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Climate change in popular magazines: The role of long form journalism in communicating 'the most important issue of our time'

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CLIMATE CHANGE IN POPULAR MAGAZINES:

THE ROLE OF LONG FORM JOURNALISM IN COMMUNICATING 'THE MOST IMPORTANT ISSUE OF OUR TIME'

by

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Abstract

Nettles, Katherine Doan (M.A., Mass Communication Research, Journalism and Mass Communication)

Climate change in popular magazines: The role of long form journalism in communicating 'the most important issue of our time'

Thesis directed by Assistant Professor Deserai A. Crow

This study investigates the previously unstudied role that popular magazines, as a form of soft news, potentially have in framing climate change debates, by carrying messages about the issue in ways that traditional media research has overlooked. This is done using content analysis to identify frequency of coverage and framing themes of climate change existence, causes, implications, and solutions.

With monthly circulations as high as 23 million per magazine, and a diverse audience that includes the American working class, magazines in this study vary widely across genres in their coverage and presentation of climate change from framing, sourcing, and policy evaluation perspectives. Over the one-year period measured, fewer than half of the 48 publications analyzed covered the topic at all, and those that did cover it did so with cursory treatment more often than not. Framing themes suggested that scientific consensus was favored, controversy avoided, often in favor of discussing the challenges and complications that lay ahead, and public policy was focused on more than reliance on voluntary actions for mitigation and adaptation. These findings indicate that climate change remains low on the soft news media radar, but that the topic may be undergoing a subtle but hopeful paradigm shift away from controversy toward solution.

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Introduction

When AARP Magazine ran a brief article in November 2010 about various benefits of geo-engineering versus carbon taxes to mitigate climate change (Anft, Carlson, Dudley, and Manjoo, 2010), it was delivered to an audience of more than 23 million people (Audit Bureau of Circulations, 2011). Similarly, the high circulation of many popular magazines demonstrates the power of this mainstream medium to reach the public and distribute messages about important issues and events. Closer examination of how magazines represent important issues can be useful to many perspectives in media studies. These approaches include framing theory, agenda-setting theory, attention cycle theory, and that of public opinion formation. This study identifies the relevance of each of these, but focuses in particular on both framing and agenda-setting theory.

For decades, media studies have investigated the role of media upon public opinion. The ways in which the press can influence public opinion are complex and varied, and how much media influence public opinion is difficult to determine. Yet repeated studies have found a strong relationship between what people read and how they think (McCombs and Shaw, 1972, McCombs, 2006) about subjects covered in their reading material. Media have a fundamental role in translating complex and challenging issues for the public and for giving certain issues more salience with readers by focusing more on them (McCombs and Shaw, 1972). Media are not the only form of influence on an individual's opinions, but often validate and reinforce pre-existing ideas people have about issues (Achen, 1975). The amount of news coverage and overall use of framing is strongly related to public opinion (Zaller, 1992).

Media have also been identified for their role in agenda-setting. Public opinion, as influenced by media (and other factors such as personal experience and world views) has been recognized as a driving force for public policy through several routes. In some cases, elite policy leaders mobilize support for a policy, and often arise from the general public as opinion leaders (Zaller, 1992). Elected officials in a democracy work to represent issues set by policy, public, and media agendas—and often the issues upon which they focus are those to which the electorate exposed through media and care about most (Lippmann, 2004). Environmental issues in particular are a useful topic with which to analyze media theories, because regardless of how climate change is ultimately set within the public policy agenda, it remains relevant to the public in various ways (Downs, 1972). Understanding how media plays a role in this chain is vital, as issues covered by media may frequently translate into what people think is important (McCombs and Shaw, 1972). With the democratization of privilege (Downs, 1972), climate change presents a growing threat to regions around the world, and to the very way of life to which many people have become accustomed. Because of the international importance of climate change as a political and social issue, it is vital that media research continue to examine public opinion, agenda setting, and media framing approaches to it and thereby gain further insight about the issue's complex implications in democratic society.

Popular magazines have not been recognized significantly for their part in bringing news and issues to the attention of the public, but the case can be made that they are a form of soft news, and therefore a powerful medium for communicating stories and issues to people. Soft news has been identified for its role in "bringing forth themes of justice, power, morality, crisis, and human

impact by using human-interest framing to piggyback complex policy-related information upon entertainment," (Baum, 2002, 94). Magazines are particularly suited to this effect with their use of vivid imagery and graphics, stylistic writing, popularity, and cultural commentary. The importance of all media in forming public opinion as a cumulative effect of informing individual readers has been established by mass communication studies. Soft media have been recognized for their capacity to expand issue awareness of the inattentive public as a byproduct of their passive consumption, and in turn to influence policy makers (Baum, 2002, 93).

Daily newspapers such as The New York Times, Wall Street Journal, Washington Post, and L.A. Times have been studied for their role as hard news media, bringing important issues to the attention of the public, and for framing those issues in particular ways. These newspapers are a part of the prestige press (Boykoff, 2004), with target audiences who are well informed and politically active in relation to the rest of the American public. To a lesser degree, magazines that belong to the prestige press have also been studied for their contribution to an informed public. These include Time Magazine and Newsweek Magazine. Popular magazines and tabloids have not been studied with the same focus in the field of mass communication research, although they appeal to a much wider audience and cover a broad range of topics and important domestic issues. Journalistic norms such as balanced reporting (Bennett, 1996, Boykoff 2004) are less applicable in soft news, because long-form journalism is by nature more subjective and not held to the same standard of facts only. Magazines have the benefit of more editorial freedom. The long-form style of magazines also allows them to delve deeper into particular issues or events and to extend

research, newsgathering resources, and editing further than a daily newspaper covering the latest news can afford. This medium warrants inclusion within research studies for its soft news value and coverage of major issues.

Pew Research has found a skeptical public on the subject of anthropogenic climate change (Newport 2010; Pew Research 2012), with only 47% of the public making the connection between a warming climate and human causes, even when recognition of climate change is near 67%. Pew has also found an erosion of public support for national policies to mitigate climate change, despite scientific consensus to the contrary. Studies conducted by Maxwell Boykoff and colleagues have shown that scientific consensus about climate change is sometimes misunderstood and misrepresented by the media (Boykoff, 2007), which may be partly responsible for the public's lack of enthusiasm for national or international policy, and for the legislative failure to act. Anthony Downs established in his issue attention cycle theory that public attitudes and behavior are influenced by both "the nature of certain domestic problems and in the way major communications media interact with the public," (Downs, 1972, p. 39). Millions of Americas turn to media for information and perspectives on complex public issues such as this (Leiserowitz, 2009), which calls to attention the continued need to study how the many forms of media frame and cover climate change.

Magazines remain an established and widely popular medium appealing to many generations of citizens, including those otherwise unengaged in news and current events. Yet magazine publications have been largely ignored for their role in climate change discussions. The highest monthly circulations range from 2 million to more than 23 million per magazine (ABC Reports 2011), while

the highest daily circulations for the prestige press ranges from 616,000 for the LA Times to 2.1 million for the Wall Street Journal (Beaujon, 2010; Peters, 2011). The audience and its interests may also differ dramatically between the prestige press and non-news or soft news press. To better understand how media portray this critical issue of science and how it may influence public opinion and policy, the popular magazine medium warrants further analysis for its own framing of the climate science and policy debate.

The literature presented above and the study presented in this thesis endeavor to better understand how the public may be presented with information about climate change through the medium of soft news, and why it matters. This study explores the premise that a public informed about climate change implications and policy recommendations can influence how government acts to respond to this threat. It continues with an inquiry as to how the popular press contributes to the body of information distributed to the American public. Specifically, how do magazines as a particularly powerful and popular tool of communication weigh in on the matter? Can a particular media agenda on climate change be identified in American popular magazines? An audience demographic and content analysis of popular magazines during a one-year time period is carried out for the purpose of discovering this, and a discussion of the results suggests there is much to learn of this medium and its framing of the issue.

How this paper is organized

This paper reviews prominent previous literature discussing the function of media in a democracy. This includes media's function within the agenda-setting

process of public opinion and policy. It reviews the history of framing as it relates to media and the ways in which framing has been applied in particular to magazine studies, then examines agenda setting theories of media, the issue attention cycle theory, the influence of soft news and, and the nature of public opinion—and why these are important to policy making. Previous studies of media coverage on climate change are discussed for their demonstration of cycles of increasing and decreasing coverage during specific periods in recent decades. The literature then addresses the role the U.S. media have had in reporting on this topic, which include framing climate change as controversial, and related polls showing discordance between public opinion and scientific consensus.

The next section explains the research methods used in this thesis, the history of scientific consensus about anthropogenic climate change, and the potential role of magazines in communicating complex issues. Research questions guide the quantitative and qualitative content analysis undertaken to explore how climate change is covered, and the results are then reviewed and discussed in this context within the analysis, discussion and conclusion.

Chapter 1: The role of media in the agenda-setting process

Edmund Burke declared media as the Fourth Estate, or unofficial branch of democratic government, in 1787 during a parliamentary debate in England. This concept of journalism is long established as a vitally important aspect of public policy agenda setting, and as a means of communicating key issues and events to the public (Schultz, 1998). Previous media research has concluded that a symbiotic relationship between the public, the media, elite policy leaders, and

policy makers exists (Rogers and Dearing, 1988), and find "omnipotent mass media systems as the mechanism linking the public with public policymakers,"(Rogers and Dearing, 1988, p.81). Important to understanding this role that media play are concepts of framing, agenda-setting, public opinion formation , issue salience, the stages of public attention, and the potential of soft news to expand public awareness.

Agenda Research and Agenda Setting

The overall agenda-setting process in the United States, in which certain issues and priorities are chosen over others, is one comprised of media agenda-setting, public agenda-setting, and policy agenda-setting, in which all three components have at least some influence on the others, either directly or indirectly (Rogers and Dearing, 1988). Rogers and Dearing portray mass media as the link between the public and its political leaders in a significant role. The overall components of this in society are demarcated as media, public, and policy. In these terms, an agenda means the issues under consideration or examination by one of the groups in question. The agenda is not identical among the three separate groups, though they often influence one another. Using audience research on issue salience beginning in 1968, McCombs and Shaw established the tendency of readers to learn about issues and also how much importance to attach to those issues from the amount of information provided in the news (McCombs and Shaw, 1972). They noted that information distributed by media is the only contact many people have with politics. That information is chosen by the press (as a result of the media agenda), represents only about 15% of the total potential news material in any given day, week, or month, and tends

to become homogenous among prestige press media (McCombs, 2005). Initial research conducted during the 1964 elections confirmed a high correlation between what messages voters received from the media, and what messages they recalled in systematic interviews (McCombs and Shaw, 1972). This confirmed an agenda-setting function of media, in which unfamiliarity, prominence and repetition of news stories correlated to what issues held the most salience with the audience. Similar studies have been repeated in the time since this seminal study, in different contexts and with similar findings (McCombs, 2005).

This build-up of public issue salience has considerable impact in a democracy. Information that gets more frequent or prominent attention from the media translates into what people think about, discuss with their peers and coworkers, and how they vote. Regardless of political preferences, a strong relationship exists between what media emphasizes and what voters judge to be important, and overall the public reflects the composite of mass media coverage (McCombs and Shaw, 1972). This stage of information transfer aids in constructing public opinion, because it is where information is first presented to people in many cases, and therefore has the most impact on future opinions and decisions (McCombs, 2005). The issue salience among the public is then a key early step in the formation of public opinion and potentially public agenda (McCombs, 2005).

The media agenda that Rogers and Dearing identified shows that attention-getting events and issues are interpreted within the media for their greater meaning. Agenda-setting can be a fluid process with directional changes to and from media, public and policy at any time depending on how news

headlines change. This process of agenda setting hinges on new events and information, and the quantity, frequency and prominence of its coverage, (McCombs, 2005). Despite the initial impact of a newsworthy event, which can cause continuous attention and coverage for a brief time, the timeliness of an event wears off quickly, and issues are ultimately studied more than events surrounding them. A crisis might get attention in the media and then settle into policymaking as an indication or interpretation of a larger problem. For an issue to last longer and hold public interest, it must remain dramatic or entertainment-oriented (Rogers and Dearing, 2006). Media agendas reflect that—something has to sell a headline or feature—and drama gets the attention of the public. Media "gatekeepers" make judgments about the stories of the day and determine which are most important, influencing the interests of others accordingly. These judgments drive content as an issue or event is established over time. Agenda-setting research systematically correlates the quantity of news coverage with public opinion through polls that list the most important news of the day, not only informing media agenda but also demonstrating how quantity of coverage contributes to the public issue agenda. This culmination of research and editorial decision-making defines and establishes the media agenda (Rogers and Dearing, 2006), or the grouping of priorities decided upon by media outlets.

Evidence demonstrates that the media agenda forces events and issues to the forefront of media coverage, and influences the public agenda by giving unfamiliar issues salience and personal consideration through repetition and prominence (McCombs, 2004). When coverage is repeated by multiple media sources, the topic also gains prominence with the public. A common example of this can be noted when media coverage changes a somewhat minor or

inconsequential story into a national headline, and because the media have committed the energy to coverage, the story sticks. The participating media's agendas behind this phenomenon may only involve filling an otherwise uneventful news cycle with content, but salience occurs regardless of the reason, and increases through these mechanisms. This salience helps set issue agendas, whether intentionally or not.

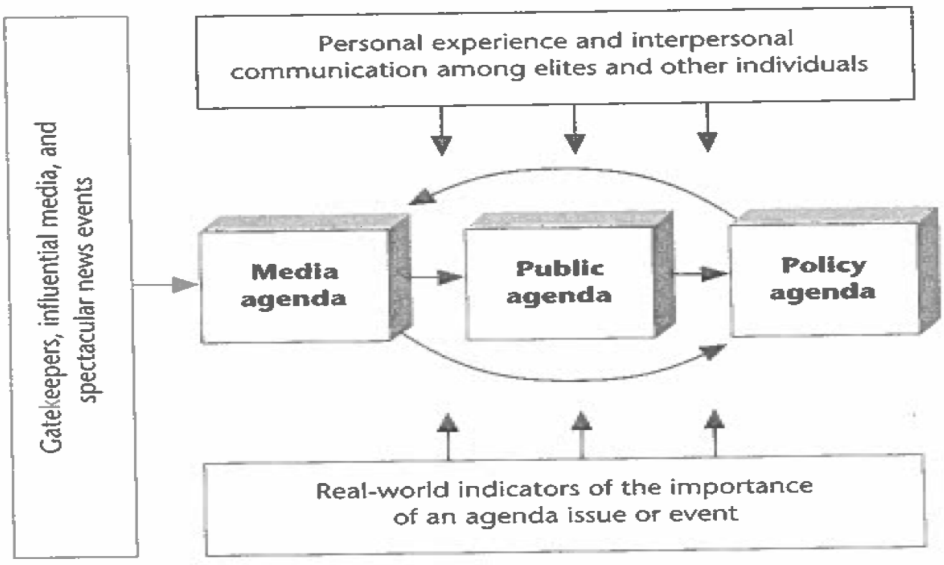
Interpersonal communication and personal experience influence the public as well, particularly when it comes to issues that are already familiar to people. Opinion leaders (or elites) circulate and diffuse ideas throughout culture by way of conversations and public discourse. The earlier theories of media's direct effect on public opinion gave way in the 1950s to the Katz and Lazarsfeld concept of a two-step flow of communication in which media introduce information and prominent members of the public adopt issues to prioritize based upon that information. Opinion leaders are those who become informed about a particular topic they care about as it repeatedly makes headlines, and who then influence friends, family and colleagues with an interest in the issue. Opinion or policy leaders act as liaisons between both public and media by carrying messages between them (McCombs, 2004; Rogers and Dearing, 1988), and Rogers and Dearing describe the agenda-setting process as a mutual, two-way relationship between public and media that is curated by opinion and policy leaders. Consequently, "opinions in a society are first circulated by the media and then passed on via opinion leaders by interpersonal communication," (Graber, 2006, p.84). While individuals gain awareness of issues by exposure to news, the reinforcement of "interpersonal channels are necessary to persuade the individual to adopt the innovation," (Rogers and Dearing, 1988, p.88). An often

cited statement by Bernard Cohen (1963) identifies that the press

> "may not be successful much of the time in telling people what to think, but it is stunningly successful in telling its readers what to think about…The world will look different to different people, depending…on the map that is drawn for them by writers, editors, and publishers of the papers they read," (Cohen, 1964, p. 7).

Public opinion then influences policy agenda, to some extent, as an expanded four-step flow demonstrates. Research recognizes the intricate connections and feedbacks within the agenda-setting process between public opinion or public-agenda, policy-agenda, and media-agenda, as shown in Figure 1.

Figure 1. Three main components of the agenda-setting process: media agenda, public agenda, and policy agenda from Rogers and Dearing, 1988)



Framing theory: The importance of framing, sourcing, and graphic value

Story-telling is a powerful way in which to communicate ideas. Media are known for their ability to inform individuals of the news or issues of the day, but they are also recognized for their power to choose which issues or events are

covered at all and how they are represented (Dreyfus and Rabinow, 1992, Derrida, 2008, Qualter 1985,) through the use of framing. A media frame has been described as "the central organizing idea for news content that supplies a context and suggests what the issue is through the use of selection, emphasis, exclusion, and elaboration," (Tankard, et al., 1991, p. 3). Framing has roots in the social sciences and has been adapted for media research purposes to identify how media portrays meaning by spinning a story in any number of ways to diagnose, evaluate and prescribe (Entman, 1933; Gamson, 1992). Frames operate as a powerful representation of reality, and media framing can suggest what a controversy is about by distilling the apparent essence of an issue for an audience (Iyengar, 1990). Framing can be used to make sense of things based upon the attributes given to an object (Reese, et al., 2001)—an issue, event, person, idea, statistic, or even a question.

This theory of framing as interpretation has converged with agenda-setting theory in recent years as research has identified that framing the objects of an agenda gives them attributes and characteristics which become the mental picture of these objects for people (Reese et al., 2001, Scheufele, 1999). Some object attributes have greater salience than others, creating a flow of some objects to lesser or insignificant roles while others find central roles in media and subsequently public agendas. (Reese, et al., 20001). Different frames can have radically different results on the audience, making framing a powerful tool with which to tell a story. The way in which a political issue is framed among the "multiplicity of interpretations and perspectives" (Iyengar, 1990, p. 20) available can alter individual opinions; when studied in the context of mass media narrative with an audience of millions, it can influence public opinion as well.

"Frames within news stories work to structure the representation of reality…the process by which certain items are highlighted and privileged and therefore become 'more noticeable, meaningful, or memorable'," (Berggreen, 2009, p. 11). McCombs and Shaw refer to this tendency of media to portray issues by selecting certain aspects to highlight over others as second-level agenda-setting, and this is widely accepted (Scheufele, 1999) because "If framing increases the salience of an issue, it will raise the chances of the audience recognizing that issue, processing it, and storing it for future recall in any agenda-setting research," (Kwansa-Aidoo, 2005). This suggests that media "tell us how to think about some objects," (Reese, et al., 2001, p.69) by emphasizing them at the exclusion of others. Emphasis can be manifested using keywords (or lack thereof), phrases, images, information sources, and clusters of information or judgments to achieve a theme (Entman, 1993).

The media play a crucial role when presenting important topics by "giving voice to some viewpoints while suppressing others, and legitimizing certain truth-claims as reasonable and credible," (Anderson, 2009, p.166). Thus, framing inevitably privileges particular perspectives over others in doing the work of simplifying issues through story. This can be done unintentionally, inconspicuously, or go unnoticed by a casual reader. Yet even with subtlety a frame can "eliminate voices and weaken arguments…in ways that favor a particular side without showing an explicit bias," Reese, et al., 2001, p. 96).

Iyengar recognized how media take different forms to frame issues, such as telling episodic news stories rather than policy stories (Iyengar, 1990). Episodic stories emphasize a particular event or person without registering that there is a larger concept going on—and the audience, over time, can receive this

habituated fragmentation or anecdote as the whole story. Iyengar uses as an example media coverage of a protest but omission of the overall social struggle and policy implications involved (Iyengar, 1990), but this can be applied to any issue that is framed by media as a snapshot rather than a full disclosure in all its complexities and ambiguity. Zaller recognized that political messages can be found within media, and that persuasive or cueing messages can involve "subtle or even subliminal messages, and considerations may involve feelings or emotions…as capable of dealing with nonrational appeals and inarticulate feelings as with other kinds of political discourse," (Zaller, 1992, p.41). Stories may dramatize or highlight a particular issue from a dominant perspective without delving into a larger scale perspective or one of a credible but opposing viewpoint—or they may skim over such perspectives without giving them much credence. Hence, messages or morals emerge from story frames.

Persuasive messages can become personal considerations, and build up over time to form opinions. "Much of the power of framing comes from its ability to define the terms of a debate without the audience realizing it is taking place...attention is directed to one point so that people do not notice the manipulation that is going on at another point," (Reese, et al, 1991, p. 97). A process model of framing as developed by Dietram Scheufele describes the inputs, processes and outcomes of framing and identifies four processes: frame building, frame setting, individual-level effects of framing, and the link between individual frames and media frames (Scheufele, 1999, p.114-115). As demonstrated in this model, framing originates from media, societal, and audience inputs, and is processed and perpetuated by frame building and setting through media. Public attitudes and behavior are then influenced or reinforced

by the very inputs media absorb and with which they frame topics. As Reese identified, frames structure our understanding of social and political phenomena by defining the roles varied individuals, groups, organizations, and institutions play. A particular group may be seen as essential in resolving a social problem, or as the cause of it—and as such may privilege a set of goals or ethics over others (Reese et al., 2001). Much like agenda building, this is a dynamic system of feedbacks and cycles, but it identifies the significance of simplifying and filtering the stories people and media share as done through framing.

If framing of an issue can have such an impact on how the public receives the issue, a journalistic duty to take care with the chosen approach seems warranted. However, stories are told in whichever creative, convenient and consumable ways they can be told, and often in the process of simplifying complex ideas or stories, journalists employ an unintended or subtly biased framing. As literature discussed above has demonstrated, all stories must be told within frames, and however unintentionally, the way one news source or medium frames an issue is more likely to be perpetuated by others and become conventional wisdom. Recognizing that framing naturally occurs, and identifying what it looks like is therefore vital in any media deconstruction using textual assessment or content analysis. Framing research within media studies can then take the form of either identifying and analyzing the frames used by journalists or focusing on the individual-level effects of such frames. The latter inherently focuses on individual cognitive effects like those studied by Entman, but cannot determine whether such effects on an individual influence public opinion. The premise that framing can lead to individual-level effects, and ultimately influence the agenda-setting process, is an inherent bias within the framing analysis field

because the end result of this process cannot be easily tested and is not likely to be done within the same study identifying frames as an entry point.

Policy agenda

Media have long been known to perform a major role in the policy agenda setting process (Fortner et al., 2000; Trumbo, 1996, Wilson, 1995, McCombs and Shaw 1972) and are also known to be more influential on attitudes and behaviors when uncertainty exists (Fortner et al., 2006). This indicates that when people are unsure of how to consider an issue, or how to vote either on the issue directly or how to choose a candidate based upon the candidate's position on the issue, media will have persuasive value. As McCombs and Shaw noted, those with political affiliation, or those who do have opinions, will continue to pay attention to the news coverage of the issues that interest them (McCombs and Shaw, 1972, McCombs, 2005). The relationship of public opinion to policy agenda can be found in the two-step flow theory described previously, through interpersonal communication. The issues that gain salience with the public are then indirectly passed on to policy agenda—as demonstrated in the four-step flow theory. This theory allows for additional feedbacks because media also contribute to public policy through relationships with policy makers (Rogers and Dearing, 1988). Evidence indicates that public opinion is important to policymaking, but exactly how is complicated by the other influences of interpersonal and policy-related dynamics (Rogers and Dearing, 1988). It is important to understand the dynamics and nature of public opinion as another key component of the agenda setting process.

Identifying public opinion

It is a cultural value that public opinion in a democracy is important, but studies of public opinion suggest, "citizens have, at most, a general grasp of political issues without having well-developed opinions on every question of public policy…the average citizen has little understanding of political matters," (Achen, 1975, pg. 1218). Numerous scholars have questioned the existence and stability of public opinion. Overall, public opinion is commonly considered amongst mass communication researchers to be inconstant, and for those least informed, fairly impressionable (Achen, 1975). Theorist John Dewey identified the field of communication in the mid-twentieth century as capable of bridging technology and democratizing society by educating people, raising their collective consciousness, and improving their moral compasses (Dewy, 1937). Yet he had doubts about the existence of public opinion at all:

> "Is the public a myth? Or does it come into being only in periods of marked social transition when crucial alternative issues stand out, such as that between throwing one's lot in with the conservation of established institutions or with forwarding new tendencies?" (Dewey, 1937, p. 128).

Dewey's examination of the public led him to predict that its ability to hold an opinion could be improved by media, literally by mediating information as it flowed from the political sphere through the fast-spreading press and into the lives of otherwise distracted or overwhelmed citizens who could enjoy greater potential involvement in the political process (Dewey, 1937). Media theorist Walter Lippmann perceived the public to be a tangible entity, but one overextended and under-engaged, and unable to focus on anything, even briefly, in the larger scope of public life (Lippmann, 1925). He did not believe people in

general had any use for the power attributed to them on a large, political scale, and found them incapable of carrying out their expected democratic role of informing themselves and taking initiative on matters to which they could not personally relate. Lippmann echoed Dewey's concerns that the number of voters continuously declined (despite increasing reliance upon mass media), suggesting a decline in self-efficacy as well. People seemed to hold no ownership or control of society at all, and Lippmann identified the role of policymakers as specialized experts who could represent the public more effectively.

Converse further expanded the study of public opinion with his research of how consistently people engaged with certain issues, and why (Converse, 1964). Converse identified numerous issue publics within the general population, in which people with specific interests or concerns in particular issues know more and pay closer attention to those particular issues (e.g. race, foreign aid, etc.). These issue publics are more likely to be mobilized and drive party elites or issue leaders. "For the truly involved citizen, the development of political sophistication means the absorption of contextual information that makes clear to him the connections of the policy area of his initial interest with policy differences in other areas…most members of the mass public, however, fail to proceed so far," (Converse, 1964, p. 246). The intricacies connecting disjointed aspects in a vast, complex, network of policies are lost on most people. Instead, people seem to depend on elites to drive public policy, who have more consistent belief systems. The elites both contribute to the public discourse, or 'history of ideas' as Converse refers to it, and make decisions over time based upon the currents of public discourse. These decisions directly affect the public, but the masses do not participate generally in them (Converse, 1964).

Converse had found that inattentive citizens' individual opinions change often, even in the short-term, and the more knowledge a person has about a topic, the stronger and more stable his or her opinion is likely to be (Converse, 1975). Therefore, existence of individuals with higher political awareness (which correlates to regular media consumption) "tend to fill their minds with large numbers of considerations [or opinions], and these considerations will tend to be relatively consistent with one another and with the citizens' predisposition. Less aware persons will internalize fewer considerations and will be consistent in doing so," (Zaller, 1992, p.52).

This seems to mean that among those who are less aware of news and/or politics, neither opinion and policy leaders nor media might effectively inform them in the short term of the issue attention cycle. Inattentive citizens are characterized as uninterested in news and politics in general, and therefore susceptible to the changing currents of culture. Opinion studies have found that the correlation between what a typical American thinks about an issue in one year and what he will believe two years later to be quite low (Converse, 1964), and that charismatic leaders, social groupings, and immediate experience (e.g. work, family, or friends) could both narrow belief systems and alter them (Converse, 1964; Zaller, 1992). Belief systems could be readily reinforced, and held onto even at the prospect of new information. Such cases require elites or semi-elites to sound an alarm and change belief systems (Converse, 1964). Elites, of course, are informed by media (Zaller, 1992).

Converse argued that the high correlations for political party affiliation, news consumption and opinion stability show that opinion consistency is possible for people, but that it "simply does not occur for broad policy issues,

since most voters find them meaningless and give a random response," (Achen, 1975, p. 1219) It has been suggested that those demonstrating higher opinion variability have less concern for the issues involved (Achen, 1975). Achen also examined the public opinion and built upon the work of Converse. He found the public in general to be constrained in a set of beliefs structured by personal experience. This public is knowledgeably unsophisticated, and at times incapable of answering policy-based survey questions for lack of familiarity with the subject (Achen, 1975). He discovered that citizens' opinions did not necessarily change as easily or often as Converse's research had suggested; rather, an inattentive public may be fairly stable and coherent in its opinions, however uninformed. He found that this remained less so than for informed citizens, but not to the extent previously indicated (Achen, 1975). This still suggests that public opinion is more moveable than that of the prestige press and readership. Achen found similar results of voter instability even among informed citizens, but not to the extent that Converse had found (attributed to survey model inconsistencies). The more educated people were, the more they held similar views over time. If an audience was not well versed on an issue, it appeared more easily persuaded to behave in certain ways, or the think about issues in a new way—but not by much. "most of the time, the voters adopt issue positions, adjust their candidate perceptions, and invent facts to rationalize decisions they have already made," Achen, 2006). In the case of constrained belief systems, interpersonal experience and communication will prevail and media influence is not as influential.

Zaller's later studies of how information is acquired by media and then converted into public opinion found that most politics in the United States do not

reach out to or engage the average citizen (Zaller, 1992). The public finds political issues to be contentious, confusing, and tedious, so people are indifferent about the details of them—even though the democratic model suggests an actively involved public. “The stakes are theoretically high, but people find it hard to stay interested,” (Zaller, 1992, p.47). Instead, information persuades people with little political awareness using powerful messages and images.

The media agenda can influence public opinion by way of informed groups of individuals who have consistent beliefs and mobilize to advocate for particular issues, and by way of issue publics who are mobilized by elite policy leaders. Citizens look to media, elites, and policy leaders, and the latter two mobilize others in support of specific issues that matter most to them in particular (Zaller, 1992). Ultimately the media agenda affects the public policy agenda through the people it reaches, whether elite or en masse, by combining with framing, or portrayal of stories, to form knowledge. This notion of “how people form an acquaintance with information” and how that knowledge and opinion formation leads to public opinion (Rogers and Dearing, 1988, p.83) is perhaps the reason for media’s role as the gatekeepers of society.

Those who do form an acquaintance with news most often are more likely to become elite issue or policy leaders, informing friends, family, and co-workers about current issues and thus influencing public opinion. Mass media is the link between the public and political leaders, interpreting policy and issues to the public and interpreting issues to elites and policy makers. Policy makers have a vested interest in the public opinion that they represent, and agenda building is "a process through which the policy agendas of political elites are influenced by a

variety of factors, including media agendas and public agendas." (Rogers and Dearing, 1988, 81).

The issue-attention cycle

The ways in which media agenda can affect the public interest in various issues have been studied at length, and one way to describe them is by using an issue attention cycle theory (Downs, 1972, p.38). Anthony Downs argued that complex public interest issues have an attention cycle within the news and media. Five common stages of public interest can be identified, which in Down's theory reflects both the nature of domestic problems and the way media and the public interact. A problem becomes apparent, receives coverage from various forms of media, and gets a great deal of attention and support from the public. Policy-making follows the public concerns, and then at a certain point the media and public (and therefore policymakers) move on to other issues—often prematurely. This happens despite the former issue's persistent challenges, and poses a continued struggle for those attempting to maintain focus and support in solving the problem.

In the first, pre-problem stage, a problematic condition exists and is often on the radar of experts and interest groups. In the second stage, Downs describes an alarmed discovery of the problem and confident enthusiasm for solving it. This is often ushered in by a "trigger" event, such as a disaster or scandal, and brings notoriety to the problem on a national or even global scale. The third stage is the point when people realize the actual cost of solving the problem, which can require a major restructuring of society or a major inconvenience or sacrifice made by millions.

Next comes a gradual decline of the initially intense public engagement, as people lose interest and media take notice of how their coverage of the problem is no longer popular. Downs suggests that often people feel threatened by the problem and suppress thoughts about it, or become bored with it. He also explains that usually another problem enters the public awareness (because the media agenda changes) and claims more attention. Downs refers to the fifth stage as the post-problem stage. The formerly center-stage issue moves into limbo, but still benefits from the measures taken during the alarmed discovery phase in some ways—particularly where organizations and regulations have been established for its sake. Because it has already been in the public eye, the issue also has a higher probability of being (temporarily) retrieved for renewed attention, either as a related issue to something else in phase two, or as a fragmented problem. An example of a fragmented problem might be environmental degradation, which has many complex aspects with different policy and solution paths.

Downs finds that several characteristics of all problems which get "discovered," or make it onto the media agenda and go through a public interest cycle. First, most high profile issues are ones that only affect a small, and often underprivileged, portion of the population. Second, the majority does not suffer from it to the same extent, and may even benefit from it. This keeps the majority from maintaining focus (or agenda) on the issue, since high profile issues also benefit a large or more powerful group by subtle social arrangements. Third, such issues do not tend to have intrinsically exciting qualities. This last condition means that generally, the public interest will fade.

Although it may appear that the environmental movement has or is progressing through this cycle, many fragments have entered or even revisited the early stages of public interest since Downs first published this theory in 1972. Downs estimated that the environmental movement was nearing the end of the third cycle in the 1970s, where the cost of solving problems gives way to disinterest. But he also recognized that the persistence of new environmental issues, which may never end, as well as their fragmentation into more specific areas, and the ways that environmental degradation affect the powerful and influential groups of society that seek conservation as a way to engage the public arena, all ensure that the environmental movement will never truly cycle out of public interest as many other issues do. Once an issue goes through the cycle, it can be resurrected in part or attached to other issues more readily, creating micro-cycles.

The influence of soft news

Previous studies have examined how soft news brings foreign policy and other issues to the inattentive public, one different from the prestige press' elite public readership, and allows consumers to learn passively or even accidentally about issues with which they are unengaged (Baum, 2002). Research points out that the coverage, though not always frequent or in-depth, is significant in a different way, namely, with dramatic, sensationalistic human-interest framing. "Where traditional news outlets typically cover political stories in manners unappealing—either too complex or too arcane—to individuals who are not intrinsically interested in politics," soft news might bring up more general themes of justice, morality, power, and "human-impact" (Baum, 2002, p. 94).

Baum discusses the method of "piggybacking" political information on entertainment-oriented programs, thereby allowing for viewers to learn passively or even "incidentally," (Baum, 2002, p. 96). His concern is whether piggybacking can be done effectively, and he argues that this entails attaching political information without increasing the mental cost of paying attention.

Substantial research has shown that public opinion can, at least sometimes, influence policy outcomes, including in foreign policy; and even minimal attention to politics through the mass media disproportionately increases partisan stability in voting (Baum, 2002). Baum credits "soft news media" with increasing the attentiveness of the general public in some cases, and he suggests that soft news media might therefore especially expand the size of the attentive public in times of crisis and influence policymakers. This suggests potential for significant impact from soft news coverage of politics and domestic issues. "Indeed, while viewers of many of these programs are not among the most politically engaged Americans," (Davis and Owen 1998), low-attention individuals do vote in significant numbers… the soft news media appear to have, to some extent, "democratized" foreign policy," (Baum, 2002, p.106).

This can be identified as both a challenge and a call to duty for America's political leaders.

> "Leaders must reformulate their messages in terms that appeal to programs preferred by these politically uninterested individuals. The rise of the soft news media also offers an opportunity, because, to the extent that they are able to adapt their messages accordingly, soft news outlets allow leaders to communicate with segments of the population that have traditionally tuned out politics and foreign affairs entirely. This may allow future leaders to expand their support coalitions beyond the traditionally attentive segments of the population," (Baum, 2002, p. 106).

Because soft news media frame content as "compelling human dramas," such as celebrity gossip, crime, and disasters, it can be used to deliver information about some political issues (Baum, 2002). Other scholars have called for the investigation of other forms of mainstream media for their role in covering important topics and influencing the public as well:

> "A multiplicity of gates means that agenda-setting researchers can no longer depend on the mainstream media and their gatekeepers (the traditional news sources), and also the format of news, in trying to determine the media agenda. What practitioners must do then is look to the myriad of other news sources and formats such as the Internet, cable and satellite television, radio, current affairs programs, talk shows, radio call-in programs and conservative periphery publications," (Kwansa-Aidoo, 2005, p. 46).

Rogers and Dearing concluded that many issues which truly affect people never get media coverage, while often events that raise human-interest alarms, such as tragic and dramatic accidents, get priority because they are easy to sensationalize and sell. This is certainly true in mainstream media. Increasingly, soft news may provide knowledge as an incidental by-product of entertainment (Baum, 2002). Sometimes both the medium and the message are different from traditional news outlets. But different media offer additional venues for people so the media can be tooled for different purposes to reach the largest audience, and sacrifice the in-depth material for more appetizing basics.

Other studies of soft news mediums has also raised questions about whether otherwise uninformed audiences may receive messages that overly inflate their sense of political knowledge (Baumgartner & Morris, 2006), which suggests these type of media are worth studying further for their messages about and framing of important issues. Many have argued that soft news threatens the integrity of the democratic process by overemphasizing trivial events,

downplaying significant public affairs issues, and oversimplifying the complex reality of these issues (Baumgartner and Morris, 2006).

Journalistic norms

Researchers have established several journalistic normative behaviors that often guide and encompass reporting of complex issues and events. These include balanced reporting, framing, and sourcing methods. Balancing opposing sides of an issue is a common journalistic approach to covering controversial stories without demonstrating bias (Boykoff and Boykoff, 2004). As Boykoff and Boykoff demonstrated in their studies of how balanced reporting of climate change portrayed a false bias against scientific fact, this approach is flawed when used as a normative behavior without just cause. Yet this happens in a newsroom when journalists are under time constraints and lack expertise in the subject matter.

Framing of an issue is another pitfall of journalism which often goes unnoticed. “Framing selected aspects of a complex story and simplifying it, focusing on just one part of the story…to pinpoint the most compelling aspect,” (Berggreen, 2009, p. 12) also means choosing what to emphasize, and is left to the evaluation of the writer. Kovach noted this power of the press when acknowledging that "correspondents, editors, pundits, and publishers who work for major media outlets tend to see themselves as members of an opinion-making elite,” (Kovach, 1996, p. 169). In the name of objectivity, journalists may avoid absolute or obvious evaluations, but this too can keep an untrained journalist from clearly stating what is fact due to lack of confidence or expertise. There is also the journalistic tendency to use elite sources for not only quotes or perspectives, but even for the

majority of information on a subject. The "reliance on routine channels such as press releases and press conferences, for their convenience, efficiency, and seeming credibility," (Sigal, 1999, p. 234) and on routine sources who become somewhat typecast as the expert on a given subject homogenizes the way that subject is covered across different media and does not necessarily accurately represent unbiased truth. It is important to recognize the presence of such norms when assessing how media cover important and controversial topics, as they will not all do so in the exact same way but may exhibit overall tendencies and propagate misconceptions among the public. These norms can contribute to the general way a subject is framed within the overall public agenda, if agenda-setting research is given credence.

Studies have found that in low public involvement conditions, in which people are not fully engaged because discourse is tedious or uninteresting, people tend to engage in peripheral messages and ignore the fundamental quality of arguments in favor of source credibility," (Zaller, 1992, p.47). Peripheral cues of the political affiliation, religious affiliation, employment sector, and fame or success of a person advocating for a position are taken into consideration much more than the substance of their position. This is based on real-world cues, in which people respond to external cues when presented with new information (Zaller, 1992, p.27). Graber identified that the gate-keeper effect of media is most powerful when journalists preside over the framing and interpretation of the news, assembling information packages with visual and printed data to be transmitted to a captive audience (Bennet & Entman, 2001).

Summary

Many readers in America receive information about complex issues from the media, and agenda setting research shows a link between what people read about and what they think is important. Public opinion is thought to be at least somewhat susceptible to media coverage, and is necessarily based upon the framing and quantity of material provided by media as the gatekeepers of political and news information. The amount of time an issue holds salience in public opinion depends on framing of that issue, and depends on the overall media agenda as well. In turn, media drives public policy, whether by way of public opinion, opinion leaders, policy elites, or a combination of them. When an issue comes to the attention of the media and then the public, the window of time during which policy focus is maintained is precious. If an issue is framed as uncertain, controversial, or unimportant, that window may close without effective policy measures. Even if the attention span of the public—and media—can be maintained, it may cycle through various stages of prioritization depending on what other news and events arise. Soft news can possibly engage readers in the policy process by informing them of important issues as a byproduct of entertainment-oriented consumption.

Better-informed audiences can in turn contribute to the collective public opinion. With this in mind, studies in mass communication research are apt to focus on how all media set agendas for issues of particular relevance, to better understand the role they each play in the scheme of public policy. The study of how media participate in agenda setting in regard to the issue of climate change is especially relevant as policy discussions of it remain controversial and the issue itself presents complex challenges likely to persist for many decades.

Chapter 2: Media representation of climate change

Having explored the nature of media framing and influence upon public opinion as an overall agenda-setting function, as well as the potential influence of soft news on an audience that is not engaged with news topics, the subject of climate change presents an opportunity to study how soft news might make a scientific and newsworthy issue more readily familiar to those who are not otherwise actively seeking information about it. This chapter reviews the scientific basis of anthropogenic climate change studies, the persistent controversies surrounding it, and the media tendencies found in previous studies of climate change coverage all of which make a compelling case for continued and expanded studies of how media portray this significant issue.

Scientific certainties of climate change

According to the Working Group I contribution to the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, greenhouse emissions now far exceed pre-industrial quantities. Greenhouse gasses such as carbon dioxide, nitrous oxide and methane break down the protective ozone layer of the planet and allow both long and short wave solar radiation to penetrate the Earth's surface and remain trapped on land surfaces. The effect is the warming of key polar regions in which immense expanses of glaciers, ice sheets, sea ice and permafrost have undergone what is believed to be the beginning stages of a long-term melting cycle beyond normal, natural seasonal and decadal variations. Receding glaciers and melting land ice is linked to sea level rise, further solar absorption and warming, and increasing sea water salinity. These changes cause a domino effect of complex but interconnected

elements within the Earth's climate system. From disappearing islands and shorelines in some areas to counter-intuitive land rises in other regions, a host of ecological and human habitat vulnerabilities are increasing with a rapidly changing climate (IPCC 2011).

The likelihood of long-term climate changes is fairly high—with varying degrees of extremity according to projected international development, population growth, natural resources management and implementation of alternative energy technology (IPCC 2007). According to IPCC studies, the current trajectory of industrialized nations and emerging markets to maintain or increase greenhouse gas emissions are very likely to lead to accelerated sea level rise, more intense winds and droughts, heavier precipitation events, more common heat waves, fewer cold days and nights, and increasingly intense sea storms (IPCC 2007, Karl 2008). The social, economic, and agricultural impacts of such changes are very difficult to predict, but the U.S. Climate Change Science Program has stated that "Changes in extreme weather and climate events have significant impacts and are among the most serious challenges to society in coping with a changing climate," (Karl, 2008 pg. vii). Such sentiments echo almost unequivocally throughout the field of climate science.

A challenge is presented to scientifically untrained political and media commentary in trying to explain the various aspects of climate patterns and then explaining the "uncertainties and biases" within the models that predict likely changes. Often it seems that the mere existence of uncertainty, even about a subtle nuance, can undermine what is otherwise fairly certain information about climate patterns (Pielke et al., 2007). As Pielke notes, the established scientific method of stating the uncertainty of any research results is easily misconstrued

as general scientific uncertainty due to public misinformation, and scientists are increasingly being coached in public relations and policy communication due to this pitfall. Climate modeling depends upon hypothetical concepts of different possible global trends throughout the next millennium, including population levels, food production, technology investment, collective climate remediation efforts, and more (IPCC, 2007).

Although the IPCC predicts that the next millennium will be subject to climate change, aggressive policies can help slow the process and modify the extremities of long-term climate change and environmental disaster we face (IPCC 2007). This would be a challenging economic change for the carbon-producing industries, but it would allow for what remediation is still possible. Environmental disasters are economically ruinous to individuals, regions and governments. As policy makers balance economics, present and future human welfare, and environmental viability, they look to public opinion and support. Hence these very issues in many contexts may be framed within popular narratives and thus influence the public and, in turn, the international stage, in ways as yet unmeasured. Throughout the past two decades, concerns about anthropogenic climate change have emerged with increasing urgency from the science community, and experts have hailed the issue as the most important of our time. Environmentalists and media often frame global warming as an issue that will require great sacrifice and expense on behalf of government and individual citizens to resolve (Schellenberger and Nordhaus, 2004). The industries using fossil fuels, which contribute to greenhouse gases, are integral to food and energy production in modern civilization, so the incentive to veer away from their use from both personal and legislative policy perspectives is

challenging, complicated and undesirable to many. This is directly in line with the type of issues identified in the issue attention cycle, in which powerful groups or industries, as well as the majority of citizens, benefit from the status quo. Both the oil industry and oil producing regions of the world have challenged climate science and questioned the viability of energy alternatives or carbon reduction policies, presenting the American public with conflicting and often confusing accounts of the problem. Furthermore, it seems Unites States citizens, though among the most privileged in the world, mostly have bigger, more immediate threats, interests, and concerns, and cannot understand environmental movement values on their own (Schellenberger and Nordhaus, 2004).

Media representation

Many studies have drawn attention to the cycles in reporting climate change over time, as well as the framing themes found at different times. Such studies have provided a baseline understanding of how much and how accurately the prestige press has covered climate change since the late 1980s, when climate change discussions began to surface for the first time in national print media (Anderson 2009). Anderson (2009) and Boykoff (2009) have identified extensive connections between media, politics, and climate change policy ranking on the national and international agenda from the time global warming conversations arose through 2009. While Boykoff's earlier research indicated a commonly used false bias in reporting about climate change, recent studies find that the prestige press has improved the accuracy and frequency of its coverage (Boykoff and Boykoff, 2007). Yet, as recent polls show, public

opinion does not yet reflect this "improvement" (Newport 2010). The audience of the prestige press has demonstrated better understanding of the subject over the past decade (Reynolds, 2010), but this audience of educated lay people only represents a fraction of the overall population.

Media and public interest spiked in the late 1980s, when climate scientist James Hanson made a timely testimony to Congress during a drought and record high summer temperatures that he was confident of long-term global warming trends underway (Anderson, 2009). The speech caught headlines, and that same year, British Prime Minister Margaret Thatcher made a now famous 'green' speech and advanced the international agenda even further (Anderson, 2009). During this time, scholars found that climate scientists were used often as the principal sources for global warming news stories, but soon the scientific discourse gave way to political debate and policy controversy (Carvalho and Burgess, 2005). At the same time, headlines in the U.S. carried balanced opinions about climate science with climate skeptics, which created a bias described as "the divergence of prestige-press global-warming coverage from the general consensus of the scientific community" (Boykoff and Boykoff, 2004, p. 128). The political debates about the existence of climate change that kept the U.S. from coordinating with the efforts of other developed countries to make mandatory commitments to greenhouse gas reduction have been attributed in part to this biased coverage in the media (Boykoff and Boykoff, 2004).

From 1991 and 1996, editorial fatigue and competing issues such as the war in Iraq marked a decline in the issue attention cycle of climate change coverage (Anderson, 2010) and balanced reporting of the science in what coverage there was, despite the 1995 release of the IPCC Report (Anderson,

2010). Following this decline, Anderson identified another short-lived rise in coverage between 1997 and 2003, as the impacts of climate change were discussed surrounding severe local weather patterns, and policy events like the Kyoto Protocol in 1997 generated significant news media coverage. Then, however, another decline occurred as "Alex Kirby, former Environment Correspondent for BBC News, commented:

> 'Alarming or not, climate change is becoming an increasingly hard subject to sell in much of the media ... Editors are simply bored with what they think is an old story they have heard before.' (Anderson, 2010, p. 68).

Last, the mobilization of international policy leader support, the destruction caused by Hurricane Katrina in 2005, the release of Al Gore's climate change film *An Inconvenient Truth*, 2006, and perhaps the attention raised by Boykoff and Boykoff's studies of climate change reporting coincided with a steep rise in climate change coverage. Boykoff and Mansfield studied the United Kingdom tabloid press coverage of climate change during the period from 2000 to 2007, and found that coverage of climate change issues in that medium increased dramatically (Boykoff and Mansfield, 2008). The patterns of increase mirrored those of Anderson's findings, correlating to severe weather patterns, major policy or political events, and the release of *An Inconvenient Truth.* As Anderson noted, the issue attention cycle theory can be used to identify the ebb and flow of this coverage period, but it also limits the perspective to media and public agendas. For the purposes of this study, however, it is noted that other factors of political economy, structural, and cultural nature go beyond this scope of research.

Climate change politicized

As noted throughout media studies of climate change, the subject has become increasingly connected to political ideology. "A storyline of increased uncertainty and debate has arisen in public and policy discourse through such troubles in translating the consensus in climate science regarding anthropogenic influences," (Boykoff, 2008, pg. 41). "Convergent views" have been portrayed as "contentious," within prestige newspapers and television coverage of climate change science, and public opinion polls show an increasing public perception to match, (Maibach, 2011). This indicates a miscommunication of climate science. "Contentious" does not so much describe a scientific debate but rather reflects the heightened political turmoil throughout U.S. policymaking branches today.

If climate change is being increasingly perceived as a political matter, and the public has difficulty understanding political matters, a clear barrier to knowledge and action may exist. Given the complexities of the Earth's climate system, there remain areas of uncertainty within climate science. Anthropogenic climate change has been demonstrated to be "almost certain" (IPCC 2007), but the extent of effects, the timeline of onset, and capacity for reversibility or adaptation are not well understood. These myriad uncertainties relate to how quickly the climate is changing, what levels of carbon dioxide and other greenhouse gases can be tolerated by the climate without drastic consequences, and how climate change will take effect (IPCC 2007, Pielke, 2007, Han et al. 2010).

Despite these uncertainties, which "climate change skeptics" often highlight, a 2008 Gallup poll shows that more than 95% of climate scientists concur that the Earth is in fact warming due to anthropogenic greenhouse gas

emissions (Dunlap, 2008). Yet according to a 2010 poll by Gallup, a record high of 41% of the public believed the seriousness of climate change to be exaggerated by media (Newport, 2010). Boykoff and Boykoff found that US prestige-press coverage of global warming from 1988 to 2002 "contributed to a significant divergence of popular discourse from scientific discourse" (Boykoff and Boykoff, 2004).

Media framing of climate change and public opinion

The first Environmental Protection Agency administrator William Ruckelshaus said, "If the public isn't adequately informed [about climate change], it's difficult for them to make demands on government, even when it's in their own interest" (Ruckelshaus, 2004). Clearly U.S. public opinion and policy interest does not reflect those of the scientific community (Newport, 2010; Saad, 2009). It may instead reflect the ongoing political bickering and controversy reported by media. Gallup polls show that public certainty about anthropogenic climate change and knowledge of scientific consensus have been eroding since 2007 and closely follow political allegiance. In 2006-2007 public alignment with scientific consensus was much higher (Newport, 2010). According to PEW in 2011, the consensus had fallen from 77% to 58% in agreement that climate change is occurring, with 32 to 34% uncertain about or uninterested in the subject (PEW 2011). This appears to be a three-way split about an issue upon which scientists overwhelmingly agree and many consider the most important one of human history.

Public awareness has been eroding, yet climate science is more reliable and results that converge on the same conclusion of anthropogenic warming are

more consistent than ever (IPCC 2007). If climate science is not well understood in general, the slight shades of gray that crop up regarding specific climate and weather patterns might be the cause of further misunderstanding. Messages may be misconstrued to suggest that climate scientists are wrong or that climate models are manipulated, when instead a dynamic climate system contains many feedbacks and the relationships between them vary greatly. The U.S. maintains a position of political world leadership and economic influence. It also emits a significant portion of the greenhouse gases being released into the atmosphere, making it a clear stakeholder and expected authority on climate change policy. But if the public is increasingly unaware of the scientific facts about climate change and unable to think critically about it, public support or demand for policy changes will continually stall as the problem persists. Understanding the complications involved is vital to addressing the issue and critically analyzing widely varying and seemingly politicized messages effectively.

Research from past decades indicates that the U.S. gets its knowledge of climate change from mass media, (Nelkin, 1987, Wilson 1995, Boykoff orig. source, 2008), and recent studies demonstrate that media play a more central and integral role in our lives than ever (Baum, 2002). The focus of previous research about media and climate change has been limited to that of newspapers and television. One reason for this may be that newspapers and television have been identified as the primary sources to which the American public turns for its scientific knowledge (Dunwoody and Peters, 1992; PEW, 2003).

Mainstream media sources

Boykoff and Mansfield noted the importance of studying the popular press in their 2007 study of United Kingdom tabloid newspapers: "when discussing links between media representations and sustainability communications, these [prestige press] approaches have suffered from a massive blind spot in their considerations: large segments of the population simply are reading other newspapers," (Boykoff and Mansfield 2008, p. 1). In the U.S. the prestige press in general refers to newspapers and journals whose readership is highly educated and affluent. Although initial studies of both newspapers and television showed an under-representation of scientific consensus (Boykoff, 2004), this has improved. Recent studies have found these media to be communicating scientific consensus more effectively and accurately, but they also fall along political party lines of liberal or Democratic (Maibach, 2011). These outlets do not appeal to conservatives—who have been found to be most often uninformed, dismissive or disengaged with the issue.

This prestige field has been analyzed extensively for messaging about climate change, but it also represents the media habits of a minority of Americans. Therefore the likelihood of the majority of the public consuming such coverage is quite low. In the U.S. the majority of citizens are distracted with busy schedules and basic needs, and they do not have the time or energy to follow the details of major policy issues (Downs, 1957; Zaller, 1992). If the public is not engaged, it is unlikely to peruse scientific journals or the science topics within newspapers, on television and radio, or on the Internet—and it therefore has limited exposure to the topic at all. Popular press, on the other hand, is still widely circulated among the middle and lower socio-economic classes of the U.S.

(Jossi, 1993). Magazines within the popular press vary in topics, giving readers a variety of information and ideas in an entertaining and accessible narrative. This may be one of the only ways people get information about climate change. Boykoff and Mansfield noted that tabloid coverage of other science and environment issues "Influenced public views on these politicized issues; thus it is useful to examine their possible influences in the issue of anthropogenic climate change," (Boykoff and Mansfield, 2008, p. 2).

In 2010, Gallup found that Americans' global warming concerns continued to drop (Newport, 2010), while concerns over the economy increased (Saad, 2010). This demonstrates an overall change in public opinion, and raises concern over lack of public concern in the U.S. over an issue that scientists say will cause significant problems in the future. Fortner et al. (2000) found that the more uncertain the public is about environmental issues, not only are misconceptions more likely but that that the media becomes more influential on these issues. By repeatedly framing issues as environmental and expecting that technical solutions based on a strictly rational identity will appeal to policy makers, some scholars attribute the climate change legislation surrounding the Kyoto protocol failures to the environmental movement's mismanagement of opportunity and collaboration (Schellenberger and Nordhaus, 2004, p. 25).

In summary, the history of climate science in the press has been inconsistent and subject to misrepresentation. The bias depicted in offering a false or forced balance has been related to a plummeting public opinion and lack of definitive policy support to mitigate or adapt to global warming. This body of work indicates that we should continually monitor media coverage and that

policy leaders might benefit from better understanding where possible outreach might be focused.

Literature Review Summary

An investigation of how often and in what ways soft news and long-form media frame issues such as climate change is worthwhile and yet the topic is thus far understudied. Certain audiences do seek out articles and publications about climate change, but soft news media may carry messages about the issue of climate change and appeal to a different group of readers that are not seeking out specific coverage on the topic, or regularly consuming traditional news that covers the topic, such as newspapers or news broadcasts. In the case of such an audience, the information it comes across in leisure and lifestyle media sources might be some of the only information it receives regarding the science, policy, and personal, political, and economic implications of climate change. Furthermore, until we account for all the media streams portraying this issue to our American public, we cannot fully identify how it is being covered or affecting public opinion and policy.

Research questions

The purpose of this research was to learn more about the role of soft news in the ongoing climate conversation that begins with how science is communicated by media to the public and is carried into interpersonal communications, public opinion, and eventually public policy. The industry also has the potential to play into and perpetuate a false controversy as Boykoff identified in "Balance as Bias" (Boykoff, 2004). If the public is demonstrating less

likeliness or ability to think critically about the issue, perhaps we ought to look at the messages that public receives—in a medium it uses and trusts. The following research questions guided this exploratory study:

R1: Are non-news or soft news media broaching the topic of anthropogenic climate change?

R2: How do non-news or soft news media that cover climate change differ from those that do not, or what demographic correlations might be implied by coverage based on magazine audiences?

R3: Among non-news or soft news media that do cover the topic of climate change, how often and in what depth are they doing so?

R4: How are these media framing the issue?

R4a: Do they present current scientific consensus (based on the 2007 IPCC Report)?

R4b: Do they present climate change as a controversy and avoid taking a position?

R4c: Do they discuss climate skeptics, or the deeper issues and challenges of creating public policy?

R4d: Are these non-news or soft news media encouraging or criticizing individual, governmental, or international involvement in mitigation and/or adaptation?

Chapter 3: Research Methods

The literature presented above synthesizes the important considerations when scholars investigate the influence media have over the public's agendas and the issues considered important. Inherent to this is how soft news media frame or cover the issues. The research questions guided the content and textual analysis of soft news for coverage of climate change. The decision to study the content of soft news rather than its effects on readers by way of public polling or individual-level effects testing was a choice to look at the source of information rather than the endpoint and was based on framing literature which suggests that how a subject is presented to a reader is important. The primary focus here was on the message rather than the receiver.

Magazines are a specific, long-form example of soft news media, and popular magazines in particular are more broad-based and generalized, appealing to a wide audience. As such they were chosen as the medium for this research. This study identified the most widely read popular magazines in the U.S. based on total distribution and analyzed each for climate change articles and related images, graphs, or charts. It was then determined how the issue was framed within such articles with the purpose of gaining insight about the medium's overall coverage of climate change in general. Given the framing and agenda-setting perspective of media and potential of soft news to expand the knowledge of an inattentive public, particular attention was paid to framing themes, potential article impact based on graphic imagery, and length, as well as

coverage of the complexities and uncertainties of climate science. This chapter discusses the viability of studying magazines as a convenient, relevant, and under-examined medium; it then describes the sample selection and noteworthy events and issues of 2010 as the year chosen for study. Finally, data gathering methods, metrics of measurement used for the content analysis, operational definitions, and intercoder reliability testing are described as they were undertaken for this research.

The significance of magazines

As the literature reviewed indicates, media are quite capable of influencing an audience through issue framing and frequent, prominent and multi-media coverage. This is true of soft news and hard news, though hard news has been studied in the case of climate change messaging a great deal more than soft news. It is possible that a specific form of soft news, the popular magazine, may have an unnoticed and under-researched ability to maintain focus on the scientifically confirmed but politicized environmental threat of climate change. Popular magazines and tabloids have not been studied with the same focus as the prestige press in the field of mass communication research, although they appeal to a much wider audience and cover a broad range of topics and important domestic issues. As stated previously, the most popular monthly magazines reach a range of 2 million to 23 million readers (ABC Reports 2011), while the highest daily circulations for the prestige press range from 616,000 to 2.1 million (Beaujon, 2010; Peters, 2011). The study of popular magazines can be useful in determining their role in the agenda setting process, because they are an enduring and influential component of the popular press. They are

widespread, appeal to a diverse range of readers, and they have steadier advertising sales and readership than print newspapers (GFK Media Research & Intelligence 2006-2010, GFK MRI 2010).

Popular magazine publications provide specialized information to very specific audiences but appeal to a wider range of people than most daily newspapers. Out of the 25 most popular print magazines in the U.S., 23 reach more people than even the most widely circulated daily newspaper, The Wall Street Journal—even when the paper's digital and print edition are combined (Peters, 2011). Newspapers and other traditional print media have struggled to keep up economically as circulation and advertising revenues fall, but the public demand for short and long-form journalism grows with an increasingly media-oriented and globalized market. While circulation growth rates have slowed overall, print magazine circulation continues to increase at a faster rate than newspapers or television (GFK MRI 2006-2010). This medium continues to appeal to diverse audiences, reaching 93% of all Americans and 96% of those under the age of 35 years (GFK MRI 2010). The most popular magazine sales remain stable, particularly in the sector of women's fashion and lifestyle, which according to 2010 ABC figures rose 1.4% in 2010 (Mickey 2011; O'Reilly 2011).

Popular magazines, particularly women's fashion and lifestyle publications such as Vogue, Glamour, O Magazine, Redbook, and Real Simple have held up somewhat better in the recent technology shift as well (O'Neil, 2010). These categories, general home interest magazines, and news and current events magazines such as Time and even environmentally-oriented magazines like National Geographic, all show circulation and sales increases despite the ongoing economic recession and a print industry crisis. Such figures

"demonstrate the continued strength of magazines in a rapidly evolving market and underline their unique ability to create a real emotional connection with audiences through their trusted and engaging content," (O'Reilly 2011).

Within their industry, magazines are known as the medium of engagement due to their use of diverse long and short form journalism, high resolution print quality, and "browsing" entertainment potential. This reader engagement efficacy has proven true in studies of reader perceptions of trustworthiness, life enhancement, and social interaction as a result of consuming content (Experian 2010), although magazines are not limited to unbiased hard news and in fact often portray events, issues and ideas using opinion and editorial perspective and style. Magazines are effective in holding readers' undivided attention, according to studies demonstrating low simultaneous reader participation in either media or non-media activities while consuming (BIGresearch 2010), which makes messages potentially more powerful to an attentive reader consuming a magazine's content. In studies of reader influence over friends and family, magazine readers are also prone to sharing information they read with others and have higher influence than average on others as interpersonal communicators (GFK MRI Fall 2010). The average magazine reader spends 42 minutes reading each issue (GFK MRI Fall 2010), and scores higher on advertising receptivity scores (Experian Simmons Multi-Media Engagement Study, Spring 2010), which suggests that magazines are chosen for more involved, and longer engagement (GFK MRI).

While studies show a declining number of television and radio broadcast fans, The Association of Magazine Media has found that most Americans of all ages still read at least one magazine (GfK MRI 2006-2010). Many magazines

specialize in specific subjects such as fashion, home décor, recreation, health and culture, yet the most popular magazines in the U.S. also cover a wide range of topics in addition to or within these specific themes. Often they cover major issues and controversies from which readers can receive general knowledge and perspective about science, news, and policy. In PEW studies of those who get their news from reading news magazine rank above those who use CNN, daily newspapers, and USA Today, for primary sources on knowledge of politics and science (PEW, 2010). Moreover, magazines reflect the diverse interests of most Americans—and 55% of news magazine readers are age 18-49 (PEW, 2010). In recent studies six of the 10 overall most trustworthy media vehicles named by consumers were print magazines (Experian 2010). Of these six, four (Smithsonian, National Geographic, Parenting, and Reader's Digest) were also among the 25 most widely read (Audit Bureau of Circulations, 2011). Magazine circulation has remained steady despite overall declines in print readership as online media become more common and competitive (Frankel et al., 2011). And as reading tablets grow in popularity (currently used by 15% of Americans) ever more consumers read magazines and news items digitally—which ensures future relevance. Magazines may be one of the most influential mediums for several reasons. As summarized in GFK MRI research, magazines offer a medium of "active engagement" in the content, and advertising has long patronized this medium for its persuasiveness upon readers:

> "…one of the medium's advantages is that it can draw attention serendipitously to categories in which the consumer is not otherwise particularly interested…because consumers that are engaged in reading activity have put themselves in a frame of mind in which they are open to new images, messages, and experiences,"
> Mattlin, Bahary, and Galin, 2011, "Exploring New Technologies to

Measure Responses to Magazine Advertising: test of a new approach"

Scholars have acknowledged that the scientific process lends itself poorly to media interaction and therefore needs better media clarification (Boykoff, 2009). Perhaps legacy media such as newspapers, which face declining consumer following, declining advertising sales and subsequently lower labor allowances in addition to producing content on a daily or weekly basis, cannot adequately report on the nuances of this issue. Magazines may be better suited to do this, with proven stability and readership trust. The magazine medium with weekly or monthly deadlines provides a platform for more well-researched and in-depth coverage than newspapers can achieve. High resolution, specialized photography, high-quality paper, and high definition graphic elements such as charts and sidebars offer multiple dimensions and levels of engagement, which are proven to engage readers for longer periods of time and to aid in memory retrieval of the content.

Laserowicz and Safron O'Neil both have researched how images and metaphors create narratives which magazines are uniquely positioned for with high-resolution photography, graphics, and textual references (Laserowicz, 2009). Magazines use higher resolution than all other mediums, which is linked to closer, more focused and sustained viewing. As the aging population decreases in numbers and influence, an entirely different technology of mobile interconnectivity will remain, and magazines are poised to transition effectively. Mobile magazines began launching in 2010, and an estimated market worth of billions of dollars now lies in the relatively fast rise of 85% of U.S. magazines who now offer mobile content (Audit Bureau of Circulations, 2011). While the market

appears to be constricting at present, major publishers that continue to innovate with mobile interfaces are expected to prevail. Tablet readers have been shown to regularly read long-form articles (PEW 2011), which suggests that this medium of engagement remains appealing and stable at present. Many tablet users also continue subscribing to print magazines and also subscribe to online content, demonstrating the continued future role of the medium and the importance of its content. The interactivity and "browsing metaphor" of a print magazine appeals to readers (Wang, 2011), and this leads to a higher level of user/reader involvement and evaluation or comprehension. (Feltham & Arnold, 1994).

Sample Selection

Since this study was the first of its kind analyzing magazine content for framing and sourcing of climate change, the researcher selected a one-year period wherein more robust understanding of the processes and concepts outlined above could be explored in depth. The most recent complete year of coverage, 2010, was chosen. A selection of 48 magazines was analyzed based upon a cross-reference of the "Top 25 Consumer Magazines by Total Paid & Verified Circulation," as shown in Table 2, and "Top 25 Consumer Magazines by Single-Copy Sales," as shown in Table 3, from the 2011 Audit Bureau of Circulations.

Table 1. Consumer magazines by circulation

Top 25 magazines by subscription and newsstand sales	Audit Bureau of Circulations 2011 circulation July-August 2010
Publication	
AARP the Magazine	23,748,475
AARP Bulletin	23,574,132
Better Homes and Gardens	7,677,497
Game Informer Magazine	5,073,003
Reader's Digest	5,533,037
National Geographic	4,493,024
Good Housekeeping	4,418,398
Woman's Day	3,895,813
Family Circle	3,841,651
People	3,602,006
Time Magazine	3,314,946
Ladies' Home Journal	3,837,286
Taste of Home	3,253,392
Sports Illustrated	3,174,355
Cosmopolitan	2,905,659
Prevention	2,900,365
Southern Living	2,846,757
Maxim	2,528,569
AAA Living	2,469,830
O, The Oprah Magazine	2,506,037
Glamour	2,307,714
American Legion Magazine	2,306,231
Parenting	2,237,158
Redbook	2,232,476
Smithsonian	2,044,406

Source: Audit Bureau of Circulations, 2010

Table 2. Consumer magazines by single-copy sales

Top 25 magazines by single copy sales	Single copy sales for the six months ending 12/31/10
Publication	
Cosmopolitan	1,566,658
Woman's World	1,273,019
People	1,257,536
First for Women	1,129, 967
In Touch Weekly	689,365
US Weekly	683, 485
In Style	654,800
Lindy's Football Annuals	531, 292
All You	459,812
Family Circle	603,504
People Style Watch	549, 912
National Enquirer	533,308
Glamour	521,213
Food Network Magazine	376,761
O, The Oprah Magazine	608,212
Men's Health	399,283
Life & Style Weekly	411,012
Woman's Day	396,299
Real Simple	395,344
Vogue	369,489
Weight Watchers	368,912
Good Housekeeping	382,273
Seventeen	343,742
Vanity Fair	405,605
Star Magazine	496,395

Preliminary Figures as filed with the Audit Bureau of Circulations

While this is a large number of publications, many of them were expected to have not published any articles on the topic and would therefore only be noted for their lack of content and then used to analyze an overall pattern of coverage (or non-coverage) within a genre. Using these selection criteria, as applied to the 48 most popular U.S. magazines, the primary audience demographics for each magazine were identified for background and target audience information. Then the frequency of climate change coverage and framing of it was analyzed using

the 2007 IPCC report as the most recent basis for understanding the scientific consensus on climate change. There were 127 articles found across 20 different publications. The distribution is shown in Tables 3 and 4.

Table 3. Distribution of top 25 magazines in 2010 based on single copy sales and climate change articles

Publication	Circulation	Number of climate change articles published
Cosmopolitan	1,566,658	2
Woman's World	1,273,019	0
People	1,257,536	4
First for Women	1,129, 967	0
In Touch Weekly	689,365	0
US Weekly	683, 485	0
In Style	654,800	0
Lindy's Football Annuals	531, 292	0
All You	459,812	0
Family Circle	603,504	1
People Style Watch	549, 912	0
National Enquirer	533,308	1
Glamour	521,213	2
Food Network Magazine	376,761	0
O, The Oprah Magazine	608,212	3
Men's Health	399,283	3
Life & Style Weekly	411,012	0
Woman's Day	396,299	0
Real Simple	395,344	0
Vogue	369,489	3
Weight Watchers	368,912	0
Good Housekeeping	382,273	1
Seventeen	343,742	0
Vanity Fair	405,605	9
Star Magazine	496,395	0
Total		**29**

Among this group of publications with highest newsstand/single-copy sales, only 10 of them (40%) covered climate change in a total of 29 articles.

Table 4. Distribution of top 25 magazines in 2010 based on total circulation and climate change articles

Publication	Circulation	Number of climate change articles published
AARP the Magazine	23,748,475	2
AARP Bulletin	23,574,132	7
Better Homes and Gardens	7,677,497	0
Game Informer Magazine	5,073,003	0
Reader's Digest	5,533,037	1
National Geographic	4,493,024	13
Good Housekeeping	4,418,398	1
Woman's Day	3,895,813	0
Family Circle	3,841,651	1
People	3,602,006	4
Time Magazine	3,314,946	50
Ladies' Home Journal	3,837,286	0
Taste of Home	3,253,392	0
Sports Illustrated	3,174,355	1
Cosmopolitan	2,905,659	2
Prevention	2,900,365	0
Southern Living	2,846,757	0
Maxim	2,528,569	0
AAA Living	2,469,830	0
O, The Oprah Magazine	2,506,037	3
Glamour	2,307,714	2
American Legion Magazine	2,306,231	0
Parenting	2,237,158	0
Redbook	2,232,476	0
Smithsonian	2,044,406	21
Total		**99**

Among the group of highest subscription selling publications, thirteen of them (52%) covered climate change, for a total of 99 articles. The highest-ranking subscription publications were 12% more likely to cover the topic, and they covered it with 3.4 times more frequency, than the highest-ranking single copy publications. Family Circle, People, Cosmopolitan, and Glamour appeared in both categories and published climate change related articles; the others were exclusive to one category or the other.

Summary of relevant 2010 events and issues

During this time period, the U.S. economic recession that had begun in 2008 with the sub-prime mortgage collapse among many large banks was a key issue, both for its palpable effect on employment, housing markets, and investment markets. This issue dominated policy debates as President Barack Obama and a short-lived Democratic majority in the House of Congress and U.S. Senate navigated a host of controversial legislative actions initiated in 2009: an economic stimulus bill, healthcare reform, the largest government funded bank bail-out in U.S. history, financial regulation reform, and an additional bail-out of the U.S. auto industry.

Climate change legislation, which Obama had declared a major goal of his presidency, was also fiercely debated. While it had received key early bi-partisan support in congress—and a bill had passed in the House during the summer of 2009—the legislation ultimately fell prey to partisanship bickering over details and the disagreement between the House and Senate over different versions. By the time the November elections arrived, the legislation was abandoned and a new Republican majority, including many members of a very fiscally conservative branch of the GOP called the Tea Party, assured the public it had no intention of resurrecting the cause. International efforts were much the same. A much-anticipated summit in Copenhagen rang in 2010 but accomplished little. China was particularly hostile to renewing similar ratifications of the 1997 Kyoto Protocol, which was set to expire in 2012, and a series of other nations backed away from their own previous pledges to carbon reduction. A second international effort later in the year in Mexico and several smaller conferences in between produced little headway, and the news media largely concluded that the

international consensus to commit to the level of emissions reductions recommended by scientists were unsuccessful (Broder, NY Times 2010).

The U.S. suffered its largest oil spill (Deepwater Horizon) in history in the Gulf of Mexico, just after President Obama had lifted a moratorium on exploratory oil drilling off U.S. coastlines. This event brought media attention and public outcry to the forefront of energy policy debates. But eventually it led only to tightening regulations of the offshore oil industry and greater economic downturn in the southern U.S. where coastline industries of fishing and tourism were damaged. The average number of hurricanes reported in 2010 doubled, and the average number of named (more significant) hurricanes nearly doubled, according the national weather reports (Weather Channel, 2011). The nation had not forgotten the devastating effects of Hurricane Katrina in 2005, which had reignited climate change conversations as well. Record snowstorms on the Eastern U.S. coast raised questions among conservative politicians about Al Gore's climate change assertions. An investigation into the climate scientists involved in the Climategate scandal was conducted and a conservative Tea Party movement contributed to a November turnover in both houses of congress, giving Republicans a majority and the president's legislative agenda an added challenge.

Data Gathering

Articles were searched for by using Boolean terms such as "climate change" OR "global warming" within several academic databases. The primary

databases used were Factiva, Ulrichs, Lexis Nexis, Ebsco Host, Reader's Guide, and Electronic Journal Finder. Approximately two-thirds of the overall population of popular magazines were listed within these databases, and the remaining articles were found by searching each publication's individual online archives where available and querying editors to confirm the existence or nonexistence of articles within 2010 using either search term. In the case of Martha Stewart Living, Family Fun and Better Homes and Gardens, each issue was manually scanned for articles because they were unavailable online—and all three publications turned out none.

These data gathering methods produced 127 articles from 20 different publications. Several publications were confirmed to have not published any issues in 2010 with the search terms, while others could only be ruled out with a high level of confidence. In the latter case academic databases did not carry the titles, editors did not respond or could not verify any information, and individual publication websites either did not produce any articles using the search terms or they produced articles but not the year in which they were published.

Content Analysis

Metrics

The analysis measured each article for several metrics using a codebook that analyzed the following variables within each article (Appendix A):

1. section location within the publication
2. word count
3. presence of graphics

4. role of the topic within the article theme

5. issue framing for existence of climate change, causes, implications, and recommendations.

6. Sources and their evaluations

Each article was coded with the first three consonants of the name of the publication from which it came, followed by the month and year in which it appeared in the publication, e.g. VNT0210 for Vanity Fair, February 2010. If more than one article appeared within the same issue, an additional letter was assigned to each article, e.g. VNT0210-A.

Operational Definitions

The operational definition of an article included brief articles, letters to the editor/reader responses, editorials, and feature stories. The operational definition of *From the editor* was that an article clearly state opinions of the author in first person narrative and use a header describing "from the editor" or otherwise indicating a regular opinion feature of the publication, as in the case of Smithsonian's "Around the Castle" written by Smithsonian Institute secretary G. Wayne Clough. Similarly, *Reader Responses* were identified by headers but also by the name and location of the reader and the presence of references to previous articles within the publication. *Features* were operationally defined within this study as 800 words or more, and *Brief articles* were 799 words or less. This was not based upon previous studies, but simply upon a workable definition for this study.

Publication and article characteristics were noted for each article, including page number (where identifiable), section of article within the publication, publication length, author, and presence and number of graphic

images or illustrations accompanying the article. Next, variables were identified relating to the way in which climate change was discussed. The content of each article was analyzed for variables identified based upon the research questions. These primarily focused on the manner in which climate change (or global warming) was framed, the role it had within the overall focus of the article, whether climate change or global warming were used interchangeably or one was used and not the other, which sources were cited, and the overall evaluations of both the author and the sources used in regard to the existence of climate change, the need for personal, industrial, national, or international actions to prevent, mitigate or adapt to climate change, and which scientific studies or research was cited.

For the purpose of coding and quantifying these measures, operational definitions such as climate change exists, does not exist, or is uncertain were chosen for implications or statements about the existence of climate change. For example, when climate change was referred to as an implied basis for a point made in an article, it was coded using the operational definition that climate change exists. When climate change was referred to in any way as a topic of uncertainty, controversy or disagreement, or when coverage of climate scientists discussed criticism of climate science or scientists, this was coded as a theme or evaluation (depending on whether it came from the author [theme] or a source [evaluation] within the article) using the operational definition of describing *uncertainty, doubt or controversy over the science, causes or implications of climate change*. Likewise, human and environmental implications that were either stated or implied were noted as such, and evaluations and

recommendations made by authors and sources were noted under additional categories.

Sources identified

The first four relevant sources cited within articles were categorized using seven fields: public sector, U.S. elected official, government agent or agency, industry affiliate, advocacy member or group, academic/research or international. When sources were identified as authors but also as professionals within the public, industrial, advocacy, academic, or government sectors, the profession was favored over authorship to identify the source's area of expertise or perspective. Evaluations and recommendations made by sources were coded similarly to those made by the articles' authors.

Audience demographics

Last, the reader demographics of each publication was obtained, based upon market research from Mega Media Marketing, Market Research and ABC 2011 studies, and the media kits of individual publications when available and which most often referenced GFK MRI market analysis information. These data were used to assign publications into one of three distinct groups based upon other similar audiences. The groups were primarily women's interest, primarily men's interest, or general interest where a relatively similar distribution of both men and women existed. The assignment of Women's interest magazines was given to all publications in which the proportion of female readers was determined to be equal to or greater than 60%. The assignment of Men's interest magazines was given to all publications in which the proportion of male readers

was determined to be equal to or greater than 60%, and the assignment of general interest was given to all publications in which the distribution of both male and female readers was equal to or greater than 40%, therefore demonstrating a margin of equal to or less than 20%.

The codebook underwent several iterations, and the final product was given an inter-coder reliability test with the researcher and three other coders to demonstrate that the same procedures would produce identical or similar results if replicated by other researchers. The data from all articles were catalogued using an Excel spreadsheet, and the data were then used to run regressions and correlations for the purpose of answering the research questions.

Scott's Pi

One person coded all articles in the study. Inter-coder reliability tests were done using three additional coders, each coding the same three articles as the principle coder, to obtain measures for Scott's Pi. The observed agreement was measured by dividing the number of items annotators agreed upon, 604, by the total number of items, 624. The observed agreement was .967. The variables that coders disagreed upon are itemized in Table 5 and were consequently altered for clarification.

Table 5. Scott's Pi for variables with inconsistent coding scores

Variable	agreement sum of items	Observed agreement	rate of agreement
7	10	12	.833
9c	11	12	.916
9d	9	12	.75
10	10	12	.833
17b	8	12	.666
17c	8	12	.666

Chapter 4: Analysis

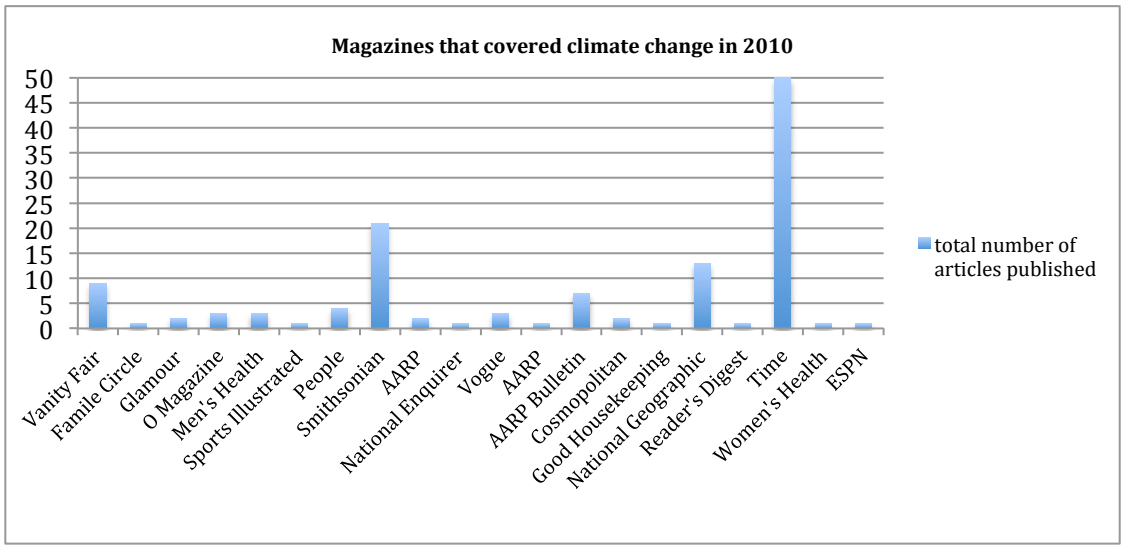
Magazine coverage of climate change

The first analysis identified the percentage of popular magazines discussing climate change as discussed in

R1: Are non-news or soft news media broaching the topic of anthropogenic climate change?

Out of 44 publications studied, 45% (N=20) published articles using the terms climate change or global warming. These publications published 127 articles between them, which became the sample size. The central tendency of discussion was .45, based upon the mean of the total number of publications using the term climate change divided by the total number of publications. Therefore, based upon this study, a popular magazine had less than one in two chance of publishing at least one article during 2010 discussing global warming. Among magazines that did publish articles related to the topic, the mean number of articles for the time period was 6.35 per publication, with a standard deviation of 11.46. Magazine coverage is shown in Figure 2.

Figure 2. Total magazine coverage in 2010 by title and total annual frequency



Magazines varied widely in their frequency, however. The top publishing magazines on the topic were Time Magazine, National Geographic, and Smithsonian. Each of these publications published more than 10 articles within the time period regarding climate change. Time Magazine covered the topic the most by far: 50 times within this period, with a standard deviation of 43.65 from the mean (6.35). AARP Bulletin and Vanity Fair each published more than five articles on the topic, and the remaining 15 publications published between one and three articles on the subject.

Magazine audience

In order to examine the differences between those publications that did cover the topic and those that did not, the primary subject and target audience for each publication was taken into consideration. A pattern emerged showing that magazines of particular audiences had different rates or likelihood of covering climate change in 2010, and therefore audience demographics warranted closer inspection. The genres that emerged from audience demographics and magazine types were distinctly of male interest, of female interest, and a combination of both, labeled general interest, which did not focus on gender topics and whose audience was an almost even split between male and female readers. Demographic statistics for the entire sample size, and for each of the distinct publication types, are compared with those of the general United States population according to the U.S. Census Bureau 2010 in Table 6. The audience demographics of the sample are not diverse overall. The average audience ranges from 41 to 49 years of age for each genre, which represents

Generation X (born in the late 1960s and 1970s) most. This audience tends to be more educated, more affluent and older relative to the average American.

Table 6. Demographic mean for audiences of popular magazine by genre

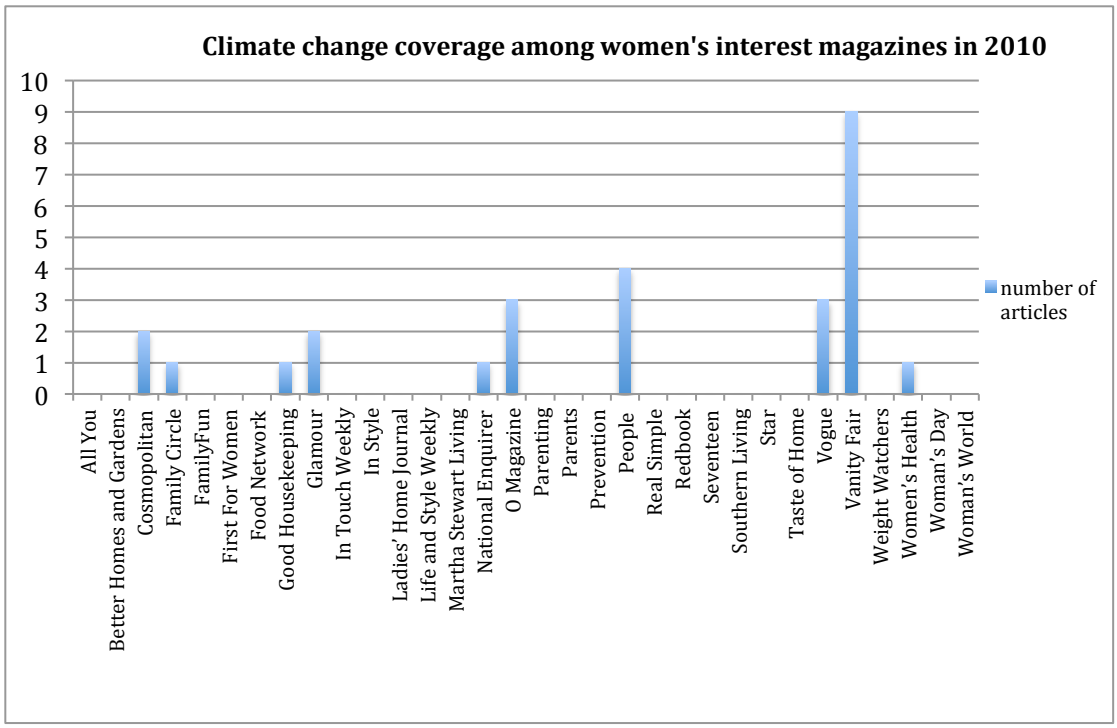
Population	Mean age	Income	Education (attended some college)
Men's interest	42	51,984	66%
Women's interest	41	58,421	65%
General interest	49	66,624	68%
All publications	44	59,009	66%
U.S. population	**36**	**45,016**	**56%**

Source: GFK MRI 2012; individual publication media information; U.S. Census Bureau

Magazine coverage according to genre

The frequency, depth and type of coverage varied greatly according to type of publication as differentiated above (men's, women's, or general interest), and therefore publications were categorized by type and demographic. Women's interest magazines were the largest group of publications in the study, with 31 of the 45 most popular publications being women's, or 68% of the total. These magazines and their climate change coverage are shown in Figure 3.

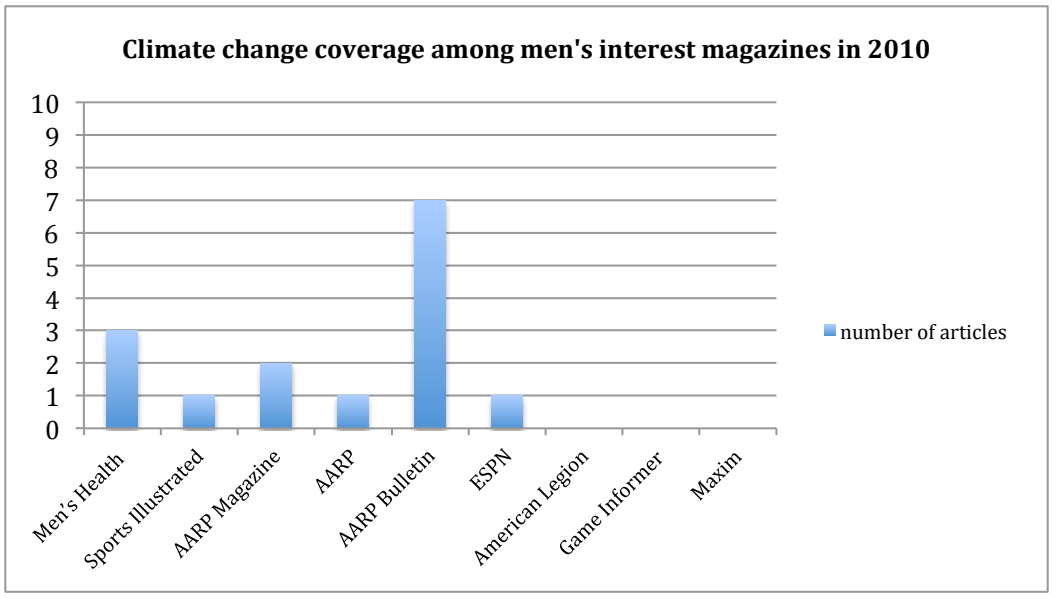
Figure 3. Women's magazines coverage by title and frequency



While this genre contained a majority of the most popular publications, only 10 (32%) of them could be confirmed as having discussed climate change in any capacity during the year 2010. Overall, women's magazines published 27 articles about climate change within the year studied. This represents 21% of the total articles coming from popular magazines on the topic.

Nine men's magazines were listed among the most widely read, and they represented 20% of the total number of popular magazines in 2010. These magazines and their climate change coverage are shown in Figure 4.

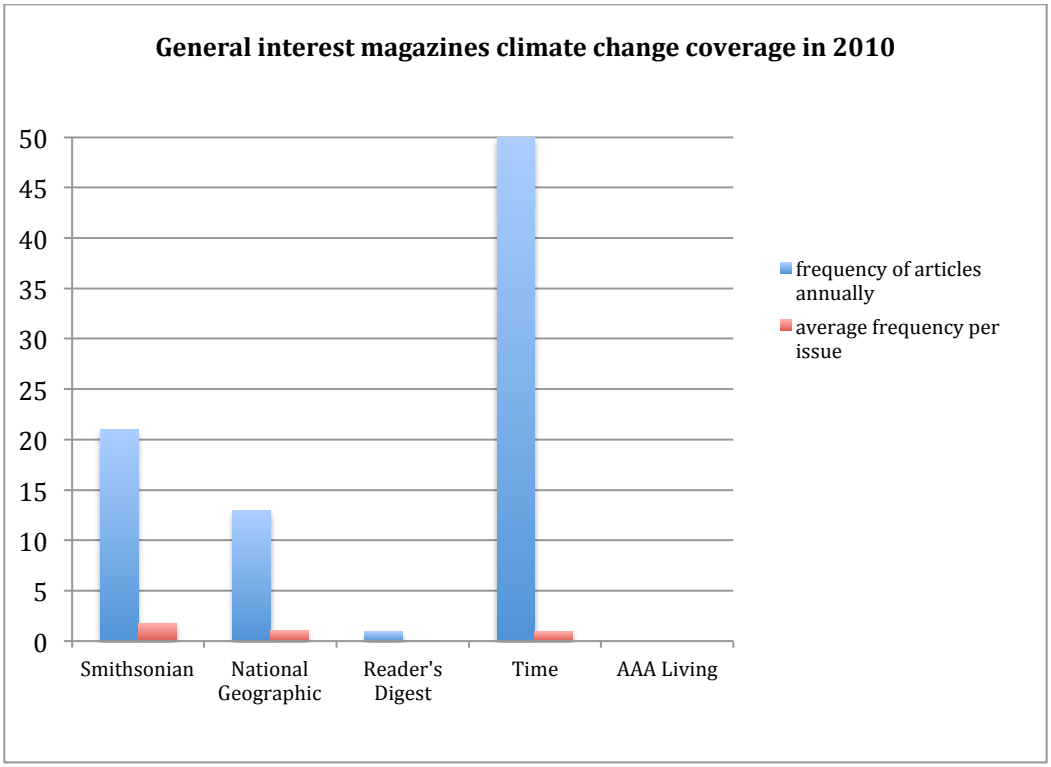
Figure 4. Men's magazines coverage by title and frequency



The men's interest magazines published 15 articles on climate change altogether, representing 11% of the articles coming from popular magazines on the topic. The articles came from six (66%) of the nine publications within this genre.

The general interest group of publications had a roughly similar number of male to female readers, and represented five of the most popular magazines. These are shown in Figure 5.

Figure 5. General interest magazines 2010 coverage by title and frequency



This was only 11% of the total number of popular magazines, yet four out of five (80%) discussed climate change during 2010, and this group provided 85 articles (66% of the total articles published) on the topic during the year studied. This genre also represented 22% of all publications addressing climate change that year. AAA Living was the only magazine in the general interest category that did not publish anything about climate change in 2010. Time Magazine published the most climate change related articles overall, while Smithsonian published climate change related articles with the highest frequency per issue.

Demographic Considerations

The demographic makeup was generalized for each of the three genres using the information described below, and a correlation query was made

between the general audiences of publications that discussed climate change and those that did not in order to answer:

R2: How do non-news or soft news media that cover climate change differ from those that do not, or what demographic correlations might be implied by coverage based on magazine audiences?

Overall, the publications that covered climate change were varied across genre but had in common an average reader age in the 40s with upper middle class income or higher and a college education. The publications that did not cover climate change at all tended to be more in the genre of women's interest, and tended to be more affluent, educated and older than the general U.S. population. The women's magazines that did discuss climate change had an audience with an average (mean) age median of 42 years, an average median annual household income of $49,780, and an average of 64% had attended some college or more. The women's magazines in which no discussion of climate change could be found represented an average median age of 41, an average median household income of $62,535, and an average of 65% who had attended some college or more. The only discernible difference between the two audiences is that those of the publications covering climate change were less affluent than the audience of those who did not.

The overall group of popular men's interest publications had an average audience of well-educated, upper-middle class men in their early forties. Those covering climate change appealed to a reader who was, on average, also well-educated, in the late forties, and upper-middle class. Those that did not address climate change had a higher audience rate of education, with 69% college attendees. The group of general interest publications, which ranked highly for

coverage, had an older, more affluent and more well educated group than the other publication audiences. Because four out of five magazines covered the topic, the demographic difference between the one that did not (AAA Living) and the others was not statistically significant.

Coverage Frequency

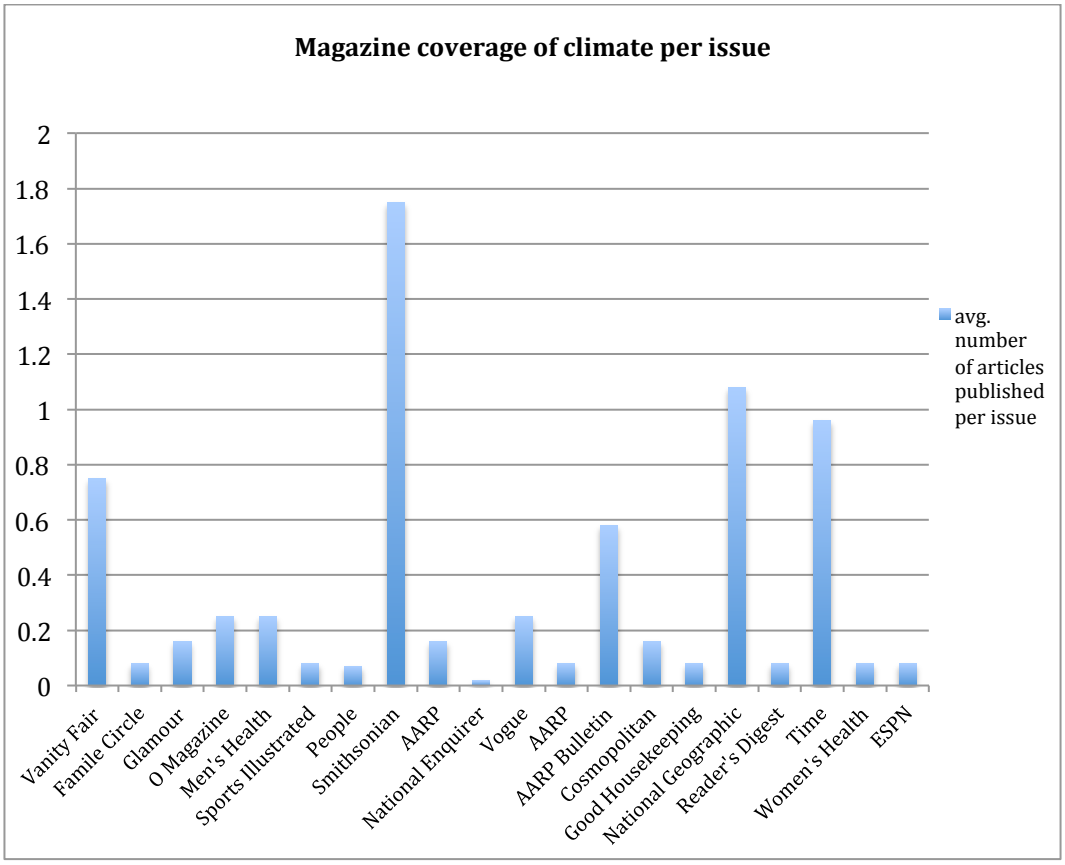
Coverage frequency and framing theme metrics were summarized next to answer:

R3: Among non-news or soft news media that do cover the topic of climate change, how often and in what depth are they doing so?

Of those that address the topic, the frequency of articles from each of the magazines was a very different picture than the average number of coverage articles per issue. This takes into account the lack of issue number consistency across the medium, where Time Magazine, People Magazine, and National Enquirer published 52 total issues and others published 12. Although Time Magazine published a significantly higher volume of climate coverage articles in 2010 than any other publication, it also published a new magazine each week—offering much more opportunity for coverage. Smithsonian Magazine, with fewer overall articles, published the highest average rate of coverage, with an average of 1.75 articles per issue. National Geographic published the next highest rate, with 1.08 articles per issue, and Time published .96 coverage articles per issue. The same calculations were made for National Enquirer and People Magazine, which also published weekly

issues and show lower article per issue frequency than simple totals indicate. These rates of frequency per issue are shown in Figure 6.

Figure 6: Magazine coverage by average number of articles per issue



Next, to assess the nature of the magazines' climate change coverage, articles were categorized by type, length, thematic significance, and presentation of scientific consensus. There were 127 articles in total. The types were identified as follows: four were From the Editor (three from Smithsonian and one from Time Magazine), two were Reader Response/Opinion pieces (one each from National Geographic and Time Magazine), 65 were Features (900 words or more), and 56 were Brief Articles (between 200 and 899 words). Features were the most prominent, with Brief articles close behind.

Thematically, articles ranged from discussing climate change as a Central Topic (N=16 or 12%), a Major Topic (N=29 or 22%), Minor Topic (N=34 or 26%), or a Brief Mention (N=48 or 37%). All articles using climate change as a central theme are shown in Table 7 and then subcategorized for article type, number of graphics, scientific consensus portrayal, and presentation of controversy.

Table 7. Article coverage using climate change as central theme

Role of climate change	Article Type	Magazine	Graphics	C.C. exists	Controversy/uncertainty portrayed
Central	**Feature**				
		National Geographic	5	Yes	
		National Geographic	9	Yes	controversy
		National Geographic	8	Yes	
		Smithsonian	19	Yes	
		Smithsonian	18	Yes	
		Time	4	Yes	
		Time	5	Yes	
	Brief				
		Time	1	Yes	
		Vanity Fair	1	Yes	
		National Geographic	2	Yes	controversy, uncertainty
		AARP Bulletin	0	Yes	
		AARP Bulletin	0	Yes	
		AARP Magazine	2	Yes	
		Time	0	Yes	controversy
		Time	3	Yes	
		Time	1	Yes	

Of the centrally themed articles, National Geographic, Smithsonian, and Time Magazine carried features accompanied by at least one high-resolution image. Smithsonian and National Geographic included multiple images and/or graphics with the story—one Smithsonian article had 3,726 words and 19 images. The

article was titled “The New King of the Sea” and discussed how a warming climate will propagate jellyfish populations. Another, 4,554 word Smithsonian article titled “Welcome to Barrow, Alaska, Ground Zero for Climate Change” included 18 graphics and discussed the quickly changing conditions in the Arctic region due to global warming. Only one of the features, a 3,743 word National Geographic article titled “The Big Melt,” which surveyed the global resource scarcity and conflict potential resulting from glacial melt, discussed climate change and mitigation as a controversial political or sociological situation. The others discussed climate change in the context of the damage and problems it creates for humans and ecosystems alike: the endangered fjords of Patagonia, Chile; human values, overpopulation, and water scarcity; the changing landscape and fishing industry of Greenland; the Arctic; food economy and strategic agriculture; the carbon footprint potential of cattle feedlots; and efforts to reclaim the expanding African deserts. Among the authors of these articles were Barbara Kingsolver and Michael Pollan—both who are well known among mainstream culture for writing best-selling works and recently focusing on environmental aspects of food production.

Centrally themed brief articles came from Time Magazine, National Geographic, AARP Bulletin, Vanity Fair, and AARP Magazine. All of them discussed the topic of climate change as a matter of scientific fact, just as the feature articles did. Two of them also mentioned controversial aspects of climate change, though only in one passing remark. The National Geographic article, titled “Maple Flow in Flux,” discussed the potential effects of climate change on maple syrup production and quoted a maple syrup producer’s dismissal of the notion. The Time Magazine article “Antarctica’s Mammoth Ice Break” stated that

while controversy and “global warming wars wage on,” unpredictable glacial and sea ice melt continues in Antarctica.

Out of 29 articles in which climate change was a major theme, 13 were feature articles, 15 were brief articles, and one was an editorial. These are shown in Table 8.

Table 8. Article coverage using climate change as major theme

Role of Climate Change	Article Type	Magazine	Graphics	C.C. exists	Controversy/uncertainty portrayed
Major Theme	**From the editor**	Smithsonian	1	Yes	
	Feature	Cosmopolitan	1	Yes	
		Glamour	1	Yes	
		National Geographic	4	Yes	
		National Geographic	5	Yes	
		National Geographic	11	Yes	
		Good Housekeeping	4	Yes	
		AARP Bulletin	0	Yes	controversy
		Smithsonian	19	Yes	
		Smithsonian	12	Yes	
		Smithsonian	10	Yes	
		Smithsonian	11	Yes	
		ESPN	6	Yes	
		Time	2	Yes	controversy
	Brief Article				
		AARP Bulletin	0	Yes	
		Smithsonian	1	Avoided	
		People	0	Yes	
		AARP Bulletin	1	Yes	
		AARP	1	Yes	
		Smithsonian	8	Yes	
		Smithsonian	1	Avoided	
		Smithsonian	11	Yes	
		Smithsonian	3	Avoided	
		Smithsonian	1	Yes	
		Time	0	Yes	controversy
		Time	1	Yes	
		Time	1	Yes	
		Time	1	Yes	
		Vogue	1	Yes	

As shown, Cosmopolitan, Glamour, Good Housekeeping, AARP Bulletin, ESPN, Time Magazine, National Geographic, and Smithsonian carried feature articles, but only AARP Bulletin and Time Magazine discussed controversy within them. The 1,709 word AARP Bulletin article, "World's First Personal Carbon Credit

Sold," lauded a Pennsylvania family's efforts to reduce household energy use but acknowledged that some people deem tax incentives for individual household emission-reduction measures to be a waste of taxpayer money. The 950 word Time Magazine article, "Sunburn," reviewed Ian McEwan's book Solar in the context that climate scientists had experienced a tough few months due to the Climategate scandal, the disappointing summit in Copenhagen, and other factors causing a congressional Republican investigation and would likely find little relief in the fictional storyline of Solar. Time Magazine also carried the only brief article using climate change as a major theme that addressed controversy. This article honored the late climatologist Stephen Schneider for his activism and recognized that his last published work was criticized by climate skeptics.

The articles discussing climate change either casually or as a minor theme represented the majority of all articles in this study. These are shown in Table 9.

Table 9. Article coverage using climate change as minor theme

Role of climate change	Article type	Magazine	Graphics	C.C. exists	Controversy/uncertainty
Minor Theme	**From the editor**	Smithsonian	1	Yes	
		Smithsonian	2	Yes	
	Reader Response	Time	0	Yes	
	Feature	Men's Health	1	Yes	controversy
		Men's Health	1	Yes	
		National Geographic	18	Yes	controversy
		National Geographic	10	Yes	
		Smithsonian	14	Yes	
		Time	1	Yes	
		Time	5	Yes	
		Time	1	Yes	
		Time	0	Yes	controversy
		Time	1	Yes	
		Time	1	Avoided	Controversy, uncertainty
		Time	1	Yes	
		Time	1	Yes	
		Time	1	Yes	
		Time	2	Yes	
		Vanity Fair	2	Avoided	
	Brief Articles	People	0	Yes	
		People	0	Yes	
		Reader's Digest	1	Avoided	
		AARP Bulletin	0	Avoided	
		Smithsonian	2	Yes	
		Sports Illustrated	1	Yes	
		Time	1	Yes	
		Time	1	Avoided	
		Time	1	Yes	
		Time	1	Yes	
		Time	0	Avoided	
		Time	1	Yes	
		Vogue	1	Yes	
		Vanity Fair	4	Yes	
		Vanity Fair	1	Yes	

Minor climate change themes came from 34 articles, of which 16 were features, 15 were brief articles, two were editorials and one was a reader response. Men's

Health, Smithsonian, National Geographic, Time Magazine, and Vanity Fair carried features. Climate change controversy appeared in four features—from Time Magazine (two total), National Geographic, and Men's Health. It did not appear in any brief articles, editorials, or the reader response. Time Magazine covered the news that an independent panel had cleared climatologists involved in the Climategate scandal of any bias or falsified information in the first briefing of the 905 word "The World" article on current news and events. A 1,160 word Time Magazine article, "Obama's Risky Fight Against the U.S. Chamber of Commerce," covered the U.S. Chamber of Commerce lobbying efforts to oppose climate change legislation and a later disavowed argument by one of its members to re-examine the science behind climate change. The 2,608 word Men's Health feature "15 Ways to Change The World (and Your Life)…One Apple at a Time," by Maria Rodale, addressed the reader directly and wrote that shopping for organic food is worthwhile for reasons including the "decrease of global warming, (whether you believe it exists or not!)" The author later referred to debates over global warming and their tendency to focus on energy use rather than agricultural practices. A 4,240 word National Geographic article titled "Deep Dark Secrets" recounted the author's experience diving in flooded offshore caves to discover ancient, preserved life forms that provide information about climate changes of the past—indirectly stating that climate change is at times a natural occurrence versus an anthropogenic one.

There were 48 articles containing a casual or brief mention of climate change, with 25 features, one editorial, one reader response, and 21 brief articles. These are shown in Table 10.

Table 10. Article coverage using climate change as brief mention

Role of climate change	Article type	Magazine	Graphics	C.C. exists	Controversy/uncertainty portrayed
Brief Mention	**From the editor**	Time	1	Yes	
	Reader Response	National Geographic	0	Yes	
	Feature	Good Housekeeping	1	Yes	
		Glamour	12	Avoided	
		National Geographic	13	Yes	
		Oprah	5	Yes	
		Oprah	3	Yes	
		AARP Bulletin	0	Yes	
		Smithsonian	4	Yes	
		Smithsonian	14	Yes	
		Time	1	Yes	
		Time	1	Yes	
		Time	1	Avoided	
		Time	1	Yes	
		Time	1	Avoided	controversy
		Time	1	Yes	
		Time	1	Avoided	
		Time	1	Avoided	
		Time	1	Avoided	
		Time	1	Avoided	
		Time	1	Yes	
		Time	1	Avoided	
		Time	1	Yes	
		Vogue	2	Yes	controversy
		Vanity Fair	1	Yes	
		Vanity Fair	1	Yes	
		Vanity Fair	1	Yes	
		Women's Health	1	Avoided	

Role of climate change	Article type	Magazine	Graphics	C.C. exists	Controversy/uncertainty portrayed
	Brief Article	Time	1	Yes	
		Time	1	Yes	
		Time	1	Yes	
		Time	1	Yes	
		Time	1	Yes	
		Time	1	Avoided	
		Time	1	Avoided	
		Time	1	Avoided	
		Time	1	Avoided	
		Time	1	Avoided	
		Vanity Fair	11	Avoided	
		Vanity Fair	9	Yes	
		Cosmopolitan	1	Yes	
		Family Circle	1	Yes	
		Men's Health	0	Yes	
		National Geographic	4	Yes	
		National Enquirer	0	Yes	
		People	0	Yes	
		AARP Magazine	0	Yes	
		Smithsonian	1	Yes	
		Smithsonian	5	Yes	

Features came from Good Housekeeping, Glamour, National Geographic, Oprah Magazine, AARP Bulletin, Smithsonian, Time, Vogue, Vanity Fair, and Women's Health. One of these features discussed the subject in the context of controversy: a 1,380 word Time Magazine article, "Hoping for Audacity," mentioned that President Barack Obama's critics had taken the initiative to frame the debates over climate change in addition to those of healthcare and the economy. Two

brief articles discussed controversy as well. An 836 word Time Magazine article "Health Reform: Can the Democrats Cross the Finish Line?" described the political treachery of the U.S. House of Representatives having supported controversial climate change legislation only to see it shredded or buried in the U.S. Senate. An 844 word article in Vanity Fair summarized the results of a telephone poll conducted in September 2010 in which few respondents indicated concern for our species being eradicated by global warming.

Overall, articles discussing climate change tended to be Features (N=61) or Brief articles (N=60). Thematically, however, a brief mention of the topic (N=48) or use of it as a minor theme (N=38) was most common. Scientific consensus was unanimous, and despite the portrayal of controversies, such as legislative measures, personal practices, or the opinions of cited sources, there were no actual endorsements of climate skepticism among any of the articles studied.

Framing

The last aspect of the analysis identified and compared frames within the magazines in order to answer:

R4: How are these media framing the issue?

As found in R3, media were framing climate change as a scientific fact in general. But because there was the presence of controversial aspects, and at times sources were included that made statements of doubt or denial, additional measures were taken to further identify and contextualize frames. The prominence and characteristics of climate change coverage were operationalized

using four different framing themes. The first frame looked at how climate change was portrayed scientifically, to address:

R4a: Do they present current scientific consensus (based on the 2007 IPCC Report)?

As seen in tables seven through 10, 104 of the articles (81%) did in fact represent scientific consensus that climate change is a reality. These articles tended toward one of three themes:

1. Offering advice, ideas or inspiration about how individuals can or do help mitigate the problem
2. Describing how climate change is affecting or will affect people, animal species, or ecosystems
3. Discussing the challenges involved in national or international policymaking regarding climate change

Although the majority of articles framed climate change in this way, discussing climate change as a scientific fact to be understood, mitigated, or adapted to, they did not entirely portray scientific consensus that climate change is caused in large part by human activity. Only 45 articles (35%) portrayed climate change as anthropogenic.

The next frame addressed:

R4b: Do they present climate change as a controversy and avoid taking a position?

The majority (81%) of all articles did not present climate change within a frame of controversy. In 23 articles (18%) the reality of climate change was neither supported nor denied (either by the author's implication or direct statements) but rather avoided. Although some articles did use sources to portray disparate perspectives or evaluations of climate change, these were separate from overall frames used in the articles. Sources were never used to frame an overall message of climate change uncertainty. Many were cited for expressing doubt about climate science, but if the overall theme of an article was that climate change exists, that was identified in this study as a frame. In this way, climate change was framed as existing, a position was avoided, or it was referred to as a debate about how to address the challenges of creating public policy. No articles framed the science as uncertain or faulty, though climate skeptics were at times a topic of an article.

The next frame identified sources and the evaluations they made in order to address:

R4c: Do these media discuss climate skeptics, or the deeper issues and challenges of creating public policy?

The issues and challenges of creating public policy were most commonly discussed using sources in the articles found. Therefore the sources used in each article for either direct quotation, paraphrasing, or reference were accounted for, as well as their respective evaluations. These are shown in table 11.

Table 11. Sources used in articles by type and quantity, grouped by publication genre

Source type	Men's (15 articles)	Women's (27 articles)	General Interest (85 articles)	Source type total
Industry/corporations	4	1	15	20
Government	2	1	8	11
Research/academic	7	5	45	57
Public	8	11	11	30
International organization/research group	0	4	7	11
Advocacy group	6	2	29	37
Elected U.S. official	1	0	15	16
Total sources	28	24	134	186

Source types were broadly categorized into one of seven groups: industries or corporations, government agencies, the academic or research sector, the public sector, international figures, advocacy groups, or elected U.S. officials. The largest number of sources came from the research or academic sector, followed distantly by the advocacy groups. The evaluations made by these sources are detailed in Table 12.

Table 12. Source evaluations regarding controversial and complex climate change issues

Evaluations regarding climate change	number of sources
supportive of scientific consensus	42
supportive of individual actions to prevent/mitigate	49
supportive of national prevention/mitigation policy	26
supportive of industrial prevention/mitigation policy	38
supportive of international prevention/mitigation measures	17
emphasis on environmental/social risks	40
emphasis on moral/ethical implications	22
critical of scientific consensus	2
unsupportive of individual actions to prevent/mitigate	2
unsupportive of national prevention/mitigation policy	8
unsupportive of industrial prevention/mitigation policy	6
unsupportive of international prevention/mitigation measures	1

Sources at times represented controversial aspects of climate change in the form of climate skepticism or the deeper and more complex issues surrounding prevention or mitigation. There were 95 overall positive evaluations regarding climate science, anthropogenic duties and justification to act. The majority of them supported scientific consensus, supported individual actions to prevent/mitigate climate change, and/or emphasized environmental or social risks posed by a changing climate. Much less represented were evaluations discouraging concern about climate change or action to prevent or mitigate it. There were two negative evaluations of scientific consensus, two negative evaluations of individual actions, eight negative evaluations of national mitigation policy, six negative evaluations of industrial mitigation policy, and one negative evaluation of international mitigation policy. Most literature incorporating the controversial aspects focused on national and industrial policymaking rather than the science itself or implications of climate change upon the environment and population.

Overall, 15 articles cited at least one source with a negative evaluation of climate change science or mitigation or adaptation actions or policy. The largest number of these skeptical sources, a total of five, could be identified as advocacy groups or group members. At least one public sector source, meaning a citizen, legal voice, economist, religious representative, consumer group, labor union, or celebrity, was used in 21 articles. Of these articles, only one contained at least one such source that gave a negative evaluation of science or actions or public policy to mitigate or adapt to climate change. At least one industry or corporation representative as a source, meaning an industry lawyer or representative, lobbyist, scientist, or someone from the energy or automobile industry, was cited in 13 articles. Of these articles, two contained at least one such source that gave a negative evaluation of science or actions or public policy to mitigate or adapt to climate change. At least one advocacy group source, such as an environmental, agricultural or political organization, the U.S. Chamber of commerce, or a political policy group, was cited in 23 articles. Of these articles, five contained at least one such source that gave a negative evaluation of science or actions or public policy to mitigate or adapt to climate change.

At least one elected U.S. official was named in nine of the articles, and two of these articles contained at least one such source that gave a negative evaluation of science or actions or public policy to mitigate or adapt to climate change. At least one government agency, such as the Environmental Protection Agency, Congressional Budget Office, Department of Energy, or Department of Agriculture, was used in eight of the articles, and none of these articles contained any sources that gave a negative evaluation of science or actions or public policy to mitigate or adapt to climate change. At least one academic or research

professional, such as a professor, scientist, author, or scientific study was cited as a source in 38 articles. Of these articles, three contained at least one such source that gave a negative evaluation of science or actions or public policy to mitigate or adapt to climate change. At least one international figure, such as a European Union, United Nations, or Intergovernmental Panel on Climate Change member or representative was used as a source in nine articles. Of these articles, two contained at least one such source that gave a negative evaluation of science or actions or public policy to mitigate or adapt to climate change.

Last, this study identified the way in which solutions or recommendations were framed by the authors to answer:

R4d: Are these media encouraging or criticizing individual, governmental, or international involvement in mitigation and/or adaptation?

To examine if and how the publications encouraged or criticized involvement in climate change mitigation or adaptation, frames were identified that encouraged or prescribed solutions (personal, industrial, national or international actions). The publications are shown in Table 13 with the rate at which their relevant article(s) portrayed climate change, anthropogenic causes, individual or industrial actions recommended, and public policy support.

Table 13. Frequency of magazine portrayal of climate change, mitigation and policy

Magazine (N)	cc exists frequency	anthropogenic	actions recommended	Support for policy
National Geographic (13)	1.0	0.61	0.62	0.62
AARP Bulletin (7)	1.0	0.57	0.86	0.86
AARP (2)	1.0	0.00	1.00	1.00
AARP Magazine (2)	1.0	0.00	1.00	1.00
ESPN (1)	1.0	1.00	1.00	1.00
Sports Illustrated (1)	1.0	1.00	1.00	1.00
Cosmopolitan (2)	1.0	0.5	0.50	0
Family Circle (1)	1.0	1.0	0.00	0
Good Housekeeping (1)	1.0	1.0	0.0 0	0
Vogue (3)	1.0	0.33	0.67	0.66
National Enquirer (1)	1.0	0.00	0.00	0.00
Smithsonian (21)	0.86	0.29	0.46	0.29
Vanity Fair (9)	0.78	0.33	0.56	0.56
People (4)	0.75	0.00	0.50	0.25
Oprah (3)	0.75	0.33	0.33	0.25
Men's Health (3)	0.67	0.67	0.67	0.50
Time (50)	0.60	0.30	0.32	0.30
Glamour (2)	0.50	0.00	0.50	0.50
Reader's Digest (1)	0.00	0.00	0.00	0.00
Women's Health (1)	0.00	0.00	0.00	0.00

An overall solution or adaptation-oriented frame was found in 44% of the articles, and categorized for recommending either actions by individuals or industries, or a form of public policy. At a rate of 34%, public policy was promoted three times more often than individual actions, which were promoted in 11% of the articles. 14 articles (11%) recommended individual or industrial actions to mitigate or adapt to climate change, while 44 articles (34%) recommended public policy through governmental or international actions to mitigate or adapt to climate change.

A correlation was run between magazine type and the role of climate change within the article. The magazine type was coded in ascending order from women's interest (one), to men's interest (two), to general interest (three) in order to identify the possibility of genre trends. The role of climate change in

each article was coded in ascending order from central (one) through casual mention (four). This is shown in Table 14.

Table 14. Frequency of magazine portrayal of climate change, mitigation and policy by genre

Type (N)	Climate change exists	Climate change is anthropogenic	Personal/industrial actions recommended	Policy recommended
Women's (27)	0.77	0.34	0.3	0.22
Men's (15)	0.94	0.54	0.92	0.89
General Interest (85)	0.61	0.3	0.35	0.3
Overall	**0.81**	**0.35**	**0.11**	**0.34**

A statistically significant negative correlation (-0.125, p= .001) was found, demonstrating that the women's interest magazines were least likely to focus on climate change as a central theme, men's interest magazines were more likely to do so, and general interest magazines were most likely to do so. A correlation was run between magazine type, in the same ascending order, and likelihood of stating that climate change exists or is anthropogenic. Neither correlation was found to be statistically significant.

A correlation was measured between magazine type and likelihood to use governmental or scientific sources, but none was found to be statistically significant either. Therefore, although men's interest magazines were more and general interest magazines were most likely to use governmental or scientific sources in their articles when referring to climate change compared to women's interest magazines, it was not on a significant level. A correlation was also run between magazine type and likelihood to support policy actions to prevent or mitigate climate change. A statistically significant positive correlation was found showing that men's interest magazines were more likely (p=.001) and general

interest magazines were most likely (p=.01) to recommend proactive steps or policies to prevent or reduce climate change compared to women's interest. Only three articles in the sample recommended any sort of climate change adaptation, and these came from the general interest category (Smithsonian and National Geographic). No articles in this sample specifically recommended or criticized personal, national, industrial, or international measures to either prevent or adapt to climate change.

This analysis investigated the coverage frequencies, tendencies, and frames used in the context of climate change by the most widely circulated magazines in 2010 according to both subscription and newsstand sales. It found trends among different magazine genres and identified the typical audience for them as well, finding statistically significant correlation coefficients between genre and likelihood to present particular frames about climate change. The closing chapters identify how this analysis can be rooted in the major theories and literature that guided it, namely, agenda-setting and framing research.

Chapter 5: Discussion

This study began with an examination of how many popular magazines published articles in 2010 discussing climate change, in response to the research question:

R1: Are non-news or soft news media broaching the topic of anthropogenic climate change?

The answer is that some of them are. The database searches and content analysis undertaken found that out of the 48 most widely circulated magazines of 2010,

cross-referenced based upon the top 25 for both subscription and newsstand sales, fewer than half of them discussed the topic of climate change.

The second topic of the study was to identify the differences between those that did publish articles and those that did not. This addressed the research question:

R2: How do non-news or soft news media that cover climate change differ from those that do not, or what demographic correlations might be implied by coverage based on magazine audiences?

The publications that covered climate change were varied across genre but had in common an average reader age in the 40s with upper middle class income or higher and a college education. The most interesting finding here was that publications that did not cover climate change at all tended to be more in the genre of women's interest. There was also a slight difference among non-coverage audiences to be more affluent, educated and older than the coverage audience. Because this aspect of the research did not find significant differences here, magazine genre was analyzed more closely and these genres were used later to compare with one another to find differences in coverage frequency, depth, and framing themes.

The frequency and depth of coverage were identified in order to answer the next research question:

R3: Among non-news or soft news media that do cover the topic of climate change, how often and in what depth are they doing so?

The frequency of coverage among these magazines ranged from .019 to 1.75 times per issue, and only the prestigious science and policy related publications such as Time Magazine, Smithsonian and National Geographic covered it with

any regularity or depth. The type of coverage was very minor and superficial in the majority of articles, as 62% of all coverage appeared as either a casual mention of the phrases climate change or global warming or as a side note or minor theme in an article about something else. Articles focusing primarily on climate change represented 12% of the sample. The only articles that focused on climate change as a central theme and provided depth in long-form feature-length format came from the same prestigious magazines found to cover it frequently: Time Magazine, Smithsonian and National Geographic. Other magazines covered it as a major theme in feature form, and three others covered it as a central theme in shorter articles: AARP Bulletin, AARP Magazine, and Vanity Fair. The publications covering climate change as a major theme in both brief and feature-length stories were more diversified across genre and included Cosmopolitan, Glamour, Good Housekeeping, AARP Bulletin, and ESPN.

The next topic addressed four separate framing themes to answer the research question:

R4: How are these media framing the issue?

To better understand how these magazines painted a picture of climate change for readers through the use of graphics, sources, and text, this research question was answered by identifying four different frames. These were used to investigate 1) the rate at which scientific consensus that climate change is a fact and in part anthropogenic was supported, 2) the rate at which controversy surrounding the issue was portrayed, 3) the rate at which the complexities of climate science and public policy were portrayed through the use of sources and their respective evaluations, and 4) the rate at which individual or public policy actions were supported.

The first frame, agreement with scientific consensus, was used to answer:

R4a: Do they present current scientific consensus (based on the 2007 IPCC Report)?

The analysis found that climate change was portrayed accurately in 81% of all articles in terms of its existence. It was not addressed using this frame in the remainder of the articles, and was never denied thematically., The anthropogenic aspect of climate change was studied as a separate frame and was portrayed accurately much less frequently, or 35% of the time. Discussion of human causes was never denied, but rather avoided 65% of the time.

Next, this study identified controversy within the sample to address the research question:

R4b: Do they present climate change as a controversy and avoid taking a position?

Controversy was not found to be a significant element in most of the sample, and when it was introduced it was in 11 out of 13 cases to describe political or legislative issues, or to dismiss skepticism. There were 13 articles, or 12% of the sample that portrayed climate change in the context of controversy. They came from National Geographic, AARP Bulletin, Time Magazine, Men's Health, and Vanity Fair. National Geographic and Time each published multiple articles discussing the controversies and in some cases avoided taking positions by portraying the controversies of policy or scientific inquiry without bias. The other three publications, as well as Time Magazine and National Geographic in other instances, acknowledged controversy but presented a position that favored scientific consensus of climate change.

The next query was closely related to and in many cases overlapped with controversy to address the research question:

R4c: Do they discuss climate skeptics, or the deeper issues and challenges of creating public policy?

Very few of the articles discussed climate skepticism, with six coming from Time Magazine and one coming from National Geographic totaling seven overall. National Geographic, Time Magazine, AARP Bulletin, and Men's Health carried articles that discussed the deeper issues and challenges of climate change in the context of resource scarcity, human conflict, environmental hazards, and loss of flora and fauna species, but not policymaking. Time Magazine covered public policy challenges three times and AARP Bulletin covered it once as well, but no statistically significant representation suggested this is a trend among popular magazines in this study.

The last framing theme identified was one of mitigation or adaptation recommendations to answer the research question:

R4d: Are these non-news or soft news media encouraging or criticizing individual, governmental, or international involvement in mitigation and/or adaptation?

No criticism frames of mitigation or adaptation were found. Mitigation-oriented frames were found in less than half of the articles, and adaptation frames were found in only three articles. Mitigation frames were then focused on as the majority of frames, and categorized for recommending either actions by individuals or industries, or a form of public policy. At a rate of 34%, public policy was promoted three times as often as individual actions, which were recommended in just 11%. This study found framing trends among different

magazine genres and identified statistically significant correlation coefficients between genre and likelihood to present particular frames about climate change.

Chapter 6: Conclusions

The research conducted in this study has many implications for agenda-setting and framing as applied to magazine coverage. While it cannot make specific connections to agenda-setting, the media agenda apparent in popular magazines as studied here suggests that climate change is framed and covered in ways that could affect public opinion and policymaking if propagated in other media and agendas. The articles published during 2010 did not mimic the balanced reporting found in previous newspaper studies in which climate change was presented from two opposing sides; rather, it was reported widely as a fact and focused more on its implications than explaining or disputing the science. Among the 127 articles the science of climate change was never disputed. In fact, the only manner in which climate change was presented as controversial had a decidedly political or policy-related theme. A few exceptions were found among the sources quoted in articles, some of whom downplayed the implications of climate change. But overall article framing themes demonstrated acceptance of scientific consensus. These sources presented the complexities involved in climate science, mitigation, and adaptation. They were used as voices of expertise, personal opinions, beliefs, and political context. Some were counterbalanced with opposing sources or evaluations, and the authors themselves contradicted others—although only when the sources were skeptical of climate science, and rarely at that. Overall, these sources added complexity to the subject matter and represented the greatest measureable context for

evaluating complexity within articles aside from overall thematic climate change framing used by the authors.

Climate change was most often written about as a given, and its implications moved beyond contemplation of the science to more complex concerns about impacts, policy decisions, and personal involvement. This tendency was found within the collective group of publications, and also traced within genre groups for the purposes of comparison based on publication type and audience.

Women's magazines did not rank highly in coverage frequency, though publications like Vanity Fair made the exception within this genre by covering the topic accurately and frequently relative to other popular magazines. The Women's Magazines overall demonstrated a positive correlation for framing of scientific consensus about global warming, but only as far as acknowledging or implying the existence of climate change as a reality. They avoided controversial aspects of discussing the human role and the need for industrial reform and public policy measures much more than the other two genres, and did not promote personal actions to mitigate or adapt to climate change to the extent that the men's interest and general interest magazines did. This theme carried over into the largest magazine genre, women's interest, in other ways. It was noted almost immediately when browsing through women's interest magazines that even among those that did not cover climate change during the study period, information about eco-living, sustainability, and organic recipes and housecleaners appeared frequently. A future case study of how women's magazines frame sustainability as a personal action, without using terms that are more politically charged such as climate change, might be of

use to the field. Similarly, men's interest and particularly general interest magazines addressed climate change more thoroughly and more directly with features that centered on the subject. They addressed the tougher questions from science and policy standpoints, and they used scientific and governmental sources more often to discuss them. Conversely, some such publications avoided the subject of anthropogenic cause more extensively, which may also be the subject of further investigation. This might be an underlying assumption or it may be an effort to avoid framing the issue from a negative human interest perspective.

This study was limited by several factors. As a first attempt to study this genre of media in this context, there were no precedents from which to base this research. The large number of popular publications and their common exclusion from academic research databases resulted in a convenience sample of publications with intact database records. Given the number of variables studied, many additional correlations and inquiries could be made that were not possible within the scope of this project. The coding method might be streamlined in future with assistants and smaller sample sizes (or longer timelines) that focus on specific magazine niches, such as women's fashion and celebrity interest genres, which were relatively underrepresented here for coverage of the topic. Another limitation was that not all graphics could be obtained and in most cases, even when graphics could be obtained for an article, the front cover of that publication was unavailable, making it impossible to determine whether featured articles about climate change had appeared prominently on the cover and made a potentially deeper impact as a result.

Overall, fewer than half (45%) of the most popular magazines published any articles on the subject of climate change at all during 2010. The majority (62%) of those publications that did publish articles regarding the issue either casually mentioned the phrase or used it as a minor or secondary theme in an article about something else. The vast majority (81%) of all published articles framed climate change as a scientific fact, but not an anthropogenic one (35% did portray anthropogenic cause). While none denied climate change or even anthropogenic causes, the remaining articles did not discuss it within such a frame of fact or fiction. The articles that focused on the topic as a central or major theme had more theoretical potential to make an impact, as they allowed for more prominence, content, and numerous and relevant graphics.

A diverse range of magazines covered the issue in articles ranging from editorials and reader responses to brief articles and feature length articles. Categorization of the publications based upon type and target audience suggests that genre was a factor in how frequently and thoroughly the publications covered the subject, and how it was framed. The demographic makeup of the target audience for these publications revealed that the average readers were a specific group, namely in their forties, and relatively affluent and educated compared to national U.S. averages. This is not by any means a representation of the overall voting population, so it is questionable whether this very specific group is 1) open minded to climate change as a salient issue, 2) significant in the overall scheme of public opinion, or 3) influential in public policymaking or agenda-setting. Furthermore, the inclusion of more prestigious, hard-news and hard-science publications in this

study by virtue of popularity make it difficult to determine if this research accurately represents the tendencies of more tabloid-like magazines. One implication is that some magazines represent similar audience demographics to those of the prestige press. This indicates that the study has not necessarily fully isolated a new audience that is disinterested in politics and news issues. Perhaps the tabloid papers are a relative minority among the most widely circulated publications, with a unique audience and need to be studied with greater scrutiny. In part, this would involve acquiring hard copies of the tabloid-like publications that are not available on public records after their publication period has passed. When the prestigious popular magazines are removed from the results and more mainstream publications are isolated, the magazines in both men's and women's categories with the lowest household income, in the range of $30,000-40,000, represented climate change only 25% of the time—which present very different implications. Magazines targeted at these working class audiences may be aimed at simply entertaining readers who are distracted by their basic needs and not interested, as Achen suggested (Achen, 1975, Boykoff and Mansfield, 2008), in complex issues and policies. Because the coverage among the more tabloid-like magazines was the lowest of the group, it appears that this medium is underdeveloped as a transmission tool for public outreach among policy elites or leaders. This audience may get its information on climate change elsewhere, or not at all. It may also represent an opportunity for policy-making to recognize an under-utilized market in which to inform citizens about the science of climate change and climate mitigation possibilities using different communication strategies.

The mainstream women's fashion and celebrity interest magazines that most represented a tabloid paper as defined in the Boykoff and Mansfield study (Boykoff and Mansfield, 2008) show signs of being an unexplored medium with which policy leaders, advocacy groups or journalists might encourage better coverage, whether by celebrity advocate interviews, lifestyle guides, human interest stories, or simplified policy articles. Each of these article types appeared throughout this study, indicating there is a market for them that might be better capitalized on in the future. That the women's magazines did not score highly for portraying anthropogenic contributions to climate change, nor for making recommendations for industry actions or policy actions to either mitigate or adapt to it, are of interest for public outreach in an agenda-setting paradigm. This medium may avoid controversial and polarizing aspects of climate change debates, which tend to center around industry and policy. It was expected that they would better promote personal actions within their narratives, however. General interest magazines covered the topic more frequently and demonstrated an audience and content (news, policy, and science) most like the prestige press. Yet they represented scientific consensus the least frequently of all three genres. This is potentially problematic from an agenda-setting and framing perspective because this genre published so many articles on climate change, used many primary sources, and includes more prestigious publications which readers and opinions leaders may actually look to purposefully and trust more readily as elite sources for information on the topic. It might be speculated that they do not feel the need to describe scientific consensus if their readership is already engaged in the issue and its causes. This genre did provide the most

varied, obscure, in-depth, and scientific narratives of climate change implications for human life, animal and plant species, and for mitigation and adaptation potential.

The finding that men's magazines over-represented the framing of scientific consensus is also a subject to be explored. A next step might be to test hypotheses about many of these findings, including the hypothesis that the entertainment principles of sports, gaming and lifestyle magazines in this genre skew it from representing scientific and policy issues with much vigor, as may similar assumptions for women's lifestyle and entertainment magazines. The men's interest category warrants a second and closer look for its role in the dispersal of ideas about climate change mitigation, and its propagation of issue salience with public opinion might be studied with individual-level effects of framing approaches.

This study is only the beginning of much more work to be done in understanding how soft news, the popular press, and magazines in particular represent important issues such as climate over time. Certainly the context of the 2010 coverage has changed in the years that have passed. The 2011 IPCC report has been released, hurricane seasons have continued to draw attention, the 2012 United States presidential election has granted a second term to an incumbent president who may re-prioritize climate change legislation, and the U.S. is by some accounts recovering economically from the sub-prime mortgage crisis and economic downturn of 2008. Industry and public pressure to expand domestic energy production will continue, and more recent coverage of climate change in such contextual framework warrants further study and will lend itself to a longer periodic examination of the ebb

and flow of the topic within mass communication as a whole and particularly main stream media. There is great potential to repeat this study for subsequent years, or to expand it using more ambiguous terms (e.g. eco-friendly, organic living, alternative energy, energy efficiency and sustainability) that promote personal actions to mitigate and adapt to climate changes (preparing for droughts, floods, other extreme weather, and reduced energy, food or water) in mainstream content.

Last, it is an assumption within this study that public opinion and public policy can be in any way influenced in an agenda-setting paradigm by the coverage and framing of a subject within a soft news medium. Agenda-setting research has proven that material is most influential to the public when it is new, prominent, and repetitive. Climate change has been covered by all forms of media for many years, and is therefore less salient a topic for theoretical public engagement. Although much has been studied about the prestige press coverage of climate change, the popular press has not been studied in the U.S. As Boykoff has stated, a working-class majority of citizens may be reading something else besides the prestige press (Boykoff 2008). The soft news medium's representation of climate change is of potentially great importance for agenda-setting approaches if this working-class group is paying attention to its messages on the subject.

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Appendix A: Content Analysis codebook

ARTICLE CODE:_____

U.S. Magazine Coverage of Climate-Change Science January – December 2010
Content Analysis coding sheet

I. Basic information

==========

V1 Article number _____

==========

V2 Magazine [*circle one*]

Vanity Fair	1
Family Circle	2
Glamour	3
O Magazine	4
Men's Health	5
Sports Illustrated	6
People	7
Smithsonian	8
AARP Magazine	9
National Enquirer	10
Vogue	11
AARP	12
AARP Bulletin	13
Cosmopolitan	14
Good Housekeeping	15
National Geographic	16
Reader's Digest	17
Time	18
Women's Health	19
ESPN	20

==========

II. Placement

These variables measure the location in which articles about climate change appear in the publication.

==========

V3 Page number ____ out of _____total pages

Information not available 0

This metric tracks the page number only. If it is not labeled, attempt to determine the page number based upon the nearest page number labeled and confirm calculations.

==========

V4 Type of article _____

This information is based upon the heading of the section of the publication in which the article is published. If there is not a decipherable section, circle the non-applicable choice.

Brief article	1	From the Editor	2
Reader responses/Opinion	3	Feature	4
Sidebar	5		

==========

V5 Total word count of article _____

==========

V6 # of Graphic item(s) _____ Type: _____

This variable measures whether any graphic elements, such as photographs, charts, graphs or sketches accompany the articleNone 0

Chart/table	3		
Graphic/illustration	1	Pull-out quote	4
Image/photograph	2	Other (*list)*_____	5

==========

III. Framing Themes

V7 Central focus of the article- (qualitative)_____

This measures the overall theme or conceptual focus of the article. The primary focus may be on climate change in any aspect, or climate change may be a secondary or minor aspect of the article.

Role of climate change within article:

Central focus	1	minor theme	3
Major theme	2	casual reference	4

Code for the presence or absence of each variable below, and where in the article the theme appears. Divide articles into thirds, and add uneven numbered paragraphs to second and third sections.

A. <u>Themes regarding the existence of climate change</u> (can be secondary or minor)

These measures identify the primary framing in which climate change is mentioned.

Variable		Headline	Subhead	1st	2nd	3rd
V8-a	Climate change exists					
V8-b	Climate change does not exist					
V8-c	Climate change is uncertain					
V8-d	Other: describe_____					

NOTES:

B. <u>Themes regarding the causes of climate change</u>

Variable		Headline	1st	2nd	3rd
V9	Mentions CAUSES OF CLIMATE CHANGE				
V9-a	Mentions natural variations				
V9-b	Mentions human activity				
V9-c	Mentions greenhouse gases				
V9-d	references to industries or nations (specify which)				
V10	presents SCIENTIFIC DATA/NUMBERS or REPORT (by scientific bodies or other second-hand references about climate change or GHGs). ***LIST DATA/FINDING cited:*** **_____**				
V11	Describes UNCERTAINTY, DOUBT or CONTROVERSY over the SCIENCE of climate change. ***LIST TYPE OF*** **CONTROVERSY AND WHO IS RAISING DOUBT:**				

NOTES:

C. Themes regarding the implications of climate change

Variable		Headline	1st	2nd	3rd
V12	mentions impacts of climate change to ENVIRONMENT (Includes 'dire' or 'severe' consequences, sea rise, coastal flooding, loss of plants/animals). ***LIST IMPACTS and TIMING OF IMPACTS HERE*** _____				
V13	Mentions impacts of climate change to PEOPLE (loss of habitat, agriculture or natural resources, property damage, fatalities, displacement, violence)				
V14	Reference to the ETHICAL or MORAL dimensions of climate change and policy (human rights, impacts to poor, future generations, loss of life). **LIST: ____**				
V15	Reference to impact on human health ***LIST:*** _____				
V16	Reference to impact on national security **LIST: _____**				

NOTES:

D. Actions to prevent, mitigate, or adapt to climate change

Variable		Headline	1st	2nd	3rd
V17-a	Recommends **personal actions** to prevent/mitigate climate change				
V17-b	Recommends **national actions** to prevent/mitigate climate change				
V17-c	Recommends **industrial actions** to prevent/mitigate climate change				
V17-d	Recommends **international actions** to prevent/mitigate climate change				
V18-a	Recommends **not taking personal actions** to prevent/mitigate climate change				
V18-b	Recommends **not taking national actions** to prevent/mitigate climate change				

V18-c	Recommends **not taking industrial actions** to prevent/mitigate climate change				
V18-d	Recommends **not taking international actions** to prevent/mitigate climate change				
V19-a	Recommends **personal adaptations** to climate change (i.e. it is inevitable and we must prepare)				
V19-b	Recommends **national adaptations** to climate change				
V19-c	Recommends **industrial adaptations** to climate change				
V19-d	Recommends **international adaptations** to climate change				
V20-a	Recommends **NO personal adaptations** to climate change _____				
V20-b	Recommends **NO national adaptations** to climate change (i.e. it is inevitable and we must prepare). **LIST REASONS** _____				
V20-c	Recommends **NO industrial adaptations** to climate change (i.e. it is inevitable and we must prepare). **LIST REASONS** _____				
V20-d	Recommends **NO international adaptations** to climate change (i.e. it is inevitable and we must prepare). **LIST REASONS** _____				

NOTES:

==========

IV. Sources

Type of Actors. Code **only the first four sources** in each article. Code for either quoted or paraphrased content. Source statements are denoted by "according to," "said," "says," "saying," "pointed out," "accused," "noted" or "cited" and accompanied by a statement or evaluation. **If a source says something that is also included as a theme variable** in Section III, code as a STATEMENT /EVALUATION in Section V, and NOT AS A THEME.

	Sources: 1st	2nd	3rd	4th
V21. public sector				
citizen/lay opinion _____	1	1	1	1
judicial or legal voice_____	2	2	2	2
economist_____	3	3	3	3

religious organization_____ 4 4 4 4
consumer group_____ 5 5 5 5
labor unions_____ 6 6 6 6
the public, public opinion (also: "we," "one") _____7 7 7 7
celebrity _____ 8 8 8 8

V22. industry/corporations

industry lawyer_____ 9 9 9 9
industry group or lobbyist_____ 10 10 10 10
corporate/industry scientist_____ 11 11 11 11
oil/gas company _____ 12 12 12 12
coal company _____ 13 13 13 13
electric utility _____ 14 14 14 14
automobile industry_____ 15 15 15 15
renewable energy sector_____ 16 16 16 16

V23. advocacy groups

ENVIRONMENTAL organization or foundation ____17 17 17 17
clean energy group _____ 18 18 18 18
U.S. Climate Action Partnership (USCAP) _____ 19 19 19 19
American Petroleum Institute _____ 20 20 20 20
U.S Chamber of Commerce_____ 21 21 21 21
CONSERVATIVE think tank/policy group _____ 22 22 22 22
LIBERAL think tank/policy group _____ 23 23 23 23
SOCIAL or public health group _____ 24 24 24 24
agriculture/farming _____ 25 25 25 25
generic reference to 'ADVOCATES' 26 26 26 26
generic reference to 'OPPONENTS' 27 27 27 27

V24. U.S. elected official

local/state elected____ 28 28 28 28
US Senator – REPUBLICAN _____ 29 29 29 29
US Senator – DEMOCRAT _____ 30 30 30 30
US Senator - INDEPENDENT_____ 31 31 31 31
US House of Representatives – REPUBLICAN ____ 32 32 32 32
US House of Representatives – DEMOCRAT _____33 33 33 33
US House of Representatives - INDEPENDENT____34 34 34 34
President OBAMA _____ 35 35 35 35
state governor_____ 36 36 36 36
US Congressional COMMITTEE_____ 37 37 37 37
Obama Administration_____ 38 38 38 38

V25. government agency

Environmental Protection Agency (EPA) _____39 39 39 39
Congressional Budgetary Office (CBO) _____ 40 40 40 40
Department of Energy (DOE) _____ 41 41 41 41
Agricultural (USDA)_____ 42 42 42 42
other agency (*name here*)_____ 43 43 43 43

V26. Academic/research sector

academic/professor _____ 44 44 44 44
academic journal or research publication _____ 45 45 45 45
author (or book) _____ 46 46 46 46

scientific study/published research _____ 47 47 47 47
(incl. scientists, economists)

V27. international

European Union or international elected _____48 48 48 48
United Nations/Intg'l. Panel on Climate Change 49 49 49 49
other international organization/figure_____50 50 50 50

V28. other (*list*) _____ 51 51 51 51

NOTES:

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V. Demands/Evaluations of sources

Instructions: Identify the sources interviewed or identified within the article. Ex.) "According to the EPA…", or whenever there is a quote or mention of "he or she says/said". Demands and evaluations by sources involve the questions *what is the author or source recommending?*

- Code up to FOUR sources
- Start at the top of the article (including headline) and code *in sequence*.
- Be pragmatic – choose expressions that fit the coding book.
- Prefer demands and evaluations in the present form.
- Where possible, include any other relevant details regarding statements in the notes sections.

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V29. Type of source (*use variables in Section IV: politician, celebrity etc.)*

_____

DIRECTIONS: *Code with corresponding number if present*

Sources:

	1st	2nd	3rd	4th
V30. POSITIVE EVALUATION of science	1	1	1	1
V31. NEGATIVE EVALUATION of science	2	2	2	2
V32. POSITIVE EVALUATION of personal actions to mitigate climate change List personal actions evaluated _____	3	3	3	3
V33. NEGATIVE EVALUATION of personal actions to mitigate climate change List personal actions _____	4	4	4	4

V34. POSITIVE EVALUATION of national mitigation legislation/policy
5 5 5
List policy_____
V35. NEGATIVE EVALUATION of national mitigation legislation/ policy
6 6 6
6
List policy_____
V36. POSITIVE EVALUATION of industrial mitigation legislation/ policy
7 7 7
7
List policy_____
V37. NEGATIVE EVALUATION of industrial mitigation policy 8 8 8
8
List policy _____
V38. POSITIVE EVALUATION of international mitigation policy 9 9 9
9
List policy _____
V39. NEGATIVE EVALUATION of international mitigation policy 10 10 10
10
List policy _____
V40. Other: _____ 11 11 11
11
V41. Addresses environmental and/or social risks of climate change
List _____ 12 12 12
12

V42. Explicit reference to MORAL/ETHICAL dimensions
LIST_____ 13 13 13
13