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THE GREEN ISSUE

Why Isn't the Brain Green?

By [JON GERTNER](#)

Two days after [Barack Obama](#) was sworn in as president of the United States, the [Pew Research Center](#) released a poll ranking the issues that Americans said were the most important priorities for this year. At the top of the list were several concerns — jobs and the economy — related to the current recession. Farther down, well after terrorism, deficit reduction and energy (and even something the pollsters characterized as “moral decline”) was [climate change](#). It was priority No. 20. That was last place.

A little more than a week after the poll was published, I took a seat in a wood-paneled room at [Columbia University](#), where a few dozen academics had assembled for a two-day conference on the environment. In many respects, the Pew rankings were a suitable backdrop for the get-together, a meeting of researchers affiliated with something called CRED, or the Center for Research on Environmental Decisions. A branch of behavioral research situated at the intersection of psychology and economics, decision science focuses on the mental processes that shape our choices, behaviors and attitudes. The field's origins grew mostly out of the work, beginning in the 1970s, of Daniel Kahneman and Amos Tversky, two psychologists whose experiments have demonstrated that people can behave unexpectedly when confronted with simple choices. We have many automatic biases — we're more averse to losses than we are interested in gains, for instance — and we make repeated errors in judgment based on our tendency to use shorthand rules to solve problems. We can also be extremely susceptible to how questions are posed. Would you undergo surgery if it had a 20 percent mortality rate? What if it had an 80 percent survival rate? It's the same procedure, of course, but in various experiments, responses from patients can differ markedly.

Over the past few decades a great deal of research has addressed how we make decisions in financial settings or when confronted with choices having to do with health care and consumer products. A few years ago, a Columbia psychology professor named David H. Krantz teamed up with Elke Weber — who holds a chair at Columbia's business school as well as an appointment in the school's psychology department — to assemble an interdisciplinary group of economists, psychologists and anthropologists from around the world who would examine decision-making related to environmental issues. Aided by a \$6 million grant from the [National Science Foundation](#), CRED has the primary objective of studying how perceptions of risk and uncertainty shape our responses to climate change and other weather

phenomena like [hurricanes](#) and droughts. The goal, in other words, isn't so much to explore theories about how people relate to nature, which has been a longtime pursuit of some environmental psychologists and even academics like the [Harvard](#) biologist E. O. Wilson. Rather, it is to finance laboratory and field experiments in North America, South America, Europe and Africa and then place the findings within an environmental context.

It isn't immediately obvious why such studies are necessary or even valuable. Indeed, in the United States scientific community, where nearly all dollars for climate investigation are directed toward physical or biological projects, the notion that vital environmental solutions will be attained through social-science research — instead of improved climate models or innovative technologies — is an aggressively insurgent view. You might ask the decision scientists, as I eventually did, if they aren't overcomplicating matters. Doesn't a low-carbon world really just mean phasing out coal and other fossil fuels in favor of clean-energy technologies, domestic regulations and international treaties? None of them disagreed. Some smiled patiently. But all of them wondered if I had underestimated the countless group and individual decisions that must precede any widespread support for such technologies or policies. "Let's start with the fact that climate change is anthropogenic," Weber told me one morning in her Columbia office. "More or less, people have agreed on that. That means it's caused by human behavior. That's not to say that engineering solutions aren't important. But if it's caused by human behavior, then the solution probably also lies in changing human behavior."

Among other things, CRED's researchers consider global warming a singular opportunity to study how we react to long-term trade-offs, in the form of sacrifices we might make now in exchange for uncertain climate benefits far off in the future. And the research also has the potential to improve environmental messages, policies and technologies so that they are more in tune with the quirky workings of our minds. As I settled in that first morning at the Columbia conference, Weber was giving a primer on how people tend to reach decisions. Cognitive psychologists now broadly accept that we have different systems for processing risks. One system works analytically, often involving a careful consideration of costs and benefits. The other experiences risk as a feeling: a primitive and urgent reaction to danger, usually based on a personal experience, that can prove invaluable when (for example) we wake at night to the smell of smoke.

There are some unfortunate implications here. In analytical mode, we are not always adept at long-term thinking; experiments have shown a frequent dislike for delayed benefits, so we undervalue promised future outcomes. (Given a choice, we usually take \$10 now as opposed to, say, \$20 two years from now.) Environmentally speaking, this means we are far less likely to make lifestyle changes in order to ensure a safer future climate. Letting emotions determine how we assess risk presents its own problems. Almost certainly, we underestimate the danger of rising sea levels or epic droughts or other events that we've never experienced and seem far away in time and place. Worse, Weber's research seems to help establish that we have a "finite pool of worry," which means we're unable to maintain

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help establish that we have a “finite pool of worry,” which means we’re unable to maintain our fear of climate change when a different problem — a plunging stock market, a personal emergency — comes along. We simply move one fear into the worry bin and one fear out. And even if we could remain persistently concerned about a warmer world? Weber described what she calls a “single-action bias.” Prompted by a distressing emotional signal, we buy a more efficient furnace or insulate our attic or vote for a green candidate — a single action that effectively diminishes global warming as a motivating factor. And that leaves us where we started.

Debates over why climate change isn't higher on Americans' list of priorities tend to center on the same culprits: the doubt-sowing remarks of climate-change skeptics, the poor communications skills of good scientists, the political system's inability to address long-term challenges without a thunderous precipitating event, the tendency of science journalism to focus more on what is unknown (will oceans rise by two feet or by five?) than what is known and is durably frightening (the oceans are rising). By the time Weber was midway into her presentation, though, it occurred to me that some of these factors might not matter as much as I had thought. I began to wonder if we are just built to fail.

Columbia's behavioral labs are located underground and consist of a windowless suite of bright, sparsely furnished rooms with whitewashed cinder-block walls and gray industrial carpet. Each lab has a common area with a small rectangular table; adjacent to the common area are several tiny offices equipped with Dell computers. Depending on the experiment, test subjects, who are usually paid around \$15 to participate and who are culled largely from Columbia's student body, can work on tests collaboratively at the table or individually in the private offices.

Each lab room is also equipped with a hidden camera and microphone. One afternoon in February, I sat in a small viewing room and watched, on a closed-circuit television monitor, a CRED experiment being conducted down the hall by Juliana Smith, a graduate student at Columbia. Three subjects were dealing with several quandaries. The first involved reaching a consensus on how to apply \$5 billion worth of federal funds to wind-energy technologies. Should they spend it all on conventional [wind turbines](#)? Should they invest some (or all) of the money on an as-yet-unproven technology that would employ magnetic levitation to create a huge, long-lasting, superefficient wind-powered generator? After the group came to a consensus in each of the test segments, its members were asked to go into the offices and figure out their own individual decisions.

When I first heard about these particular experiments at CRED, I assumed they were meant to provide insight into our opinions about wind power. It turned out the researchers had little curiosity about what we think of wind power. Because CRED's primary goal is to understand decision-making in situations of uncertainty, the wind-turbine question — should we spend money on building turbines now with a proven technology or should we finance technologies that might be more efficient someday? — was intriguing not for its content but for the way it

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revealed how our minds work. The familiar variables were all there: uncertainty, time, potential gains, potential losses.

For the researchers, it was crucial to understand precisely how group dynamics shaped decisions during the experiment. In Weber's view, many important environmental choices (building codes, for instance, or vehicle purchases) are made by groups — households, companies, community boards and the like. And various experiments at CRED have established the ease of getting random individuals to cooperate; in one test, simply giving some subjects a colored sticker, a blue star, say, and telling them they were on the “blue-star team” increased group participation from 35 percent to 50 percent. (Just seating them together at a table increased participation rates to 75 percent.) “So cooperation is a goal that can be activated,” Weber told me one morning. Her point was that climate change can be easily viewed as a very large “commons dilemma” — a version, that is, of the textbook situation in which shepherders have little incentive to act alone to preserve the grassy commons and as a result suffer collectively from overgrazing. The best way to avoid such failure is by collaborating more, not less. “We enjoy congregating; we need to know we are part of groups,” Weber said. “It gives us inherent pleasure to do this. And when we are reminded of the fact that we're part of communities, then the community becomes sort of the decision-making unit. That's how we make huge sacrifices, like in World War II.”

A few days before visiting Columbia's behavioral labs, I watched a test run of the same experiments at a large conference table at CRED's nearby offices in Schermerhorn Hall. Student subjects, two men and one woman, debated the two windmill scenarios. “We should put more money in project A,” one said. Another countered, “But science grows exponentially, so I think we should put more in B.” An impassioned discussion about wind turbines went round and round.

I sat between Weber and Michel Handgraaf, a member of CRED and a professor of psychology at the University of Amsterdam. Handgraaf, who had already started running a similar experiment in Amsterdam, leaned over and whispered to me: “You'll notice they're saying, ‘This has so-and-so effect over so many years’ — that's analytical. But then often they're saying, ‘But I feel this way’ — that's emotional.” In short, what Handgraaf and Weber were hearing wasn't a conversation about the best wind turbine but a tussle between the subjects' analytical and emotional methods of risk assessment. These experiments would be run with 50 different groups in New York, Handgraaf told me, and the conversations would be recorded and scored for data. The data were in the words. They were in how individuals parsed uncertainty and future trade-offs; they were in the phrases they used as they navigated between thinking and feeling; they were in the way the subjects followed a winding path to a consensual decision, soothing worries or explaining technical information to one another or appealing to the group's more courageous instincts.

Embedded deep within the experimental structure was another inquiry, too. The subjects in half of the 50 test groups would first make their decisions individually and then as a group:

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half of the 50 test groups would first make their decisions individually and then as a group; the other half would make group decisions first and individual ones second. Weber and Handgraaf were fairly confident, based on previous work, that the two approaches would produce different results. In Amsterdam, Handgraaf told me, he had already seen that when subjects made decisions as a group first, their conversations were marked far more often by subtle markers of inclusion like “us” and “we.” Weber, for her part, had seen other evidence that groups can be more patient than individuals when considering delayed benefits. “One reason this is interesting is that it’s general practice in any meeting to prepare individually,” Handgraaf said. Or, to put the matter another way: What if the information for decisions, especially environmental ones, is first considered in a group setting before members take it up individually, rather than the other way around? In Weber’s view, this step could conceivably change the decisions made by a corporate board, for example, or a group of homeowners called together for a meeting by a public utility. Weber’s experiments have also looked at how the ordering of choices can create stark differences: considering distant benefits before immediate costs can lead to a different decision than if you consider — as is common — the costs first. Here, then, is a kind of blueprint for achieving collective decisions that are in the world’s best interests, but I asked Weber if that wouldn’t that skew the natural decision-making process.

“We tend to always wonder,” she replied: “What’s that person’s true preference? What do they really want? I think that’s the wrong question, because we want it all.” People have multiple goals. If group involvement or the ordering of choices changes the process of making a particular decision, and in turn the result — whether because it tweaked our notions of risk or because it helped elevate social goals above individual goals and led to better choices for the global commons — that isn’t necessarily a distortion of our true preference. There is no such thing as true preference.

At the moment, about 98 percent of the federal financing for climate-change research goes to the physical and natural sciences, with the remainder apportioned to the social sciences. In science-policy-speak, that leftover percentage is typically referred to as “human dimensions” research, an omnibus description for studies on how individuals and groups interact with the environment. Paul Stern, a psychologist who heads the Committee on Human Dimensions of Global Change at the [National Research Council](#) in Washington and whose work includes looking at how people consume energy in the home, told me that human-dimensions work usually falls into one of three categories: the human activities that cause environmental change, the impacts of environmental change on people and society and the human responses to those consequences. Much of CRED’s research is about the human responses to the experiences (or anticipated experiences) of climate change. What makes CRED’s work especially relevant, though, is that various human attitudes and responses — How can there be global warming when we had a frigid January? What’s in it for me if I change the way I live? — can make the climate problem worse by leaving it unacknowledged or unaddressed. Apathetic and hostile responses to climate change, in other words, produce a feedback loop

and reinforce the process of global warming.

Lab experiments in the social sciences, like the ones I witnessed at Columbia, are sometimes criticized for their counterfeit drama. After all, how often do we actually get to disburse \$5 billion from the Department of Energy on windmills? Also, is the real world made up entirely of Columbia University students? These factors don't necessarily affect the knowledge that researchers can gain about human decision-making processes; lab experiments on investment decisions, for instance, have long been shown to offer useful insights into our real-world investment choices. Nonetheless, fieldwork has a value that can't always be reproduced in a lab. The lab experiment designed by Weber and Handgraaf actually took a cue from research done by another CRED member, Ben Orlove, an anthropologist at the University of California, Davis, who studied farmers in southern Uganda. In 2005 and 2006, Orlove observed how the behavior of the region's poor farmers could be influenced by whether they listened to crucial rainy-season radio broadcasts in groups or as individuals. Farmers in "community groups," as Orlove described them to me, engaged in discussions that led to a consensus, and farmers made better use of the forecast. "They might alter their planting date," he said, "or use a more drought-resistant variety of seed." Those in the community groups also seemed more satisfied with the steps they took to increase their yields.

In 2005, Anthony Leiserowitz, a CRED member who directs the [Yale](#) Project on Climate Change, began a multiyear field project when he drove to Anchorage in a camper with his wife and 2-year-old son. "I had worked on some national studies about American perceptions of climate change," he told me, "and one of the clear findings was — and still is — that most Americans think about climate change as a distant problem. Distant in time, and distant in space." In Alaska, however, there was already evidence of melting permafrost, insect-driven tree mortality and diminished sea ice. Leiserowitz saw a natural opportunity. The possibility that society won't act decisively on global warming until we experience a shattering realization — a Pearl Harbor moment, as the climate blogger and former Department of Energy official Joe Romm recently put it — aligns with our tendency to respond quickly to the stimulus of experience and emotion, but slowly to a risk that we process analytically and that may be rife with uncertainties. Leiserowitz simply wondered if Alaskans, now living in a state of easily perceived climate changes, could illuminate how — and by how much — direct experience could change attitudes.

Traveling the state, Leiserowitz interviewed scientists, journalists, environmental leaders, politicians and — in the remote northwestern city of Kotzebue — indigenous tribal leaders. He also commissioned a survey. His data showed that the majority of Alaskans had indeed detected a change in climate and attributed it to man-made causes; they also said they believed warming would have significant impacts on Alaska and the world. But Leiserowitz found deep perceptual gaps between urban Alaskans, whose experience of climate change was limited, and rural residents. (People living in Kotzebue, for instance, were experiencing a threat to their culture from the erosion of sea ice, which limited their ice fishing.) In sum

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threat to their culture from the erosion of sea ice, which limited their ice fishing.) In sum, Alaskans were no more worried than the American public as a whole about climate change. And they were no more inclined than typical Americans to see it as a serious threat to themselves or to their communities. About half of them, in fact, considered climate change a long-term problem that required more study before acting.

Among other things, the results suggested that experience of climate change is a relative thing: something happening to another part of your state, or to a different cultural group, doesn't necessarily warrant a change in your own response. It likewise hinted at the complexity of instilling feelings of climate-related urgency in Americans. If you don't think or feel there's a risk, why change your behavior? In response, researchers like Leiserowitz have investigated messages that could captivate all different kinds of audiences. Reaching a predominantly evangelical or conservative audience, Leiserowitz told me, could perhaps be achieved by honing a message of "moral Christian values," an appeal possibly based on the divine instruction in Genesis 2:15 to tend and till the garden.

Over the past few years, it has become fashionable to describe this kind of focused communication as having the proper frame. In our haste to mix jargon into everyday conversation, frames have sometimes been confused with nudges, a term made popular in a recent book, "Nudge: Improving Decisions About Health, Wealth and Happiness," written by Richard Thaler and Cass Sunstein when they were academics at the [University of Chicago](#). (Sunstein later moved to Harvard Law School and has since been nominated as the head of the White House Office of Information and Regulatory Affairs.) Frames and nudges are not precisely the same; frames are just one way to nudge people by using sophisticated messages, mined from decision-science research, that resonate with particular audiences or that take advantage of our cognitive biases (like informing us that an urgent operation has an 80 percent survival rate). Nudges, more broadly, structure choices so that our natural cognitive shortcomings don't make us err. Ideally, nudges direct us, gently, toward actions that are in our long-term interest, like an automated retirement savings plan that circumvents our typical inertia. Thaler and Sunstein explain in their book that nudges can take advantage of technology like home meters, which have been shown to reduce electricity usage by making constant feedback available. These appeal to our desire for short-term satisfaction and being rewarded for improvement. Or a nudge might be as simple as a sensor installed in our home by a utility that automatically turns off all unnecessary power once we leave for the day — a technology, in effect, that doesn't even require us to use our brains. "I think the potential there is huge," Thaler told me recently, when I asked him about environmental nudges. "And I think we can use a whole bag of tricks."

Leiserowitz and Weber spend a fair amount of time talking to scientists and policy makers about how to translate their insights into possible frames and nudges. In Weber's view, CRED was established because the traditional model of using decision research — in which physical scientists doing a study might seek the input of psychologists at the end to help them frame their findings — seemed both backward and ineffective. "By then it's too late," Weber said

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their findings — seemed both backward and ineffective. “By then it’s too late,” Weber said, “because you haven’t explored all the initial options that would have been more beneficial.” In other words, Weber says he believes decision science isn’t only about structuring choices or finding the right frame to get a better outcome; it’s about identifying useful information that can be used for innovative products, policies and scientific studies. At the National Research Council, Paul Stern offered the example of a climatologist who had been discussing climate change with cherry farmers in several Michigan counties. The farmers didn’t care about future temperatures as much as the date of the last spring frost. “No one has been interested in trying to predict the date of the last spring frost,” Stern told me, but maybe they should be. “They’ve been trying to predict average temperature and heat waves.” Weber likewise envisioned a similar application in technology or government policy. “Whatever you design as the most cost-effective or technologically feasible solution might not be palatable to the end users or might encounter political oppositions,” she said. Behavioral research could have helped you see such hurdles ahead of time. “You could have designed a way to implement it better. Or you could have thought about another solution.”

Over the winter, the Obama administration began working on regulations for carbon-dioxide emissions, arguably the most important climate-related policy ever undertaken. While many economists favor the simplicity of a carbon tax, it seemed every person of influence in the United States government agreed that a cap-and-trade policy — in which carbon emissions are capped and firms can buy and sell credits — was preferable. Perhaps this was understandable: the poisonous associations of the word “tax” appear to doom it as a policy. And yet this assumption can obscure what actually happens in the minds of Americans on this issue. Not long ago, David Hardisty, a student of Weber’s, led an experiment in which a 2 percent fee added to an airline ticket was described to various subjects as either a carbon “tax” or a carbon “offset.” The subjects were told the fee would finance alternative-energy and carbon-reduction technologies. Hardisty predicted he would get different results from Democrats and Republicans, and that was indeed the case. Democrats were willing to pay a fee for an offset or a tax; Republicans were willing to pay for an offset but not a tax. Clearly, the tax frame affected the outcome — very much so for Republicans.

A more interesting part of the experiment came next. Hardisty asked his subjects to write down their thoughts, in order, as they decided whether to pay the tax or the offset. Why should this matter? We’ve long understood that many of us find the word “tax” repellent, but we don’t know precisely how it repels us. For the past few years, Weber and her husband, Eric Johnson, a professor at Columbia’s business school, have been looking at how we construct our preferences when making a choice; they theorize that we “query” ourselves, mustering evidence pro and con from memory as we clear a path to a decision. The order of the thoughts matters — early thoughts seem to sway our opinion, biasing subsequent thoughts to support the early position. For Republicans in the experiment who considered a carbon tax, their early thoughts were strongly negative (“I will be old and dead by the time this world has an energy crisis”) and thus led to conclusions that were overwhelmingly

negative, too. That's why they rejected the tax. Yet for the same group, the word "offset" actually changed the way subjects processed their choice. In their thinking, they considered the positive aspects of the offset first — the financing of clean energy — and found the overall evidence positive and acceptable. Indeed, in a follow-up study by Hardisty, merely asking people to list their thoughts about the fee in one order or another (pros first or cons first) affected their preference, regardless of whether they were Democrats or Republicans.

So in terms of policy, it may not be the actual tax mechanism that some people object to; it's the way a "trivial semantic difference," as Hardisty put it, can lead a group to muster powerful negative associations before they have a chance to consider any benefits. Baruch Fischhoff, a professor at Carnegie Mellon and a kind of elder statesman among decision scientists, told me he's fairly convinced a carbon tax could be made superior to cap and trade in terms of human palatability. "I think there's an attractive version of the carbon tax if somebody thought about its design," Fischhoff told me, adding that it's a fundamental principle of decision research that if you're going to get people to pay a cost, it's better to do it in a simple manner (like a tax) than a complex one (like in cap and trade). Fischhoff sketched out for me a possible research endeavor — the careful design of a tax instrument and the sophisticated collection of behavioral responses to it — that he thought would be necessary for a tax proposal to gather support. "But I don't think the politicians are that informed about the realm of the possible," he added. "Opinion polls are not all that one needs."

One objection to potential nudges, whether on carbon taxes or household energy use, is that they can seem insidious. "They empower government to maneuver people in its preferred directions," Thaler and Sunstein note in their book, "and at the same time provide officials with excellent tools by which to accomplish that task." Thaler and Sunstein conclude that a crucial principle is to always preserve choice as an option (nudging people with a home energy meter, for instance, is fine as long as they can opt out of using it). Weber and David Krantz, two of the co-directors of CRED, have given the matter a good deal of thought, too. "People need some guidance over what the right thing to do is," Krantz told me. But he said that he was doubtful that you could actually deceive people with decision science into acting in ways that they don't believe are right. "Remember when New York tried to enforce its jaywalking laws?" he asked. "You can't enforce stuff that people don't believe should be done."

When I raised the issue of possible ethical dilemmas with Weber, she countered by claiming that government constantly tries to instill behaviors that are considered to be in society's best interest. "There's no way around it," she told me. "We're always trying to push some agenda." Take the decision to allow certain kinds of mortgages and securities to be sold that are now considered disastrous. In doing so, according to Weber, "we were privileging certain people, and certain institutions. And for a long time we were pushing the idea that everyone should own a house." As for the question of manipulation, Weber contended that there is no neutral, "value-free way" of presenting people with information. "I think you have to take it as a given that whatever we do, whether it's what we currently do or what we plan to do."

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as a given that whatever we do, whether it's what we currently do or what we plan to do," she said, "has some value judgment built into it." The crucial question, at least to her, is whether (and when) we want to use the tools of decision science to try and steer people toward better choices. If our preferences aren't fixed the way we think they are — if, as Weber has argued, they're sometimes merely constructed on the spot in response to a choice we face — why not try new methods (ordering options, choosing strategic words, creating group effects and so forth) to elicit preferences aligned with our long-term interest? That has to be better, in Weber's opinion, than having people blunder unconsciously into an environmental catastrophe.

In fact, any potential climate disasters, at least to a behaviorist like Weber, would likely signal the start of an intriguing but ultimately dismal chain of events. A few years ago Weber wrote a paper for the journal *Climatic Change* that detailed the psychological reasons that global warming doesn't yet scare us; in it, she concluded that the difficulties of getting humans to act are inherently self-correcting. "Increasing personal evidence of global warming and its potentially devastating consequences can be counted on to be an extremely effective teacher and motivator," she wrote, pointing to how emotional and experiential feelings of risk are superb drivers of action. "Unfortunately, such lessons may arrive too late for corrective action."

Jon Gertner, a contributing writer, often writes about business and the environment.

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