



# **Cognitive Barriers to Environmental Action: Problems and Solutions**

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Chapter 13

Cognitive Barriers to Environmental Action: Problems and Solutions

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## Abstract

We explore interventions at the level of the individual and focus on recognized cognitive barriers from the behavioral decision-making literature. In particular, we highlight three cognitive barriers that impede sound individual decision making that have particular relevance to behaviors impacting the environment. First, despite claiming that they want to leave the world in good condition for future generations, people intuitively discount the future to a greater degree than can be rationally defended. Second, positive illusions lead us to conclude that energy problems do not exist or are not severe enough to merit action. Third, we interpret events in a self-serving manner, a tendency that causes us to expect others to do more than we do to solve energy problems.

We then propose ways in which these biases could actually be used to our advantage in steering ourselves toward better judgment. Finally, we outline the key questions on the research frontier from the behavioral decision-making perspective, and debunk the myth that behavioral and neoclassical economic perspectives need be in conflict.

The preceding chapters have offered many excellent business and non-market strategies to promote environmental sustainability initiatives. Together, these chapters offer novel interventions at the corporate, policy, and organizational levels to help society move toward better environmental solutions. In this chapter, we turn inward to explore interventions at the micro level—the level of the individual—from both the citizen and policymaker perspectives. We focus on recognized cognitive barriers from the behavioral decision-making literature. In particular, we highlight three cognitive barriers that impede sound individual decision making that have particular relevance to behaviors impacting the environment. We then discuss possible ways to overcome these cognitive barriers, first from the perspective of the individual citizen and then from the perspective of the policymaker.

In 2002, the Nobel Committee broke with tradition by awarding its Prize in Economics to Daniel Kahneman. Kahneman, together with the late Amos Tversky, carved out a field devoted to systematic and predictable mistakes people make in everyday decision making (Tversky and Kahneman 2004). At its core, the field of behavioral decision making presumes that all people rely on simplifying strategies, or cognitive heuristics, when facing judgments and choices. These heuristics evolved to equip us with faster decision-making abilities that can withstand the numerous complexities of everyday life. But speed comes at a cost: As Tversky and Kahneman identified, heuristics also lead people to systematic and predictable errors. Decision-making errors, or biases, are defined as pervasive departures from rational thought in predictable directions. The long list of specific biases that have been identified has hugely impacted the existing models of decision making in the fields of economics, financial markets, consumer behavior, negotiation, medicine, and organizational behavior (see Bazerman and Moore 2008).

The behavioral decision-making perspective is oftentimes considered the diametric opposite of the neoclassical economics perspective. In actuality, the two approaches have much more in common than the academic debate suggests. Research on decision-making biases does not discredit all models of economic rationality; rather, the behavioral perspective aims to uncover predictable departures from economic rationality (in specific domains and decision contexts) to better improve existing models of behavior.

The field of behavioral decision-making has documented a long list of biases (Bazerman and Moore, 2008), many of which are relevant to faulty environmental decisions (Hoffman and Bazerman, 2007). In order to provide a deeper understanding of how behavioral decision-making research can be used, we focus on three biases that we believe are particularly relevant to behaviors that impact the environment. First, despite claiming that they want to leave the world in good condition for future generations, people intuitively discount the future to a greater degree than can be rationally defended. Second, positive illusions lead us to conclude that energy problems do not exist or are not severe enough to merit action. Third, we interpret events in a self-serving manner, a tendency that causes us to expect others to do more than we do to solve energy problems. We then propose ways in which these biases could actually be used to our advantage in steering ourselves toward better judgment. At the end of this chapter, we outline the key questions on the research frontier from the behavioral decision-making perspective, and debunk the myth that behavioral and neoclassical economic perspectives need be in conflict.

## **COGNITIVE BIASES OVERVIEW**

### **Discounting the Future**

Would you prefer to receive \$10,000 today or \$12,000 a year from now? People faced with this question often say they would prefer to receive \$10,000 today, ignoring the opportunity to earn a 20 percent return on their investment. Similarly, homeowners often fail to insulate their homes appropriately or to purchase energy-efficient appliances and fluorescent lighting, even when the long-term rate of return would be huge. Research demonstrates that people too often use an extremely high discounting rate regarding the future—that is, they tend to focus on or overweight short-term considerations (Loewenstein and Thaler 1989).

Organizations are also guilty of discounting the future. One top university undertook a significant renovation of its infrastructure without using the most cost-efficient products from a long-term perspective (Bazerman, Baron, and Shonk 2001). Facing capital constraints on construction, the university implicitly placed a very high discount rate on construction-related decisions, emphasizing the minimization of current costs over the long-term costs of running the building. As a result, the university passed on returns that its financial office would have enjoyed receiving on its investments. By contrast, as part of its Green Campus Initiative, Harvard University set up a fund to finance worthwhile projects for different colleges within the university that, due to short-term budget pressures, might otherwise have been overlooked. The Green Campus Initiative helps university departments avoid making poor long-term decisions that could result from the tendency to overly discount the future.

Over-discounting the future can contribute to a broad array of environmental problems, ranging from the overharvesting of the oceans and forests to the failure to invest in new technologies to address climate change. Hoffman and Bazerman (2007) document the disastrous impact of extremely high discount rates on the global fishing crisis. 11 of the 17 world's largest fishing basins have been depleted. High-tech equipment and government subsidies have allowed

fishers to deplete the oceans. The subsidization of the global fishing fleet has helped produce enough boats, hooks, and nets to catch far more fish than the entire resource. Too many boats are chasing too few fish, and international skirmishes over poaching have emerged.

Ecological economist Herman Daly has observed that many of our environmental decisions are made as if the earth “were a business in liquidation” (Gore 1992). We are most likely to discount the future when the future is uncertain, distant, and when intergenerational distribution of resources is involved (Wade-Benzoni 1999). Specifically, when people espouse the view that the earth’s resources should be preserved, they tend to think about their descendants. But when consumption opportunities arise today that would inflict environmental costs on future generations, they begin to view “descendants” as vague groups of people living in a distant time. In their book, *Priceless: On Knowing the Price of Everything and the Value of Nothing*, Frank Ackerman and Lisa Heinzerling connect discounting of the future to phenomena such as species extinction, the melting of polar ice caps, uranium leaks, and failure to deal with hazardous waste. From a societal perspective, overweighting present concerns can be viewed as both foolish and immoral, as it robs future generations of opportunities and resources (Ackerman and Heinzerling 2004; Stern 2007).

### **Positive Illusions**

Many countries’ borders are likely to be substantially altered by the effects of climate change in the form of more destructive hurricanes and the submersion of oceanfront land. Yet most governments continue to ignore opportunities to play a constructive role in addressing climate change and fail to take steps to control or reduce their countries’ reliance on fossil fuels. Contributing to this problem has been political action by the groups most threatened by aggressive responses to climate change, such as heavy manufacturing businesses, oil and gas

companies, and elected officials closely tied to these industries. But average citizens also contribute to the problem by failing to modify their energy usage, at least until the price of gas skyrockets. Why do we make such egregious long-term mistakes?

Our positive illusions about the future are a likely culprit. In general, we tend to see ourselves, our environment, and the future in a more positive light than is objectively the case (Taylor and Brown 1988). Such positive illusions have benefits, as they can enhance self-esteem, increase commitment to action, and encourage persistence at difficult tasks and strength in the face of adversity (Taylor 1989). But, research also shows that positive illusions also reduce the quality of decision-making and prevent us from acting in time to address significant problems (Bazerman and Watkins 2004; Bazerman and Moore 2008).

We all hold a wide variety of positive illusions, yet two are particularly relevant to inattention to energy and climate change: unrealistic optimism and the illusion of control (Bazerman, Baron, and Shonk 2001). Unrealistic optimism can be described as the tendency to believe that one's own future will be better and brighter than that of others, and also better and brighter than an objective analysis would imply (Taylor 1989). Undergraduates and graduate students alike tend to expect that they are far more likely than reality suggests to graduate with honors, get a good, high-paying, and enjoyable job, and be featured in the newspaper. People also assume that they are less likely than their peers are to develop a drinking problem, get fired or divorced, or suffer from physical or mental ailments. In alignment with these tendencies, we believe and act as if the repercussions of climate change will be far less significant than the scientific community predicts.

We also tend to think that we can control uncontrollable events (Crocker 1982). Experienced dice players, for example, believe that "soft" throws help them roll lower numbers;



gamblers also believe that the silence of observers affects their success (Langer 1975). Such illusory beliefs result from a false sense of control over the most uncontrollable of events. In the realm of climate change, this type of positive illusion translates to the common expectation that scientists will invent new technologies to solve the problem. Unfortunately, despite claims such as those made by Steven D. Levitt and Stephen J. Dubner in their bestselling book *Freakonomics* (Harper 2009), little concrete evidence exists that a new technology will solve the problem in time. In fact, such claims make the task of climatologist all the harder. As a result, unrealistic illusion that a new technology will emerge serves as an ongoing excuse for the failure to act today.

### **Egocentrism**

Whose is to blame for climate change? As we saw in Copenhagen, parties are likely to have different assessments of their proportionate blame and responsibility for the problem. Emerging nations such as China and India tend to blame Western countries for their past and present industrialization and excessive consumption. Meanwhile, the U.S. government failed to contribute to an agreement in part because China and India accepted little responsibility for their increasing contributions to climate change. Developed economies tend to blame emerging nations for burning rainforests and for unchecked economic and population expansion.

These opposing views are consistent with the common tendency to be egocentric—that is, to be biased in a self-serving manner (Babcock and Loewenstein 1997; Messick and Sentis 1983). A bias related to the positive illusions described above, egocentrism refers more specifically to the tendency to make self-serving judgments regarding allocations of blame and credit, a phenomenon that in turn leads people to differing assessments of what a fair solution to a problem might be.

Psychologists David Messick and Keith Sentis have found that we tend to first determine our preference for a certain outcome on the basis of self-interest. Next, we justify this preference on the basis of fairness by changing the importance of the attributes affecting what is fair (Messick and Sentis 1985). Thus, each government might indeed seek a climate change agreement that is fair to all parties, but its view of what is fair is biased by self-interest. Unfortunately, egocentrism leads all parties involved to believe that it is honestly fair for them to bear less responsibility for reversing climate change than an independent party would judge as fair. The problem is worsened not by a desire to be unfair but by an inability to view information objectively.

It is important to note that energy issues tend to be highly complex, lacking conclusive scientific and technological data. This uncertainty can allow egocentrism to dominate (Wade-Benzoni, Tenbrunsel, and Bazerman 1996; Wade-Benzoni, Okumura, Brett, Moore, Tenbrunsel, & Bazerman, 2002). When data are clear and obvious, the mind's ability to manipulate fairness is limited; by contrast, extreme uncertainty exacerbates egocentrism. Philosopher John Rawls proposed that we should assess fairness under a "veil of ignorance"—that is, we ideally should judge a situation with no knowledge of the role we play in it (Rawls, 1971). From Rawls's perspective, egocentrism describes the difference between our perceptions with and without the effects of a veil of ignorance.

The three biases just discussed—positive illusions, egocentrism, and the tendency to discount the future—can have an interactive effect. After insisting for decades that the scientists are flat-out wrong, many of those who have strongly opposed efforts to reduce climate change for self-interested reasons have changed their tune. No longer arguing that climate change does not exist, that humans do not contribute to climate change, or that others are to blame for the

problem, they now argue that it would be too costly to respond to the problem. This transition in argument—from “There is no problem” to “We aren’t responsible” to “It’s too expensive to fix”—allows the current generation to receive small benefits in exchange for high costs to future generations. The opponents of climate change action may be correct about certain details and proposals, but little evidence suggests that they are interested in having their assertions tested through an objective, cost-benefit analysis.

### **OVERCOMING COGNITIVE BARRIERS**

The three cognitive barriers we have just discussed are innate and pervasive roadblocks that prevent individuals from adopting energy-efficient behaviors and technologies. Decades of research confirming these biases paint a bleak picture of the difficulty of overcoming hard-wired patterns. However, recent scholars have begun to see a silver lining in our reliance on heuristics. Armed with the knowledge that people act in predictably irrational ways, we can structure choices in a way that optimally exploits our stubborn reliance on heuristics to gently nudge us toward better decisions. In particular, Richard Thaler and Cass Sunstein, the champions of such “choice architecture,” have identified several ingenious ways of seamlessly designing choice environments to avoid systematic pitfalls in decision making (2008).

The behavioral decision-making literature has shown the difficulty of fully debiasing human judgment (Milkman, Chugh and Bazerman 2009). We see greater potential to design decision-making contexts in ways that lead to wiser choices (Thaler and Sunstein 2008). In the spirit of choice architecture, we propose harnessing the following tools to help citizens and policymakers overcome the pitfalls of our decision biases.

#### **The Power of Defaults**

Given innate cognitive barriers to environmental solutions to climate change, how can we guide people to adopt better behaviors? A simple intervention would be to make use of existing human tendencies. Notably, people have an exaggerated tendency to stick with a default option. Bill Samuelson and Richard Zeckhauser (1988) observed this effect when Harvard University switched from enrolling its faculty members in a default healthcare plan to allowing faculty members to choose their own plans. Faculty members overwhelmingly chose to remain with their existing plans; having become accustomed to the original default as a reference point, they were reluctant to switch from an established status quo.

An even more powerful demonstration of the power of defaults was conducted by Eric Johnson and Daniel Goldstein in their investigation of organ donation behavior (2003). Using the variation in timing of the shift in European Union countries from opt-in organ donation policies to opt-out policies that enrolled all citizens by default, the authors revealed a staggering difference caused simply by the established default. Countries with opt-in policies had donor consent rates of 4.25-27.5%; countries with opt-out policies had effective consent rates of 85.9% to 99.98% (Johnson and Goldstein 2003).

Given the established strength of defaults and the widespread reluctance to move away from them, we recommend that governments and organizations make greener options the norm with the goal of steering people toward better behavior. Maintaining the status quo turns out to be a powerful driver of choice precisely because it takes advantage of people's tendency to avoid choosing. In the consumer arena, car manufacturers that offer both hybrid and non-hybrid models could move toward making the hybrid model the default. Default settings for all home electronics such as air conditioners, refrigerators, and computer monitors could be tuned to lower factory presets while still giving the user the same range of power.

Small changes across numerous domains could drive a move toward ever-more energy-conserving choices. In the process, individuals could become incrementally more tempered consumers of energy without making any explicit effort or even being consciously aware of foregone choices. Setting wise defaults is a powerful tool, as it demands little conscious effort within the individual to steer everyone toward better decision making. However, such reliance on effortless influence is not sufficient to counteract a problem as staggeringly large as energy conservation.

### **Making Energy Costs Salient**

Despite their strong desire to maintain the status quo, people are not impervious to new information. Seligman and Darley (1977) conducted one of the first studies demonstrating the effect of feedback on energy consumption. The researchers gave homeowners feedback on their daily rates of electricity usage as a fraction of actual consumption over predicted consumption, determined by usage history. Feedback was displayed four times a week over the course of a month. Compared to a control group that started with the same baseline levels of energy consumption, homeowners who received feedback used 10.5% less electricity.

More recent work highlights the specific form such feedback messages should take. P. Wesley Schultz (1999) studied the effect of feedback on community curbside recycling in 120 households, each of which received one of the following five treatments: a plea to recycle, a plea plus individual-level written feedback, a plea plus neighborhood-level written feedback, a plea plus information about recycling, or no treatment (control group). The results indicated significant increases from baseline recycling for groups that received feedback interventions (either individual or neighborhood-level information), but no observed increases in other

conditions. This work suggests that feedback itself is not sufficient to change behavior and that behavior change produced through feedback needs to coexist with norm activation.

Furthermore, the units in which energy consumption is reported matters. Richard Larrick and Jack Soll (2008) exposed the fact that measuring fuel efficiency as miles per gallon (MPG) leads consumers to systematically misinterpret their automobile fuel usage. The “MPG illusion” refers to people’s false belief that the amount of gas a car consumes decreases linearly as a function of a car’s MPG, when the actual relationship is curvilinear. More specifically, the illusion leads one to assume that the same fuel savings occurs under the following scenarios: trading a 10 MPG car for a 15 MPG car, and trading a 20 MPG car for a 25 MPG car. In actuality, the first scenario will save much more fuel than the second, holding miles driven constant. The 5 MPG improvement from 10 to 15 MPG has much more impact on fuel savings than the same 5 MPG improvement from 20 to 25 MPG.

Larrick and Soll (2008) offer gallons per mile (GPM) as an alternative unit measure of fuel efficiency that would more accurately reflect consumption and savings. Fuel consumption actually does decrease linearly with GPM, thereby correcting the misperception caused by the MPG illusion. Participants in Larrick and Soll’s study more accurately chose fuel-efficient cars when consumption was expressed as GPM as opposed MPG. While Europe, Canada, and Australia have already moved to volume over distance measures such as GPM, the United States, Japan, and India have yet to correct the MPG illusion.

### **Policy Bundling to Reduce Loss Aversion**

One of the most robust findings in behavioral decision research is that losses loom larger than gains (Kahneman and Tversky 1979; Tversky and Kahneman 1992). People expect and experience the pain of a loss to be larger than the pleasure of an equal-sized gain. This suggests

that legislators face an uphill battle when proposing legislation that has both costs and benefits, due to the expected overweighting of losses relative to gains. Wise environmental legislation has benefits that outweigh the costs, but people's tendency to overweight the costs can be a barrier to the passage of such legislation. Thus, we believe that strategies are necessary to help policymakers overcome their loss aversion.

Research cited earlier in this chapter highlights policy applications of loss aversion. A knowledge of people's tendency to view any deviation from the status quo as an aversive loss can help policymakers understand the enormous implications of defaults on important issues such as organ donation (Johnson and Goldstein 2003) and 401k participation (Madrian and Shea 2001). As noted, Johnson and Goldstein found that countries with an opt-out organ donation system have far greater donation rates than countries that require citizens to opt in to participate. In the 401k context, employers can encourage retirement savings by assuming that new employees want to enroll in the retirement system, rather than requiring them to proactively sign up. Similarly, Samuelson and Zeckhauser's demonstration of faculty reluctance to switch from the default healthcare option (1988) shows that Harvard University faculty exhibits loss aversion. Older faculty members were unwilling to switch unless the possible benefits dramatically outweighed the possible costs, while new faculty experienced no such loss aversion.

We believe that knowledge of a strategy for overcoming loss aversion through bundling could also help policymakers pass better legislation. It is common for legislators to combine *unrelated* policies into a single bill to increase support for their legislation. Milkman, Mazza, Shu, Tsay, and Bazerman (2009) propose a different type of policy bundling technique, where the goal is to combine *related* bills in a way that reduces the harmful effects of the tendency to irrationally overweight losses relative to gains. They show that it is possible to combine one bill

that has costs in Domain A (e.g., job losses in Town X) and benefits in Domain B (e.g., acres of forest preserved in Town X) with a matched bill that has the inverse structure: benefits in Domain A (e.g., job gains in Town Y) and costs in Domain B (e.g., acres of forest lost in Town Y).

Each piece of legislation in the Milkman et al. (2009) study was either a single bill or a combined bill in which the costs and benefits of two separate bills summed to generate net benefits in two domains. For example, participants were randomly assigned to view one of the following three bills:

- *Bill 1*: A law to establish new park areas in Community X where logging would be prohibited, costing the community 100 jobs but preserving 60,000 acres of forest;
- *Bill 2*: A law to eliminate a protected park area in Community Y, which would allow logging on 50,000 acres of previously protected forest, destroying that forest region but creating 125 new jobs;
- *Combined Bill*: A bundled bill presenting the proposals in both *Bill 1* and *Bill 2* as two components of a single piece of legislation.

83% of participants indicated they would vote for the *Combined Bill*, a significantly greater percentage than for either *Bill 1* (54%) or *Bill 2* (45%). Each individual bill suffered from loss aversion on the dimension where a sacrifice was required. This study demonstrated that policy bundling may be an effective tool for policymakers hoping to pass legislation that is advantageous overall, but that contains necessary costs.

Milkman et al. (2009) confirm across a set of four legislative domains that this bundling technique increases support for bills that have both costs and benefits. Single pieces of



legislation often fail to gain the necessary support because they are too narrowly specified, preventing legislators from overcoming loss aversion. Bundling may help legislators move beyond the irrational reluctance to support wise legislation that loss aversion can induce.

### **The Benefit of Slightly Delaying Wise Policies**

In many cases, passing wise environmental legislation consists of doing what we know what we *should* do, but not what we *want* to do (Bazerman, Tenbrunsel, and Wade-Benzoni 1998). We know we should reduce our consumption of goods, conserve energy by reducing our use of fossil fuels, and generally avoid destroying our eco-system. The best-intentioned among us confidently expect that we will take such actions in the future (Epley and Dunning 2000). Yet, when the moment of decision arrives, we often fail to do what we established we should do. Why? Because at the moment of decision, we tend to experience intra-subjective conflict between what we should do and what we want to do (Tenbrunsel, Diekmann, Wade-Benzoni, and Bazerman 2011).

The tension that underlies these inconsistencies between expected preferences and actual behaviors has been metaphorically called the “multiple selves” phenomenon (see Schelling 1984). Bazerman, Tenbrunsel, and Wade-Benzoni (1998) describe the two selves as the “want” self and the “should” self. The former refers to what people affectively feel they want to do at the moment. The “should” self refers to what people more deliberatively think they should do. The want-should tension often, though not always, coincides with a tension between an individual’s short-term and long-term interests.

Citizens are often asked to consider policies that trade short-term interests for long-term ones. An example of a contemporary issue that could benefit from steering a future choice towards the “should” option is the question of how to reduce domestic consumption of fossil

fuels that contribute to global climate change. While the vast majority of citizens agree that the U.S. needs to reduce its contribution to this global problem, most legislative efforts face stiff opposition. Rogers and Bazerman (2008) argue that one strategy that would help policymakers is to leverage the benefits of what they call “future lock-in.” They show that people are more likely to choose based on the interests of their *should* selves when choosing in the present for the future than when choosing in the present for immediate implementation.

Many wise environmental policies require people to make a small-to-medium current sacrifice in return for larger benefits in the future (or to avoid larger future harms). Such proposals often fail because people overweigh the immediate costs of implementation. People are more likely to support environmentally friendly policies that have initial costs and long-term benefits when the policies will be implemented in the future—even in the near future—rather than today. While a slight delay may create inefficiency, large increases in support may be possible with even this delay in implementation. Effectively, the slight delay persuades people to look beyond the steep slope of their emotional dislike of incurring the immediate costs of implementation.

Rogers and Bazerman (2008) first identified a set of policies that people report feeling they *should* support but do not *want* to support. In a pre-study, participants were asked to evaluate the extent to which they felt they *should* support the policy and the extent to which they *wanted* to support the policy. A policy was classified as a *should* policy when participants reported feeling significantly more strongly that they *should* support than they *wanted* to support it. The policies that Rogers and Bazerman (2008) identified as *should* policies included a policy that would increase the price of gasoline to reduce pollution and a policy limiting the number of

fish that could be caught to reduce ocean overharvesting, along with three other non-environmentally relevant policies.

For the fish harvesting issue, participants were asked to consider a policy to limit the amount of fish that could be caught by the fishing industry. The policy would increase the price of fish for all consumers, reduce the number of jobs in the fishing industry, protect the fish stocks in the oceans, and extend and sustain the survival of the fishing industry. Participants were randomly assigned to evaluate this proposal—either assuming that the policy would go into effect as soon as possible or four years from now. The latter condition dramatically increased the receptivity of the policy.

Rogers and Bazerman (2008) suggest that delaying the time to implementation may be a useful strategy for policymakers who are trying to bolster support for policies that people feel they *should* support but do not *want* to support. While the vast majority of citizens agree that the United States needs to do more to reduce its contribution to the global environmental problem, most proposed initiatives face strong opposition from legislators and citizens. Advocating for reforms that would go into effect in the future, policymakers might be able to leverage the benefits of the future lock-in effect to increase the proportion of people who support *should* reforms.

In some cases, applying future lock-in to public policy would be practically costless. Many laws are already designed to go into effect well into the future, yet are communicated in language that evokes immediate, self-interested concerns. Rogers and Bazerman (2008) show that future lock-in can occur even under minimal conditions. They asked a national sample of subjects about how favorably they would view a policy that would increase the price of gas by

53 cents in two years, but which they would vote on in a few months. All participants in their study read the following:

If passed, this policy would reduce gas consumption by increasing the price of a gallon of gas by 53 cents. In doing this, the policy would reduce US contribution of carbon emissions into the atmosphere, which is one of the leading causes of global climate change. This policy would also reduce US dependence on oil from foreign countries, especially the Middle East. This 53 cent price increase in a gallon of gas would also make gas more expensive for Americans, and increase the costs of all forms of travel, especially driving. It would also probably cost jobs in the short-term as the gas price increase would slow economic growth.

This policy would be voted on early in 2007 and go into effect in 2009.

After reading this policy, participants were asked “How strongly would you oppose or support this policy, which would either a) go into effect two years in the future or b) be voted on by Congress as soon as possible?” Participants who read version “a” indicated that they supported the policy significantly more and were significantly more likely to vote for the policy than participants who read version “b.” Essentially, delaying implementation reduced the emotive reaction that comes from immediately facing losses.

Independent of how much support people give to *should* legislation that will take effect in the distant future, an additional benefit of delaying a policy’s implementation is that it gives people time to prepare for the legislation’s impact. For example, passing stronger fuel-efficiency legislation that would take effect a few years in the future allows vehicle owners to enjoy more

years of value out of the vehicles they currently own and allows producers to gradually increase their capacity to manufacture more efficient vehicles.

One obvious risk of passing policies designed to take advantage of the future lock-in effect is that future legislatures could overturn the legislation. Rogers and Bazerman (2008) counter that this danger is not as risky as one might fear, since initially passing a policy is very different from overturning an existing one. Once implemented, citizens anticipate its instatement, and the policy gradually comes to be viewed as the default or status quo. As we reviewed above, defaults are powerful (Johnson and Goldstein 2003), and people are averse to changes from the status quo (Samuelson and Zeckhauser 1988).

### **REMAINING QUESTIONS: RESEARCH FRONTIER**

While most research in the environmental management arena has focused on technology innovation and organizational change (Bazerman and Hoffman 1999), we have highlighted research relevant to environmental change that focuses on the minds of decision makers. We are not the first to do so. Related efforts have been published (Bazerman and Hoffman, 1999; Bazerman, Baron, and Shonk, 2001; Hoffman and Bazerman, 2007). And these related works cover other decision biases (e.g., mythical fixed-pie, overconfidence, etc.), and in some cases, focus on specific environmental issues (see Bazerman [2006] for an application to climate change). We continue to believe that powerful insights can be obtained by thinking about the faulty decisions that negatively affect the environment. The goal of the current paper has been to highlight exemplars of the decision effects that we see as most important, and to focus on how to change environmentally destructive decisions.

We admit to a long history of disappointment in the ability of decision researchers to debias their judgment (Fischhoff 1982; Bazerman and Moore 2008). Nevertheless, we believe in

leveraging the insights of behavioral decision researchers to change systems in a manner that takes positive advantage of the mind's natural tendencies. Specifically this involves changing the choice environment by framing choices in ways that would advantage pro-environmental interventions. The choice architecture perspective that we have overviewed is in its infancy, and its application to environment issues remains minimal. We view it as a significant opportunity.

One popular myth that future research could help debunk is the myth that there is a battle between the different techniques of behavioral economists and neoclassical economists in designing interventions to help people and policymakers make wiser decisions. Though the two groups recommend very different solutions for the same problems (e.g., neoclassical economists rely on increasing prices—both sticker price and opportunity costs—to discourage behaviors with high environmental costs), there is great benefit to combining the recommendations of both groups. The different recommendations for the same problem from behavioral and neoclassical thinkers are oftentimes complementary instead of competing. One specific example could be decreasing gasoline consumption by increasing the price of gasoline (neoclassical approach) as well as measuring fuel efficiency by gallons per mile to more accurately reflect gasoline consumption (behavioral approach). The two approaches do not have to be in opposition; rather, the behavioral approach can actually be used to supercharge the incentive-compatible recommendations of the neoclassical approach.

Methodologically, we also see an important change coming from behavioral decision research and behavioral economics. Over the past quarter century, most of this research has been conducted in the lab, and pure experimental methods have been used. While we believe lab research has proven to generalize amazingly well (Bazerman and Moore 2008), it is also clear that strong evidence from the field can create a powerful desire to change. One interesting

observation from behavioral economists is that if you give a good idea to an organization, it should have an interest in working with researchers to test the idea in order to use and diffuse it more broadly. Ideally, field experiments should be conducted so that causality can be inferred. We believe that this will be very useful in helping organizations and nations think about wise interventions in the future.

One question in particular that could benefit from field evidence is which behaviors leading to energy conservation are easiest to change. We have decent measures of how behavioral change can impact our energy footprints, but relatively poor measures of how likely people are to engage in such behaviors. Researchers and practitioners are natural partners in helping each other answer this type of question. By identifying the behaviors that are ripest for change—the lowest-hanging fruit with regard to intervention—we will be able to gain the most impact from their respective efforts.

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