Perspective

Climate Change Communication: A Provocative Inquiry into Motives, Meanings, and Means

Branden B. Johnson*

The deliberately provocative theme of this article is that perceived difficulties in climate change communication (CCC)—e.g., indifference about or denial of climate change's reality, negative consequences, anthropogenic causes, or need to mitigate or adapt to it—are partly the fault of climate change communicators. Fischhoff's model of risk communication development is used to demonstrate that CCC to date has tended to stress persuasion, rather than social movement mobilization or deliberation, and with a focus on the model's early stages. Later stages are not necessarily better, but a more diverse strategy seems superior to a focus perhaps narrowed by empathic, ideological, psychological, and resource constraints. Furthermore, even within persuasion, emphasizing a wider set of values, consequences, and audiences could be fruitful. Social movement mobilization has its own set of weaknesses, but usefully complements persuasion with a focus on developing power, subverting mainstream assumptions, and engaging people in collective action. Deliberation similarly has its drawbacks, but unlike the other two approaches does not define the solution—or even, necessarily, the problem—in advance, and thus offers the chance for people of contending viewpoints to jointly develop concepts and action agendas hitherto unimagined. Simultaneous pursuit of all three strategies can to some degree offset their respective flaws, at the potential cost of diffusion of energies and contradictory messages. Success in CCC is by no means guaranteed by a more diverse set of strategies and self-reflection by communicators, but their pursuit should better reveal CCC's limits.

KEY WORDS: Climate change; communication; deliberation; persuasion; social movements

1. INTRODUCTION

My aim in this thought piece is to retreat from details of indifference, denial, and other barriers[1] for a wider perspective on climate change communication (CCC). Research and practice allow little time for reflection on unexamined assumptions behind some CCC behavior. My deliberately provocative argument is that success has been partly hampered by CC communicators themselves.

Here I define as communicators those who wish to prevent or reduce climate change and its impacts

*Address correspondence to Branden B. Johnson, Decision Research, Inc., Decision Research, 1201 Oak St., Ste. 200, Eugene, OR 97401, USA; branden@decisionresearch.org.

through communication that moves people to reduce emissions of greenhouse gases, remove excess carbon from global sinks, or adapt to changed climate. CCC problems and solutions are also affected by many other communications and communicators whose actions or inaction can pose barriers to CCC success; for brevity and focus their communications are not discussed in detail in this article, but challenges they pose and possible solutions are noted briefly where appropriate.

My definition of communication here is inclusive, covering three major strategies: persuasion of individuals to change their own energy use and adaptations, mobilization to foster collective action to change individuals' and institutions' behavior, and

deliberation, collective efforts to identify problems and solutions. While some normatively label a behavior as "communication" as either criticism or praise (e.g., of one-way messages or deliberation, respectively), communication in the sense of meaning being conveyed in one or multiple directions among two or more parties is central to all three strategies. Communication can include conveyance of facts, discussion of which values are salient and their implications for action, and a host of other possibilities, one at a time or jointly. To assume communication can be only one of these makes the process, and these varied strategies, unduly simple, and contradicts the discipline of environmental communication, which features them all.[2] As all three strategies have their limits—while being potentially complementary and sometimes contradictory—my aim here is to make them all problematic while exploring their potential, rather than privileging one (e.g., deliberation) over all others.

I begin by suggesting that CCC has not evolved far along a proposed sequence of risk communication stages, for varied reasons. Then I review opportunities and drawbacks of the three strategies, and trade-offs and potential complementarities among them, as well as between CCC and other approaches to dealing with climate change.

2. HOW EVOLVED IS CLIMATE CHANGE COMMUNICATION?

Baruch Fischhoff[3] suggested a sequence of risk communication development, at least for hazards to which people allegedly overreact, such as nuclear power. Table I shows these stages and equivalents or examples for CCC; despite climate change being a target of underreaction, according to CC communicators, the definition of stages matches quite well hypothetically. However, how does this sequence match CCC's history or potential future? Two sources offer indications in lieu of currently unavailable systematic data about actual CCC efforts and their outcomes. The Moser and Dilling[4] edited volume on climate change communication (disclosure: I co-authored a chapter) aimed to represent cutting-edge scholarship and practice, and is cited as "the most comprehensive book yet published about the communication of climate change" (p. 247).[5] The annual Behavior, Energy and Climate Change Conference (BECC), sponsored by the American Council for an Energy-Efficient Economy, among other organizations, aims to use knowledge of how

individuals and organizations behave and make decisions to quicken a low-carbon society. A brief survey of both book chapters and 2009 BECC talks indicates CCC foci.

One of Moser-Dilling's 32 chapters covered deliberation, Fischhoff's penultimate stage; three other chapters mention it. Collective mobilization (in general and among Alaskan natives) to influence policymakers takes two full chapters; three chapters discuss movement-related rhetoric or methods. Jointly these two methods take up at most 28% of chapters, less than 10% for full chapters. Five more chapters cover institutional movements, e.g., internal mobilization of firms for mitigation; cities and states inspiring or collaborating on climate change action. Thus the book emphasizes persuasion strategies. The 2009 BECC talks (http://www.aceee.org/conf/09becc/09BECCPresentations.html) are less easily categorized; they covered more than just communication, and not all talks were available. However, only three items covered deliberation, among university students,[6] a test with stakeholders as well as citizens of group discussion and structured feedback via keypads, and New England town meetings. Social movements were omitted entirely; all other CCC talks covered persuasion.

A reviewer objected that it was misleading to use the Moser-Dilling volume, whose editors favor deliberation, and the BECC papers, which include technology and economics (although I only counted the communication papers), particularly as calls for deliberation on climate change are common in both the United States[7–11] and Europe.[12,13] I argue, however, that my samples misrepresent the population of actual CCC very little. Calls for deliberation[1] are not themselves climate deliberations; Ref. 10, for example, spends a page on deliberation while largely focused on conveying information (a table of tips does include "maintain respectful discourse" and "Let people discuss and draw their own conclusions from the facts"—p. 272). Some institutions favoring deliberation in their scientific reports have programs to educate people about climate science (e.g., Climate Education Roundtable, U.S. National Academy of

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[1]Ref. 12 reports results of enhanced focus groups on climate change that offer "deliberation lite" at best. People with competing views were explicitly recruited into each group, which was asked to report its disagreements as well as consensual topics, but conclusions were general (e.g., take low-cost action despite uncertainty) with no clear audience or action implication; participants themselves were not asked to commit to any course of action.

Table I. Climate Change Communication in the Context of Fischhoff's Stages of Risk Communication

Fischhoff (1995) Stages	Climate Change Communication Equivalents or Examples
Get the numbers right	Climate scientists doing normal science, in both Kuhnian and colloquial senses
Tell them the numbers	Reporting scientific findings and projections publicly
Explain what we mean by the numbers	E.g., ocean thermal expansion + ice sheet melting > sea level rise > projected submerged shorelines and storm surge impacts
Show they have accepted similar risks in the past	(a) Show they've rejected similar risks (to those of climate change) in the past (e.g., persistent toxic waste; nuclear waste)
	(b) Show they've accepted similar risks (to those of mitigation and adaptation) in the past (e.g., precautionary action in other personal or policy areas)
Show that it is a good deal for them	E.g., stress ancillary benefits (lower energy costs, green jobs) of action against climate change
Treat them nice	Offering respect, and fair decision-making procedures, to opponents
Make them partners	Inclusive deliberation on problems and potential solutions
All of the above	Both analysis (early stages) and deliberation can be necessary for all but routine cases

Note: First column from Ref. 3, Table I.

Sciences[14]). Whether this reflects belief in its effectiveness despite official reports to the contrary,[15] or an ideological or organizational imperative to educate, is unclear. Regional Integrated Science and Assessment (RISA) teams funded by the U.S. National Oceanic and Atmospheric Administration are indeed analytic/deliberative efforts, to ensure scientific climate information meets needs of regional stakeholders (e.g., farmers, water utilities, governments—see www.climate.noaa.gov/cpo_pa/risa).[16] Yet RISA's valuable co-production of knowledge little increases the proportion of deliberation in actual CCC efforts to date; its decision support focus may or may not generalize to more diverse participants (see a later Fischhoff paper on dangers of best practices that are "unthinkingly copied"[17]).

These reviews suggest communication about climate change has been rooted in Fischhoff's first three plus good-deal stages. The risk rejection/acceptance stage is entirely absent, but precautionary action on other long-term uncertain threats might be inspiring.[18,19] Deepening animosity between climate deniers and climate scientists and activists, exemplified by Climategate, undermines potential niceness. Deliberative stages are also rare, with an increase caught between calls for more such efforts and examples by RISA and others, and continuing examples of science education emphases. Partnership is difficult given CCC emphasis on mitigating greenhouse gas emissions, with little thought to whether this supposed need or its methods might merit wider discussion (see Section 5).

2.1. Possible Internal Barriers to CCC Progress

If more emphasis on later strategies might increase communication success,[1,20] perhaps particularly for climate change,[21] why have CC communicators used them so little? Understanding this gap might be as important a research question for CCC success as refining strategies. Aside from topic-specific reasons reviewed shortly, attributes of CC communicators may hamper their efforts.

Possible explanations are laid out in Table II. Unconscious lack of empathy[17,22] may make it difficult to imagine other beliefs, attitudes, and behaviors could be meaningful to one's audiences. Cultural or ideological biases[14,23−28] might make only certain means tolerable to achieve desired ends, aside from questions of effectiveness, as in a World Wildlife Fund report arguing one cannot plausibly "market less consumptive lifestyles using techniques developed for selling products and services."[29] Although the literature on communicative rationality[30,31] implies CCC deliberation would be highly compatible with liberal, egalitarian, or universalist mindsets, perhaps this propensity has been overwhelmed by impaired perspective-taking or the boundary-breaching threat of taking climate deniers as potential partners. Combining climate change's great threat with great uncertainty whether humans will take preventive or adaptive action potentially creates in CC communicators fear without self-efficacy, which undermines action.[32,33] Emotional commitments can be so entangled in strategic and tactical choices that change in the first may need to precede the second.[34]

Table II. Hypothesized Factors for Partial Use of Fischhoff's Stages by Climate Change Communicators

Factor Type	Variants	Examples	References
1. Limits to perspective taking	(a) Morally important issues	Belief climate change is real, human-caused, catastrophic, and everyone's personal and institutional responsibility	
	(b) Professional blinders	Technology designers see its users as having characteristics consistent with predefined project targets, despite information to the contrary	22
2. Cultural or ideological biases	(a) Political liberals versus conservatives	Whether an environmentally fragile world requires global government interventions in the market for people's own good	14, 23
	(b) Egalitarians versus hierarchists and individualists	Former favor talk, less consumption (also reduces big business/government power they fear), decentralized technological innovation; latter favor centralized technological innovation and money	24–26
	(c) Those with universalism versus power and achievement values	Former favor inclusiveness, latter favor financial incentives or imposing rules on others	27, 28
3. Need for reassurance	(a) Social engineering implies mastery over individual behaviors[a]	Social marketing and social movement mobilization offer sense of controlling others that true deliberation does not	5 (p. 12)
	(b) Sense of mastery can help avoid despair	Persuasion and mobilization presume communicator has *the* answer	
4. Resources	(a) Funding or authority for a good deal	Activists have less money to offer incentives, and lack authority to relax regulations	147
	(b) Finding partners willing to talk	If CCC morality is questioned by putative partners	30, 31
	(c) Producing new technologies[b]	Activists often lack the financial or human capital to invent new tools	

[a]Geoengineering and geopolitical engineering (e.g., international, intergovernmental protocols) allow the same assumed mastery over the planet and governing institutions (Ref. 5, p. 12), presumably for other groups than CC communicators.
[b]Technological innovation is an alternative to communication for reducing energy use (Refs. 48, 59).

Finally, power and resources needed in later Fischhoffian stages are less available to many CCC parties than to neutral or denier parties. The weapons of the weak[35] include talk, more equal in its use across power differences than are deployment of money or force, but even use of new social media to diminish the advantage of the powerful with regard to one-way, mass-mediated talk will not substitute for deliberation.[36]

Thus a combination of cognitive, emotional, cultural, and resource factors might explain what my observation of practice, rather than of theory or inspirational arguments, implies is a CCC presumption that the right answers are known and one-way communication will promote mitigation of or adaptation to climate change. Whatever the merits of these speculations, all Fischhoff's stages can be valuable: "there is no single simple recipe for climate communication" (p. 5).[37] But each strategy carries assumptions about who is talking to whom with which powers that subtly shape prospects for success even in the proponent's own terms, much less in terms salient to others.[38] In weighing tradeoffs among strategies, CC communi-

cators need to consider how they conceive of both the people they want to reach[39] and themselves as CC communicators. A little humility can go a long way in communication; can this become a default condition for CCC?

3. PERSUASION

Persuasion aims directly at those whose behavior seems to need changing. No one assumes energy decisions just for homes and personal transportation will resolve mitigation issues, but CCC to date has largely focused on individuals and households, as I will do here. (Persuasion, of course, also can target institutions, as in the next section on social movement mobilization.) Persuasion has been studied and criticized more than social movement mobilization and deliberation, so the greater length of this section is not meant to imply it is a more valuable strategy.

Definitions of persuasion opportunities, barriers, or methods in CCC are too varied for full review. Analyses have examined alternative frames for

climate change, such as social progress, economic development, and Pandora's box/Frankenstein's monster;[40] corrected errors in mental models of its causes;[41] provided neutral information;[42] or probed how terms (global warming versus climate change) alter values or beliefs.[43] Arguments for a save-civilization message[44] contrast with the social construction of a barely conscious, seemingly natural denial of the implications of knowledge of CC.[45,46] Many projects use conventional mass media or public relations channels, but increasingly stress social marketing (public commitments, normative pressures),[47] touted as effective[48] if within limits.[49]

My focus here, arbitrarily, will be message definition and audience identification, arguing for the limitations of both much CCC work to date in these areas and of the alternatives.

3.1. Message Definition

As a loose framework for these comments I will use the values–beliefs–norms (VBN) model of environmental behavior (e.g., recycling and environmentalist group membership[50,51]), although it is not the only potential model for behavior change.[52,53]

3.1.1. Values

Values used to motivate mass action on climate change have been primarily social altruism (for one's grandchildren or residents of drowning atolls) or biospheric altruism (save the polar bears). While Crompton[29] urged CCC engagement with important values and identities,[54] he both disavowed monetary approaches and argued that CCC and general environmental success require explicit, intense promotion of environmentalist values because other means are insufficient or inherently contradictory.[29,49] Such approaches certainly help rally the already convinced, and cross-national assessments show how widely values are shared, if with diverse distribution across and within nations.[55] However, values are difficult to change; thus CCC might usefully supplement this by reframing existing high-priority nonenvironmental values for climate and energy action. One's case is much easier to make if the target's response is "I can achieve what I want this new way" rather than "I must abandon all my current aspirations in order to address climate change." Even small efforts, such as carpooling or use of mass transit, require at best reconciling potentially divergent

goods, and often goods with bads as well; the fewer such tradeoffs people foresee, the more effective persuasion will be. Although long-term impacts of social identities evoked by persuasion, such as "environmentalist" versus "money-saver," must be taken into account,[49] superiority of the former over alternative identities and values is still in doubt. For example, an English community-based pro-environmental behavior change effort built upon support for the local football (soccer) club, recruiting participants unmotivated by pro-environmental values.[56]

Money, faith, and health each have been suggested as communication frames that might provide common ground,[40] offering useful illustrations of strengths and weaknesses of the values emphasis. For example, money is already valued widely; well-designed financial incentives can have strong effects; and many cultures exhibit entrepreneurial and exchange values and behaviors without requiring capitalism (see Section 5).[57] An anti-consumption message is an obvious virtuous counterpart to commercial marketing, although what constitutes consumption is debatable, given data available on voluntary simplifiers.[58] Neutral as well as denier audiences might ask why those who wish to avoid monetary incentives (Section 2.2) would discard *any* tool as inappropriate if climate change would be catastrophic. On the other hand, price manipulations have little effect on institutional and trust barriers to behavior change,[59] financial incentives have unpredictable behavioral effects[2] (even sensitivity to price varies across individuals),[60] and money is a weak motivator when residential energy adds little to housing costs.[61] Among small business owners a strategy that touts environmental responsibility as a mere aid to financial success may backfire,[62] and promotion of green jobs may allow other parts of the economy to remain unsustainable, and even foster market consumption as another unsustainable way to be green.[63,64] However, as with other strategies financial incentives are heterogeneous, varying 10-fold or more in impact, based more upon their structure

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[2]Criticisms of financial incentives include that their effect often ends with the incentive, and they could undermine intrinsic motivations to act as desired.[49,65] However, these criticisms apply less (if at all) to purchase of equipment, a one-time action more effective at reducing energy use, than to changing usage behavior or to equipment maintenance, habitual behavior likely less affected by money than identity. This underlines the importance of not assuming identical dynamics of adoption/rejection for seemingly similar behaviors.[38]

than their magnitude;[65] generic criticism is less important than matching their design to needs.[60,66]

As for faith and health, several religions offer messages about stewardship of God's earth, the holiness of nature, the community of all beings, and other faith-based frames that cannot be reduced simply to social or biospheric altruism. Furthermore, several mainstream Christian denominations have affirmed environmental damage as a sin.[67] Efforts at faith-based reframing of CCC by liberal and fundamentalist Christians in the United States,[68] and by Moslems in the United Kingdom,[69] highlight the relative lack of religious or spiritual values in climate messages, insufficiently explained by need for credible religious sources of such messages.[70] However, we lack evaluations of whether faith- versus altruism-based messages, versus messages that do not even mention climate change, substantially alter energy behavior of liberal denominations, Muslim women, or American fundamentalists. Liberals, for example, may hear the CCC message as one more rationale for action and church just one more place to be exposed to it. Nor may appeals to spirituality lead to "reconciling a fragmented and argumentative world" (Ref. 5, p. 175). Health benefits of reducing greenhouse gases,[71] primarily from reducing pollutants associated with fossil fuel use, perhaps equal estimated costs of reducing greenhouse gas emissions, and would be highest in developing countries.[72] Yet these benefits have been little mentioned in CCC, although activists used health rather than climate arguments to lobby for regulations that would reduce methane emissions from oil and gas operations.[73] Those high in egoistic values might find public health benefits salient,[74] although also perhaps inclined to fear job impacts of such limits.

Beyond money, faith, and health, a national security frame for CCC could stress action's value for avoiding military involvement in volatile areas,[75] and perhaps to lessen motivation for terrorist attacks. If national security is interpreted as implying "energy independence," this might increase support for tapping all domestic oil, natural gas, coal, and uranium resources, or focus audiences on terrorism and warfare in general. However, one could counter that efficiency and renewable energy are less vulnerable to terrorism than oil wells, pipelines, and nuclear power plants; redefine independence as not simply freedom from foreign energy supplies; or define national security excluding anti-terrorism or independence implications. Framing anti-CC action as consistent with the status quo and patriotism (e.g.,

"Being pro-environmental allows us to protect and preserve the American way of life. It is patriotic to conserve the country's natural resources") eliminated climate change denial, and reduced system justification undermining motivation for pro-environmental action.[76]

Finally, CCC need not evoke only praiseworthy values. Making status motives salient led to choice of green products over nongreen products, despite the latter's relative luxuriousness, particularly when shopping was public and green product prices were higher. Altruism in this experiment became a costly, thus valued, signal of status.[77] For those who already believe in anthropogenic warming, collective guilt significantly mediates between this belief and willingness to act against greenhouse gases, whereas collective anxiety does not.[78]

3.1.2. Beliefs About Consequences and Vulnerable Entities

The overall drawback of emphasizing values to motivate behavior change is that values have only indirect effects on behavior,[57,59] so other tools should supplement CCC value framing and targeting, such as consequences and their targets.

Current CCC tends to frame as salient consequences loss of nonhuman species, more droughts in Africa, or swamping of Pacific atolls and much of Bangladesh by rising seas. Yet emphasizing more direct climate change impacts, as in visualization of local coastline effects in Delta, British Columbia,[79] might enhance concern and action; as climate change produces multiple hazards,[18] many candidate concerns are feasible.[80] For example, Los Angeles residents were more concerned about drier or hotter climates than wetter or colder ones,[81] and concern about climate change seems highest in parts of the United States recently experiencing warmer, less snowy winters.[82] Residents of areas of significant warming and high natural hazard incidence supported climate change policies more than residents of coastal areas subject to inundation, perhaps due to coastal locations' offsetting benefits. However, coastline proximity and natural hazard fatalities raised risk perception, while increasing temperature trends and floodplain residence did not.[83,84] In short, the distress people feel when a valued environment suffers harmful change[85] offers leverage to make potential climate change effects salient.

Some researchers suggested physical or bodily exposure to a hazard motivates actions, proposing

that high room temperature and humidity might heighten a climate change simulation's salience.[86] Experience of severe weather or climatic events may help integrate climate change into one's frame of reference, if not undermined by contested definitions of "natural" versus anthropogenic change[87] or mixed interpretations of experience and its meaning across hazards and contexts.[88]

Other kinds of consequences could be deployed for smaller audiences. Hunting and fishing organizations petitioned the U.S. government to act on mitigation and adaptation, concerned about shifting climatic zones' effects on members' pleasures.[89] Farming impacts have featured in adaptation in the developing world, less so elsewhere, and recreational impacts for such industries as skiing. Messages that emotionally tap core identities and concerns of the audience—as state independence, outdoor spaces, water, lifestyle, and locals versus outsiders did for residents of coal mining areas of Wyoming—may be more effective than expertise-based messages about benefits and harms of carbon capture and sequestration, although this was not tested directly.[90] These and other impacts if featured more prominently could widen potential audiences for CCC, including some climate neutrals and deniers not otherwise open to persuasion.

3.1.3. Target Behaviors

Appropriate behaviors emphasized in CCC have included reducing fossil fuel consumption in home lighting, heating, and personal transportation. Yet this need not mean that mitigation-related behavioral changes subject to far less CCC attention are less effective, perhaps due to relative plasticity of behavior (proportion of targets that could be induced to take the action), low utility, or presumed negative nonclimate connotations for some audiences. For example, increasing vegetarianism to reduce fossil fuel impacts of industrialized carnivorism is rarely mentioned,[91] even less than the related local food argument, which tends to unduly assume closer is less energy consuming.[92,93] Adaptation has until recently been the black sheep of CCC, with activists fearing its mention would undermine the mitigation case: If we will suffer climate change impacts anyway, why bother cutting greenhouse gas emissions? Yet adaptation might justify cooperation across otherwise contending groups, even if this focus ignores some impacts of climate change impossible to

tackle without mitigation, such as ocean acidification. For example, Nigel Lawson, Thatcher's Chancellor of the Exchequer, claimed adaptation is more cost effective than mitigation and requires less global agreement over burden sharing.[94] Furthermore, their often common causes allow benefits from similar strategies.[95] Finally, a behavioral focus partly liberates CCC from need to mention climate change, which in some cases (Section 3.2) would hinder success.

That said, promoting behavior change remains challenging despite advances in the last 30 years. Practitioners are still learning how to conduct interventions at the point of decision (e.g., equipment purchase). Meanwhile, incentives, legislation, or technological innovations that disrupt existing cues for habitual behavior (e.g., by removing supportive social contexts) and establish new ones (e.g., by setting new social norms)[96] require even more creativity and multi-institutional alliances to pull off.

3.1.4. Limits to Persuasive Flexibility

Values, consequences, and behavioral strategies work best when audiences find meaning in them already[87] and nonpsychological constraints are weakest.[37,97] The more CCC supporters stress messages *they* find persuasive, the less such messages will resonate with diverse audiences (next section). Doing more of the same simply because doing less did not work is not a sound strategy; if current emphases fail to work, or work widely enough, one must find something audiences do care about.

However, no suite of persuasive hooks will do the job alone. There is competition for audience attention, message content is only part of persuasion (e.g., trusted sources; capacity to implement suggested behaviors; social norms), and household energy use is best predicted by factors (income, life stage, location, size) not amenable to exhortation.[59,98] Noncognitive barriers also limit swift success, e.g., denial of uncomfortable emotions and compliance with local emotional norms both serve individual needs and perpetuate national economic interests and global disparities;[99] hiding in the present or past to avoid thoughts of the future and anchor oneself against changing times;[1,45,100] and grieving for one's current situation as prelude to moving to the next stage of behavioral change.[101,102] Norgaard argues that the mix of socially constrained personal denial with organizational cultures, and complexity

of production and consumption, raise doubts about individual ability to grapple with climate change (Ref. 45, pp. 366–367).

3.2. Audience Identification

If communicators imagine their climate change audiences too narrowly, whether as fellow travelers or potential enemies, CCC aims, strategies, and communication methods also will be unduly narrowed. Yet salient groups are much more diverse than CCC to date seems to have acknowledged. For example, small-business owners of Modbury in Devon, United Kingdom unanimously agreed in 2007 to refuse to provide plastic bags to customers, becoming the first town in Europe to ban them.[103] The tendency to market such habit changes to consumers themselves indicates the imaginative leap needed to conceive of small businesses as a suitable target for persuasion. Carrigan *et al.*,[103] however, show they can be quite amenable to such changes as long as their resource and knowledge constraints, and social contexts, are properly addressed; treating them as petit bourgeois profit maximizers beyond persuasion is both incorrect and a loss of opportunity.

Several studies[61,104–108] offer segmentation data on climate change, for example, identifying publics distinguished by their stances toward problem recognition, constraint recognition, and involvement.[109] However, far less attention has been paid to how these attitudinal differences might translate into need for different communication strategies or being at different stages of behavior change.[110–112] For example, some people might be amenable to change, but lack needed facts; others might lack motivation or be completely unaware of the issue. Communication should emphasize issues pertinent to the stage in behavior change reached by one's audience, yet segmentation analyses to date may not provide appropriate data, while such analyses' attitudinal data might suggest further distinctions within the limited steps envisioned by current stage models of behavior change. Corner and Randall[49] note that segmentation may undermine development of social capital and sustainability norms, although perhaps more for segmentation by beliefs and attitudes than by social networks.

It seems "the vast majority of people who believe we should do something about climate change believe that we shouldn't do anything very difficult, expensive or inconvenient—pretty much what the skeptics believe[, except] that if it doesn't cost [the majority] anything substantive, they'd be happy if the problem went away."[113] Thus perhaps CCC should not be unduly concerned about avoiding engagement with deniers of climate change, its causes, or efficacy of proposed solutions, particularly as these foci of doubt have varied over time and space,[114] offering assorted vulnerability to persuasion. In fact, a 30-year-old argument for the general need of social movement rhetoric to transform its target audiences' views of past, present, and future history parallels the full range of CC denial: audiences "may be unaware of a problem, may refuse to believe that a problem exists, may believe that the problem does not require drastic action, and may be optimistic about the future" (p. 302).[115] Deniers of climate change, or that it would be detrimental, might be reached by removing "climate" and "climate change" from arguments for mitigation and adaptation, as these self-defeating terms evoke notions—nature as fragile; doom-saying—incompatible with deniers' worldviews.[116] It can be debated whether "most local, state, and private-sector mitigation efforts in the United States to date [already] mention climate change only in passing or as a secondary justification, instead arguing for solutions to more immediate problems (such as air pollution) or highlighting immediately felt and highly resonant benefits (such as saving energy and money),"[117] yet more could be done in this vein. Those who acknowledge undesirable climate change but doubt it is anthropogenic can be targeted with arguments for adaptation, and for forestalling greenhouse gases' release from or foregone sequestration in such natural or quasi-natural sources as peat bogs, tundra, undersea methane hydrates, deforestation, and livestock. Whether deniers are converted by these methods, what is said to or about one population segment is heard by others, including audiences CCC supporters might find more amenable to such arguments. Further, CCC is not the only source of messages; deniers and a host of sources for nonclimate messages produce noise (and undoubtedly some sense) that obscures the CCC signal. Success is not simply producing a message effective in isolation, but in producing one that reaches the intended audience, grabs its attention, wards off counter arguments and other static from the audience, mass media, the Web, and social networks, and gets encoded in memory and behavior.

Several objections can be raised to such broadening of CCC audiences. Scientific literature on persuasion, confirmation bias, and third-person media

effects raises questions about the efficacy of treating climate deniers as persuadable. Deniers fit oddly into stages-of-change models: they are neither ignorant of the topic nor motivated to mitigate, but differ from the as-yet-indifferent by actively opposing—in words if not deeds—both behavior change and alleged reasons for change. Besides individual resistance to "an inconvenient truth" and institutions' resistance to their interests being harmed, a concerted effort over decades by corporations and conservative think tanks has helped create and maintain a strong denialist stance about climate change.[23,118–120] Those who deny global warming or the human role in it, an estimated 7% of the U.S. population,[104] have been targets of hostility in turn from CCC supporters. Besides doubt about either side's ability to be nice (Table I), CC communicators may argue that talking to them only encourages or legitimates deniers, wasting the time of or even co-opting supporters, and watering down policies. Certainly the history of environmental policy is littered with examples of such problems, but this must be decided case by case. If people generally foreswore talking to (alleged) fools, hostiles, and scoundrels, life would be rather lonely, and more to the point, likely ineffective. Given the dangers of an individualist style of social marketing,[49] strategies that build upon social networks and place and other pertinent identities rather than consensus on climate beliefs and attitudes seem suited to building bridges to these groups rather than erecting barricades against them.

3.3. The Nonpersuasion Stance

I cannot end without noting that some risk communication scholars, in general[121] or for climate change, raised doubts over the universal value of persuasion. Pidgeon and Fischhoff[37] warned against scientists becoming polemicists,[122] while Weber and Stern belittled "disguised efforts to engage support for a line of public policy" (Ref. 18, p. 323). Fischhoff[17] also noted that persuasion provides clear instructions but can arouse suspicion, while nonpersuasive approaches offer autonomy and self-efficacy at the cost of forcing decisions people may be unable or unwilling to face. Lopez[36] argued that "industrialized" mass frames (e.g., national security) "feel more like pandering to an abstract political discourse rather than cultivating awareness, responsibility and action" (p. 103). My focus on persuasion here is not meant to favor it over, say, the nonpersuasive deliberation discussed later, merely to point out that

within its limits more is feasible than seems yet to have been deployed in CCC to date.

4. SOCIAL MOVEMENT MOBILIZATION

Sociologies of science, technology, and knowledge have shown neither users nor developers solely determine an idea's or technology's design, use, or users.[123,124] But clearly, physical, social, and economic constraints within which short-term individual and household decisions will be made are often determined by government and business decisions, products, and services. For climate change mitigation, people will not adopt mass transit, energy-efficient lighting, home weather-proofing, or low/no-meat diets where those energy-reducing options are either not available or intolerable. Institutional decisions on land use, employment, transportation infrastructure, product design, agricultural subsidies, regulation of energy contractors, and product pricing, among many others, constrain individuals to a large degree. Thus prospects for energy-focused attitudinal and behavior change by individuals depend in part on change by institutions, which in turn depend to some degree on individuals' collective pressure on those institutions.[125]

Brulle[126] argued that the market imperative "to maximize return on investment through continuous economic expansion," and government's imperative to ensure "security,...economic growth, and...its political legitimacy" both limit the scope of allowable environmental policies. Thus marketing-based appeals to self-interest and identity-based appeals to core values of mass persuasion assume that planning and regulation will allow economic growth while curbing undesirable environmental effects. But beyond effectiveness, Brulle[126] argued that persuasion infantilizes citizens by manipulating them with environmental and communication professionals' definitions of the public interest, undermines broader and more radical mobilization by treating citizens as atomized consumers, and leads to continuous spin wars among elites competing for political advantage by shifting poll figures. These observations complicate the seemingly simple question of what to do about CCC.

The last 40 years have seen several explanations of social movement evolution and behavior: resource mobilization (e.g., material resources, elite support),[127,128] political process (e.g., opportunity structure; social networks),[129,130] new social movement (e.g., collective identity[131,132]), and new

culturalist (e.g., framing[133]). The last is the most explicitly communication oriented, but despite possible overextension of these varied perspectives,[134] communication complements other mobilization factors just as it complements noncommunication factors in promoting behavior change among individuals.

Social movements aim to transform, whether through collective political action (e.g., women's suffrage; environmental action groups), cultural action (e.g., messianic religions; collective self-help efforts), or a combination of policy and self-change.[135] Hence the centrality of conflict in defining social movements[118]—and their explicit subversion of social reality.[115,136] The profoundly conservative, taken-for-granted nature of the world is difficult even to see, meaning that those who are dominated must struggle to break free from their own complicity in the dominant ideology, a breakout not feasible with mere will or education.[115,137,138]

A central element of social movement emergence is an organizing narrative that defines a problem, a blame-worthy target, and a proposed solution mobilizing citizens to pressure the target (even themselves) to enact the solution.[139] While persuasion can be part of political mobilization favoring social change, the latter highlights collective rather than individual action through subversive narratives (e.g., highlighting injustices and ideological bias in mainstream messages; "a rhetoric of salvation") and methods (social interactions and dialogue; civic engagement).[126] Broader taxonomies of the functions of social movement rhetoric also include such items as justifying setbacks and delays, and maintaining the visibility of the movement.[115]

Mobilizing also inherently evokes norms of responsibility,[108] of the potential activist as well as of the movement's institutional targets.[140] While the VBN model[50−51,142] of environmental behavior posits that a norm for personal action derives from awareness of negative consequences of inaction, for at least some hazards people may see attempts to recruit them for personal action as a denial of business' and government's responsibility for the problem and/or the solution.[141,142] This belief could enhance political mobilization but undermine self-transformative mobilization and persuasion; alternatively, citizens recruited to a political social movement partly from a felt imbalance between true and ascribed responsibilities might thereby be more willing to act themselves. Such personal action, if a criterion for membership in a political movement,

could reduce its members' apparent hypocrisy or shirking of duty, and as part of the movement narrative place a claim upon the target institution to meet its obligation as others have done.

Movement mobilization has more potential than one-shot persuasion efforts to foster medium-to-long-range behavior change, across both individuals and institutions, if movement organizations have sufficient commitment, resources, and opportunities. A few calls have been issued for using or creating social movements in favor of climate-change-related action.[108,143,144] Brulle has particularly argued that a sustainable society may require "a tough and confrontational political/cultural struggle" that he suggests makes communication scholars too uncomfortable to outline transformative communication strategies.[145]

On the political end, the Sierra Club's Beyond Coal campaign is an example of CCC mobilization against nodes in market and political structures that leverage larger forces. Its often successful attempts to delay or block coal power permits awarded by state utility commissions immediately affect individual firms, of course. But they also influence larger capital flows by signaling to institutional investors an increase in cost of coal-based carbon and in risk of failing to achieve expected returns from coal-power investments.[146] Only this approach, it is claimed, will exert needed "changes on the *scale and timetable* that climate . . . crises require" (Ref. 146, p. 125, original emphasis); short-term mass-public efforts, such as the one-day Step It Up campaign or 350.org's solidarity events, do not influence the powerful. However, insider methods such as lobbying, lawsuits, and participation in stakeholder processes do not foster ecological citizenship,[108] relying on the public only for donations. Whether insider approaches are inevitable concomitants of movement success or cooptation (e.g., need for foundation and government funding), or options that succeed when presence of radicals makes compromise with insiders more palatable to the powerful, are widely debated.[147−150] But mass political mobilization around climate change has been attempted little, if at all.

On the cultural end, Global Action Plan's EcoTeams of 4–8 people, preferably from the same street or at least neighborhood, meet monthly over four to six months to discuss how to address household environmental issues. These higher wealth people already have green intentions and social networks, but achieve significant reductions in waste production and energy use. Meetings

offer participants social support and affirmation, performance contrasts to other greens, and education on how to do more locally or with a specific system.[151] Similar small-group efforts to promote grassroots discussion and action for low-carbon personal behavior change include car clubs to share access, "walking buses" to take children to school, and Carbon Reduction Action Groups (also see www.transitionnetwork.org).[125] How much this approach would appeal to those not already at that late stage of behavior change,[110–112] whether participants become evangelists for the cause, and the relative effectiveness of collective energy behavior transformation versus individually focused persuasion are all uncertain.

Social movement mobilization faces several challenges. The mobilizing narrative needs to be compelling and to fit sufficiently with prior worldviews to be accommodated despite its subversive text,[152] possibly more difficult for climate change than for many other hazards, and for certain CCC themes (e.g., anti-consumption) in particular. Even within the environmental movement there are multiple discourses available to adapt to different audiences,[153] but their often conflicting messages also could create more cacophony than clarity. Intentionally mobilizing narratives are no more guaranteed to produce intended results than are persuasive messages.[36] Variations in frames' accessibility in memory, movement narratives, and mass media; interpretations; and effects are never fully controlled by activists, as too many potential structural and individual moderators intervene.[154] As a result, "the shift from the implicit to the explicit [in conflicting understandings] is in no way automatic: the same experience of the social may be uttered in very different expressions" (Ref. 136, p. 730). Even when the deployment of alternative perspectives succeeds it can yield unexpected effects: environmentalist discourses and mobilization efforts managed to help scotch waste-to-energy plants in the United States and resuscitate recycling as more than a trivial option for managing solid wastes, but also helped make recycling a for-profit enterprise rather than a radically transforming grassroots, decentralized activity.[155]

Despite radicals' fears of marketing or conservatives' fears of a Leninist power grab, both persuasion and movement mobilization aim to prompt behavior changes,[156] which is manipulation (a descriptive rather than pejorative term here) regardless of who does it or whether the frame sincerely represents the communicator's identity.[36,126,157] Will integrating persuasion into political mobilization[120] avoid the atomization, social distancing, ethical, and other charges brought against persuasion on its own? Further, the denial of climate change implications—not its existence, as in the "deniers" most often the focus of CCC angst—found among the concerned but nonactive, noted earlier, is a challenge for mobilization as well as persuasion. If those privileged enough to be able to act effectively against climate change impacts and other unjust outcomes are the very ones least able to see them (Ref. 45, p. 367), we need worry little about free-riders stifling mobilization. The tensions over movement goals and adherents' motivations—is it large-scale transformation of society or alteration of one's life's meaning?[158]—add to the difficulty. If one can only engage people in climate change activism by linking it to attempts to address unemployment, financial challenges, and economic inequality—invoking collective fate despite political or cultural polarization[159]—this raises the bar for mobilization even higher. Perhaps these barriers can be partly offset by encouraging grassroots innovations with personal carbon allowances,[125] although this policy likely requires political mobilization to be adopted.

Both political and cultural mobilization can be undermined by institutions' responsiveness and counter-subversion,[160] as well as by counter-movements that are not always institutionally supported fakes.[161] Making climate deniers the "bad guys" can energize both adherents and opponents, turning a potentially more subtle struggle into a matter of brute force that status-quo-supporting institutions are likely to win. If American mitigation efforts are little worse than those in countries with far more consensus on climate change or energy policies (e.g., Denmark, Netherlands, Japan), can climate skepticism really be the cause, and a battle against it the solution?[14] Furthermore, the conflict-based narrative presents problems for climate change movements, as it means to some extent warring on oneself and other potential recruits; blaming others for climate change is only plausible to a point. If CC action will require simultaneously tackling barriers in the legislature, the mass media, public opinion, and elections,[162] this further raises the odds against movement success. This does not mean the attempt is fruitless or guaranteed to fail. But social movement mobilization's strengths relative to persuasion (e.g., greater personal engagement; tackling structural constraints on individual and collective behavior; creation of facilitating social norms) are complemented by great

barriers as well (e.g., narrower appeal; more direct opposition).

5. DELIBERATION

Several observers have noted the vital role in environmental, energy, and climate change choices of the desired future: "the kinds of lives people want to forge for themselves, their communities, and their descendants;"[163] "the vision of a desirable urban (or even more broadly, national or global) future...to sustain engagement in mitigation actions;"[164] "choices about human identity and community—about what kinds of communities we live in and how the risks and benefits of modern societies are distributed."[39] While both persuasion and social movement mobilization feature such visioning, their futures are largely prepackaged because social marketers, movement entrepreneurs, and proselytizing neighbors all want you to buy *their* visions of that future. By contrast, ideally deliberation is a means to identify problems and develop solutions through brainstorming and (perhaps) consensus decision making; the aim is the process, with solutions at most emergent. It promises production of widely acceptable solutions that probably were not on participants' agendas before the deliberative exercise, but its threat is that participants must be open to alternative views and positions that may be self-subversive. As with collective action, deliberation can foster shared commitment and responsibility, creativity, confidence, and challenges to the status quo.[165]

How might deliberation be used in CCC? Seeking wholesale transformation of global society into a low-energy, low-consumption enterprise means layering these social uncertainties (including inevitable pleasant and unpleasant unintended changes) onto those of physical climate change. Deliberation might bridge the gap between those who fear radical change, and those who fear a piecemeal approach may not stem inertia or obstinate powers. By contrast, persuasion and social movement mobilization could be construed as treating public opinion as if it were the object of an athletic contest, which might be ineffective as well as undemocratic.[36] The deliberation route potentially allows people to take part in decisions about their own communities, identities, and futures, and thus in climate change solutions. CC communicators' decisions about what is at stake or what are tolerable tradeoffs do not necessarily match their audiences' views, nor may all

parties clearly imagine options already in mind without the opportunity offered by informal or formal deliberative processes with "the other" to explore possibilities. For example, limiting consumption rather than seeking only sustainability[166] has become an increasing focus of scholarly interest,[167–169] with a strong contingent urging an end to the "treadmill of production"[170] of capitalism itself. Popular aspirations to keep up with the Joneses, Chuns, Guptas, Rodriguezes, and Appiahs, and fears of constrained choice; government concerns about policies that might restrict needed revenues or foster political instability; and business concerns about how to benefit from nonconsumption all pose critical challenges to this agenda. Nor can we ignore billions in dollar-equivalents spent by businesses and governments worldwide to encourage consumption. Unless social movements or changed institutional incentives remove these obstacles, only deliberation might address them. That need not involve a compromise that leaves the current system largely intact, at least hypothetically. Because "different ownership patterns, resource availabilities, social facilities, and rules of operation" can produce diverse "prices, terms of trades, income distributions, and, more generally, very different overall [market] outcomes"[171] (pp. 136–137), restructuring market systems could be an alternative. However, scholars debate whether such ecological modernization eliminates or merely postpones the clash between capitalism and environmental quality.[172,173] Global deliberation, if without discussion of logistics, also has been proposed for any geoengineering research, as representative democracy seems insufficient for projects with major, diverse, and uncertain consequences.[174] Proposals to address climate change as a risk management issue—i.e., which societal risks associated with climate are we prepared to take at what cost?[8,9,17,175]—also are ripe for deliberation. Small, perhaps one-shot deliberative efforts could be part of social movement mobilization and of mass persuasion, as narratives help people see anew a difficult or controversial issue.[176] When recorded with permission, video and Web streaming of such deliberations in small, slow communications through such venues as community radio stations and bottom-up poetry slams or discussions of documentaries[36] could help send deliberation viral.

However, deliberation has its own challenges.[177] Given apparent urgency of action now to limit centuries of potentially undesirable global conditions, it may seem unduly time-consuming versus alternatives. Deliberation, as with all risk

communication, has validity, reliability, and representativeness challenges whose solutions in actual policy formulation or adaptive management are still emerging.[178,179] Effective deliberation must occur in small groups, limiting its mass-change applications to seeking limited agreement among influential individuals or focus within a social movement organization or network. Nor is it yet clear how unequal powers will be controlled so discussion will be mutually productive, not merely consensual.[31] Deliberation also requires all participants be treated nicely (Table I), which raises uncomfortable questions. Acknowledging that observing climate change cues is difficult even for scientists, much less others, fits with advice on correcting mental models;[180] coupled with explanation that this acknowledgment does not recant on anthropogenic climate change, this may get neutrals and moderate deniers to realize CC communicators are actually listening to them, and thus merit attention in return. Yet being honest about uncertainties and acknowledging the understandable points of others, however consistent with Habermasian notions of fair process,[31] might merely fuel deniers' use of uncertainties to undermine action.[1,5,119] However, these latter problems arise from direct discussion of climate change; if deliberation instead emphasizes energy diversification or enhancement of social resilience against shocks of any kind, these problems may be postponed. Deliberation can be successful, if slow, even when participants are initially defensive, but requires all to acknowledge that not taking part risks even greater potential catastrophe than does participation. That acknowledgment will not occur in many cases.

6. LARGER CONTEXT

Persuasion, social movement mobilization, and deliberation all have defects. Persuasion alone might fail in mitigation or adaptation, and leave the populace atomized as individual households. However, persuasion and deliberation are more likely to reach those not yet convinced of climate change's reality, importance, or causes than will social movement mobilization, at least until its spread creates a bandwagon effect. Mobilization and deliberation have greater potential than persuasion to emphasize institutions' responsibilities; social scientists disagree whether voluntary action alone leads people to start demanding policy changes.[181] Persuasion and mobilization can potentially reach and engage many,

while deliberation engages few directly, although its outcomes might be usable in subsequent persuasion and mobilization.

Thus the presumed best alternative for CCC would combine two or three of these, alone or combined with noncommunication strategies (e.g., financial; technological innovation; command and control). Mixed strategies may be vital for success at multiple scales from very local to global,[5,48,125,182] with the mix fitted to the target. For example, persuasion and deliberation could jointly help mobilize social movements, which in turn could pressure both institutions and individuals (subject also to institutions' persuasion efforts). Institutions also might undertake internal or cross-organization deliberation on internally driven change,[183] which at minimum might create elite divisions[184] that open up the political opportunity structure for social movement action.[130–131] This approach is even more feasible given the diversity within strategies: e.g., persuasion can be individualistic or communitarian;[49] movement mobilization can be inclusive or divisive; deliberation's agenda can be narrow or broad.

Criticisms of a mixed strategy also can be raised. Whether scattering available resources across multiple approaches is cost effective is debated (e.g., contrast Ref. 48 with Ref. 5, p. 339); some strategies may be unnecessarily redundant, as when financial incentives or disincentives are sufficient to change energy behavior without persuasion, or vice versa. Segmentation by attitudes may not always work in a globalizing world, for example, as those asked to implement biospheric values in personal and collective action overhear messages aimed at others' egoistic values to seize monetary opportunities offered by behavior change, and vice versa. The use of some strategies and channels of communication has been argued to be self-contradictory, undercutting their intended aims.[29,36,49] Hulme argues against the vain dream of "solving" climate change—and, perhaps, CCC—through cobbling together solutions via "multiple values,…frameworks,…and voices" (Ref. 5, pp. 334–339). Instead, he urges proliferation of "creative applications of the idea of climate change" in technology, art, social movements, adaptation, and other areas that he hopes will "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" (Ref. 5, pp. 363–364).

What are the implications for CCC of achieving a more diverse communication approach (Section 2)? Deliberation allows for partnership and

mutual respect, while in movement mobilization partnerships are contingent and niceness often not a productive strategy. In fact, neither social movements' rhetoric nor logistics fit well in the Fischhoff sequence (Table I), developed to explain evolution only of government and business risk communication. Yet the three strategies together might reasonably cover Fischhoff's stages, assuming CC-oriented social movement mobilization can be aroused from its current anemic state and deliberation can be promoted by convergence of academic resolution of technical challenges and practitioners' recognition of its benefits. My assumption is not that later stages of the Fischhoff sequence are better than earlier ones, but that CCC is more likely to achieve its goals by using the range of strategies best suited for the goal and situation.

A final comment addresses the heterogeneity of leverage points and levers CCC should exploit, despite potential contradictions. Temporal and structural gaps between aims and opportunities, and between attitudes and behaviors, offer potential for personal and social change with sufficient creativity and support (Ref. 34, p. 483; Ref. 103, p. 521–522). For communicators to seize these chances—and, especially, to aid people individually and collectively to identify, appreciate, and exploit them to achieve their own goals—they must be attuned to the particularities of people's lived situations at several scales simultaneously. This will require both researchers and practitioners to be patient, imaginative, and reflexive.

7. CONCLUSIONS

There is wide agreement—if more among theorists than in practices of governments, activists, and scientists—that information provision alone is a weak tool for climate change communication: "Lack of understanding and concern is not the limiting factor" (Ref. 18, p. 325) in household and organizational actions to mitigate or adapt to climate change. Less agreed, or even noticed, are the differing response efficacies within, as well as across, such communication types as persuasion, social movement mobilization, and deliberation. Not everything works, but success depends upon matching a strategy to appropriate goals, audiences, resources, and contexts, and far too often the necessary careful research and design has not been done.[17] The aim of this article has

been to provoke self-reflection and creativity among climate change communicators.

One need not accept that social engineering implied by persuasion and mobilization is doomed to failure[5] to consider a broader and more flexible approach to CCC, whether that includes deliberation or simply a willingness to accept uncertainty, surprise, and more-than-occasional disappointment as inevitable results of CCC as well as of climate change. Narrowly focused CCC, whether for informative, persuasive, or democracy-building purposes, is to be expected, particularly by those convinced it is "the overriding project of this generation" on which alone "future generations will judge us" (Ref. 5, p. 339). The CCC program I discuss here—mitigating of and adapting to climate change—differs on the surface from that of the Hartwell Paper,[185] which emphasizes energy diversification, short-term sustainability, and enhancement of social resiliency. Yet except for my willingness to make climate change a more explicit focus where (occasionally) feasible, my suggestions for CCC are consistent with those of the Hartwell Paper and its co-author Sarewitz:[14]

> a successful politics of climate will be advanced upon the pursuit of multiple agendas, pursued along politically feasible lines, for their own sakes, with progress toward climate management as a contingent benefit of the successful pursuit of these agendas.

My message here has been that CCC need not be harmed by self-inflicted wounds, including those of excessively narrow instrumentality.[49] Diversity alone will not save us either; I have tried to indicate some limitations of alternative persuasion, social movement mobilization, and deliberation approaches. But the hopeful stance behind diverse thinking about CCC is that success is more likely by attempting than not attempting the seemingly impossible.[186] Perhaps persuasion will convince everyone; social movement mobilization will enroll some and force others; deliberation will allow everyone the chance to build unexpected dreams together. Self-understanding, like truth, may not be as liberating as claimed, but introspection might offer CC communicators a springboard to renewed creativity, commitment, and success.

Risk Communication and Public Engagement, July 20–22, 2010, Cumberland Lodge, Windsor Great Park, United Kingdom offered me the chance to make these observations. Workshop attendees, and two anonymous reviewers, also helped improve this article.

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