

**CHANGING CLIMATE, CHANGING MINDS:  
APPLYING THE LITERATURE ON MEDIA EFFECTS,  
PUBLIC OPINION, AND THE  
ISSUE-ATTENTION CYCLE TO INCREASE PUBLIC  
UNDERSTANDING OF CLIMATE CHANGE**

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Abstract

While media coverage and public discourse on climate change have increased significantly in the U.S. in recent years, it is not clear that this communication has gone beyond political elites to inspire action among the mass public. This paper applies knowledge from 30 years of literature on media effects and public opinion to the issue of climate change, examining the role of key communications concepts such as framing, priming, agenda-setting, and the issue-attention cycle. As the environment achieves prominence for the third time since the 1970s, this paper examines characteristics of information that would increase the accessibility and salience of the climate change issue for the general public.

*1. Introduction*

In recent years, the salience of global climate change has greatly increased for political elites in the United States. In an op-ed column published in *The Washington Post*, Harvard climate change experts John Holdren and Kelly Sims Gallagher describe a “Sea Change in the Politics of Climate,” noting a proliferation of communication on this topic by and for political elites. Such events as the 4<sup>th</sup> IPCC Report, the IPCC’s Nobel Peace Prize, the UN Conference in Bali, the Stern Report, Al Gore’s film “An Inconvenient Truth,” and the Regional Greenhouse Gas Initiative in the northeastern U.S. have greatly increased exposure to this issue for those citizens who follow global and national events. In addition, the U.S. Supreme Court ruled that the U.S. EPA is obligated to consider regulating greenhouse gas emissions (Rutemberg & Andrews 2007).

Current news cycles have placed climate change higher on the elite agenda than it has been in previous years. For instance, using coverage in *The New York Times* as a rough measure of exposure to the issue for an elite audience, a cursory search in Lexis Nexis

indicates that the term “climate change” or “global warming” appeared in 865 articles in The New York Times during the one-year period April 20, 2006 – April 20, 2007. This totals more than twice the mentions of climate change or global warming in The New York Times during any previous single year 2000 to 2005.<sup>1</sup> While the framing of climate change within these articles remains unclear without content analysis, the numbers alone suggest a significant increase in coverage.

But what about members of the U.S. mass public who are not reading 865 articles in The New York Times? Public knowledge among non-elites is also increasing, yet is likely to remain at a more modest level than that of elites. In 2002, 61 percent of Americans surveyed by Gallup thought global warming was happening, compared to 48 percent in 1997 (Corbett & Durfee 2004). Surveys by Bord, O’Connor, and Fisher (1998, 2000) found that the issue of climate change holds little salience for Americans and is not fully understood. Yet, the greatest predictor of voluntary behavior change was an accurate understanding of the causes of climate change. Elite media communication alone does not address this problem.

In discussing the political shift on climate change, Dr. Holdren commented that a critical next step is to communicate with the general public on individual attitudes and behaviors related to climate change, its causes, and its effects (Holdren 2007). With this goal in mind, what findings from the literature on media effects can be applied to climate change—an arcane, complex, scientific issue that apparently lacks urgency for many Americans—in order to increase salience to the public? What can be learned and applied regarding salience, attention, priming, framing, and agenda-setting? What characteristics of information would make the topic more interesting to people? In addition, looking at literature on news coverage of the environment, what can we learn about communicating about climate change to the public?

The findings are meaningful in terms of future thought and action for policymakers, scientists, and educators. Australian scientists Nicholls and Kestin (1998) observe, “Most people and organizations . . . receive climate information through the media. It is crucial, therefore, that organizations and individuals with a climate change message develop improved methods for delivering their message through the media.”

## *2. How People Gather, Process, and Use Information*

### *Low-information rationality*

In the last 40 years, numerous social scientists have effected a transformation in thinking about how public opinion on policy issues is formed and maintained, from the earlier focus on minimalism (i.e., minimal public knowledge, attention, and stability of opinion)

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<sup>1</sup> Searches for Jan. 1 – Dec. 31 for each year yielded: 268 in 2000, 414 in 2001, 341 in 2002, 301 in 2003, 291 in 2004, 415 in 2005 (and 654 in 2006). 2006 is not included above because of the overlap with the one-year calculation April 2006 to April 2007.

to a more complex view of how individuals formulate political views. In their comprehensive review of more than 50 years of media research, Aldrich et al. (2006) argue that the mass public does hold coherent, rational opinions regarding U.S. public policy and is able to consider current issues using a “low-information rationality” approach. Members of the public use these political attitudes to make choices, such as voting decisions, when the policies and information presented to them are made salient to their lives.

The concept of low-information rationality is widely discussed and debated in the literature since the 1990s. Both Popkin (1991) and Graber (2001) present theories similar to low-information rationality, which Graber describes as a kind of “potpourri rationality” and Popkin explores via the “by product theory” of information-gathering. According to the latter view, citizens gather their political and civic information as a byproduct of their everyday activities, rather than as an activity unto itself. While people possess little civic knowledge, they acquire information from personal experience, daily life, personal contacts, news media, and political campaigns. They then filter it through old and new beliefs, arriving at a practical “gut” approach to political decisionmaking. News, campaigns, or speeches may focus the citizen’s attention or prime the information in the individual’s mind.

#### *Heuristics*

Widely accepted in the recent literature, heuristics or ‘information shortcuts’ allow individuals to gather information efficiently to formulate political judgments. In his review of public opinion theory, Sniderman (1993) suggests that individuals are unlikely to spend time acquiring copious amounts of information and are in fact very selective about what they pay attention to. For instance, the likeability heuristic (Sniderman 1993) is one such shortcut, in which individuals may reach a conclusion based on their perception of the liberal or conservative stance and their own political identification.

According to Anthony Downs, “Voters will rely on information shortcuts because they do not have much incentive to gather information about politics solely in order to improve their voting choices” (cited in Popkin 1991). Thus, voters may fill in the gaps from a few basic cues such as party identification, candidate demographics, the candidate’s personal life, and overall assessments of integrity, competence, and track record.

Graber’s work on schema (2001) has much in common with the use of heuristics. She describes the individual’s use of top-down processing in which new data are evaluated based on existing schema, or mental maps, which saves time and effort but may increase errors. The more laborious bottom-up processing, deductive reasoning that avoids information shortcuts, may be both more accurate and more time-consuming, thus less likely to be used by people in their busy, everyday lives (Graber 2001). According to the schema model, individuals store information with judgments and emotional tags attached and retrieve this information as needed when triggered by newly presented data (Graber 2001). These schema may help people assimilate new information based on prior

knowledge (Krosnick & Brannon 1993), with individuals rejecting new data if it cannot be linked with existing schema.

Once formed, schema are hard to change, although individuals may be more open to bottom-up processing in new, unfamiliar, or fearful situations (Graber 2001). Operating within schema or a sort of locked prior framework, citizens may “misperceive the messages in ways that reinforce their preexisting ideas and commitments” (Popkin 1991). An environmental disaster such as a toxic waste spill, for instance, may trigger very different responses in different people: some “assume the corporation guilty until proven innocent, and others assume the corporation innocent until proven guilty,” depending not on knowledge but on pre-existing views (Popkin 1991).

### *3. Framing the Issue of Climate Change*

#### *Description and types of framing*

Since the 1950s, the uses and effects of framing have been well-established, with the term framing referring to a range of phenomenon involving frames of reference that wield an influence on an audience. Druckman (2001) provides a useful summary of different types of framing effects.<sup>2</sup> Frames in communication refers to the style used by a presenter, such as a journalist or a political leader, in providing information.

*Equivalency framing* involves the use of different but equivalent language which may influence opinion. For instance, advertising language could describe a product as 97% fat-free or as containing 3% fat, with the former, positive equivalency frame more likely to have a positive effect with the audience than the latter, negative frame (Druckman 2001).

*Emphasis framing*, meanwhile, refers to techniques in which a speaker guides individual perceptions by focusing on particular elements of an issue, thereby influencing opinions (Druckman 2001).

Based on the literature related to equivalency framing, Druckman observes the effects of negative and positive wording on individual preferences. For instance, audiences may be more likely to make a choice framed as a risk-taking option in which poor outcomes are possible but there is potential to avert disaster than to make a choice in which poor outcomes appear certain (Tversky and Kahneman 1981, 1987 in Druckman 2001), certainly a relative finding to apply to climate change scenarios.

A different example of equivalency framing within the environmental arena is the use of the word “global warming,” which recently is being replaced with the seemingly equivalent

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<sup>2</sup> Citing a host of works not otherwise cited here, including Iyengar 1991; Capella and Jamieson 1997; Kinder and Sanders 1990; Scheufele 1999; Krosnick 1988; Entman 1991, 1993; Kinder 1998.)

term “climate change.” Both describe a complex group of effects from emissions of greenhouse gases but climate change tends to suggest a disruption in the forces of the earth, while global warming may sound somewhat innocuous, vague, and even cozy.

Emphasis framing, meanwhile, may influence viewer’s attention and interpretation of an issue based on the relevance of the frame to the individual. For instance, individuals may oppose a public spending initiative when it is portrayed as a taxation issue but support it when framed as an effort to assist poor people (Druckman 2001).

A key understanding from the framing literature is to consider individual and group internal schema (sometimes called frames in thought), before constructing external frames in communication. Effective framing of an issue such as environmental sustainability may increase attention by presenting information in an accessible, relevant way for the audience. Inappropriate or irrelevant framing can lead the audience to reject or ignore otherwise useful information. For example, climate change, when framed with an emphasis on an “environmental issue,” may appear to lack urgency or salience to the audience, as opposed to being framed in terms of economic or human losses from unpredictable weather. Examples of climate change frames are examined below.

#### *Framing climate change in scientific uncertainty*

Since climate change first emerged as a public issue in the U.S. in the 1980s, the news media have tended to focus on the scientific uncertainty surrounding it, at times to the point of inaccurate reporting that distorts scientific data (Boykoff 2005). This phenomenon is amply described in a series of articles in Harvard University’s *Nieman Reports* in winter 2005 (Boykoff 2005; Becker 2005; Tolan & Berzon 2005), in which researchers critique media presentations of climate change as a two-sided debate giving equal weight to both sides. Likewise, journalist Ross Gelbspan in his 1998 book, *The Heat Is On*, presents evidence for his claim that the widespread reporting of scientific dissensus on climate change was the result of an orchestrated campaign by oil and coal interests working with conservative leaders (Corbett & Durfee 2004).

Comparing U.S. and European news coverage, Becker (2005) notes that the U.S. emphasis on an appearance of objectivity may skew the actual data or the consensus view of scientific leaders, as follows:

“[T]he news media in the United States are so intent on hearing both sides in a debate that they often are virtually incapable of showing where the majority opinion lies. In the climate debate, this means the same old skeptics can take up their position and receive equal time against an overwhelming majority of scientists.”

Becker also notes that this reporting trend has changed, giving rise to new frames for the issue that may create greater urgency or new issue publics.

*Framing climate change as a political issue*

In his cross-cultural comparison, Becker (2005) finds that U.S. reporting, compared with European coverage, has focused to a far greater degree on domestic and foreign policy issues surrounding climate change than on environmental effects. Political aspects appeared to be less salient in Germany, whereas environmental effects were more so.

Framing climate change in political terms comes at a cost. Public opinion about climate change divides along party lines. A survey by the Pew Center for the People and the Press (2006, cited in Nisbet & Mooney) found that 23 percent of college-educated Republicans think climate change is caused by humans, whereas 75 percent of Democrats think so. This may be due to the “scientific uncertainty” frame or the “economic burden” frame adopted by some Republican leaders (Nisbet & Mooney 2007).

Other frames are emerging. Nisbet and Mooney (2007) describe the need to acknowledge people’s pre-existing values and beliefs, citing Popkin’s and Zaller’s arguments for low-information rationality. Christian religious leaders in the U.S., for instance, have begun to present climate change within a frame of religious morality and stewardship of the creation. Business journalists now report on the market opportunities presented by new energy technologies, potentially driven by regulation. “To engage diverse publics, scientists must focus on ways to make complex topics personally relevant,” note Nisbet and Mooney (2007). The potential result is an expanded audience to whom climate change is made salient.

*4. The Role of Priming*

According to the priming hypothesis, people makes decisions based not on a comprehensive analysis of a full range of information but rather on a smaller subset of information that is readily available, often due to extensive news coverage relating to the topic at hand (Miller and Krosnick 1996). The basis for priming is that people find it easier to retrieve information recently stored or accessed frequently (Graber 2001).

Krosnick and Brannon (1993) examine the role of priming, in which information is made more accessible to audiences by news coverage or other information prompts, and individual susceptibility to media priming. The traditional view is that the more media exposure (“dose”) an individual receives, the more he is influenced, while the more knowledge he has (“resistance”) the less influenced he is. Contemporary psychology suggests a different view: that priming effects would be stronger for people with low exposure and interest because they only pick up the “big” messages and don’t have a memory bank of information to consider their judgments.

Research by Krosnick and Brannon (1993) and by Miller and Krosnick (1996) find evidence that priming works in terms of making an issue more accessible. Results on susceptibility, however, are mixed. Previously, Popkin (1991) asserted that higher education levels increase framing effects from television because people have enhanced

abilities to construct complex, sometimes ambiguous, narratives. In the 1993 study, for example, higher knowledge people were more influenced by priming, that is “greater impact was associated with higher levels of knowledge and lower levels of exposure and interest,” a challenge to traditional views but supportive of modern theories of information processing. Priming appeared to be issue-specific; news coverage on one topic did not increase interest on related issues. In the 1996 study, however, high levels of political knowledge provided some resistance to priming effects on news regarding Iran-Contra but not for the first Gulf War, although the authors make a reasonable argument that the difference may be due to timing of the studies.

While the priming literature does not focus specifically on environmental affairs, it has implications for news coverage on climate change for the mass public. A quick Lexis Nexis search suggests somewhat less priming occurring for the general public versus elites in terms of the amount of coverage each constituency is exposed to: Using news coverage in *USA Today* as a rough indicator yields 218 hits for articles containing the terms “global warming” or “climate change” for April 20, 2006 to April 20, 2007,<sup>3</sup> compared with the earlier count of 865 during the same period in *The New York Times*. Even given potential differences in coverage in the length, tone, and placement of the coverage (as well as the fact that *USA Today* publishes fewer articles overall), this suggests a meaningful difference. Whether priming has more impact on political elites or the mass public is not necessarily so relevant if the issue already has salience for many political elites; rather the evidence that priming works may be useful in terms of increasing accessibility to environmental information for the mass public.

In his own analysis of environmental news coverage, Mazur (1998) cites the “availability heuristic” previously described by Tversky and Kahneman (1974) that the amount of coverage of an issue matters more than the content in terms of gaining public attention. This finding seems to relate closely to priming effects, that increased coverage of an issue makes information more readily accessible to the public.

### *5. Agenda Setting and Climate Change*

#### *Agenda setting, political elites, and the news media*

The agenda-setting literature focuses on the various directional and interactive effects that elite opinion, news media, and public opinion may have on each other in terms of defining priorities and leading the conversation on public policy. Miller and Krosnick (1996) describe the “agenda-setting hypothesis: media coverage of an issue increases the national importance that Americans ascribe to it,” although subsequent interpretations ascribe agenda-setting powers to political elites as well.

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<sup>3</sup> Compared to 83 hits for “global warming” or “climate change” in *USA Today* from January 1 – December 31, 2005.

In his 1994 study, Zaller asserts that both elite and media perspectives can set the agenda for public opinion, for instance on the first Gulf War. When elites have consensus, the public follows suit and the issue becomes mainstreamed. When elites disagree, polarization occurs, and citizens rely on other indicators, such as political party or source credibility, to make up their minds. Zaller argues that even politically informed citizens tend to rely on elite messages for their opinion formation and, in the absence of elite consensus, save time by turning to other political cues such as ideology.

While specific findings related to public opinion on the first Gulf War may not be transferable to nonmilitary civic issues, Zaller's work suggests strong agenda-setting capabilities by political elites and the news media, yet remains unclear regarding the real-world interaction between the two. Those with greater exposure to political information actually showed a stronger tendency to respond to agenda-setting (consistent in both the Gulf War and World War II) and independent thought actually appeared to be linked with a lack of exposure to information. (Zaller 1994 also points out some examples of the mass public leading opinion rather than the other way round.) In his 1993 review of public opinion research, Sniderman also points to the role of elite consensus in swaying public opinion (based in part on Brody 1989 and Shapiro 1990), acknowledging that causality and direction are difficult to establish.

Robinson (2001) proposes a two-way model between news media and political leaders for influencing the public agenda. In doing so, he challenges a pure "CNN effect" of media influence while examining "manufacturing consent" models in which media serve to reflect the views of political leaders or the current administration. His finding: the media can play an influential role when elites do not agree, in which case news framing can raise the urgency of an issue to increase the likelihood of public/political action and "play a key role in the creation of policy." While the origins of public opinion are likely to be diverse and complex, Page and Shapiro document a significant correlation between public opinion and actual policy changes for issues with a high degree of salience (1983).

#### *Agenda setting on climate change*

Although much of the agenda-setting literature above focuses on the use of military force, the findings have implications for other policy issues as well, such as U.S. climate change policy. In the past, climate change appeared to lack elite consensus, as it was presented with a high degree of scientific uncertainty in the news media. This was due in part to actual uncertainty and to journalistic norms that heightened the appearance of uncertainty. Journalist Bud Ward (2007) comments, "Following the traditional journalistic approaches . . . the media long had sought to 'balance' the IPCC findings with the contrarian views of a handful of professional doubting scientists . . . [As with] efforts to 'balance' the coverage of health impacts of tobacco, that approach has pretty much fallen by the wayside as editors strive to balance not mere opinion, but scientific evidence."

Presently an elite consensus has formed in terms of the Intergovernmental Panel on Climate Change, although not necessarily in the U.S. administration 2007-2008; indeed,



it is unclear if the public or elites are currently leading on the issue (Holdren and Gallagher 2007; Mongoven 2006). As recently as October 2006, however, members of Congress such as Oklahoma Senator James Inhofe wanted “to see equal time given to scientists who dismiss global warming as a threat to the planet” (Jensen 2006).

Based on the notion of “equal time,” news media may influence the political agenda by giving voice to nonelite groups, as observed by Wolfsfeld (1997) in his study of “challengers” or marginalized groups who gain media sympathy and influential coverage. It can be argued that this phenomenon occurred with climate change: Elite consensus in the IPCC and the National Academy of Sciences actually occurred years ago, but challengers in the U.S. promoted the idea of dissensus in the form of scientific uncertainty and the media reflected this in its coverage until quite recently.

### *6. Climate Change and the Issue-Attention Cycle*

If the attention of elites and the news media sets the political agenda, then climate change is clearly a top global priority. But, will the attention last? Two pieces of communications research help address this question.

#### *Rise and fall of environmental news*

In his examinations of environmental agenda setting, Mazur (1993; 1998) examines the rise and fall of media coverage of environmental topics in the 1980s and 1990s. He looks specifically at how policy elites—scientists, elected officials, and environmental organizations—influenced journalists on the issue of global warming. According to Mazur, climate change first emerged as an issue among scientists in the 1970s, heightened by the energy crisis and linked with the rising issue of ozone depletion (both falling under the category of atmospheric hazards). Climate change fell from view, supplanted by concerns over nuclear arms, but achieved news prominence again in 1987-1990 due to several factors, including the emergence of prominent sources/spokespersons, exogenous events (e.g., drought), and the existence of a dramatic storyline, such as:

- Scientists and reporters presented the greenhouse effect in tandem with ozone depletion—which became urgent when the ozone “hole” was discovered over Antarctica in 1985. Leading science agenda setters included James Hansen at NASA.
- Hot temperatures, the drought of 1988, and the Yellowstone wildfire were three exogenous events that created credibility and concern about global warming, while the Exxon Valdez oil spill in March 1989 highlighted problems with oil reliance.
- Reporter Phil Shabecoff of *The New York Times* covered climate change and other environmental news prominently, while two Congressional leaders, Senators Timothy Wirth and Al Gore, championed the issue. Agenda setters with nongovernmental organizations such as Sierra Club, Environmental Defense, and the Union of Concerned Scientists, also highlighted the issue.

Climate change then fell out of favor, Mazur argues, in part due to a reduction in the number of elite agenda setters. Shabecoff was removed from the environmental beat due to concerns about activist reporting and left the paper in 1993. Wirth and Gore left Congress and actually became less vocal as they were absorbed into the Clinton Administration. The Montreal Protocol on ozone-depleting CFCs was signed in 1987 and then implemented,<sup>4</sup> reducing urgency of this linked (though actually unrelated) issue, while the persistent media framing of climate change as a scientific uncertainty may have detracted from its urgency in the media and public mind (Mazur 1993; 1998).

#### *The issue-attention cycle*

A second lens for viewing the issue of climate change is Anthony Downs's issue-attention cycle. Writing in 1972 about the prominence of environmental issues at the time, Downs describes how problems rise to public prominence and then fall again, often unresolved, according to a predictable process (see figure 1).

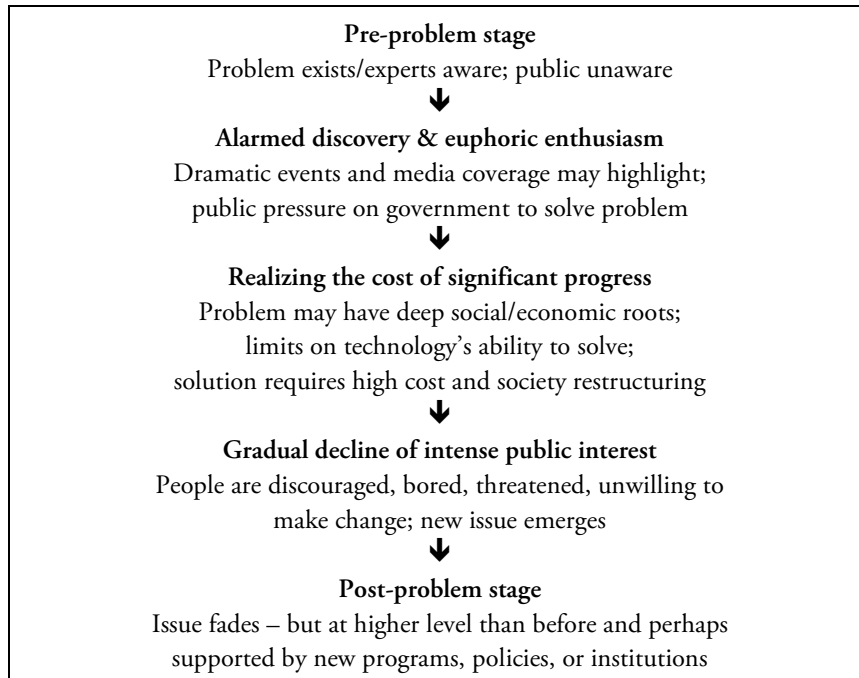
Not all issues are subject to this cycle. According to Downs, issues most likely to lose salience over time tend to affect a minority not a majority of the public (fewer people care long-term), tend to be rooted in some sort of social inequality or unfairness in which a small minority benefits, and represent an issue that isn't exciting in and of itself.

Climate change is currently on the rise, for the third time, in the issue-attention cycle. This reflects Downs' assertion that a major problem may resurface from time to time, especially if it is linked with some other prominent issue. In the past, climate change was linked, somewhat inaccurately, with ozone depletion; now it is beginning to be linked with natural disasters and disaster preparation.

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<sup>4</sup> Mazur's analysis tends to neglect economic forces exogenous to his elite-news model: News coverage of the ozone hole, and the U.S.'s subsequent commitment to the Montreal Protocol banning ozone-damaging CFCs, were strongly influenced by a change of position by the Dupont Corporation. The CFC manufacturer had initially opposed restrictions but later supported the protocol as the company commercialized the world's first CFC alternative. Mazur does acknowledge the pivotal role of the ozone hole being linked with skin cancer and the potential effect of this finding on President Reagan, a skin cancer survivor, who also changed his position on this issue.

Figure 1: Downs's Issue-Attention Cycle



Will the issue of climate change remain in the public eye? Applying Downs's logic, the answer is mixed. Climate change, like his example of air pollution, has universal effects, which argues for continued attention. Likewise, climate change is the focus of many potential technological fixes and has given rise to economic opportunity among firms seeking to commercialize technology to save energy and avoid emissions, both Downsian factors in persistent public attention.

On the opposite side of the argument, climate change does not affect everyone equally or visibly. Nor is it a problem that can entirely be tagged to a particular villain, although the onus clearly lies with more highly industrialized countries. Rather, it requires lifestyle changes and political and financial support by the majority of Americans, an "inconvenient truth" that may argue against issue longevity.

The outcome remains to be seen. Downs notes: "The greater the apparent threat from visible forms of pollution and the more vividly this can be dramatized, the more public support environmental improvement will receive and the longer it will sustain public interest." Thus, the longevity of climate change in maintaining public interest will depend in part on the effectiveness of framers and information providers in terms of communicating the threat in a way that is visible, universal, and at least somewhat fixable.

### *7. Salience and How Information Can Increase It*

Having examined larger issues behind the availability of information in the media, what characteristics of the actual information increase the likelihood of the public paying attention to it? That is, what makes an issue such as sustainability salient? It is helpful first to look at the meaning of cognizance, attentiveness, and salience.

#### *Definition of salience*

Baum (2003) points out that cognizance equals awareness of an issue, but does not necessarily entail action or behavior change. In contrast, salience implies urgency, he says, “a more purposive and intensive interaction.” Attentiveness occupies a middle ground between the two, that is, a person might pay attention because they find something interesting or exciting, not because they plan to do anything about it.

As Popkin (2001) discusses, salience is the critical feature in political campaigns. Baum (2003) essentially equates salience with personal importance, observing that “one excellent indicator of a respondent’s propensity to follow a given issue is the relative importance of the event to the respondent. . . . the more personally important the issue, the more attentive a typical individual is likely to be to it.” It seems likely that such salience is critical in expecting the public to take action on a particular issue.

Popkin raises the issue of salience on environmental issues, noting that people care most about clean air and clean water (Popkin 2007). He also observes increased attention to the environment in recent years: “A new interest in health information and an age-old fascination with disasters have made ecological calamities matters of worldwide interest” (1991). Climate change has only recently joined this list, as it becomes more visible, more certain, and more closely tied to disasters.

Given this understanding of salience to the public, how can information about climate change be presented in a way that increases salience, urgency, and likelihood of behavior change? Features of information that increase salience are explored below.

#### *Increasing salience by creating a dramatic story*

Popkin, Graber, and others point to the uses of dramatic storytelling to grip the public’s attention. In her discussion of television, Graber (2001) says that mainstream audiences don’t find political news “intrinsically interesting” and pay attention to “gripping political spectacles that emphasize the human drama of politics, rather than its more abstruse features.” Citing Nisbet and Ross (1980), Graber finds: “Most American audiences are attracted by vivid information, which means that ‘it is (a) emotionally interesting, (b) concrete and image-provoking, and (c) proximate in a sensory, temporal, or spatial way.’”

High drama and story frames may be especially appealing to less informed audiences. In fact, Baum (2003) suggests that politically inattentive individuals may gain knowledge of political or foreign policy news as a byproduct of seeking entertainment through soft news

media. Typical of soft news stories, framing environmental news as a dramatic story is one means of making it interesting to mass audiences. Graber (2001) notes the role of documentary storytelling on chemical and nuclear weapons in influencing viewers and bringing about new policies.

At the same time, some researchers warn against inappropriate effects of dramatizing the news, as Sharkey (1993) notes: “Dramatic images can oversimplify complex issues,” creating pressure to implement foreign policy based on immediate emotional responses.

#### *The role of emotions in salience*

Information and campaigns that trigger emotions increase salience of an issue, creating more urgency than mere facts. Faced with large amounts of information, people may intuitively select what to pay attention to based on emotional cues. Thus, Popkin (1991) notes, “Data presented in an emotionally compelling way may be given greater consideration and more weight than data that is statistically more valid, but emotionally neutral.” From a physiological and psychological standpoint, memories with strong emotions attached are both deeply embedded and readily accessible (Graber 2001; Sniderman 1993).

In his research on political advertising, Brader (2006) argues that ads use evocative pictures and sounds to trigger certain emotions for or against candidates and their issues. Symbols, images, music, and other audiovisual cues act overtly and subliminally to elicit an emotional response by the audience. Noting a relative dearth of research on emotional appeals, Brader does find evidence that “positive and negative ads can evoke distinct emotions and that such differences can affect memory, perceptions of social desirability, and nascent political orientations.” Similarly, reports that incorporate emotional components, such as striking visuals, can increase urgency for policy changes (Sharkey 1993).

Brader also notes limits on the effects of emotional appeals, citing a study by Huddy and Gunthorsdottir (2000) in which subjects were given an environmental flyer to protect a particular wildlife species. Different versions of the flyer depicted a cute or ugly animal or no picture. The cute animal flyer, a positive appeal, elicited a strong positive response in pro-environment respondents and a strong *negative* response in those who were not predisposed to support the cause. This suggests that emotional appeals can backfire. As Graber (2001) notes, the effect of emotional accounts seems to be modulated by context and by the audience’s existing views and predispositions.

Brader (2006) also examines research on the role of affective intelligence and its influence on political behavior. Citing work by Marcus, Neuman, and MacKuen (2000) and others, he observes that a viewer’s enthusiastic response to campaign appeals is correlated with interest, caring, and involvement, especially in keeping with the audience’s

pre-existing views. An anxious response actually increases attentiveness, learning, and overall participation because it challenges pre-existing views and may increase attention to new data.

#### *The use of visuals in provoking salience*

The power of visuals to tell a story, evoke emotion, and sway political decisionmaking is widely discussed as the “CNN Effect,” in which compelling visuals by the news media create a dramatic story, triggering emotion and swaying public opinion and policy decisions. The reality is more complex. Graber (2001) makes a case for the effect of television and pictures. Visuals, she argues, serve as information shortcuts but can also cut through existing schema or preconceived notions to attract viewer attention. In addition, visual evidence triggers emotion, activating more areas of the brain and enhancing learning and recall of the information (Graber 2001).

Iyengar & Kinder (1987) point out the pitfalls of relying too strongly on visual messages. Viewers may focus on individual victims and be “less likely to think . . . in terms of the social and political conditions that caused the unfortunate situation.” In such cases, providing context through verbal narration is critical to ensuring accurate messages are transmitted. In addition, the power of pictures is likely moderated by other factors, so that high-impact visuals serve primarily to add urgency to issues, especially when the view is predisposed toward the viewpoint depicted.

#### *8. Implications of Media Effects for Climate Change Education*

Given what is known about the formation of public opinion, how can researchers, practitioners, scientists, and others make the issue of global climate change more urgent and salient to the U.S. mass public? Climate change experts John Holdren and Henry Lee offered this advice: Elite and public support for policy initiatives (such as a cap-and-trade system) have grown, making this an ideal time to prepare the public not only to accept the consequences of these changes but to pursue individual actions and changes in their daily lives. It’s also important to work at the state and local level (Holdren & Lee 2007), as regional initiatives in the U.S. have made greater progress than federal ones, including the Regional Greenhouse Gas Initiative among the northeastern states, which has initiated a regional carbon trading system (RGGI 2005).

#### *Reframe climate change as a nonpartisan issue*

The persistent link between U.S. Democrats and the environment may be impeding progress, given the population’s use of a likeability heuristic to adopt issue stances consistent with their political identification. Veteran ABC reporter Bill Blakemore observed that the film “An Inconvenient Truth” posed a challenge to nonpartisan journalists because it was presented by a Democratic leader, framing the story as a political one rather than a scientific one (Jensen 2006). Activist groups such as Republicans for Environmental Protection have identified this problem, but overcoming it will require a more mainstream shift in thinking and communication.

*Frame the issue as disaster prevention and preparedness*

While Graber (2001) notes that less than 5 percent of news stories capture the close attention of most Americans, people did pay attention to coverage of disasters, especially those affecting everyday people. Survey respondents said they paid “close” attention to only 35 out of 763 stories and 18 of those were disaster stories. Notes Graber: “Most viewers’ main purpose for watching news is surveillance to make sure that their world is intact and safe” (based on Pew 2000b), with stories linked to potential disasters suggesting the world is not safe and the issue becomes more salient. In addition, disasters have the advantage of being highly visual and intrinsically interesting, adding to issue persistence (Downs 1972).

At the same time, avoid overdramatizing. An article in *Science News* discusses the depiction of scientific phenomenon in popular culture and warns against inaccurate and overblown portrayals such as climate change triggering an ice age within a few days (Perkins 2004). Such coverage is likely to backfire, as people generate counterarguments to the highly conflictual frame (Druckman 2001). In addition, highly dramatic and emotional news reports can be problematic as viewers tend to focus on the individuals in question rather than on larger policies and management strategies to avert such disasters (Connell 2003). Rather the visuals and drama need to be framed within a larger context.

*Frame the story as one partially solvable by technological fixes*

Trumbo (1995, as cited in Corbet & Durfee 2004) observes that this has already occurred, to the neglect of stories framing the problem as one requiring individual behavioral changes. In fact, the technical side of the story (e.g., the potential of renewable power sources, hybrid cars, and carbon sequestration) may serve as an effective, relatively apolitical lead-in to more complex changes.

*Provide context, simply*

Graber (2001) notes that “[t]he fact that audiences find it difficult to understand news stories and relate them to their lives often springs from reporters’ failure to supply internal and external contextual information. . . . Societal forces that shaped the reported events are left unexplained.” Thus, it may be helpful to link individual stories to an ongoing theme, for instance linking a series of strange weather patterns to their cause, carbon emissions, once difficult to do but now possible given scientific data.

*Increase salience by relating the topic to people’s lives*

Making news salient is difficult. As Neuman et al. 1992 observe (in Graber 2001): “The attempt to relate the abstractions of national political debate to one’s immediate life circumstances is a complex, delicate, subtle, and often frustrating process.” Effective information providers will help the public make this leap. Three ways to do so for climate change include:

- Make the link between oil dependence and deployment of troops: This is more a question of salience than of politicking against military action. People pay attention to the troop movements; a Pew study found that 9 of the top 10 stories to which Americans paid close attention related to U.S. action in Iraq and Kuwait. A tenth, unrelated story focused on global warming and U.S. policy, suggesting that a combination of the two would be of interest (Pew 2000a in Graber 2001).
- Talk about the price of gasoline: Always an attention-getting wallet issue, the price of gas has relevance to energy efficiency, hybrid technology, and other strategies to reduce carbon emissions. Four of the stories in the Pew study cited by Graber (2001) focused on gas prices, as it is an issue naturally salient to many people's lives, especially given suburban sprawl, long commutes, and mediocre public transportation in some American cities.
- Put a local angle on the story: Much of the action occurring on climate change in the U.S. is taking place at the state and local level, generating potential stories close to home for local news outlets. Climate change can also be linked to local issues surrounding development, agriculture, housing, and public health (Ward 2007). More Americans routinely watch local TV news (61 percent) than watch national (52 percent) or international news (34 percent (Pew 1998b in Graber 2001).

*Improve accessibility for low-information rationality audiences*

In addition to the frames suggested above, the verbal and visual style of the information is critical for reaching mass audiences. The challenge is making technical information accessible, such as:

- Avoid an overdose of technical language: In launching a Weather Channel series on climate, network official Terry Connelly said, "The biggest challenge is "bringing it down to a digestible level for even educated people" (Jensen 2006). Educators and reporters can simplify global warming by tying it to well-known concepts such as air pollution or car exhaust. Various readability tests allow information providers to test the grade level of materials, with formulas generally relying on a combination of sentence length and average syllables per word. Given low functional literacy levels, the 4<sup>th</sup> to 6<sup>th</sup> grade level is preferable for maximum accessibility.
- Use visual formats creatively: Both Baum (2003) and Graber (2001) note that a majority of Americans receive political and foreign policy news primarily from television, with the likelihood of relying on TV increasing for nonwhites, women, those without college degrees, and people under 30; in the last 5 years, of course, access is shifting toward Internet news, especially for younger people. Examining media coverage of global warming, Corbett and Durfee note that



Americans gain the majority of their information about climate change from the news media, especially television (citing Wilson 1995). These findings, combined with what is known about the impact of visual information, make it especially important to visualize climate change for the mass public, both via television and the web. Disaster images, responsibly used, are one method as are the kind of emotionally compelling images of polar bears and penguins confronting the effects of climate change, as seen in the films *An Inconvenient Truth* and *Happy Feet*.

In other examples, climate change expert Holdren relies on a colorful animated map that clicks to show where sea levels will be on the east coast of the U.S. in future decades if carbon emissions continue unchecked. The sequence of rising tides elicits a strong emotional response as familiar landmarks such as Cape Cod, Manhattan, and the city of Cambridge disappear beneath the ocean (Holdren 2007). Similarly, college students in Boston recently proposed painting lines on the brick walls around campus showing where sea level will be in future centuries given current rates of global warming (Davidson 2007). The intent is consistent with what is known about visual learning: creating a visual shortcut that people remember.

### *9. Conclusion*

If the issue of climate change were a U.S. presidential candidate, then it has had an image problem in the same way that John Kerry and Al Gore did in their respective presidential campaigns: it is aloof, apparently cerebral, and not an average, middle class guy. This quality of the climate change issue is changing, as climate-related disasters add real-life urgency and drama to what was previously viewed as an arcane scientific issue. Recent political candidates in U.S. elections made what Baum calls “an effort to show themselves as ‘regular guys’” by appearing in soft news formats such as talk shows in order make themselves more accessible to the mass public. Similarly, it is clearly time for climate change as an issue—and the experts who interpret it—to bring the discussion to more accessible levels.

From a political and practical angle, climate change is a challenging issue to communicate to the mass public: a technical, seemingly arcane, previously invisible issue that, until fairly recently, has been the subject of much controversy and debate in the U.S. From a more optimistic viewpoint, climate change offers intriguing opportunities to test the significant range of theories and previous findings about how people learn and what they care about. The time is ripe to do so: in his pivotal 1972 work on the issue-attention cycle, Anthony Downs notes how environmental issues periodically soar into public view, only to fall once again into obscurity. “It may be possible to accomplish some significant improvements in environmental quality,” he notes, “if those seeking them work fast.”

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