The Information Deficit Model is Dead. Now What?

Evaluating New Strategies for Communicating Anthropogenic Climate Change in the Context of Contemporary American Politics, Economy, and Culture

by

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Abstract

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Thesis directed by Professor Michael Tracey

Social science researchers studying the public controversy over Anthropogenic Climate Change (ACC) in the United States have convincingly argued that the "Information Deficit Model" (IDM), which assumes that the public needs more and better information, represents an insufficient strategy for communicating the science and risks of, and solutions to, ACC. Instead, these researchers propose alternative strategies, under the umbrella of what has been called the "contextual model." These strategies attempt to incorporate social context — in the form of culturally resonant messages, frames, and other rhetorical devices — into communication with the public. Several researchers have even developed rigorous experimental methodologies to test the efficacy of these strategies, dubbing this burgeoning field the "science of science communication." This thesis reviews a variety of social science research showing that ACC communication researchers underestimate the challenge of implementing contextual model strategies outside of a lab setting, especially at the scales necessary for significant shifts in public opinion and meaningful changes in public policy. This is due primarily to the fragmented, polarized, and highly contested spaces of contemporary American culture, politics, and economics within which communication occurs, as well as the unequal distribution of power within these complex systems.

Contents

Introduction…….....1

Part One: The Information Deficit Model is Dead…….10

Now What? New Strategies for Communicating ACC…….…21

Part Two: Cultural, Media, and Political Challenges and Barriers to Implementation……...36

Cultural Challenges and Barriers……37

Media Challenges and Barriers……...41

Political Challenges and Barriers……51

Part Three: The Climate Wars……...…….81

Part Four: Realistic Expectations and Alternative Strategies……..96

Bibliography……...…….105

Introduction

The questions of whether Earth's climate is warming, and, if it is, whether human activity is the primary cause, have been hotly debated among United States politicians, journalists, and members of the public since National Aeronautics and Space Administration scientist James Hansen brought the issue to the attention of the American public in the summer of 1988. He famously declared on the Senate floor: "it is time to stop waffling so much and say that the evidence is pretty strong that the greenhouse effect is here" (Shabecoff 1988). In the same year the World Meteorological Organization and the United Nations Environmental Programme created the Intergovernmental Panel on Climate Change to bring together the world's top climate scientists to evaluate the relevant scientific literature and determine the current state of scientific knowledge on human-induced warming (IPCC website 2015). The IPCC issued its first report in 1990. Writing in their 2010 book "Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming," science historians Naomi Oreskes and Erik Conway note that a scientific consensus on anthropogenic (human-caused) climate change (ACC) coalesced soon after:

> As early as 1995, the leading international organization on climate, the Intergovernmental Panel on Climate Change (IPCC), had concluded that human activities were affecting global climate. By 2001, IPCC's Third Assessment Report stated that the evidence was strong and getting stronger, and in 2007, the Fourth Assessment called global warming 'unequivocal.' Major scientific organizations and prominent scientists around the globe have repeatedly ratified the IPCC conclusion. Today, all but a tiny handful of climate scientists are convinced that Earth's climate is heating up, and that human activities are the dominant cause" (Oreskes & Conway 2010).

The IPCC's most recent report, the Fifth Assessment Report, was issued in 2013 and again states that global warming is "unequivocal," and with 95 percent certainty, that human activity is the "dominant cause" of recorded warming (IPCC 2013). The IPCC defines 95 percent certainty as "extremely likely," though scientific statements are notoriously conservative, cloaked in the language of uncertainty. National Center For Atmospheric Research climatologist Kevin Trenberth argues that "the estimates suggest that any natural variability has, if anything, worked against the warming" (The State of the Science 2014). The IPCC's conclusions have been endorsed by prestigious scientific organizations from around the world, including the U.S. National Academy of Sciences, the American Association for the Advancement of Science, the American Geophysical Union, and the American Meteorological Society (NASA website 2015). In 2006, the AAAS concluded: "the scientific evidence is clear: global climate change caused by human activities is occurring now" (AAAS 2006). In 2012, the American Meteorological Society summarized: "it is clear from extensive scientific evidence that the dominant cause of the rapid change in climate of the past half century is human-induced increases in the amount of atmospheric greenhouse gases" (AMS 2012).

Even some of the IPCC's critics have come to its defense, and the defense of the concept of "scientific consensus" in general, as both have come under attack in the public controversy over ACC. In his 2009 book, "Why We Disagree About Climate Change," Mike Hulme writes:

> Such scientific consensus is not ultimate 'truth' and, on occasion, may turn out to be wrong. But the alternatives to the IPCC style of consensus-building are even less likely to command widespread authority within the worlds of science and policy. Vastly better [than random solicitation of views] is the work of groups such as the IPCC … which although slow,

> deliberative, sometimes elitist and occasionally dominated by strong personalities, are nonetheless the best representation of the scientific community's current general opinion (Hulme 2009).

Statistician Nate Silver, writing in his 2012 book "The Signal and the Noise: Why So Many Predictions Fail — but Some Don't" agrees: "many of these debates turn on a misunderstanding of the term. In formal usage, consensus is not synonymous with unanimity — nor with having achieved a simple majority. Instead, consensus connotes *broad agreement after a process of deliberation*, during which most members of a group coalesce around a particular idea or alternative" (Silver 2012).

Several quantitative studies back up the notion of a strong scientific consensus on the basic tenets of ACC, both among the global community of climate scientists and their published, peer-reviewed work on the subject. In 2004, Oreskes conducted a study that surveyed a sample of 928 published papers that mentioned "climate change" in an attempt to find out how many agreed and disagreed with the IPCC consensus that "most of the observed warming over the last 50 years is likely to have been due to the increase in greenhouse gas concentrations" (Oreskes 2004). She was unable to find a single paper which disagreed with the IPCC consensus position. Oreskes concluded: "this analysis shows that scientists publishing in the peer-reviewed literature agree with IPCC, the National Academy of Sciences, and the public statements of their professional societies. Politicians, economists, journalists, and others may have the impression of confusion, disagreement, or discord among climate scientists, but that impression is incorrect." In 2010, a study published in the Proceedings of the National Academy of Sciences of the United States of America found that "97–98 percent of the climate researchers most actively publishing in the field ... support the tenets of ACC outlined by the

Intergovernmental Panel on Climate Change" (Anderegg et al 2010). The study also found that the two to three percent of researchers who were unconvinced of ACC had lower levels of climate expertise and scientific credentials than the overwhelming majority of researchers who agreed with the basic tenets of ACC. Furthermore, in 2013, a group of researchers looked at the abstracts (introductory summaries) of 11,944 published climate science papers from 1991 to 2011 on the topics of "global climate change" and "global warming" (Cook et al 2013). The authors concluded: "among abstracts expressing a position on AGW [Anthropogenic Global Warming], 97.1 percent endorsed the consensus position that humans are causing global warming."

Despite a strong scientific consensus on the basic tenets of ACC, large numbers of the American public contend that the Earth's climate is either not warming, or, if it is, that human activity is not the primary cause. A poll conducted in August 2014 by the Pew Research Center asked Americans whether the Earth is getting warmer because of "human activity" or "natural patterns in Earth's environment" (Raine & Funk 2015). Respondents were also given the option "there is no solid evidence that Earth is getting warmer." Their results showed that only 50 percent attributed warming to human activity, while 23 percent attributed warming to natural patterns and 25 percent thought there was "no solid evidence that Earth is getting warmer." Another poll, by Gallup, found that slightly over half of Americans believe ACC is already happening, but roughly a third thought that the effects of ACC will not happen in their lifetime or will never happen (Saad 2015). A 2013 report by the Yale Project on Climate Change Communication found that only 42 percent of Americans believed "most scientists think global warming is happening," with 33 percent agreeing with the statement "there is a lot of disagreement

among scientists about whether or not global warming is happening" (Marlon et al 2013). The researchers even quantified public perception of scientific agreement, finding that only 15 percent of Americans believed 81-100 percent of climate scientists think global warming is human-caused. That means that at least 85 percent of the U.S. public underestimates the extent of scientific agreement on ACC. Not only does the American public disagree on the science of ACC, but it disagrees on what the scientists believe.

The above polling data, and more, show a clear, large, and consistent gap between what climate scientists think and what the American public thinks on empirical, scientific questions, with a near unanimity of climate scientists agreeing that the Earth's climate is warming and that the warming is primarily human-caused, and a split public on such questions. Needless to say, these views spill over into related normative polling questions, such as those concerning the risks associated with ACC's effects, as well as motivation for action to mitigate these risks. Gallup has been asking Americans how much they worry about global warming/climate change since 1989. In that first poll, they found that 63 percent of Americans worried "a great deal" or "a fair amount." This figure has varied slightly over time, with a low of 50 percent in 1998 and a high of 72 percent in 2000, but has remained remarkably stable. This figure dipped down to 51 percent in 2004 and back up to 66 percent in 2008, before falling back down to 51 percent in 2011. Most recently, in 2015, 55 percent of Americans worried "a great deal" or "a fair amount" about global warming/climate change, eight percentage points lower than the original poll in 1989. Gallup has also begun including climate change in a list of issues that it asks Americans about their level of worry (Riffkin 2014). The first batch of results, from a poll in 2014, put climate change as the second least concerning issue of the 15 issues on

the list. Gallup polling also shows that worry about environmental issues in general is at its lowest level since polling on this question began in 2001, with only 33 percent saying they worry "a great deal" about "the quality of the environment" in 2014, down ten points from a high of 43 percent in 2007. In addition to being out of step with expert, scientific opinion on the basic empirical questions of ACC, significant numbers of Americans appear unconcerned about its potential risks. Perhaps more disconcerting, concern has decreased, not increased, since the issue came to the nation's attention nearly 30 years ago.

This divide extends to a range of possible policy solutions intended to mitigate the risks of ACC. In a 2010 report titled "The Climate of Belief: American Public Opinion on Climate Change," Barry Rabe and Christopher Borick of the Brookings Institution explored polling data on a variety of ACC-related issues (Rabe & Borick 2010). Their data parallel some of the findings above. They found that 44 percent of Americans "strongly agree" or "somewhat agree" that "there is not enough scientific evidence to support claims that the Earth is getting warming." In addition, they found that 42 percent agree with the statement "scientists are overstating evidence about global warming for their own interests." In 2008 and 2009, only 36 percent believed "the Earth is getting warmer because of human activity such as burning fossil fuels," while in 2009, 51 percent thought it was a combination of human activity and "natural patterns in the Earth's environment." But the report also shed some light on several issues related to policies to address climate change. For example, they found that 52 percent of Americans support increased use of nuclear power to reduce greenhouse gas emissions. In addition, 56 percent support requiring "a set portion of all electricity to come from renewable

energy sources such as wind and solar power in order to reduce greenhouse gas emissions." This method, known as a renewable energy standard, has been implemented by several states. For example, in Minnesota, electric utilities are required to produce 25 percent of their electricity supply from renewable sources by 2025 (Mn.gov 2015).

Digging deeper, they found that 53 percent of Americans support a cap and trade program, but also that 20 percent strongly oppose it. When asked if they were willing to pay $15 a month in increased energy costs for a cap and trade program that "significantly lowered greenhouse gases," there was an 11 percent decrease in support to 42 percent, and a 9 percent increase in the strongly oppose category to 29 percent, totaling a majority, 51 percent, in opposition to such a program. At $50 per month, support dropped to 22 percent, with 54 percent strongly opposed and a whopping 72 percent of all Americans opposed. These findings are consistent with other polling showing that a majority of Americans are willing to pay small amounts to address ACC, but decline when asked to pay more substantial amounts. However, it is worth noting that this polling was conducted in 2008 and 2009, the peak of the Great Recession. A carbon tax received even less support than a cap and trade program, with 55 percent opposed, and 35 percent strongly opposed, without any mention of costs. At $50 a month, 75 percent opposed the tax, with 56 percent strongly opposed. When asked generally how much they would be willing to pay annually for more renewable energy, 33 percent said "nothing" in 2009, up from 22 percent in 2008. In 2009, 31 percent said they would be willing to pay 1-49 dollars per year, meaning that a majority, 64 percent, were only willing to pay between $0 and $49 annually for more renewable energy.

So who are these Americans who are at odds with the scientific consensus on ACC, have low risk perceptions of ACC, and are unmotivated to mitigate these risks? According to a 2013 Pew survey, they tend to be politically conservative (Pew Research Center 2013). The opinions of Republicans and Republican-leaning independents divided into four roughly equal size groups, according to Pew: "23 percent say there is solid evidence of global warming and it is mostly caused by human activity; 19 percent say warming exists but is due to natural patterns; 25 percent see no solid evidence and say it is just not happening; 20 percent say there is no solid evidence but not enough is known yet." Their polling shows that 59 percent of Republicans polled in 2006 believed that there was solid evidence of warming, but that number dropped to 35 percent in 2009. It has since recovered slightly, to 50 percent in 2013. This compares with 91 percent of Democrats in 2006, 75 percent in 2009, and 88 percent in 2013. Self-identified "Tea Party" Republicans were least likely to agree with the scientific consensus. According to Pew, "just 25 percent of Tea Party Republicans say there is solid evidence of global warming, compared with 61 percent of non-Tea Party Republicans." In addition, "among Tea Party Republicans, the largest share – 41 percent – says that global warming is just not happening, while another 28 percent say not enough is known."

A 2011 study by Aaron McCright and Riley Dunlap titled "Cool dudes: the denial of climate change among conservative white males in the United States" narrows in on a key sector of the American population that is responsible for much of the resistance to ACC science, risks, and solutions in the United States (McCright & Dunlap 2011). Their survey found that "conservative white males are more likely than other adults to deny the existence of a scientific consensus [on ACC] (58.8 percent and 35.5 percent

respectively).” In addition, “39.1 percent of conservative white males but only 14.4 percent of all other adults do not worry at all about global warming.” McCright and Dunlap also found that those who claimed to be knowledgeable of climate science were actually most likely to hold views out of step with the scientific consensus. “These differences are even greater for those conservative white males who self-report understanding global warming very well.” McCright and Dunlap conclude: “climate change denial seems to have become almost an essential component of conservative white male identity.”

Part One

The Information Deficit Model is Dead

The Information Deficit Model (IDM), also known as the deficit model, knowledge deficit model, and knowledge gap model, has been the topic of much academic research and journalism in recent years, but the concept has been around for quite some time. Science journalist David Dickson, writing in 2005, claims that the phrase was coined by social scientists in the 1980s (Dickson 2005), but that the original purpose of the term was "not to describe a mode of science communication," as it has come to be used in recent years. Rather its purpose was "to characterise a widely held belief that underlies much of what is carried out in the name of such activity." Instead of a communication model crafted by researchers or communicators with a strategic purpose, the IDM describes a norm within science communication, specifically between scientists and the lay public. According to Dickson, this belief has two aspects. First, the cause of public skepticism towards new scientific and technological topics, such as ACC, evolution, genetically modified organisms (GMOs), vaccines, and others, is due mostly to a lack of knowledge about these topics and modern science and technology in general, among the public. Second, this belief assumes that the best way to alleviate public skepticism of scientific topics is to provide more and better information to the public — in other words, *to fill* the knowledge gap, or deficit. Dickson contends that this diagnosis by social scientists brought about the academic field Public Understanding of Science. This research movement gained legitimacy with the creation of the scientific journal *Public Understanding of Science*, which published its first issue in January 1992 (Public Understanding of Science website).

Matthew Nisbet and Dietram Scheufele, currently two of the leading scholars within this field, describe the deficit model as a process of communication where scientific knowledge is transmitted from scientists to the lay public (Nisbet & Scheufele 2009). "The facts are assumed to speak for themselves and to be interpreted by all citizens in similar ways," they write, and "the absence of quality science coverage is bemoaned." A common assumption of the IDM is that the public does not possess sufficient scientific literacy skills — basic knowledge of scientific facts and how the scientific process works, combined with the ability to use rational, scientific thinking. Researchers call this the Public Irrationality Thesis. Nisbet and Scheufele point to a paper by Brian Wynne, published in *Public Understanding of Science* in the year of its conception, 1992, as one of the earliest critiques of the IDM. In it, Wynne highlights a conflict between government scientists and sheep farmers in northwest England regarding soil and livestock contamination from the 1987 Chernobyl nuclear disaster (Wynne 1992). He attributed the farmers' skepticism of the scientists' warnings not to their ignorance of science, but rather to the threat that this scientific knowledge posed to their social relationships, identity, and way of life. Wynne also partially attributed these feelings of distrust and alienation to communication mistakes by the scientists, who were seen by the farmers as outsiders because they did not engage in a meaningful discourse with the farmers, instead taking a top-down approach to communicating with the public.

Two years later, in 1994, Alan Gross published a paper in *Public Understanding of Science* on the role of rhetoric within this burgeoning field. Using a rhetorical analysis, Gross found two dominant models for the public understanding of science: the deficit model and what he dubbed the "contextual model" (Gross 1994). He criticized the deficit

model for assuming "public deficiency, but scientific sufficiency" while praising the contextual model as "the joint product of scientific and local knowledge." In Maxwell Boykoff's 2011 book "Who Speaks for the Climate? Making Sense of Media Reporting on Climate Change," he quotes Oreskes on the deficit model: "when trying to communicate broadly — to the public or the press — scientists follow a deficit model that presumes that their audiences are ignorant and need to be 'supplied' with good, factual information … however, the model has failed" (Boykoff 2011). He also quotes a 2009 article by Susanne Moser: "providing information and filling knowledge gaps is at best necessary but rarely sufficient to create active behavioral engagement." Writing in 2001, again in *Public Understanding of Science*, Steve Miller criticized the deficit model as a "one-way, top-down communication process" and praised Wynne and others' analyses for highlighting "the importance of social context and lay knowledge" in the public understanding of science (Miller 2001). In the paper, titled "Public understanding of science at the crossroads," Miller cites a 1999 pronouncement by United Kingdom Science Minister Lord Sainsbury declaring the "demise of the deficit model" as a turning point for the Public Understanding of Science field. Looking ahead, Miller recommended that future researchers conduct "many experiments" in order to "work out what really works by way of public involvement in science."

Since then, several researchers have heeded Miller's call. Perhaps the most well-known of these researchers is Dan Kahan, at Yale University Law School's Cultural Cognition Project, whose work has attracted the attention of academics in a variety of social science fields for his novel experimental designs. Kahan, like most researchers studying ACC communication, has been frustrated by the assumption that more

information is the answer. “The prevailing approach is still simply to flood the public with as much sound data as possible on the assumption that the truth is bound, eventually, to drown out its competitors,” he wrote in a 2010 article in the scientific journal *Nature* titled “Fixing the communication failure” (Kahan 2010). Kahan’s experimental research reveals that this approach is likely to be fruitless on the climate issue. He and colleagues have used a rigorous experimental methodology to show empirically that the implications of belief in ACC science, not public irrationality, are to blame for high levels of public skepticism of the basic tenets of ACC science. In one experiment, he and colleagues showed that value structures, not scientific literacy skills, were responsible for divergent opinions on ACC concern (Kahan et al 2012). In fact, they found that conservatives with higher scientific literacy skills were actually more likely to hold dismissive views on the science of ACC than their less scientifically literate conservative peers. In another experiment, published in a study titled “Cultural cognition of scientific consensus,” one of his most cited papers, Kahan and colleagues found that who people regard as “experts” has more to do with the so-called experts’ conclusion, and how they interact with people’s value systems, than any factors related to the experts’ qualifications (Kahan et al 2010). “The experts whom laypersons see as credible, we have found, are ones whom they perceive to share their values,” he and his coauthors write. In other words, both liberals and conservatives accept science when it fits with their worldview, or at least does not threaten it, and reject it when it goes against their worldview. According to Kahan, “neither group is very reliable … in discerning what scientists believe on issues like these because they both are unconsciously motivated to fit evidence of expert

opinion to their cultural predispositions." This is the process of what Kahan calls "cultural cognition" at work.

According to his website, "cultural cognition refers to the tendency of individuals to conform their beliefs about disputed matters of fact (e.g., whether global warming is a serious threat; whether the death penalty deters murder; whether gun control makes society more safe or less) to values that define their cultural identities" (Cultural Cognition Project website 2015). On the public controversy over ACC, he argues that the automatic mental process of "motivated reasoning" is largely to blame, of which cultural cognition is a subset. He defines the "motivated reasoning thesis" (MRT) as "the tendency of people to conform their assessment of information … to some goal or interest extrinsic to forming an accurate belief." He also uses a famous 1954 study by Albert Hastorf and Hadley Cantril to describe the process. In the study, the researchers had students from two Ivy League universities watch a football game between the two schools and asked them to evaluate the referees (Hastorf & Cantril 1954). Both groups of students said that the referees were biased against their school's team and in favor of the other school's team. Hastorf and Cantril concluded that the student's group ties had unconsciously motivated the students to form biased conclusions about the officiating of the referees.

Kahan also uses the work of psychologist Daniel Kahneman to explain his findings. Kahneman's highly regarded 2011 book "Thinking, Fast and Slow" walks the reader through his decades of research showing that humans think in two fundamentally different ways (Kahneman 2011). The first, which he calls "System One" thinking, is automatic, fast, and easy. It is based on impressions and feelings, and is often hard-wired

through evolutionary processes. “System Two” thinking, on the other hand, is what we generally think of as reasoning: controlled, effortful, slow, and orderly. It is a deliberate process that requires attention and mental work. But according to Kahan’s research, “greater scientific knowledge and a stronger disposition to use System 2 reasoning … magnify the MRT effect reflected in cultural cognition.” This matches up with McCright and Dunlap’s finding that conservative white males who say they know more about ACC science are more likely to hold views at odds with the scientific consensus on the subject. It would seem that those with greater System 2 ability are simply better at providing evidence for their preexisting viewpoint on issues such as ACC.

The cause of these pre-existing viewpoints has to do with how individuals want society, especially the economy, to be structured. Kahan’s research indicates that group values relating to equality and authority, and individualism and community, correlate better with risk perceptions and related beliefs on issues such as ACC than any other factor, even political ideology. People who value equality and community (egalitarian and communitarian values) are more likely to view ACC as real and risky, while people who value authority and individualism (hierarchical and individualistic values) are less likely to view ACC in the same way. On the climate issue, this relates to how individuals view commerce and industry in society, with egalitarian and communitarian individuals being inherently skeptical of these societal institutions, while hierarchical and communitarian individuals greatly value their role in society. According to Kahan, “people find it disconcerting to believe that behavior that they find noble is nevertheless detrimental to society, and behavior that they find base is beneficial to it. Because accepting such a claim could drive a wedge between them and their peers, they have a

strong emotional predisposition to reject it." This is the process of motivated reasoning at work.

Unsurprisingly, egalitarian and communitarian individuals tend to be liberal and vote for Democrats, while hierarchical and individualistic individuals tend to be conservative and vote for Republicans. Thus ACC is an issue, similar to abortion and gun control, that is primed for polarization along political ideological lines, as it has surely become. "People with individualistic values, who prize personal initiative, and those with hierarchical values, who respect authority, tend to dismiss evidence of environmental risks," writes Kahan. This is because they think acceptance of such evidence will lead to restrictions on commerce and industry, activities they value. "By contrast, people who subscribe to more egalitarian and communitarian values are suspicious of commerce and industry, which they see as sources of unjust disparity," he writes. Thus they are more inclined to believe that such activities should be restricted due to their potential risks. In other words, liberals' higher acceptance of ACC science is not due to their group's superior intellect. Instead, it is because the implications of belief align with their group's societal interests.

On the other side, the implications of belief do not align with conservatives' view of what society should look like, thus triggering their motivated reasoning, the process of cultural cognition. Kahan calls this process "protective cognition" as he contends that its primary purpose is to defend one's identity — the cognitive links that connect us with likeminded peers. This constitutes the friends and family with whom we share the most basic values related to how we want society to be structured and what we view as a "fair" and "just" world. This reasoning protects not only one's social standing, but also one's

self-esteem. In a 2007 study, Kahan and colleagues write that "it is natural for individuals to adopt a posture of extreme skepticism, in particular when charges of societal danger are leveled at activities integral to social roles constructed by their cultural commitments" (Kahan et al 2007).

Kahan argues that division on scientific issues along political lines is abnormal, pointing to examples of which his research shows no such partisan divide, such as artificial food coloring, radio waves from cell phones, artificial sweeteners in diet soft drinks, nanotechnology, medical x-rays, and even GMOs. He also believes that we are usually quite good at using our skill of "knowledge-recognition." For example, a vast majority of Americans know to trust doctors and to go to them for medical advice because they have expertise in human health. We recognize that they are better sources of information than doing personal research, consulting friends and family, and other means of information-gathering. Kahan's research also shows that there are many highly-scientific literate individuals on both sides of the political spectrum. He argues that "any group that consistently misled its members on matters known to science and of consequence to their well-being would soon die out." This phenomenon usually leads different groups to converge on a common set of facts, according to Kahan. Therefore, polarization, or as he calls it, "consistent nonconvergence," is not the norm but rather is "pathological," like a disease wreaking havoc on a normally healthy system. "Consistent divergence," according to Kahan, "occurs when factual issues become entangled in antagonistic cultural meanings" — when views on scientific issues become "badges of group loyalty," as the climate issue has become in the United States. This symbolic

association between "belief" in ACC and basic group value conflicts in the United States has resulted in a politicized science communication environment on the issue.

Kahan differentiates between two types of rationality in his work: individual level rationality and collective level rationality. In the former, an individual unconsciously constructs their risk perception of ACC, and their view of the scientific concept in general, based on a careful cost-benefit analysis of how their position on the issue will cost or benefit themselves. People do not use their reasoning abilities for the sole purpose of forming accurate beliefs, but also for strategic purposes, such as to increase their social standing, according to Kahan. He uses the example of a rural barber in South Carolina (Kahan 2012). What does the barber have to gain from taking a strong public position that ACC is real and risky? Very little, argues Kahan, as ACC is a collective action problem in which one individual cannot have a meaningful impact on change. On the contrary, he argues that the costs to the barber are potentially great, as taking a position out of line with his peers, and especially customers, in rural South Carolina could result in both social and economic costs. It is not that skeptics or "deniers" of ACC science are irrational, he says, it is that they are actually being too rational. But they are being rational at an individual level, not a collective level. "Positions on climate change have come to signify the kind of person one is," writes Kahan. He relates this hypothetical to the real world example of former South Carolina Congressman Bob Inglis, who was voted out of office after taking a strong position in support of ACC science and action to reduce greenhouse gas emissions.

The problem, Kahan argues, is that individual level rationality and collective level rationality are not in line on the climate issue. Specifically, the problem is the "polluted

science communication environment," which has become populated by "toxic partisan meanings" in which one's position on ACC science has become tangled up with their cultural identity. According to Kahan, "overcoming this dilemma requires collective strategies to protect the quality of the science-communication environment from the pollution of divisive cultural meanings." The goal of his proposed communication strategies is to bring these two levels of rationality closer together. "The ability of democratic societies to protect the welfare of their citizens depends on finding a way to counteract this culture war over empirical data," Kahan writes. Again referencing the Ivy League football referee study, he argues that unlike a football game, we are all on the same team: "citizens who hold opposing cultural outlooks are in fact rooting for the same outcome: the health, safety and economic well-being of their society." Kahan places much of the blame on communicators:

> This reaction is substantially reinforced when, as often happens, the message is put across by public communicators who are unmistakably associated with particular cultural outlooks or styles — the more so if such advocates indulge in partisan rhetoric, ridiculing opponents as corrupt or devoid of reason. This approach encourages citizens to experience scientific debates as contests between warring cultural factions — and to pick sides accordingly.

If the truth "carries implications that threaten people's cultural values, then holding their heads underwater is likely to harden their resistance and increase their willingness to support alternative arguments, no matter how lacking in evidence," he writes.

Kahan coined the term the "science of science communication" to describe his empirical, experimental methodology for studying science communication. He advocates for applying the "disciplined observation, measurement, and inference" of science in communication studies (Kahan 2015). In fact, he goes as far as to say that "satisfactory

insight into this phenomenon can be achieved only by these means." He sees the science of science communication as the only way to combat "ad-hoc story-telling," where individuals come to a conclusion intuitively and then use their reasoning ability to back it up. Instead, researchers should create hypotheses, test them openly and rigorously, and accept whatever conclusions follow. People often confuse plausible hypotheses (ideas about how to communicate ACC) for "scientifically established" conclusions, according to Kahan. Testing these hypotheses by valid empirical means is the only means to move them from hypothesis to conclusion.

These views are widely held among social scientists studying ACC communication, constituting what appears to be a strong consensus among researchers that the IDM is insufficient for the task at hand and that new models should be developed, honed, and implemented. Many have begun to do so, and some have even taken Miller's advice, designing experiments to determine which messages and frames best help the public understand certain scientific concepts, such as ACC, and which messages and frames hinder their understanding.

Now What? New Strategies for Communicating ACC

As researchers have heeded Miller's call for experiments that "work out what really works by way of public involvement in science," a growing collection of studies points to an emerging consensus on what a post-IDM communication model should look like. Many of these studies rely on a scientific methodology like Kahan's science of science communication, while others rely on less empirical methods. But this collection of research appears to constitute an emerging consensus among social scientists on a new communication model for controversial science topics in general, and here specifically, on ACC. The recommendations and strategies of this model seem to fall under the umbrella of Gross' contextual model. Nisbet and Scheufele call it the "Public Engagement Model." Kahan calls it the "Two-Channel Strategy," with the first channel being scientific information and the second being "culturally congenial meanings." All of the recommendations and strategies presented below insert some form of culturally resonant context into the communication of ACC science, its risks, and solutions, in the form of specific messages, frames, and language. The Information Deficit Model is dead. The contextual model is born.

In 2004, Susanne Moser and Lisa Dilling published an article titled "Making climate hot: Communicating the urgency and challenge of global climate change" on how to increase "public understanding of, and civic engagement with" ACC (Moser & Dilling 2004). This article was followed by a 2006 book which they co-edited, titled "Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change" (Moser & Dilling 2006). This book featured their own writing as well as essays by a variety of social scientists giving their perspectives on the ACC communication

challenge. In the book, Moser and Dilling focus on what they call "the communication-social change link," the relationship between the communication of ACC and the social change needed to mitigate its risks. They point to a study led by Anthony Leiserowitz which outlines four conditions necessary for collective action. They are: a change in public values/attitudes; a vivid focusing event or events; an existing structure of institutions and organizations for change; and practical, available solutions. Moser and Dilling, along with Leiserowitz, focus on this first condition.

Moser and Dilling point to three factors that have prevented ACC from garnering the social and political resonance that leads to social change. The first is time lags. According to Moser and Dilling, ACC is a classic example of a "creeping environmental problem," characterized as "long-term and slow-onset," a "cumulative processes" with the potential to reach tipping points that could quickly delve into crises and disaster. This could mean that once the negative effects of ACC become more robust, and people finally begin to demand action, it could already be too late. At such a point, we could have already locked in very undesirable effects, or crossed a tipping point in which there is no going back. "Societies and ecosystems may be committed to damaging levels of climate change before the issue ever becomes an immediate, daily experience and stimulant of action," they write. The second factor is the geographic distribution of ACC's impacts. Rich countries, mostly in the Northern Hemisphere and cooler climates, have not experienced, and are not expected to experience, effects as harsh as developing countries, concentrated in Africa and Asia. According to a 2014 report by Standard & Poor's, countries in North America and Europe are some of the least vulnerable to climate change, while populous developing countries such as India, Bangladesh,

Thailand, the Philippines, Indonesia, Vietnam, Egypt, Ethiopia, Kenya, Nigeria, and a handful of other African countries are categorized as "very vulnerable" to climate change (Woody 2014). This fact is made even worse because developed countries are the major emitters of greenhouse gases and thus primary cause of ACC, while developing countries, especially in Africa, have little effect on the climate. "This geographic mismatch is aggravated by a political-economic separation in space between relatively unaffected decision-makers with substantial power and those most negatively affected by climate change and decisions made elsewhere," they write. Lastly, Moser and Dilling contend that ACC is overshadowed by other problems. ACC is often seen as an environmental problem, affecting non-human animals and the natural world, not a human problem. Personal concerns, such as economic security, safety from terrorism and crime, and similar issues that have more tangible and direct effects on individual well-being often take precedence. The result of all this is disconcerting: "The perception of global warming is that it is uncertain, controversial, far off in the future, and out of the public's hands."

In their 2004 article, Moser and Dilling propose seven strategies to improve climate change communication. First, abide by basic communication rules. These include tips such as knowing who your audience is and tailoring your messages and messengers towards them in order to maximize credibility and legitimacy with the audience. In addition to tailoring messages and messengers, they also recommend choosing the right communication channels to reach your intended audience. Second, Moser and Dilling recommend being positive, emphasizing empowerment. They use the term "response-ability" to convey this idea. Specifically, they recommend "highlighting the effectiveness

of recommended actions, addressing concerns over costs, and bolstering people's sense of self-efficacy" in order to foster a "can-do" attitude. Third, you can increase the persuasiveness of your message by doing things such as leading with your strongest argument. With ACC, they recommend starting with the most certain science. The importance of your opening argument cannot be overstated, according to the researchers: "Vivid, understandable, believable, interesting, and personally meaningful openings are critical." Fourth, using messengers that are trusted by the intended audience, as well as a diversity of messengers, is crucial to reaching a variety of audiences. They recommend that economists are used to talk about ACC's costs and the feasibility of proposed policy solutions, social scientists about how ACC will affect humans, industry leaders to talk to business groups, and religious leaders to talk about the moral arguments. Their fifth strategy is using your opportunities well. This means networking with a diverse range of stakeholders, as well as, for scientists especially, "establishing oneself as an expert resource to reporters through careful relationship-building." Sixth, tap into individual and cultural strengths and values. "If a problem and the actions people can take to help solve it are framed in ways that resonate with cultural values and beliefs, people are more likely to take the action than if they are not," Moser and Dilling write. They recommend using concepts such as competitiveness, leadership, ingenuity, and innovation to resonate with Americans' values. Lastly, unite and conquer. This is a collective problem that will require a collective response. "We must be made to feel part of a larger collective that can successfully tackle the problem," they write. Fostering a feeling that we are all in this together and that we can accomplish meaningful change if we work together is the hallmark of successful social change, according to the paper. Moser and Dilling end their

book with a reminder that "perfect is the enemy of good." Social change is difficult, and can take a long time, so it is important to be patient, positive, and hopeful: "Even less trivial than (re)creating the public discourse, however, is the challenge of how to maintain it."

Yale University researcher Anthony Leiserowitz pens a chapter in Moser and Dilling's book in which he provides his recommendations on the topic. One of the central themes of his recommendations is that communicators should emphasize that the consequences of ACC are not far off in the future, but are already underway. Not only are they not far off in the future, he writes, they are also not far away geographically; they are happening in our own backyard. Citing research by Nancy Cole and Susan Watrous, also featured in the book, Leiserowitz recommends highlighting the local consequences that ACC is having and will continue to have on places of cultural significance, such as national parks and beaches. This could help to make the issue more salient with the public, he argues. A good example is Glacier National Park, which has been used by climate activists for this purpose due to predictions that the famous park will be void of its namesake, glaciers, in the near future (Knoblauch 2015). This strategy has also been used by President Barack Obama in his second term in office as he has sought to make action on ACC part of his legacy (Whitehouse.gov 2015).

In another chapter of Moser and Dilling's book, Sharon Dunwoody makes the case that despite uncertain effects, information campaigns should be pursued on ACC. She notes that when these campaigns are pursued, "the goals are often noble ones, the dollars spent gargantuan, and the outcomes all too predictable: Messages seem to change the behaviors of some people some of the time but have almost no discernible impact on

most people most of the time." But while media messages are often poor catalysts for behavior change, she argues against the "minimal effects" label. "Mediated messages can have pronounced effects," she writes. "Just not the ones envisioned by those who design them." She concludes: "as countries around the globe face the prospect of encouraging massive behavior changes in order to try to prevent or, at the least, cope with climate change, it will be tempting to resort to information campaigns. I would urge us to succumb to that temptation; After all, media campaigns offer dramatic economies of scale by reaching large audiences at relatively low cost with potentially useful information."

Nisbet and Scheufele echo many of the sentiments in Moser and Dilling's book. "We may be wasting valuable time and resources by focusing our efforts on putting more and more information in front of an unaware public, without first developing a better understanding of how different groups will filter or reinterpret this information when it reaches them, given their personal value systems and beliefs," they write. The importance of reaching a diversity of media platforms and audiences is one of their central recommendations. Fostering a civil discourse by facilitating "conversations with the public that recognize, respect, and incorporate differences in knowledge, values, perspectives, and goals" is another. They highlight the need to move from science communication that emphasizes transmission of information from scientists to the public, to a dialogue between these two groups. "Effective communication requires initiatives that sponsor dialogue, trust, relationships, and public participation across a diversity of social settings and media platforms," write Nisbet and Scheufele. They argue that their and other research is beginning to take hold, and that a "paradigm shift" is under way in

how science organizations and scientists communicate with the public about ACC, from the IDM to a "Public Engagement Model" of communication.

Similar to Moser and Dilling, Nisbet and Scheufele also advocate reframing aspects of ACC in ways that resonate with specific groups. They cite a 1989 article by William Gamson and Andre Modigliani in defining frames as "interpretative storylines that communicate what is at stake in a societal debate and why the issue matters." According to Nisbet and Scheufele, frames help individuals simplify complex issues, such as ACC. "Successful framing suggests a linkage between two concepts or things, such that after exposure to a message, audiences now accept that they are connected," they write. Frames can be delivered in a variety of ways, including "frame devices" such as "catchphrases, metaphors, sound bites, graphics, and allusions to history, culture, and/or literature."

Nisbet and Scheufele argue that ACC "has historically been framed in ways that reinforce partisan divisions," and new frames are needed to depoliticize the issue. "To generate widespread public support for meaningful policy action, we need new perceptual contexts, mental boxes that resonate with something a specific intended audience already values or understands," they write. These include the economic opportunity frame, advocated by Ted Nordhaus and Michael Shellenberger, where ACC is framed in ways that resonate with people concerned about ACC's economic impact. One specific frame in this category has been the claim that the solar and wind industries are better for job growth than the coal industry. According to a recent report, there are already twice as many workers in the U.S. solar industry as there are coal miners (Fortune 2015).

Another way of framing ACC's effects that may resonate with people is the public health frame. "The potential of climate change to increase the incidence of infectious diseases, heat stroke, and other familiar health problems, especially among the elderly, children, or low income groups" could resonate with certain groups, according to Nisbet and Scheufele. Nisbet participated in a 2012 study on this topic led by Teresa Myers, titled "A public health frame arouses hopeful emotions about climate change." The study found that "across audience segments, the public health focus was the most likely to elicit emotional reactions consistent with support for climate change mitigation and adaptation," out of all of the frames they tested (Myers et al 2012). Such studies are also helpful in discrediting popular hypotheses, such as the "national security" frame. Myers' study found that this frame "may possibly boomerang among audience segments already doubtful or dismissive of the issue, eliciting unintended feelings of anger."

Another example of how framing research has informed the recommendations of communications researchers can be found in the case for framing ACC as a moral or religious issue. In a March 2015 op-ed for the *New York Times* titled "Is the Environment a Moral Cause?," Robb Willer summarizes his research with Matthew Feinberg (Willer 2015). They have found that "where liberals view environmental issues as matters of right and wrong, conservatives generally do not." According to Willer, "conservatives were less likely than liberals to describe pro-environmental efforts in moral terms, or to pass moral judgment on someone who behaved in an environmentally unfriendly way, for example by not recycling." Willer cites research that shows that people are unlikely to undertake costly political action unless they are morally engaged with the issue. When

they do feel morally engaged with an issue, "people are more likely to eschew a sober cost-benefit analysis, opting instead to take action because it is the right thing to do."

While liberals respond to messages about ACC having to do with preventing *harm* to the planet and *caring* for the planet, conservatives are less compelled by these frames. Instead, Willer and Feinberg have found that messages related to *purity* resonate more with conservatives. According to one of their studies, "conservatives presented with the purity message reported significantly greater support for pro-environmental legislation than the other two groups — indeed, they were as supportive as a group of liberals we also surveyed." They add, "conservatives who read the moral purity message even reported greater belief in global warming, though the message itself didn't mention global warming, only environmental issues in general." In fact, their study claimed that "reframing proenvironmental rhetoric in terms of purity, a moral value resonating primarily among conservatives, largely eliminated the difference between liberals' and conservatives' environmental attitudes" (Feinberg & Willer 2012). This research suggests that principles such as purity, patriotism, and reverence for a higher authority (God) or divine message, such as that of "stewardship" of the Earth referenced in the Bible, could resonate with groups traditionally associated with dismissive views on ACC.

Dan Kahan, well known for his work showing that the IDM is insufficient for ACC communication, himself admits that research on how the process of cultural cognition works is better developed than research on how to control it. However, he suggests two science communication techniques that may help. The first, proposed by colleague Geoffrey Cohen, is to "present information in a manner that affirms rather than threatens people's values." Kahan has called this strategy the "Two-Channel Strategy,"

with the first channel being well-communicated, accurate information, and the second channel being culturally affirmative meanings. We need communication that is affirming rather than denigrating to people's cultural identities, he argues. Kahan writes that "people tend to resist scientific evidence that could lead to restrictions on activities valued by their group. If, on the other hand, they are presented with information in a way that upholds their commitments, they react more open-mindedly." According to Kahan, this involves adapting rhetorical devices such as "message framing, in-group information sources, identity-affirmation, and narrative" to see if new ways of communicating avoid triggering the mechanisms of cultural cognition. For example, a 2012 study led by Kahan tested the hypothesis that by communicating the possibility of geoengineering as a solution to ACC, individualistic and hierarchical individuals would be more likely to view the science open-mindedly (Kahan et al 2015). Their results were promising, as the authors concluded: "making citizens aware of the potential contribution of geoengineering as a supplement to restriction of CO_2 emissions helps to offset cultural polarization over the validity of climate-change science." In addition, they found that "subjects exposed to information about geoengineering were slightly more concerned about climate change risks than those assigned to a control condition." The second strategy, which echoes Moser and Dilling, and Nisbet and Scheufele, is to "make sure that sound information is vouched for by a diverse set of experts." Who information is being communicated by is sometimes more important than what they are communicating or how they are communicating it. "People feel that it is safe to consider evidence with an open mind when they know that a knowledgeable member of their cultural community accepts it," he writes.

The purpose of these strategies is to disentangle knowledge and identity, which Kahan calls the "disentanglement principle." Kahan's disentanglement catchphrase is: "don't make reasoning, free people choose between knowing what's known and being who they are." Instead of "us vs. them," we need to foster a communication environment of "just us, using what we know." He writes: "we need science communication strategies that make crediting the best available evidence compatible with membership in the diverse cultural groups that comprise our pluralistic liberal society." Kahan believes that communicating the normalcy of ACC science is a good first step. "What needs to be communicated to ordinary decisionmakers is *normal climate science*; what needs to be communicated to ordinary people is the *normality* of climate science," he writes. Kahan recommends focusing on adaptation to ACC before moving on to mitigation. He writes that "by widening the positive exposure to climate science, adaptation-focused communication is likely to create greater public receptivity to open-minded engagement with this science in all contexts in which it is relevant." Talking about ACC science in the context of adaptation can serve as an ice-breaker or entry point of sorts into the world of climate science. This could make it easier to move into the more controversial topic of the risks posed by ACC, as well as trying to coax motivation for mitigation actions. Kahan has also found that simply prefacing questions about ACC with "according to climate scientists," instead of "do you believe" or other rhetorical structures that imply an endorsement of the existence of ACC, virtually eliminated the discrepancy between liberals and conservatives on climate science questions. For example, when asked "what gas do most scientists believe causes temperatures in the atmosphere to rise?," conservatives' and liberals' answers highly correlate based on their level of scientific

literacy. Whereas with "do you believe in?" type questions, or even simply "what gas causes temperatures in the atmosphere to rise?," political ideology trumped scientific literacy skills. Kahan suggests that this type of language can and should be used in the teaching of controversial science topics, such as ACC and evolution, in schools.

Kahan has begun to test these solutions in the real world, working with members of the Southeast Florida Regional Climate Compact, a coalition of county governments working to create a Regional Climate Action Plan. From this experience, he has gained several insights, including specific recommendations. By focusing on how communities can use scientific knowledge to address practical, everyday needs, we use what he calls "a natural shared vocabulary," and the central focus of dialogue on the topic of ACC becomes shared interests and values. This fosters an environment in which we are all working together towards a common goal, that we are all on the same team. He also recommends focusing on tangible effects, such as damage to property and infrastructure from flooding, reduced access to scarce water supplies, and diminishing farming yields as a result of drought. One example is using climate model projections of sea level rise in local flood planning. These effects are real, but manageable, and are talked about in a constructive way, conveying an attitude that says, "how can we fix this?" Kahan highly recommends that public engagement efforts be as participatory as possible, getting all stakeholders involved, and focusing on the local level, where change can more easily be measured, and hypotheses tested.

This includes getting a variety of local groups involved, including business and landowner associations, tourism board representatives, developers, and local chambers of commerce. Their endorsement of basic climate science can be helpful in diffusing the

perceived tension between business interests and climate science. These groups can be seen as allies due to the high degree of trust that hierarchical and individualistic Americans place in them. Kahan sums up his recommendations with a simple phrase: focus communication strategies around the question "what should we do with what we know?," while avoiding communication that elicits the question "whose side are you on?" He places this responsibility on the backs of science communication professionals, writing that they "must protect citizens from having to choose between knowing what's known by science and being who they are as members of diverse cultural communities."

Now, as the task moves from lab setting experiments intended to find out which frames and messages resonate with different cultural groups, to implementing these findings in the real world, Kahan again sees his methodology as useful. In a 2013 article titled "Making climate-science communication evidenced-based — All the way down" he argues for applying his science of science communication methodology to field experiments as well (Kahan 2013). Now that he and others have identified the mechanisms behind public conflict over ACC, these findings should be tested, using the same rigorous empirical methodology, in order to find out what works and what does not in real world settings. "Science communicators should now use valid empirical methods to identify which plausible real-world strategies for counteracting those mechanisms actually work," he writes. "Collaboration between social scientists and communicators on evidence-based field experiments is the best means of using and expanding our knowledge of how to communicate climate science." While lab experiments "identify mechanisms of consequence," they do not "in themselves furnish meaningful, determinant guides to action." Instead, "they tell communicators where to train their

attention and stimulate them to formulate concrete hypotheses about [how] the results obtained in the lab might be reproduced in the real-world setting in which they are working." In order to do this, field experiments need to be structured in such a way that effects can be measured and analyzed, Kahan argues.

To summarize this thesis thus far, it seems that there exists a strong consensus among social scientists that the Information Deficit Model is insufficient to communicate ACC science, risks, and potential solutions. Social scientists have instead proposed and tested strategies under an alternative model, the contextual model, featuring a variety of specific frames and messages that have been shown to have an intended persuading effect on their receivers. Communication researchers are now beginning to test these strategies in field experiments, as well as implement them in the real world. Not only is a consensus beginning to form around specific contextual model strategies, but a consensus on a methodology for identifying and testing these strategies seems to be emerging. Nisbet and Scheufele mention the emergence of a "growing international network of scholars and practitioners who are focused on science communication research and related applications." There remain disagreements about which specific frames and strategies are effective. Examples include whether informing members of the public that there is an overwhelming scientific consensus on ACC science works, and whether emphasizing the potential effects that ACC may have on extreme weather events and human health will do more good than harm. However, this growing network of scholars seems to agree that social context matters, and that scientific methods of inquiry are needed. And so it would seem, the public controversy over ACC has met its match: quality science. While it may take time, as scientific progress often does, and there may be conflict among researchers,

as there often is in science, there appears to be an emerging framework for how to diffuse the public controversy over ACC. With the causes of public controversy identified, and solutions in the works, the central task moves to implementing these new communication strategies in the real world. And again, the science of science communication is posed to take on this challenge. Or is it?

Part Two

Cultural, Media, and Political Challenges and Barriers to Implementation

Section two of this thesis explores the cultural, media, and political challenges that must be accounted for as communication researchers and professionals attempt to transfer their lab-based experimental findings to the real world. Using Moser and Dilling's "communication-social change link" as the focus, this section highlights ways in which the relationship between communication and social change may be different from the assumptions of communication researchers. These assumptions constitute what Roger Pielke Jr. has called the "linear model of science and decision making," in which a problem is identified by science, is then communicated to the public, and the public in turn puts pressure on policymakers, who enact the will of the people (Pielke Jr. 2003). These assumptions involve an idealistic idea of the how U.S. media outlets operate, as well as how American democracy works. This section will argue that several points in the communication-social change link are far more complicated than assumed, while others seem to be broken, featuring no such causal link. The social science research presented below, coming from a variety of disciplines, including sociology, media studies, economics, and political science, must be confronted by communication researchers as they seek to change public opinion on ACC science, risk perceptions, and motivation for action. In turn, they must also consider what role public motivation for action really plays in the enactment of meaningful policy action, and whether public opinion is the lever that researchers should be focusing their attention.

Cultural Challenges and Barriers

One of the main themes of this section is the fragmentation and polarization of both the U.S. media and political spheres. But it is important to first understand that these characterizations are also features of American society at large. While it remains up for debate whether these characterizations originate in the public and then transfer to the U.S. media and political worlds, or are endemic features of these environments, it is clear that the public's cultural fragmentation and polarization present several daunting challenges to communication campaigns.

In early 2014, the Pew Research Center conducted a nationally representative telephone survey of over 10,000 Americans and found a striking rise in political polarization among the American people in recent years (Pew Research Center 2014). According to Pew, the percentage of Americans who describe themselves as consistently conservative or consistently liberal doubled from ten percent in 1994 to 21 percent in 2014. In 2014, 92 percent of Republicans expressed views to the right of the median Democrat, compared to only 64 percent in 1994. For Democrats in 2014 that number is 94 percent, compared to 70 percent in 1994. The group in the middle, with mixed ideological views, shrunk from 49 percent in 1994 to 39 percent in 2014, meaning that ten percent of Americans have moved to the right or left in the last two decades. Perhaps most alarming, the survey found that party affiliates with a highly negative view of the opposing party had more than doubled since 1994, with Republicans who view the other party "very unfavorably" jumping from 17 percent in 1994 to 43 percent in 2014, and Democrats similarly moving from 16 percent to 38 percent. This facet includes a particular survey question that found 27 percent of Democrats and 36 percent of

Republicans believe the opposing party's policies are "so misguided that they threaten the nation's well-being."

This division does not limit itself to only political views, with both liberals and conservatives living in "ideological silos" or "echo chambers." According to Pew, "people with down-the-line ideological positions – especially conservatives – are more likely than others to say that most of their close friends share their political views." They continue: "Liberals and conservatives disagree over where they want to live, the kind of people they want to live around and even whom they would welcome into their families." According to their data, 63 percent of consistent conservatives and 49 percent of consistent liberals say that most of their close friends share their political views. Among those with mixed ideological views, only 25 percent say the same. Significant numbers of consistent conservatives (30 percent) and consistent liberals (23 percent) go as far as to say that they would be unhappy if an immediate family member married a member of the opposite party.

There are strong differences among these camps about some of the most basic questions regarding the type of society they want to live in. Seventy-six percent of liberals think it is important to have racial and ethnic diversity in their community compared to only 20 percent of conservatives. On the flip side, 57 percent of conservatives think it is important to live in a place where many people share their religious faith, compared to only 17 percent of liberal Americans. According to the report, "three-quarters of consistent conservatives prefer a community where 'the houses are larger and farther apart, but schools, stores, and restaurants are several miles away.'" The preferences of liberals are almost the complete opposite, "with 77 percent saying

they'd chose to live where 'the houses are smaller and closer to each other, but schools, stores, and restaurants are within walking distance.'" This particular piece of data helps to explain why climate and energy-related topics such as public transportation, specifically the building of light rail train lines, and making communities more bike-friendly by creating bike lanes on roads, have become so controversial. In addition, with the recent rise of Donald Trump and similar candidates in the 2016 Republican presidential primary election, it is surprising to learn that GOP (Grand Old Party, a nickname for the Republican Party) voters have actually moderated on social issues such as homosexuality and immigration, according to Pew. However, they write that "GOP thinking on issues related to government and the economy has veered sharply to the right." The Republican ideal of cutting taxes and shrinking both the size and power of government has gained resonance in recent years, another worrying sign for climate activists.

There does seem to be one thing that both sides agree on: compromise, or, to be more precise, not compromising. According to Pew, "an equitable deal is in the eye of the beholder, as both liberals and conservatives define the optimal political outcome as one in which their side gets more of what it wants." Fifty-seven percent of consistent conservatives say that an ideal agreement between President Obama and congressional Republicans is one in which GOP leaders hold out for more of their goals while 62 percent of consistent liberals favor terms closer to Obama's position than the GOP's.

While Pew admits that their data do show that a majority of Americans do not have uniformly conservative or liberal views, do not see either party as a threat to the nation, and still believe in compromise, they also found this majority group to be less

politically active. “Many of those in the center remain on the edges of the political playing field, relatively distant and disengaged, while the most ideologically oriented and politically rancorous Americans make their voices heard through greater participation in every stage of the political process,” the Pew report states. The more politically extreme your views are, the more likely you are to vote in primary elections, write letters to government officials, and volunteer for or donate to a campaign. The fact that those in the middle are more likely to stand on the sidelines gives partisan members of the public increased influence over the political process.

Media Challenges and Barriers

The U.S. media environment in which contextual model strategies for communicating the science and risks of, and solutions to, ACC pose several challenges for researchers and practitioners. For starters, the media environment, like the U.S. population at large, is highly fragmented and polarized. Many liberals consume only liberal-leaning media sources such as the *New York Time*s and *National Public Radio*, while many conservatives consume only conservative-leaning media sources such as *Fox News* and the *Rush Limbaugh Show*. And this polarization of media consumption habits appears to be increasing. Other trends in the U.S. media industry suggest both new opportunities and new challenges for strategic communication campaigns. The economic turmoil that has decimated revenues at major U.S. newspapers in recent years is placing a greater workload on the backs of fewer reporters. These economic troubles have also resulted in fewer specialist and investigative journalists with the expertise necessary to cover complex science and environmental topics such as ACC, and fewer sections and units devoted to these specialized topics. The rise of the internet, smartphones, social media, search engines, and blogs suggest several opportunities for better communication and engagement with the public, but these new technologies also have the potential to further fragment and polarize our society, as people have the freedom to choose only those media sources, and even Facebook "friends," with which they agree with on important topics.

These characterizations of and trends in the U.S. media environment suggest that field trials intended to move tested messages and frames from the lab into the real world will find it difficult to successfully implement their strategies at the scales they hope for.

Part of this is due to the media environment itself, but another factor that must be considered is how power flows through this important world. While the term "gatekeepers" is often used in a positive sense to describe the traditional role that major newspapers have played in filtering out factually incorrect information and news, the fragmented media environment of today gives media outlets new "gatekeeper" power in preventing unwanted information, messages, and frames from reaching their audience. The agenda-setting capabilities of media outlets has been well-documented in the academic literature, and several outlets seem to have clearly defined agendas when it comes to ACC — agendas that will be difficult to shift from the outside. The ownership and market-driven structure of the media industry also represent worrying trends related to how power flows through the media environment.

In a 2013 review article titled "Political economy, media, and climate change: sinews of modern life," Maxwell Boykoff and Tom Yulsman explore the role that ideological groups of individuals play in the shaping of news content and agendas (Boykoff & Yulsman 2013). "Media workers and institutions powerfully shape and negotiate meaning, influencing how citizens make sense of, and value, the world," they write. They cite a study by Anabela Carvalho which looked at U.K. media coverage of ACC from 1985 to 2001 and found that "the left-leaning *Guardian* and *Independent* provided more coverage to market regulation, the precautionary principle, and climate mitigation than their right-of-center counterpart *The Times*," while *The Times* "advocated business-as-usual, using the lack of definitive proof as justification for the continuation of [status quo] policies and practices." Boykoff and Yulsman also note cultural differences between nations on how they cover news: "the U.K. press itself is known for being more

adversarial, while the U.S. press has been seen to be more deferential to their sources." This could lend more power to "expert" sources in the U.S. who can frame issues and information in strategic ways. Leonard Doyle, an editor at *The Independent*, has called U.S. mass media outlets "too trusting," according to Boykoff and Yulsman. However, they note that the *Washington Post's* Michael Getler has argued that "European readers, in contrast to Americans, are much more accustomed to, and accepting of, newspapers with political leanings." In the United States, an expectation of impartiality and objectivity is often manipulated by outlets and readers alike.

Another Pew survey conducted as part of their 2014 year-long look at political polarization in the United States explored the public's media consumption habits, concluding: "there is little overlap in the news sources [liberals and conservatives] turn to and trust" (Mitchell et al 2014). Particularly fascinating was their finding that *Fox News* has carved out a virtual monopoly among consistent conservatives. According to Pew, consistent conservatives "are tightly clustered around a single news source, far more than any other group in the survey, with 47 percent citing *Fox News* as their main source for news about government and politics." While an impressive 88 percent of consistent conservatives trust F*ox News*, they are more distrustful than trustful of 24 out of the 36 news sources measured in the survey. No other source comes close to *Fox News*' domination among consistent conservatives, as "nearly half of consistent conservatives (47 percent) name it as their main source for government and political news, as do almost a third (31 percent) of those with mostly conservative views." Consistent liberals on the other hand are very distrustful of *Fox News* (81 percent), as well as Rush Limbaugh's radio show (75 percent).

The report also delved into the world of social media. On Facebook, consistent conservatives are "more likely than those in other ideological groups to hear political opinions that are in line with their own views," according to the report. However, consistent liberals "are more likely than those in other ideological groups to block or 'defriend' someone on a social network – as well as to end a personal friendship – because of politics." Nearly half (44 percent) of consistent liberals say they have blocked or unfriended someone on Facebook because they disagreed with something that person posted regarding politics. This compares with 31 percent of consistent conservatives and 26 percent of all Facebook users. The report found that conservatives are more likely to talk with those they disagree with than liberals.

The media polarization report also added weight to Pew's characterization of those with mixed ideological views as more politically disengaged and disinterested in politics. When they do follow politics, their main news sources include "*CNN*, local TV and *Fox News*, along with Yahoo News and Google News." This finding elicits two potential characterizations. First, it is possible that those in the middle are more likely to consume political media from television rather than text. Second, when they do consume text media, they access it through online news aggregators, which likely provide a more diverse ideological media diet than the individual outlets that more partisan individuals consume.

In their article, Boykoff and Yulsman explore how economic trends are affecting the media industry, especially science and environmental coverage. They found that "greater workloads and reductions in specialist science journalism," along with "digital innovations and new media organizational forms," have had meaningful effects on

science and environmental news coverage in the United States. The decline of the newspaper industry is the most notable trend, according to their research. “In the U.S., it has been estimated that approximately 25 percent of the news industry’s workforce has been cut since 2001,” they write. Boykoff and Yulsman note that newspaper revenue began to drop in 2006, well before the 2008 financial crisis and subsequent recession, “yet shockingly, profits at many large newspaper companies did not drop.” Even after the financial crisis, top media companies continued to turn a profit. In fact, their profits grew more than they had on average the previous two decades. Boykoff and Yulsman quote journalist Laura Frank, who argues that these companies accomplished this by “siphoning money from their newsroom budgets to pad profits, which many then leveraged to buy more properties.” Technological trends have also played a part in the industry’s decreasing revenue, according to the authors: “traditional news outlets now rely on aggregators such as Google and social media networks such as Facebook to bring them much of their audience — which means they must share a lot of the advertising revenue that once went exclusively to them.” In 2011, five technology companies accounted for 68 percent of all online ad revenue, according to their research. All of this begs the question, which Boykoff and Yulsman ask: “do contemporary news media have the capacity to cover the high-profile, high-stakes, and highly politicized issues of climate science and policy in nuanced ways that can enhance democratic processes through better public understanding?”

These structural changes have direct repercussions for coverage of ACC and related topics. “The number of newspapers that featured weekly science sections atrophied, losing nearly two-thirds in the past two decades,” write Boykoff and Yulsman.

According to a survey they cite, "even by 2008, only 8 percent of newspaper editors surveyed said their papers had dedicated more resources to covering science than 3 years prior, whereas 24 percent said resources dedicated to the topic had declined." The same survey found that "nearly 50 percent of newspaper editors considered coverage of science and technology to be 'nonessential.'" In another survey, of 493 science journalists in 2009 by *Nature*, "journalists found that many jobs in that field were being lost; yet, those who remained found that their workloads increased." Dedicated science sections were also taking a hit: "such sections were popular in U.S. newspapers in the 1980s, and their number peaked at 95 in 1989. By 2006, only 34 daily U.S. newspapers featured science sections … and those that did often had a concentration on health and lifestyle." According to Boykoff and Yulsman, declining readership and revenue trends hit the United States harder than other countries. Some notable examples include the *New York Times*, which disbanded its entire environment desk and shuttered its popular Green Blog in early 2013, and *CNN*, which slashed its entire science, technology, and environment reporting unit in 2008.

These economic trends point to a science and environmental media environment in which journalists are expected to do more with less. Boykoff and Yulsman quote investigative journalist Nick Davies: "where once we were active gatherers of news, we have become passive processors of second-hand material generated by the booming PR industry and a handful of wire agencies, most of which flows into our stories without being properly checked. The relentless impact of commercialisation has seen our journalism reduced to mere churnalism." They also quote the *Columbia Journalism Review's* Alissa Quart on the subject: "When journalists are generalists, they rely, often

uncritically, on outside experts for specialized things. They are famously able to immerse themselves in a fresh subject and report back. But they carry with them their ignorance of the area's debates and politics." Boykoff and Yulsman conclude their piece with these words: "individual journalists can (and often do!) heroically swim upstream to provide fair and accurate coverage of climate change, but they do so by paddling against a strong current of political economy, such as newsroom cuts. Suffice it to say, the evidence is that this paddling is tiring and ultimately unsustainable."

In his 2001 report "Echo Chambers: Bush v. Gore, Impeachment, and Beyond," Harvard legal scholar Cass Sunstein describes how our worldviews affect our media choices, and in turn how these media choices reinforce our worldviews (Sunstein 2001). He writes that "the increased power of individual choice allows people to sort themselves into innumerable homogenous groups, which often results in amplifying their preexisting views." He describes this media environment as a system of gated communities. "Having heard group members, you might move your stated position, simply to maintain a certain self-conception and reputation," he writes. In addition, these "echo chambers" create a "misunderstanding of what opponents actually do and think," resulting in stereotyped views of those on the other side of the issue. Sunstein concludes that in order to deal with these problems we will need to "create institutions, and a system of communications, that will ensure that deliberating groups will avoid the isolation and homogeneity that can lead them, by the laws of social interaction, to unjustifiably extreme positions."

Bringing technology into the fold, Sunstein writes that "although millions of people are using the Internet to expand their horizons, many people are doing the opposite, creating a *Daily Me* that is specifically tailored to their own interests and

prejudices." Sunstein contends that the internet makes it easier for like-minded people to engage with each other, resulting in a sort of "groupthink" where existing viewpoints are reinforced and thus made stronger, and also more extreme. This is due to what Sunstein calls a smaller "argument pool." If the people you are interacting with hold similar views to your own, you begin to see your viewpoint as vindicated. In addition, you are not exposed to other points of view which could challenge your existing viewpoint. Regarding the partisan division on whether or not President Bill Clinton should have been impeached, Sunstein argues that the mass media and the internet amplified the division: "on many outlets, people did hear 'both sides,' but in the form of intense disagreement between mutually suspicious advocates that was bound to produce, for most people, a stronger version of their antecedent views."

Boykoff and Yulsman also explore how the United States' market-driven media system affects coverage of science and environmental topics such as ACC. They quote Peter Dykstra, former head of *CNN*'s science and environment unit, who commented on this phenomenon in relation to what gets clicks online:

> I can tell you that it's not [climate scientist] Stephen Schneider or Pat Michaels [senior fellow at the conservative Cato Institute] … It's water skiing squirrels. It's Casey Anthony's trial. And it might be a good war story. But it's not science, it's not the environment. If web clicks are ruling the day and *Fox News* is your competition, it does not bode well for covering climate or environment on television.

Because media outlets in the United States operate similarly to other market-driven businesses, there exist economic pressures to give media consumers what they want, not necessarily what is in their best interest or the best interest of society as a whole. Demand for entertaining media amplifies so-called "journalistic norms," such as personalization,

dramatization, novelty, balance, and authority order, according to Boykoff and Yulsman. With news media coverage as the output, and events, issues, and information as the input, journalistic norms serve as part of the machine in between that shapes how the inputs become the final product. "Journalists often focus reporting on events, thereby underemphasizing these 'creeping' stories as well as the contexts within which they take place," Boykoff and Yulsman write of environmental issues such as ACC. They also quote Peter Weingart, who notes that "the media … tend to translate hypotheses into certainties."

Boykoff published a now well-known study in 2004 with his brother Jules Boykoff on how the journalistic norm of balance affects ACC coverage (Boykoff & Boykoff 2004). The study analyzed media stories about global warming from 1988 to 2002 and found that "balanced" articles — those that gave equal time to views representing the scientific consensus and views representing outlier perspectives, such as those who contend that the climate is not warming or that the warming is not due to human activity, represented more than half of all media stories on the subject. Only 35 percent of articles correctly highlighted the scientific consensus, with many still mentioning contrarian perspectives. Boykoff and Yulsman describe this norm as "he said/she said reporting, in which a reporter seeks out representatives of 'different sides' of an issue to provide a 'balanced' view." But it is their view that it is the journalist's job to determine the status of the scientific subject and report it accurately. "That takes sophisticated knowledge, not only of the subject matter but also of how science itself works," they write.

Boykoff and Yulsman argue that these demand-side, market-driven pressures have resulted in a news environment that is lacking in substantive content, especially television news: "In this way, seeking news on climate change through cable television is like filibustering one's analytical engagement with these critical issues, as the discourses put forward have obstructed — rather than delivered — productive, effective, and content-rich climate coverage." They also see the climate issue, and environmental issues in general, as lacking the compelling narrative and drama that more popular issues possess. The data bear out this point, as Boykoff and Yulsman cite a 2009 analysis which found that environmental issues in general, of which ACC is just one facet, make up only 1.5 percent of all news coverage in the United States. For newspapers it was 2.7 percent, radio 1.6 percent, network television news 1.3 percent, internet 1 percent, and cable T.V. 0.8 percent. "Relative to other issues like health, medicine, business, crime, and government, media attention to climate change remains a mere blip," they write. Overcoming these challenges requires more than a carefully crafted message; it requires grabbing and holding the attention of large sectors of the public, beating out other competitors for their attention. The efforts of many of the candidates currently running for president are testament to how difficult a task this can be.

Political Challenges and Barriers

In a 2015 book titled "The United States of Excess: Gluttony and the Dark Side of American Exceptionalism," Robert Paarlberg parallels ACC with the obesity epidemic in the United States as he explores why America stands out as an "over-consumer" of both food and fuel (Paarlberg 2015). He cites a 2011 Pew survey which asked citizens of several countries whether they favored "freedom to pursue life's goals without state interference" or "state guarantees that nobody is in need." In the United States, 58 percent chose the first option while 35 percent chose the second option. In Europe, the responses were almost the complete reverse. In the U.K., 38 percent chose the former while 55 percent chose the latter. At least 62 percent of citizens in Germany, France and Spain also favored the second option. *New York Times* journalist Roger Cohen, reviewing the book in a column titled "Incurable American Excess," writes of the United States:

> A resource rich, spacious nation, mistrustful of government authority, persuaded that responsibility is individual rather than collective, optimistic about the capacity of science and technology to resolve any problem, and living in a polarized political system paralyzed by its 'multiple veto points,' tends toward 'a scrambling form of adaptation' rather than 'effective mitigation' (Cohen, R. 2015).

According to Paarlberg, it is this faith in the power of innovation, the power of the free market, coupled with distrust of government, that hinders the United States' ability to deal responsibly with problems of overconsumption, he argues. Americans do not want measures where "voting-age adults are being coerced into a lifestyle change," he writes. This obsession with individual liberty leads to an environment where societal scale issues are viewed as individual-level responsibilities. Cohen writes that a majority of Americans do not want to increase taxes on fossil fuels "because they see such measures as a

regressive encroachment on individual freedoms — to drive an automobile and consume what you want." The logic seems to be that if you want to mitigate ACC, you should personally do something about it, such as driving a hybrid or electric vehicle instead of a sport utility vehicle, but do not force consumers to do anything. In the book, Paarlberg argues that this environment has resigned leaders to a focus on adaptation measures, a sort of Plan B. Paarlberg writes that it is "easier, and potentially more profitable, to develop drought-resistant farm crops or improve coastal protection systems than tackle global warming by cutting carbon emissions." He concludes that the world should not expect America to change. Instead, the United States is content "to protect itself, and itself alone."

In their book, "Merchants of Doubt," Oreskes and Conway argue that this market-driven path is not only ill-advised, it is both highly unlikely to work and structurally at odds with what we know about the process of innovation. They defer to David Hounshell, a historian of technology at Carnegie Mellon University, whose 2005 article "Regulation as the Mother of Innovation" explored what drives innovation in environmental control technology. He argues that due to the lack of immediate financial benefits, companies underinvest in research and development in general, with those related to negative externalities such as environmental benefits rarely receiving adequate funding. Oreskes and Conway write that "because pollution prevention is a public good — not well reflected in the market price of goods and services — the incentives for private investment are weak." There is no demand in the free market for such measures. However, when the government establishes a regulation, this creates demand and spurs companies to invest in such activities. Oreskes and Conway note that "regulation is not

the only possible government action. Governments can invest directly in R & D, provide tax credits and subsidies, or facilitate knowledge transfer." Another option is a tax, such as the carbon tax that has been proposed in the case of ACC. Oreskes and Conway write:

> Many economists prefer these alternatives to straight-out regulation, thinking they provide companies greater flexibility, increasing the likelihood that resources will be allocated in appropriate ways and the desired goals actually met. But Hounshell and his colleagues show that this presumption may be wrong. The empirical evidence shows that regulation may be more effective means, because clear and stringent regulation provides a strong and continuous stimulus for invention. Necessity is the mother of invention and regulatory compliance is a powerful form of necessity.

Whatever the measure, action on ACC will require some form of government intervention in the free market. If we agree that we should mitigate the risks of ACC, then we should debate how and what government actions we should take. But sitting back and leaving it to the free market is simply not a realistic option.

This logic has spurred new communication-social change link strategies that have nothing to do with ACC. One example is shifting the goal of communication strategies to that of building public support for specific solutions for mitigating ACC risks, such as power plant regulations. This is pursued by framing power plant regulations as good for human health, due to their impact on air pollution, instead of focusing on the benefits to ACC mitigation. Roger Pielke Jr. refers to such strategies as "opaque" (Pielke Jr. 2010). While focusing on the solutions to ACC instead of the problems certainly has several advantages, it also highlights some of the political hurdles that policies to address ACC must overcome. The political science literature, as well as some ambitious investigative journalism, reveals a host of challenges for communication researchers and practitioners

who envision their efforts serving as catalysts for meaningful progress in the policy arena.

Before exploring the more controversial problems with the prevailing myth of a linear model of democratic policymaking in the United States, there is a much more obvious challenge: the bureaucratic structure of the U.S. political system. In what is known as a "status quo bias," the U.S. political system was intentionally designed to resist quick changes that could be hastily ushered in by a new majority coalition. Instead, the system is structured in such a way as to require far greater than a simple majority in order to achieve policy change, with several "veto points" in which key players and minority coalitions can disrupt the process. There is of course the president's veto power, which requires a two-thirds majority vote in both the House and the Senate in order to override. In addition, the need for legislation to pass through both houses of congress and the president's desk makes it more difficult for proposed legislation to become law. Then there is the third branch, the judicial system, which oversees the other two branches, making sure that their activity is in line with the constitution and other existing laws.

Several components of this system of checks and balances have both helped and hindered advocates of policy action on ACC in recent years. With a Democratic president, recent bills passed by the Republican majority in the House and Senate to force through approval of the Keystone XL pipeline and block funding of commitments related to the 2015 Paris climate accord have met their fate thanks to the president's veto threat. But looking back at the infamous cap and trade bill that was passed by the Democratic majority in the House in 2008 presents a clear example of the difficulty of passing legislation even with a majority in the House and the Senate, and a Democratic president.

In this case, the bill passed by the House moved to the Senate, but without a filibuster-proof 60-vote "supermajority," the Senate could not avoid the threat by the minority Republicans to filibuster the bill. Thus the bill never even made it to the president's desk. Instead, the Obama administration has sought to use the power of the executive branch to regulate carbon emissions from power plants under the power of existing legislation. This strategy appears to be withstanding attempts by Republicans in the House and Senate, as well as Republican-controlled state governments, to block its implementation, but it still faces one last test by the judicial system as the coal industry and its allies in state and national politics sue. Worth mentioning is the fact that none of these provisions are set in stone, and could be undone by the election of a Republican president in 2016. This includes aspects of the Paris climate deal, which the Obama administration has verbally committed the United States to despite Republican opposition in the House and Senate.

There are also other elements of the U.S. political structure which have posed problems for ACC-related legislation. First, the U.S. Senate is not as representative a body as the House. Each state gets two senators regardless of the number of citizens living in the state. So a state such as Wyoming, with a very small population, has the same representation in the Senate as a state such as California, which has a much larger population. This is particularly noteworthy on the climate issue as low population states such as Wyoming, North Dakota, Montana, Oklahoma, Kentucky, and others have strong economic ties to the extraction of carbon-based energy sources, such as coal, oil, and natural gas. In 2012, despite losing the presidential election by a significant margin, Republican candidate Mitt Romney still carried 24 states representing 48 senators. While Democrats have had some success in Senate elections in these states in recent years, it

appears to be an up-hill battle, with the structure of the senate favoring Republican control, as it is today.

In the House, geographic and demographic factors also appear to favor Republicans. Because Democratic voters tend to be more concentrated around large metropolitan areas while Republican voters are more spread out, the House often features a few heavily Democratic districts in which Democrats consistently win, and more mixed suburban and rural districts which Republicans more often win. While far more representative than the Senate, the House also does not have perfect representation. Each state is guaranteed at least one representative in the House, which means low population states such as Wyoming have only one representative, and high populations states such as California have far more. While Wyoming's population is just over 550,000 with one representative in the House, there are over 700,000 people per congressional representative in California.

This is all without even taking into account the controversial practice of "gerrymandering." Every ten years state legislators are allowed to draw the national congressional district lines for the state. While there are rules within which they must operate, the process often involves strategic drawing of districts in order to amplify or diminish the aforementioned geographical and demographic factors that benefit or hinder each party. In 2010, Republicans swept to power in many state capitals, and they used this power to gerrymander congressional districts in several states that have benefited Republicans in subsequent elections. These districts will not be redrawn again until 2020, giving Republicans an advantage in several states for the foreseeable future.

In 2014, Pew summarized research from political scientists Keith Poole and Howard Rosenthal documenting congressional polarization over time (Desilver 2014). After decades of relatively little polarization, the two parties began pulling apart in the mid-1970s, according to their data. Pew quotes Poole and Rosenthal, who argue that "Congress is now more polarized than at any time since the end of Reconstruction," a little more than a decade after the end of the Civil War. In the past, regional distinctions, such as the split within the Democratic party between northern and southern representatives in the 1950s and 1960s on the issue of civil rights, were common. Today, political ideology accounts for "about 93 percent of roll call voting choices in the 113th House and Senate," according to Poole and Rosenthal. Writing in 1984, the researchers argued that "there is now competition between equally balanced but extreme support coalitions throughout most of the United States" (Poole & Rosenthal 1984). This polarization has only increased since then, and can be attributed in large part to the disappearance of moderate-to-liberal Republicans, mainly in the Northeast, and conservative Democrats, primarily in the South. While Democrats have certainly moved to the left, the Republican shift to the right has been significantly greater, according to their data (Polarized American/voteview.com 2015). House Republicans have been steadily moving farther right since Democratic President Jimmy Carter was elected in 1976. Based on Poole and Rosenthal's metric, the period from the mid-1990s to today is the most conservative that House Republicans have ever been. A similar trend is apparent in the Senate, however Senate Republicans' rightward shift accelerated beginning in 2006, when Democrats gained control of the House and the Senate.

It has been argued that congressional polarization is hindering the policymaking process, with the 113th congress (2013-2014) clocking in as the least productive group of lawmakers, measured in laws enacted during the first year of their two-year term, going back at least two decades (Desilver 2013). According to Pew, this group enacted only 55 pieces of "substantive" legislation. This compares to previous congressional productivity of 144 "substantive" laws enacted in 2003-2004, and 130 in 1997-1998. Whether the American public's polarization on political issues led to polarization among elected officials or the reverse is still being debated. While the former seems the more likely relationship, it is worth considering that political tactics by one or both of the parties have contributed to public views.

In their 2012 book "It's Even Worse Than It Looks: How the American Constitutional System Collided With the New Politics of Extremism," Thomas Mann and Norman Ornstein argue that the modern Republican party is unique in its radical views and extreme political strategies (Mann & Ornstein 2012). While Mann is a senior fellow at the Brookings Institution, a nonpartisan think tank, Ornstein is a resident scholar at the conservative American Enterprise Institute. "The GOP has become an insurgent outlier in American politics. It is ideologically extreme; scornful of compromise; unmoved by conventional understanding of facts, evidence and science; and dismissive of the legitimacy of its political opposition," they write. Mann and Ornstein argue that the reason the Republican party has shifted so far to the right is due to a confluence of factors. First, the realignment of the south in which southern Democrats virtually disappeared. Second, the mobilization of social conservatives after the 1973 Roe v. Wade decision ensuring access to legal abortion. Third, the anti-tax movement that was

launched in 1978 by California's Proposition 13. And lastly, the rise of conservative talk radio after a congressional pay raise in 1989, and the emergence of *Fox News* and right-wing blogs. "But the real move to the bedrock right starts with two names: Newt Gingrich and Grover Norquist," write Mann and Ornstein. Gingrich became the House majority leader in 1995, after the 1994 "Republican Revolution" election in which Republicans took control of the House and Senate. Mann and Ornstein argue that Gingrich's strategy to create a Republican majority in the House was based on "convincing voters that the institution was so corrupt that anyone would be better than the incumbents, especially those in the Democratic majority." He did this "by bringing ethics charges against Democratic leaders; provoking them into overreactions that enraged Republicans and united them to vote against Democratic initiatives; exploiting scandals to create even more public disgust with politicians; and then recruiting GOP candidates around the country to run against Washington, Democrats and Congress." Norquist founded the group Americans for Tax Reform (ATR) in 1985 and created the Taxpayer Protection Pledge the following year. Writing in 2012, Mann and Ornstein note that "the pledge, which binds its signers to never support a tax increase (that includes closing tax loopholes), had been signed as of last year by 238 of the 242 House Republicans and 41 of the 47 GOP senators, according to ATR." This dogmatic approach to policymaking shuns the very idea of compromise, leading to gridlock, they argue. "For Republicans concerned about a primary challenge from the right, the failure to sign such pledges is simply too risky," write Mann and Ornstein.

The authors also highlight recent unusual political maneuvers, such as efforts to repeal previously passed legislation (for example, the Affordable Care Act, also known as

"Obamacare"), abuse of the filibuster and the confirmation process (for example, blocking any and every nominee to head the Consumer Financial Protection Bureau in order to prevent it from beginning operations), and refusal to raise the debt ceiling (which resulted in a government shutdown and the first credit downgrade in U.S. history). Mann and Ornstein quote former Republican Senator and Defense Secretary Chuck Hagel: "I think the Republican Party is captive to political movements that are very ideological, that are very narrow … I've never seen so much intolerance as I see today in American politics." They also quote Mike Lofgren, a veteran Republican congressional staffer: "the Republican Party is becoming less and less like a traditional political party in a representative democracy and becoming more like an apocalyptic cult, or one of the intensely ideological authoritarian parties of 20th century Europe."

In addition to the U.S. political system's structural challenges, some of which were intentionally built into the system, there are also more controversial issues which suggest that even the previously described flawed democratic system is not as representative as is commonly believed. A 2014 study titled "Testing theories of American politics: Elites, interest groups, and average citizens," by Martin Gilens, a professor of politics at Princeton University, and Benjamin Page, a professor of decision making at Northwestern University, sheds some light on the essential question of whether the U.S. political system is in fact a representative democracy (Gilens & Page 2014). Gilens and Page begin by describing four theoretical traditions in the study of American politics: Majoritarian Electoral Democracy, Economic-Elite Domination, Majoritarian Pluralism, and Biased Pluralism. The first, Majoritarian Electoral Democracy, is what we traditionally think of as American democracy, a system which attributes government

policies "chiefly to the collective will of average citizens, who are seen as empowered by democratic elections." The main "actor" in such a system is the average citizen or "median voter," as they define it. Economic-Elite Domination is a system where "U.S. policy making is dominated by individuals who have substantial economic resources, i.e., high levels of income or wealth." The other two, Majoritarian Pluralism and Biased Pluralism, are types of interest group pluralism; the former being democratic, with "Mass-based Interest Groups" representing the will of the people, and the latter being undemocratic, representing "Business-oriented Interest Groups or industries." In a governing system of Majoritarian Pluralism, "the wants or needs of the average citizen tend to be reasonably well served by the outcomes of interest-group struggle," whereas a system of Biased Pluralism consists of "struggles among an unrepresentative universe of interest groups." With this study, Gilens and Page sought to determine which of these four theoretical traditions best matched up with reality and which did not. Their conclusions are clear, and sobering: "the results provide substantial support for theories of Economic-Elite Domination and for theories of Biased Pluralism, but not for theories of Majoritarian Electoral Democracy or Majoritarian Pluralism."

Not only did Gilens and Page find that economic elites have outsize influence compared to the average voter, they concluded that these individuals have "a quite substantial, highly significant, independent impact on policy" while ordinary citizens have "little or no independent influence on policy at all." They continue: "when the preferences of economic elites and the stands of organized interest groups are controlled for, the preferences of the average American appear to have only a minuscule, near-zero, statistically non-significant impact upon public policy." While the authors concede that

their results suggest that a pure theory of Economic-Elite Domination is not quite accurate, as economic elites have to share power with organized interest groups, they do point out that their findings "probably understate the political influence of elites." This is because they defined economic elites as Americans at or above the 90th income percentile. It is plausible, they concede, that their methodology only captures the political influence of the top one percent or even the top one-tenth of one percent of wealth-holders. Further, by using annual income as a measurement for wealth, other forms of wealth accumulation, such as inheritance, are unaccounted for. They also note that business and industry-associated interest groups dominate political spending and lobbying among such groups. Their takeaway message is clear: "if policymaking is dominated by powerful business organizations and a small number of affluent Americans, then America's claims to being a democratic society are seriously threatened." The implications for ACC policy action are distressing. Gilens and Page write that "when a majority of citizens disagrees with economic elites or with organized interests, they generally lose."

One ream of hope found in their study is that the outsize influence of economic elites does not necessarily mean that the general public always loses. "Policy making is not necessarily a zero-sum game among these actors. When one set of actors wins, others may win as well," they write. In fact, they found that "the preferences of average citizens are positively and fairly highly correlated, across issues, with the preferences of economic elites." However, they also found that "the issues about which economic elites and ordinary citizens disagree reflect important matters, including many aspects of trade restrictions, tax policy, corporate regulation, abortion, and school prayer, so that the

resulting political losses by ordinary citizens are not trivial." It would seem that tax policy and corporate regulation are issues of tremendous importance if ACC policies are going to have a meaningful impact, with the assumption being that elites are opposed to higher taxes and greater regulation of corporations.

But we need not rely on this assumption, thanks to a 2013 study led by Benjamin Page titled "Democracy and the policy preferences of wealthy Americans" (Page et al 2013). In it, the researchers surveyed the policy preferences of a sample of individuals in the top one percent of the income distribution, and compared their views to a nationally representative sample. (It is worth noting, however, that the average annual income of members in their top one percent of income earners sample was $10 million, suggesting that most, if not all, members of the sample were not "super wealthy" of the likes of well-known figures such as Sheldon Adelson, Bill Gates, Tom Steyer, Charles and David Koch, Donald Trump, and others who command assets in the billions of dollars. The use of a methodology that relies on income data instead of wealth data is also important, as accumulated assets, including inheritance, are not factored in. Income data are often used in these studies because it is more readily available, while wealth data are often not available at all — an important concern for those who study the power of wealth in society.)

The researchers found these wealthy individuals to be "extremely active politically" and "much more conservative than the American public as a whole with respect to important policies concerning taxation, economic regulation, and especially social welfare programs." They also asked about climate change, finding that only 16 percent thought climate change was a "very important" problem, the lowest figure of the

ten topics on which they asked this question. To put this figure in context, one of the other nine topics was "energy supply," which 70 percent of respondents said was a "very important" problem, while the highest, "budget deficits," clocked in at 87 percent. When asked whether spending on various federal government programs should be "expanded," "cut back," or "kept the same," the group favored cutting back rather than expanding spending on "environmental protection" by eight percent. This contrasts with the general public, who favored expanding spending on environmental protection over cutting back by 29 percentage points, for a net difference of 37 percentage points between elite and public opinion on the issue. Five percent more wealthy individuals in the sample favored greater regulation of the oil industry, but this contrasts with a 50 percentage point margin among the general public, suggesting far less enthusiasm among the wealthy for greater regulation of the oil industry. Sixty-nine percent of wealthy respondents agreed that "the federal government has gone too far in regulating business and interfering with the free enterprise system." Perhaps just as concerning for ACC policy proponents, 65 percent of the general public agreed. However, 71 percent of the general public agreed that "the government has an essential role to play in regulating the market" compared to only 55 percent of wealthy respondents. Lastly, the researchers found that "variation within this wealthy group suggests that the top one-tenth of 1 percent of wealthholders (people with $40 million or more in net worth) may tend to hold still more conservative views that are even more distinct from those of the general public." However, it is worth noting that the economic elites in their sample favored increasing spending for "improving public infrastructure such as highways, bridges, and airports" by a 50 point margin, six percentage points greater than the general public. The wealthy individuals surveyed also

favored increasing spending on "scientific research" by a wide margin, 18 percentage points greater than the general public.

Gilens and Page reference work by Jeffrey Winters, whose research suggests that the United States could very well be categorized as an oligarchy — a country, organization, or institution which is controlled by a small group of people. Winters contends that a small group of extremely wealthy individuals dominates U.S. government policy, especially those related to issues of wealth and income protection. He even makes the case that this power structure could be described as a "civil oligarchy" due to the seeming willingness of large sectors of the public to support such elite-friendly economic policies. In a 2009 study, Winters and Benjamin Page write that "a very small group of the wealthiest (perhaps the top tenth of 1 percent) may have sufficient power to dominate policy in certain key areas" (Winters & Page 2009). That this elite group could be as small as 0.1 percent of the U.S. population is striking, particularly with the recent political and activist rhetoric focused on the top one percent of Americans. "A brief review of the literature suggests possible mechanisms by which such influence could occur, through lobbying, the electoral process, opinion shaping, and the U.S. Constitution itself," they write. "Vilifying candidates who might threaten oligarchs, sowing distrust of government, changing the subject (e.g., promoting 'values' rather than economic policies), and obfuscating the merits of proposals seen as dangerous" were just some of the strategies that the researchers suggested have been used successfully to influence public opinion. The role of the mass media is also not to be discounted: "oligarchs could orchestrate information campaigns through advertising and through friendly or subsidized communicators." One quickly thinks of the *Fox News Channel* and similar conservative

media outlets when "friendly" communicators are mentioned. The piece also references work by political scientists showing "how 'crafted talk' by politicians (themselves likely influenced by special interests), and information campaigns by the interests themselves, can mislead citizens about what the politicians are doing and about what sorts of policies would actually benefit the citizenry."

Despite this compelling argument, it is important to remember that the reproduction of elite power is not easy to maintain, but involves a substantial degree of effort on the part of elites, write Winters and Page:

> Any opinion shaping on behalf of a U.S. oligarchy is more likely to operate in a much more slow, subtle, and hard-to-pin-down fashion, involving long-term influences through the policy planning apparatus noted above (foundations, think tanks, helpful scholars, and commentators); the increasingly concentrated and corporate-owned mass media, few of which have much sympathy with egalitarian economic notions; and the U.S. education system.

They continue:

> It is very difficult to gather definitive evidence concerning the presence or absence of such long-term persuasive effects, but it seems possible that Americans' apparent reluctance to seek any major redistribution of wealth, and their pervasive distrust of government, may reflect oligarchic influence on opinion. Anti-redistributive attitudes by ordinary citizens could constitute a major element in a stable oligarchy-mass settlement.

Understanding how power manifests itself in the United States is an important part of understanding why policy proposals to address ACC have not come to fruition, and why increasing public support may not be enough to turn the tide. Gilens and Page cite American sociologist and social critic C. Wright Mills in their analysis for "lending theoretical weight to their data-based conclusion." Mills is perhaps best known for his book "The Power Elite," published in 1956 (Mills 1956). In it he describes mid-twentieth

century America as a society governed by a small group of individuals presiding over a triangle of political, economic, and military institutions, with citizens holding little, if any, power. Gilens and Page write that the book "offers a rather nuanced account of how U.S. social, economic, political, and military elites have historically alternated in different configurations of dominance." This trend of increasing power in the hands of a decreasing pool of elites is an important component of Mills' work, and is looked upon as prescient by those who observe similar trends in American society today. However, Mills is not attempting to predict the future in "The Power Elite." Instead, he is describing the world he lived in: the first half of the twentieth century. This is particularly noteworthy because the period beginning at the end of World War II and ending in the 1970s is regarded by many economists as the "glory days" of middle class economic prosperity in America. In addition, the period before this consisted of two world wars and the Great Depression, all of which are widely believed to have substantially weakened the wealth and power of America's richest citizens. Mills sees the power elite as increasingly enabled by America's growth in the world power structure, both economically and politically: "That the facilities of power are so enormously enlarged and so decisively centralized surely means that the powers of quite small groups of men, which we may call elites, are now of literally inhumane consequences." These trends have only intensified since Mills wrote these words over half a century ago.

Mills describes the power elite as a class of individuals and families separate from, and above, the rest of society. He writes: "in so far as the power elite is composed of men of similar origin and education, of similar career and style of life, their unity may be said to rest upon the fact that they are of a similar social type." This social cohesion

makes it easier for the elite class to coordinate and remain unified, especially compared to the large, fragmented, and quarrelsome public. “The top of modern American society is increasingly unified, and often seems wilfully coordinated: at the top there has emerged an elite whose power probably exceeds that of any small group of men in world history,” writes Mills. What makes Gilens and Page’s analysis so important is its empiricism; it backs up the careful argument of Mills with data. It was over 50 years ago that Mills wrote that our idealistic vision of American democracy was a farce: “We must now recognize this description as more a fairy tale than a useful approximation” and “the issues that now shape man’s fate are neither raised nor decided by any public at large.” But we did not heed his warning, and continue to ignore even the scientific analysis of Gilens and Page. Why?

Unsurprisingly, Mills sought to answer this question as well. He argues that it is not necessarily that the public does not have any power, it is that they do not exercise it, or at least not in their interests. “Authority *formally* resides ‘in the people,’” he writes. But their power is coerced, manipulated by the small group of powerful elites. And where there are small groups of people with power, but no authority, manipulation is the method of choice. Mills writes that “small circles of men are making decisions which they need to have at least authorized by indifferent or recalcitrant people over whom they do not exercise explicit authority. So the small circle tries to manipulate these people into willing acceptance or cheerful support of their decisions or opinions — or at least to the rejection of possible counter-opinions.” And as power has become more and more concentrated, the power to manipulate the public has grown: “with the increased means of mass persuasion that are available, the public of public opinion has become the object

of intensive efforts to control, manage, manipulate, and increasingly intimidate." He writes that "such influence that they [the public] do have is guided; they must now be seen not as public acting autonomously, but as masses manipulated at focal points into crowds of demonstrators." Central to this scheme is creating the illusion of power in the people: "the standard strategy of manipulation is to make it appear that the people, or at least a large group of them, 'really made the decision.'" This involves keeping the power of the elite, and their mechanisms of manipulation, secret: "the powerful seek to rule without showing their powerfulness. They want to rule, as it were, secretly, without publicized legitimation."

Gilens and Page also reference William Domhoff for his work showing "how elites (working through foundations, think-tanks, and an 'opinion-shaping apparatus,' as well as through the lobbyists and politicians they finance) may dominate key issues in U.S. policymaking despite the existence of democratic elections." Domhoff is most well-known for his book "Who Rules America? The Triumph of the Corporate Rich," first published in 1967 (Domhoff 1967). In the book, he uses the "sociology of leadership" method to study power in America. This method examines "the social backgrounds of the men who control institutions and make decisions" in order to gain insights into how individuals gain, hold, and exercise their power.

Similar to Mills, Domhoff argues that the governing class is surprisingly homogenous, constituting a social class. They tend to be similar in income, education, and occupation, and rarely marry or socialize outside of their class. The role that wealth plays in the power of this governing class is central to Domhoff's analysis. He writes that "a governing class is a social upper class which receives a disproportionate amount of a

country's income, owns a disproportionate amount of a country's wealth, and contributes a disproportionate number of its members to the controlling institutions and key decision-making groups in that country." The corporate rich maintain their hold on power through a variety of dynamic processes, but their ability to protect and enlarge their material wealth through political means is a central component. "Members of the upper class and their corporations benefit most from the tax structure and tax loopholes, large businesses receive most of the subsidies, welfare spending has dropped from $30 per citizen in 1939 when it made up 44 per cent of the budget to $16 per citizen in 1963 when it made up 7 per cent of the budget," he writes, with eerie parallels to today's political debates.

In a section of the book titled "Why businessmen complain," Domhoff writes that the American revolution created a unique mood in the United States that persists today: "this long and bitter struggle created an anti-government ideology, especially against a strong central government." He writes that "this hostility has remained one of the most prominent features of American thought, if not of American practice." Writing to the section's title, he adds: "in short, there are historical and ideological reasons why businessmen would verbalize hostility toward the federal government." While "most businessmen are not part of the group that controls the government," Domhoff argues that "there are good reasons why businessmen well aware of their power would pretend that they did not control the government." By maintaining the illusion that they are at odds with government, they help to maintain their power. "Attacks upon government in general place continuing pressure on governmental officers to accommodate their activities to the groups from which support is most reliable," he writes. While Domhoff notes that politicians and generals gained greater power in Mills' triangle thanks to the

Great Depression, World War I, and World War II, the corporate rich seemed to be tilting the balance of power back in their favor as of his 1967 publishing of the book. He concludes:

> The income, wealth, and institutional leadership of what Baltzell calls the 'American business aristocracy' are more than sufficient to earn it the designation 'governing class.' As Sweezy would say, this 'ruling class' is based upon the national corporate economy and the institutions that economy nourishes. It manifests itself through what the late C. Wright Mills called the power elite.

Domhoff admits that "there may or may not be more than one 'ruling clique' within the 'governing class.'" He uses the example of the New Deal to display this point. "The New Deal created a split within the power elite which has not yet healed," writes Domhoff. He argues that "liberal elements of the American upper class" were responsible for the New Deal's implementation, and that "many members of the upper class remain unreconciled to the New Deal, believing that aristocrat Franklin Roosevelt … was a traitor to his class who was part of an international Communist-Jewish conspiracy." So while it is possible to point out examples of liberal elites today, for example Bill Gates, Mark Zuckerberg, and Tom Steyer, Domhoff argues that this does little to change the upper class as a whole. Social classes, according to Domhoff, are "relatively static in their values and attitudes," as Page's survey results seem to confirm.

One important point that Domhoff highlights in his book is that it is not necessary for elites to always win for this group to be considered a ruling class. It is possible, and quite likely, that members of the upper class have had to make concessions in the past in order to maintain power. He writes that "a very wealthy class that makes concessions remains a wealthy upper class." He also admits that there are "restraints on the power of

the governing class," and adds that "members of the power elite often try to anticipate the reactions of other groups when they make decisions." Domhoff notes that "the potential power of angry, organized masses is well known in twentieth-century America thanks to foreign revolutions, the battle over women's suffrage, labor strikes, and the civil rights movement." This form of mass social movement seems to Domhoff to be the only kryptonite of the elite power structure.

Recent research by prominent political scientists has shown that Republican and Democratic party elites have exerted a surprising amount of influence on their party's presidential nomination processes in recent decades. In 2008 a group of political scientists published a highly regarded book titled "The Party Decides: Presidential Nominations Before and After Reform" that found that money, media attention, and poll numbers were not nearly as predictive as endorsements by party elites. (Cohen, M. et al 2008). According to *New York Times* journalist Nate Cohn, the term "party elites" is "a broadly defined category of nearly anyone who has the power to sway public opinion with money, skills or media reach" (Cohn 2015). "It includes party officials, politicians, political operatives, donors, activists, television pundits and radio hosts." In what has become known as the "invisible primary," political scientists and journalists have begun tracking endorsements by sitting politicians in addition to other factors such as the ammount of money raised and polling data. The basic premise of the term is that this "invisible primary" is not democratic at all. Instead, it involves impressing a small pool of wealthy and/or powerful individuals within the power structure of one of the two parties.

A 2015 report by the *New York Times* sought to peel back the curtain on the modern process of how wealth influences politics (Confessore et al 2015). They found that less than 400 families account for almost half of all money raised to support Democratic and Republican presidential candidates in their bids for the 2016 presidential election. To put this number in perspective, there are 120 million families in the United States, according to the report. Each of these elite families has already given more than $100,000, while an even smaller group, "just 158 families, along with companies they own or control, contributed $176 million in the first phase of the campaign." These 158 families have already given more than $250,000 each. The report found:

> Regardless of industry, the families investing the most in presidential politics overwhelmingly lean right, contributing tens of millions of dollars to support Republican candidates who have pledged to pare regulations; cut taxes on income, capital gains and inheritances; and shrink entitlement programs.

Of the 158 top donating families, 138 donated to Republican candidates, while only 20 donated to Democratic candidates. However, one caveat could be that the Democrats seem lined up behind an obvious front-runner, Hillary Clinton, while the Republican field is in disarray. This could suggest that liberal mega-donors are waiting to spend their money in the general election. Nevertheless, these findings also match Page's survey results of America's wealthy class.

These mega-donors and their families have much in common, according to the report. "They are overwhelmingly white, rich, older and male," the journalists write, and they overwhelmingly reside in upscale neighborhoods in a handful of U.S. cities. "Most of the families are clustered around just nine cities," they write. "Many are neighbors, living near one another in neighborhoods like Bel Air and Brentwood in Los Angeles;

River Oaks, a Houston community popular with energy executives; or Indian Creek Village, a private island near Miami that has a private security force and just 35 homes lining an 18-hole golf course." One neighborhood in Dallas already accounts for nearly $13 million in donations, much of which went to Jeb Bush's campaign. The degree to which these individuals attempt to shield their political activity from the public is reminiscent of Mills' rhetoric on the secrecy of the power elite:

> Like most of the ultrawealthy, the new donor elite is deeply private. Very few of those contacted were willing to speak about their contributions or their political views. Many donations were made from business addresses or post office boxes, or wound through limited liability corporations or trusts, exploiting the new avenues opened up by Citizens United, which gave corporate entities far more leeway to spend money on behalf of candidates. Some contributors, for reasons of privacy or tax planning, are not listed as the owners of the homes where they live, further obscuring the family and social ties that bind them.

The piece concludes that this group of donors seems to represent "a class apart, distant from much of America while geographically, socially and economically intermingling among themselves."

Perhaps most pertinent to the climate issue, the report notes that "in an economy that has minted billionaires in a dizzying array of industries, most made their fortunes in just two: finance and energy." In fact, the two industries accounted for over half of the money contributed by the top 158 families. In addition to the potential for energy money to be dolled out with favors in mind which could hinder political action on ACC, it is also worth noting that those who make their fortunes in the finance and energy industries are most likely risk-takers. This falls in line with polling showing that the richest Americans are more willing to accept risks, such as ACC, than the general public. The journalists write that "most built their own businesses, parlaying talent and an appetite for risk into

huge wealth." The piece quotes Doug Deason, a Dallas investor whose family donated $5 million to Texas Governor Rick Perry's presidential bid before he dropped out: "It's a lot of families around the country who are self-made who feel like over-regulation puts these burdens on smaller companies." This statement also falls in line with Page's survey results, suggesting that the wealthiest Americans are very sensitive to regulation of industry, a glaring problem for proponents of policy action on ACC.

According to the report, the donations coming from the energy sector are primarily related to the oil and gas industry. In a related article, the *New York Times* highlights the role that the fracking boom has played in the United States. "The great American energy boom of the last decade has produced a wave of new billionaires and multimillionaires … Now they are throwing tens of millions of dollars into the presidential campaign, with the biggest checks going almost exclusively to Republicans and their 'super PACs,'" they write (Lichtblau & Confessore 2015). That the Republican party has become the party of fossil fuel industry interests is no secret. Members of the Hunt family of Hunt Oil, one of the largest privately held oil companies in the United States, have contributed significant sums from their partially-inherited fortune to Republican candidates, according to the article. Ray Lee Hunt and his wife have donated more than $2 million to Jeb Bush's campaign. The top donating family thus far, the Wilks, have already shelled out $15 million. They earned their billions in the fracking boom. Kelcy Warren, from Dallas, is the fourth largest donor so far. He earned his fortune as chief executive of an energy company. The report notes that these donations seem to be pushing for two specific things: allowing the export of crude oil, and approval of the Keystone XL pipeline. These demands represent a somber reminder that in the

current political environment, there is no need for donations aimed at blocking ACC legislation — such policies are considered dead on arrival in congress.

The rise and scope of Political Action Committees (PACs) and 501(c)(4) organizations have become worrying additions in recent years to trends suggesting increasing economic elite and corporate influence on politics. So-called "super PACs," which have garnered much interest from journalists and the public in recent years, were made possible by two judicial decisions. First, in January 2010, the Supreme Court ruled in Citizens United v. Federal Election Commission that the government may not prohibit corporations from making "independent expenditures" for political purposes, overturning sections of the Campaign Reform Act of 2002, also known as the McCain-Feingold Act. This means that although corporations are still prohibited from donating directly to candidates' campaigns, they can form or donate to independent organizations, such as PACs and super PACs, that participate in political campaigns, often in support of specific candidates. Two months after the Citizens United decision, the Federal Court of Appeals for the D.C. Circuit ruled that such contributions could not be limited in size or source in Speechnow.org v. FEC. And so, the super PAC was born. Unlike other PACs, super PACs have no legal limits to the amount of funds they can raise from individuals, corporations, unions and other groups. Basically, these decisions made it explicitly legal for corporations and other groups to use funds from their general treasuries to donate to political campaign efforts.

According to the Center for Responsive Politics, super PACs are often funded by small numbers of extremely wealthy individuals (Center for Responsive Politics 2015a). During the 2012 election, the center found that 60 percent of the money that went to the

797 super PACs (more than $349 million as of the date of the report) had come from just 100 donors. And their influence on campaigns appears to be substantial. According to a recent report on the 2016 election cycle, "super PACs have sponsored 81 percent of the TV ads in the GOP presidential primaries, up about 71 percent over 2011 and a 12,000 percent jump over 2007" (Center for Responsive Politics 2015b). Writing in *The Nation* in 2015, Democratic Rhode Island Senator Sheldon Whitehouse argues that super PACs have given Republicans and their corporate and wealthy donors an unfair advantage (Whitehouse 2015). He writes:

> Super PACs and other nonprofit organizations spent upward of $390 million in the 2012 presidential election supporting Republicans or attacking President Obama, compared with $164 million in spending by groups supporting Democrats. And so far in this election cycle, PACs and super PACs supporting Republicans have raised 93 percent of all outside donations.

Whitehouse also cites a report claiming that "the political network of Charles and David Koch has said that it plans to spend as much as $900 million in the 2016 election cycle, raised mostly from undisclosed donors." This sum would be on par with that of both party committees' campaign spending. The role of undisclosed donors also worries Whitehouse: "in the 2014 elections, the most expensive midterms in U.S. history, *The Washington Post* reported that dark money made up at least 31 percent of all independent spending. And that doesn't count spending on so-called issue ads, which is also not reported." He notes that public opinion is at odds with these trends, yet they continue unabated: "a June 2015 *NYT/CBS* News poll found that more than 80 percent of Americans believe money plays too great a role in campaigns, while two-thirds say that

the wealthy have a greater chance of influencing the electoral process than other Americans."

While PACs and super PACs are required by law to disclose all of their donors over $200, another type of organization does not. 501(c)(4) organizations are only required to disclose their spending on political activity, and are not required to disclose information on their donors unless those donors gave for the express purpose of political advocacy (Center for Responsive Politics 2015c). 501(c)(4) organizations are defined by the Internal Revenue Service as "social welfare" organizations, but unlike traditional 501(c)(3) charitable organizations, they may also participate in political campaigns and elections, so long as the organization's "primary purpose" is the promotion of social welfare and not political advocacy. In addition, because these organizations are categorized as nonprofits, they do not have to pay any taxes. The secretive nature of these organizations has allowed many wealthy individuals to effectively hide their political advocacy from the public.

In 2006, just over one percent of political spending, other than that done by political parties and campaign committees, did not disclose donors, but by 2010 that number had risen to 44 percent, according to the Center for Responsive Politics. This spending has also overwhelmingly benefited Republican candidates. According to *ProPublica*, during the 2012 election two of the biggest 501(c)(4) groups, Crossroads GPS and Americans for Prosperity, both of which support Republican candidates, had put more money into the presidential campaign than all super PACs combined (Barker 2012).

Applied to the climate issue, it is important to look at the campaign contributions of relevant industries, corporations, and individuals. According to data from the Center

for Responsive Politics, contributions from the oil and gas industry almost doubled from the 2008 elections to the 2012 elections. In 2012, the industry donated almost $80 million to political campaigns (Center for Responsive Politics 2015d). Of that, a record $16 million went to PACs and super PACs. Surprisingly, that number was bested in the next election cycle, the 2014 midterms, with $19.5 million going to PACs, and the 2016 presidential election cycle will almost certainly set a new record. As of December 2015, the oil and gas industry has already donated $18.5 million to PACs for the 2016 election. This money has overwhelmingly benefited Republican candidates, with $52.9 million going to Republican candidates and groups and only $6.5 million going to Democratic candidates and groups in 2012. This trend continued in 2014, and thus far in the 2016 cycle, the industry has donated $15.1 million to Republicans and just $1.3 million to Democrats. While spending significantly less than the oil and gas industry, the coal mining sector's donations mirror the trends outlined above in the oil and gas industry (Center for Responsive Politics 2015e). While the oil and gas industry donated almost $80 million in 2012 and the coal mining sector donated just shy of $16 million, alternative energy production and services accounted for less than $3 million (Center for Responsive Politics 2015f). Of that comparatively small sum, there was little difference between the sector's contributions to the two parties, with $1.6 million going to Democrats and $1.2 million going to Republicans. The same played out in 2014, with $1.2 million going to Democrats and just under $1 million going to Republicans. So far in the 2016 election cycle, the sector has donated less than $325,000 to Democrats and less than $280,000 to Republicans.

All of this suggests that the U.S. political system does not represent a friendly environment for those advocating policy action to address ACC. This is especially true when these activists view increasing public support as the main lever through which public policy is enacted. While several of the characteristics described above have been present within the U.S. political system for many years, some appear to be trending in the wrong direction. Further, ACC has been a contested political issue for many years now, and evidence points to more of the same in the years to come.

Part Three

The Climate Wars

The previous section was intended to show that implementation of communication campaigns based on the research presented in section one will be very difficult due to a variety of cultural, media, and political factors. This section highlights another challenge to successful implementation: the simple fact that there is another communication campaign, already underway, with the complete opposite goals of the research-based strategies presented in section one. In fact, this alternative communication campaign uses many of the same strategies, and has experienced significant success. The primary difference is the definition of success. As the previous section outlined, the U.S. political system has a "status-quo bias." This makes it much easier to garner support for political inaction than political action. This is exactly what has played out thus far in the "climate wars," the heated debate between proponents and opponents of action to mitigate ACC and its subsequent effects. In Boykoff's book, he describes the battleground in which this war is fought as "dynamic and contested spaces where various 'actors' battle to shape public understanding and engagement." Opponents of action have used a well-crafted communication campaign to garner enough support to thwart policies to address ACC, thanks in part to significant financial support from fossil fuel-based industries.

This network of conservative think tanks, politicians, and friendly media outlets, funded by fossil fuel money, use a similar contextual model of communication. While not quite as scientific as Kahan's and others' methodology, practitioners did gain insight into what resonates with conservative Americans using focus groups and survey data. In his

book, Boykoff cites research by McCright and Dunlap on the work of Republican pollster Frank Luntz: "based on dial groups and polling, Luntz recommended that the [climate] issue be framed by skeptics narrowly in terms of scientific uncertainty and the 'unfair economic burden' to the U.S." Boykoff claims that this strategy was effectively implemented "by conservative think tanks and members of Congress to defeat adoption of the Kyoto treaty and other major policy proposals."

Mills writes of "opinion managers" in his book, and his words seem to be pointed directly at the research cited in section one. He writes of the opinion managers' slogan "Mass Persuasion Is Not Enough":

> Frustrated, they reason; and reasoning, they come to accept the principle of social context. To change opinion and activity, they say to one another, we must pay close attention to the full context and lives of the people to be managed. Along with mass persuasion, we must somehow use personal influence; we must reach people in their life context and through other people, their daily associates, those whom they trust: we must not show our hand directly; rather than merely advise or command, we must manipulate.

Better methods of manipulation, à la Kahan, will not be enough, at least on the climate issue, as those on the other side are both fully capable of adopting such methodology, and have a variety of structural cultural, media, political, and economic factors in their favor. Not only will contextual model communication campaigns have to compete against other such campaigns in the framing of ACC-related issues, but they will also have to compete with these campaigns for the attention of the public. This requires entertaining, compelling, and engaging media, not just effective framing.

Robert Brulle, writing in a 2010 paper titled "From environmental campaigns to advancing the public dialog: Environmental communication for civic engagement,"

argues that while "identity campaigns" may offer short term gains, they are most likely "incapable of developing the large scale mobilization necessary to enact the massive social and economic changes necessary to address global warming" (Brulle 2010). These approaches "based exclusively on cognitive science, rhetoric and psychology … lack any contextual basis within a larger theoretical structure of the role of communication in facilitating large-scale social change processes … [and] fail to address meaningfully the ecological imperatives defined by global warming," he writes. Brulle was also quoted in a 2009 *New York Times* article on a communication campaign by ecoAmerica, an environmental activist group, arguing that their efforts were simply a mirror image of what industry and political conservatives have been doing: "The form is the same; the message is just flipped … You want to sell toothpaste, we'll sell it. You want to sell global warming, we'll sell that. It's the use of advertising techniques to manipulate public opinion" (Broder 2009). In a 2003 article titled "Democracy in the age of assessment: Reflections on the roles of expertise and democracy in public-sector decision making," Steve Rayner describes the limitations of social science-based "participatory techniques" for engaging the public on scientific issues (Rayner 2003). Rayner describes these efforts in similar ways to that of researchers such as Kahan. He writes that these techniques "attempt to equip groups of citizens to make informed decisions about issues involving complex science or technology." Rayner writes that "participatory techniques may have significant potential to inform and supplement representative democracy." However, he sees a danger in these processes becoming mere "participatory management" which "permits rational debate only within received expert frames." By trying to externally set the agenda, in terms of messages, frames, and more, communication researchers are

turning the climate issue into a framing war between "expert" scientific frames and frames based on industry defense and conservative ideology. Instead, Rayner argues, these features of the debate should be set by the citizenry itself through processes of democratic discussion:

> Are consultative and participatory decision processes devised by social scientists a true path to increased democracy or just another layer of technocracy? Is it possible that rather than digging ourselves out of the technocratic hole we are really just digging ourselves in deeper? Are we seeking to compensate for the triumph of technique by devising new techniques, this time social science techniques of consultation? As social scientists, we need to ask whether such initiatives move us closer to, or further still from, the participation of an informed citizenry in key decision making.

He concludes: "it seems that the discourse of participation is essentially a managerial discourse, perhaps, even more narrowly, a crisis management discourse masquerading as a theory of democracy."

In his book, Boykoff notes the important role that monied interests have played in the climate wars. He cites a 1998 article in the *New York Times* by John Cushman Jr. which reported on a leaked report from a meeting in which major oil companies and conservative think tanks met at the American Petroleum Institute's Washington office to assemble a plan to spread misinformation on ACC science (Cushman Jr. 1998). According to the article, the plan "would be directed at science writers, editors, columnists and television network correspondents, using as many as twenty 'respected climate scientists' recruited expressly to inject credible science and scientific accountability into the global climate debate, thereby raising questions about and undercutting the 'prevailing scientific wisdom.'" The leaked report revealed a "campaign to recruit a cadre of scientists who share the industry's view of climate science and to

train them in public relations so they can help convince journalists, politicians and the public that the risk of global warming is *too uncertain* to justify." Recognizing the power of mass media, especially radio, among conservative Americans, the group planned to measure success "by counting, among other things, the percentage of news articles that raise questions about climate science and the number of radio talk show appearances by scientists questioning the prevailing views."

McCright and Dunlap, writing in their previously mentioned study on the "conservative white male effect," argue that a major component of this population's public resistance to ACC science, risks, and solutions is due to the careful work of conservative white male elites. They write:

> To the extent that conservative white males in the general public view their brethren within the elite sectors as an in-group, then we expect that the former also will tend to reject the global warming claims of the scientific community, the environmental movement, and environmental policy-makers.

On the climate issue, the strong opinions of conservative elites such as Glenn Beck, Rush Limbaugh, and Senator James Inhofe likely influenced the views of conservative white males in the general population. McCright and Dunlap cite a 1994 study that found a subgroup of 30 percent of the white male population in a national sample which matched their criteria: "this subgroup of risk-accepting white males had an affinity for hierarchy, had greater trust in authorities, and opposes democratization of risk management." They also argue that "white males are more likely than are others to have an individualistic worldview" due to their place and role within the historical power structure in the United States. "Conservative white males are likely to favor protection of the current industrial capitalist order which has historically served them well," they write. This seems

particularly relevant to the climate issue, as many conservative white males' employment and/or investment income is directly or indirectly supported by the robust U.S. fossil fuel industry.

McCright and Dunlap point to their earlier work on the subject in making the case that efforts by conservative white male elites are an important source of public resistance to ACC science, risks, and solutions. "Conservative think tanks, conservative media, corporations, and industry associations (especially for the fossil fuels industry) — domains dominated by conservative white males — have spearheaded the attacks on climate science and policy from the late 1980s to the present," they write. "Conservative white males in the general public have become a very receptive audience for these efforts." Citing a 2007 study, they add that "over the last twenty years, conservative white male elites have challenged the reality of climate change via conservative talk radio, websites, television news and newspapers." In other words, an information campaign was undertaken by conservative white male elites. McCright and Dunlap's survey indicated that "climate change denial has increased over the time period between 2001 and 2010." They even argue that these efforts have moved to other countries, with similar strategies at play: "since the mid-1990s, organized climate change denial has diffused from the United States to other Anglo nations with established conservative think tanks that promote free-market conservatism and front groups promoting industry interests, most notably Great Britain, Canada, Australia, and New Zealand." McCright and Dunlap conclude that "this spread of climate change denial has been driven to a significant degree by key actors — and their resources, strategies, and tactics — in the U.S. climate change denial machine."

Mills again adds theoretical weight and historical evidence to this characterization. Writing of the conservative establishment culture of his day, he defines establishment as "the overlap of culture and authority." According to Mills, "the essential feature of any establishment is a traffic between culture and authority, a tacit co-operating of cultural workmen and authorities of ruling institutions. This means of exchange between them includes money, career, privilege; but above all, it includes prestige." He adds that "any establishment of culture means the establishment of definitions of reality, values, taste." Establishment cultural icons, such as the conservative white male elites highlighted by McCright and Dunlap, serve as "fashion-leaders in matters of cultural and political opinion" who "certify others, their work, their taste," writes Mills. "In the end, what is 'established' are definitions of reality, judgments of value, canons of taste and of beauty." Within these bubbles of culture, debate is limited, only certain views are allowed. Mills writes: "But more than that, the terms of debate, the terms in which the world may be seen, the standards and lack of standards by which men judge of their accomplishments, of themselves, and of other men — these terms are officially or commercially determined, inculcated, enforced." A perfect example of this concept is the homogeneity of views on stage at recent Republican presidential primary debates, on issues such as "Obamacare," military spending, and, of course, ACC mitigation policy.

Perhaps the most in-depth and detailed account of organized efforts to sway public opinion on ACC is Oreskes and Conway's book, which tells the story of how individuals and organizations associated with business and ideological interests sought to influence public opinion on issues ranging from the link between tobacco and cancer, to acid rain, the ozone hole, and ACC. The duo argue that the strategies pioneered by

tobacco companies to sow doubt among the public regarding whether cigarettes cause cancer have since been used on a variety of issues. In what they dubbed the "tobacco strategy," the industry found a winning formula, their key insight being "that you could use normal scientific uncertainty to undermine the status of actual scientific knowledge." The authors cite a memo written by a tobacco industry executive in 1968 that stated: "doubt is our product."

Oreskes and Conway were surprised to learn that not only were the strategies the same on all of these issues, some of the players were too. A handful of scientists had been relied on to give their "expert" opinion on a variety of issues not even remotely related to their field of study. According to their research, these scientists "had access to power all the way to the White House":

> In 1989, to give just one example, [Fred] Seitz and two other players in our story, physicists Robert Jastrow and William Nierenberg, wrote a report questioning the evidence of global warming. They were soon invited to the White House to brief the Bush administration. One member of the Cabinet Affairs Office said of the report: 'Everyone has read it. Everyone takes it seriously.'

Later, when that Bush's son was in the White House, the president referred to this group of scientists as "my scientists," according to the book. In 1995, Republican House majority leader Tom DeLay said of ozone depletion: "my assessment is from reading people like Fred Singer," one of the scientists featured in the book.

The media plays an important role in their story. Conservative outlets such as the *Wall Street Journal*, the *National Review*, *Forbes*, *Fortune*, and the *Washington Times* often ran op-eds and published letters to the editor written by the scientists. In 1986, the *Wall Street Journal* published an article on the front page by Fred Seitz dismissing

climate science. But Oreskes and Conway do not pin all of the blame on these outlets, noting that respected mass media outlets such as the *New York Times*, the *Washington Post*, and *Newsweek* "repeated these claims as if they were a 'side' in a scientific debate." This "balanced" coverage was not representative of the state of the science, creating a distorted perception among that public that the issue was highly contested within the scientific community. The authors write:

> While the idea of equal time for opposing opinions makes sense in a two-party political system, it does not work for science, because science is not about opinion. It is about evidence. It is about claims that can be, and have been, tested through scientific research — experiments, experience, and observation — research that is then subject to *critical review by a jury of scientific peers*. Claims that have not gone through that process — or have gone through it and failed — are not scientific, and do not deserve equal time in a scientific debate.

In science, they argue, "a conclusion becomes established not when a clever person proposes it, or even a group of people begin to discuss it, but when the jury of peers — the community of researchers — reviews the evidence and concludes that it is sufficient to accept the claim." Oreskes and Conway conclude that "the divergence between the state of the science and how it was presented in the major media helped make it easy for our government to do nothing about global warming." They quote environmental journalist Eugene Linden, writing in his book "Winds of Change": "members of the media found themselves hounded by experts who wrote outraged letters to the editor when a report didn't include their dissent." Regarding the media's role as "gatekeepers": "if they have tried, our story shows that at least where it comes to science they have failed." However, at the end of the book they note that "the degree of research we have done for this book cannot be done in time for a daily or weekly deadline, so it is

understandable that most journalists would not know what we have discovered in five years of research."

In addition to the media, the rise of the internet has also played a role in the proliferation of doubt-enabling information, according to the book. "The internet has created an information hall of mirrors, where any claim, no matter how preposterous, can be multiplied indefinitely. And on the internet, disinformation never dies," write Oreskes and Conway. Referring to IPCC scientist Ben Santer, who was attacked by the coalition of contrarian scientists for his contribution to an IPCC report: "if you Google 'Santer IPCC,' you get not the chapter in question — much less the whole IPCC report — but instead a variety of sites that repeat the 1995 accusations." The internet, it appears, is a central background in the climate wars.

What tied these scientists together, Oreskes and Conway contend, was ideology. They were all scientists during the Cold War, and viewed regulation as the road to communism — the very thing the Cold War was fought to defeat. The scientists called environmentalists "watermelons," green on the outside, red on the inside. They saw themselves as defenders of the free market, and Oreskes and Conway use the term "free market fundamentalism" to describe their ideology. Under this worldview, unfettered capitalism is not just the best way to run an economy, it is the only way, and all government regulation of the free market is a slippery slope to socialism, and eventually communism. In addition, the authors note, "the specter of expanded government control was often linked to the threat of global governance." The fear that the United States would lose its autonomy to a global government resonates with many Americans. Writing in the *Washington Post*, conservative columnist Charles Krauthammer sees

environmentalism as socialism — wealth transfer from the rich to the poor, by other means: "with socialism dead, the gigantic heist is now proposed as a sacred service of the newest religion: environmentalism … the Left was adrift until it struck upon a brilliant gambit: metamorphosis from red to green." Krauthammer pins the Environmental Protection Agency as the enemy: "since we operate an overwhelmingly carbon-based economy, the EPA will [soon] be regulating practically everything … Not since the creation of the Internal Revenue Service has a federal agency been given more intrusive power over every aspect of economic life." He concludes: "Big Brother isn't lurking in CIA cloak. He's knocking on your door, smiling under an EPA cap."

The book also uncovers the role that right-wing think tanks played in the deception. According to their research, the tobacco company Philip Morris commissioned reports which the conservative Heartland Institute then distributed as their own. Heartland also met with members of congress, organized "off-the-record" briefings, wrote and placed op-eds, and organized radio interviews and letters to the editor on behalf of the tobacco industry. Basically, they operated as public relations firms for these companies, but under the guise of "foundations" and "institutes," which conveyed an air of official, academic, and nonpartisan prestige. According to the book, Philip Morris paid Heartland $50,000 in 1997, along with $200,000 for the front group called The Advancement of Sound Science Coalition (TASSC); $125,000 for the conservative think tank the Competitive Enterprise Institute; and $100,000 for the American Enterprise Institute, another conservative think tank. These contributions were referred to in company documents as "philanthropy," and because these organizations were all registered as nonprofit and nonpartisan, the donations were fully tax deductible. In 2008,

Heartland even held a conference in New York City specifically to bring together climate "skeptics." The authors cite a 2008 study which found that only 13 "environmentally skeptical" books were published in the 1980s, but that number jumped to 56 in the 1990s. In the 1980s, all 13 books were linked to right wing foundations, while in the 1990s, all but five were. The authors also reference work by historian Robert Proctor, who has "documented the creation of newsletters, magazines, and journals — including journals with ostensible peer review — in which the results of industry sponsored research could be reported, published, and then cited, as if they were independent." The group of scientists even created an organization to counter the IPCC, called the NIPCC, or Non-Governmental International Panel on Climate Change, with similar looking reports. These reports were sponsored by Heartland. With the appearance of official and academic reports, it can become increasingly difficult for members of the public to differentiate between real experts and fake ones. According to the authors, the conservative George C. Marshall Institute "didn't create their own journal, but they did produce reports with the trappings of scientific argumentation — graphs, charts, references, and the like." While these reports were taken seriously by politicians, journalists, and members of the public, including the Bush administration, "they were not subject to independent peer review — the most basic requirement of any truly scientific work. Had they been, it's likely they would have failed."

Oreskes and Conway also summarize a 2005 report by journalist Chris Mooney in *Mother Jones* which uncovered titan oil company ExxonMobil's involvement in the doubt coalition. "In just a few years ExxonMobil had channeled more than $8 million to forty different organizations that challenged the scientific evidence of global warming,"

they write. This included $60,000 to the Competitive Enterprise Institute for "legal fees" and $75,000 to Steve Milloy, a columnist for *Fox News'* website and "adjunct scholar" at the conservative Cato Institute. *Fox News* published Milloy's column and the *Washington Times* republished it, neither of which identified his ExxonMobil funding.

This coordinated network of right-wing foundations, the corporations that fund them, and the "journalists" who echo their claims are largely responsible for the culture of doubt on the climate issue, the authors contend. "We take it for granted that great individuals — Gandhi, Kennedy, Martin Luther King — can have great positive impacts on the world. But we are loath to believe the same about negative impacts — unless the individuals are obvious monsters like Hitler or Stalin," write Oreskes and Conway. "But small numbers of people can have large, negative impacts, especially if they are organized, determined, and have access to power."

To summarize this thesis thus far:

Despite a strong scientific consensus on the basic tenets of Anthropogenic Climate Change (ACC), the American public remains deeply divided on the issue. This is true of the positive, empirical questions of climate science, as well as the normative, value-based aspects of the issue, such as those related to risk perception and motivation for mitigation actions. Research by social scientists has shown that how scientists, journalists, politicians, activists and others communicate the science and risks of, and solutions to, ACC to the public is not helping to close these gaps, and may in fact be exacerbating them. This is because communicators assume that what the public needs is to be educated about the basic facts of ACC, and then their belief, concern, and motivation for action will follow. Social science researchers have dubbed this method of

communication the Information Deficit Model (IDM), because it implies that the public possesses a deficit in information that needs to be filled. The lack of success in persuading the public using this method has frustrated communicators, leading many to complain that certain sectors of the U.S. public do not possess the basic scientific literacy skills necessary to comprehend the topic, or that they are irrational or downright stupid.

But again, careful research has shown that this is not the case. Instead, it is people's cultural value systems, their worldviews, that are to blame for divergent opinions on these issues. Individuals who value individualism and authority are likely to associate the diagnosis of ACC as a problem with a prognosis that is counter to their cultural values. They associate their acceptance of the science of ACC and recognition of its risks with an endorsement of specific government policies intended to mitigate the problem, such as taxes and regulations of industry and consumer behavior, that are counter to their deepest held beliefs about how society should be organized. Those groups that value equality and community accept a similar premise, but the prognosis that both groups associate with the ACC diagnosis matches up well with their cultural values, and thus they are much more likely to accept the science, recognize the risks, and support solutions to address ACC.

With this knowledge in mind, social science researchers have turned to the task of proposing and testing alternative communication strategies, and here too a consensus appears to be emerging. By testing different messages and frames in lab experiments, these researchers have hit on several rhetorical devices which have a persuading effect on individuals within cultural groups associated with dismissive views on ACC. In other words, you can convince an individualistic and hierarchical person that ACC is real,

risky, and worth addressing using carefully worded messages that contain meanings that resonate with their identity, and avoiding meanings that threaten their identity. Researchers are even beginning to test these strategies in field experiments using the same rigorous methodology as in the lab, hoping to figure out what works in the real world.

However, it is the argument of this thesis that the burgeoning field of the science of science communication contains several idealistic assumptions about the relationship between communication and social and political change in the United States. First, there are cultural and media barriers, due to the fragmented, polarized, and contested nature of the U.S. communication environment. Many Americans consume only media that matches up with their cultural worldviews, and these media providers have message and agenda-setting "gatekeeper" powers which makes accessing targeted audiences difficult. These and other challenges hinder the ability of communication campaigns, however well designed and tested in the lab, to influence public opinion at meaningful scales. In addition, even if these strategies do work in the real world, there are political and economic factors that limit the role that public opinion plays in policymaking. For example, the U.S. political system is well known for its "status quo bias," which intentionally slows down the policymaking process. But there are also more sinister incursions on American democracy, such as the outsize influence that economic elites and business interest groups have on policy outcomes. In combination, these trends suggest that efforts to shift public opinion on the climate issue at the necessary scales will be incredibly difficult, and even if they succeed, their relationship with the desired social and political outcomes is further muddied.

Part Four

Realistic Expectations and Alternative Strategies

One point that stands out, thanks to its endorsement by several researchers, is that it would have been ideal to have implemented these strategies when the climate issue first came to the public's attention. Instead, scientists, activists, and other communicators went with their gut, and they paid the price. Kahan argues that even though the Public Understanding of Science research movement and science communication studies were not as far along as they are today, these practitioners should have known better, as there was ample social science research on the bungling of communication on the risks of nuclear power in the 1970s and 1980s. "Had this body of knowledge been integrated into the practice of science and science informed policymaking back in 1988, when James Hansen made his initial warnings about the impact of anthropogenic global warming, perhaps political conflict could have been avoided or at least reduced," he muses. Instead, what occurred was an unorganized, uncoordinated hodgepodge of efforts by scientists, activists, and others to persuade the public that ACC is scary enough to merit policy action. Couple this with the organized, coordinated reaction of opponents of policy action to address ACC, and you begin to see how, in retrospect, the climate wars could have played out differently.

In this vein, perhaps the research on ACC communication could be useful on future environmental issues, as this thesis has shown that its potential on the climate issue is limited. However, it is not the intent of this thesis to discourage this body of research application on the climate issue, and suggest that researchers and practitioners should simply give up. On the contrary, their efforts are entirely necessary, if only to counteract,

to a certain degree, the efforts of their opponents in the climate wars. Further, ACC is here to stay, and it will maintain its status as an important political issue for decades to come. So getting the communication right, however small the gains, could have a meaningful impact in the long run. With these tempered expectations in mind, this research movement still has the potential to do a lot of good.

In a 2014 interview with Jon Stewart on his Comedy Central television show The Daily Show, Gilens and Page commented that they believe the problem of wealthy individuals' and business interest groups' outsize influence on U.S. politics is solvable (The Daily Show 2015). However, they suggest it will not be easy, requiring a mass social movement, bipartisan legislation, and a collection of wealthy elites on the side of change. They suggest working to reform campaign finance rules, pass measures to increase political competition (for example, by replacing the practice of gerrymandering with an independent, non-partisan procedure), and focusing on policies that have support among all income levels. A mass social movement on ACC is advocated by many climate activists. In her 2014 book "This Changes Everything: Capitalism vs. the Climate," Naomi Klein argues that ACC should be treated as the central thread tying together several popular narratives critical of capitalism, including income inequality, racial disparity, and poverty (Klein 2014). She sees ACC as "the basis of a powerful mass movement, one that would weave all these seemingly disparate issues into a coherent narrative about how to protect humanity from the ravages of both a savagely unjust economic system and a destabilized climate system." Her argument seems to be gaining some traction, as Senator Bernie Sanders from Vermont has used similar rhetoric in his

campaign for the democratic nomination for president. “Climate change could become a catalyzing force for positive change,” writes Klein. She elaborates:

> It could be the best argument progressives have ever had to demand the rebuilding and reviving of local economies; to reclaim our democracies from corrosive corporate influence; to block harmful new free trade deals and rewrite old ones; to invest in starving public infrastructure like mass transit and affordable housing; to take back ownership of essential services like energy and water; to remake our sick agricultural system into something much healthier; to open borders to migrants whose displacement is linked to climate impacts; to finally respect Indigenous land rights — all of which would help to end grotesque levels of inequality within our nations and between them.

By framing ACC as a social, political, and economic opportunity, Klein hopes that the issue can unite people around the world to stand up to the capitalist system, which she argues is necessary to responsibly deal with ACC. Noam Chomsky was asked in a recent interview how to motivate and mobilize the public for political purposes (Segantini 2015). He responded:

> It’s not that complex. The task of organizers and activists is to help people understand and to make them recognize that they have power, that they’re not powerless. People feel impotent, but that has to be overcome. That’s what organizing and activism is all about. Sometimes it works, sometimes it fails, but there aren’t any secrets. It’s a long-term process — it has always been the case. And it’s had successes. Over time there’s a kind of a general trajectory towards a more just society, with regressions and reversals of course.

Whether this trend applies to environmental issues such as ACC, which do not command the same attention and passion that human-oriented issues do, remains up for debate. But the success of campaigns such as those to block the expansion of the Keystone XL pipeline and divest university endowments from fossil fuel assets, and the turnout of over 300,000 people for the People’s Climate March in New York City in September 2014,

suggest a growing environmental movement reminiscent of those in the 1970s. Those actions resulted in substantial policy changes, including the enactment of the Clean Air Act, the Clean Water Act, and the creation of the EPA, all of which required, and received, the signature of Republican President Richard Nixon.

In a 2015 article, political scientist Jonathan Ladd argues that mass social movements do not necessarily have to contain a majority of citizens to bring about policy changes (Ladd 2015). He uses the abolition of slavery as an example of how a vocal minority can exert outsize influence in the U.S. political system. "By all available (admittedly imprecise) measures, a majority of Northerners never supported abolition prior to 1861, and likely still didn't prior to the 1863 Emancipation Proclamation and the 1865 13th Amendment," he writes. "Some of the ways abolitionists prevailed were by being very organized and motivated, having resources, and connecting themselves to a Republican Party coalition based on 'Free Soil' ideology, which eventually gained control of the presidency and Congress." Ladd argues that the political process of coalition building is a messy business. In the case of abolition, "it required the abolitionists to team up with those who wanted to colonize free blacks back to Africa, those who opposed extending slavery to the western territories because they simply didn't want blacks in the territories at all, and those who simply didn't want to have to compete with businesses that used slave labor." But in the end, their political goal was reached: "through their zealous activism and membership in a partisan and ideological coalition, they achieved a goal (abolition) that, since it arguably contradicted the existing U.S. Constitution, must have seemed almost impossible prior to the Civil War."

Ladd sees a fundamental distortion of this concept in today's politics. He notes that in U.S. politics today, two groups hold outsize power: "those with more intense political opinions and those with more socioeconomic resources." The goal should be to maintain the power of the former and reduce the power of the latter, argues Ladd. He sums up his argument with these words: "the problem is not that organized groups have disproportionate influence in politics. The problem is that American society is deeply unequal and has campaign finance rules making it very easy to translate private inequality into politics." He concludes that significant social progress in a democracy will almost always come at the hand of agitation and protest. "The challenge is making sure the deck isn't stacked in favor of rich and privileged organized factions," he writes. "A realistic less-elitist political system would be one in which interest groups that control parties are built more on preference intensity than privilege."

Hidden in much of the research and commentary on communicating ACC is the desire for a "civil discourse," and ultimately a "civil society." Moser and Dilling write of the need to "mutually engage" with ACC skeptics by focusing on finding "mutually agreeable meanings." Nisbet and Scheufele write of the need to "facilitate conversations with the public that recognize, respect, and incorporate differences in knowledge, values, perspectives, and goals." Kahan often calls for avoiding partisan language, and emphasizes using a "shared language" that is positive and constructive. These comments suggest that healing the wound that is the divisive, combative, and unconstructive public discourse on American politics may be the underlying and more comprehensive goal of ACC communication researchers.

With this more expansive goal in mind, several researchers mention the education system as part of a potential path forward. Moser and Dilling criticize the U.S. education system for its heavy focus on "recall of details," neglecting "integrated education," such as that which teaches "systems-thinking capabilities," which could help individuals better understand how complex systems, such as the climate system and the global energy system, work. Nisbet and Scheufele even advocate for education in "civic science media literacy" to be "formally incorporated into university, junior college, and high school science courses across the country." Their curricula would "introduce students to quality online news sources about science, teach students about how to constructively use participatory tools such as blogs and other social media applications, educate students on how to critically evaluate evidence and claims as presented in the media, introduce students to the relationships between science and institutions as they are often covered in the news, and socialize students into enjoying and following science by way of digital media after they complete their formal science coursework." While projects such as this likely require greater effort and financial resources than communication campaigns, and they certainly face their own fair share of societal challenges, they may represent a more constructive path towards the ideal of a civil society. This path also seems to be more ethical, as it refrains from managing and manipulating individuals, instead giving them the knowledge, skills, and tools to critically and thoughtfully engage with topics of societal consequence on their own and with others.

In a 2015 paper titled "The language desert: The condition of literacy and reading in contemporary America," Michael Tracey explores the role of a "literate" citizenry in a democracy (Tracey 2015). He cites cultural critic Richard Hoggart's 2001 book

"Between Two Worlds: Politics, Anti-Politics, and the Unpolitical" in which Hoggart writes that we need to move beyond a basic definition of literacy, that of simply being able to read and write, to a "critical literacy" which is "alert to the manifold deceptions — carried mainly in language — by which persuasion operates in an open society." This literacy is "critically aware, not easily taken in, able to 'read' tricks of tone, selectivities, false ad hominem cries and all the rest." What Hoggart describes is not literacy in its traditional sense, but literacy combined with education: "critical literacy means combining, with training in literacy, teaching about the difficulties, challenges and benefits of living in an open society which aims to be a democracy." But even "critical literacy" is often not enough, Hoggart argues. He goes a step further in calling for what he calls a "cultivated literacy": "the next step must be from critical literacy to a condition even more difficult … cultivated literacy … the ability to read other than functionally, which is after all only a simple matter. It means being more than critical in our reactions to what we see, hear and read, but being open, intellectually and imaginatively responsive." Tracey writes that "producing cultivated individuals and through them, collectively, a cultivated community" should be the goal for any democratic society. "Literacy — high level literacy, cultivated literacy — provides for the opportunity to participate in the cultural, moral, ethical and philosophical systems that define a society," he adds.

Mills echoes many of these sentiments. He writes that "the end product of such liberal education of sensibilities is simply the self-educating, self-cultivating man or woman." Teaching people how to educate *themselves* is the key here. This could involve teaching skills such as how to conduct research on the internet and in libraries, how to

read and take notes, and how to write well. But it also involves educating people about our shared cognitive limitations, about how to be skeptical, critical, and open minded, how to avoid using logical fallacies, and the like. Mills writes of the need to develop "those skills as controversy with oneself, which we call thinking: and with others, which we call debate." This all requires mental effort, and can be difficult to confront, as critical inquiry is not as comfortable as the unrealities we have created for ourselves, or that have been bestowed upon us. Mills writes that the result of such an education is that "this citizen can now see the roots of his own biases and frustrations." The goal is ultimately to get us out of our bubbles, to learn how to interact with each other in constructive ways: "publics live in milieux but they can transcend them — individually by intellectual effort; socially by public action. By reflection and debate and by organized action, a community of publics comes to feel itself and comes in fact to be active at points of structural relevance," writes Mills.

Hulme ends his book on why we disagree about ACC with a similar call: "If used wisely this condition of climate change in which we are now embroiled may teach and empower us to embark on different projects from those that come easily to us." He continues: "Even so, we will disagree. But let us at least recognise that the sources of our disagreement about climate change lie deep within us, in our values and in our sense of identity and purpose. They do not reside 'out there', a result of our inability to grasp knowingly some ultimate physical reality." It is easy to get caught up in the details of our disagreements, especially on complex topics such as ACC, but stepping back and looking upon the subject with clear eyes, it is easy to see that disagreement in itself can be cathartic, so long as those disagreements are open, honest, and constructive. Hulme

concludes: “let us remember that our disagreements should, at best, always lead us to learn more about ourselves — our lament for the past, our fear of the future, our desire for control, and our instinct for justice. Our engagement with climate change and the disagreements that it spawns should always be a form of enlightenment.”

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