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Climate Change as a Predictable Surprise

Max H. Bazerman,
Graduate School of Business Administration
Harvard University

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Abstract

In this article, I analyze climate change as a "predictable surprise": an event that leads an organization or nation to react with surprise, despite the fact that the information necessary to anticipate the event and its consequences was available (Bazerman and Watkins, 2004). I then assess the cognitive, organizational, and political reasons why society fails to implement wise strategies to prevent predictable surprises generally and climate change specifically. Finally, I conclude with a call to action and outline a set of response strategies to overcome barriers to change.

Climate Change as a Predictable Surprise

The issue of global climate change was first noted by the media in the 1930s when a prolonged period of warm weather demanded explanation; however, interest in the matter dissipated when cooler temperatures returned. Decades later, scientists documented melting glaciers and other environmental disturbances as clear evidence of widespread global warming. Accepted as fact by most experts, climate change became almost impossible to ignore—yet many politicians, and the voters who elect them, have done exactly that. Society's ongoing lack of attention to the issue of global climate change is likely to result in global costs that dramatically exceed the costs of prevention. In an essay on climate change, economist Thomas Schelling (1984) wrote: "There isn't any scientific principle according to which all alarming possibilities prove to be benign upon further investigation." Many nations finally rallied to the issue in a landmark agreement, the 1997 Kyoto Protocol, which called for the return of greenhouse emissions to 1990 levels by the year 2000. But because the United States has refused to ratify the measure, the Protocol did not achieve its stated objectives and may never be fully implemented.

Scientists tell us that the problem of climate change will not solve itself. The effects of global warming on ocean levels and weather patterns will dramatically change the climate of some areas. Glaciers will melt and oceans will rise, with potentially disastrous consequences for coastal areas and low-lying countries such as Bangladesh. Some islands and coasts will become uninhabitable; dikes will have to be built to protect cities and agricultural land. Millions will be forced to relocate; others will have to reorganize their systems of farming. The net change is expected to significantly decrease

food production. Currently, crop production and distribution is barely keeping pace with population growth, and climate change is likely to upset this balance.

The Third Assessment Report of the Intergovernmental Panel on Climate Change presents a comprehensive overview of the consequences of climate change (Watson et al., 2001). My goal is to explore the cognitive, organizational, and political barriers to an appropriate response, barriers that persist despite the clarity and urgency of the scientific community's arguments for action. Michael Watkins and I (Bazerman and Watkins, 2004) have argued that the events of September 11, 2001 were what we call a "predictable surprise," as were the fall of Enron and other recent corporate financial scandals. We define a predictable surprise as an event or set of events that catch an organization off-guard, despite leaders' prior awareness of all of the information necessary to anticipate the events and their consequences. Most leaders, from managers to presidents, recognize growing systemic weaknesses in their organizations, in their nations, and in the world that have the potential to flash into a major crisis over time. Recent disasters such as 9/11 suggest that individuals and organizations are unlikely to respond efficiently, effectively, or swiftly to avert a predictable surprise.

In this paper, I argue that the disasters that will occur as a result of climate change are a predictable surprise. I will identify the barriers that prevent our leaders from pursuing the wise strategies that could aggressively confront this predictable surprise. Visionary and courageous leaders anticipate predictable surprises and take action to mitigate the damage of such threats. Yet far too often, leaders are predictably surprised. The United States' lack of preparedness for a terrorist attack using commercial airliners rendered the nation terribly, and avoidably, vulnerable. Likewise, unwillingness on the

part of U.S. government to deal with well-recognized weaknesses in the financial oversight of companies set the stage for Enron's collapse.

I assume that many readers will be skeptical of the claim that 9/11 and the collapse of Enron were predictable surprises. A full treatment of these arguments is beyond the scope of the current paper (see Bazerman and Watkins, 2004). But, in short form, consider the weaknesses in the U.S. airline security system that led the terrorists to decide to use airplanes as weapons. Our government knew that militant Islamic terrorists were willing to become martyrs for their cause, and that their hatred and aggression toward the United States had increased throughout the 1990s. Our leaders knew that terrorists bombed the World Trade Center in 1993, and that, in 1994, terrorists hijacked an Air France airplane and attempted to turn it into a missile aimed at the Eiffel Tower. In 1995, the U.S. government learned of a failed Islamic terrorist plot to simultaneously hijack eleven U.S. commercial airplanes over the Pacific Ocean, then crash a light plane filled with explosives into CIA headquarters. These details existed in many General Accounting Office reports and/or were identified by Vice President Al Gore's special commission on aviation security, as were the lax screening, minimal training, and low wages prevalent at U.S. airport security checkpoints (Bazerman and Watkins, 2004). Any frequent flyer knew how simple it was to board an airplane with items, such as small knives, that could be used as weapons.

Add up these details, and you have a predictable surprise waiting to happen. Yes, no one knew, and arguably could not have known, that terrorists would use four airplanes to attack New York and Washington. The fall of the World Trade towers was a shock to us all. Yet the U.S. government had all of the data it needed to know that dangerous

deficiencies in airline security existed that could be exploited in a variety of ways, thereby requiring urgent attention. The use of commercial airplanes as weapons on September 11 was therefore a predictable surprise. It is the responsibility of the federal government to ensure that our skies are safe and secure. Our leaders failed miserably in this regard. Similar levels of incompetence surrounded the failure of the federal government to reform corporate accounting in the years that preceded Enron (Bazerman and Watkins, 2004).

I believe that society is currently on target to be as inept in responding to climate change as the U.S. government was in preventing the 9/11 disaster and the financial scandals that began in late 2001. The largest and potentially most dangerous predictable surprise is also the policy issue most consistently avoided by the George W. Bush administration: climate change. We know that the problems caused by climate change will not go away on their own. But, just as we did not know that four planes would be used to attack the United States on 9/11, or what their targets would be, we do not know which climate-related disasters will occur, when they will occur, or how great they will be. This is the nature of predictable surprises: while uncertainty surrounds the details of the impending disaster, there is little uncertainty that a large disaster awaits. On this issue, the scientific community has reached a consensus regarding climate change (Watson et al. 2001).

1. Why Don't We Act?

Effective action to halt climate change would inflict significant short-term costs on taxpayers; compliance with the Kyoto Protocol, for example, would cost the U.S.

between $50-100 billion per year. Developing economies, such as China and India, would suffer economically if they were required to reduce their reliance on fossil fuels. Workers would lose jobs, and their lifestyles would suffer as a consequence. While the costs of prevention are real, scientists have clarified that they are likely to be far lower than the eventual costs of inaction (Watson et al., 2001).

Effectively responding to predictable surprises such as climate change necessitates an understanding of the existing barriers to their prevention. Why don't wise leaders simply take action when the expected benefits of action far outweigh the expected costs from a long-term perspective? Think about any predictable surprise – 9/11, Enron, climate change, or a disaster brewing in your own organization. Why don't leaders act to prevent the crisis?

Most of us respond to this question with a single explanation, a key error that we make when explaining any event (McGill, 1989). This tendency to identify only one cause holds true for social problems ranging from poverty to homelessness to teenage pregnancy (Winship and Rein, 1999). Winship and Rien (1999) argue that one of the main barriers to creating effective social policy is the desire to identify a single cause; unfortunately, responding to only one cause will leave others to fester and allow the social problem to grow. McGill (1989) demonstrates this error by noting that people have argued endlessly over whether teenage promiscuity or lack of birth control causes teenage pregnancy, when the obvious answer is that both cause the problem. Similarly, Winship and Rien (1999) note that the right wing traditionally blames individuals for virtually all social problems, while the left wing is more likely to blame social structures.

While either individuals or social structures may play a bigger role in any given problem, the total neglect of the other factor over-specifies the problem.

Michael Watkins and I (Bazerman and Watkins, 2004) have argued that most predictable surprises result from the failure to confront cognitive, organizational, and political barriers to change, and that efforts targeted to just one level of response will allow crucial barriers to remain. The cognitive explanations for the failure to respond to climate change are based on the psychological research of many of the other authors in this special issue (Baron, this volume; Sunstein, this volume; Weber, this volume). In the next section, I explore the cognitive barriers to an effective response to climate change. Watkins and I have also analyzed the organizational and political causes of predictable surprises; I will extend this analysis to climate change in the third section.

2. Cognitive Explanations for the Failure to Address Climate Change

Society's failure to respond effectively to climate change can be explained in part by common patterns of decision making (Tversky and Kahneman, 1974, Bazerman, 2005). People rely on simplifying strategies, or cognitive heuristics, that lead them to make predictable errors. These errors have pervaded the fields of medicine, law, business, and public policy.

This section examines how five common cognitive patterns of decision making partially explain our failure to respond to climate change. First, positive illusions lead us to conclude that a problem doesn't exist or is not severe enough to merit action. Second, we interpret events in an egocentric, or self-serving, manner. Third, we overly discount the future, despite our contentions that we want to the leave the world in good condition

for future generations. Fourth, we try desperately to maintain the status quo and refuse to accept any harm, even when the harm would bring about a greater good. Fifth, we don't want to invest in preventing a problem that we have not personally experienced or witnessed through vivid data. This section explores these psychological mechanisms to explain the failure to respond to climate change.

2.1 Positive illusions. People view themselves, the world, and the future in a considerably more positive light than is objective (Taylor, 1989, Taylor and Brown, 1988). Positive illusions have a number of benefits, such as enhancing and protecting self-esteem, increasing personal contentment, and helping us persist at difficult tasks and cope with aversive and uncontrollable events (Taylor, 1989). However, others argue that positive illusions reduce the quality of decision making (Dunning, Heath, and Suls, 2005 working paper) and play a role in preventing us from responding to predictable surprises that warrant our attention (Bazerman and Watkins, 2004; Bazerman et al., 2001).

Two prominent types of positive illusions that are particularly relevant to inattention to climate change are unrealistic optimism and the belief that events are more controllable than reality dictates (Bazerman et al., 2001). Unrealistic optimism describes a bias in judgment that leads people to believe that their futures will be better and brighter than those of other people (Taylor, 1989). Students tend to expect that they are far more likely to graduate at the top of the class, get a good job, secure a high salary, enjoy their first job, get written up in the newspaper, and give birth to a gifted child than reality suggests. People also assume that they are less likely than their peers to have a drinking problem, get fired or divorced, become depressed, or suffer physical problems. These same patterns emerge when individuals think about their group, organization, nation, or

society (Kramer, 1994). We appear immune to the continued feedback that the world provides on our limitations.

People also falsely believe that they can control uncontrollable events (Crocker, 1982). Evidence suggests that experienced dice players believe that "soft" throws are more likely to result in lower numbers being rolled; these gamblers also believe that silence by observers is relevant to their success (Langer, 1975). Superstitious behaviors result from a false illusion of control.

The U.S. government, under George W. Bush, has ignored numerous opportunities to be a constructive party in the effort to deal with climate change. We know that the United States is likely to be substantially altered by the effects of climate change; for example, oceanfront land may become uninhabitable, especially in Florida. Despite such dire scientific predictions, the federal government has ignored the problem and failed to advocate solutions, such as controlling or reducing the country's heavy reliance on fossil fuels. Those groups in the United States most threatened by aggressive responses to climate change – auto manufacturers, oil and gas companies, elected officials closely tied to these industries, etc. – are quickest to develop the positive illusions necessary to ignore the challenge.

How can the U.S. government, with the support of voters, make such a devastating error? The answer lies in part in the unrealistically optimistic belief that the changes caused by climate change will be far less significant than the scientific community predicts. The industries and politicians that would be most affected in the short term by an effective response to climate change emphasize the costs of prevention

and argue that a true disaster is unlikely. The best scientific estimates contradict this view, painting a far direr picture.

The other positive illusion common in the climate change debate – the belief that events are more controllable than reality dictates – is found in the idea that people will invent technologies that will solve the problem. Certainly, scientists have discovered amazing technologies in the past. However, humankind has never faced an environmental challenge as great as halting destructive global climate change. Scientists have offered little concrete evidence that a new technology will solve the problem. Rather, proposed solutions have focused on changing human behavior to reduce the harms we inflict on the environment. Nevertheless, the likely illusory belief that a new technology will emerge to solve the problem creates a continuing excuse for the failure to act.

2.2 Egocentrism. Who is to blame for climate change? The United States largely blames emerging nations for burning rainforests, overpopulation, and economic expansion. In contrast, emerging nations blame the West for global warming caused by its past and present industrialization and excessive consumption. Both views of climate change are biased in a self-serving manner called "egocentrism" (Babcock and Loewenstein, 1997, Diekmann et al., 1997, Messick, and Sentis, 1983). While related to the positive illusions described above, egocentrism specifically describes the human tendency to make self-serving judgments regarding allocations of blame and credit, which in turn lead to differing assessments of what a fair solution to a problem would be.

Any comprehensive response to climate change will require agreement and coordination across nations. Yet, as we saw in the Kyoto negotiations, parties are likely

to differ in their assessments of their proportionate blame and responsibility for the problem. The United States justified its failure to ratify the Kyoto Protocol at least in part on its view that China and India bore little responsibility under the agreement that was on the table. Messick and Sentis (1985) argue that, when searching for a solution to a given problem, individuals (or, for our purposes, governments) first determine their preference for a certain outcome on the basis of self-interest, then justify this preference on the basis of fairness by changing the importance of attributes affecting what is fair. So, while the U.S. government may indeed want a climate change agreement that is fair to all, its view of fairness is predictably biased by self-interest. Egocentrism leads all parties to believe that it is honestly fair for them to bear less responsibility for reversing climate change than an independent adviser would judge. Thus, the problem is caused, in part, not by our desire to be unfair but by our inability to interpret information in an unbiased manner.

Philosopher John Rawls (1971) proposed that fairness should be assessed under a "veil of ignorance." That is, if individuals and nations judged a situation without knowing what role they personally played in it, they would not be affected by their role. In Rawlsian terms, egocentrism describes the difference between our perceptions with and without the veil of ignorance. Most environmental conflicts, with climate change being an extreme prototype, tend to be highly complex, lacking conclusive scientific and technological information. This uncertainty allows egocentrism to run rampant (Wade-Benzoni et al., 1996). When past causes and future events are certain, the mind's ability to manipulate fairness is limited; under extreme uncertainty, egocentrism is strongly exacerbated.

2.3 Overly discounting the future. Would you prefer to receive $20,000 today or $24,000 in a year? People often choose the former, despite the fact that 20 percent would be a very good return on your investment in a year. Homeowners often fail to adequately insulate their attics and walls and fail to purchase more expensive, energy-efficient appliances even when the payback would be extremely quick. Not only individuals discount the future. One of the finest universities in the United States undertook a major renovation of its infrastructure, but failed to use the most cost-efficient products from a long-term perspective (Bazerman et al., 2001). Due to capital budgets for the construction project, the university implicitly placed a very high discount rate on construction decisions; current benefits (reduced upfront costs) were given much greater weight than future costs (increased energy consumption). The university's administration passed up returns that its financial office would have been delighted to receive on the university's endowment. By comparison, Harvard University recently set up an account within its central administration to fund worthwhile projects for different colleges within the university that may have been overlooked due to short-term budget pressures. Essentially, Harvard created a structure to reduce the likelihood that university units will make bad decisions due to the tendency to overly discount the future.

Research consistently identifies such myopic preferences, which seem to reflect an extremely high discounting of the future (Loewenstein and Thaler, 1989). Rather than evaluating options from a long-term perspective, people tend to focus on or overweight short-term considerations. At a societal level, the problems brought about by overdiscounting the future can be severe. Herman Daly argues that many

environmental decisions are made for the world "as if it were a business in liquidation" (Gore, 1993). Overweighting the present is not only foolish, but also immoral, robbing future generations of opportunities and resources.

The tendency to discount the future interacts with the biases discussed earlier, positive illusions and egocentrism. After insisting for many decades that the scientists are flat-out wrong, those who are unmotivated to halt climate change for selfish reasons have changed their argument. No longer do they argue, against reason, that climate change does not exist, or that humans do not contribute to climate change. Now the most common argument is that it would be too costly to respond to the problem. These progression of denials – from "There is no problem" to "We are not responsible" to "It's too expensive to fix" – result in small benefits for the current generation in exchange for high costs to future generations. We tend to discount the future the most when the future is distant and uncertain and when intergenerational distribution is involved (Wade-Benzoni, 1999). When people claim that they want to treat the earth with respect, they are generally thinking about their descendants. But when the time comes to make investments for future generations by reducing our own standards of living, we begin to view future generations as vague groups of people living in distant lands.

2.4 The omission bias and the status quo. Ritov and Baron (1990, Baron, 1998) show that people, organizations, and nations tend to follow the often-heard rule of thumb, "Do no harm." This may often be a useful moral guideline, but when followed too closely, it can have enormous adverse consequences. To create a greater good, we must often accept tradeoffs that require the infliction of a small harm. Due to the desire to avoid inflicting any new harm, we are much more prone to make "errors of omission"

(inaction) than "errors of commission" (causing harm) (Ritov and Baron, 1990). As a result, we fail to make smart choices to prevent predictable surprises and we accept the dysfunctional status quo.

Ritov and Baron (1990), in a study of vaccination decisions, asked participants if they were willing to vaccinate children against a disease that was expected to kill 10 out of 10,000 children when the vaccine itself would kill a smaller number of children through side effects. Many people would not accept a single death from the "commission" of vaccinating – even if their decision would cause five additional deaths. Our minds treat an error of commission that results in five deaths as greater than an error of omission that causes 10 deaths. Baron (1998) argues that this preference defies (utilitarian) logic.

We can see the great harm caused by errors of omission in the domain of organ donation programs. Organ donation causes a minor harm (the loss of organs after death) and creates major benefits (lives saved). Yet, approximately 6,000 people die in the United States each year while waiting for an organ to be found. A solution to the problem is obvious: the United States could switch to a system in which eligible Americans would donate their organs after death by default unless they opted out of the system. This system could save 6,000 U.S. citizens every year, twice the number of those who died on 9/11 (Bazerman et al., 2001; Johnson and Goldstein, 2003). Johnson and Goldstein (2003) show that European countries with an opt-in program (similar to the current United States system) have organ donations rates that fall only between 4 and 28 percent. Meanwhile, European countries with opt-out programs have rates ranging from

86 to 100 percent. If the change in U.S. donations resulted in even half of the difference between the two European experiences, the U.S. organ shortage would be eliminated.

Related to the omission bias is the innate human tendency to maintain the status quo (Samuelson and Zeckhauser, 1988). People are often unwilling to give up what they already have – their "endowment" – for a better set of options (Kahneman 1991). Why? Because, for most people, losses loom larger than gains (Kahneman and Tversky, 1982). Imagine that you receive an offer for a job that is much better than your current job on some dimensions (pay, responsibility, etc.) and marginally worse on others (location, health insurance, etc.). A rational analysis would imply that if the gains exceed the losses, you should accept the new job. However, the psychological tendency to pay more attention to losses than to gains will lead many to turn down the job, preserve the status quo, and forego a net gain (Kahneman and Tversky, 1982). The status quo effect is even stronger when multiple parties who place different weights on different concerns are involved (e.g., Congress). As a result, governments are particularly affected by the staus quo, and often fail to make effective improvements to current policy (Bazerman et al., 2001).

If airlines flying in the United States had sealed every cockpit door of every plane prior to 9/11, at a cost of approximately $1 billion, the tragedy would not have occurred. Similarly, acting now to halt climate change is likely to be a far less expensive option than responding after the first major climate-change disaster occurs. Unfortunately, virtually all changes at the governmental level require some losses in exchange for (often delayed) gains. Even as scientific evidence supporting the phenomenon of climate change has grown, Congress has remained reluctant to take action. Along with political

and economic barriers (discussed in the next section), the desire to maintain the status quo hinders acceptance of effective solutions to prevent a predictable surprise. Paradoxically, the omission bias makes us reluctant to act to reduce the effects of climate change, though we know that inaction will lead to harmful changes away from the status quo. Compounded with our tendency to discount the future, our tendency to try to preserve the status quo leads us to ignore changes that will be required of us later.

2.5 Vividness. Tversky and Kahneman (1974) show that when people judge the frequency with which an event occurs by the availability of its instances, events whose instances are more easily recalled will appear more frequent than events of equal frequency whose instances are more difficult to recall. One effect of this "availability" heuristic is that decision-makers overweight vivid events. Why are some events more vivid than others? Events that affect us, or those close to us, are more vivid than events that affect those who we do not know. Events that we can imagine readily are more vivid than events that are hard to comprehend. And events that affect the current or near future are more vivid than events that will occur in the distant future. The image of job loss due to a manufacturing plant shutdown is vivid, as is the image of selling one's SUV and taking the bus to work. If the ocean does indeed rise significantly, as scientists predict, the migration, disease, and death of millions of Bengalis will be vivid. Yet, unlike the first two images, this last image is not vivid in the minds of the decision-makers who currently are exacerbating the rate of climate change.

The lack of vividness prevents us from acting to address climate change. This is consistent with Bazerman and Watkins' (2004) argument that leaders often fail to act on predictable surprises that have not yet occurred. In fact, some political actors argue that

the political will for action cannot occur until demonstrable harm has occurred. Unfortunately, in the case of climate change, if we do not act before the harms created become vivid, this failure to act will cause dramatic destruction.

Positive illusions, egocentrism, discounting the future, the omission bias, the desire to maintain the status quo, and inattention to data that are not vivid are the most fundamental, innate sources of predictable surprises. But these cognitive explanations offer only a partial explanation for our failure to address climate change. These errors work in combination and in conjunction with the organizational and political factors explored in the next section.

3. Organizational and Political Explanations for the Failure to Address Climate Change

Failures in the way organizations make decisions are partially due to failures within the minds of key decision-makers; the biases in the previous section apply to individual decision-makers in organizations and governments (Bazerman and Watkins, 2004). Other barriers extend beyond the human mind. This section explores barriers that occur at the organizational and political level.

Structural barriers in how we collect, process, and use information can contribute to predictable surprises such as climate change. One common example is the role that organizational "silos" play in preventing an organization from taking action to prevent or mitigate a predictable surprise. No single agency or individual in the United States government had the specific task of preventing a disaster such as 9/11; many parties bore this responsibility. The FBI, CIA, FAA, the White House, Congress, and many other

governmental agencies had some of the information needed to head off the attack. Presidents Clinton and Bush and Vice-Presidents Gore and Cheney failed the nation by not adequately improving aviation security (Bazerman and Watkins, 2004). But prevention was not any specific individual's job, and no one has been held accountable for one of the nation's most amazing blunders. Similarly, no particular group or individual is responsible for ensuring that we are making wise decisions regarding climate change. When the disaster occurs, the blame will be diffused. The U.S. government lacked structures and accountability to adequately prepare for and prevent terrorism; regarding climate change, not much is different.

Dysfunctional incentives also affect decisions. When no one believes they are in charge of addressing a looming crisis, and when people find it safest to "just do my job," an organizational structure exists that encourages the eruption of predictable surprises. In addition, leaders are unlikely to be rewarded for avoiding disasters that the public did not even know were on the radar screen.

Beyond these organizational issues, certain individuals and organizations benefit from corrupting the political system for their own benefit. Concentrated groups that are intensely concerned about a particular issue tend to have greater influence on policy related to that issue than do those who lack strong feelings about the issue. The continued failure of the U.S. government to pass significant campaign finance reform creates a system in which money corrupts the potential for a wise decision-making process. Corporations can delay action on predictable surprises by calling for more thought and study, or simply by donating enough money to the right politicians so that wise legislation never even comes to a vote. When a predictable surprise such as the

collapse of Enron occurs, politicians and journalists tend to focus blame on a small number of evildoers, rather than on the systemic flaws that create incentives for abuse. The tyranny of the minority keeps us from preventing predictable surprises.

The oil industry, the auto industry, and other interested parties have succeeded in distorting politics and keeping the United States from implementing wise and honorable practices regarding climate change. These special-interest groups are motivated to lobby elected officials against acting to prevent climate change solely for their own benefit. The efforts of these groups effectively prevent Congress from enacting meaningful legislation on the issue. Sadly, legislators often will oppose ideas that are beneficial to the majority of their constituency rather than risk a backlash from a more vocal and deep-pocketed special-interest group.

In addition to risking campaign financing, an elected official who supports measures aimed at combating climate change can expect constituents to question the wisdom of incurring the substantial costs of action, especially if those costs include new taxes on SUVs, gasoline, and so on. An elected official is faced with the dilemma of imposing costs on the current generation for a problem that is not in focus for many constituents. Thus, politicians may well have an incentive to ignore the climate change issue. Without being educated about the potentially disastrous long-term effects and costs of climate change, the public is probably not willing to accept these short-term costs. As a result, our leaders are unlikely, for example, to mandate changes in how industries and individuals use energy. The natural human impulse to discount the future and avoid all costs, even minor inconveniences, prohibits the public from endorsing the

actions of politicians who accept the need to inflict small costs in the present to avoid a future catastrophe.

Finally, corporations that do not want us to effectively respond to the climate change challenge use a key tool that has worked effectively for the tobacco industry for decades – obfuscation. The tobacco industry knew far more about the hazards of cigarette smoking before the public health community did. But to avoid or slow down anti-smoking measures, the tobacco industry created confusion about the effects of smoking, and it is now doing the same regarding the effects of second-hand smoke. Similarly, the coal, oil, and automobile industries first obfuscated about the existence of climate change, then about the role that humans played in creating the problem, and now about the magnitude of the problem. Obfuscation creates uncertainty; for the reasons described earlier, the public is less willing to invest in solving an apparently uncertain problem than a certain one.

4. Not All Failures to Address Predictable Surprises are Equal

Throughout the paper, I have made the case that the concept of predictable surprises describes 9/11, climate change, and many other disasters. I have highlighted many commonalities across past and future disasters. Of course, differences also exist between contexts. One difference is the relative force that various cognitive, organizational, and political barriers have in preventing wise action to stop predictable surprises. Another lens for viewing these differences is presented in Bazerman and Watkin's (2004) prescriptive framework for diagnosing predictable surprises. We argue that leaders must address three core surprise-avoidance tasks: recognition, prioritization,

and mobilization. Prevention of predictable surprises requires leaders to enhance the capacity of their organizations to recognize emerging threats, prioritize action, and mobilize available resources to mount an effective preventative response. We have argued (Bazerman and Watkins, 2004) that failure to prevent a predictable surprise can result from the lack of any of these three components of effective action.

In the case of 9/11, the key failures appear to have been prioritization of the threat of aviation terrorism by the Clinton administration (since recognition was evident in the Gore Commission's report) and, later, recognition of the problem by the Bush administration. In contrast, in the case of climate change, such strong consensus exists regarding the magnitude of the problem that it is difficult to believe that recognition is the chief challenge facing the Bush administration. Despite scientific uncertainty about the details of future disasters, a broad swath of the scientific community insists that the problem is real and inevitable. In fact, if recognition was the key obstacle, given what we know in 2005, climate change should be a comparatively easy crisis on which to motivate action. However, failure to act appears to have much more to do with prioritizing the problem amid other shorter-term priorities, coupled with lobbying efforts from industries such as automobile, oil, and coal. Until the U.S. government makes the issue a priority, mobilization obviously will not occur. Finally, while the Bush administration has implied that it does not recognize the existence of global climate change, I believe that such statements are merely political justifications for failure at the prioritization stage.

This brief analysis highlights the importance of recognizing that parties who might prevent a predictable surprise are not monolithic. Clinton and Gore may well have recognized and prioritized the need to address climate change, but without recognition

and prioritization from Congress, the Clinton administration could not mobilize action. Thus, even with the most pro-environment vice-president of our generation, support for Kyoto was doomed. Accordingly, a more detailed political analysis of failures across the recognition, prioritization, mobilization framework is needed. I have attempted to clarify that while the categories of barriers remain the same across predictable surprises (cognitive, organizational, and political), as do the necessary steps for avoiding predictable surprises (recognition, prioritization, and mobilization), the relative importance of each barrier and step varies across contexts.

5. Conclusions and a Call to Action

Climate change, due to its significant potential for disaster, presents us with all of the ingredients of a predictable surprise in action. Our leaders know about the problem and recognize that it must be addressed, yet they are rendered immobile by cognitive, organizational, and political factors. Without action, the threat of climate change will only increase over time. By avoiding the costs of prevention, we only exacerbate a larger burden in the future, thereby a disastrous predictable surprise. When the disaster begins, we can count on our leaders to deny that they had any reason to believe that the problem could become so massive.

Because barriers to change exist on multiple levels, any action plan to change the willingness of U.S. government to attack the climate change issue must be carried out on multiple fronts. Responding to cognitive barriers while ignoring organizational and political barriers will not solve the problem. Similarly, political and organizational change will not occur as long as leaders and citizens are affected by the biases

documented in this paper. While I have listed these barriers separately, it is important to recognize that the processes that prevent wise policy formulation are interconnected.

If the cognitive biases are as strong as I have depicted, is there any hope that we can eliminate them from our behavioral repertoire and confront predictable surprises head on? In fact, there is plenty of reason to believe that individuals and organizations are capable of developing a more rational approach to important judgments and decisions. Students in management and other professional schools are routinely taught to audit their decision-making process for the biases described in this chapter. The identification of these biases is the first step toward changing one's views and behavior in a positive direction. As voters, we can send a similarly strong message by educating ourselves on climate change, educating others, and lobbying our representatives in government for a tougher stance on the issue. In doing so, we may inspire others to take a closer look at their own biases and acknowledge that they can, in fact, do real harm.

We also need to recognize that the U.S. government is currently not organized effectively to deal with climate change. No unit is in charge of scanning the environment and collecting information on climate change, analyzing that information, and transforming it into effective policy. Our nation, like others, developed structures for historic and institutional reasons that have not adapted optimally to current threats. For example, we only developed an Office of Homeland Security and made it a Cabinet-level post after 9/11. We should not wait for a vivid climate-change disaster to occur, but develop a structure that logically collects, organizes, and acts on climate change while we can still mitigate the disasters that will occur.

At the political level, we should not only support politicians who are wise and brave enough to advocate action on climate change, but also value campaign finance reform legislation (and the politicians who pursue such measures). As long as oil and auto companies can distort our politics through donations and lobbying, wise climate-change interventions will be hampered. Perhaps the most important initiative of all is the education of citizens. As long as the U.S. citizenry lacks understanding of the enormity of the issue that we are confronting, change at all other levels will be hampered.

Overall, this article advocates a rational response to climate change. This is a tough challenge, as society is in denial on multiple levels about the nature of the problem. I hope that the ideas in this paper can play a small role in bringing the insights of science to the forefront of climate policy.

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