



The Battle Over Climate Change Science: Implications for Public Action

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Introduction

“Very few aspects of the climate change debate are uncontroversial, and the controversies between protagonists are often intense and even bitter” (Giddens, 2008).

On September 14, 2011 the Climate Reality Project presented a live webcast they called “24 hours of climate reality.” The Project’s web site described the project this way:

Each hour, a citizen activist trained by Al Gore delivered a presentation that connected the dots between recent extreme weather events — including floods, droughts and storms — and the man-made pollution that is changing our climate. This was a round-the-clock, round-the-globe snapshot of the climate crisis in real time. The deniers may have millions of dollars to spend, but we have a powerful advantage. We have reality. (Climate Reality Project, 2011)

Almost as soon as the broadcast was announced, climate change deniers began harsh criticism. One blogger wrote, “Liberals like Al Gore who push human-caused climate change like drug lords push dope, are gearing up to mass brainwash America on September 14-15 with 24 hours of climate insanity and fraud” (Berry, 2011). Certainly a different view of reality.

This paper will examine the roots and relevant issues that may drive such passionate belief or disbelief. It will focus primarily on the issue as discussed in the United States as this is where climate change denial is most vehement. While it will not try to resolve the debate between believers and deniers, it will explore the challenges for leaders trying to catalyze action on either side of this issue.

Climate Change: Believers and Deniers

Climate science examines changes in the Earth's physical characteristics over time including air and water temperatures, weather patterns, atmospheric composition, percentage of the Earth's surface covered with ice, and other indicators. Climate change is defined as:

Any systematic change in the long-term statistics of climate elements (such as temperature, pressure, or winds) sustained over several decades or longer. Climate change may be due to natural external forcings, such as changes in solar emission or slow changes in the earth's orbital elements; natural internal processes of the climate system; or anthropogenic forcing. (American Meteorological Society, n.d.)

Those who "believe" current climate change science hold that there is sufficient evidence derived through rigorous research to support the hypothesis that the Earth's climate is deviating significantly from what has been the accepted norm (Logical Science, 2007). They believe that human activity has contributed to and accelerated these changes and that these changes may be detrimental to human welfare (Whitmarsh, Seyfang, & O'Neill, 2011). This evidence includes statements that the concentration of carbon dioxide has increased to levels not heretofore experienced with the largest increases coinciding with the industrialization of the developed world (National Oceanic and Atmospheric Administration, 2009); that polar ice caps are melting at an accelerating rate including that the Canadian Arctic ice cap has seen greater melt over the past twenty-five years than in the previous two millennia (Fisher, et al., 2011); and that extreme weather events are increasing in intensity and frequency (Intergovernmental Panel on Climate Change, 2007). This evidence is presented through traditional knowledge channels: peer-

reviewed journals, papers presented at academic conferences, and on-going monitoring of scientific indicators for which data is made available to researchers and the public.

“Deniers” or “environmental skeptics” are those who do not believe that major change is underway, that human activity is responsible for the changes, or that any changes pose a potential threat to humans (Dunlap & McCright, 2010, p.240). They hold that fluctuations in the climate have been going on for millennia and that it is not possible to establish that any current changes are any more than would be part of this natural cycle.

Deniers or believers may have one or more of several motivations: they may have examined the science and found the evidence one side is offering is compelling while the other side is wanting or unreliable; they may have examined and believe one side’s science but have a political or economic motivation for denying its validity; or they may not have examined the science but found that either believing or denial aligns with their general worldview or political or economic interests.

Historically, climate change denial is rooted in the Judeo-Christian belief that Man had “dominion” over the Earth and the other species with which Man shared the planet (Genesis 1:25-27: King James Version; Kline, 2007, p.4). This attitude continued in various forms through the Enlightenment, Industrial Revolution, and into the modern day where it has also become closely linked to laissez-faire economics, private property rights, and small government advocacy. It is what Dunlap & McCright consider to be the “dominant social paradigm” (Dunlap & McCright, 2010, p. 241). Many deniers see climate change advocacy not simply as a scientific debate but as a challenge to that paradigm.

Deniers do not have an exclusive connection to Judeo-Christian beliefs. There is an evangelical environmental movement based on stewardship rather than dominion and that

“biblical faith is essential to the solution of our ecological problems” (Evangelical Environmental Network, 2011a). They cite concerns for nature as part of the Lord’s creation and thus requiring stewardship by Christians. They also are concerned with social justice issues: they believe that environmental degradation disproportionately affects the poor and cite Biblical calls to care for the poor and less powerful (Evangelical Environmental Network, 2011b).

The modern environmental movement has its roots in the 1960s when the evidence of the negative impact of industrial production and excessive waste became impossible for some to ignore: Rachel Carson’s book *Silent Spring* brought forward the dangers of pesticides and other chemicals to bird species. The Cuyahoga River caught fire in Cleveland drawing national attention. An oil spill off Santa Barbara fouled the California coast. The first Earth Day was celebrated in 1970 (Dykstra, 2008). The Environmental Protection Agency was formed and the Clean Air Act was passed by Congress in 1970 (Lewis, 1985) followed by the significant changes to the Federal Water Pollution Control Act in 1972 (“History of the,” n.d.) marking a more muscular Federal regulatory approach to confronting environmental damage. Corporations became the target of environmentalists’ ire.

The two movements came into open conflict beginning around 1980. The election of Ronald Reagan as President of the United States marked the resurgence of the conservatism in the Republican Party along with anti-regulatory sentiment and a more sympathetic view of business (Klein, 2007, p. 102). The Reagan administration pursued policies that were overtly anti-regulation and were widely viewed as anti-environmental (Dunlap & McCright, 2010, p. 242). The Clinton administration pursued policies more supportive of the environment and then Reagan-style policies were continued under President George W. Bush whom environmentalist Robert F. Kennedy, Jr. said would be a near-universal choice as the “greatest threat to the global environment” (Kennedy, 2005). Environmental issues, however, have played little role in voter

preferences in national elections (Mitchell 1984, Dunlap 1987, Dunlap 1991 as cited in Guber 2001).

Increased scientific knowledge and the ability to construct increasingly complex computer models have, in the minds of believers, strengthened their case. These advances have, however, fortified the resolve of deniers who see the models as unproven and open to manipulation. The closest experience that the average person has with climate models are the storm projections used by meteorologists and, as most will attest, the local weatherman seems to be wrong as often as she is right.

Discussion

So is there “truth”—and does it matter? In a BBC poll, the vast majority of respondents expressed knowledge of climate change and belief that human activity has contributed to the change—an average of 79% across 21 countries including the United States. Ninety percent said that action was required to address the issue (“Man causing climate change,” 2007). Yet in a Pew poll of the priorities of the American people for 2010, global warming came in dead last (Pew Research Center, 2010). Relatively few people either change their personal habits or engage in larger social action to influence public policy (Blake, 1999 as cited in Whitmarsh, Seyfang, and O’Neill, 2011).

The goal of believers is to stimulate policy and behavior changes that they believe will begin to limit and possibly reverse the effects of climate change. The goal of deniers is to thwart those efforts and maintain the status quo. If this were a courtroom, the believers would be the prosecution with the need to convince an entire jury beyond a reasonable doubt and hope that this evidence would catalyze the desired actions. The deniers are the defense aiming to raise as

much “reasonable doubt” as possible. Unlike a jury trial, however, neither side is ever required to rest its case nor is the jury required to make a decision.

The deniers’ arguments have been made through a vocal, influential minority that need only sow enough doubt to stall policy changes and regulation. This strategy may be driven by an awareness of the general intransience of the public with regard to behavior change. Deniers have a long and well-documented relationship with conservative think tanks to produce thought leadership that discredits climate change (Jacques, Dunlap, & Freeman, 2008). Some of the deniers are accredited climate scientists but many are not. The pursuit of the latter group has not been to find truth but rather to create the belief, whether real or perceived, that climate change advocates neither possess nor present the truth.

It is difficult to discern definitively whether this is because deniers feel they already grasp the truth or because of other ideological or economic motivations. An example of the former are the attacks have been made on the teaching of evolutionary theory in public schools (Kirkpatrick, 2000): a principle which the scientific community considers settled unless and until sufficient peer reviewed research contradicts it. Evolution is called into question by non-scientists who rest their case on non-scientific evidence, in this case the Biblical version of creation which they hold to be the truth. An example of the latter is the tobacco industry’s challenges to the health risks of their products (Oreskes & Conway, 2010).

Climate change is a difficult case to make: the science complex, the impact is long-term and largely intangible at present, and the specific risks for individuals are not well defined (Whitmarsh, Seyfang, and O’Neill, 2011). Though some changes are based on observable fact, the projected large-scale negative effects are based on theoretical models and informed estimates (Giddens, 2008). The public is accustomed to significant fluctuation in weather patterns, for

example, and thus underestimates the long-term impact of seemingly small increases in global temperatures (Berk & Schulman, 1995; Kempton, 1991 as cited in Whitmarsh, Seyfang, and O'Neill, 2011).

Epistemologists may see an evidentiary problem: climatologists see evidence that to them indicates climate change and extrapolate their conclusions. The average person, however, sees little such direct evidence and has the perception that there is minimal immediate risk and, in any event, fault lies with other people and thus they can have little impact through their personal actions (O'Neill & Hume, 2009; Lorenzoni & Pidgeon, 2006; and Whitmarsh, 2009b as cited in Whitmarsh, Seyfang, and O'Neill, 2011).

Climate deniers may see an issue of reliability: their criticism of climate science believers is that the evidence they present is ill-reasoned, inconclusive, or unreliable. For example, an open letter to the Director General of the United Nations signed by 141 scientists demands that believers present

...OBSERVATIONAL EVIDENCE [emphasis theirs] for their claims of dangerous human-caused global warming and other changes in climate. Projections of possible future scenarios from unproven computer models of climate are not acceptable substitutes for real world data obtained through unbiased and rigorous scientific investigation.” (Copenhagen Climate Challenge, 2009)

Believers would counter that climate, unlike individual weather events, is not directly observable (Whitmarsh, Seyfang, and O'Neill, 2011) and thus the deniers set a reliability bar that cannot be achieved.

Those in pursuit of knowledge, particularly those without the technical expertise to accurately judge the veracity of the various scientific claims, rely on second-hand information which is subject to bias, distortion, and misinterpretation by both the source and the reader. The

traditional check of peer review is intended to mitigate this risk but the deniers have called even this into question. A popular target is the Intergovernmental Panel on Climate Change (IPCC), a Nobel Prize-winning body with the declared aim to amass “as much scientific data as possible, subject it to rigorous review, and reach overall conclusions on the state of scientific opinion” (Giddens, 2008). Critics have accused it of sloppy science, bias toward climate change belief, and conflicts of interest (Kintisch, 2010).

Deniers would seem to have the upper hand, at least in the United States. The 1997 Kyoto Protocol with binding targets for greenhouse gas emissions (UNFCCC, n.d.) was never ratified by the U.S. Senate. The U.S. did sign on to the 2007 “Bali Road Map,” which was intended to pave the way for a post-Kyoto international accord, but only after an acrimonious debate and intense pressure from other nations (Fuller & Revkin, 2007). Attempts to put a price on carbon through either a carbon tax or cap-and-trade system have stalled (Lavelle, 2010). As noted in the Pew study above, Americans place a low priority on global warming and are more focused on the economy and other issues they see as more immediate.

Conclusions

Is there a way forward for climate change believers—or is the battle lost? Research into cognitive and social psychology suggests that knowledge about individual learning may hold clues. In particular, two key processes are relevant: objectification (making the abstract concrete) and anchoring (making the unfamiliar familiar by utilizing pre-existing cognitive frameworks). These highlight the need to understand how individuals translate and apply knowledge in daily living: “situated meaning” (Whitmarsh, Seyfang, and O’Neill, 2011). For example, research has shown that “global warming” is perceived as more important than “climate change” (Whitmarsh, 2009 as cited in Whitmarsh, Seyfang, and O’Neill, 2011) and thus may be a more effective term

with the general public. Whitmarsh et al. have proposed fostering “carbon capability,” that is “the ability to make informed judgments and to take effective action regarding the use and management of carbon, through both individual behavior change and collective action (Whitmarsh et al, 2009 as cited in Whitmarsh, Seyfang, and O’Neill, 2011). They describe this model as comprising three components: decision-making (e.g., knowledge, judgment, etc.); individual practices (e.g. recycling, energy conservation, etc.); and engagement with the “system of provision” (e.g. voting, lobbying, creating alternative social infrastructures, etc.). Its goal is to transform abstract knowledge into tangible actions that it is possible for individuals to take.

One way to do this is to reframe choices such that individuals make low-carbon choices without having to explicitly consider climate change science. For example, the Barr Foundation in Boston, Massachusetts is committed to combating climate change through programs that reduce vehicle miles traveled. They have found that they make the greatest progress when they present the options in terms of “what people care about” such as neighborhood design that facilitates walking children to and from school rather than reducing carbon emissions (Skelton-Roberts, 2011). This is an approach that both makes the abstract concrete—objectification—and shows the desired end state in the context of a positive, pre-existing framework—anchoring.

Thus, just as climate change deniers advance their cause by engaging through indirect issues such as the desire of some to limit the scope of the federal government, believers may have to delve more deeply into the factors through which social practices are constructed rather than simply amassing more and more scientific evidence. These tactics may not satisfy those who desire an epistemologically robust quest for an ultimate truth but they may be more likely to effect change.

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