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## Dragons, mules, and honeybees: Barriers, carriers, and unwitting enablers of climate change action

Robert Gifford

### Abstract

Why aren't more people engaged in actions that would help mitigate climate change? The psychological "dragons of inaction" that impede green behaviors fall into seven "genera," each with multiple "species" of barriers to pro-environmental behavior. Collectively, they represent a formidable challenge to policy makers, not only because there are so many of these dragons, but also because policy makers will need to learn much more about which dragons impede which sorts of people in order to target policies cost-effectively. Some people, dubbed "mules," carry heavy loads of responsibility as they take major steps to mitigate climate change. Others are "honeybees" who help the environment, but without intending to do so. Too few people fall into either of these categories to make a real difference for the climate, the author writes, but he identifies five behavioral-science strategies that might help overcome the psychological barriers to climate action.

### Keywords

climate change, dragons, ideology, inaction, psychology, risk, social norms, sunk costs

Gallup polls from 1989 to 2013 show that the percentage of Americans who worry about global warming "a great deal" or "a fair amount" has varied by plus or minus 10 percent, but overall has been pretty flat, averaging roughly 60 percent. However, the percentage who worry "not at all" has nearly doubled, from about 14 percent in the early part of this period to about 26 percent in recent years (Gallup News Service, 2013). Meanwhile, the annual amount of carbon dioxide from fossil fuels poured into the atmosphere has linearly increased for many years and, for the first time in millions of years, the average daily level of carbon dioxide in the atmosphere recently reached 400 parts per million (Gillis, 2013). This milestone is just the latest in a long string of media reports and scientific warnings spanning several decades. So why aren't more citizens engaged in actions that would help to ameliorate the problem?

Of course, some citizens have taken *many* steps to mitigate climate change,

and others have taken *some* steps in that direction. As a whole, however, humans continue to degrade the environment and emit massive quantities of greenhouse gases. Thanks to these heat-trapping gases, each of the past 12 years has been among the 14 warmest years since global record-keeping began in 1880.

In some cases, the reasons for climate inaction are structural—that is, beyond an individual’s reasonable control. For example, having a low income severely limits one’s ability to purchase solar panels; living in a rural area usually means that public transport does not exist as an alternative to driving; and living in a region with very cold winters greatly restricts one’s ability to reduce energy use for home heating. However, many people *do* have the financial and structural capacity to act, but do not . . . or do much less than they could. So the question remains: What limits more widespread pro-environmental behavior on the part of individuals for whom such actions are feasible?

The psychological barriers to behavior that would effectively mitigate climate change—what I have called the “dragons of inaction” (Gifford, 2011)—fall into seven genera, each of which contains a number of subspecies so that, collectively, at least 30 dragons hinder pro-climate action by individuals. By individuals, I mean not only average citizens, but also prominent business executives, senior government officials, and other important players whose choices and decisions have a major impact on climate change. Collectively, the dragons of inaction represent a formidable, Hydra-headed challenge to policy makers, not only because there are so many of them, but because policy makers must learn more about which dragons impede

which sorts of people, so as to target climate policy instruments in the most cost-effective ways.

### Limited cognition

One dragon genus is limited cognition, in various forms. Humans are famously less rational than once believed (Tversky and Kahneman, 1974). This is as true for environmental issues as it is in other behavior domains. One problem is that the human brain has not evolved much in thousands of years, and our ancestors on the African savannah were chiefly focused on the here and now: their own band, immediate risks, and immediate opportunities (Ornstein and Ehrlich, 1989). Although humans obviously are able to think about the future, it usually takes a back seat to the present. “The climate will cause *what* in 2080?” Dealing with the slowly unfolding impacts of global climate change does not come naturally.

Another barrier is, to be blunt, ignorance. Some people—to be sure, few in the developed world by now—simply remain unaware of key environmental realities. Most often, citizens are paralyzed less by knowledge that the problem exists than by a lack of knowledge about which actions to take, how to undertake actions of which they are aware, and the relative benefits of different actions. This is understandable when computation of the lifecycle costs of products is in its infancy and some studies produce counterintuitive results. For example, New Zealand lamb shipped to the United Kingdom for consumption there apparently has a much smaller carbon footprint than lamb produced and eaten in the United Kingdom (Goleman, 2009).<sup>1</sup>

A kind of weariness sets in when environmental danger messages from the media, the government, or scientists are too similar and too frequent; they become wallpaper (Burke and Edell, 1986). Behavior change is unlikely when this occurs.

Numerous behavioral science studies demonstrate that perceived or real uncertainty reduces the frequency of pro-environmental or sustainable behavior (Budescu et al., 2009). Furthermore, people tend to interpret uncertainty in self-serving ways. For example, if people believe that global warming might not be occurring, or at least not here and not now, and they desire a fuel-inefficient vehicle for reasons unrelated to climate concerns, they may well purchase it.

People temporally and spatially discount events and outcomes. My colleagues and I found, in an 18-nation study, that people tend to believe that environmental conditions are worse in countries other than their own—and, of course, people in those countries tend to believe the same thing about other countries (Gifford et al., 2009). When problems are presumed to be worse elsewhere, people are less motivated to improve their own environment. Future environmental risks often are also discounted (Hendrickx and Nicolaij, 2004).

Optimism generally is healthy and is one mother of invention, but it can be overdone. For example, people underestimate their own objective risk from 22 environmental hazards (Pahl et al., 2005). Underestimation of risk obviously hinders pro-environmental action.

Perceived lack of control is a final form of limited cognition. Because some problems, such as climate change, are global, many people believe that their actions will lack efficacy (Ajzen, 2002).

Similarly, fatalists believe that nothing can be done even through collective human action (Lorenzoni et al., 2007).

## **Ideologies that foster inaction**

Some belief systems are so broad that they pervade many aspects of a person's life and filter down to views on climate, which in turn reduce climate-positive choices. Among these are certain religious and political views that can act as strong barriers to behavior change (Mortreux and Barnett, 2009). Some people take little or no climate-positive action because they believe that a religious deity or Mother Nature, as a secular deity, is in complete control.

A different sort of "deity" is technological. Mechanical innovation certainly has an admirable history of improving our standard of living, and of course it can help with environmental problems, but some take this further and believe that technology alone can solve the problems. Overconfidence in the efficacy of technology can serve as a barrier to pro-environmental behavior.

Free-market ideology has also been linked to lack of pro-environmental action (Heath and Gifford, 2006). System justification (Feygina et al., 2010), the tendency to defend the societal status quo, is another: "I'm all right, Jack—don't rock the boat."

## **Other people**

Humans are social animals; we compare our situations to those of others. If significant others, family, and friends are not doing their part, individuals are likely to decide that they should not exert effort either (Heath and Gifford, 2002). People look to others to derive

their norms about what is the proper course of action. Social norms can be forces for progress in environmental issues, but they can also be forces for regress (Aquino et al., 1992). Perceived inequity is often cited as a reason for inaction: “Why should I change if *they* won’t change?” Well-known persons, organizations, or other nations are cited as environmental foot-draggers, and these are used to justify an individual’s own non-action.

### Sunk costs

Investments of money and time can be valuable to an individual—but potentially harmful to the environment. Financial investments are the most obvious. Owning oil stocks is a glaring example. Owning a car is a more common, more subtle example: Once one has purchased a car and is paying for its insurance and other costs, why should this cozy portable living room be left at home?

Some sunk costs are behavioral in nature. In his 1890 work *The Principles of Psychology*, American psychologist and philosopher William James called habit the “enormous flywheel of society,” and indeed many habits are extremely resistant to change. Some that contribute to environmental degradation (for example, commuting by car) have a great deal of behavioral momentum.

Conflicting goals and aspirations can serve as sunk-cost barriers to action. Everyone has multiple goals, and some of them clash with the goal of making better environmental choices. Being willing to combat climate change, for example, is not compatible with aspirations such as buying a larger house or the latest electronic gadget (Lindenberg and Steg, 2007).

Residents may be more likely to care for a place to which they feel attachment than for one they do not, but the *lack* of attachment to one’s place of residence probably acts as an impediment to actions on behalf of its welfare. For example, evidence suggests that nature-based—but not civic-based—place attachment is related to more pro-environmental behavior (Scannell and Gifford, 2010).

### Disbelief, distrust, and denial

When people begin with a basic disbelief in others’ views, they are unlikely to take direction from them. For example, if scientists and politicians are disbelieved as a matter of course, their suggestions to be green are likely to be ignored. Trust is essential for healthy relationships. When it is absent, as it is between some citizens and scientists or government officials, resistance to their behavior-change suggestions will follow.

Policy makers have implemented many programs designed to encourage climate-friendly behavior. However, citizens choose whether to accept these offers, and often decide that the program is “not good enough” for their participation (Pelletier et al., 1999). Some people strongly react against policy that seems to threaten their freedom (Brehm, 1966). This can even lead to actively choosing climate-harmful products to spite policy makers.

Distrust and reactance (a type of psychological reaction that occurs when someone feels that his freedom of choice is threatened) can easily slide into denial. This may include denial that climate change is occurring, that it has anthropogenic origin, or that one’s own actions play a role in climate change. Mitigative actions are unlikely to follow.

## Perceived risk

Changing any important behavior holds at least six kinds of potential risk (Schiffman et al., 2006). Broadly speaking, people are risk-averse, so each of the risk species below is a drag on action.

### *Functional risk*

Will a climate-positive technology work? If one purchases, for example, an electric vehicle, it might, as a new technology, have battery problems. “Range anxiety” is the worry about getting only halfway there. The same could be said for many new green technologies.

### *Physical risk*

Some environmental adaptations may pose, or be perceived as posing, a danger to self or family. “Is that electric vehicle as crash-safe as the SUV that I currently own?” Riding a bicycle is a great response to climate change but has the potential to result in a visit to an emergency room.

### *Financial risk*

Green solutions require capital outlays. How long is the payback period? If the product becomes a fixed part of a residence (for example, solar panels mounted on a roof), will the owner recoup the installation costs or accrue enough energy savings before moving? What about the premium paid for that electric vehicle?

### *Social risk*

Others notice our choices. This leaves individuals open to judgment by their friends and colleagues, which could lead to reputation damage. “If I ride

my bicycle, will my significant others deride me behind my back?” “If I become a vegan, how much ‘granola’ teasing will I have to endure?”

### *Psychological risk*

If an individual is criticized or even rebuked by significant others or colleagues for making a green choice, that person risks damage to his or her self-esteem and possible losses of social resources.

### *Temporal risk*

The time spent planning a green course of action might fail to produce the desired results. Most people spend considerable time deciding whether to buy an electric vehicle, become a vegetarian, or plan how to cycle to work or school. What if it doesn’t work out? Time that could have been spent on something more enjoyable or productive was wasted. And if the planning process results in a decision *not* to change, that time was completely wasted.

## Limited behavior

Many, perhaps even most, people engage in some pro-environmental actions. However, most people could do much more than they currently do. Sometimes a little is viewed as “enough,” and sometimes a little is actually less than zero.

Tokenism is the dragon that takes this form: “I recycle, so I’ve done my part.” Usually a behavior that is easy to adopt is used for tokenism, and unfortunately the easy changes often are less climate-positive than more difficult changes.

A second species of limited behavior, the rebound effect, is one that actually

reverses any objective gains for the environment while allowing the person who made the change to think that he or she has done the right thing. That is, after some mitigating effort has been made, the gain is diminished or erased by subsequent actions. For example, evidence has shown that after buying a fuel-efficient vehicle, people drive farther than others who purchased less-fuel-efficient vehicles. The net climate effect can be negative.

### Which dragons for which people?

Not everyone faces the same dragons. Effective policy requires an understanding of which segments of the population need help dealing with which dragons. The genera of dragons described above are based on rational analyses; that is, which dragons *seem* to fall into the same groups. Empirical studies of different population segments show different groupings of dragons, and some dragons are more powerful for different segments. The elderly, the wealthy, students, and busy householders, for example, will have different mixes of dragons to overcome. In four recent survey studies we have conducted, the most common dragons are limited cognition (including lack of perceived control), system justification, conflicting goals and aspirations (involving sunk costs), and the dampening influence of other people.

An in-progress experimental study in my lab, in which people are asked to manage a simulated fishery with others, finds three main dragon factors. One is related to ideologies and belief in the free-market system; a frequently endorsed reason for exploiting the fishery was “Earning some money seemed more relevant in this situation than maintaining

the fish supply.” The second dragon factor is related to the categories of “discredence” (disbelief and distrust) and other people; a common justification for overharvesting was “I simply did not trust the other fishers.” The third factor is limited cognition; a typical justification offered for overfishing was “I didn’t think that taking a bunch of fish would really harm the supply.”

### Is there any hope for climate action?

Depending on an individual’s optimism or pessimism, the answer to this question can vary. Some people believe that humans simply have to “hit bottom” before their ways will change, not unlike the levee that only gets built after a flood, or the highway warning sign erected at the dangerous curve only after a serious car accident. Others believe that humans can see the dangers that lie ahead and can slay enough dragons, soon enough, to avoid some of the worst climate outcomes that some scenarios envisage. Thus, three answers are possible:

#### *No*

Structural barriers stand in the way of behavioral changes that would help mitigate climate change, but many psychological barriers remain even for individuals who do not face structural barriers—including limited cognition, ideologies, significant others, sunk costs, discredence, perceived risks, and limited behavior. Some structural barriers might be removed, but this is not likely to be sufficient. The future for humans and other life forms is either very dark, very expensive (to pay for enormous climate-responsive infrastructure), or both.

## Maybe

Psychologists and other social scientists have an important role to play if psychological barriers to climate inaction are to be overcome. Very briefly, five strategies that behavioral scientists are equipped to provide assistance with include gaining a better understanding of the barriers that different groups of people face; educating people about the differential efficacy of pro-environmental actions; improving education about climate change and communicating the problem more effectively; designing, implementing, and evaluating more effective interventions; and working with other experts and policy makers. Each discipline has valuable skills, and all are necessary if we are to succeed in this grand challenge.

## Yes

Some people are taking many steps to mitigate climate change. These people are in the minority, but they carry heavy loads of responsibility and action. For that reason, I call these carriers—with affection and admiration—the “mules” of climate change.

Another group is also taking mitigating steps, but, perhaps surprisingly, they do not claim to be helping with climate change or the environment. These are the people who cycle for health reasons, remain childless by choice, or use very little in the way of resources because they either are poor or have chosen simplicity as a lifestyle. Because they help the environment without intending to, I call these unwitting enablers the “honeybees” of climate change; the actual insects with that name keep us all in food, but their own goals are to serve their hive, not to feed humankind.

Everyone must overcome their dragons and become more mulish, or at least more like honeybees.

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## Note

1. The example in Goleman (2009) comes from a 2006 life-cycle assessment carried out by scientists at Lincoln University in New Zealand, where better weather and greener pastures produce more grass than in the United Kingdom, thereby reducing the amount of fertilizer and feed needed to raise lambs.

## References

- Ajzen I (2002) Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology* 32(4): 665–683.
- Aquino K, Steisel V, and Kay A (1992) The effects of resource distribution, voice, and decision framing on the provision of public goods. *Journal of Conflict Resolution* 36(4): 665–687.
- Brehm JW (1966) *A Theory of Psychological Reactance*. New York: Academic.
- Budescu DV, Broomell S, and Por H (2009) Improving communication of uncertainty in the reports of the Intergovernmental Panel on Climate Change. *Psychological Science* 20(3): 299–308.
- Burke MC and Edell JA (1986) Ad reactions over time: Capturing changes in the real world. *Journal of Consumer Research* 13(1): 114–118.
- Feygina I, Jost JT, and Goldsmith RE (2010) System justification, the denial of global warming, and the possibility of ‘system-sanctioned change’. *Personality and Social Psychology Bulletin* 36(3): 326–338.
- Gallup News Service (2013) Gallup poll social series: Environment. Available at: [www.gallup.com/file/poll/161663/Global\\_Warming\\_130408.pdf](http://www.gallup.com/file/poll/161663/Global_Warming_130408.pdf).
- Gifford R (2011) The dragons of inaction: Psychological barriers that limit climate change mitigation and adaptation. *American Psychologist* 66(4): 290–302.
- Gifford R, Scannell L, Kormos C et al. (2009) Temporal pessimism and spatial optimism in environmental assessments: An 18-nation study. *Journal of Environmental Psychology* 29(1): 1–12.



- Gillis J (2013) Heat-trapping gas passes milestone, raising fears. *New York Times*, May 10. Available at: <http://www.nytimes.com/2013/05/11/science/earth/carbon-dioxide-level-passes-long-feared-milestone.html>.
- Goleman D (2009) *Ecological Intelligence: How Knowing the Hidden Impacts of What We Buy Can Change Everything*. New York: Broadway.
- Heath Y and Gifford R (2002) Extending the theory of planned behavior: Predicting the use of public transportation. *Journal of Applied Social Psychology* 32(10): 2154–2189.
- Heath Y and Gifford R (2006) Free-market ideology and environmental degradation: The case of belief in global climate change. *Environment & Behavior* 38(1): 48–71.
- Hendrickx L and Nicolaj S (2004) Temporal discounting and environmental risks: The role of ethical and loss-related concerns. *Journal of Environmental Psychology* 24(4): 409–422.
- James W (1890) *The Principles of Psychology*. Available at: <http://psychclassics.yorku.ca/James/Principles/index.htm>.
- Lindenberg S and Steg L (2007) Normative, gain and hedonic goal frames guiding environmental behavior. *Journal of Social Issues* 63(1): 117–137.
- Lorenzoni I, Nicholson-Cole S, and Whitmarsh L (2007) Barriers perceived to engaging with climate change among the UK public and their policy implications. *Global Environmental Change* 17(3–4): 445–459.
- Mortreux C and Barnett J (2009) Climate change, migration and adaptation in Funafuti, Tuvalu. *Global Environmental Change* 19(1): 105–112.
- Ornstein RE and Ehrlich PR (1989) *New World New Mind: Moving toward Conscious Evolution*. New York: Doubleday.
- Pahl S, Harris PR, Todd HA et al. (2005) Comparative optimism for environmental risks. *Journal of Environmental Psychology* 25(1): 1–11.
- Pelletier LG, Dion S, Tuson K et al. (1999) Why do people fail to adopt environmental protective behaviors? Toward a taxonomy of environmental amotivation. *Journal of Applied Social Psychology* 29(12): 2481–2504.
- Scannell L and Gifford R (2010) The relations between natural and civic place attachment and pro-environmental behavior. *Journal of Environmental Psychology* 30(3): 289–297.
- Schiffman LG, Kanuk LL, and Das M (2006) *Consumer Behaviour*. Toronto: Pearson Education.
- Tversky A and Kahneman D (1974) Judgment under uncertainty: Heuristics and biases. *Science* 185(4157): 1124–1131.

### Author biography

**Robert Gifford** is a professor in the Department of Psychology and the School of Environmental Studies at the University of Victoria in Canada, where he is the founding director of the program in the Human Dimensions of Climate Change. He is editor of the *Journal of Environmental Psychology*, author of four editions of the textbook *Environmental Psychology: Principles and Practice* (Optimal, 2007), former president of the environmental psychology division of the International Association of Applied Psychology, and a former member of the American Psychological Association's Task Force on the Interface between Psychology and Global Climate Change. His research includes experimental investigations of commons dilemmas in resource management and applied studies designed to increase pro-environmental behavior.