Engaging Diverse Audiences with Climate Change:
Message Strategies for Global Warming's Six Americas

Connie Roser-Renouf, Neil Stenhouse, Justin Rolfe-Redding,
Edward Maibach and Anthony Leiserowitz

A version of this paper will appear in the Routledge Handbook of Environment and Communication, Anders Hanson & Robbie Cox (Eds.); projected publication date is Dec. 2014.

Abstract

Global climate change – a threat of potentially unprecedented magnitude – is viewed from a variety of perspectives by Americans, with some dismissing the danger, some entirely unaware of its significance, and still others highly concerned and motivated to take action. Understanding the sources of these diverse perspectives is key to effective audience engagement: Messages that ignore the cultural and political underpinnings of people's views on climate change are less likely to succeed.

In this chapter, we describe Global Warming's Six Americas – six unique audience segments that view and respond to the issue in distinct ways. We describe the beliefs and characteristics of each group and discuss methods of effectively communicating with them in light of: (1) the pro- or counter-attitudinal nature of messages on the issue for each group; (2) their willingness to exert the cognitive effort necessary to process information on the issue; (3) their propensity for counter-arguing, motivated reasoning and message distortion; and (4) the communication content they say they most desire and, hence, would be most likely to process and accept.

Introduction

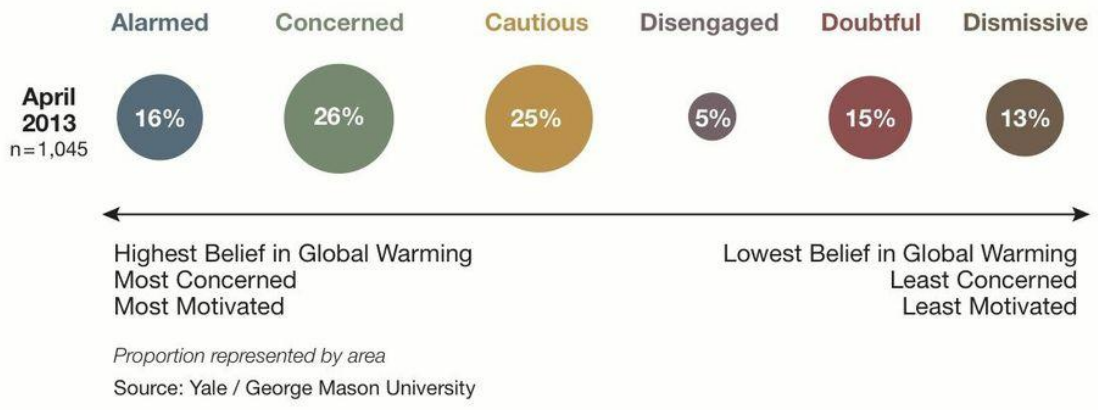
Global climate change is a threat of the gravest magnitude to human societies and natural ecosystems – a threat recognized by virtually the entire climate science community. Among Americans, however, it remains a divisive issue, viewed from multiple perspectives: Some dismiss the threat as a hoax, some are uninterested and know little about it, and others are very worried and motivated to take action to reduce the threat.

To build public understanding and engagement with the issue, climate change communicators must recognize and respond to these varied points-of-view: Messages are unlikely to be effective if a diverse population is treated as a homogeneous mass, ignoring the diversity of opinion, the cultural and political underpinnings of these opinions, and the informational needs and interests of sub-groups within the population.

In this chapter, we discuss climate change communication strategies in light of the information-processing propensities of *Global Warming's Six Americas* – six unique audience segments that perceive and respond to the issue in distinct ways. The Six Americas range across a spectrum of concern and issue engagement, with segments that accept and reject climate science at the ends of a continuum, and those that are less certain and less engaged in the middle (see Figure One). At one end of the spectrum are the *Alarmed,* who are very concerned about the issue and support aggressive action to reduce it, and at the other end are the *Dismissive,* who do not believe it is real or a problem, and likely to believe it is a hoax. Between these two extremes are four groups – the *Concerned, Cautious, Disengaged and Doubtful* – with lower certainty and issue engagement.

The segments are strongly associated with a range of characteristics, including climate and energy policy preferences; political ideology and party identification, cultural values; political efficacy, and consumer and political behavior (see Maibach et al., 2009, 2011; Leiserowitz et al., 2010a 2010b, 2011, 2012, 2013). A variety of climate change communicators – government agencies, non-governmental organizations, companies, media organizations science educators, including science museums, zoos and aquaria – have used this information to select target audiences, and tailor communication and educational content.

Figure 1: Global Warming's Six Americas



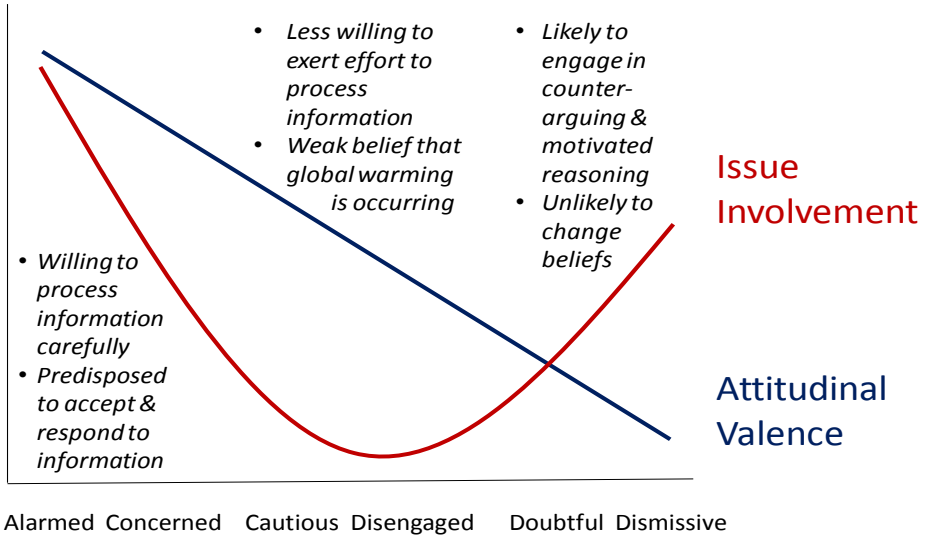
To date, publications describing the segments have been largely descriptive, detailing the beliefs, behaviors and characteristics of each group. The framework is not merely descriptive, however: Two theoretical dimensions that underlie the Six Americas – *attitudinal valence* and *issue involvement* (Figure 2) link the segmentation to well-developed literatures on persuasion, information-processing, science and risk communication, and opinion leadership, suggesting a wealth of communication strategies for reaching and engaging the Six Americas.

Attitudinal valence is defined here as *the inclination to accept or reject the science of climate change*, and is assessed with measures of several key beliefs: Climate change is happening; it is harmful; humans are causing it; humans can reduce it; and scientists agree on its reality and human causes. These beliefs have been shown to predict support for national action on the issue and for mitigation policies, as well as political activism (Ding et al., 2012; Lewandowsky et al., 2012; Roser-Renouf et al., 2011; Krosnick et al., 2006).

Issue involvement refers to *cognitive and affective issue engagement*, and is assessed in terms of the amount of thought devoted to the issue and attitudinal certainty. Both the *Alarmed*

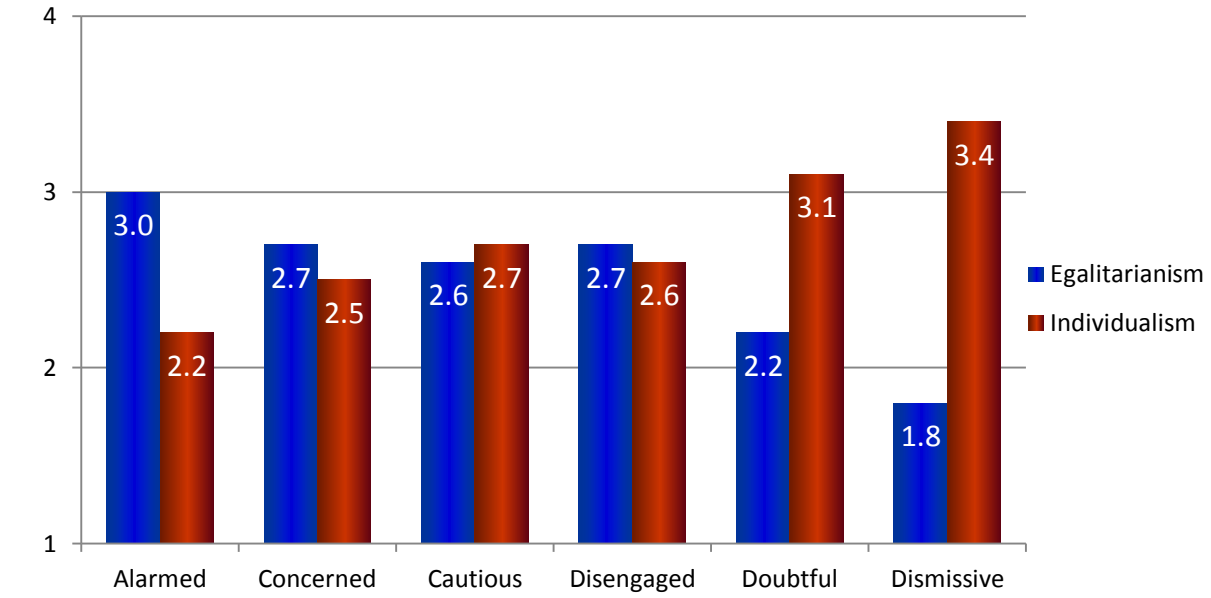
and *Dismissive* think about the issue and are certain of their opinions, but the *Alarmed* are likely to accept all the key beliefs and are predisposed to accept messages that are consistent with the science, while the *Dismissive* reject the key beliefs and are predisposed to reject and counter-argue these same messages.

Figure 2: Information-Processing Propensities Among the Six Americas



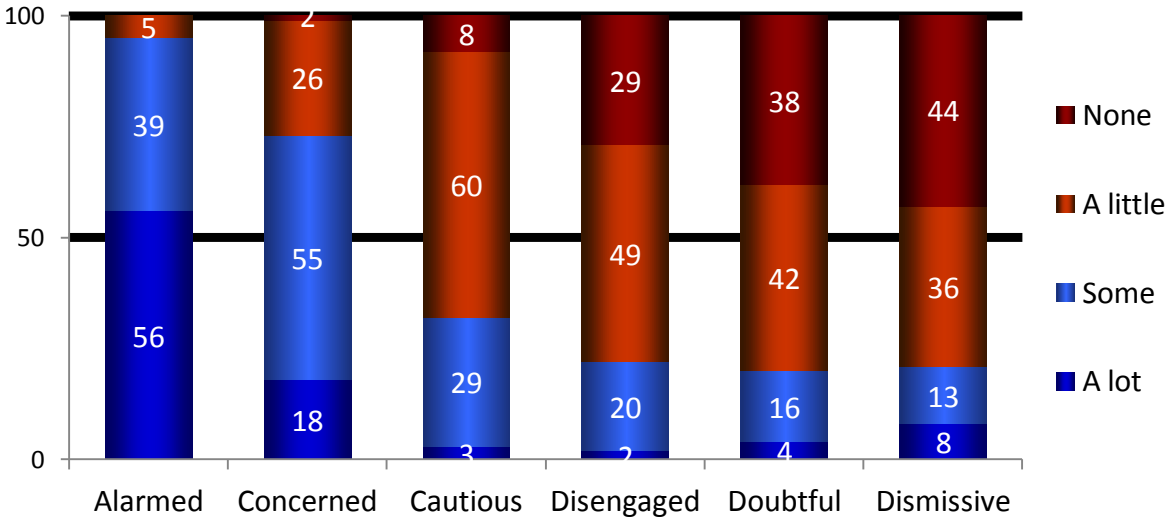
The remaining four segments, currently comprising about 70 percent of the U.S. population, have lower issue involvement and greater uncertainty regarding the reality, dangers and causes of climate change; they differ, however, in their levels of uncertainty, predispositions to accept or reject climate science, cultural values (Figure 3), media use, attention paid to information about global warming (Figure 4), and, to a smaller extent, demographics. All of these differences have implications for the types of information the groups are interested in learning (Figure 5), the communication channels most likely to reach them, and the communication strategies that are most likely to engage them.

Figure 3: Cultural Values of the Six Americas



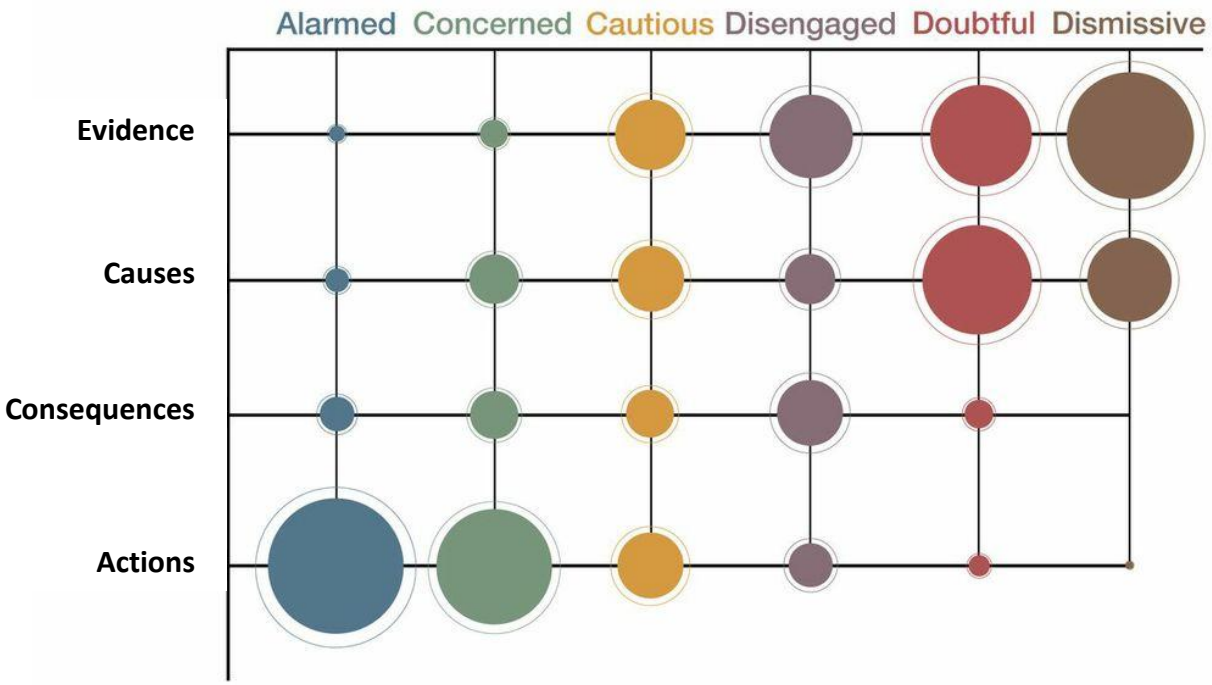
Caption: The Six Americas differ in the weight they ascribe to egalitarian values – i.e., equal opportunity, a more equal distribution of wealth, and protections for vulnerable minorities and the poor – as opposed individualistic values – i.e., freedom from government intervention in the lives of individuals and in business.

Figure 4: Attention Paid to Global Warming Information



Source: Yale-George Mason, Apr. 2012, unweighted N=1,008

Figure 5: Nature of the one question respondents would most like to pose to a climate scientist



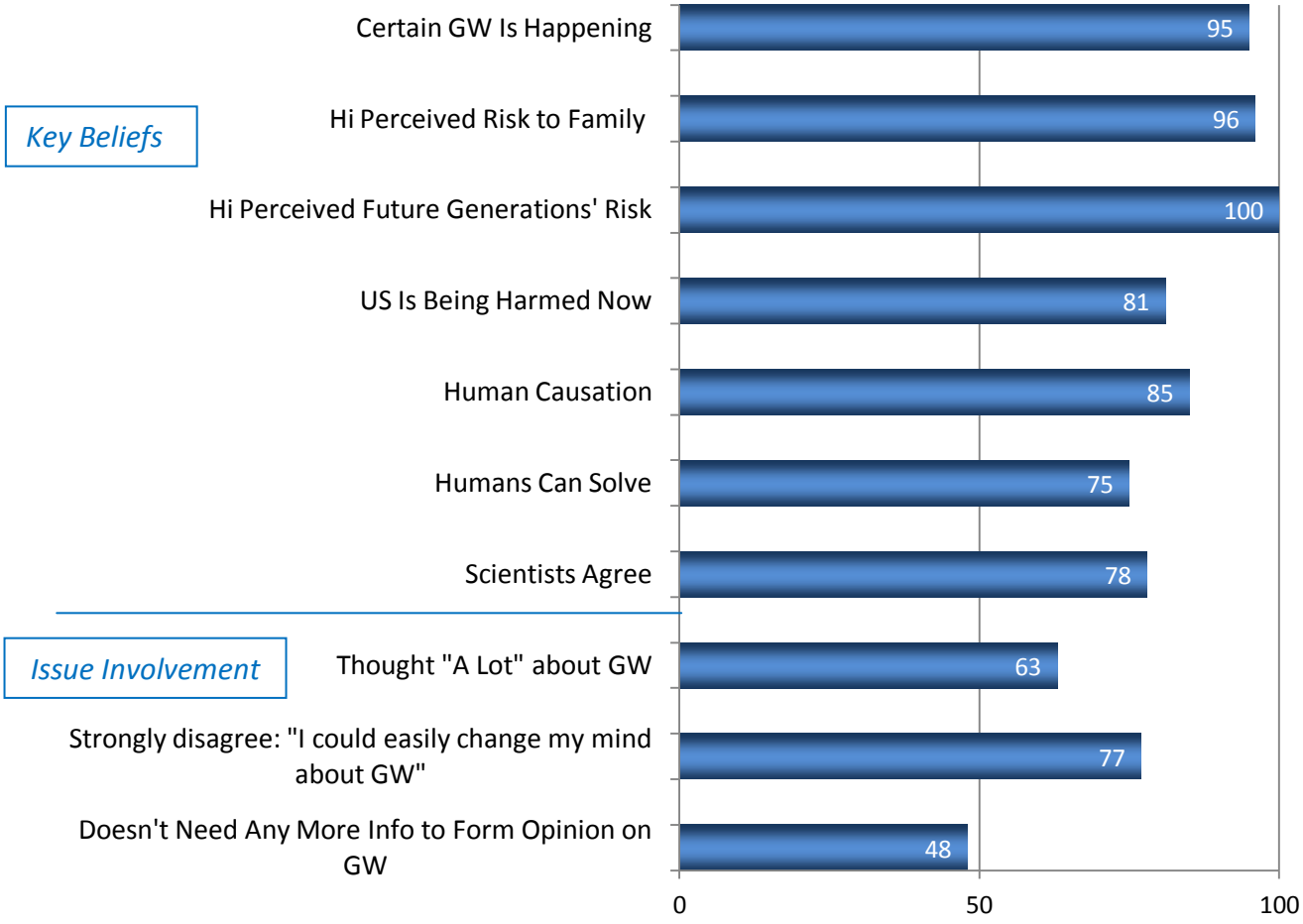
Caption: The Six Americas are interested in learning different types of information about global warming, with the unconcerned segments most interested in information about the evidence for and causes of global warming, the concerned segments interested in information about action to mitigate climate change, and the uninvolved segments varying widely in their questions. Source=Yale/George Mason University, May 2011; unweighted N=1,010; Figure credit: Ian Barin.

Publics with High Involvement and Positive Climate Change Attitudes

The Alarmed

Key Beliefs & Issue Involvement: The *Alarmed* show very high levels on measures of the five key beliefs: Almost all are certain that global warming is happening, believe their own family is at risk, and perceive future generations to be at risk; three-quarters or more believe that global warming is human-caused, understand that most scientists think that global warming is happening, believe that people in the U.S. are being harmed now, and see global warming as potentially solvable. They are highly involved with the issue – much more so than even the *Concerned*: sixty-three percent report having thought a lot about global warming, a proportion more than four times as large as that of any other segment. For the *Alarmed*, global warming is a real, worrisome and urgent threat.

Figure 6: *Alarmed* Key Beliefs & Issue Involvement



Note: See Appendix for item descriptions; source: Yale/George Mason University, April 2013; n=1,045.

Characteristics: The *Alarmed* have a higher proportion of liberals and Democrats than any other segment. About half identify as liberal, compared to about 30 percent of the *Concerned*, and a quarter of all Americans. The *Alarmed* are the most egalitarianism segment, and the least individualistic.

The *Alarmed* are not homogenous, however: About half do not identify as liberal or as Democrats. And although the *Alarmed* are more educated than the national average – close to 40

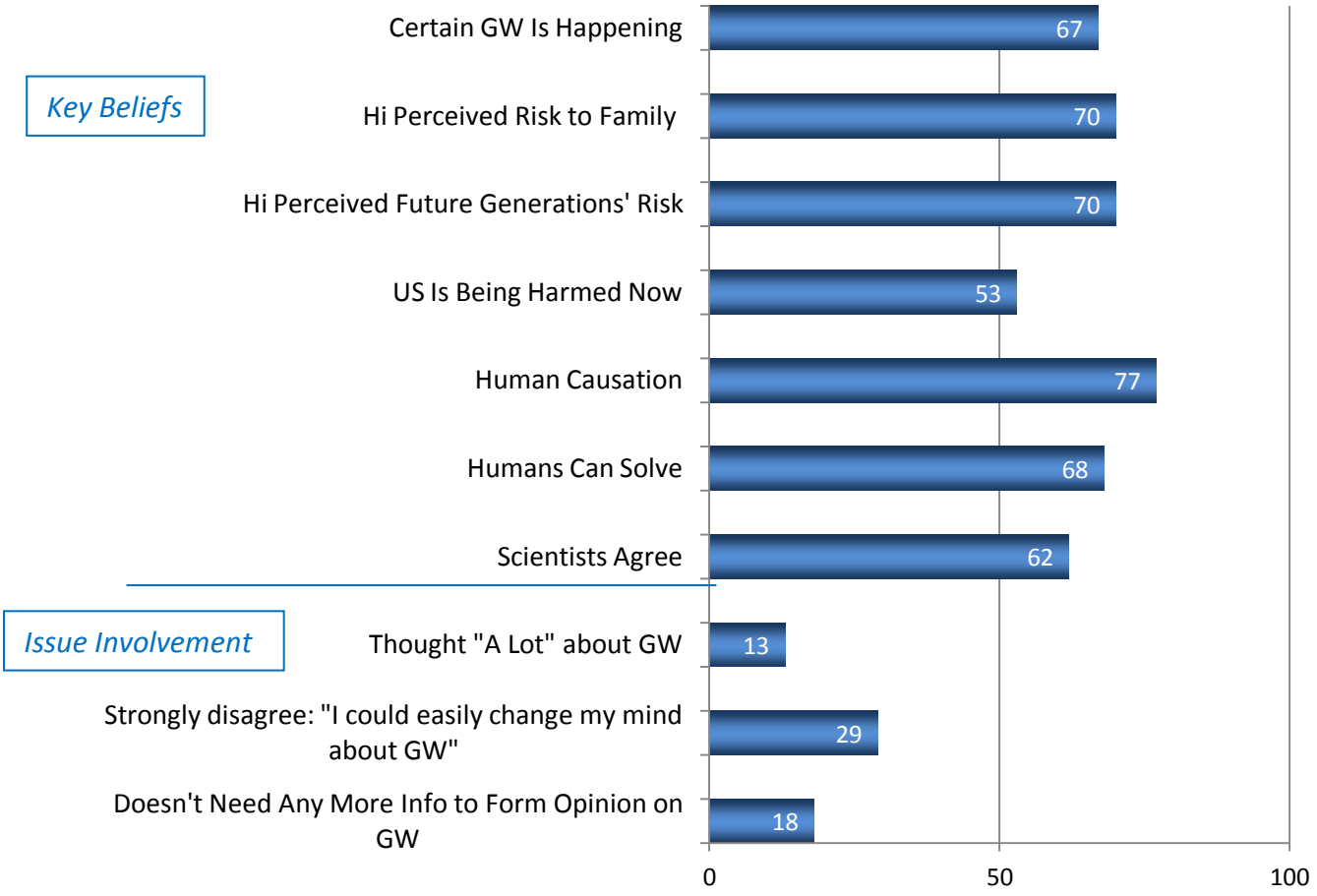
percent have a bachelor's degree or higher, compared with just under 30 percent nationally – on other demographic variables, the *Alarmed* are not substantially different from national averages.

Informational Needs and Media Use: Since the *Alarmed* are already convinced of the reality, danger and human-caused nature of climate change, they are most likely to report an interest in finding out what kind of actions can be taken to reduce it, either by the U.S. or personally. They are very attentive to global warming news, compared to the other segments: fifty-five percent report paying "a lot" of attention to news stories about global warming, more than four times as high a proportion as any other segment. Almost 80 percent of the *Alarmed* follow environmental news, compared to a national average of 38 percent, and over half say they pay "a lot" of attention global warming information. They are more likely to closely follow news about politics, science and technology than any other segment except the *Dismissive*.

The Concerned

Key Beliefs & Issue Involvement: On many measures, the *Concerned* are midway between the *Alarmed* and the less-engaged middle segments. The *Concerned* are less likely than the *Alarmed* to espouse some of the key beliefs on the issue, such as certainty that global warming is happening and belief that their own family is at risk. They're less likely than the *Alarmed* to think that global warming is human-caused or that future generations are at risk. They are, however, still much higher than all segments other than the *Alarmed* on all key beliefs. Perhaps the largest difference between the *Concerned* and *Alarmed* is the proportion reporting high levels of involvement with climate change: Only 13% of the *Concerned* report having thought "a lot" about climate change, compared to 63% of the *Alarmed*; and only 18% say they do not need more information to form a firm opinion about climate change, compared to 48% of the *Alarmed*.

Figure 7: *Concerned* Key Beliefs & Issue Involvement



Note: See Appendix for item descriptions; source: Yale/George Mason University, April 2013; n=1,045.

Characteristics: The *Concerned* are less politically left-leaning than the *Alarmed*, with the proportion of people reporting liberal ideology and Democratic party allegiance only slightly higher than national averages. They value egalitarianism over individualism, but are closer to the national averages than the *Alarmed*. Demographic distributions of the *Concerned* – gender, ethnicity, education, age and income – are all close to national averages.

Informational Needs and Media Use: Like the *Alarmed*, the *Concerned* are most likely to say they'd like to learn what the U.S. and they themselves can do to reduce global warming; these proportions are lower than for the *Alarmed*, however, and they are more likely than the *Alarmed* to want to know whether global warming is happening, and how experts know it is happening. Although close to three-quarters report paying at least "some" attention to information about global warming, the proportion paying "a lot" of attention (18%) is much lower than among the *Alarmed* (56%). Their other media use habits are quite similar to national averages, except that they are somewhat more likely than the national average to follow environmental news.

High Involvement Communication Strategies

The challenge with the high involvement segments is motivating them to take action, particularly political action and opinion leadership: Even among the *Alarmed*, political actions are not the norm; e.g., less than a third have contacted an elected official about global warming over the past year.

Two promising strategies may elicit more substantial engagement from the Alarmed and Concerned:

- Using centrally processed arguments to promote lasting behavior change;
- Building perceptions of efficacy – collective, response and self-efficacy – to complement the groups' high risk perceptions to motivate action.

A third strategy for consideration with the *Alarmed* is tapping their potential to act as opinion leaders.

Systematic Information Processing: Dual-processing theories such as the Elaboration Likelihood Model suggest that high-involvement audiences like the *Alarmed* and *Concerned* will

be receptive to messages with a great deal of information and complexity, including relatively high-level science and policy content (Petty, Brinol & Priester, 2009); these messages may be delivered via print media, which require greater processing effort. Because messages to these audiences will likely be processed effortfully, message content is more likely to be remembered, and effects are more likely to be long-lasting in guiding subsequent behavior (Petty et al., 2009). A caveat is that it becomes more important to use strong, logically sound arguments for action, since weaker arguments are more likely to be detected, and may lead to a potentially *lower* level of behavior change than if no message had been received (Petty et al., 2009).

Both the *Alarmed* and *Concerned* are most interested in learning about solutions to climate change – actions they and the U.S. can take to mitigate the effects. They are already strongly convinced of the reality and danger of climate change, so strong arguments on these topics aren't needed; they need instead information about solutions that are both feasible and effective.

Efficacy: The *Alarmed* and *Concerned* tend to have high levels of concern about climate change, but lower levels of efficacy with regard to solving it; hence, communicators may wish to focus on building efficacy to complement the groups' high risk perceptions to motivate them to take action. While majorities of these groups agree that humans *could* reduce climate change, the proportions who believe their own actions make a "some" or "a lot" of difference in reducing their emissions have decreased over the past five years by 13 percentage points among the *Alarmed* (from 68% to 55%), and by 23 percentage points among the *Concerned* (from 61% to 38%).

Several forms of efficacy are relevant for climate change: Response efficacy – the belief that responses to the threat will be effective in reducing it; self-efficacy – the belief that one is

capable of taking these actions; and collective efficacy – the belief that one's group is capable of acting effectively together (Bandura, 1986). Much evidence suggests that people who feel both threatened and capable of taking effective action to reduce the threat are more likely to take action (Witte & Allen, 2000), and a recent meta-analysis supported the idea that threatening information only promotes behavior change when efficacy is also high (Peters, Ruiter & Kok, 2013). The Alarmed and Concerned already feel threatened, however, so messages emphasizing the ability of individuals or groups to effectively fight climate change are likely to be most effective with these groups. The messages must, however, be convincing, or they may boomerang, lessening both confidence in solvability and behavior change.

An additional strategy for consideration with the *Alarmed* is tapping their potential to act as opinion leaders. This is actually a strategy for reaching the less involved middle segments that are more likely to be influenced interpersonally than through the mass media. But it entails a campaign objective for communications with the *Alarmed* – i.e., activating their opinion leadership potential.

Scholars have suggested using a "two-step flow" model of communication on climate change: Rather than trying to communicate with all citizens directly, climate communicators might instead promote opinion leadership among the *Alarmed*, encouraging them to discuss the issue with friends and family more frequently (Nisbet & Kotcher, 2007). Targeting those *Alarmed* who are already opinion leaders – i.e., people who are well-connected socially and who frequently give advice or have their advice sought out by those they are connected to – would be particularly desirable. These people may then proceed to use personal influence within their social networks to create a larger overall effect than if the communicator had tried to reach the same audience directly. One scholar has shown evidence that the ideal opinion leader is one who

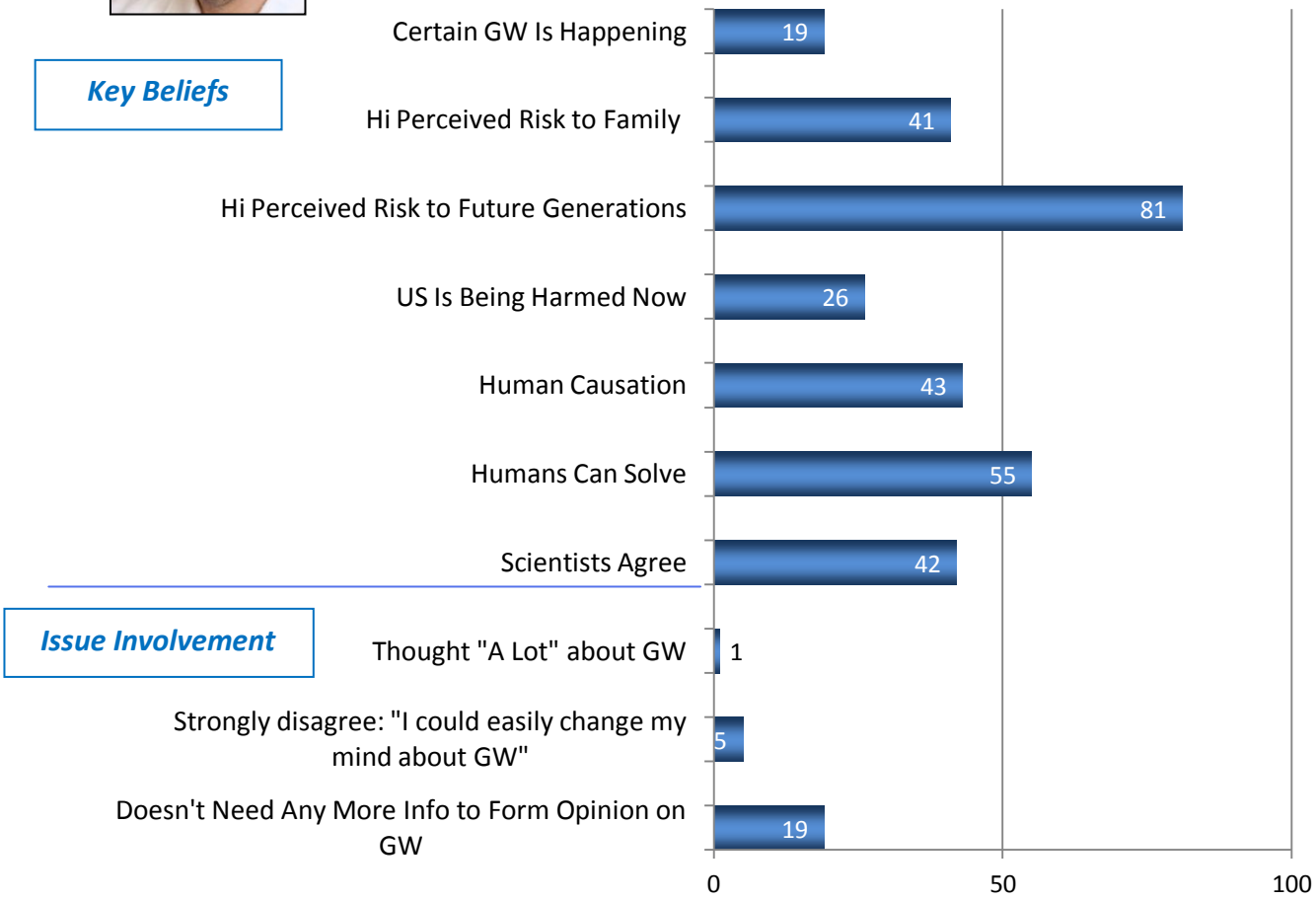
both sets a normative behavioral example and explicitly communicates about why behavior change is a good idea (Venkatraman, 1989). Our surveys of the *Alarmed* and *Concerned* show that in addition to being more likely to talk about global warming, they are more likely to engage in behaviors designed to reduce carbon emissions, making them good candidates for this type of leadership.

Low Involvement Publics

The Cautious

Key Beliefs & Issue Involvement: The *Cautious* are weak on all key beliefs and have low issue involvement. They're more likely to believe climate change is happening than not, but only one in five is certain; four of out five believe future generations are at risk, but half as many perceive their own family to be at risk. They have given very little thought to the topic, and only 5 percent are very certain of their opinions. Global warming is far from *Cautious* minds – a problem for people in the future.

Figure 8: *Cautious* Key Beliefs & Issue Involvement



Note: See Appendix for item descriptions; source: Yale/George Mason University, April 2013; n=1,045.

Characteristics: The *Cautious* are in some ways the least distinctive segment: Their levels of egalitarianism and individualism, and their party identification and political ideology track population means closely. They're slightly less likely than average to have a college degree, but follow population distributions on other demographics, including ethnicity, gender, income and age.

They show signs of a higher-than-average tendency to social comparisons, however – i.e., they are significantly more likely to say that having a home as well-equipped and furnished as their peers is important to them, and that they follow the latest fashion trends. They're also more likely than the *Alarmed* or *Dismissive* to say they prefer brands and products that make them feel accepted by others.

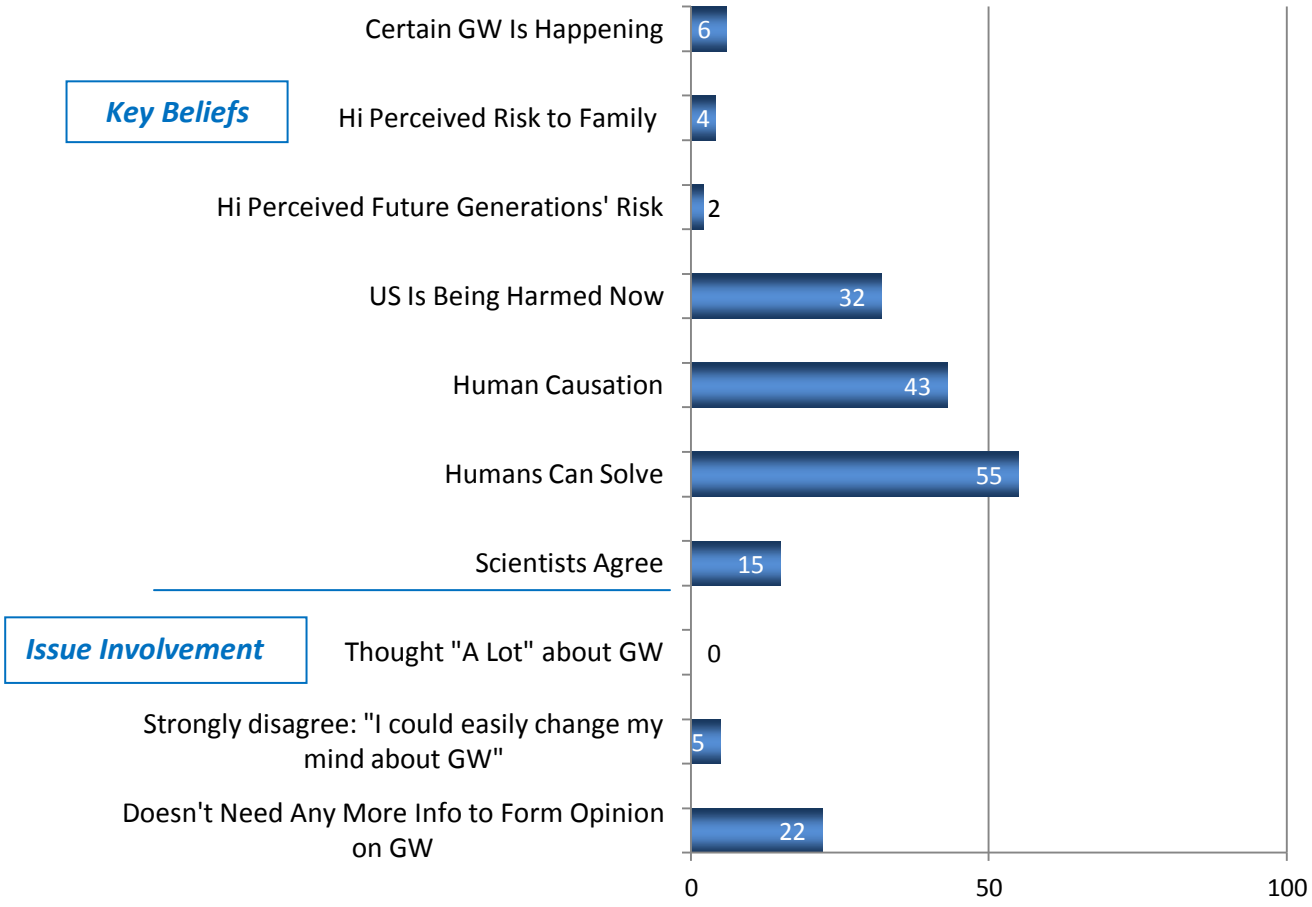
Informational Needs and Media Use: The top questions that the *Cautious* have about climate change are how scientists know it is caused by humans, and whether it is really happening. They're unlikely to encounter the answers, however: Close to 70 percent say they pay little or no attention to global warming information.

While they report average levels of media use, they pay less-than-average attention to news, and have the lowest attention to environmental news of all six segments. Hence, reaching them through informational channels may be challenging.

The Disengaged

Key Beliefs and Issue Involvement: The *Disengaged* are the group that has given the issue of global warming the least amount of thought. On questions with a "don't know" response option, they overwhelmingly choose this response – e.g., in April 2013, 88 percent said they don't know how great the threat is to their family, and 98 percent said they don't know how great the threat is to future generations. Only six percent are certain that global warming is happening, and only one in 20 are very certain of their opinions. If pressed, however, they are inclined to believe that global warming is somewhat dangerous: When no "don't know" response option is offered, their risk perceptions tend to be slightly higher than the risk perceptions of the *Cautious* – e.g., 32 percent of the *Disengaged* say Americans are being harmed now, as compared to of the 26 percent of the *Cautious*.

Figure 9: *Disengaged* Key Beliefs & Issue Engagement



Note: See Appendix for item descriptions; source: Yale/George Mason University, April 2013; n=1,045.

***Characteristics**:* The *Disengaged* have lower socio-economic status than other segments: They are least likely of the segments to have graduated from college, and they have the lowest incomes. About 60 percent are women, and a quarter are African-American. They're more likely than other segments to be retired, disabled, and renters.

They tend to be moderate Democrats who are politically inactive. Close to a quarter have no party identification, saying they are uninterested in politics; the group has the lowest

proportion of registered voters. Their levels of egalitarianism and individualism are about equal and similar to national norms, but they are higher than average in biblical literalism and in rejection of the theory of evolution.

Informational Needs and Media Use: The *Disengaged* do not follow political news very closely and while they say they need more information on global warming, they are unlikely to seek it. They are high television viewers, watching more entertainment programming than any other group, but less news and public affairs. They pay the smallest amount of attention to national politics of the six segments, and close to 80 percent say they pay little or no attention to global warming information.

Low Involvement Communication Strategies

Reaching and engaging audiences that are uninterested in an issue begins with the recognition that no matter how important we believe our message to be, audience members are unlikely to pay attention if understanding the content requires cognitive effort – hence, we must turn to methods that are not effortful. These include message strategies that:

- Require only peripheral/heuristic information processing, e.g., visual imagery, humor, and attractive or highly credible sources;
- Promote positive social norms by demonstrating that climate-friendly behaviors are popular, respected and common;
- Show rather than tell what is happening, thereby triggering automatic information-processing;
- Personalize the threat by showing impacts on places that are physically close or emotionally significant (such as national parks), and on people with whom the audience can identify.

- Generate involvement through the use of narratives.

These communication strategies apply to all segments, in that we are all influenced by social norms, we all become emotionally engaged with compelling narratives, are drawn to attractive sources, and process visual information effortlessly and instantly. They are, however, particularly applicable to the *Cautious* and *Disengaged* because these groups lack the drive to pay attention that characterizes involved segments.

Barriers communicators face with low involvement audiences are motivation and ability, two prerequisites for deep information processing: Three-quarters of the *Disengaged* and 44% of the *Cautious* say they have difficulty understanding global warming news; over half of the *Disengaged* and more than a third of the *Cautious* say they don't like to read or hear about the topic (Figure 10). Note, however, that these barriers exist across all six segments, with close of a quarter of the Alarmed saying they have difficulty understanding, and majorities of the *Doubtful* and *Dismissive* saying they don't want to read or hear about the issue. Either barrier can be sufficient to halt information processing, and the challenge for communicators is to create content that will draw audiences in and be simple to understand.

Figure 10: Ability and Motivation Barriers

	Alarmed	Concerned	Cautious	Disengaged	Doubtful	Dismissive
"I have difficulty understanding news reports about global warming."	23%	39%	44%	77%	35%	19%
"In general, I don't like to read or hear anything about global warming."	10%	28%	37%	59%	57%	72%

Note: Cells show the proportions that agree with each statement; source: Yale/George Mason, June 2011; n=1,043

While the use of attractive, credible sources and humorous messages may generate the short-term engagement typical of peripheral/heuristic message processing, such effects tend to be short-term and unstable; hence, communicators may wish to employ additional strategies in reaching the *Cautious* and *Disengaged*.

Narratives: Because neither segment attends to global warming information or news, narratives may be a more effective way of reaching them – particularly the *Disengaged*, with their high use of entertainment programming. Narratives foster involvement with a story and characters, and prior issue involvement is unnecessary for drawing the audience's attention. Memory of narrative content tends to be high, allowing educational content to be conveyed, and studies find that the persuasive effects of fiction can be as high as for non-fiction if the individual has become absorbed in the story (Green & Brock, 2000). An empathic response to story characters fosters acceptance of their values and beliefs, at least in the short-term, and some evidence suggests that absorption decreases counter-arguing and increases message acceptance (Slater & Rouner, 2002).

Social Norms: Another strategy that may be effective with low involvement audiences is the promotion of positive social norms, which can influence both attitudes and behaviors (Cialdini & Trost, 1998). Studies show that low issue involvement is associated with greater normative influence (Petty & Brinol, 2012), and the *Cautious* may be particularly good targets for this approach in light of their higher-than-average sensitivity to social appearances.

Social influence occurs for three reasons: (1) we wish to maintain a positive self-image, both in our own eyes and in the eyes of others; (2) there are social rewards for conforming to group norms; and (3) when we are uncertain of the acceptable and/or appropriate perspective on issues and behaviors, the views and actions of others can help guide us. Such influence occurs at

a largely unconscious level through our observation of the actions of others around us (descriptive norms), but also through learning what those we respect and care for expect us to do (injunctive norms).

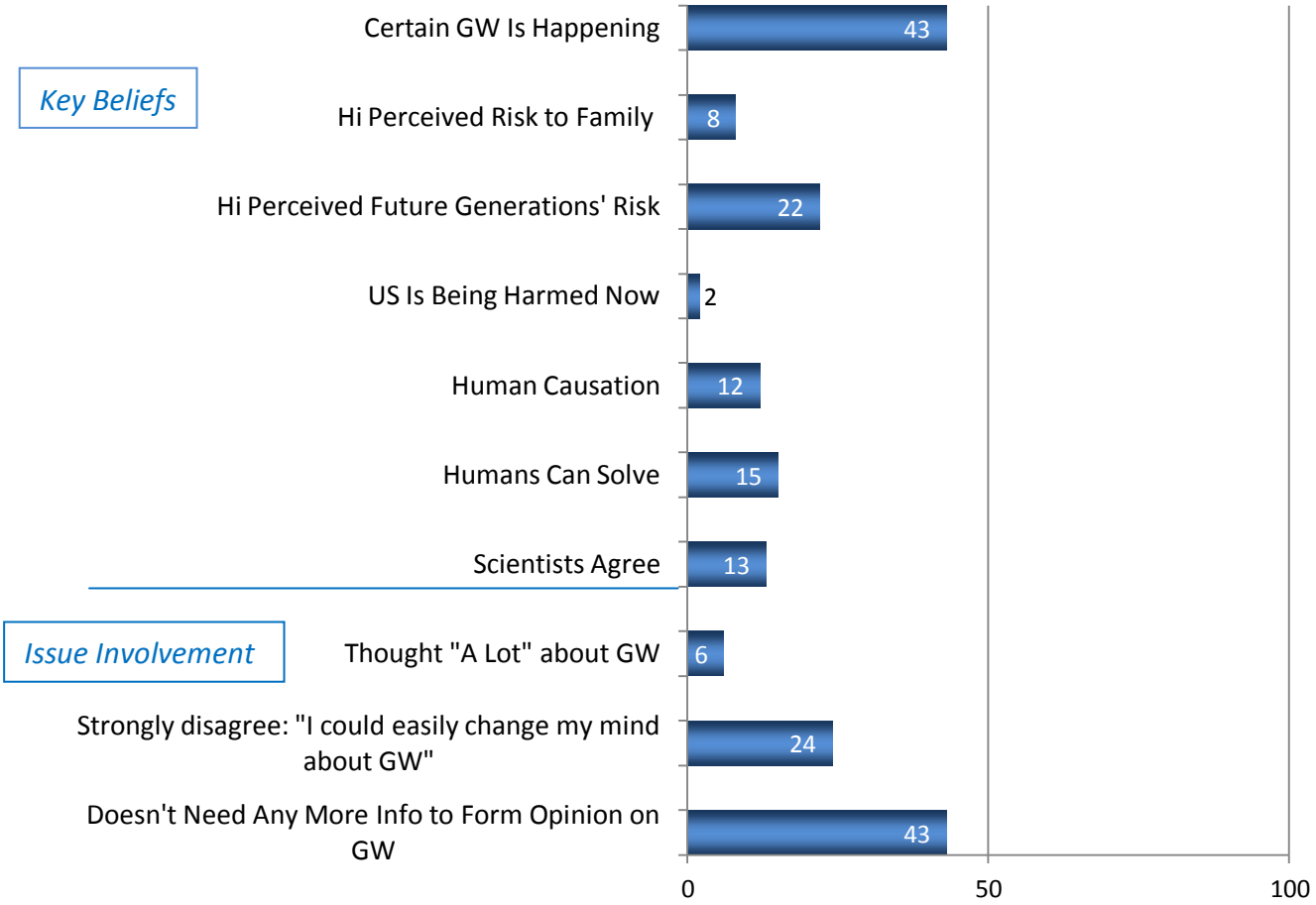
Environmental communicators unwittingly use descriptive norms to promote behaviors they wish to extinguish by stating how prevalent undesirable behaviors are. Instead, to the extent that it's possible to do so honestly, messages should emphasize that many desirable views and actions are widespread, growing in popularity, and characteristic of admired individuals; maintaining consistency between descriptive and injunctive norms is an important component of effective norm messaging: This is popular *and* it's socially approved (Cialdini, 2003).

Involved Publics Who Hold Negative Climate Change Attitudes

The Doubtful

Key Beliefs & Issue Involvement: The *Doubtful* have similar levels of issue involvement to the *Concerned*, but low acceptance of the key beliefs. While 40 percent are certain global warming is occurring, they view it as a low risk and take a dim view of the notions that humans have caused climate change or can solve it; few think that scientists agree that climate change is happening. They are more involved in the issue than the middle segments, however, and even though they do not actively think a lot about climate change on a daily basis, they are moderately certain of their views, with three-quarters very certain of their opinions, and close to half not needing any new information to make up their minds. The *Doubtful* have concluded that climate change is not an important issue, but are not strident in their views.

Figure 11: *Doubtful* Key Beliefs & Issue Involvement



Note: See Appendix for item descriptions; source: Yale/George Mason University, April 2013; n=1,045.

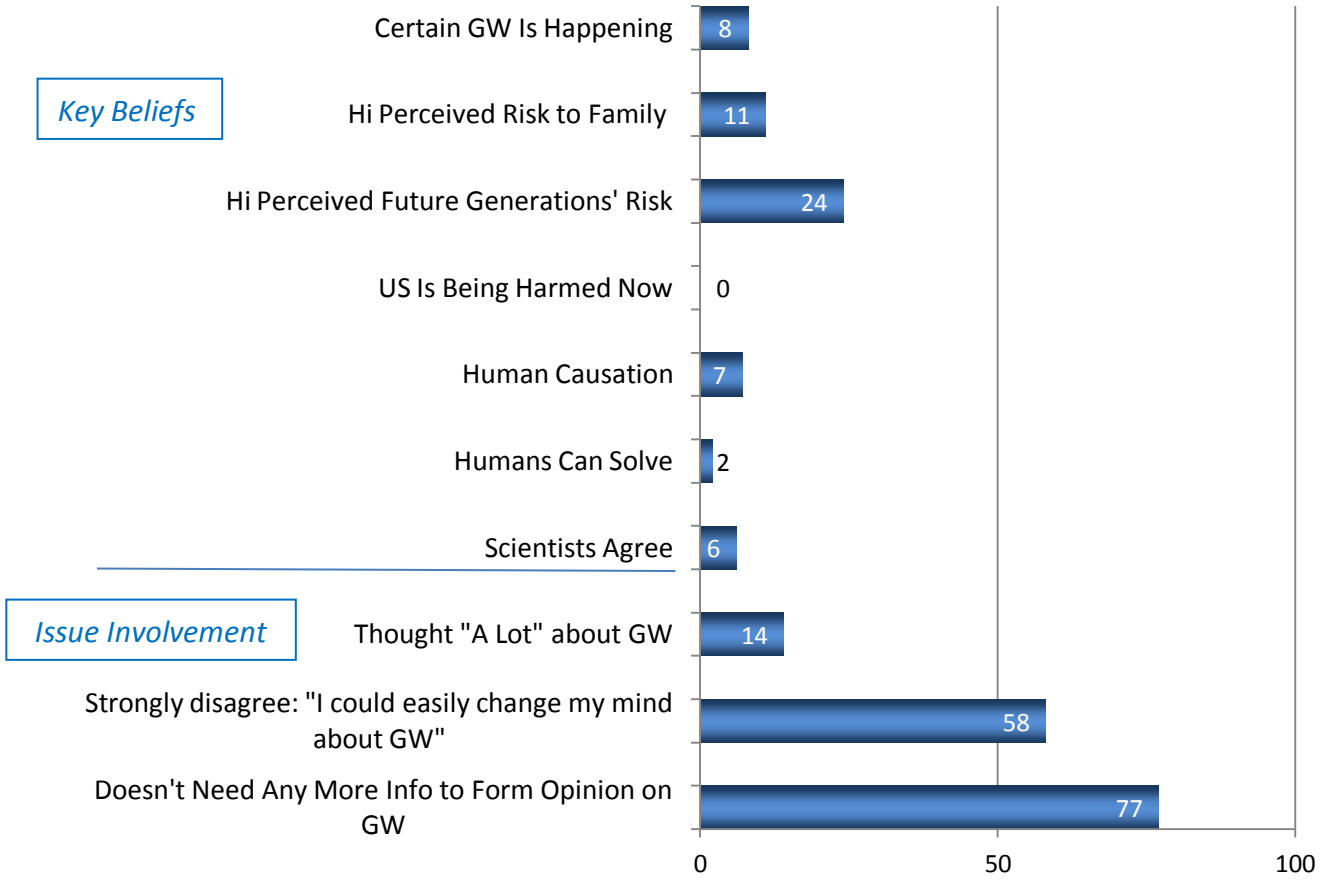
Characteristics: The *Doubtful* tend to be politically conservative, with over half somewhat or very conservative, and only around one in ten liberal. Party identification skews Republican, as do cultural values: Among the segments, the *Doubtful* are the second lowest in their level of egalitarianism, and second highest in their levels of individualism. While they are slightly more likely to be white and male than the national average, their income, age, and education do not substantially differ from the rest of the country.

Informational Needs and Media Use: The *Doubtful* would most like to know how scientists know that climate change is real – the proportion that would ask this question is twice the national average. They are unlikely to attend to the topic, with only 3% saying they pay a lot of attention to global warming information. Few follow environmental news, but they do pay an average amount of attention to news about politics, science and technology.

The Dismissive

***Key Beliefs & Issue Involvement*:** The *Dismissive* are the most certain that climate change is not happening and are highly confident in their views. They are the inverse of the Alarmed—strong issue partisans, but with a diametrically opposed position. *Dismissive*s are very unlikely to hold any key beliefs about climate change. None believe that climate change is harming the U.S. now. While on several measures (belief certainty and risk perceptions) the *Disengaged* are nominally lower, this is due to their high proportion of "don't know" responses, whereas the positions taken by *Dismissive*s indicate a firmer rejection of climate science. This is further evinced in *Dismissive*s' high levels of issue involvement. While climate change is a greater presence in the everyday thoughts of the *Alarmed* – they think "a lot" about climate change at six times the rate (63%) of Dismissives (14%) – *Dismissive*s are the most likely of any segment to say that they do not need any more information to make up their mind on the topic.

Figure 12: *Dismissive* Key Beliefs & Issue Involvement



Note: See Appendix for item descriptions; source: Yale/George Mason University, April 2013; n=1,045.

Characteristics: More than 70 percent of the *Dismissive* are somewhat or very conservative. Over half identify as Republicans, with only 3 percent Democrats, and their cultural values are the least egalitarian and the most individualistic of any segment. Demographically, they are more likely to be male and white than the national average. Their socio-economic status is also notably higher, with greater educational attainment and the highest income of any of the Six Americas.

Informational Needs and Media Use: The question *Dismissive*s would most like answered is how climate scientists know that climate change is real; they are very unlikely to ask about anything else. They do, however, follow climate change news and information. Whereas the *Doubtful* are largely uninterested, the *Dismissive* are the second most likely to say that they pay "a lot" of attention to global warming, second only to the Alarmed. However, whereas virtually all of the *Alarmed* pay at least some attention to global warming, a substantial portion of the *Dismissive* choose to ignore information on the topic.

The *Dismissive* pay average attention to news about the environment, above average attention to science and technology news, and are the segment most likely to follow politics, with more than a third following it "very closely." Unlike other segments (including the *Doubtful*), the *Dismissive* are unlikely to trust scientists on climate change.

Counter-Attitudinal Communication Strategies

Research suggests that reaching counter-attitudinal audiences such as the *Doubtful* and *Dismissive* may be achieved by adopting less confrontational and more indirect approaches. A key challenge with the *Doubtful* and *Dismissive* segments is not merely to *inform* or *confirm* existing beliefs that climate change is real and problematic (as with the *Cautious* and *Disengaged*), but more fundamentally to *persuade* the *Doubtful* and *Dismissive* that their suspicions and beliefs about the issue are incorrect. Yet because the views of these segments are opposed to efforts aimed at addressing climate change, direct communication is likely to trigger counter-arguing, rather than persuasion, in a process of motivated reasoning (Kunda, 1990). Information casting doubt on the reality or seriousness of climate change is likely to be accepted uncritically, whereas information demonstrating its reality and threat is likely to be subjected to

biased processing and critical review. Thus the counter-attitudinal message is likely to be rejected, while the pro-attitudinal message is accepted.

The *Dismissives*' high issue involvement means that their beliefs and attitudes are strongly held and well-established; they will critically scrutinize messages about climate change, rejecting the science, while uncritically accepting information questioning climate change in a process of biased assimilation. The *Doubtful* are midway between that characterization and the low-involvement segments. Though skeptical, the *Doubtful* hold their attitudes and beliefs about climate change less fervently, spend less time and energy thinking about climate, and are less likely to have the motivation to closely scrutinize climate change communication.

Emphasizing scientific agreement on the reality of climate change may help the *Doubtful* become less skeptical, though this message is unlikely to work with the *Dismissive*, who are highly motivated to reject scientific information that disagrees with their views, and who are distrustful of climate scientists. Whereas the *Doubtful* are quizzical and potentially persuadable, the *Dismissive* are certain about their views and likely to strenuously resist efforts to change their minds (Taber & Lodge 2006).

A prime risk of directly engaging with the *Dismissive* is that any mention of climate change may result in a "boomerang effect" (Hart & Nisbet, 2012) in which an attempt at persuasion results in attitude change in the opposite direction than desired, due to counter-arguments generated by the message recipient.

An important aspect of the indirect approach is appreciating the underlying motivational structure beneath expressions of skepticism about climate change and mitigation proposals. Research on the cultural cognition of risk suggests that individuals develop their understanding of societal issues with reference to their underlying cultural values (Kahan & Braman 2006).

Climate change is perceived by some as a threat to the values of individualism and respect for established order that mark political conservatism in the United States (Kahan et al. 2011; Kahan 2012), values that are strongly held by the *Doubtful* and *Dismissive*. This implies that communicating about climate change in more value-congruent ways may increase engagement. One experiment indicates that trust in a fictive climate change scientific expert increased among those with individualistic and hierarchical values when that expert advocated nuclear power (as opposed to government regulation) as a policy solution (Kahan et al. 2011).

Although communicating with these segments may be difficult, several approaches may be of use: Pointing out concrete ways in which people have personally experienced climate change may be effective with the *Doubtful*, as research has found that personal experience of climate change leads people to become convinced of its reality (Myers et al., 2013). Health frames have been shown to have some resonance with these segments, and language choice may also be important (Myers et al., 2012).

Discussion

While theory and prior research can guide us on communication strategies appropriate for publics with different beliefs and issue involvement, real-world communication presents us with audiences containing multiple publics. This challenge may be addressed in several ways:

(1) Examination of the channels most used by particular segments permits targeting to some extent: The *Alarmed* are unlikely to listen to Rush Limbaugh, or the *Dismissive* to watch Jon Stewart. Building opinion leadership among the *Alarmed* may be best accomplished through specially focused channels, such as environmental magazines, email newsletters, and social media postings by environmental, scientific and social action organizations. A strategy employed by a number of organizations is to ask those who have signed a petition or made an online

donation to repost the original request they received on Facebook or to email it to their friends and families, encouraging them to act as opinion leaders, fostering interpersonal (although mediated) communication, and broadening the original message's impact.

(2) Reaching the middle segments is likely to require the use of channels that have a broad, mass audience. Low involvement strategies are most likely to be effective in these channels, as they have demonstrated efficacy across audiences.

(3) Messages should be layered, including both efficacy-building and threat content. The low involvement publics need to be taught the danger posed by climate change, but placing too much emphasis on the threat may lead to defensive avoidance and despair among the *Alarmed* and *Concerned*, who already understand the threat and are fearful. It has sometimes been suggested that threat information should be dropped altogether – that the audience has heard enough about the threat and positive, efficacy-building messages are sufficient. A recent meta-analysis finds, however, that both risk perceptions and efficacy beliefs are necessary to motivate action (Peters et al., 2012).

There remains a gulf between the communication strategies we have suggested and the actual crafting of effective messages. Communicators are often advised, for example, to frame messages in ways that are consistent with the values and beliefs of the audience. A recent effort to engage *Dismissives* using a national security frame backfired, however: Although national security is prized among the *Dismissive*, a short essay attributed to a general concerning the national security threat posed by global warming resulted in anger, rather than persuasion (Myers et al. 2012). Subsequent surveys have found that *Dismissives* simply do not believe this to be the case, and the essay is likely to have fostered counter-arguing, resulting in boomerang effects. By contrast, a public health frame was more effective, across all six segments.

The time window within which we can act to prevent the most severe impacts of climate change is closing; scientists across diverse disciplines have identified impacts that are already occurring and that will occur in the absence of action. In light of the urgency, studies on effective climate communication should be topping our field's research agenda.

References

Anderson, A. et al. (under review). "Global warming" vs. "climate change": The influence of terminology on beliefs and affective imagery. Submitted to *Climatic Change*, July, 2013.

Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory.* Prentice Hall, Englewood Cliffs, NJ.

Cialdini, R. (2003). Crafting normative messages to protect the environment. *Current Directions in Psychological Research, 12*(4), 105-109

Ding, D., Maibach, E., Zhao, X., Roser-Renouf, C. & Leiserowitz, A. (2011). Support for climate policy and societal action are linked to perceptions about scientific agreement. *Nature Climate Change, 1,* 462-466. doi: 10.1038/NCLIMATE1295

Green, M. & Brock, T. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology, 79,* 701–721.

Hart, S. & Nisbet, E. (2012). Boomerang effects in science communication: How motivated reasoning and identity cues amplify opinion polarization about climate mitigation policies. *Communication Research, 39*(6). doi: 10.1177/0093650211416646

Krosnick J., *et al.*, (2006). The origins and consequences of democratic citizen's policy agenda: A study of popular concern about global warming. *Climatic Change,* 77, 7-43.

Kahan, D. & Braman, D., (2006). Cultural Cognition and Public Policy. *Yale Law & Policy Review, 24,* 149.

Kahan, D., Jenkins-Smith, H. & Braman, D. (2011). Cultural cognition of scientific consensus. *Journal of Risk Research, 14,* 147-174.

Kunda, Z. The case for motivated reasoning. *Psychological Bulletin*, 480-498 (1990).

Leiserowitz, A., Maibach, E., & Roser-Renouf, C. (2010a). *Global Warming's Six Americas, January 2010.* Yale University and George Mason University. New Haven, CT: Yale

Project on Climate Change. http://environment.yale.edu/uploads/SixAmericasJan2010.pdf

Leiserowitz, A., Maibach, E., & Roser-Renouf, C. (2010b). *Global Warming's Six Americas, June 2010.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change. http://environment.yale.edu/climate/files/SixAmericasJune2010.pdf

Leiserowitz, A., Maibach, E., Roser-Renouf, C. & Smith, N. (2011). *Global Warming's Six Americas, May 2011.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change. http://environment.yale.edu/climate/files/SixAmericasMay2011.pdf

Leiserowitz, A., Maibach, E., & Roser-Renouf, C., & Hmielowski, J. (2012). *Global Warming's Six Americas in March 2012 and November 2011.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change. http://environment.yale.edu/climate/files/Six-Americas-March-2012.pdf

Leiserowitz, A., Maibach, E., Roser-Renouf, C. , Feinberg, G., & Howe, P. (2013). *Global Warming's Six Americas in September 2012.* Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change. http://environment.yale.edu/climate/files/Six-Americas-September-2013.pdf

Lewandowsky, S., Gignac, G. & Vaughan, S. (2013). The pivotal role of perceived scientific consensus in acceptance of science. *Nature Climate Change, 3*, 399-404. doi: 10.1038/NCLIMATE1720

Maibach, E., Leiserowitz, A., Roser-Renouf, C., & Mertz, C. K. (2011). Identifying Like-Minded Audiences for Climate Change Public Engagement Campaigns: An Audience Segmentation Analysis and Tool Development. *PLoS ONE,* 6(3): e17571. doi:10.1371/journal.pone.0017571

Maibach, E., Roser-Renouf, C. & Leiserowitz, A. (2009). *Global Warming's Six Americas 2009: An Audience Segmentation Analysis.* http://climatechange.gmu.edu

Myers, T., Maibach, E., Roser-Renouf, C., Akerlof, K., & Leiserowitz, A. (2013). Personal experience or belief in the reality of global warming: Which comes first? *Nature Climate Change, 3*, 343-347. doi: 10.1038/NCLIMATE1754

Myers, T., Nisbet, M., Maibach, E. & Leiserowitz, A. A public health frame arouses hopeful emotions about climate change. *Climatic Change, 113:* 1105–1112. doi: 10.1007/s10584-012-0513-6

Nisbet, M. & Kotcher, J. (2009). A two-step flow of influence? Opinion-leader campaigns on climate change. *Science Communication*, *30*(3), 328-354.

Peters, G., Ruiter, R., & Kok, G. (2013). Threatening communication: a critical re-analysis and a revised meta-analytic test of fear appeal theory. *Health psychology review, 7* (sup1), S8-S31.

Petty, R., Brinol, P. (2012). A multi-process approach to social influence. In Kenrick, D. et al., (Eds.*). Six degrees of social influence: Science, application, and the psychology of Robert Cialdini.* New York: Oxford University Press, 49-58.

Petty, R., Brinol, P., & Priester, J. (2009). Implications of the Elaboration Likelihood Model of Persuasion. In Bryant, J., & Oliver, M. B. (Eds.), *Media effects: Advances in theory and research*. New York: Taylor & Francis US, 125-164.

Phipps, M., & King, Z. (2011*) Planet earth decision theater live performance: Formative evaluation.* Unpublished report.

Roser-Renouf, C., Maibach, E., Leiserowitz, A., & Zhao, X. (2011, May). *The Genesis of Climate Change Activism: From Key Beliefs to Political Advocacy.* Paper presented to the International Communication Association Conference, Boston.

Schuldt, J., Konrath, S. & Schwarz, N. (2011). "Global warming" or "climate change"? Whether the planet is warming depends on question wording. *Public Opinion Quarterly, 75* (1): 115–124.

Slater, M. & Rouner, D. (2002). Entertainment-education and elaboration likelihood: Understanding the processing of narrative persuasion. *Communication Theory, 12(2):* 173-191.

Taber, C. & Lodge, M. (2006). Motivated skepticism in the evaluation of political beliefs. *American Journal of Political Science, 5* (3), 55-769

Venkatraman, M. (1989). Opinion leaders, adopters, and communicative adopters: A role analysis. *Psychology and Marketing, 6*(1), 51-68.

Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior, 27*(5), 591-615.

Appendix: Measures of Key Beliefs & Issue Involvement

Figures 6 through 9, 11 and 12 show the proportions of respondents with the following beliefs:

1. Certainty that global warming is happening: "Extremely sure" or "very sure" global warming is happening.

2. Risk Perceptions:

- *Amount of harm:* Their families and future generations will be harmed "a great deal" or "a moderate amount."
- *Timing of harm:* People in U.S. are being harmed now.

3. Human Causation: "Assuming gw is happening," it is caused mostly by human activities.

*4. Solvability: "*Humans could reduce global warming, but it's unclear whether we will" *or* "Humans can reduce global warming and will."

5. Scientific Agreement: Most scientists think global warming is happening.

6. Prior Thought: They have thought "a lot" about global warming before today.

7. Opinion Certainty: Strongly disagree with statement: "I could easily change my mind about global warming."

8. Need for Information: Say they do not need any more information to form a firm opinion on global warming.

Author Information

Connie Roser-Renouf, PhD (Stanford, 1986) is an Associate Research Professor at the Center for Climate Change Communication at George Mason University. Her research focuses on identifying effective communication strategies for building audience engagement with climate change.

Neil Stenhouse is a doctoral student in communication and graduate research assistant for the Center for Climate Change Communication at George Mason University. His interests include communicating the scale and nature of the risks involved with climate change, and building understanding of (and support for) the transformation of global energy systems.

Justin Rolfe-Redding is a doctoral candidate in the Department of Communication at George Mason University. His research at Mason's Center for Climate Change Communication has focused on messaging strategies, the role of cultural values in climate beliefs, and the attitude structures of those who identity with the Republican party.

Edward Maibach, MPH (San Diego State, 1993), PhD (Stanford, 1990) is a University Professor and Director of the Center for Climate Change Communication at George Mason University. He co-chairs the Engagement and Communication Working Group of the National Climate Assessment Development and Advisory Committee, and conducts research on a range of topics related to public engagement in climate change.

Anthony Leiserowitz, PhD (University of Oregon, 2003) is a research scientist at the Yale University School of Forestry & Environmental Studies and Director of the Yale Project on Climate Change Communication. An expert on public opinion about climate change and the environment, his research investigates the psychological, cultural, and political factors that influence environmental attitudes, policy support, and behavior.