textual elements including (1) headlines, (2) subheads, (3) photos, (4) cutlines, (5) leads, (6) source selection, (7) quotes selection, (8) pull quotes, (9) logos, (10) statistics and charts, and (11) concluding statements and paragraphs.

Note that the clearly identifiable list does not mean that frame analysis can be non-interpretive. In fact, Tankard (2001) suggested only places to look for frames, not how to read text and identify frames. It becomes especially challenging to capture latent frames constituted by thematically reinforced clustered judgments (Entman, 1993, p. 52) that are scattered across various textual elements and reflected in diverse rhetorical devices such as metaphors, exemplars, and catch-phrases, as discussed by Gamson and Modigliani (1989, p. 3). Specific operational definitions and intense coder training are needed for precise and consistent frame capture.

The complexity of the way frames are embedded in media messages is attested by not only the interpretive nature frame coding, but also how frames are manipulated in experimental studies. Different from content analyzers' meticulous attention to framing nuances, experimenters tend to form frames in a much more simplistic fashion than does real world news. Price et al. (1997), when testing audience cognitive responses to news frames, established frames by inserting interpretive introductory and concluding paragraphs in each story while the other paragraphs in the articles were kept identical. Even some content analyses failed to develop appropriate operational definitions of frames that agree with the way frames are sophisticatedly manufactured. For example, Neuman, Just, and Crigler (1992) divided news stories into sections containing "frames" and sections containing "facts." Perhaps the distinction between factual elements and frame-carrying elements is applicable to experimental studies, but the taxonomy ignores the often loosely plotted framing devices in rhetorical structure. Nor does it heed the notion that selections and omissions of facts are a vital part of framing as well.

Frame Typologies

Even though frames are too loosely defined operationally to give researchers a systematic research paradigm to follow (D'Angelo, 2002; Entman, 1991, 1993; Hertog & McLeod, 2001; Koenig, 2004; Reese, 2001, 2007; Scheufele, 1999, 2000), Vreese (2002) still provided a rather simple but reasonable typology of frames categorized by their concreteness in relation to the texts under study. Issue-specific frames are those applicable only to specific topics or events; generic frames transcend topical constraints and are identifiable across different topics or cultural contexts over time (Vreese, 2005). The “horse race” frame commonly found in political election news (Hallin, 1990) is an exemplar of issue-specific frames. Sometimes, issue-specific frames are so issue-sensitive that researchers equate them with news topics. For example, Norris’s (1995) content analysis of U.S. international news coverage before and after the Cold War employed a frame categorization comprised of war, politics, human interest, disasters, and economics. Similarly, when Shah, Watts, Domke, and Fan (2002) studied news coverage of Bill Clinton during the final stage of his presidency, the frames identified were “Clinton behavior scandal,” “conservative attack scandal,” and “liberal response scandal.” The advantage of issue-specific frames “allows for a profound level of specificity and details relevant to event or issues under investigation” (Vreese, 2005, p. 55). The ad hoc convenience of dissecting and applying frames based on text, nonetheless, is precisely its weakness, which has been criticized for fragmenting framing research, because it is difficult to label framing as a cohesive theoretical establishment when scholars tend to develop a unique set of frames for every study (Hertog & McLeod, 2001).

There have been, however, endeavors to generate less issue-sensitive frames

applicable to much broader texts. A trend emerged between the mid 1980s and mid 1990s, when some scholars began to realize that excessive attention on text itself would only help them achieve deeper levels of specificity. To unveil more general patterns of framing, they needed to resort to those who receive masses of news content daily, namely the audience, for clues to a frame typology. Neuman et al. (1992) adopted a constructivism viewpoint and held that news is what it is perceived. Advocating the necessity of audience-driven frames, the research included in-depth interviews with 48 subjects to find out their structuring news issues and opinions. Five frames were identified: “human impact,” “powerlessness,” “economic,” “moral values,” and “conflict.” The human impact frame is manifested by description of individuals and groups affected by an issue; the powerless frame focuses on the dominance of forces over underprivileged individuals or groups; the economics frame deals with the economic consequences of an issue, ranging from “the bottom line” to wider values of the culture of capitalism; the moral values frame refers to the often implicit reference to morality and social prescription; the conflict frame portrays an issue as a battleground where often polarized opinions and actions collide. Audiences, as the researchers stressed, file news stories into these five frame folders for further cognitive process, and therefore one should not assume a connection between the frames and audience opinions (Neuman et al., 1992).

Iyengar (1989, 1990, 1991) believed that frames go beyond a mere organizational tool and wondered whether they reflect both journalistic practices and influence public opinions. He conducted several studies (Iyengar, 1990, 1991) that employed an “episodic vs. thematic” framework to analyze news stories and their cognitive effects. The episodic category includes stories that portray issues “predominantly as concrete instance or events,” while the thematic

category is comprised of articles that depict issues “more generally either in terms of collective outcomes, public policy debates, or historical trends” (Iyengar, 1991, p. 18). Although episodic and thematic frames are conceptually distinct and exhaustive, relatively few stories were purely episodic or thematic. As most stories are highly skewed toward either episodic or thematic terms, Iyengar found it easy for researchers to identify the predominant type. After studying news broadcasts of major U.S. television networks from 1981 to 1986 that covered four major social issues—poverty, racial inequality, crime, and terrorism—he found that networks were considerably more likely to frame stories episodically. This preference, he worried, often led to news stories as isolated events or instances of sensationalism without a broader interpretation or context. News coverage on terrorism during the 1980s, for example, showed “hundreds of reports of particular acts of terrorism but virtually no reports on the socioeconomic or political antecedents of terrorism” (Iyengar, 1991, p. 2). Iyengar attributed the U.S. media’s obsession with episodic frames to distinct visual and cognitive properties of the two frames types. Episodic framing “is visually appealing and consists of 'on-the-scene', live coverage,” whereas “thematic coverage which requires interpretive analyses, would simply crowd out other news items” (Iyengar, 1990, p. 7). Therefore, it is not surprising that under the pressure of covering a wide range of topics in less than thirty minutes, the news media would prefer a style capable of actually telling readily digestible stories rather than providing abstract meta-narratives that demand significantly more cognitive work of the audience.

Even though Iyengar’s (1989, 1990, 1991) research preceded Cappella and Jamieson’s (1997) work, his “episodic vs. thematic” frame dichotomy complies with the four frame identification criteria put forth by the two scholars (Cappella & Jamieson, 1997). The two

frame types (1) have highly identifiable conceptual characteristics, (2) derive from common journalistic practices, (3) are mutually exclusive, and (4) have distinct influences on audience perceptions of news and social issues at large. The linkage between his frame typology and audience reception is especially worth noting because it distinguishes his work from many others that employ researcher-oriented frame induction. He tied his frame analysis to the Attribution of Responsibility theory developed mainly by Heider and Simmel (Heider, 1958; Heider & Simmel, 1944) based on the assumption that people try to understand social issues by reducing them to questions of responsibility—individual responsibility and social responsibility. Field experiments and national surveys were conducted to delineate the way episodic and thematic frames affect audiences’ attribution of responsibility on four social issues: crime, terrorism, poverty, unemployment, and racial inequality. Except for unemployment, Iyengar (1991) found that attribution of responsibility is sensitive to whether the media choose to frame stories on all the other issues episodically or thematically. Specifically, thematic frames increase attribution of responsibility to government and society, whereas episodic frames induce attribution of responsibility to individual victims or perpetrators.

The five audience-generated frames (Neuman et al., 1992) and the “episodic vs. thematic” frames’ effects on attribution of responsibility (Iyengar, 1989, 1990, 1991) were separate venues in framing research until Semetko and Valkenburg (2000) brought the two together by proposing the following frames: conflict, human interest, economic consequences, morality frames, and responsibility. This theoretical mesh of the earlier frame typologies was successful for a number of reasons. First, there are similarities between the human interest frames and the episodic frame, because both focus on individual stories often with an

emotional angle. Second, the overbroad scope of thematic frames was broken down to conflict, economic consequences, morality, and responsibility frames. Third, Semetko and Valkenburg (2000) employed the theory of attribution of responsibility in media messages analysis and argued that before reaching their audiences, news stories already provide interpretive cues by “presenting an issue or problem in such as to attribute responsibility for its cause or solution to either the government or to an individual or group” (p. 96). The results eloquently supported their reasoning: the responsibility frame was not only measurable, but predominant in both print and TV news coverage on European politics.

Contrary to Iyengar’s (1991) finding that excessive episodic frames encouraged viewers to attribute responsibility for social problems to the individual, Semetko and Valkenburg’s (2000) discovered that although television news stories in many European countries were primarily episodic, they tended to hold the governments, rather than individuals, accountable for social problems. The finding suggested that “Iyengar’s argument about consequences of the episodic nature of TV news is actually culture bound and not generalizable beyond television news in the U.S.” and that “the way in which responsibility is framed in the news is influenced by the political culture and social context in which the news is produced” (p. 106).

In sum, the distinct beauty of framing theory largely resides in frames’ ubiquity and their value in helping researcher understand the organization of experience. as Reese (2007) elaborated:

Framing’s value ... does not hinge on its potential as a unified research domain but, as I have suggested before, as a provocative model that bridges parts of the field that need to be in touch with each other: quantitative and qualitative, empirical and

interpretive, psychological and sociological, and academic and professional. If the most interesting happens at the edges of disciplines—and in the center of policy debates—then framing certainly has the potential to bring disciplinary perspectives together in interesting ways. (p. 148)

It is, however, precisely the far-reaching capabilities of framing that have given rise to the fragmented frame typologies and poor comparability across framing research. Moreover, the implementation of frames in media message is so sophisticated that quantitative researchers often find it difficult to find the appropriate unit of analysis (Reese, 2007), especially when multiple frames coexist in the same text but with varying degrees of prevalence.

Hertog and McLeod (2001) suggested that researchers adopt a multiperspectival approach to frame analysis. Both abstract frames and subframes should be used because the full extraction of media frames depends on the use of frame classifications at different level of abstraction. While abstract frames encompass a wide range of content, subframes target specific aspects of a designated issue. It is also important that scholars thoroughly review earlier research and use relatively stable frames to make their analyses replicable (Hertog & McLeod, 2001).

CHAPTER 3

CLIMATE CHANGE AS A SOCIAL ISSUE:

MEDIA COVERAGE, PUBLIC PERCEPTIONS, AND MEDIA EFFECTS

This chapter focuses on the role of new media in the social construction of climate change. The review looks at three pivotal dimensions—media coverage, public perceptions, and media effects—of how the news media have helped mobilize and demobilize public opinions on climate change. To lay a solid foundation for the current study, an international perspective is adopted in this review to examine the media coverage in the U.S. and other countries.

Media Coverage of Climate Change in the U.S. and Other Countries

Media Coverage of Climate Change in the U.S.

The scientific community rarely speaks directly to the public in the U.S. The public's scientific knowledge in general is highly mediated via the news media (Corbett & Durfee, 2004; Kahlor & Rosenthal, 2009). Especially for less “visible” scientific issues such as climate change, the public learns about them “less through direct experience or past education than through the filter of journalistic language and imagery” (Nelkin, 1987, p. 2). This propensity in scientific knowledge acquisition has turned much academic attention to how the news media portray climate change in ways that may shape the public perceptions of the issue.

Studies on media coverage of climate change started in the 1980s when Dr. James Hansen, head of the NASA Goddard Institute for Space Studies, testified to the Congress about unusual increase in global temperature and raised broad awareness of global warming. Literature in the 1980s primarily dealt with the characteristics of environmental stories that

prioritized environmental issues in the media agenda. Greenberg, Sandman, Sachsman, and Salomone (1989) examined environmental stories presented by three major news broadcasters from 1984 to 1986. Instead of reporting from the realm of science and discussing potential risks of environmental problems, the networks featured extensively dramatic events such as dioxin contamination and emission leaks while offering little scientific background information. The dramatization tactic used in environmental reporting in the 1980s has been repeatedly found in later research (Mazur & Lee, 1993; McComas & Shanahan, 1999). What concerned media scholars was the lack of interest in linking dramatic incidents to scientific information for educational purposes. Environmental reporting in the 1980s was mainly driven by human drama, along with several other non-scientific factors such as prominent news sources, extraneous events, and attention by prominent national news media (Greenberg et al., 1989; Mazur & Lee, 1993; McComas & Shanahan, 1999).

A finer examination of environmental issues was warranted then, because the degrees to which these issues can be linked with human drama vary greatly. Toxic leaks almost always emerge in news in the form of accidents, whereas greenhouse gas emission hardly manifests itself by dramatic incidents. Wilkins' (1993) qualitative investigation excavated U.S. print media coverage of the greenhouse effect between 1987 and 1990 for underlying news values, attempting to extend Gans' (1980) classic work on the news production mechanism. Contrary to the earlier finding that human drama was heavily present in environmental stories, most greenhouse gas coverage was confined to scientific and political debate (Wilkins, 1993). Three values permeated the coverage: progress, the institutionalization of knowledge, and innocence, all of which contributed to a larger latent frame. That is, science and technology, rather human behavioral change, can "fix" the global

warming problem. Wilkins (1993) argued that the optimistic view is deeply rooted in the American culture:

Americans, in their literature and art, have solved problems by changing the world around them, not by changing themselves. In a European context, such a view would be described as a cultural unwillingness to exchange innocence for knowledge (experience). (p. 80)

An important shift in the way that climate change was reported occurred in the late 1980s. Wilkins' (1993) qualitative observation that political events were introduced to climate change coverage in the late 1980s with increasing frequency was confirmed by Trumbo's (1996) study, which content analyzed a decade of climate change coverage by four major U.S. newspaper from 1985 to 1994. Politicians and interest groups significantly outweighed scientists as information sources, especially late in the period when judgments and remedies became the focal point, suggesting "a politicization of the issue, an increase in its level of controversy, and a shift toward judgments and solutions" (Trumbo, 1996, p. 281).

Different from many longitudinal content analyses of climate change stories, Antilla (2005) offered only a snapshot of the socially constructed news of climate science during the time period of March 2003 to February 2004, but with a much wider angle of view: 554 stories in 251 U.S. newspapers, national and regional, were under the radar. Climate change was primarily framed as a scientific and political controversy replete with rhetoric emphasizing uncertainty and skepticism, and the internal structure of the U.S. news media played a critical role in perpetuating this frame. Wired news was often picked up quickly by regional newspapers, which lacked the access to scientific and political elites. The top-down news distribution model showed that "collective newswire/news service community is not

only an essential but a dominant source of climate science news,” which bears the risk of amplifying misinformation (Antilla, 2005, p. 350).

Antilla (2005) also looked at how original scientific research was used in news by identifying 32 widely cited studies in the sample and analyzing whether they were used as “valid science” or as parts of the controversy. Eleven out of 32 these studies were used to construct the frame of ambiguous cause or effect, uncertainty, or scientific controversy, a proportion that was “sufficiently prominent as to effect substantial confusion among readers” (p. 344).

The research design of comparing texts from both the science community and the news media can be commonly found in content analysis of media representation of climate change conducted in recent years, due largely to the ongoing discovery and extensive research in climatology driven by increased governmental and private funding, as well as media researchers’ concerns about how scientific dialogs were translated and introduced by the news media to the public. This comparison was also ubiquitous in texts of public discourse on climate change, many of which referred an article published in *Science* written by Naomi Oreskes (2004). This extensively cited article used the ISI (Institute for Scientific Information) database and drew 928 climate change research abstracts that were published in refereed scientific journals between 1993 and 2003. The papers were divided into six categories: explicit endorsement of the consensus position, evaluation of impacts, mitigation proposals, methods, paleoclimate analysis, and rejection of the consensus position. Oreskes (2004) found that none of the papers fell into rejection category. Nor did any of them argue that current climate change is natural. The article gained immediate attention in public discourse and became one of the most powerful ammunitions for alarmists and media critics

to rebut skepticism. Green Earth Society (2006), sponsored by electric companies and their suppliers, published an article a few months later on its website challenging Oreskes' (2004) findings. However, the article was soon discredited widely for the organization's link to special interests and the author's less than scientific evidence.

So how accurately or inaccurately do the news media represent scientific knowledge on climate change? There seemed to be a considerable gap between an emergent "scientific consensus" regarding anthropogenic climate change and the U.S. news media's persistent portrayal of it as controversial and contentious (Boykoff, 2006, 2007b; Boykoff & Boykoff, 2004). A content analysis (Boykoff & Boykoff, 2004) looked at four U.S. "prestige press" newspapers' coverage in 25 years (1988-2002) and found that more than half of the coverage (52.65%) featured balanced accounts of anthropogenic contribution to warming by giving roughly equal attention to the view that human activities were contributing to climate change as well as other alternative explanations that attribute the temperature increase to natural fluctuations. By contrasting the finding with high agreement ratios on anthropogenic factors obtained from IPCC reports and other journal articles, the authors criticized the misuse of "journalistic objectivity" by contending that the apparently "balanced" reporting in fact formed an "informational bias" that painted an elusive picture of scientific research on climate change, confused the public, and caused political inaction. The discursive mistranslation, as the authors believed, "is systematic and occurs for perfectly logical reasons rooted in journalistic norms and values" (p. 134).

Media Coverage of Climate Change in International Perspectives

In addition to contrasting media coverage with scientific research, scholars realized that another comparative perspective must be adopted—international comparisons

correspond to the global scale of the issue, scientifically and politically, and therefore become critical to enhancing the understanding of how culturally distinct journalistic enterprises shape the issue and public opinion with their own territories. There have been a multitude of studies centering on cross-national media coverage on climate change and cross-cultural perceptions of it. Media coverage in the U.S. has been compared with that in the U.K. (Boykoff, 2007a), France (Brossard et al., 2004; Dispensa & Brulle, 2003), New Zealand (Dispensa & Brulle, 2003), and other developed and developing countries (Jones, 2006). Similarly, public knowledge and risk perceptions of climate change were compared internationally (Brechin, 2003; Dunlap & Mertig, 1995). Moreover, in-depth analyses of the interaction among climate science, politics, news media, and public in several developed countries, including New Zealand (Bell, 1994), Australia (Harriet, 2000), Germany (Weingart, Engels, & Pansegrau, 2000), and the U.K. (Carvalho, 2007; Carvalho & Burgess, 2005; Smith, 2005), have delineated a mosaic picture of the culturally diverse climate change discourses.

By comparing major British newspapers with their American counterpart from 2003 to 2006, Boykoff (2007a) found several differences that attest to the distinct societal and political dynamics in the two countries. British newspapers had heavier coverage of the issue, but consistently with much less skepticism to anthropogenic climate change. Over the four years, more than 97% of the British stories portrayed human influences as a significant factor in climate change. Interestingly, the U.S. coverage underwent a transition from 36.59% of the stories containing “balanced accounts of anthropogenic contributions” in 2003 to a mere 3.3% in 2006 with 96.7% of the coverage agreeing with significant anthropogenic contributions in the same year. Boykoff (2007a) called this transition an “evolutionary shift” (p. 475),

attributing it to various political movements, scientific activities, and meteorological events that happened between 2003 and 2006. Such incidents include (1) the Bush Administration's recommitment to greenhouse gases emission reduction, (2) the disclosure of the Administration's secretive revisions to reports prepared by the U.S. Climate change Science Program to make anthropogenic factors look more uncertain and contentious, and (3) Hurricane Katrina, which stimulated tremendous media coverage and public speculations of the disaster's possible connection with warming temperature.

To further explain the difference practices of both countries' news media, Boykoff (2007a) argued that political elites' position also played an important role in media framing of the issue. In the U.K., neither the Labour nor the Conservative party took issue with anthropogenic contributions, whereas the Bush Administration was criticized for downplaying anthropogenic climate change. This explanation was supported by the fact that the change from divergence to convergence observed in the U.S. media happened concurrently with Bush's repositioning of his stance later in his presidential tenure (Boykoff, 2007a).

Jones (2006) investigation of several elite U.S. newspapers and network TV news (1993-2003) agreed that contention was the main frame in the U.S. media. In addition, the study included newspaper content from eight other countries (Japan, Malaysia, Singapore, Canada, Ireland, UK, New Zealand, and Australia), and employed Iyengar's (1989, 1991) dichotomy of "episodic vs. thematic" frames. It was found that the U.S. coverage was more significantly episodic than all the others and that coverage of western developed countries tended to be more episodic than the rest. However, of a particular concern is the study's design. First, it employed Iyengar's analytical framework in an isolated manner. Iyengar's

conceptualization of the episodic and thematic frames was interconnected with two things: the episodic frame's de-contextualization function and both frames' correlation with attribution of responsibility. Neither of the two matters was discussed in Jones cross-national research. Second, the inclusion of nine countries made it very difficult to incorporate individual cultural elements in the analysis. Simplistic categories were used in frame comparisons, such as "U.S. vs. the others" or "western developed countries vs. the others," which prevented the study from offering in-depth analysis and explanation of the apparent differences.

Despite the cross-national nature of Jones' (2006) work, differences in journalistic norms and practices were largely missing in the study. In contrast, Brossad, Shanahan, McComas (2004) concerned primarily with how these two factors affect French and American journalists' framing of climate change stories. They noted that "what is considered 'interesting' or 'exciting' in one cultural context may not have the same significance in another," and "journalistic regimes will offer different opportunities, standards and guidelines for assessing potential audience interest in a story or series of stories" (p. 363). The authors then elaborated on a key difference between the French and American press: most French newspapers look more like "opinion journals" with a style "described as indirect, with allusion, and story-telling" (p. 364), all of which to certain degree contradict the American tradition of objectivity. In a deeper level, the French press has been committed to a socially progressive mission, relatively distant from the American "detachment" norm, and in support of social and political engagement. These characteristics seem to hold substantial explanatory power regarding the research findings. An analysis of coverage in *Le Monde*, a major French newspaper, and the *New York Times* (1987-1997) showed that similar to the

British news media, much of the French coverage, long before the U.S. media's final convergence to "scientific consensus" (Boykoff, 2007a), assumed that the scientific debate was over. Lacking discussion on the scientific side of the issue, Le Monde employed an "international relations" frame, which dealt with the culpability of the U.S. as both a cause and a solution to the problem. The conflicts between the United States and the European Union regarding climate change solution dominated other topics such as potential consequences and domestic politics.

The New York Times, on the other hand, presented a wider variety of viewpoints and information sources, but rarely addressed the issue in an international diplomacy perspective. Also, consequences of global warming and the use of business sources appeared with higher frequencies in the New York Times than in Le Monde. Journalistic objectivity was obviously linked to the Times' prevalent use of balanced accounts, as the authors suggests; political engagement and social progressiveness explained Le Monde's emphasis on international relation and human behavioral change as a key approach to mitigate climate change. Considering the explanatory power of culture differences to the variances in climate change coverage, the authors called for more comparative cross-culture research that elucidate how the social construction of climate change is situated in and represented by not only journalistic, but also organizational, political, economic, and societal interests in diverse cultures.

To summarize, research centering on media representation of climate change has provided us with several thematic conclusions. First, controversy and contention, either in scientific or political sense, had been the dominate frame in the U.S. media coverage before 2005 (Antilla, 2005; Boykoff, 2006; Boykoff & Boykoff, 2004; Dispensa & Brulle, 2003;

House of Representatives, 2007a; Jones, 2006; Trumbo, 1996; Trumbo & Shanahan, 2000). Second, although the media have started to give much more credence to the “scientific consensus” on anthropogenic climate change since 2005, political debate still dominates the coverage (Boykoff, 2007a; Russill, 2008). Third, rather than monitoring the U.S. media alone, a number of studies have been conducted to culturally compare climate change coverage (Boykoff, 2007a; Brossard et al., 2004; Jones, 2006; Sitton, 2004), an indispensable perspective to understand the social construction of climate change on a global scale. Nonetheless, future work needs to go beyond journalistic norms and practices and examine how differences higher in sociological hierarchy, such as media structure, media-government relation, political economy, and traditional culture values, help to shape media coverage in various ways.

Factors Affecting Climate Change Coverage

Although the aforementioned research represents a long-standing interest in longitudinally tracing the news media’s portrayals of climate change, rationalization of such accounts is scattered throughout scholarly literature and public discourse. The following pages will offer a systematic understanding of why the media interpret and re-interpret, construct and reconstruct climate change in certain ways.

Major factors affecting climate change can be grouped into three categories. First, journalistic norms and newsroom practices are the most immediate determinants. Besides “journalistic objectivity” that may have created what Boykoff and Boykoff called (2004) “informational bias,” deadlines, editor’s preference concerning the hierarchy of news values, and journalist’s lack of scientific training have been influencing climate change coverage over the years. When topics contest in the newsroom, editors usually do not consider climate

change a priority unless political polemics or dramatic elements are involved (Abbasi, 2006; Gelbspan, 2005). This preference reflects science's relatively inferior position in news agenda setting: recounts of scientific discovery are often relegated to specialty pages that attract far less editorial attention than politics, war, and foreign policy (Abbasi, 2006).

Stemming from journalistic detachment, the preference to minority views often functions to legitimize balance and plurality in reporting. It is true that science is not a popularity contest, and many minority theories in the past, such as continental drift, have been proven correct later. Driven largely by this rationale, journalists have a tendency to put scientific dissent in a "Galileo fighting the establishment" frame (RealClimate.org, 2006). This propensity, however, results in a fallacy that blindly treats all viewpoints and evidence with equal scientific weight (Wilson, 2000), creating an illusion of endless scientific debates on climate change that has confused both the public and journalists themselves (Abbasi, 2006).

Limited training in science and in climate science specifically also explains why journalists themselves are often confused, as their audiences are. Rather than arguing that journalists set the news agenda for the public and shape its opinion, their approach to climate change is appropriated within a larger social context by mirroring the gap in science education within society (Abbasi, 2006). Wilson (2000) measured American reporters' understanding of climate change and surprisingly found that even environmental journalists learned about climate change primarily not from scientific sources, but from newspapers. With a myriad of climate change studies published each year, scientists and science journals placed distant second and third as the journalists' information sources. This troubling discovery strongly suggests that the discrepancy between the news media and the scientific

consensus on climate change is to a large degree self-perpetuated by the media's own scientific illiteracy. Wilson's (2000) finding of considerable misunderstanding of climate science among American reporters does not seem to be culturally bound; Bell's (1994) study showed that in New Zealand newspapers, one in six stories contained significant misreporting of climate change.

The second category of influence deals with the political economy side of climate reporting. Economic pressure facing the news media, especially newspapers, has led to fewer investigative stories, which require sizable financial and human resources, making in-depth reporting of social issues a scarcity in recent years (McChesney, 2004). This tendency, coupled with the objectivity norm, legitimizes a writing style that mechanically quotes different sources as if they are equally credible. The problem has afforded special corporate interests the leverage to manipulate the making of climate change news and mobilize public opinion. In addition to providing funding for research projects that gives "desirable" results (Rampton & Sauber, 2002), public relation firms have employed a variety of classic persuasion tactics to speak to the journalistic community, including sending out monthly newsletters underscoring the uncertainty of climate change to environmental reporters (Trumbo & Shanahan, 2000) and endorsing climate change skeptics (Gelbspan, 1998). Gelbspan (1998) gave such an example:

The Information Council on Environment (ICE) was the creation of a group of utility and coal companies. In 1991, using the ICE, the coal industry launched a blatantly misleading campaign on climate change that had been designed by a public relations firm. The public relations firm clearly stated that the aim of the campaign was to "reposition global warming as theory rather than fact." Its plan specified that three of

the so-called greenhouse skeptics—Robert Balling, Pat Michaels, and Sherwood Idso—should be placed in broadcast appearance, op-ed pages, and newspaper interviews. (p. 34)

The third kind of influence goes beyond competing social interests and concerns with the relationship of the scientific nature of climate change, knowledge production, and media rituals. Beamish (2002) used the term “crescive troubles” to describe the chronic and accumulative characteristics of environmental issues and related potential risks.

"Crescive" is used in the applied science to denote phenomena that accumulate gradually, becoming well established over time. In case of such incremental and cumulative phenomena, identifying the "cause" of injuries sustained is often difficult if not impossible because of their long duration and the high number of intervening factors. Applied to a more inclusive set of social problems, the idea of crescive troubles also conveys the human tendency to avoid dealing with problems as they accumulate. We often overlook slow-onset, long-term problems until they manifest as acute traumas and/or accidents. (p. 4)

The crescive nature of environmental issues has two observable social effects. First, literature indicates that political interests have long been taking advantage of “creeping” environmental issues to discredit long-term risks, divert public attention, and mobilize public opinion (Beamish, 2002; Molotch, 1970). Climate change is no exception. Equating the lack of temporary direct experience with the absence of crescive change is a common strategy used by skeptics and PR groups alike. For example, an advertisement by the Information Council on Environment (ICE) appeared after a major snow storm in Minneapolis. The copy reads “If the earth is getting warmer, why is Minneapolis getting colder?” despite the data

indicating that the area had actually warmed between 1 and 1.5 degrees Celsius in the 20th century (Gelbspan, 1998). Second, often ignoring inherent risks of incremental problems, the news media's favoritism of dramatization has degraded climate change in both news and public agendas (Corbett & Durfee, 2004; Greenberg et al., 1989; McComas & Shanahan, 1999).

The discrepancy between the consensus on anthropogenic climate change found in the scientific community and the contention frame composed by the media can also be attributed partly to the two social institutions' starkly different approaches to knowledge production. Scientific works are critiqued, assessed, and negotiated before publication through peer review, a process that does not necessarily remove disagreements but does offer protections to "mitigate against untested, out-of-context and inaccurate entries into the ongoing and unfolding scientific discourse" (Boykoff, 2007b, p. 484). No matter how strong scientific evidence is to support a particular conclusion, uncertainty is always an essential component of hypothesis testing; scientists are trained to look at phenomena in terms of probabilities and use rhetoric that conveys a level of uncertainty (Jones, 2006). Journalists, however, have a different set of criteria called "news values" to approach knowledge. As Miller and Riechert (2000) noted, nearly all introductory news reporting textbooks teach news values such as consequences, timeliness, proximity, prominence, and human interest. In sharp contrast to scientists' way to mitigate conflicts and move toward convergence with conventionally agreed degrees of uncertainty, the news media often attempt to propel conflicts by translating uncertainty along with revolving debates that sometimes come outside of peer-reviewed research into a cacophony of equally weighted voices (DiPeso, 2006).

Public Perceptions of Climate Change and Media Effects

Opinion polls have consistently shown that the U.S. public is fully aware of the issue but with limited concern. Only a third of the Americans predicted global warming would pose a serious threat in their lifetimes, and public concern of the issue gave way to other more “immediate” environmental problems such as water and air pollution (Gallup, 2006). Although public knowledge of the issue increased significantly over the years, the public’s worry did not grow proportionally but rather remained stable from 1989 through 2008 (Gallup, 2006, 2007b, 2008b). Political partisanship was the most significant predictor for climate change perceptions. Democrats were much more likely than Republicans to endorse anthropogenic climate change, and the gap was widening in recent years with a noticeable drop in the number of Republicans who believed in human contribution to the problem (Gallup, 2006, 2008a; Pew Research Center, 2008).

Both extreme weather and political discourse may entail public interest in climate change. In the U.S., public concern peaked in hot dry summers (Ungar, 1992) and during President Bush’s rejection to the Kyoto Protocol (Krosnick, Holbrook, & Visser, 2000). For another example, two things happened in 1988, making it a milestone in the development of public concern for global warming in the United State. A severe drought and heat-wave coincided with James Hansen’s historic testimony before Congress. The news media and environmental groups dramatized and linked these events, and public concern surged (Colglazier, 1991). A strikingly similar pattern appeared between 2005 and 2006, when a series of Gulf Coast hurricanes was followed by the film "An Inconvenient Truth"; the number of Americans who worried greatly about climate change reached historic high (41%) in late 2006 (Gallup, 2008b).

Research has transcended opinion polls by measuring the public concern on both national and international scales and identifying its determinants. The global perception of climate change somewhat resembled what had been found in the U.S: there was considerable perceived threat, but the issue lacked salience compared with other environmental and social issues. The tendency partly explained the international respondents' strong unwillingness to cope with the problem by changing personal life style, and perhaps political inaction as well (Bord, Fisher, & O'Connor, 1998).

Leiserowitz (2005) drew a picture of the public perceptions with finer detail. While concurring with Bord, Fisher and O'Connor (1998) regarding the lack of perceived salience in the U.S., he found that most Americans tended to believe the impact of climate change was remote and personally irrelevant: only 1 % of the respondents in a national survey thought that the issue affected their local communities, but 50% believed that it affected people all over the world. Also, the study dealt with "affective images" by asking "What is the first thought or image that comes to your mind when you think of global warming?" Associations to melting glacier and polar ice were the largest category of responses (21%), followed by heat, nature, ozone, alarmists, climate change, and floods/sea level rise, all of which indicated that "most Americans lack vivid, concrete and personally relevant affective images of climate change" (p. 1438). In one of Leiserowitz's earlier studies (Leiserowitz, 2003), he demographically portrayed two extreme interpretive communities—the "naysayer" and the "alarmist"—in the following ways. Naysayers were predominantly white, male, Republican, politically conservative, holding pro-individualism, pro-hierarchy, and anti-egalitarian worldviews, anti-environmental attitudes, distrustful of most institutions, highly religious, and to rely on radio as their main sources of news. They were also significantly

more likely to vote, have strong representation in national government, and have powerful allies in the private sector. Alarmists, in contrast, held pro-egalitarian and anti-individualist and hierarchist worldviews, were politically liberal, strongly supported government policies to mitigate climate change, and were significantly more likely to have taken personal action to reduce greenhouse gases emissions (Leiserowitz, 2003). The rest of the population had its stance relatively closer to the alarmist than to the naysayer, but Leiserowitz (2005) worried that its misunderstanding of climate change (i.e. confusing ozone depletion with climate change, regarding the impact confined to distant areas and the non-human nature) might have foretold an unpromising future.

It is conventional wisdom environmental issues are limited primarily to people in the wealthy and highly industrialized countries, whereas residents of the poorer and underdeveloped countries are more concerned about physical survival and living standards (Beckerman, 1975). Dunlap and Mertig's (1995) study contradicts this assumption. Data indicating public concern of environmental issues in 24 nations were retrieved from a Gallup international survey. By correlating the data with the per capita GNPs (Gross National Product) of the countries, the researchers found that overall national affluence was more often negatively rather than positively related to citizen concern of environmental issues. Two reasons were offered to explain this counterintuitive finding. In those underdeveloped countries, environmental issues were not perceived as a luxurious social concern but as a basic threat to human survival, "moving from a 'higher order' value to a 'lower order' need in Maslowian terms" (p. 135). Serious environmental degradation created an urgency that gave rise to grass-root environmentalism in much of the Third World; the movement in turn contributed back to perpetuating broad-based concern in these countries (Dunlap & Mertig,

1995).

Does Dunlap and Mertig's (1995) study also infer another paradoxical relationship that people in affluent countries with better education systems in fact know less about climate change? Empirical data failed to find this relationship, but international surveys in 2001 found that the U.S. public's lack of knowledge on climate change fell into the middle of 15 countries surveyed, tied with Brazil, and slightly lower than Cuba. Japan, the founding country of the Kyoto Protocol, and France, whose new media persistently endorsed the idea of anthropogenic climate change, were among the lowest in understanding the issue scientifically. Surprisingly, Mexicans took the lead (Brechin, 2003).

The public knowledge deficiency in the U.S. seems to imply that the public does not worry much about climate change because it does not know enough about it. A handful of media effect studies, however, have suggested otherwise. Concerned with the contention frame heavily present in the U.S. news media, Corbett and Durfee (2004) conducted an experiment on 209 undergraduate students. The subjects were required to read a news story about a scientific discovery about thickening Antarctic ice sheets, which presumably introduced uncertainty in climate change. Four treatments (a. controversy, b. context, c. controversy context, and d. control) were used. "Controversy" was operationalized by the inclusion of a paragraph that presented scientists who disagree with the journal article findings; "context" was operationalized by the inclusion of a paragraph that put the journal articles findings in a background of much earlier research that had found Antarctic ice to be thinning. The "controversy and context" treatment included both paragraphs. Results showed that when controlling for prior perception of climate change, the "context" frame entailed the highest perceived certainty of climate change among the subjects, whereas control group

showed the lowest. The researchers concluded that providing a broad context to a standalone science news story is crucial to understanding complex nature phenomena in quest for scientific knowledge (Corbett & Durfee, 2004). Even when the context introduced contradicting views, a holistic picture of the research avenue allowed readers to weigh the scientific evidence and assess the uncertainty in an informed manner. The simple inclusion of disagreement in opinion and the mere description of the discovery increased perceived uncertainty and confusion. Considering the disconnection of textual analyses and opinion polls that portrayed certain facets of the social construction of climate change, Corbett and Durfee's (2004) provided empirical evidence that bridged the gap between the enduring conflict frame in the news media and the relatively indifferent American public.

So if the conflict frame does raise perceived uncertainty of climate change and the pervasiveness of the frame has been consistently identified, then it can be hypothesized that the more one reads about climate change in the media, the less he or she will be worried about it. A recent study (Kellstedt, Zahran, & Vedlitz, 2008) supports this hypothesis, challenging a widely accepted assumption that the public does not care enough the climate change because it does not know enough about it. By using a random national survey, the research found that informedness—the degree to which individuals learn about climate change from the media—was negatively correlated with risk perception and responsibility. In other words, more informed subjects showed less personal responsibility and less concern for the issue, a finding confirmed by Kahlor (2007), who discovered that perceived information insufficiency on climate change increases anxiety. Contrary to the researchers' (Kellstedt et al., 2008) expectation, respondents who had higher confidence in scientists felt far less responsible and less concerned than did those with lower confidence. To explain this

intriguing result, it takes a retrospective look at Wilkin's (1993) discussion on what he called the "American innocence," which refers to an American cultural value that technology and its inventors (scientists) are optimistically viewed as being able to fix many problems. Moreover, Kellstedt, Zahran, and Vedlitz (2008) considered informedness' negative correlation with responsibility and concern parallel to similar findings on public perceptions of genetically modified foods (Durant & Legge, 2005) and embryo research (Evans & Durant, 1995). This comparison, however, ignored some key differences of these issues including issue immediacy and characteristics of media coverage. Self-reported informedness does not take into account the nature of the messages that inform the audience; "informed" alarmists and "informed" skeptics would presumably show distant degrees of worry and responsibility, especially when news stories framed in the ubiquitous conflict frame allow both groups to feel adequately "informed."

A gestalt picture of socially constructed climate change has emerged from this review. Suppose that our inquiries start from public perceptions of climate change. Some studies portrayed the perceptions, either nationally or internationally, and wondered why the public of the U.S., one of the most technologically advanced and well educated countries in the world, showed much confusion about the issue and did not worry about on climate change as strongly as did those in other, even some underdeveloped countries (Bord et al., 1998; Brechin, 2003; Dunlap & Mertig, 1995; Leiserowitz, 2005). Scholars have followed the question and attempted to identify factors influencing the public perceptions in the U.S. The most paradoxical finding is probably that increasing media consumption was found to be associated with decreases in the worry about and responsibility for the issue, provided that demographic and attitudinal variables are controlled for (Kahlor, 2007; Kellstedt et al., 2008).

The conclusion is especially intriguing when a scientific consensus on anthropogenic climate change has been identified, although a relatively small number of skeptics keep questioning the existence of such a consensus (Boykoff, 2006; Grundmann, 2006; McCright & Dunlap, 2000; Oreskes, 2004; Wilson, 2000). If, as Corbett and Durfee (2004) have found, framing climate change news stories as scientifically uncertain increases perceived uncertainty, we may safely infer that media representation of climate science is so laden with such a frame that the more audiences use the news media, the more likely they will become agnostic and indifferent about it. Unsurprisingly, this frame had been consistently identified in the U.S. news media by both scholarly and non-scholarly examinations (Antilla, 2005; Boykoff, 2006; Boykoff & Boykoff, 2004; Dispensa & Brulle, 2003; House of Representatives, 2007a; Jones, 2006; Trumbo, 1996; Trumbo & Shanahan, 2000), until 2005 when the media coverage began to shift from contention to the scientific consensus and mitigation measures (Boykoff, 2007a).

Therefore, findings of the aforementioned content analyses hold prominent explanatory power, although media framing is not the single most powerful determinant of public perceptions. Rather, it works in conjunction with a wide range of factors, such as political partisanship (Gallup, 2008a, 2009; Leiserowitz, 2003, 2005) and cultural values (Boykoff, 2007a; Brossard et al., 2004; Kellstedt et al., 2008; Wilkins, 1993) in the full spectrum of the social construction of climate change, from the crecive nature of climate change (Beamish, 2002) and the struggle for mainstream narrative power sought by various interests (Gelbspan, 2005; Jones, 2006; McChesney, 2004; Rampton & Sauber, 2002), to news production (Abbasi, 2006; Bell, 1994; Wilson, 2000) and public reception (Bord et al., 1998; Brechin, 2003; Gallup, 2008b; Leiserowitz, 2005). It must be noted that researchers

have to be especially careful with the cultural limitations of their findings, not only because of the various cultural differences already found in the mounting body of literature, but also due to the fact that how climate change has been socially constructed in rising political and economic powers, including China and India, is still an enchanting mystery to western intellectuals (Kellstedt et al., 2008).

The next chapter will journey a virtual land rarely explored by research concerning the social construction of climate change—the blogosphere—and contrast it with traditional news media in terms of both information production and audiencing mechanisms. The chapter will also explicate the dynamics between bloggers and professional journalists and later escalate the discussion to various theoretical challenges that blogging has posed to journalism norms.

CHAPTER 4

BLOGGING IN THE CHANGING CLIMATE OF THE NEWS MEDIA

The rise of blogging has been a dominating phenomenon in the cyberspace during the past few years. Blogs' swift proliferation gives us little time to observe, interpret, and understand their multi-dimensional social impacts as reading blogs becomes our daily routine, even though researchers from various disciplines—computer science, social science, linguistic, education, and especially mass communication—strived to keep up with the heartbeat of the movement. Journalists are among the few who reacted quickly and strongly to blogging with fairly polarized attitudes: some loved it, embraced it, and started writing blogs of their own, while others accused bloggers of having no commitment to accuracy, credibility, and professionalism. Communication scholars, on the other hand, have been trying to help better understand the feud and the marriage between blogging and journalism by conducting empirical research to examine critical issues such as blog and mainstream media's agenda similarity and their use of sources (Tremayne, 2007b). This chapter, through a thorough review of available research on blogging, tries to break the path to conceptually comprehend blogging by inquiring into the very essence of journalism as a social institution and more importantly, how the phenomenon of blogging reveals contemporary journalism's covert drift from its origin. Later in this chapter, we also review the development of blogging in China and its implications to the public discourse on Chinese environmental issues.

Blogging's Role Transmutation: From Experiment, to Challenge, to Homogenization

In spite of the fancy technology terms regarding blogging, such as Really Simple Syndication (RSS), Atom, Extensible Markup Language (XML), trackback, and blogroll, the simplicity of blogs is remarkably straightforward. Blogs, in essence, are no more than online

diaries that cover a wide variety of topics including thoughts, reflections, and events in the writer's life (Eastment, 2005). As a journalist, Palser (2002) defined blogs as “online journals consisting of brief entries displayed in chronological order on a page,” and “they are usually written in a conversational voice and usually peppered with links and references to other sites” (p. 58). Similar to personal homepages and online forums, which had existed long before blogs emerged, blogs are considered a personal publishing tool widely available to Internet users. They, however, carry certain distinctive attributes that other online media do not possess. Bloggers often discussed issues as a community, rather than as individuals. It is common to see a number of blogs carrying out a conversation, each referencing other blogs posts, either supporting or rebutting others’ viewpoints. Marlow (2004) looked at blogs from a social network perspective and argued that blogs are “a massively decentralized conversation where millions of authors write for their own audience; the conversation arises as bloggers read each other and are influenced by each others’ thoughts” (p. 3). Herring et al. (2005) combined blogs’ descriptive and collective characteristics and defined blogs as web-based journals in which posts are displayed in reverse chronological sequence and recent addition to the repertoire of computer-mediated communication technologies through which people can socialize online.

Before year 2000 there were only several dozens of blogs (Jensen, 2003), owned by a group of innovators who were merely experimenting with this new tool of self-publishing. The community was so small then that one could read through all the blogs on the Internet in a short period of time (Blood, 2003). Since 2001, several major events helped bring this little-known corner of cyberspace to public attention, and blogs began to show surprising influence on politics and pose unprecedented challenges to mass media as an alternative

information source. First, the September 11 attack in 2001 turned a great number of New Yorkers to bloggers to cover the attack live, tell personal stories from numerous personal perspectives, and report its ripple effects on a daily basis (USA Today, 2002), something well beyond what any journalists could achieve. Second, also in 2002, U.S. Senate Majority Leader Trent Lott made a comment at a party honoring U.S. Senator Strom Thurmond, praising Senator Thurmond by suggesting that the United States would have been better off had Thurmond been elected president. Not a single professional journalist at the party picked up the remark as an implicit approval of racial segregation, but bloggers did. They ran the story persistently until several days later mainstream media reported it, which consequently forced Lott to resign as majority leader. Third, blogs' function as a watchdog to the mainstream media is probably best exemplified by the "Rather Gate" scandal, in which Dan Rather and his news crew during campaign 2004 used forgery documents to deface George W. Bush's early military records. It was some conservative bloggers who first raised questions about the documents; two of the most influential political blogs on the Internet, Drudgereport.com and Powerlineblog.com soon publicized the suspicion and forced CBS to self-debunk the story. It is ironical that as the two blogs also kept their readers updated on their endeavor to search for experts on 1970s typewriters, CBS looked to the blogs to find their own experts (Eberhart, 2005).

Technological advances have also entailed low barriers to entry. The proliferation and free availability of users-friendly content management programs have allowed even novice web users to post and manage information in their own personal cyberspace with minimal cost (Barlow, 2007; Bedell, 2000). The diversity such programs ranges from those offered by large software companies, such as blogger.com by Google and MSN Space by Microsoft, to

those affiliated with the open source movement, such as Wordpress and Nucleus.

Blogs' challenges to the mainstream media stem from their dual roles as both a competitor and a critic. While they provide alternative information to the masses and those who want to get around mainstream media messages, they also function as a watchdog on the media, criticizing, questioning, and sometime depreciating them. Rushkoff (1996) quoted a widely acknowledged manifesto, particularly by early bloggers, from the "Immediast Underground." The manifesto posits that blogs are supposed to be an arena where the grassroots have their own voices, enjoying a cacophony which nowhere else can be heard, whereas the mass media are owned by people higher in the social hierarchy where a few voices attempt to dominate lower social strata. The quotation from Greg Ruggiero's "Immediast Underground" reads:

Media are a corporate possession...You cannot participate in the media. Bringing that into the foreground is the first step. The second step is to define the difference between public and audience. An audience is passive; a public is participatory. We need a definition of media that is public in its orientation. (as cited in Rushkoff 1996, p. 206)

Blogs' challenges to mainstream media also reside in the fact that blogs' news production procedure is in sharp contrast to traditional journalism. While mainstream media news reporting is confined by a centralized, top-down approach, bloggers, as a community, often use a decentralized, bottom-up approach to turn conventional passive reporting into active reporting, each more or less contributing to the story and finally make it surface at the top of the blogosphere (Gillmor, 2004; Rothenberg, 2003). Some scholars, according to this unique news production mechanism, argued that blogs have great potential to become a radically different medium from mainstream media, covering much wider spectrums of

sources, topics, and competing ideas, which readers can not only read, but compare and contrast as well (Bruns, 2003; D. Matheson, 2004; Sunstein, 2007). Matheson (2003) attributed blogs' capability of encompassing the topical and ideological diversity to the use of hyperlinks, a tool often used by bloggers to link with and comment on other Internet content.

The heavy reliance on hyperlinks points to a model of knowledge in which the truth of what is happening in the world cannot be channeled exclusively through one news test. Instead, the blog can be thought of as claiming a more contingent authority in its use of multiple hyperlinks. (p. 457)

Contrarily, some other scholars claim that the highly anticipated journalistic revolution, unfortunately, has been reversed and therefore will not take place. They argue that in fact, the entire blogosphere is being normalized and homogenized by the mainstream media, and thus increasingly resembles conventional news reporting (Haas, 2005; Singer, 2005). Interestingly, despite the on-going debate regarding the relationship between journalism and blogging, the convergence between the two happens quietly in a multitude of dimensions.

First, the blogosphere has been "invaded" by flocks of professional journalists during recent years, even though some purist journalists still remain doubtful to the blog-journalism integration. It is not surprising nowadays that most mainstream media have placed blogs written and maintained by the affiliated journalists in spotlight; CNN, for example, has put up "360° Blog" written by correspondent Anderson Cooper to cross-promote his television program; MSNBC.com, has adopted a more aggressive, if not radical, approach and made blog a news section where many of its columnists and commentators as well as several celebrity bloggers update their blogs on a daily or even hourly basis. Moreover, news

organizations have been exploring the synergy of traditional news reporting in the form of blogs by creating a whole new type of online news sites wherein many established journalists are paid to post their blogs (Jesdanun, 2005).

Second, due partly to this trend, empirical studies showed that many blogs were increasingly relying on the mass media. (Delwiche, 2003; Halavais, 2002a; Reynolds, 2005). Wall (2006) investigated blogs about the second Iraq War and found that their primary sources of information, both in terms of news reporting and commentary, were major U.S. and U.K. mainstream news organizations, including CNN, the BBC, and the New York Times. She concluded that the reliance on the mainstream media “raises the question of whether the blogs are supplying significantly different perspectives than mainstream media” (p. 13). Other scholars echoed his concern by positing that blogging may depend upon the re-mediation of mainstream media content (Redden, 2003; Redden, Caldwell, & Nguyen, 2003). After analyzing twenty political blogs written by journalists, Singer (2005) contended that although expressions of opinions are common, most journalists were seeking to remain gatekeepers even in this highly interactive and participatory format. Political journalist bloggers used links extensively—but mostly to other mainstream media sites. The journalists were “normalizing” blogs as a component, and in some ways an enhancement, of traditional journalistic norms and practices. To synthesize these findings, Singer (2005) finally characterized blogs as an “online echo chamber of mass-mediated political views” (p. 196)

Third, scholars examined the news production of conventional journalism and blogging and found similarities. Having reviewed earlier research on blog news production, Haas (2005) summarized that many blogs implemented gatekeeping procedures that highly resembled traditional news reporting. Downing (2002) observed that many blogs hosted at

Indymedia.com, an influential global network of over a hundred blogs, underwent strict editorial scrutiny before being posted. Others also found the headquarter of Indymedia has been exerting a standard newsroom operation (M. Fisher, 2000) and is becoming “professionalized, with greater reliance on de facto staff reporters and more stringent editing” (Meikle, 2003, p. 6). Similar, editorial practices were found at Slashdot.com, another leading blog news site (Bruns, 2003).

In sum, the development of blogs seemed to feature a transformation from an experiment, to a challenge, to the object of homogenization. The role of blogs has shifted from challenge and surveillance to a derivative, if not parasitic, relationship to the mainstream media. Is the homogenization, however, the home stretch of our inquiry into the blog myth? Or is it a fresh start of a possible revolutionary reconceptualization of journalism as a social institution? Or does it lead to a theoretical retrospect and confession that we can make about today’s journalism?

Why Blogs vs. Mainstream Media Still Matter

Before proceeding to the next level of theoretical debate, several fallacies in current blog research must be pointed out. Scholars tended to either investigate a particular type of blog and generalize the findings to the entire blogosphere, or consider the blogosphere as a whole without distinguishing grassroots blogs from those written by professional journalists. Both lead to one consequence—a distorted image of the blogosphere.

Haas’ (2005) paper, for instance, concluded that “distinct similarities have emerged between the mainstream news media system as a whole and the blogosphere, and between the journalistic norms and practices of mainstream news organization and individual blogs” (p. 387). Although he did well in presenting relevant literature, his line of reasoning for

generalization can be challenged in two respects. First, his conclusion is primarily based on two categories of empirical studies: one focusing on blogs written and maintained by professional journalists, columnists, or former journalists, the other hinging on warblogs—blogs about the Iraq War. It is reasonable to believe that journalists who write blogs as an extension of their journalistic practice consistently carry on traditional journalism norms, such as referring to the AP or other major news outlet for credible stories, or following the agenda set by mainstream media. Therefore, Singer’s (2005) finding, which suggested the mass media’s overwhelming influence on journalists’ blogs, makes good sense with the logic and thus may surprise few. Warblogs are probably a better example of why journalists’ blogs conformed to the mainstream media. War news has always relied on military and government news releases, meaning both the mainstream media and bloggers had to resort to the same sources to get information. Even if there were unofficial new sources on the Internet, bloggers’ “gatekeeping” function might be confined by the norm of building credibility by using the most reliable sources available when covering such an important and sensitive issue. Although Haas (2005) admitted that there was little empirical research on non-journalist blogs, it may very likely be erroneous to generalize the findings from the two specific kinds of blogs to the entire blogosphere. The fallacy is also manifest in the use of “double standards”—Haas resorted to two unique types of blogs to counterargue the notion that grassroots blogs and “amateur journalism,” which constitute a significant arena in the blogosphere, have the potentials of presenting ideologically diverse ideas.

The fallacy also stems from the failure to acknowledge the full spectrum of blogs “ranging from the least to the most institutionalized in terms of their relationship to the established media” (Domingo & Heinonen, 2008, p. 3). An example is the resurrection of

civic journalism, a fast growing force in the blogosphere. Due partly to the low technological barriers of blogging, numerous people are blogging online, covering a topical spectrum as vastly as the universe of human interest. A great deal of such blogging, for example, contributes to civic affairs reporting and political commentary (Fanselow, 2008; Rutigliano, 2007).

Other than ignoring important parts of the blogosphere, the term “echo chamber” suggests mindless imitation and a lack of independence, both of which inaccurately portray the dynamics and diversity of the blogosphere. Even though many bloggers tended to heavily use links from the mass media (Halavais, 2002b; Walejko & Ksiazek, 2008), non-journalist bloggers also like to link to themselves and other bloggers (Xie, 2007). Furthermore, when a news story featured in a mainstream media website was linked by a non-journalist blog, the blogger often used it as a “straw man” and commented on the media coverage negatively (Xie, 2007). Additionally, if “echo chamber” implies synchronization between the topic agendas of the media and bloggers, then a more immediate attack would come from the striking dissimilarity between the two agendas found by the Pew Research Center. Based on two major blog search engines (Technorati and Icerocket) and over 100 million blogs, the Pew Research Center created the New Media Index, “a weekly report that captures the leading commentary of blogs and social media sites focused on news and compares those subjects to that of the mainstream press” (Pew Research Center, 2009a). By contrasting the index to the traditional media agenda, Pew Research often found the two so different that a overlapping topic would make the headline of its report (Pew Research Center, 2009b).

While the traditional news media are jumping into the blogosphere and the diversity of blogs is expanding continuously, it is increasingly difficult for researchers to define the term

“blogosphere.” There is an emerging consensus that blogging, in a broad sense, is not journalism (Tremayne, 2007a), despite the fact that most politically interested blogger readers considered the blogs they frequented comparable to and even more credible than the news media (Johnson & Kaye, 2004, 2009; Johnson, Kaye, Bichard, & Wong, 2008). Of the 260 blogs that Papacharissi (2007) examined, only five were devoted to discussion of news, and other 15% linked to news items occasionally. Rather than a social institution parallel to the news media, the blogosphere has become the entire public discourse in microcosm, or what Sunstein (2007) vividly described as “a gigantic town meeting” (p. 139). Researchers, therefore, need to define carefully the target of their examinations and take extra caution when the term “blogosphere” is associated with research findings. Other propensities of blogs soundly distinguish themselves from the mainstream media: personal blogs are in general accumulative, nomadic, and sporadic, whereas the media are organized, concentrated, and periodic. Even if individual blogs contain a small number of politically related posts, collectively these posts can create a sizable debate (Farrell & Drezner, 2008).

Rosen (2005) believed that convergence is a better word to describe the future of blogging and journalism than contention and homogenization, calling the fabrication of the journalists vs. bloggers tension false and reductive. Removing the pretentious debate, Rosen (2005) said, allowed us to make rationale comparisons between the two. Often times, bloggers and journalists’ work complement rather than compete with each other (Blood, 2003). Blogs excel at producing raw materials and ideas whereas the new media specialize in reducing information in structured forms (Rosen, 2005). Lowrey (2006) further argued that because of its occupational and social constraints, journalism tends to neglect some types of news information, including partisan expression, “old stories,” stories driven by non-elite

sources, and highly specialized content. These types of information have in turn been poached by bloggers.

Theoretical Challenges

The rise of blogs initially made many journalists uncomfortable, not only because blogs sometimes act as a competitor to traditional media, but due to the fact that they have posed theoretical attacks on journalism as a social institution and reflected a number of problems of today's journalism. The challenges will be enumerated as follows.

First, conventional journalism has been characterized by its gatekeeping function for quality, credible, and objective news stories. Gatekeeping often comprises an array of editorial decisions at both organizational and individual levels, constituting a reconstruction of social reality (Shoemaker, Eichholz, Kim, & Wrigley, 2001). While recognizing gatekeeping as a device to prevent possible personal bias from appearing in news stories, Schramm (1949) expressed alarming concerns regarding the backfire effect that gatekeeping might have on journalistic practice; that is the longer the gatekeeping chain, the more likely the message transmitted does not resemble the message that started. In most news organizations nowadays, the gatekeeping chain tends to be quite lengthy. As news items pass from gate to gate, the various influences may distort news stories into something far from where they started.

Grassroots bloggers enjoy greater freedom of editorial autonomy than professional journalists do. Organizational scrutiny and censorship are minimum; multiple editing is not necessary; publishing is even more self-controlled, compared with web forums where moderators are usually present to censor unwanted messages. As opposed to traditional news reporting as a window to a number of people's perceptions of reality, blogging is often a

window of one person's perceptions of reality. Is this window more transparent than the one that conventional journalism provides? Bloggers do not seem to care about answering the question. Instead, some of them believe that the eradication of multiple editing itself is a revolution and therefore serves as the very nature of blogging. Some extremists even consider unprofessional and sloppy writing one of the virtues of blogging. According to Regan (2003), one established blogger once said "As rhetoric, I think it's important that a blog is written badly. It's daily. You have a sense that it's closer to the person's authentic self. By reading a first draft, you tend to be 'forgiven' by the readers for the mistakes you make." Journalists such as Regan himself strongly oppose the notion, arguing that typographical errors may be forgiven for the first couple of times, but repeated writing mistakes will undermine the writer's credibility in the long run. The one step gatekeeping celebrated by bloggers has unquestionably started to influence traditional news practice. Falcone (2003) from New York Times reported that as more professional journalists are joining the blog army, the debate of whether multiple organizational editing ruins the very nature of a blog bubbled to the surface. He observed that the focus of gatekeeping has shifted from the organizational level to the individual level. Reporters are now heavily relying on their professional experience to minimize editing because they believe that the best blog entries are fresh, spontaneous and instant and that they can be achieved without jeopardizing journalistic standards.

The second theoretical challenge has to do with why some journalists are still resisting blogs as an alternative form of reporting. They firmly believe that the essence of blogging is a significant departure from one of the most celebrated merits of journalism—objectivity.

Objectivity for decades remains unchallenged as the most importance principle of

journalistic practice. Generations of scholars from Durkheim and Weber, to Tuchman and Gans, seemed fascinated by the concept and put substantial endeavor to explore and explicate its theoretical implications. Gans (1980) wrote “journalists try hard to be objective, but neither they nor anyone can in the end proceed without values. Furthermore, reality judgments are never altogether divorced from values” (p. 39). These statements implicitly reveal the ultimate dilemma that the press has been struggling with for decades: it attempts to be neutral yet investigative, disengaged yet participatory. It can be argued that the media’s decades of worship and practice of objectivity has given rise to several problems.

Objectivity can be an excellent excuse for lazy reporting. Numerous deadlines and the obsession with objectivity make news reporting a mere matter of presenting “both sides of the story.” Reporters are satisfied by the “he said, she said” type of reporting without working toward a deeper understanding of what is not being said and why so. They tend to push the all the burdens on the reader, who usually has the least access to the information, to decide who is right and who is wrong. The obsession also exacerbates the tendency to rely on official sources to get “both sides of the story.” Moreover, objectivity cultivates reporters’ hesitance to raise issues against the current administration, for the “political bias” label can be readily attached. The media’s collective failure to report critically the justification of the Iraq War is the most recent and probably the best illustrated symptom of the problem.

When talking about news stories on air wreck survivors, Barlow (2007) showed a good example how journalistic objectivity sometimes slipped to ridicule:

All claims to the contrary, this is not news "for the reader" at all, for it provides the reader nothing useful, nothing for participation in the substantive discussion of the day. It plays only to the same voyeuristic impulse that also makes us slow down and look at

auto wrecks. We may claim we're happy to see survivors, but it's the bloody wreck that fascinates us. (p. 120)

The popularity of blogs seems to be an attack precisely to this weakness. Johnson and Kaye (2004) surveyed some 3000 blog readers and found that the overall credibility of blogs was higher than television network news, not because blogs appear more credible and accurate than television news, but because they are much more in-depth. As political commentary rather than factual reporting dominating the blogosphere, most political bloggers possess a trait that many journalists lack—passion—that prioritizes in-depth understanding of political affair over objectivity. Journalists' belief in detachment disconnects themselves from the stories and also separates the story from the audience in certain sense. Lasica (2003) argued that blogs threatened to expose journalism to one of its weakest points—its lack of personal contact with readers in the sense that journalists are remotely disconnected from the communities they are supposed to serve. To respond to this legitimate challenge, many journalist bloggers have started to use the first person and insert personal analysis sometimes emotionally charged, practices that some may consider blatantly against objectivity..

A further inquiry into why objectivity has been highly appreciated and routinely honored as the most important journalistic norm will elicit a more fundamental challenge that blogging has proposed. For decades, U. S. journalism has been working under the underwritten contract of “social responsibility,” one of the four theories of the press that Siebert, Peterson, and Schramm (Siebert, Peterson, & Schramm, 1963) developed. They argued that the goal of the social responsibility system is that media as a whole are pluralized and independent from the government but take certain social responsibilities, indicating a

reflection of the diversity of society as well as access to various points of views. The press commits its responsibilities only by presenting a marketplace of ideas as diverse as possible to the public and therefore helps solidifying the foundation of democracy.

This theoretical ideal seems especially challenged by the news consumption changes that have been facilitated by blogs. The challenge comes from the following two aspects: (1) political blogs are becoming increasingly polarized in terms of conservatism and liberalism ideologies (Adamic & Glance, 2005) and (2) the RSS (Real Simple Syndication) technology has made customizing the subscription to blogs never easier. Instead of logging onto different news sites for news updates, the RSS technology now pushes news updates to readers in one news aggregator. It is reasonable to be concerned that selective exposure may help confine readers' information exposure to certain views that are in line with their preexisting mindset while intentionally missing opposite ideas. In other words, even though blogs have overall widened the ideological spectrum and made the diversity the marketplace of ideas to the extent that conventional journalism could never accomplish, will the audience, with completely autonomous maneuver and customizability of information exposure, be willing to expose themselves to such a spectrum? Will they be better off and better informed if blogs do not exist? Will the marriage between journalism and blogging make this profound threat to democracy less threatening by hoping that professional journalists will bring virtues of journalistic conventions to the blogosphere? While the conflicts and convergence between journalism keep both practitioners and scholars concerned, excited, and inspired, these theoretical questions that touch the deepest nerve of democracy are still waiting to be answered.

Blogging in China:

A Comparative Overview of the Chinese Blogosphere

Much literature on the Chinese blogosphere adopted a comparative perspective regarding media-government relation in China. This relation has been generally understood in the context of extensive media monitoring and control from the government. Contrary to the expectation of many Western scholars, the proliferation of the Chinese media industry has failed to deliver more democratic public discourse in the media (House of Representatives, 2003). In fact, there has been widely shared observation in recent years that media control has been tightened under the Hu Jintao administration (Zhao, 2008). Although the media censorship is often arbitrary, the degree of media control imposed on a particular mass medium is generally in proportion to the magnitude of its social influence. Television, for example, receives the most expansive censorship because of its highest penetration in the Chinese population compared with other media. In addition to stringent control over news broadcast production, television dramas are subject to preproduction approval and postproduction censorship so as to align themselves with the “main melody” promoted by the government (Zhao, 2008). “Politically incorrect” voices, however, have been taking advantage of the technological and structural complexity of the Internet by playing a “cat and mouse” game with the censorship machine. Therefore, the Internet, with its exponential growth, has become a new battleground between state control and iconoclastic expressions.

China has embraced blogging with open arms with the number of bloggers growing at “a furious rate” (Yuann & Inch, 2008, p. 186). With the Internet user population reaching 298 million as of the end of 2008, China now has more than 162 million bloggers (Chinese

Internet Network Information Center, 2009), more than half of the U.S. population. Different from many quickly diminished Internet activities, blogging seems to be anything but a fad. Not only does the Chinese blogosphere keep growing, but the bloggers are becoming increasingly committed to this new means of personal publishing. Compared with 2007, 11% more bloggers reported that they updated their blogs routinely in 2008 (Chinese Internet Network Information Center, 2009). Meanwhile, the blogger population has been supported by burgeoning free blog hosting services (Chinese Internet Network Information Center, 2008b). A myriad of web portals and community-based websites has been providing such a value-add service since 2002 (Chinese Internet Network Information Center, 2009).

A typical American blogger is likely to be internet-savvy, well-educated, and older than the age of 30 (Rainie, 2005; Technorati, 2008), and the demographics of Chinese bloggers share some similarities. A Chinese blogger tends to be in college, internet-savvy, and self-expressive (Chinese Internet Network Information Center, 2008a, 2009). However, blogging tends to be more of a generational phenomenon in China (Jin, 2007) because the penetration of blogging in Internet users under 30 is much higher in China (92.6%) than in the U.S. (48%).

The evolution of both spheres contrasts with their native cultures in interesting ways. In the U.S., blogging picked up enormous public momentum during moments such as the September 11 2001 terrorism attack (USA Today, 2002) and the Indian Ocean Tsunami in 2004 (Schwartz, 2004) because such breaking news gave bloggers opportunity to showcase the unparalleled instantaneity and immediacy of blogging. The American culture being highly individualistic, one of the initial and significant uses of blogs in was paradoxically to create collective memories. Conversely, collectivism being a primary characteristic of the Chinese

culture, the rise of the Chinese blogosphere stemmed from intellectual elitism and radical self-expression. In 2002, a group of Chinese intellectuals, including Fang Xingdong and Sun Jianhua, began to write and publish extensively on the popularity of blogging in the U.S. while characterizing blogs as a challenge to the traditional news media. Meanwhile, Fang and others gave the English word “blog” a Chinese name “Bo Ke,” meaning “erudite person.” Although their endeavors marked the formal introduction of blogging to China, many Chinese did not know the word until a blog written by a female writer named Mu Zimei gained considerable attention in Chinese online communities and even in international news media (Yardley, 2003). The blog, which had as many as 160,000 visits per month in 2003, was a personal diary of Mu known for its obscene depictions of her personal life. A heated debate followed regarding how far bloggers can push the envelope of “ethically” expressing themselves. The question remains unanswered, but the word “blog” penetrated the public sphere and was associated with much freedom in self-disclosure. Unsurprisingly, socially marginalized groups, such as homosexuals, are voicing their feelings much more publicly through blogging (Yowei & Yang, 2009).

The absence of a political root differentiates the Chinese blogosphere from its U.S. counterpart. While American bloggers have been playing an indispensable role in political commentary and activism (Adamic & Glance, 2005; Reynolds, 2005; Sweetser, Golan, & Wanta, 2008; Williams, Trammell, Postelnicu, Landreville, & Martin, 2005), most Chinese bloggers see blogging as a way of documenting their personal lives and entertaining others. The entertainment role is attested by CNNIC’s (Chinese Internet Network Information Center, 2008b) finding that a predominate portion of blog readers (43%) looks for entertainment, far more than 24% for education/self-improvement and 21% for “psychic

resonance.” Only about 10% of the readers seek coverage on social issues and a better understanding of news.

A blogosphere is comprised of numerous hyperlinks that bloggers placed voluntarily to interconnect with each other as members of a community. A topic becomes popular by being propagated through numerous blogs and their hyperlinks, and such a topic originates from either prominent A-list blogs or non-prominent ones (Herring et al., 2005). This connectivity is what structurally distinguished the blogosphere from the mainstream media, though hyperlinked conversational blog entries have clear political boundaries (Adamic & Glance, 2005). As opposed to the connectivity in the American blogosphere confirmed by many empirical studies (Adamic & Glance, 2005; Gibson, 2003; Herring et al., 2005; Marlow, 2004; Moor & Efimova, 2004; Stanyer, 2006), most Chinese bloggers do not consider themselves as members of a community. According to the CNNIC (Chinese Internet Network Information Center, 2008b), only 20% of the surveyed bloggers claim that they joined some sort of blogging community. Most of these members (63%) based their decisions on whether other members are their offline acquaintance, while one out of four (26%) sees the entry purely interest-based. Hyperlinking is largely restricted to placing friends’ blog addresses in blogrolls (Chinese Internet Network Information Center, 2008b), and in-text linking is limited compared with other cultures (He, Caroli, & Mandl, 2007). Therefore, it is unclear if *Guanxi*, a core Chinese culture value emphasizing the importance of personal relationship, will transcend offline acquaintance in the blogosphere, making unfulfilled Jin’s (2007, p. 97) prediction that blogging will propel social involvement by connecting the “scattered citizens” from different walks of life.

Public perceptions of blogs’ credibility are one of the first inquiries that scholars

proposed to understand the social impacts of blogging. Despite blogs' perceived low credibility by the general U.S. audiences (Banning & Trammell, 2006), they are considered moderately credible for politically interested Internet users, but as more credible than any mainstream media and online sources (Johnson & Kaye, 2004, 2009; Johnson et al., 2008). Chinese Internet users perceived blogs as far less credible than mainstream news and read blogs primarily for knowing what friends were doing and about celebrity gossip rather than serious news consumption (Chinese Internet Network Information Center, 2008b; Jin, 2007).

Luqui (2006), a professional journalist and a blogger, did not believe that blogs would be at a constant disadvantage. Instead, she saw a promising future of blogging in China because some journalists had already begun to write blogs as a supplement to their professional work. People craved these posts, Luqui said, because they are bored with cold-faced hard news in the official media.

The convergence of journalism and blogging still has a long way to go in China. In fact, the less than credible reputation of blogs may have to do with the portrayals for blogs in Chinese mainstream media. To explore the relationship between the mainstream media and blogs, Zhang (2007) examined how four major Chinese print newspapers covered blogs in recent years. While overall the newspapers tended to have a neutral attitude towards blogs, blogs were often mentioned as sources of entertainment information, especially in two of the largest metro newspapers in China. Party newspapers, on the other hand, had more negative portrayals of blogs, often characterizing them as problematic and unrepresentative of public voices. People's Daily, the most prominent party newspapers based in Beijing, gave the most coverage to blogs during the sampled time period but covered blogs in the most negative terms compared with the other three (J. Zhang, 2007).

The relation between party affiliation and newspapers' portrayals of blogs allows us to glimpse how Chinese political elites think about blogs and perhaps the Internet overall. There had been much anticipation in Western countries that the great potentials of personal publishing accompanied by the burgeoning blogosphere would free the voices of Chinese political dissidents and therefore accelerate the course of democratization in China (Kristof, 2005; G. Yang, 2003a). This pluralistic view, nonetheless, proved to be too optimistic. In fact, the Chinese government has been fully aware of the "risk" and had moderate success in making the "risk" manageable by implementing the most extensive, technologically sophisticated, and broad-reaching systems of Internet filtering in the world (OpenNet Initiative, 2007). To exert censorship on a decentralized system of information, the government, accordingly, has adopted a decentralized regulatory approach—outsourcing censorship from private sectors and giving censorship authority to local governments (Zhao, 2008). Much censorship in the blogosphere depends on blog hosting companies' self-regulation, either by technical keyword filtering or human moderation (MacKinnon, 2009). Violations will result in a wide range of punishments including written warnings, temporary or permanent shutdown of the website, and cancelling the company's business license, methods that resemble the system for controlling professional news media. Internet content has been under increasingly stringent censorship since 2002 when Hu Jinyao, Chairman of the Community Party, and Wen Jiabao, Premier of the State Council came into power. Dozens of political bloggers who posted "politically sensitive" information were arrested and detained (Woan, 2008), including Shi Tao, whose identification information was turned in to the government by Yahoo!. These prosecutions were so successful that many feared that aggressively promoting the democratic role of blogging would backfire, leading to more

ensorship and even less freedom of expression. After MSN deleted political dissident Zhao Jing's account, blogger Chui Yung wrote that MSN actually did the right thing by "sacrificing" Zhao so that millions of other Chinese bloggers could continue to use MSN (MacKinnon, 2007). A monitored platform to express limited ideas, after all, is better than none.

It is, however, inaccurate to characterize the government's media control as complete repression. The Chinese government has been trying to maintain a delicate balance between ruling out political and ideological heresies and allowing user-generated content to relieve public grief that may otherwise turn into street protests. MacKinnon (2007) elaborated the latter use of the Internet often ignored by critics of the government.

Forums, chatrooms and blogs also serve as a "safety valve" by allowing enough room for a sufficiently wide range of subjects that people can let off steam about government corruption or incompetence, thus giving people more things to do with their frustrations before considering taking their gripes to the streets. (p. 33)

MacKinnon (2009) systematically tested the extensiveness of media control in the Chinese blogosphere. It was found that the extent of censorship by each Blogging Service Provider (BSP) varied drastically, which precisely reflected the decentralized regulatory paradigm but at the same time cast doubts on its effectiveness. The censoring machine, functioning strikingly similar to the rebel-hunting robots portrayed in the movie *Matrix*, has blind spots that allow politically sensitive information to survive in the blogosphere and empower individuals to influence the overall balance of freedom and control in the Chinese blogosphere.

What Would Environmental Issues Look Like in the Chinese Blogosphere?

It is not surprising that little has been done to explicate the role of environmentalists in the Chinese blogosphere because, as Yao (2008) observed, environmental activists in China have been poorly-documented and gained disproportionately little academic attention compared with their U.S. counterparts. However, scattered news pieces have suggested the presence of such a group in the blogosphere (Hon, 2007), and an examination of the Chinese environmental movement and its social contexts may provide the cue to sketching the contour of this group.

China has been plagued by a diversity of environmental problems, including water and air pollution, sand storms, greenhouse-gases emissions, and forest deterioration, due largely to its rapid economic growth (G. Yang, 2004). These issues are sometimes life-threatening and have turned the environmental protection imperative to survival (Inglehart, 1997). China's greenhouse-gas (GHG) emissions are trailing slightly behind the U.S. and will become the highest in the world as earlier as 2009 (Pew Center on Global Climate Change, 2007). The Chinese central government has shown a strong commitment to mitigating the environmental impacts of the nation's industrialization by (1) developing a "comprehensive corpus of environmental policies and laws," (2) increasing "environmental capacity through the steady buildup of environmental technologies, and (3) cultivating a "relatively positive stance toward emerging green activism" (Ho, 2006, p. 24). These endeavors, however, seem to be only the first footsteps of a long odyssey. For example, even though emission intensity (emissions per unit of GDP) has been significantly reduced and overall emissions decelerated through aggressive energy efficiency policies, about 65% of China's energy consumption still relies on coal (Pew Center on Global Climate Change, 2007). Reversing the emission growth would require "a fundamental transformation of energy systems" that involves new

energy sources and technologies (Pew Center on Global Climate Change, 2009, p. 6).

While forging domestic laws and policies that purport to bolster sustainable economic development, China, at the same time, has been criticized for not being cooperative enough in the past multilateral international negotiations to fight climate change (Kobayashi, 2003). Many developed countries have attempted to encourage China to assume equal responsibility, but the Chinese leadership has been remarkably alert to eco-colonialism and therefore still tries to avoid any concrete responsibility that may slow down the country's economic expansion (Kobayashi, 2003; Yu, 2008). Yu (2008) summarized several principles of how the government has diplomatically responded those international quests, as follows.

China's environmental diplomacy has sought to further several goals: protect Chinese sovereignty, acquire foreign aid and technical assistance, promote China's economic development, and promote its role as a responsible great power and leader of the developing world. China has used its dual status as a developing country (with rights to and needs for development) and its growing role as a major contributor to global environmental problems (such as GHG emissions) to acquire substantial influence in international environmental negotiation. (p. 55)

Rather than deciphering the stance of political elites on climate change, several studies adopted a bottom-up perspective and examined environmentalism as a social movement propelled by a wider range of political agents (Stalley & Yang, 2006; B. Yang, 2008; G. Yang, 2003b, 2005). University students have been at the frontier of grass-root environmental organizations with a thriving number of student environmental associations (SEAs) since 1990, even though little experience and insufficient funding often challenged the daily operation of these groups (Lu, 2003). These organizations served as the prototype of

many Chinese nongovernmental organizations (NGOs) that later became important players in environmental activism. Grass-root environmental NGOs first appeared in 1994 and flourished since then. As of April 2008, there were 508 such organizations in mainland China, not to mention that the total number of government and non-government affiliated environment groups reached 3539 (All-China Environment Federation, 2008).

The growth of the grass-root environmental NGOs took place concurrently with the successful penetration of the Internet in China. Scholars, however, are divided about the roles the Internet has played and will play in Chinese environmental activism. Guobin Yang (2003b) believed that the Internet would turn to be a critical platform for two environmentalism actors—NGOs and unaffiliated volunteer environmentalists—both lacking official status and office spaces. The internet, he articulated, may (1) enable voluntary environmental activity with minimal financial resources and in a restrictive political climate, (2) be used for organizing both on- and off-line activities, and (3) provide environmental groups with social presence and publicity (p. 91). In retrospect, Boxu Yang (2008) critically looked at a decade of development of Chinese NGOs and concluded with a relatively pessimistic view. While agreeing with the great potentials of the Internet in facilitating the NGOs work, he contended that these promises have not been delivered. As opposed to the high expectations, Chinese NGOs have become “increasingly bureaucratic and elitists” and “refused to take advantage of the opportunities that the Internet provides” (p. 41). This observation is supported by earlier scholarly work. Of a particular concern is the tendency that more NGOs are abandoning their advocate role and working with the government to accomplish their own initiatives, one of which is often profitability (Wexler, Ying, & Young, 2006; Zhou, 2006). Meanwhile, the organizational culture and leadership style of the NGOs

have begun to bear increasing resemblance to those of the Chinese government (B. Yang, 2008). This mutation has to do with the various barriers that the government put forth for NGOs, such as restrictive registration and scarce financial support, but the NGOs themselves should also be held accountable due largely to a lack of volunteerism that conventionally distinguishes NGOs from other organizations (NGO Research Center at Tsinghua University, 2008).

The internal transformation of the NGOs has led to (1) their divergence from cyberspatial grassroots and (2) their failure to mobilize citizens for civil engagement. Criticisms toward, and concerns about, Chinese environmental NGOs and their inaction to a handful of environmental problems could be easily found in many blogs and online forums where commentaries were posted by Internet users in a spontaneous and nomadic manner. These concerned users, “politically engaged and responsive to the ideal of civil society”, seemed to have lost confidence not only in government authorities but also in Chinese NGOs (Yang, 2008, p. 39). They, instead, opted for a “Do-It-Yourself” approach by casting their voices online in a sporadic and intentionally disorganized fashion (Yang, 2008) against the backdrop of extensive cyber censorship.

All these dim views of the environmental NGOs have raised two important questions. First, since, as William Fisher (1997) wrote, NGOs have a history of playing key roles in many social movements globally, is there an environmental movement in China? Second, if the NGOs have become less representative of grass-root environmental activism, what do grass-root Chinese environmentalists look like? Stalley and Yang (2006) tackled the first question by surveying university students, a group that has been acting as both a large base of environmental activism (Lu, 2003) and the most active blogging camp (Chinese Internet

Network Information Center, 2008b), about their environmental beliefs. Their study (Stalley & Yang, 2006) aimed to understand why, unlike the contentious nature of many environmental movements in other societies, China's environmental activities rarely involved conflicts and challenges. It was found that college students in Beijing, though fully acknowledging the importance of environmental issues, tended to perceive economic growth as a higher priority, hold optimistic views of China's ecosystems, and maintained low awareness of environmental NGOs. There also seemed to be a general trust in the government to handle environmental problems, which may be attributed largely to both the government's media control and its solid resolution to protect environment. The researchers, therefore, saw little likelihood that environmentalism among students would transform into an independent grassroots movement or become a source of pressure for political change. However, as the authors conceded, the regional sample had limited generalizability, and the results did not preclude the possibility that college students could still be a critical force of environmental activism, but perhaps in a way different from what Western scholar defined as "social movement" (Stalley & Yang, 2006).

If universities are not likely to cultivate aggressive environmentalism, then what makes an environmentalist in China? Using a national survey, Yao (2008) found that a number of traits of Chinese environmentalists indirectly suggested their use of a new communication conduit to disseminate environmental messages in ways that might not necessarily agree with the government. Chinese environmentalists were found to be much more postmaterialistic than average Chinese; in other words, they tended to value non-material needs such as self-expression, freedom of speech, and spiritual pursuit. The postmaterialist values suggest some important demographic characters of these

environmentalists: they are likely to be young, westernized, and computer-savvy. They are also politically interested and have significantly less confidence in the government; their ambivalent attitude towards the news media was attested by their considerable news consumption and less trust in the media (Yao, 2008). These characteristics are both striking and unsurprising, in the sense that they coincide with the image of grass-root political bloggers but at the same time reflect the progressively more heterogeneous Chinese society.

Overall, environmentalism in China is full of contradictions. The government is committed to environmental protection but gives economic interests higher priorities. Diplomatically, environmental issues have been directly associated with national image and have been used to obtain international aid. For instance, while acknowledging the second largest GHG emissions in the world, the central government also portrays China as a victim of global warming who, like other developing countries, needs much financial and technological help from the international community (Zhang, 2003). Two unfulfilled promises run through the development grass-root environmental activism in recent years. First, the rise of environmental NGOs neither helped advocates project their voices to the public sphere in an organized way, nor did the groups effectively take their surveillance duty, mainly because of the organizations' increasing affiliation with, and growing resemblance to, the government (NGO Research Center at Tsinghua University, 2008; Wexler et al., 2006; G. Yang, 2005; Zhou, 2006). Second, the Internet has not presented itself as a powerful technological propellant for environmental movement in China, despite sporadic criticisms from concerned environmentalists dressed in virtual avatars (B. Yang, 2008). It is, however, evident that grass-root Chinese environmentalists, mostly young, self-expressive, internet savvy, and politically interested, are not subscribers of governmental stance. Instead, they are

relatively more critical to the government and to the mass media than the average Chinese person (Yao, 2008). To make social commentary on climate change even more intriguing, online discussions regarding climate change do not come solely from environmentalists. Individual bloggers sometimes act as cultural critics to discuss environmental issues in sporadic ways (Yang, 2008). To circumvent Internet censorship, Chinese Internet users have resorted to highly contextual and indirect rhetoric to express socially shared frustrations (Wacker, 2003; Wines, 2009). Similarly, online environmentalists are likely to exercise their advocacy and criticize established social institutions, if necessary, in implicit ways, thus falling into MacKinnon's (2007) view that blogging and other forms of user-generated content lacked conspicuous short-term political impact but would be "a catalyst for long term political change" (p. 31).

The lack of research on climate change in the Chinese blogosphere and the contradictory nature of environmentalism in China make it difficult to hypothesize how Chinese bloggers have covered the topic. However, we would expect differences between the Chinese news media and the blogosphere regarding the framing of the issue. Different from the polarization in the American blogosphere typically divided by manifest political partisanship, polarization may exist in the Chinese blogosphere, but in a latent anti-establishment sense. Because the topic of climate change does not appear to be as politically sensitive as those A-list political taboos, such as human rights issues and the Tibet controversy, bloggers may have enjoyed more leeway to participate in the debate. The deviation of Chinese blogs from the news media as well as its magnitude, if any, will be systematically measured in this study.

Chapter 5 will enumerate the research questions and hypotheses of this study. To

avoid using ad hoc frames that offer little to the systemic understanding of media messages, the chapter will draw clear connections between the research inquiries and traditions in both frame analysis and the research of media portrayals of climate change.

CHAPTER 5

RESEARCH QUESTIONS AND HYPOTHESES

The research questions and hypotheses of this study stem from six avenues in news framing research and the social construction of climate change: (1) skepticism towards climate change, (2) episodic vs. thematic (E v. T) framing, (3) micro-issue salience, (4) audience-based frames, (5) attribution of responsibility, and (6) E v. T and responsibility frames interaction. The rest of this chapter elaborates on how the research questions and hypotheses derive from these six interrelated dimensions. Table 1 details the research design by enumerating the research questions and hypotheses, the corresponding independent and dependent variables, and the associated statistical procedures.

Skepticism

As discussed in Chapter 3, a handful of studies attempted to probe the degree of skepticism towards climate change in the American and international press. However, the skepticism in the blogosphere has never been systematically documented and studied in a culturally comparative perspective. To track the variances of skepticism in both the news media and blogosphere in the U.S. and China, we ask:

RQ1: To what extent does the skepticism towards climate change vary by media outlet and country?

In addition, this study tries to capture the longitudinal fluctuation of the skepticism. To avoid the elusiveness of interpreting a three-way analysis of variance, RQ2 and RQ3 deal with different media outlets in the U.S. and China respectively.

RQ2: To what extent does the skepticism vary by media outlet and year in the U.S.?

RQ3: To what degree does the skepticism vary by media outlet and year in China?

Episodic vs. Thematic Frames

Iyengar's (1991) conceptualization of episodic and thematic framing, according to Chaffee (1992), "nicely framed a presumptive case for further research" (p. 241). It is probably one of the most cited and applied typologies in media frame analyses, not only because of its almost universal applicability, but also due to its observed cognitive effects (Gross & Brewer, 2002; Iyengar, 1991). An episodic frame, compared with a thematic one, is more personal, immediate, decontextualized, and requires less cognitive work to understand (Iyengar, 1991). The preponderance of episodic framing in the U.S. media, especially in television news, has been consistently identified (Iyengar, 1991; Jones, 2006), but under the criticism that the practice might simplify "complex issues to the level of anecdotal evidence" and "encourage reasoning by resemblance" (Iyengar, 1991, pp. 136-137). However, from available literature, we cannot find much indication of whether this practice is also present in different media outlets and in different cultural settings, considering that blogs are supposed to be more personal and that the Chinese culture is highly contextualized. Therefore, we ask:

RQ4: To what degree does the use of episodic vs. thematic framing vary by outlet and country?

Jones (2006) found that all the international presses under investigation (China was not examined in the study) used less episodic framing in climate change coverage than did the U.S. press. Accordingly, we hypothesize:

H1: The U.S. news media are more likely to frame stories episodically than are the Chinese news media.

Micro-Issue Salience

Entman's (1993) contribution to framing theory largely resides in his use of

progressive stages of social issues as a frame capturing device. He said “to frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and treatment recommendation” (Entman, 1993, p. 52). The “definition—cause—morality--remedy” dichotomy provides empirical researchers with an analytic framework to measure micro-issue selection and salience. In the case of climate change coverage, the selection and salience of the four stages show the cues through which the media try to either guide or reflect the public discourse on climate change. For example, extensive coverage of possible causes of climate change, regardless of their anthropogenic or natural origins, assumes the rising global temperature, thus suggesting the end of the debate over whether humans are having climate change. By the same token, a good number of stories on mitigation approaches reflect an implied consensus on both the existence of a problem and a defined range of causes. Therefore, the salience of these micro-issues may affect how recipients of the news come to understand social issues (Price et al., 1997) in a progressive sense. RQ5 examines the micro-issue salience across media and cultures.

RQ5: To what extent are the variances in the use of micro-issue salience (definition, cause, morality, and remedy) explained by outlet and country?

Chapter 4 reviewed China’s diplomatic strategies revolving international cooperation to fight climate change. It was found that the Chinese leadership has long been using its commitment to environmental protection to promote the sovereignty’s international image (Ho, 2006; Kobayashi, 2003; Yu, 2008). To know if the Chinese news media have helped to propagate this agenda, we need to take a closer look at the “remedy” frame in Entman’s (1993) analytical paradigm by differentiating between “domestic mitigation,” “foreign

mitigation,” and “international mitigation.” “Domestic mitigation” refers mitigation accomplishments in the media’s native country; “foreign mitigation” refers to those in specific foreign countries; “international mitigation” means those achieved by international cooperation. Then we hypothesize the following:

H2: The Chinese news media will cover more on domestic mitigation than foreign mitigation.

Audience-Based Frames

A major criticism of frame analyses is their fragmented frame typologies as well as their disconnection with audience cognition. A number of frame studies responded to this criticism by addressing certain frames’ consequence for the public’s interpretation of social events (Cappella & Jamieson, 1997; Iyengar, 1991; Neuman et al., 1992; Norris, 1995; Schnell & Callaghan, 2005). Adapted from some of these works, Semetko and Valkenburg’s (2000) frame categorization includes conflict, human interest, economic consequences, morality, and responsibility.

As Semetko and Valkenburg (2000) themselves pointed out, the deductive approach to frame analysis requires researchers to examine cautiously the applicability of their analytical framework. “This approach” the authors said, “makes it necessary to have a clear idea of the kinds of frames likely to be in the news, because the frames that are not defined a priori may be overlooked” (p. 94-95). Hence, another frame—non-human interest—becomes a new member of the frame family for deconstructing climate change coverage. The rationale is quite straightforward. A news story depicting the retreating glacier at the North Pole as well as the hardship that polar bears are facing falls into none of the frames specified by Semetko and Valkenburg (2000), even though human interest may be remotely implied. Like the other

members of the family, the non-human interest frame carries particular significance to the public's understanding of climate change, because the perceived consequences of climate change were found to be confined to distant and non-human nature, which may have contributed to political inaction and the issue's lower priority in public agenda (Leiserowitz, 2005). The next research question warrants an omnibus observation on these frames' cross-media and cross-cultural variances:

RQ6: To what extent does the use of audience-based frames (conflict, human interest, non-human interest; economic, morality, and responsibility) vary by outlet and country?

The following research questions and hypotheses tap into the longitudinal fluctuations of two particular types of frames—consequence frame and responsibility frame. Note that the consequence frame is an umbrella term for human interest, non-human interest, and economic consequence frames. The focus on consequence and responsibility frames is justified by two trends revealed by recent literature. On the one hand, the U.S. news media have shifted their skeptic tone by giving more credence to the scientific consensus on climate change since 2004 (Boykoff, 2007a). On the other hand, the number of Americans who believed that climate change is exaggerated by the media increased by one third (31% to 41%) between 2006 and 2009 (Gallup, 2009). Such a belief may have to do with (1) dramatized portrayals of the various possible consequences of climate change, and (2) judgments that burden individuals, organizations, or governments with overwhelming responsibilities to combat climate change. The following two research questions look in retrospect into how the U.S. and Chinese news media and bloggers stressed the consequence and responsibility aspects of climate change over time.

RQ7: To what degree do the uses of consequence and responsibility frames vary by

outlet and year (2005-2008) in the U.S.?

RQ8: To what degree do the uses of consequence and responsibility frames vary by outlet and year (2005-2008) in China?

To know whether the increasingly popular perception of exaggerated effects of climate change is the public's response to an amplified portrayal of climate change in the U.S. news media, we hypothesize:

H3a: The prevalence of consequence frames increased from 2005 through 2008 in the U.S. news media.

H3b: The prevalence of responsibility frames increased from 2005 through 2008 in the U.S. news media.

Attribution of Responsibility

An array of sociological works has demonstrated that individuals tend to simplify complex issues "by reducing them to questions of responsibility, and their opinion on issues flow from their answers to these questions" (Iyengar, 1991, p. 8). Although Iyengar (1989, 1990, 1991) explored in depth the relationship between episodic vs. thematic frames and audiences' attribution of responsibility, his work did not pay much attention to how the news media explicitly or implicitly assigned responsibilities to various parties so as to provide interpretive clues to the audience. The absence of a more immediate framing effects research design explains in part why the episodic frame's effects on the audience were the often weak and always topic dependent.

This study draws upon Semetko and Valkenburg's (2000) analysis of responsibility in media messages and focuses on the attribution of "treatment responsibility" to parties including individuals, government, scientists, not-for-profit organizations (NPOs), and

industry. The following research questions compare the attribution of responsibility across media outlets on a cross-cultural and longitudinal basis.

RQ9: To what extent does attribution of responsibility vary by outlet and country?

RQ10: To what extent does attribution of responsibility vary by year and outlet in the U.S.?

RQ11: To what extent does attribution of responsibility vary by year and outlet in China?

E v. T and Responsibility Frames Interactions

The last inquires that this frame analysis tries to answer deal with the relation between E v. T framing and responsibility framing. Correlating the use of E v. T framing and the media's attribution of responsibility carries considerable theoretical significance, because the analysis is in fact reveals possible "frame interactions"—a new research agenda that no other frame analysis explored before. Of a particular concern is that quantitative researchers sometimes treat frames as static entities insulated from meta-narratives, such as cultural values, and other sociological factors, such as time (Hertog & McLeod, 2001). For example, research has found that frames change with the transformation of cultural idiosyncrasies (Parameswaran, 2002) and even in 24 hours (Li, 2007). Reese (2007) correctly pointed out that frames are essentially structures rather than lists of categories and therefore the relations among layered frame classifications need to be examined. Accordingly, we argue that frames interact with each other within texts to form an organism that induces orientations for interpretation. In other words, the exploration of "frame interactions" tells about the ways frame typologies at different semantic and conceptual levels work with one another and constitute the rhetorical structure and framing patterns in media messages. The analysis

shows, for example, when the news media use one of its most powerful framing devices—the episodic frame—to attribute vividly treatment responsibilities to certain social groups. At the same time, it also examines how specific groups’ accountability is discussed in thematic terms, which, according to Iyengar (1991) are in-depth, interpretive, and “more susceptible to charges of journalistic bias” (p. 14).

The “episodicity” of a news story is associated with varying degrees of persuasiveness, especially when responsibility attributions are involved. Instead of using thematic description of the warming temperature in China, MSNBC (2006) ran a story about the quickly melting glacier on the Qinghai-Tibet plateau and linked the phenomenon to instances of sandstorms and droughts. The article indicated several times the critical role that the Beijing government needed to play in fighting the problem. Since the U.S. media have long been relating the Chinese government to the alleged deteriorating natural and cultural environments in Tibet, it is evident that the attribution of responsibility works at its persuasive peak when climate change is framed episodically in the Tibet context.

The last two research questions concern with the frame interactions between E v. T framing and attribution of responsibility in the U.S. and Chinese news media respectively. The questions explore how the variances in the use of episodic vs. thematic frame are explained by the variances in attribution of responsibility in the two countries’ news media.

RQ12: To what extent is the use of episodic vs. thematic frame related to attribution of responsibility in the U.S. news media?

RQ13: To what extent is the use of episodic vs. thematic frame related to attribution of responsibility in the Chinese news media?

Table 3. *Research Questions and Hypotheses, Corresponding Variables, and Statistical Tests*

	RQ&H	Variables		Stats
		IV(s)	DV(s)	
Skepticism	RQ1: To what extent does the skepticism towards climate change vary by media outlet and country?	Country Outlet	Skepticism	Two-way ANOVA
	RQ2: To what extent does the skepticism vary by media outlet and year in the U.S.?	Year Outlet	Skepticism	Two-way ANOVA
	RQ3: To what degree does the skepticism vary by media outlet and year in China?	Year Outlet	Skepticism	Two-way ANOVA
Episodic vs. Thematic (E v. T)	RQ4: To what extent does the use of episodic vs. thematic framing vary by outlet and country?	Country; Outlet	E v. T	Two-way ANOVA
	H1: The U.S. news media are more likely to frame stories episodically than are the Chinese news media.	Country	E v. T	Independent t-test
Micro-Issue Salience	RQ5: To what extent are the variances in the use of micro-issue salience (definition, cause, morality, and remedy) explained by outlet and country?	Country; Outlet	Definition; Cause; Morality; Remedy	Logistic Regression
	H2: The Chinese news media cover more on domestic accomplishments to mitigate climate change than developing solution.	Outlet	Mitigation Phase	Chi-square
Audience- based Frames	RQ6: To what extent does the use of audience-based frames (conflict, human interest, non-human interest; economic, morality, and responsibility) vary by outlet and country?	Country; Outlet	Conflict; Human interest; Non-human interest; Economic; Morality; Responsibility	Two-way MANOVA
	RQ7: To what degree do the uses of consequence and responsibility frames vary by outlet and year (2005-2008) in the U.S.?	Year; Outlet	Consequence frames	Two-way ANOVA
	RQ8: To what extent do the uses of consequence and responsibility frames vary by outlet and year (2005-2008) in China?	Year; Outlet	Consequence frames	Two-way ANOVA
	H3a: The prevalence of consequence frames increased from 2005 through 2008 in the U.S. news media.	Year	Consequence frames	Trend analysis
	H3b: The prevalence of responsibility frames increased from 2005 through 2008 in the U.S. news media.	Year	Responsibility frame	Trend analysis

Table 3 (Continued)

	RQ&H	Variables		Stats
		IV(s)	DV(s)	
Attribution of Responsibility	RQ9: To what extent does attribution of responsibility vary by outlet and country?	Country; Outlet	Individual; Government; Organization; Industry; Scientist; Human	Two-way MANOVA
	RQ10: To what extent does attribution of responsibility vary by year and outlet in the U.S.?	Year; Outlet	Individual; Government; Organization; Industry; Scientist; Human	Two-way MANOVA
	RQ11: To what extent does attribution of responsibility vary by year and outlet in China?	Year; Outlet	Individual; Government; Organization; Industry; Scientist; Human	Two-way MANOVA
E v. T & Responsibility Relation	RQ12: To what extent is the use of episodic vs. thematic frame explained by attribution of responsibility in the U.S. news media?	Individual; Government; Organization; Industry; Scientist	E v. T	Standard multiple regression
	RQ13: To what extent is the use of episodic vs. thematic frame explained by attribution of responsibility in the Chinese news media?	Individual; Government; Organization; Industry; Scientist	E v. T	Standard multiple regression

The focus of the next chapter will now turn to the methodological execution of this study. It will detail the operationalization of key variables, sampling procedures, and the pilot study, and explain how reliabilities and validities are established through a rigorous research design.

CHAPTER 6

METHOD

This study employs a quantitative content analysis of news articles and blog posts about climate change in prestige newspapers and grass-root blogs in the United State and China from 2005 through 2008. This chapter will articulate the definitions and measures of key variables, sampling techniques, statistical procedures, factorial validity, semantic validity, instrument reliability, and preliminary intercoder reliability. Full details of the operational definitions of all the variables can be found in the coding protocol (Appendix A). The operationalization of frame variables follows a “co-existence assumption.” That is, rather than overlooking the sophisticated nature of framing rhetoric and structure and assigning one “primary frame” to each story, this study assumes the co-existence of multiple frames in a story and measures the degree of their individual visibility or prevalence.

Unit of Analysis

The unit of analysis of this study is individual news stories or blog posts. News stories include hard news, editorials, and opinion pieces that center on climate change. The inclusion is based on the rationale that blog posts, which have much less formulaic and editorial constraint than do newspaper articles, need to be compared with the full spectrum of traditional news pieces. However, blog posts that have fewer than 100 words will not be analyzed because they usually fail to carry serious discussion and therefore have little analytical value.

Definitions and Measures of Key Variables

Episodic vs. Thematic Frame

The episodic frame portrays stories “predominantly as concrete instance or events,”

whereas the thematic frame depicts issues “more generally either in terms of collective outcomes, public policy debates, or historical trends” (Iyengar, 1991, p. 18). Operationally, the variable is measured at the interval level, which distinguishes weak frames from strong frames, because as Iyengar (1991) pointed out, episodic and thematic frames were often used in a mixed form in news stories. It is, for example, common to have a thematic opening and an ending paragraph that “bracket” an episodically narrated story.

The number of words devoted to describing and discussing a concrete instance or events will be divided by the total number of words of the story. The percentage then goes into one of four categories (1) strongly thematic (0-25%), (2) moderately thematic (25%-50%), (3) moderately episodic (50%-75%), and (4) strongly episodic (75%-100%). The cutoff lines were determined based on Iyengar’s (1991) finding that a typical episodic story devoted “nearly 80%” of the story’s air time to episodic coverage (p. 19).

Micro-Issue Salience Variables

Micro-issue salience variables include Definition, Cause, Morality, and Remedy. The coder will answer “yes or no” to a question that identifies the presence of the frame. For example, the question “Does the story describe or discuss what climate change is or its consequence?” detects whether problem definition is present in the story.

The variable Mitigation Boundary further distinguishes mitigation means geographically: (1) mitigation that is accomplished, being executed, or being developed by the native country, (2) mitigation that is accomplished, being executed, or being developed by foreign countries, and (3) mitigation that is accomplished, being executed, or being developed but cannot be identified as domestic or foreign. H2, which hypothesizes that the Chinese news media covered more on domestic mitigation than foreign mitigation,

necessitates the measurement of this variable.

Audience-Based Frames

Several frame analyses have provided us with lists of audience-generated frames (Cappella & Jamieson, 1997; Iyengar, 1991; Neuman et al., 1992; Norris, 1995; Schnell & Callaghan, 2005). These frames are essentially mental drawers in which the audience files news. Because they are, to a large degree, cognitive and interpretive in nature, their measurement is of particular concern. In general, the more latent a variable is, the more multi-faceted it is, and consequently the more difficult its measurement becomes (Riffe et al., 2005; Tankard, 2001). To raise the question of how much subjectivity may be involved in coding latent variables, Tankard (2001) asked “Does one reader saying a story is using a conflict frame make that really the case?” (p. 98). There are a few quantitative methods to cope with the problem. An intercoder reliability check is necessary to assess the degree to which different coders give consistent estimates of the same phenomenon. However, when multiple coding items are developed to measure a multi-dimensional variable, such as the conflict frame, internal consistency reliability tests become necessary to measure the consistency of scores across conceptually grouped coding items. This study adapts the coding instrument stringently developed and tested by Semetko and Valkenburg (2000) to measure six audience-based frames: conflict, human interest, non-human interest, morality, economic consequences, and responsibility. Based on the factor analysis they ran to investigate whether the items cluster to reveal underlying dimensions, items with a factor loading higher than 0.6 are selected and adapted to fit the purpose of this study (see V12-V17 in Appendix A for detail).

The multi-item scales are designed to measure the prevalence (visibility) of the six

frames. Take the conflict frame as an example. Three yes/no questions measure the prevalence of the conflict frame. The prevalence score for the conflict frame is calculated by averaging the unweighted scores on the three individual items. Therefore, the prevalence scores of all six frame variables range from 0 (no frame prevalence) to 1.00 (strong frame prevalence). A binary coding strategy is used because it tends to yield higher intercoder reliability, despite its potential vulnerability to measurement error. Semetko and Valkenburg (2000) did not find measurement error to be a problem to the instrument's development because the binary coding still yielded a clear factor structure.

Attribution of Responsibility Variables

This study followed Semetko and Valkenburg (2000) and developed multi-items scales to measure the visibility of attribution of responsibility. Six types of attribution will be used—individual responsibility, government responsibility, industry responsibility, organization responsibility, and responsibility of humans in general—each has three items to measure compositely its prevalence (see V18-V23 in Appendix A for details).

The variable “Government mitigation boundary” looks deeper into government responsibility and distinguishes among responsibility attribution to (1) domestic government, (2) specific foreign governments, and (3) international governments. A Chinese news story criticizing Bush's refusal to sign the Kyoto Protocol is coded as the second category, whereas a call for more aggressive UN initiatives is coded as the last category.

Skepticism

Skepticism toward climate change is measured at the ordinal level: (1) little to no skepticism (2) skepticism as one side of a relatively balanced account, and (3) strong skepticism. Skepticism is defined as an attitude of doubt toward any of the following areas: a.

the existence of climate change, b. the anthropogenic nature of climate change, c. validity of the scientific research on climate change, d. individual, corporate, governmental or organizational interests to promote the seriousness of climate change.

Sampling Procedure

Sampling of Newspaper Articles

To draw a sample from the traditional news media, this study opts for three major newspapers in the U.S. (the New York Times, USA Today, and the Washington Post), and two major national newspapers in China (the People's Daily, and the China Daily). These newspapers are chosen because of their large circulations and considerable social influence in their native countries. The three U.S. newspapers are in the top tier in the Pew News Coverage Index, which tracks news agendas in the traditional media (Pew Research Center, 2009c). They have also been consistently used to analyze their coverage on climate change or other environmental issues (Boykoff & Boykoff, 2004; Jones, 2006; Trumbo, 1996; Wilkins, 1993). The People's Daily, with a daily circulation of more than 1,000,000 worldwide (People's Daily, 2008), is known as the official voice of the Central Committee of the Communist Party in China. The China Daily, with a daily circulation of more than 300,000 worldwide (ChinaDaily.com, 2007), is the largest English-language newspaper published in China that targets primarily English speakers.

Except for the People's Daily, all the other newspapers are systematically archived by LexisNexis, the most widely used news archive for content analysts (Deacon, 2007). The sampling begins with using two key phrases—"climate change" and "global warming"—to search for stories published from 2005 through 2008 on climate change in the four newspapers. The searches are stratified by year and publication in order to increase sampling

representativeness and minimize over- or underrepresentation of particular segments in the sample. For example, by using the advanced search options in LexisNexis, a search is performed to list all relevant stories published in USA Today in 2005, which yields 82 articles. A screening then determines that only 25 of them center on climate change. These articles are recorded and numbered in sequence. Sampling for USA Today's coverage in the following years follows a similar method. The same approach is used to record articles in the other newspapers. After all the articles on climate change are collected, systematic sampling is then executed by (1) evenly dividing the search results in each publication/year strata in N-story segments, depending on the number of recorded articles and a workable sample size, (2) randomly determining a number n from 1 to N , and (3) sampling every n th story. These steps are repeatedly done to sample stories of all the years and newspapers. The use of stratified and systematic sampling techniques integrates the beauty of both methods: stratified sampling's precision in proportion and systematic sampling's special capacity to deal with large sampling frames. Stories in the People's Daily come from the newspaper's online portal (www.people.com.cn), whose archive search functionality allows access to the new articles dating back to 2000. A similar sampling method is performed.

Sampling of Blog Posts

The dynamic nature of web content has posed considerable challenges to probability sampling (McMillan, 2000). Scholars have used the approach of sampling posts in defined groups of blogs to investigate discourse in the blogosphere. For example, Sweetser, Golan, and Wanta (2008) analyzed a handful of blog posts on the presidential candidates' official website in the 2004 campaign. Similarly, Adamic and Glance (2005) looked at prominent political blogs to examine the degree of political polarization in the blogosphere. However,

climate change is a topic that encompasses political, scientific, economic, and, to a large degree, humanistic dimensions. To understand how opinions are mobilized in the blogosphere, a single type of blogs will fail to answer the question. The challenge becomes especially concerning when environmental issues seem to be sporadically discussed in all sorts of blogs in China, even in personal diaries (B. Yang, 2008). Methodologically, the focus on topic-based A-list blogs necessitates the use of cluster sampling, which is prone to sampling bias due to interclass correlation (Riffe et al., 2005). As opposed to the top-down blog sampling technique reminiscent of sampling for traditional media messages, a bottom-up approach, therefore, is warranted for this study.

Despite methodological difficulties, a number of studies did blog sampling by using blog aggregators and search engines specialized in searching blogs (D. Li & Walejko, 2008). However, there are a few assumptions that must be agreed upon before using blog search engines as a sampling tool. First, if the term “blogosphere” refers to a comprehensive population of all the blogs available on the internet, probability sampling of blogosphere is practically impossible. This is primarily because a master list of all the blogs, if its existence is theoretically recognized, cannot be found even if the scope is narrowed to blogs within certain cultural barriers. Second, probability sampling techniques become feasible when the population is tailored carefully to fit the research purposes. For this study, we define our population as “all blog posts on climate change that are tracked, indexed, and made searchable by specialized blog search engines such as Google Blog Search.” Random sampling techniques then can be applied to the search results. Third, if limited types and numbers of blogs may be deemed representative of the entire blogosphere (Haas, 2005), then search results generated by blog search engines that track millions of blogs are evenly, if not

more, qualified to speak for the blogosphere. These assumptions are precisely why the Pew Internet Research has been using blog search engines like Technorati to create the New Media Index in order to map the dynamics of the blogosphere (Pew Research Center, 2009b). Even though Pew Research describes that the sample derived from this method is “illustrative but not strictly representative” of the blogosphere (Pew Research Center, 2009c), the method is indeed the best available way to approach the universe of blogs in entirety.

A comparable example was made by Weaver and Bimber (2008), who contrasted the topic-based news search capability of LexisNexis’s with that of Google News, another Google service that indexes online and traditional news. A satisfactory agreement (83%) was found, and Google News showed overall more depth in representing news stories covered by major news publications as well as more width in reaching the variety of non-major ones, notwithstanding its lack of a master list of all the publications it tracks. We would expect that Google Blog Search has similar properties in blog searches.

For this study, the question then becomes the selection between two major blog search engines—Google Blog Search and Technorati. Google Blog Search is chosen for several reasons. First, it offers advanced search options that allow for searches within a time frame, a feature missing in Technorati. Second, as opposed to Technorati’s inclusion of the traditional news media that appear in a blog form (BBC’s blogs, for example), Google Blog Search does not index those sources. Third, Google Blog Search excels at searching blogs archives, whereas Technorati focuses on “what’s new”—blog posts updated within hours and days.

A similar multistage sampling procedure involving stratified and systematic sampling will be performed to sample blog posts provided by Google Blog Search. However, the same systematic cycle will not be applied across the years because possible increases in the

number of stories on climate change are probably better explained by the exponential growth of blogs rather than blossoming interest in the topic of climate change among bloggers. Therefore, different cycles will be employed to focus on the efficiency and cost of sampling and coding.

Special considerations must be taken when sampling blogs in China. Even though Google Blog Search indexes Chinese blogs, its reach is considerably limited because most Chinese blogs do not “ping” blog indexing services (MacKinnon, 2009). This means Google has no way to track these blogs unless the bloggers submit their entries manually. Several major blog hosting services in China, such as Sohu, use proprietary technologies that prevent their blogs from being indexed. Therefore, this study resort to blog search engines provided by those services (Blog China, Bokee, Sohu, Sina, and MSN Space China) to search for the posts within their own territories, in order to supplement the search results generated by Google Blog Search. Only systematic sampling will be used because none of the search engines provides timeframe-based searches.

It is noteworthy that all the sampled posts will undergo further filtration, as will the sampled traditional news stories. A post must meet the following criteria to be in the final sample: (1) it must be sufficiently long to carry analytical meaning (more than 100 English words or Chinese characters), (2) a background check will be performed to ensure that the post was written by an American or Chinese blogger, and (3) it must have its own intellectual contribution, which means posts that simply forward stories from elsewhere will not be considered.

Reliability and Validity

A pilot study was done to test the frame identification coding instrument and

intercoder reliability. To prevent an overlap between the pilot coding and final coding, 102 stories including newspaper articles and blog posts from both countries were drawn, all of which constituted a separate sample from the final sample. A computer program dedicated to the coding of this study was developed to streamline the coding process and minimize input errors (Appendix C). After a bilingual (Chinese and English) coder coded the pilot sample, varimax-rotated Principal Component Analysis was run to test the internal structures of the audience-based frame items and the attribution of responsibility frame items. This test examines the factorial validity—a form of construct validity—of the coding instruments. Both instruments showed clear structures (Table 1 and 2) with all the factor loadings more than 0.7, indicating that the items grouped appropriately to map the constructs they purported to measure. Cronbach's Alpha was used to measure the internal consistency of the items that corresponded to the eleven frames (six audience-based frames and five responsibility frames). The Cronbach's Alphas scored from .82 to .96, showing high internal consistencies of the measures.

Then two other bilingual coders coded the 102 articles. Cohen's Kappa was used to calculate the intercoder reliability on all the coding items except country, year, and outlet. A satisfactory omnibus K of .81 was reached with individual Ks ranging from .74 to .96. After the calculation, the three coders discussed the disagreements and formed suggestions to improve the coding protocol. Some minor protocol adjustments were made to minimize wording ambiguity and enhance intercoder agreement.

The fact that both the audience-based frames and responsibility frames derive from framing effects research (Iyengar, 1991; Neuman et al., 1992; Price et al., 1997) establishes what Krippendorff (2004) called "semantic validity." This kind of validity accesses "the

degree to which the analytical categories of text correspond to the meanings these texts have for particular readers or the role they play within a chosen context” (p. 323). It is high when the “users of the texts ... serve as sources of validating evidence of the categories that a content analysis employs” (p. 323).

Table 2. *Varimax-Rotated Factor Analysis of the Audience-Based Frame Items*

	Factors					
	1	2	3	4	5	6
	Conflict	Human Interest	Non-Human Intrst	Morality	Economic	Respon-sibility
Framing Items						
Conflict-a	.866					
Conflict-b	.789					
Conflict-c	.825					
Human Interest-a		.862				
Human Interest-b		.826				
Human Interest-c		.861				
Human Interest-d		.805				
Non-Human Intrst-a			.942			
Non-Human Intrst-b			.842			
Non-Human Intrst-c			.925			
Morality-a				.932		
Morality-b				.865		
Morality-c				.807		
Economic-a					.942	
Economic-b					.826	
Economic-b					.927	
Responsibility-a						.866
Responsibility-b						.866
Responsibility-c						.757

Note: Factor loadings less than 0.1 are not shown.

Table 3. *Varimax-Rotated Factor Analysis of the Attribution of Responsibility Frame*

Items

Attribution of Responsibility Frame Items	Factors				
	1 Individual	2 Govern- ment	3 Industry	4 Organi- zation	5 Scientists
Individual-a	.926				
Individual-a	.941				
Individual-c	.825				
Government-a		.959			
Government-b		.965			
Government-c		.950			
Industry-a			.972		
Industry-b			.933		
Industry-c			.842		
Organization-a				.914	
Organization-b				.847	
Organization-c				.865	
Scientists-a					.963
Scientists-b					.963
Scientists-c					.793

Note: Factor loadings less than 0.1 are not shown.

Another round of reliability test was conducted during the final coding. One coder coded the entire sample (N = 638), and the other two coders coded a set of randomly selected articles (N = 128) that accounted for approximately 20% of the sample size. Again, Cohen's Kappa was used on all the measures except country, year, and outlet. A good omnibus K of .83 was reached with individual Ks ranging from .72 to .94.

CHAPTER 7

RESULTS

Similar to the research questions and hypotheses chapter, this chapter is organized by the following sections: (1) skepticism toward climate change, (2) episodic vs. thematic (E v. T) frames, (3) micro-issue salience, (4) audience-based frames, (5) attribution of responsibility, and (6) E v. T and attribution of responsibility interaction. An alpha level of 0.05 was adopted for all statistical procedures.

The sample for this study included a total of 638 articles—242 U.S. newspaper stories, 130 U.S. blogs posts, 202 Chinese newspaper stories, and 64 Chinese blog stories. Table 4 profiles the sample by country, outlet, and year. The smaller number of Chinese blog posts was due to the difficulty to find many covering climate change, even though a multitude of Chinese blog search engines were employed. Therefore, for Chinese blogs, a census was used.

Table 4. *Sample Profile by Country, Outlet, and Year*

		Newspapers (N = 242)	Blogs (N = 130)
U.S.	2005	12.8%	26.1%
	2006	21.1	25.4
	2007	33.9	23.1
	2008	32.2	25.4
	Total	100%	100%
		Newspapers (N = 202)	Blogs (N = 64)
China	2005	15.8%	10.9%
	2006	20.8	35.9
	2007	37.7	26.6
	2008	25.7	26.6
	Total	100%	100%

Note. Sample size N = 638.

Skepticism toward Climate Change (RQ1 – RQ3)

RQ1 asked about the degree to which the skepticism towards climate change varied by media outlet and country.

Skepticism was measured by a three-point scale that ranges from “little to no skepticism” (1) to “strong skepticism” (3). Table 5 shows the descriptive statistics of skepticism means varied by outlet, country, and year.

Table 5. *Mean Scores of Skepticism by Outlet, Country, and Year*

		Mean Scores of Skepticism	
		Newspapers (N = 242)	Blogs (N = 130)
U.S.	2005	1.65 (SD = .71)	1.53 (SD = .75)
	2006	1.29 (SD = .58)	1.73 (SD = .88)
	2007	1.27 (SD = .45)	2.07 (SD = .98)
	2008	1.14 (SD = .39)	2.30 (SD = .88)
	Total	1.28 (SD = .52)	1.90 (SD = .91)
		Newspaper (N = 202)	Blogs (N = 64)
China	2005	1.06 (SD = .25)	1.57 (SD = .98)
	2006	1.07 (SD = .26)	1.43 (SD = .73)
	2007	1.05 (SD = .23)	1.59 (SD = .87)
	2008	1.04 (SD = .20)	1.41 (SD = .71)
	Total	1.05 (SD = .23)	1.48 (SD = .78)

A 2 (country: U.S vs. China) × 2 (outlet: newspaper vs. blog) factorial ANOVA showed significant main effects of both country and outlet. The U.S. newspaper and blogs combined (M = 1.44, SD = .70) were significantly more skeptical than their Chinese counterparts (M = 1.16, SD = .47), $F(1, 634) = 36.52, p < .001$, and the blogs in both countries (M = 1.65, SD = .86) tended to be significantly skeptical than the newspapers (M =

1.18, SD = .43), $F(1, 634) = 97.43$, $p < 0.001$ (Table 6).

Table 6. *Two-Way Analysis and Variances for Skepticism by Country and Outlet*

Source	Type III SS	df	MS	F	p
Country	12.73	1	12.73	36.52	.000***
Outlet	33.96	1	33.96	97.43	.000***
Country × Outlet	1.10	1	1.10	3.17	.076
Residual	220.98	634	.349		
Total	1453.00	648	19.75	56.67	.000

Note. Two-tailed tests of significance: *** $p < .001$; ** $p < .01$; * $p < .05$

Pairwise comparisons revealed more details of the level of skepticism toward climate change varied by outlet in each country. The U.S. blogs ($M = 1.90$, $SD = .91$) were more skeptical than the U.S. newspapers ($M = 1.82$, $SD = .52$), $F(1, 634) = 52.34$, $p < .001$, and a similar pattern was found between the Chinese blogs ($M = 1.48$, $SD = .78$) and the Chinese newspapers ($M = 1.05$, $SD = .32$), $F(1, 634) = 26.57$, $p < .001$. Comparisons of the standard deviations (see Table 5) indicated that the degree of skepticism in the blogosphere tended to be more polarized than in the newspapers in both countries.

RQ2 aimed to find the longitudinal fluctuation of skepticism in both the U.S. newspapers and blogs. A subsample that excluded China was used. Another 2 (outlet) × 2 (year) ANOVA showed not only a significant difference in the skepticism between the newspapers and blogs in the U.S., $F(1, 364) = 60.82$, $p < .001$, but also a strong interaction between outlet and year $F(3, 364) = 13.29$, $p < .001$ (see Table 7). Figure 2 shows that while over the four years the U.S. newspapers became decreasingly skeptical toward climate change, the blogosphere showed exactly the opposite. Two follow-up trend analyses

confirmed the linear trends in both the U.S. newspapers ($F = 21.81$, $df = 238$, $p < .001$) and blogs ($F = 8.41$, $df = 126$, $p < .01$).

Table 7. *Two-Way Analysis and Variances for Skepticism by Outlet and Year*

Source	Type III SS	df	MS	F	p
Outlet	25.91	1	25.91	60.82	.000***
Year	2.17	3	.72	1.70	.168
Outlet × Year	16.98	3	5.66	13.29	.000***
Residual	155.08	364	.43		
Total	49.91	7	7.13	16.74	.000***

Note. Two-tailed tests of significance: *** $p < .001$; ** $p < .01$; * $p < .05$

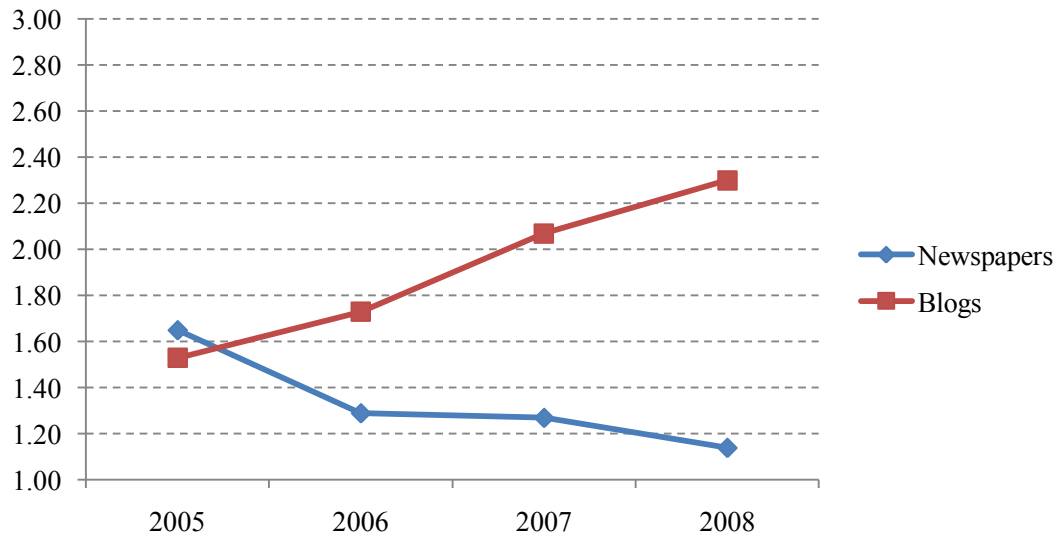


Figure 2. *Longitudinal Changes of Skepticism toward Climate Change in U.S.*

Newspapers and Blogs

Similar to RQ2, RQ3 looked at the longitudinal changes of the skepticism but focused on the Chinese newspaper and blogs. The only statistically significant difference was found between the outlets, $F(1, 258) = 43.59$, $p < .001$, with the blogs ($M = 1.48$, $SD = .78$) significantly more skeptical than the newspapers ($M = 1.05$, $SD = .23$). Despite the

difference, it must be noted that on the 1-3 scale, the Chinese newspapers showed a negligible amount of skepticism over the years, and the skepticism in the Chinese blogosphere was also at the low end.

Episodic vs. Thematic Framing (RQ4 & H1)

RQ4 asked: to what degree does the use of episodic vs. thematic framing vary by outlet and country? A 2 (country: U.S vs. China) × 2 (outlet: newspaper vs. blog) ANOVA found no significant main effects, interaction, or simple effects. Therefore, H1, which predicted that the U.S. news media were more likely to frame stories episodically than were the Chinese news media, was not supported. It is worth noting that all four outlets scored very close to the middle (2.5) of a one to four scale with the largest standard deviation close to one (See Table 8). Overall, almost two out of three articles (68%) were “moderately thematic” or “moderately episodic.”

Table 8. *Mean Scores of E v. T framing by Country and Outlet*

	Newspapers		Blogs	
	M	SD	M	SD
US	2.49 (N = 242)	.92	2.53 (N = 130)	.99
China	2.41 (N = 202)	.85	2.55 (N = 64)	1.08

Micro-Issue Salience (RQ5 & H2)

RQ5 probed into how the variances in the use of micro-issue salience (definition, cause, morality, and remedy) were explained by outlet and country. A binary logistic regression was run on each of the micro-issues in order to know the probability that country and outlet would contribute to the various emphasis on the micro-issues. Because both

country (1 = U.S.; 2 = China) and outlet (1 = Newspapers; 2 = Blogs) were coded categorically, they were treated as categorical covariates in the binary logistic regression in SPSS.

Table 9 includes the logistic regression coefficients, Wald tests, and p values for each of the predictors under all the micro-issues. For definition, both country, Wald $\chi^2(1, N = 638) = 8.28, p < .01$, and outlet, Wald $\chi^2(1, N = 638) = 30.28, p < .001$, served as significant predictors. As the directions of the β s indicated, the U.S. and newspapers were significantly related to the focus on defining climate change. For causes, outlet, was the only significant predictor, Wald $\chi^2(1, N = 638) = 10.63, p < .01$. Specifically, newspapers were significantly related to the emphasis on causes of climate change. For morality, both country, Wald $\chi^2(1, N = 638) = 5.10, p < .05$, and outlet, Wald $\chi^2(1, N = 638) = 80.50, p < .001$, were significant predictors, suggesting that (1) the U.S. was more likely to use the morality frame than China and that (2) and blogs was more likely to use the morality frame than newspapers. For remedy, outlet was the significant predictor, Wald $\chi^2(1, N = 638) = 27.39, p < .001$, with newspapers significantly related to the focus on mitigation climate change.

H2 predicted that the Chinese news media covered more on domestic mitigation than foreign mitigation. The distinction was made among mitigations that have been or will be achieved by (1) the newspaper's native country, (2) specific foreign countries, or (3) the international community. A crosstab analysis (see Table 8) was done on the newspaper articles from both countries that mentioned achievements on fighting climate change (N = 260). Of all the Chinese newspaper articles that mentioned mitigation achievements (N = 116), almost one out of two (49.2%) mentioned the achievements in China, whereas 22.4% and 28.4% went for foreign and international achievements, respectively.

Table 9. *Logistic Regressions Predicting Micro-Issue Salience from Country and Outlet*

	Predictor	β	Wald χ^2	p
Definition	Country	-.50	8.28	.004**
	Outlet	-1.12	30.28	.000***
Causes	Country	.06	.09	.760
	Outlet	-.66	10.63	.001**
Morality	Country	-.51	5.10	.024*
	Outlet	1.91	80.50	.000***
Remedy	Country	.015	.01	.929
	Outlet	-.933	27.39	.000***

Note. Two-tailed tests of significance: *** p < .001; ** p < .01; * p < .05

Of the U.S. newspaper stories that mentioned mitigation achievements (N = 144), about two out of three (66.7%) reported mitigation achievements in the U.S., whereas only 12.5% described foreign achievements and 20.8% international achievements. Significant differences were detected, $\chi^2(2, N = 260) = 8.62, p < .05$, with Cramer's V = .18 indicating a parallel association between the Chinese and U.S. newspapers.

Table 10. Newspaper Coverage of Mitigation Boundary by Country

	Domestic	Foreign	International	Total
U.S. Newspapers	96 (66.7%) ^a	18 (12.5%)	30 (20.8%)	144 (100.0%)
Chinese Newspapers	57 (49.2%)	26 (22.4%)	33 (28.4%)	116 (100.0%)
Total	153 (58.9%)	44 (16.9%)	63 (24.2%)	260 (100.0%)

Note. $\chi^2(2, N = 260) = 8.62, p$ (one-tailed) < .05; Cramer's V = .18.

a. N (Row%)

Table 10 presents something beyond what was hypothesized. Although H2, which hypothesized the Chinese newspaper's preference to cover domestic mitigation, was supported, the crosstab analysis showed that the U.S. newspapers showed an even stronger tendency to report domestic mitigation accomplishments while paying significantly less attention to foreign and international achievements.

Audience-Based Frames (RQ6 – H3b)

RQ6 looked at the extent to which the use of audience-based frames (conflict, human interest, non-human interest; economic, morality, and responsibility) vary by outlet and country.

A two-way multivariate analysis of variances (MANOVA) was performed. Significant multivariate main effects for outlet, Wilks Lambda = .92, $F(6, 629) = 8.95$, $p < .001$, was accompanied by significant univariate effects on nonhuman interest, $F(1, 634) = 6.68$, $p < .05$, and morality, $F(1/634) = 46.29$, $p < .001$. Blogs were significantly more likely to frame climate change as a moral issue and as a nonhuman interest issue than were the newspapers. The multivariate effects for country, Wilks Lambda = .87, $F(6, 629) = 15.47$, $p < .001$, was accompanied by significant univariate effects on conflict, $F(1, 634) = 67.82$, $p < .001$, human interest, $F(1, 634) = 14.41$, $p < .001$, nonhuman interest, $F(1, 634) = 25.92$, $p < .001$, and responsibility, $F(1/634) = 4.57$, $p < .05$. The U.S. newspapers and blogs combined were more likely to cover climate change in the conflict frame and less likely in the human interest, nonhuman interest, and responsibility frames than were the Chinese newspapers and blogs combined. Significant multivariate interaction effects were found on conflict, $F(1, 634) = 6.25$, $p < .05$, and morality, $F(1, 634) = 9.64$, $p < .01$.

A follow-up test was conducted to examine the variability closely. The test aimed to

Table 11. *Simple Effects Comparisons of Audience-Based Frames by Outlet and Country*

		Newspapers	Blogs	Cross-Media Comparison
Conflict	US	.39 ^a (SD = .47)	.55 (SD = .46)	F = 8.66 ^{***}
	China	.18 (SD = .36)	.14 (SD = .35)	F = 2.70
	Cross-Country Comparison	F ^b = 27.52 ^{***c}	F = 49.05 ^{***}	
Human	US	.23 (SD = .40)	.21 (SD = .40)	F = .02
	China	.33 (SD = .43)	.40 (SD = .48)	F = .19
	Cross-Country Comparison	F = 5.50 [*]	F = 8.57 ^{**}	
Non-Human	US	.21 (SD = .39)	.14 (SD = .33)	F = .14
	China	.43 (SD = .46)	.31 (SD = .44)	F = 19.79 ^{***}
	Cross-Country Comparison	F = 26.93 ^{***}	F = 12.11 ^{**}	
Morality	US	.12 (SD = .32)	.45 (SD = .45)	F = 61.04 ^{***}
	China	.17 (SD = .35)	.29 (SD = .44)	F = 6.63 ^{***}
	Cross-Country Comparison	F = 3.56	F = 24.29 ^{***}	
Economic	US	.10 (SD = .29)	.08 (SD = .27)	F = .93
	China	.06 (SD = .22)	.07 (SD = .25)	F = .57
	Cross-Country Comparison	F = 2.40	F = .04	
Responsibility	US	.52 (SD = .49)	.48 (SD = .48)	F = .06
	China	.59 (SD = .47)	.61 (SD = .47)	F = .43
	Cross-Country Comparison	F = 1.93	F = 3.05	

Note. a. Cell means are followed by standard deviations in parentheses. b. df of all F values = 6/629. c. Two-tailed tests of significance: *** p < .001; ** p < .01; * p < .05

detect the simple effect of one factor (either outlet or country) within a given level of the other factor. The following can be concluded from Table 11, which summarizes the test.

1. Both the U.S. media ($F = 27.52$, $df = 6/629$, $p < .001$) and blogs ($F = 49.05$, $df = 6/629$, $p < .001$) were more likely to frame climate change as a contentious issue than were their Chinese counterparts. The conflict frame was stronger in the U.S. blogs than in the U.S. newspapers ($F = 8.66$, $df = 6/629$, $p < .001$).

2. The human interest frame was stronger in both the Chinese newspapers and blogs than it was in the U.S. newspapers ($F = 5.50$, $df = 6/629$, $p < .05$) and blogs ($F = 8.57$, $df = 6/629$, $p < .01$). Similarly, the nonhuman interest frames was stronger in both the Chinese newspapers and blogs than it was in the U.S. newspapers ($F = 26.93$, $df = 6/629$, $p < .001$) and blogs ($F = 12.11$, $df = 6/629$, $p < .01$). However, the Chinese newspapers tended to focus more on the nonhuman frame than did the Chinese blogs ($F = 19.79$, $df = 6/629$, $p < .001$).

3. The U.S. blogs were more likely to cover climate change as a moral issue than were the Chinese blogs ($F = 24.29$, $df = 6/629$, $p < .001$), and in both countries, the morality frame was stronger in the blogs than in the newspapers (U.S.: $F(6, 629) = 61.04$, $p < .001$; China: $F(6, 629) = 6.63$, $p < .001$).

The complex results generated by the MANOVA procedure may be better streamlined by Figure 3, which shows the data in Table 11 from another perspective. The table presents the four media contribution to each of the audience-based frames. Overall, the responsibility frames was atop all others, followed by conflict, human interest, nonhuman interest, morality, and economic consequences. The color-coded bars allow us to closely examine each media's contribution to each of the frames. To take the conflict frame as an example, by comparing the colored areas in the conflict bar, it is easy to find that the newspapers and blogs in the

U.S. were more likely to frame climate change as a contentious issue than their Chinese counterparts.

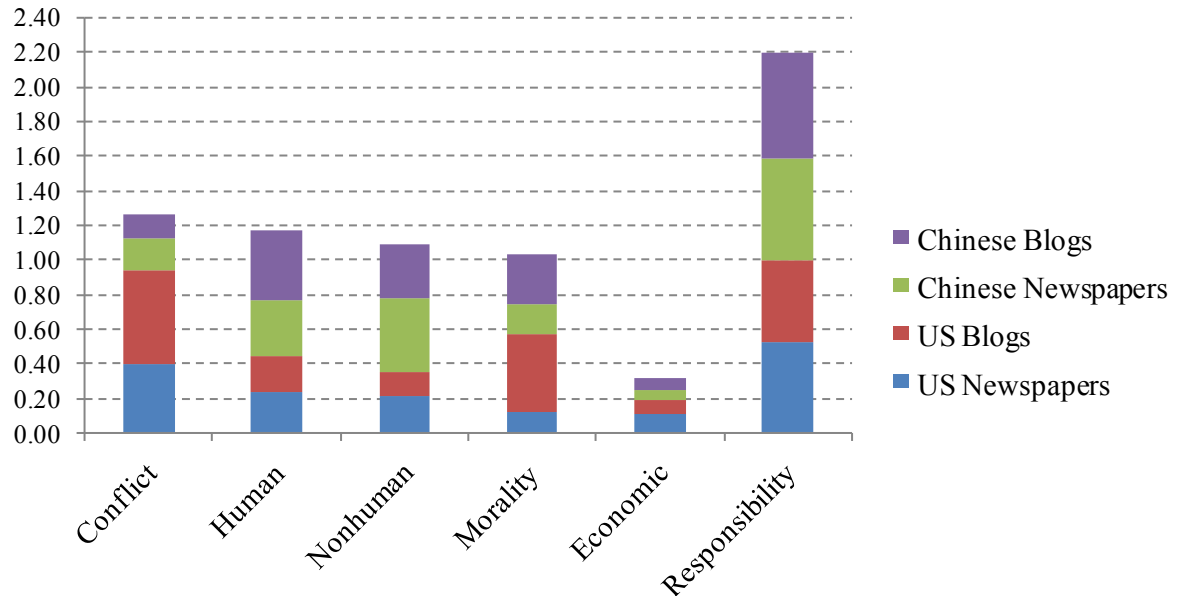


Figure 3. *Contribution to Audience-Based Frames from the Four Outlets*

RQ7 asked: to what degree do the uses of consequence and responsibility frames vary by outlet and year in the U.S.? A 2 (outlet) \times 4 (year) MANOVA yielded no significant multivariate main effects of outlet or year. The consequence frame, a composite variable of human interest, nonhuman interest, and economic consequences, received neither main effect nor interaction. Therefore, H3a, which hypothesized that the prevalence of consequence frames increased in the U.S. news media over the four years, was not supported. However, there was a significant outlet-year interaction on responsibility, Wilks Lambda = .91, $F(3, 364) = 12.29$, $p < .001$. Figure 4 demonstrates this interaction, showing that while the responsibility frame became increasingly prevalent in the U.S. newspapers from 2005 through 2008, its visibility waned in the U.S. blogs at the same time. To test H3b, which predicted that the prevalence of responsibility frames increased over the years in the U.S.

newspapers, a trend analysis was conducted. The linear trend was significant, $F(3, 368) = 3.83, p < .05$. Therefore, H3b was supported.

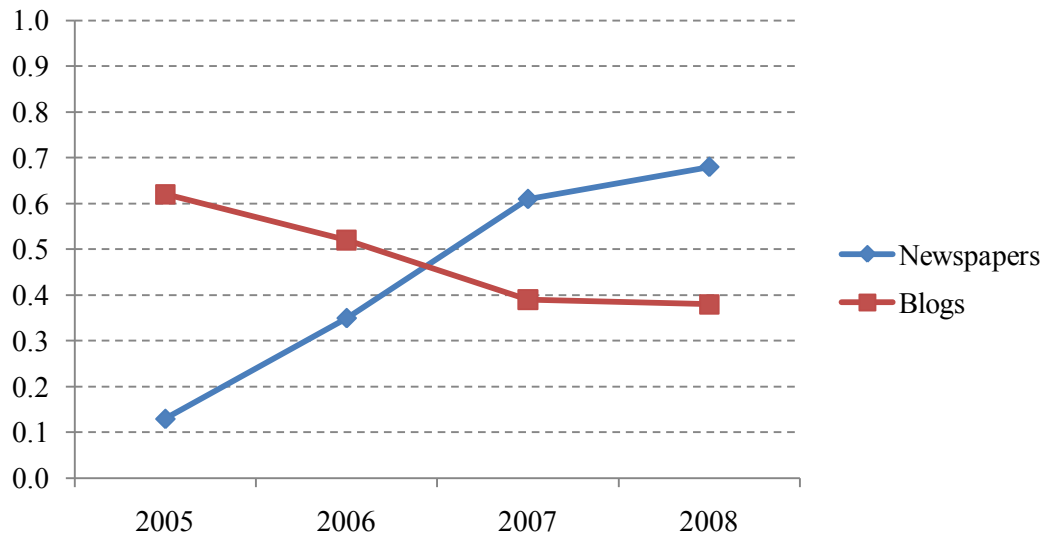


Figure 4. *Longitudinal Changes of the Responsibility Frame in U.S. Newspapers and Blogs*

RQ8 asked: to what extent do the uses of consequence and responsibility frames vary by outlet and year (2005-2008) in China? A 2 (outlet) \times 4 (year) MANOVA yielded neither significant main effect nor interaction.

Attribution of Responsibility (RQ9 – RQ11)

RQ9 asked about the extent to which attribution of responsibility varied by outlet and country. A 2 (country) \times 2 (outlet) MANOVA was run only on news stories and blog posts that attributed the responsibility of mitigating climate change to certain parties (N = 446). Significant multivariate main effects for outlet, Wilks Lambda = .84, $F(6, 437) = 54.17, p < .001$, was accompanied by significant univariate effects on individual responsibility, $F(1, 442) = 54.17, p < .001$, government responsibility, $F(1, 442) = 36.08, p < .001$, and human responsibility, $F(1, 442) = 7.18, p < .01$. The blogs were significantly more likely to attribute

responsibility to individuals and humans in general but less likely to governments than were the newspapers. Significant multivariate effects for country, Wilks Lambda = .95, $F(6, 437) = 4.25$, $p < .001$, was accompanied by significant univariate effects on industry responsibility, $F(1, 442) = 8.85$, $p < .01$, and organization responsibility, $F(1, 442) = 8.75$, $p < .01$. The U.S. newspapers and blogs combined were more likely to attribute responsibility to industries and organizations than were the Chinese newspapers and blogs combined. No significant multivariate interaction effects were found.

Table 12 summarizes a follow-up test that aimed to detect the simple effect of one factor (either outlet or country) within a given level of the other factor. The following can be concluded from the test.

1. In both the U.S. and China, blogs were more likely to attribute responsibility to individuals (US: $F(6, 437) = 24.06$, $p < .001$; China: $F(6, 437) = 20.82$, $p < .001$) than were newspapers, whereas newspapers were more likely to attribute responsibility to government than were blogs (US: $F(6, 437) = 9.83$, $p < .01$; China: $F(6, 437) = 24.27$, $p < .001$).

2. The Chinese newspapers had minimal coverage on industry responsibility ($M = .04$), significantly lower than the U.S. newspapers $F(6, 437) = 15.71$, $p < .001$ and Chinese blogs $F(6, 437) = 8.33$, $p < .01$.

3. The U.S. newspapers were more likely to attribute responsibility to organizations than were the Chinese newspapers.

Figure 5 presents the data in Table 12 from another perspective by showing the four media's contribution to each type of responsibility attribution. Overall, government and individual responsibility were the top two, with the U.S. newspapers and the Chinese newspapers contributing mostly to government responsibility, and the U.S. blogs and the

Chinese blogs contributing mostly to individual responsibility. Organization responsibility had the least coverage with the U.S. newspapers and the U.S. blogs contributing mostly to it.

Table 12. *Simple Effects Comparisons of Attribution of Responsibility by Outlet and Country*

		Newspapers	Blogs	Cross-Media Comparison
Individual	US	.11 (SD = .32) ^a	.37 (SD = .37)	F = 24.06 ^{***c}
	China	.13 (SD = .33)	.48 (SD = .48)	F = 20.82 ^{***}
	Cross-Country Comparison	F ^b = .75	F = .01	
Government	US	.60 (SD = .46)	.35 (SD = .45)	F = 9.83 ^{**}
	China	.70 (SD = .42)	.36 (SD = .47)	F = 24.27 ^{***}
	Cross-Country Comparison	F = 2.85	F = 1.75	
Industry	US	.19 (SD = .39)	.19 (SD = .37)	F = .16
	China	.05 (SD = .20)	.12 (SD = .30)	F = 8.33 ^{**}
	Cross-Country Comparison	F = 15.71 ^{***}	F = 1.68	
Organization	US	.12 (SD = .31)	.09 (SD = .29)	F = .11
	China	.04 (SD = .18)	.01 (SD = .05)	F = .71
	Cross-Country Comparison	F = 8.08 ^{**}	F = 2.65	
Scientist	US	.18 (SD = .37)	.20 (SD = .36)	F = .77
	China	.14 (SD = .31)	.11 (SD = .30)	F = .24
	Cross-Country Comparison	F = 1.72	F = .152	
Human	US	.09 (SD = .26)	.12 (SD = .31)	F = .07
	China	.09 (SD = .28)	.22 (SD = .42)	F = 3.37
	Cross-Country Comparison	F = .35	F = 1.94	

Note. a. Cell means are followed by standard deviations in parentheses. b. df of all F values = 6/437. c. Two-tailed tests of significance: *** p < .001; ** p < .01; * p < .05

Even though government was the most attributed entity in both the American and Chinese newspapers, a stark difference was found with respect to the national boundaries of governments. Three types of governments were distinguished in this study: (1) domestic, (2) foreign, and (3) international.

Table 13. *Newspapers' Responsibility Attribution to Different Governments*

	Domestic Gov	Foreign Gov	Intl. Gov	Total
U.S. Newspapers	87 (77.0%) ^a	11 (9.7%)	15 (13.3%)	113 (100.0%)
Chinese Newspapers	17 (15.2%)	37 (33.0%)	58 (51.8%)	112 (100.0%)
Total	104 (46.2%)	48 (21.3%)	63 (32.4%)	225 (100.0%)

Note: $\chi^2(2, N = 225) = 86.52, p < .001$; Cramer's $V = .62$.

a. N (Row %).

A crosstab analysis (Table 13) was done on newspaper articles of both countries that attributed responsibility to governments (N = 225). Of the Chinese newspaper articles (N = 112), a majority (84.8%) of them (N = 112) attributed the responsibility of mitigating climate change to either specific foreign governments (for example, the U.S. government) or international governments, whereas a majority (77.0%) of the U.S. newspaper articles (N = 113) attributed the responsibility to domestic governments (the U.S. government). Significant differences were detected, $\chi^2(2, N = 225) = 8.62, p < .001$, with Cramer's $V = .62$ indicating a substantive contrast between the Chinese and U.S. newspapers' coverage.

RQ10 and RQ11 inquired into the extent to which attribution of responsibility vary by year and outlet in the U.S. and in China, respectively. Two 2 (outlet) \times 4 (year) MANOVA tests were run on each country, but other than the main effect of outlet discussed in detail in RQ9, neither significant main effect of year nor outlet-year interaction was found.

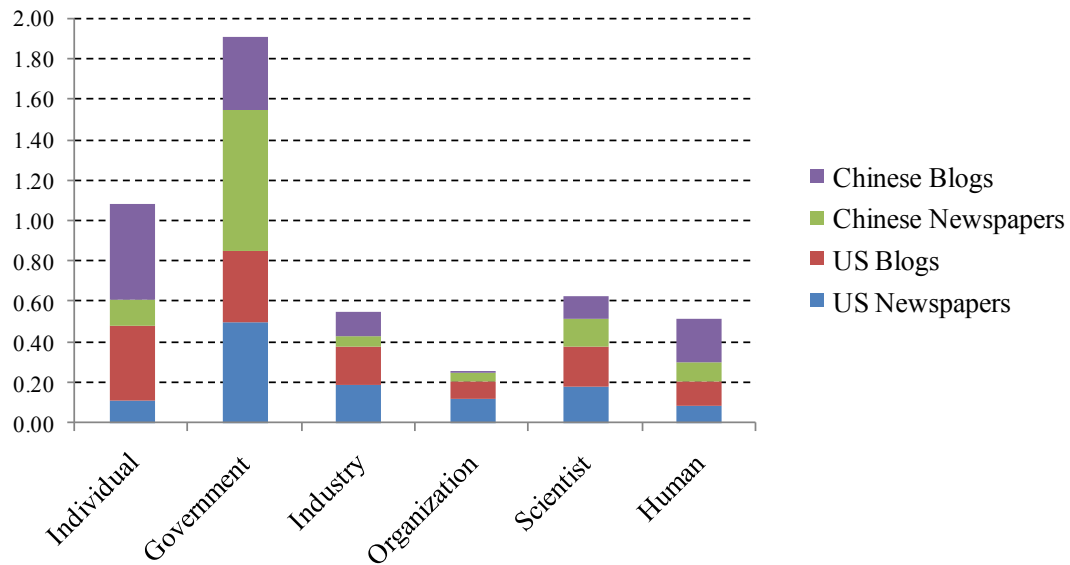


Figure 5. *Contribution to Attribution of Responsibility from the Four Media*

E v. T Frames and Attribution of Responsibility Interaction

To explore the interaction between episodic vs. thematic framing and responsibility attribution, RQ12 and RQ13 aimed to use standard multiple regression to find out how much variance of E v. T framing in the U.S. and Chinese news media could be explained by the six kinds of attribution of responsibility. Only stories that attributed responsibility were analyzed. RQ12, which focused on the U.S. newspapers, found overall significance of the model, $F(6, 141) = 3.68, p < .01$. R^2 for the model was .11, and adjusted R^2 was .08, showing relative low contribution of the independent variables to the dependent variable. Table 14 displays the unstandardized coefficients (B), standard errors for B (SE B), standardized regression coefficients (β), and significance values (p). In terms of individual relationships between attribution of responsibility and E v. T, only government responsibility ($t = 3.23, p < .01$) significantly predicted E v. T framing, suggesting that the more an American newspaper story attributed the responsibility to the government, the more likely it was framed

thematically.

Table 14. *Standard Multiple Regression of Attribution of Responsibility on E v. T framing for the U.S. Newspapers*

Predictor Variables	B	SE B	β	t	p
Individual	-.09	.24	.03	-.37	.712
Government	-.60	.18	-.28	-3.23	.001**
Industry	-.06	-.20	-.02	-.30	.767
Organization	.38	.24	.12	1.59	.114
Scientist	-.34	-.21	-.13	-1.61	.108
Human	.16	-.27	-.04	-.60	.551

Note: Total $R^2 = .11$, $F(6, 179) = 3.68$, $p < .01$. *** $p < .001$; ** $p < .01$; * $p < .05$

Table 15. *Standard Multiple Regression of Attribution of Responsibility on E v. T framing for the Chinese Newspapers*

Predictor Variables	B	SE B	β	t	p
Individual	.44	.24	.17	1.92	.06
Government	-.45	.23	-.22	-2.16	.03*
Industry	-.29	.21	-.07	-.81	.42
Organization	.62	.35	.13	1.53	.13
Scientist	-.17	.41	-.06	-.67	.51
Human	-.65	.28	-.21	-2.29	.02*

Note: Total $R^2 = .12$, $F(6, 141) = 3.23$, $p < .01$. *** $p < .001$; ** $p < .01$; * $p < .05$

RQ13, which looked at the Chinese newspapers, found overall significance of the model, $F(6, 141) = 3.23$, $p < .01$. R^2 for the model was .12, and adjusted R^2 was .08. Table 15

shows the individual relationships between the six types of attribution and E v. T framing. Government responsibility ($t = 2.16, p < .05$) and human responsibility ($t = 2.29, p < .05$) significantly predicted E v. T framing, suggesting that the more a Chinese newspaper story attributed the responsibility to government and human beings in general, the more the it was framed thematically.

CHAPTER 8

DISCUSSION

Notwithstanding the inherent complexity of media representation of climate change, this study has found clear framing patterns that mirrored the social reality of climate change in both countries. Moreover, cross-media comparisons revealed distinct characteristics of climate change framing of the newspapers and blogs. This chapter will summarize and discuss the major findings, synthesize them with earlier literature by introducing a theoretical model, acknowledge limitations, and point out how future research may further advance our knowledge in this area.

Summary and Discussion of Major Findings

Skepticism toward climate change was one of the most enduring concerns for media scholars interested in the social construction of climate change (Antilla, 2005; Besel, 2007; Boykoff, 2006, 2007a, 2007b; Boykoff & Boykoff, 2004; Brossard et al., 2004; Jones, 2006; Sitton, 2004), but little research was done to investigate how the Chinese media coverage reflected the skepticism. This study showed that, cross-nationally, while little skepticism was found in the Chinese newspapers and blogs, the U.S. newspapers and blogs were overall significantly more skeptical. The gap seemed well situated in the context of earlier findings. First, national affluence indicators (such as GDP) were found to be negatively associated with the degree of environmental concerns (Dunlap & Mertig, 1995). Second, media coverage in developed countries was overall more skeptical toward climate change than that in developing countries (Jones, 2006), and the U.S. news media were notoriously known for their contentious portrayals of the issue (Antilla, 2005; Boykoff, 2006, 2007a, 2007b; Brossard et al., 2004; House of Representatives, 2007a). Third, the Chinese government has

made solid commitment to address environmental problems that may hamper the nation's sustainable economic growth (Ho, 2006).

The design of this study also allowed us to take microscopic views of how the skepticism was manifested in different outlets of both countries. Interestingly, it was found that in the U.S., the majority of the skepticism did not come from the newspapers but from the blogosphere where the polarization between pro- and con-climate change camps was also greater. The higher degree of contention in the U.S. blogs offers another version of the social reality of climate change and suggests that at least for this topic, the blogosphere indeed served as an epitome of Justice Holmes' notion of the "marketplace of ideas," or what Sunstein (2007) called the "gigantic town meeting" where people potentially have equal access to unfettered views. The cross-media discrepancy also indicates a fundamental difference between news media and blogs; that is, the equilibrium of viewpoints in the blogosphere, especially for a controversial issue, is not managed by the "objectivity" norm that requires the presence of both sides of the coin within the writing, but presented by the cacophony of diverse opinions voiced by individual bloggers from different sociological backgrounds.

The cross-media gap was present in China but with limited magnitude. The Chinese bloggers were much less skeptical than the U.S. bloggers, but they were not entirely passive receptacles for the official media agenda where skepticism had no place at all. The Chinese bloggers have demonstrated independent thinking and their potential to become an important political stakeholder. Nonetheless, the limited divergence from the news media exemplifies two earlier arguments regarding grassroots movement in China. First, as MacKinnon (2007, 2009) stated, the political impact of blogging in China was more of long-term evolution than

revolution and therefore could not be directly related to political activism. Second, it was unlikely that environmental movement would emerge in China in the near future because grassroots environmental activities in China rarely involved contentious political actions commonly found in other countries' environmental movements (Stalley & Yang, 2006).

Perhaps the most striking finding was that while the U.S. newspapers became decreasingly skeptical toward climate change from 2005 through 2008, the U.S. blogs went the opposite direction. They are not insulated trends. Rather, the contradiction serves as a telling revelation of the media-blog relationship, but to explicate its implications, this finding must be analyzed later in conjunction with other results of the study.

The analyses of the use of micro-issue salience showed that in the U.S. newspapers, climate change was constantly defined, its causes regularly mentioned, and remedies frequently discussed. The emphasis on definition and cause signaled the newspapers' continuous attention to the scientific dimension of climate change. Meanwhile, extensive discussion on mitigation measures echoed the unwillingness to cover skeptical voices, indicating an urge to pass over problem-identifying and instead focus on problem-solving. In contrast, the U.S. blogs' coverage seemed to have transcended the scientific realm and was largely in the morality frame where moral judgments were often made based on the blogger's political or religious beliefs, or sometime personal conscience.

We paid particular attention to the national boundary of mitigation achievements reported by the Chinese newspapers and found that significantly more domestic mitigation was covered than was foreign and international mitigation. The difference suggests that the newspapers still served as the government's mouthpiece by helping to promote the image that the nation's leadership not only was committed to fighting against climate change but

also took successful actions. Here is an example that offered some interesting insights of how this agenda was sometimes executed so awkwardly that our three coders had to debate and decide whether to categorize the mitigation achievements suggested in the story as domestic or foreign. It was a story in the China Daily on July 4, 2008 about an American teenage boy named Taylor Francis, who was sent to China by the Climate Project, a U.S.-based non-profit program that promoted global awareness of climate change. Seemingly giving credit to the U.S. in terms of mitigation boundary, the story, however, ended with the following remarks:

Last summer, he [Taylor Francis] came on a school trip to China and ended up talking for the first time to Chinese 5th graders in a small town in Jiangsu province about global warming. The reactions from those students were very positive, he said. They asked many questions concerning electric cars and renewable energy, questions, Francis said, were "incredibly informed". This experience ended up reinforcing his conviction about the significance of China and the US working together in the green crusade.

He said he felt responsible for bringing back to the US the message that environmental awareness in China is stronger than expected and growing fast.

"I've been incredibly impressed at how knowledgeable and energized the students here are about climate change," Francis said. "So many have come up to ask about what they can do," he said.

It seemed that the young environmental missionary concluded his trip not by stating how much the program might have helped raise public awareness but instead by learning how even fifth graders in a small town in rural China were already incredibly informed and knowledgeable about climate change. It was difficult for the coders to decide whether the

story presented the contribution of the U.S.-based program or boasted the success of climate change education in China. If what the story said were true, then the awareness missionary should probably be sent the reverse way, from a country where most fifth graders worry about climate change to another where some seventh graders' parents outrageously protested against showing "An Inconvenient Truth" in public schools, holding their children from being "brainwashed" by Gore's "propaganda" (Harden, 2007).

While the Chinese newspapers' focus on domestic mitigation signified their conformity to the political agenda of the central government, the U.S. newspapers' heavier emphasis on domestic achievements needed to be interpreted in a different light. Traditionally, U.S. newspapers devote relatively little space to international news (Gerbner & Marvanyi, 1977; Hess, 1996), and they have generally treated climate change as a topic of science and national politics (Brossard et al., 2004). Moreover, it can be easily argued that the inward attention of both countries' news media was directly related to their leading GHG emissions in the world. However, we believe that additional explanation exists. For example, the two nations' differing levels of emphasis on domestic mitigation can be linked to Galtung's (1971) center-periphery hypothesis, which suggested that the power status (economic, scientific, and military power) of a country significantly predicted the country's visibility in international news (Kariel & Rosenvall, 1984; Swain, 2003). According to the theory, for climate change, a phenomenon whose potential impacts are without clear political and geographic borders, the higher power status a country has, the less attention its news media will pay to foreign countries.

The use of audience-based frames further pictured the social reality of climate change in both countries. The conflict frame, which was often embodied by disagreement between or

within individuals, governments, political parties, social groups, and scientists, was much more prevalent in the U.S., whereas the human and nonhuman interest frames, which stress the impacts of climate change, were significantly more visible in China. Specifically, the U.S., bloggers were much more likely to employ the morality frame and the conflict frame than the newspapers, confirming the contentious nature of the blogosphere and the dominance of the morality dimension of climate change in the American blogosphere. The popularity of the morality frame seemed to be cross-national because its prevalence was also observed in the Chinese blogosphere.

A 2009 Gallup (2009) survey found the highest level of public skepticism in the U.S. about mainstream reporting on global warming seen in more than a decade of Gallup polling on the subject. A record high (41%) said that the mainstream media exaggerated the seriousness of global warming. In response to this finding, we found that the three prestige U.S. newspapers' emphasis on the consequences of climate change (human interest, nonhuman interest, and economic consequences combined) was stable from 2005 through 2008, contrary to what one would expect. It was discovered, however, that the newspapers increasingly highlighted the responsibility to fight climate change over the four years. These two findings led us to believe that (1) the newspapers remained cautious not to become apocalyptists by holding back dramatization of possible consequences of climate change and (2) the public's impression of media exaggeration might have largely come from the news media's growing act of suggesting responsibility burdens of mitigation rather than from the consistent portrayals of the consequences. In other words, it was "who is responsible" and "what they should do" that induced the perceived seriousness and the criticism toward the "hypochondriac" and "overreacting" media coverage.

The importance of the responsibility frame warranted a more detailed examination of how the four outlets attributed responsibility to social parties (individual, government, industry, organization, scientist, and human). Cross-nationally, two common trends were found. First, both the U.S. and Chinese blogs were more likely to attribute the responsibility of climate change mitigation to individuals than were the newspapers. Second, both the U.S. and Chinese newspapers were more likely to attribute the responsibility to government, whether it be domestic governments, foreign governments, or international governments. Industry responsibility and organization responsibility, nevertheless, were much more prevalent in the U.S. Attributing responsibility heavily to government, the U.S. and Chinese newspapers, however, starkly differed in what government should be accountable. On the one hand, qualitative observations showed that the U.S. reporter's attribution to the U.S. government often derived from the dissatisfaction with the government's sluggish position on climate change mitigation (for example, George W. Bush's refusal to sign the Kyoto Protocol). That the newspapers primarily held the U.S. government liable signifies (1) the media's surveillance role as political commentators and (2) the idea that climate change mitigation was largely contingent upon the U.S. government's willingness to craft solid regulatory measures.

On the other hand, the Chinese newspapers' predominant attribution to foreign and international governments once again was in line with the Chinese government's call for leading commitment from developed countries as well as their technical and financial assistance to help developing countries combat climate change. The lack of responsibility attribution to the Chinese government is another example of the media's minor role in the sense of domestic political surveillance and criticism. Coupled with the newspapers' focus on

domestic achievements discussed earlier, it could be concluded that climate change coverage in the Chinese newspapers was primarily featured by a “domestic accomplishment, international responsibility” theme. A China Daily story published on November 17, 2006 seemed to be a typical case of this rhetoric. The story started with a UN report.

"Our analysis shows the actions China and Brazil are taking will result in emissions cuts to levels comparable to what the United States is projected to do under its voluntary target by 2010, also equal to nearly 40 per cent of what the EU will do by 2010," said Ned Helme, president of the Center for Clean Air Policy (CCAP), the US-based think-tank that produced the report.

A Chinese official then warmly heralded the report:

"Rapidly growing economies like China have been increasingly successful in decoupling economic growth from energy use, thereby reducing the emission-intensities of their economies," he [the official] told the conference on Wednesday.

The story concluded by another Chinese official's remarks that pointed out what was mostly needed for reducing energy consumption and GHG emissions in China:

"This is an ambitious goal [China's plan to reach a 20% reduction in energy consumption per unit of gross domestic product (GDP) based on the 2005 level] that will be extremely difficult to reach," Jiang said. "Realization will not only require unremitting efforts by China, but also practical and effective international co-operation guided by the principles of (the UN) Convention, in particular financial and advanced technological support."

Bloggers' tendency to stress the significance of individual responsibility sent a clear reminder of blogging as a personal medium in essence, despite the proliferation of

commercial uses of blogs in recent years. The finding can also be explained by bloggers' moral understanding of climate change. As Ricoeur (2005) argued, what mostly distinguishes the human being from other species is her capacity to attribute herself a responsibility, which makes her a moral being and becomes an imperative part of her ontological self. The recognition of individual responsibility then makes the human being recognize herself and assume obligations towards her fellow human beings, other living beings, and the environment (Ballet, Bazin, Lioui, & Touahri, 2007; Jonas, 1985). Since the collective consolidation of such transformation often requires networked support, confirmation, and reconfirmation, blogs seems to be an ideal conduit for voicing this morally powered advocacy constantly echoed in the cyberspace.

This study did not find significant variability in episodic vs. thematic framing across nations, outlets, or years. All four outlets scored very close to the middle (2.5) in a one to four scale with a majority of the articles being "moderately thematic" and "moderately episodic." We believe that the lack of variability was a reflection of some structural characteristics of climate change rhetoric. Political debate regarding climate change is almost always accompanied by the complexity of climate science. For news stories involving political tension, voices in the discussion often refers back to their preferred scientific findings; the same is true for bloggers, who often look out for scientific research bolstering their moral judgments. Moreover, the difficulty to tell episodic stories on climate change is universal because, climate change is crecive and often beyond direct experience, without which storytelling is difficult. On the other hand, covering bare scientific information with little episodic elements, unless it is itself striking, would make both journalists and bloggers somewhat reluctant because the article would look "dry" and of diluted value to the public.

These counterbalancing considerations have prevented newspaper reporters and bloggers from going too far into either the episodic or the thematic direction.

It was found that the use of thematic framing was correlated with attribution of government responsibility. The finding is one step further toward a better understanding of the effects of episodic vs. thematic framing. Iyengar's (1991) work, which explored the relationship between E v. T framing and audiences' responsibility attribution, found that in general, episodic framing tended to increase attribution of individual responsibility while thematic framing were more likely to increase attribution of societal or government responsibility. However, neither Iyengar himself nor later works following the E v. T tradition offered much to explain what might have helped to form these tendencies. This study offers some convincing explanation: for climate change coverage, the relationship between thematic framing and government responsibility is already embedded in media messages. The discovery of rhetorical antecedents has expanded Iyengar's theory in an empirical way, but we may not hold the expansion universally applicable, primarily because, as Iyengar (1991) found, E v. T framing's effects vary topic by topic, or, in his term, are "domain-specific." For example, he did not find the effects present in all the news topics he investigated—some were completely supported, and some were partially supported. Similarly, the current study failed to find any relationship between episodic framing and individual responsibility. Therefore, despite the conclusion that media frames at different conceptual levels do follow certain interactive patterns, cautions must be taken by future researchers by carefully examining and concluding one a topic-specific basis and by not over-generalizing the existence and effects of frame interaction.

Major Theoretical Implications: The B-M-S Model

As mentioned earlier, bloggers, especially those in the U.S., have distinguished themselves from journalists by stressing the moral dimension of climate change as a social issue. The explanations for this major finding have to do with the philosophical definition of morality and its connection with the nature of blogging. Here we borrow Gert's (2005) definition of morality as "an informal public system applying to all rational persons, governing behavior that affects others, and include what are commonly known as moral rules, ideals, and virtues and has the lessening of evil or harm as its goal" (p. 14). Compared with the more authoritative social institutions, such as the news media, blogs are an "informal" public opinion conduit, which makes it less burdensome for the writer to make moral judgments. In other words, the diversity of the blogosphere provides an ideal ecosystem for morality debate to thrive because, according to Gert (2005), a lively discourse regarding the moral aspect of an issue is contingent upon the lack of "authoritative judges and decision procedure that offers unique answers" (p. 11). In addition, Gert's definition also pointed out the radioactive characteristic of morality by addressing its effects on others. To elaborate in the context of this study, because of the social, economic, political, and religion origins of moral standards, moral judges are conceptually grouped and constantly in search of support, confirmation, and influence, all the which well suit the judges in the "politically divided" (Adamic & Glance, 2005) blogosphere.

For climate change and environmental issues in large, morality needs to be discussed in relation to science. Earlier literature touched on the relationship of the two. For example, scientific knowledge about climate change was found to be less of a determinant behavior predictor of climate change mitigation than socio-cultural variables such as personal moral

standards and social networks (Jaeger, Dürrenberger, Kastenholz, & Truffer, 1993). Moreover, public understanding of environmental issues in the U.S. was often guided largely by fundamental moral views on the relation between nature and humanity, the right of other species, humanity's right to change or manage nature, and the society's responsibility for future generations (Kempton, Boster, & Hartley, 1996). These studies, however, did not mean to undermine the importance of climate science in the public discourse. Beck (1992), for instance, argued that public concerns of environmental risks were sensitive to expert dissent concerning the nature of risk and often reflected increased public skepticism concerning the ability of the institutions of modernity to contain and manage risk. This argument was indeed the fundamental assumption of the "informational bias" attack (Antilla, 2005; Boykoff, 2006, 2007a, 2007b; Boykoff & Boykoff, 2004) at the news media's framing of climate change as scientifically contentious.

The diminishing skepticism toward climate change in the U.S. news media found in this study seems to be in sync with Boykoff's (2007a) observation that the media have abandoned "balanced" reporting and featured extensively the "scientific consensus" on anthropogenic climate change since 2005. This agreement, however, raised more questions than it answered. If less perceived expert dissent would entail less skeptical public belief in anthropogenic climate change, as Boykoff hoped, then why did the skepticism continuously increase in the blogosphere while the media leaned toward the scientific consensus? Why did political partisanship continue to widen on climate change (Gallup, 2008a; Pew Research Center, 2008)? Why did the public more frequently point at the news media's exaggeration of the seriousness of climate change (Gallup, 2009)? Most importantly, how do this study

and past literature on media representation of climate change and its effects fit in these inconsistencies?

These vital questions are calling for an integrative model that theorizes and synthesizes various dimensions of the social constructions of climate change by accurately picturing their patterns of interaction. Here we introduce the B (Bloggers' perception) – M (Media portrayal) – S (Skepticism) model (Figure 6) of the social construction of climate change, which is comprised of four conceptual components. First, the moral and scientific dimensions of climate change understanding of bloggers are distinguished (the vertical axis) but not in contradicting or mutually exclusive terms. In fact, they are interwoven in the public understanding of climate change but differentiate themselves from each other in important ways. The public perceptions of the topic often oscillate between the two; sometimes the perceptions mainly focus on the scientific dimension and are less subject to the influence of moral guidelines, and other times morality is such a predominant determinant of the public opinion that scientific research becomes an auxiliary ready to be “cherry-picked” to serve one’s own moral views whenever necessary. Second, media portrayals are theorized as a “skeptical to non-skeptical” continuum (the horizontal axis), which encompasses not only the degree of contention in the scientific community that earlier studies centers on, but also the degree of conflict in the political arena. Third, the plus and minus signs in the four-quadrant matrix represent the directions of skepticism in the blogosphere, resulting from the interactions of the two dual-level variables (bloggers’ perception and media portrayal). Fourth, five external factors—natural disaster, scientific certainty, political conflict, economic difficulty, and media responsibility attribution— influence bloggers’ perception in scientific and moral terms. For example, increases in

natural disasters and scientific certainty about anthropogenic climate change make bloggers' understanding of the issue less sensitive to moral factors, whereas increases in political conflict, economic difficulty, and news media's responsibility attribution (especially to the government) help to push the perception to the moral dimension and away from the scientific dimension.

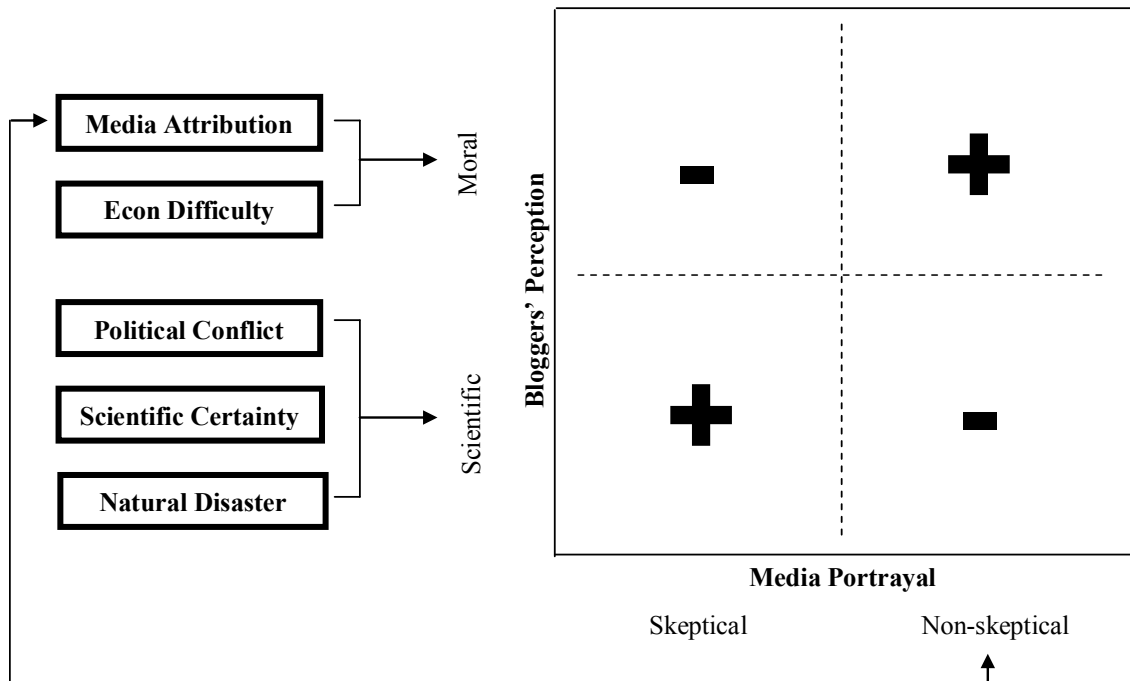


Figure 6. *The B-M-S Model of the Social Construction of Climate Change*

As the B-M-S model illustrates, when bloggers' perceptions largely reside in the scientific dimension, news media's portrayal of climate change as a politically or scientifically contentious issue tends to confuse bloggers and therefore increases the skepticism toward climate change in the blogosphere. Under the same condition, media representation that bears little skepticism is likely to entail similar attitudes in the

blogosphere. Hence, the focus on the scientific understanding in the blogosphere serves as a determinant of the attitudinal synchronization between blogs and the news media.

Nevertheless, once bloggers' perceptions of climate change move to the moral dimension, media effects show the opposite. When fewer skeptical voices are covered by the news media and bloggers' understanding of climate change is primarily guided by their political, religious, and social backgrounds, skepticism in the blogosphere tends to rise. Conversely, the morality-minded bloggers are likely to become relatively less skeptical if both pro- and con-climate change voices are delivered in media messages.

The model holds considerable descriptive and explanatory power by synthesizing scattered and sometimes inconsistent knowledge about the social construction of climate change in a holistic theoretical framework. The media-blog relationship revealed by this model can be viewed as a response to the "informational bias" criticism that were popular in both the academic and political arenas. Counter-intuitively, the weakening of the bias did not result in a more convinced public but instead backfired in the form of rising public criticism toward media dramatization and a more skeptical blogosphere.

The implications of this paradox are two-fold. First, the model informs us much about how blogs function as an alternative media outlet for suppressed public opinions. This study has found that, over the four years, the U.S. newspapers covered fewer and fewer skeptical voices not only in the scientific view of climate change, but in the political perspective as well. When the news media fail to accurately represent the contentious political reality of climate change by not offering ample space to the skeptics, no place is more welcoming than the blogosphere to host those oppressed voices, whose frustration of being overlooked by the mainstream media would likely to escalate the degree of political contention in both the

blogosphere and the public sphere. The reverse media effects within the moral dimension of the model also find support in the “Hostile Media Phenomenon.” A number of studies (Christen, Kannaovakun, & Gunther, 2002; K. Matheson & Dursun, 2001; Vallone, Ross, & Lepper, 1985) have found that individuals with strong partisan biases toward an issue as part of their identity tend to perceive media coverage as biased against their views, even when non-partisan viewers perceive the coverage as balanced. Accordingly to this theory, a slight move of the news media in the partisanship spectrum may trigger considerable criticism from the other side. Second, the model is reciprocal (indicated by the arrow linking “non-skeptical” and “media attribution”). The news media’s advocacy, reflected by the diminishing skepticism and strong attribution of treatment responsibility to the government, may have helped widen the partisan divide on climate change, eventually turning the media themselves into a major partisan player in the political game and one of external influences capable of transforming climate change into something of moral significance in the blogosphere.

To revisit the “informational bias” criticism, if the news media’s withdrawal from the scientific contention was largely a function of increased scientific certainty and social pressures, is it responsible for them to also turn away from political contention and act as if those skeptics are now negligible? A Washington Post story published on June 22, 2008 covered several universities’ initiative to integrate “green” courses in their curricula. Two skeptical voices appeared in the middle of the story:

For those who are skeptical about global warming and think that the current trend is often too alarmist, the changes carry risk. "It discredits science," said Richard Lindzen, a professor of meteorology at MIT. "It's propaganda," he added, with opposing viewpoints rarely explored.

"I think it's getting a little out of proportion, the emphasis on the environment," said Donald J. Boudreaux, chairman of the economics department at George Mason University. He said people increasingly look at environmental issues almost as a religion, with unquestioning belief, rather than thinking critically about scientific evidence or economic issues.

It is probably true that an alarmist can readily make similar counterarguments by saying that climate change skepticism, too, looks like a religion. However, putting aside the difference in stance, do we not want to see criticism like that in the news media that reminds us the importance of independent thinking and warns us not to blindly fall too far into the moral and political cliques? Is it not the inclusion of and tolerance to opposing views that distinguish the free press we are proud of from other social institutions? Does not truth triumph via collisions within intellectual plurality rather than conformity to ideological singularity?

Limitations

Despite the interesting framing dynamics uncovered in this study, some limitations exist that allow us to envision better research design and new frontiers of this research avenue. First, the limited number of Chinese blog posts on climate change indicates that the topic is still relatively marginal in the Chinese blogosphere, where discussing social issues has not been public momentum. Methodologically, the small sub-sample size has brought power problems that might have prevented significant statistical differences from being found. Solving the problem partly hinges on considerable improvement of blog archival search functionality capable of not only locating most recent blog posts but indexing older posts with greater spatial-temporal magnitude. Another solution depends on preplanning that enables researchers to capture and sample blog posts in structured timeframe, similar to

recording television commercials or broadcasts on planned days. A major advantage of this approach is that it does not rely on the underdeveloped archival blog search capability. Another advantage is especially important to research that focuses on Chinese bloggers' repercussions to politically sensitive issues because immediate capture reduces the risk of missing important information being censored.

Second, the four year timeframe employed in this study has limited comparisons between current data with historical ones. These comparisons are especially important because past research indicated that the U.S. media have gone through a number of "issue-cycles" on climate change and other environmental topics (Brossard et al., 2004; McComas & Shanahan, 1999; Trumbo, 1996). Does media framing repeat itself? Or do new social dynamics make the framing different from one attention cycle to another? These questions are worth exploring for future researchers.

Third, the inclusion of the Chinese newspapers and blogs has greatly expanded the scope of this investigation but at the same time brought additional limitations. The exclusion of television news—an important news source for both the U.S. and Chinese audience—was largely due to the absence of databases that offer Chinese television news transcripts. Also, hard news and editorials in the U.S. newspapers vary greatly in terms of production mechanism and therefore should probably be analyzed separately. However, the lack of a distinct line between editorials and other types of news in the Chinese newspapers made such cross-cultural comparisons almost impossible.

Fourth, an important player in the Chinese news industry was missing in this study—metro newspapers, which research has found to be increasingly divergent from party-affiliated news outlets due largely to metro papers' wider spectrum views regarding social

issues (J. Zhang, 2007; Y. Zhang, 2007; Zhao, 2008). Therefore, examinations of how Chinese metro newspapers covered the issue will lead to a more comprehensive understanding of media representation of climate change in China.

Directions for Future Research

The B-M-S model has opened a number of possibilities for future research. For example, experiments may take into account media's attribution of responsibility and explore how, while controlling for extraneous variables, it affects attitudinal variables regarding climate change or other environmental issues. Other than harmonizing scattered knowledge about the social construction of climate change, the beauty of the model, however, lies largely in its explanatory power. We offer two possible directions to expand the applicability of this model. First, even though the model is based on the assumption that blogs function as a friendly conduit for suppressed public opinions, the degree to which these online opinion leaders mirror public opinions has not been empirically tested. Future researchers may compare public opinion polls and national surveys to content analyses of the blogosphere on a topic-by-topic basis. It then can be readily known whether and with what refinement we may generalize the model to a revelation of public opinion-news media relation. Also, with slight modifications of the external variables, we may test the universality of the model for the social constructions of other controversial issues related to science, such as the use of biotechnology.

For cross-cultural comparisons, scholars may focus on effects of the framing patterns unearthed in this study by surveying or interviewing audiences in both countries. If the average Chinese follow the "local achievement, international responsibility" frame propagated by the newspapers, they would be very likely to view climate change as an issue

of international power struggle and therefore defend the frame in a nationalistic light while turning their attention away from local government. If the frame continues to be present and reaffirmed in the Chinese news media, there is a necessity to worry that climate change mitigation may become a central issue of conflict between the two superpowers.

This study has offered a picture of the social construction of climate change in the changing climate of new media. The landscape of the news media has changed fundamentally in the past decade. To us as human beings, in the era of personal publishing, the course of learning and debating about climate change is the course of learning about how various social institutions interact and about how we, apart from the elite social institutions, are playing an increasingly important role in constructing the reality surrounding us.

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APPENDICES

Appendix A. Coding Protocol

Coding Protocol for the Analysis of USA & China Climate Change Coverage 2005-2008

This study tries to identify various frames in the news coverage of climate change in traditional news media and blogs in the U.S. and China from 2005 through 2008.

The following steps should be taken in the content analysis coding describe below:

- (1) Read each story multiple times if necessary to fully understand it.
- (2) Answer the following coding questions by entering necessary information or checking appropriate options.
- (3) If the coding protocol (in brackets) does not seem clear enough to help you code the story, stop coding immediately and contact the author of this study (Tommy Xie, 618-303-8805, tommy.xie@gmail.com) to discuss the problem.
- (4) Turn in the coding sheets, and your coding will be compiled into a spreadsheet for data analysis.

Thanks!

Procedure

V1. Story Identification

[Leave it blank, because the author will compile all coders' coding in one spreadsheet later.

V2, text file name, will serve as a unique identifier for your part of coding temporarily.]

V2. Text file name: _____

[Enter the file name of the story you are coding. Make sure it is in a YEAR_COUNTRY_OUTLET format]

V3. Country: [Choose the country where the story was published]

1. U.S.
2. China

V4. Outlet: [Choose the outlet where the story was published]

1. Newspaper
2. Blog

V5. Year: [Choose the year when the story was published]

1. 2005
2. 2006
3. 2007
4. 2008

V6. Episodic vs. Thematic Framing

[An episodic frame describes a news piece predominantly as concrete instance or events (similar to a case study). A thematic frame describes issues more generally either in terms of collective outcomes, public policy debates, or historical trends. This variable is measure at the interval level. Use a word processing program, if necessary, to count the number of words devoted to describing and discussing a concrete instance or events, and divide the number by the total words of the story (excluding by title, byline, etc).]

if $0 < X < 25\%$, then choose (1) strongly thematic

if $25\% < X < 50\%$, then choose (2) moderately thematic

if $50\% < X < 75\%$, then choose (3) moderately episodic

if $75\% < X < 100\%$, then choose (4) strongly episodic

[V7 – V10 are variables measuring micro-issue salience. They may co-exist in a story even though they are mutually exclusive at the conceptual level. Note that proposals and speculations are also counted. For example, not only consequences that already happened but also speculations on possible consequences will count for V7. For causes, known causes and hypothesize ones both count. Likewise, developed, developing and proposed remedies will

count.]

V7. Definition

Does the story discuss what climate change is?

Yes (1) No (0)

V8. Cause

Does the story describe or discuss the causes of climate change?

Yes (1) No (0)

V9. Morality

Does the story describe or discuss moral judgment regarding climate change?

Yes (1) No (0)

V10. Remedy

Does the story describe or discuss the remedies for climate change?

Yes (1) No (0)

V11. Mitigation Boundary (Code if V9 = 1)

What is the primary type mitigation discussed in the story? [Choose the one taking up more story space (measured by number of words). A story that generally talks about an international program or treaty should fall into the third category. However, a story that addresses how the native country actively lead or participate in an international program or treaty should be code as 1]

1. Domestic mitigation that is accomplished, being executed, or being developed.

2. Foreign mitigation that is accomplished, being executed, or being developed.

3. Mitigation that is accomplished, being executed, or being developed, but cannot be identified as domestic or foreign.

[V12 – V17 measures the prevalence of user-generated frames.]

V12. Conflict

a. Does the story reflect disagreement between or within individuals, governments, political parties, social groups, and scientists regarding climate change?

Yes (1) No (0)

b. Do individuals, governments, political parties, social groups, and scientists reproach each other (between or within groups)?

Yes (1) No (0)

c. Does the story refer to two sides or to more than two sides of the issue regarding climate change?

Yes (1) No (0)

V13. Human interest

a. Does the story provide a human example or “human face” on the issue regarding climate change?

Yes (1) No (0)

b. Does the story employ adjective or personal vignettes that generate feelings of outrage, empathy-caring, sympathy, or compassion?

Yes (1) No (0)

c. Does the story emphasize how individuals and groups are affect by climate change?

Yes (1) No (0)

d. Does the story go into the private or personal lives of the actors?

Yes (1) No (0)

V14. Non-human interest

a. Does the story describe non-human nature (geographic terrains, animals, etc) affected by climate change?

Yes (1) No (0)

b. Does the story describe climate change has been or will be reshaping non-human nature?

Yes (1) No (0)

c. Does the story describe how non-human nature has been and will be negatively changed by factors derived from climate change?

Yes (1) No (0)

V15. Morality

a. Does the story contain any moral or ethic message regarding climate change?

Yes (1) No (0)

b. Does the story make reference to humanistic or religious morality regarding climate change?

Yes (1) No (0)

c. Does the story offer specific social prescription about how to behave to deal with climate change?

Yes (1) No (0)

V16. Economic

a. Is there a mention of financial losses or gains related to climate change now or in the future?

Yes (1) No (0)

b. Is there a mention of the costs/degree of expenses involved?

Yes (1) No (0)

c. Is there a reference to economic consequences of pursuing or not pursuing a course of action to combat climate change?

Yes (1) No (0)

V17. Responsibility

a. Does the story suggest that any of the parties (governments, individuals, social groups, corporations, scientists) has the ability to alleviate negative impacts of climate change?

Yes (1) No (0)

b. Does the story mention any of the parties' (governments, individuals, social groups, corporations, scientists) contribution to mitigating climate change, such as scientists' discovery related to mitigation, individuals' environmental advocacy, or governmental policy change?

Yes (1) No (0)

c. Does the story suggest that any of the parties (governments, individuals, social groups, scientists) has the responsibility to deal with climate change?

Yes (1) No (0)

[V18 – V22 identify the prevalence of attribution of responsibility to specific groups (code if the answer to any of questions under V16 is yes)]

V18. Individual responsibility frame

a. Does the story suggest that individuals have the responsibility to mitigate climate change?

Yes (1) No (0)

b. Does the story suggest that attitudinal or behavior change of individuals is necessary to deal with climate change?

Yes (1) No (0)

c. Does the story mention endeavors of individuals to fight climate change?

Yes (1) No (0)

V19. Government responsibility frame

a. Does the story suggest that government(s) (domestically or internationally) has the responsibility to mitigate climate change?

Yes (1) No (0)

b. Does the story describe government's contribution to climate change mitigation, such as policy change, funding research programs, etc?

Yes (1) No (0)

c. Does the story describe what government(s) can do to help alleviate the negative impacts of climate change?

Yes (1) No (0)

V20. Industry responsibility

a. Does the story suggest that corporations have the responsibility to mitigate climate change?

Yes (1) No (0)

b. Does the story suggest that production or practice changes of corporations are necessary to deal with climate change?

Yes (1) No (0)

c. Does the story mention possible measures that corporations can take to help mitigate climate change?

Yes (1) No (0)

V21. Organization responsibility

[The definition of organization in this study is restricted to not-for-profit organizations unaffiliated with government, industry, or the scientific community (e.g. environmental groups). Protests or rallies, if there is no mention of organizing groups, is counted as individuals, not organizations. Otherwise, count them as organization responsibility.]

a. Does the story suggest that organization(s) have the responsibility to mitigate climate change?

Yes (1) No (0)

b. Does the story mention endeavors of the organization(s) to fight climate change?

Yes (1) No (0)

c. Does the story mention what the organization(s) may do to help mitigate climate change?

Yes (1) No (0)

V22. Scientist responsibility

[Individual scientists and scientific research organizations (e.g. IPCC) both count as scientists]

a. Does the story suggest the importance of scientific discovery to the mitigation of

climate change?

Yes (1) No (0)

b. Does the story emphasize the scientific discussion on mitigating climate change?

Yes (1) No (0)

c. Does the story mention how advancement in science may help mitigate climate change?

Yes (1) No (0)

V23. All human responsibility

a. Does the story suggest that all humans in general have the responsibility to mitigate climate change?

Yes (1) No (0)

b. Does the story suggest that attitudinal or behavior change of all humans is necessary to deal with climate change?

Yes (1) No (0)

c. Does the story indicate that the responsibility transcends geographic and political boundaries?

Yes (1) No (0)

V24. Government Boundary

[Code if V19 > 0; the UN is coded as international governments; international cooperation initiated by governments of different countries is coded as international governments]

The article attributes government responsibility to

(1) Domestic government (2) Specific foreign governments (3) International governments

V25. Skepticism

[Skepticism is measured at the interval level. Choose one of the following options. A very brief mention of skepticism (e.g. “although skepticism remains...”) does not count as a balanced account and therefore falls into the first option below.] Skepticism is defined as an attitude of doubt toward any of the following areas: a. the existence of climate change, b. the anthropogenic nature of climate change, c. validity of the scientific research on climate change, d. individual, corporate, governmental or organizational interests to promote the seriousness of climate change. Note that mention of skepticism should not be the only thing to look at for this item. Rebuttal articles that mention opposite views should be coded according to the authors’ views, not the “straw man.”

1. The story has little to no endorsement of skepticism.

2. The story describes skepticism as only one side of a relatively balanced account.

3. The story expresses skepticism almost exclusively

Appendix B. Screen Capture of the Coding Program

Climate Change Coverage Coding System v. 0.98 © Tommy Xie 2009

File Name: 2005_USA_001

Country: US China

Outlet: Newspaper Blog

Year: 2005 2006 2007 2008

MEMO: reference to China

E vs. T: Strongly Thematic (0-25%) Moderately Thematic (25%-50%) Moderately Episodic (50%-75%) Strongly Episodic (75%-100%)

Mitigation Type: Domestic Mitigation Foreign Mitigation Unidentifiable

Definition: Yes No

Cause: Yes No

Morality: Yes No

Remedy: Yes No

Conflict_A: Yes No

Conflict_B: Yes No

Conflict_C: Yes No

Human_A: Yes No

Human_B: Yes No

Human_C: Yes No

Human_D: Yes No

File Name	MEMO	Country	Outlet	Year	E vs. T	Definition	Cause
2005_USA_001	reference to	1	1	1	1	1	1
2005_USA_002		1	1	1	1	1	0
2005_USA_003		1	1	1	3	1	0
2005_USA_004		1	1	1	4	1	1

Record: 1 of 50 | No Filter | Search

VITA

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People's Republic of China, 2005-2008

Major Professor: Dennis T. Lowry

Publications:

Dennis Lowry & Lei Xie (2008). "Curriculum Convergence from the Employer's
Perspective: An Analysis of Required Entry-Level Job Skills for Advertising, IMC,
and Interactive Marketing Graduates" Journal of Advertising Education (Fall 2008)

Referred Papers:

Lei Xie (2004). "Does reality TV strengthen the cultivation effect?" Paper presented to the Global Fusion, October 2004, St. Louis, MO, U.S.A

Lei Xie (2006). "A Cultural Comparison of Weblog Dependency and Credibility in Mainland China and the United States" Paper presented to the 12th Annual Conference and International Symposium of Association of Chinese Professors of Social Science, October, 2006, Buffalo, NY, USA.

Lei Xie (2007). "Nonjournalist Webloggers vs. Mainstream Media: Putting the Missing Puzzle Back to the Picture" Paper presented to the Annual Meeting of the International Communication Association, May 2007, San Francisco, CA, USA.

Dennis Lowry & Lei Xie (2007). "Agenda-Setting and Framing by Topic Proximity: A New Technique for the Computerized Content Analysis of Network TV News Presidential Campaign Coverage" Paper presented to the Annual Meeting of the International Communication Association, May 2007, San Francisco, CA, USA.

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Dennis Lowry, Lei Xie, & Oliver Witte (2008). "Agenda-setting and Rhetorical Framing by Semantic Proximity: A New Computerized Approach to the Analysis of Network TV News" Paper presented to the Annual Meeting of Association for Education in Journalism and Mass communication, August 2008, Chicago, IL, USA.