

Morality in Public Policy: Climate Change

Carmen Lawrence

Earth System scientists are telling us that, like tectonics, volcanism and fluctuations in solar radiation, humans have become a force of nature, so much so that, in the prophetic words of Will Steffen and his colleagues, the “human imprint on the global environment has now become so large and active that it rivals some of the great forces of Nature in its impact on the functioning of the Earth system”.

So powerful have we become, it appears that we have taken the planet into a new geological epoch, leaving behind that happy 10,000 years of climatic stability known as the Holocene to enter the Anthropocene. Australian geologist Mike Sandiford has estimated that with our energy use doubling every 34 years, we are on course to surpass the energy released by plate tectonics by about 2060.

It is important to place climate change in the broader context of the state of our environment, since many of the observations about climate change apply equally to other aspects of environmental degradation. The World Bank¹ has highlighted the fact that a third of the world’s population faces water scarcity, that 70% of the world’s fisheries are overexploited, that soil degradation affects a significant proportion of both irrigated and rain fed agricultural lands and that every year at least a million people die prematurely from respiratory illnesses linked to air pollution. And while the destructive *physical and economic effects* of climate change are being anticipated, the human *psychological* consequences of this devastation are not: rising rates of mental & social disorders are likely – e.g. depressive and anxiety disorders, post-traumatic stress disorders, substance abuse, suicides, and outbreaks of violence and social conflict. Examining data from Africa between 1990 and 2009, a recent study was able to demonstrate a robust relationship between environmental shocks and unrest. As one group of researchers put it, “Combine water scarcity with political instability, increasing resource demands and climate change, and the ‘perfect storm’ for conflict can be created.”

However, whether the focus is on air, land and water pollution, biodiversity loss, resource depletion – or climate change - the underpinning driver is human consumption. Our levels of consumption are high and rising and, in the West, we are more affluent – and wasteful – than we have ever been. Add to that the rising affluence of the middle classes in India and China who are beginning to consume like we are, and it is obvious that climate change is not the only momentous problem we’re facing; there are many serious commentators who believe we are already overshooting the earth’s carrying capacity.

¹ www.worldbank.org

That consumption is driven, in part, by a belief that greater affluence is conducive to happiness – if the GDP is rising, we should all be better off. While it is true that increasing income improves health and wellbeing, the gains – whether measured at an individual or a societal level – flatten out very quickly (Bok, 2009)². And a recent study has shown that countries with high incomes and high carbon emissions do not achieve higher life expectancies than those with moderate incomes and lower carbon emissions (includes Imported CO₂ – embedded in imported goods).

Obviously, many of the recommendations to reduce greenhouse gas emissions and to facilitate adaptation to a changed climate depend on people changing their behaviour. From changing our patterns of settlement to modifying our diets, there is no doubt that we need to change - and on a scale that has never before been contemplated.

Yet governments (and many citizens too) seem to be looking for an easy way out. Of course, the easiest way out is to refuse to accept that there is a problem; another is to hope that the problem is not as bad as it seems or that some new technological silver bullet will miraculously appear. These positions are not altogether surprising to people who study human behaviour, but until recently, the scientists who study human behaviour and societies have not played a significant part in the global debate about climate change and how to deal with it.

I will explore why this must be remedied and outline some of what we know – and need to know - about human psychology (including our occasional irrationality) to make any progress in crafting workable solutions to the problem of climate change.

Obviously, reducing our carbon footprints, increasing the support for climate change mitigation policies and enduring the effectiveness of legislation, sanctions, incentives and persuasive communication - traditional bases of public policy – requires at least a rudimentary understanding of the fundamentals of human psychology and behaviour change.

At the very least, this should include an examination of:

- what values people bring to their assessment of the environment and to the consumption of resources;
- how people judge the seriousness of the risks they confront and how they respond to such threats;
- how attitudes toward environmental issues are formed and changed;
- what methods of persuasive communication, including the use of fear, are most likely to facilitate changes to attitudes and behaviour and which could backfire;

² Bok, D. (2009) *The Politics of Happiness What Government Can Learn from the New Research on Well-Being*. Princeton University Press.

- what are the most effective techniques for producing rapid and widespread behaviour change; and
- what barriers and habitual modes of thinking prevent the adoption of climate friendly patterns of behaviour and what incentives and social forces facilitate such behaviours.

Many policy makers assume they know, because they are human and live in society, all that they need to know about human behaviour. Or they assume that economic theory will provide all the critical insights needed for effective policies. A moment's thought should make it clear that success in addressing complex problems like climate change – sometimes called “wicked” problems – requires, at least, a rudimentary understanding of human behaviour and cognition, not to mention the biological and social forces which shape us. The effectiveness of legislation, sanctions, incentives and persuasive communication which form the traditional basis of public policy in this area often founders on the very limited understanding of the fundamentals of human psychology and behaviour change incorporated in the policies.

Perhaps one of the reasons there has been so little engagement on these questions is that behavioural change is notoriously difficult. There are many factors that can influence behaviour, many so-called “lifestyle “issues, especially surrounding consumption, are heavily ‘value laden’ and often contentious and there are more than a few vested interests willing to spend money on reinforcing resistance. Change is made difficult because people are often “locked into” unsustainable patterns of consumption due to economic constraints and institutional barriers over which they have little control (like the absence of public transport) as well as by habits, routines and social norms and expectations, of which they are largely unaware.

Of course, any sustained reduction in greenhouse gas levels and adaptation to climate change will require action on numerous fronts – legislation and regulation, including financial penalties and incentives; investment in alternative technologies; economic instruments to alter the prices of products and services; the provision of information necessary to inform and persuade the community about the desirability of change, and techniques (both direct and indirect) to effect behaviour change. The relative importance of these courses of action and the policy weight that should be attached to each is not clear, but it *is* clear that the success of any of them requires a thorough understanding of human behaviour and failure to do so may even produce paradoxical effects.

Climate change as an emergency

There can be no doubt that the great majority of serious scientists agree that we are facing a global emergency which poses a high risk to all of us – to people, not the planet. In an open letter defending the integrity of climate science, 255 members of the US National Academy of Sciences said bluntly that, “there is compelling, comprehensive, and consistent objective evidence that humans are changing the climate in ways that threaten our societies and the ecosystems on which we depend.”

There have been many such examples over the last thirty years of climate scientists seeking to focus public attention on the urgency of action on climate change – and just as many examples of resistance and inaction. However, for the most part, people everywhere have come to view climate change as a problem, although their views about its seriousness and the urgency with which we should act have waxed and waned.

However, here as in most of the world climate change is rated as a lesser priority than other, more personally relevant issues, and the level of concern may be declining. Australians perception of climate change as a “serious and pressing” problem has declined from 68% in 2006 to 48% in 2009. While we see climate change as a problem, we are clearly not treating it as an emergency. In seeking to explain why this is so, it may be helpful to examine what is known about what influences whether people act or fail to act in emergency situations and apply this framework to better understand why people do and do not take action to mitigate climate change and what can be done to change their behaviour.

The five stages described by Latane and Darley to³ explain helping behaviour provides a useful starting point. Devised initially to explore the question of why people often fail to help others in an emergency – the bystander effect - it has been proposed⁴ as a useful way of thinking about people’s responses to the global climate crisis as well, illustrating the obstacles that inhibit action, as well as those that facilitate it. (Slide)

In this model, in order for someone to help in an emergency, they:

1. Must notice the event;
2. Interpret the event as an emergency;

³ Latane, B., & Darley, J. M. (1976) *Help in a crisis: Bystander response to an emergency*. Morristown, N.J.: General Learning Press.

⁴ Frantz & Mayer The emergency of climate change: Why are we failing to take action? *Analyses of Social Issues and Public Policy*, Vol. 9, No. 1, 2009, pp. 205--222

3. Feel a sense of responsibility to act;
4. Know what to do; and then
5. Decide to act.

Emergency situations, like climate change, are often somewhat ambiguous and other people's reactions may influence how we interpret them and whether we are prepared to act. While we may feel a sense of personal responsibility to assist others in need, research has shown that a key predictor of feeling responsible is a sense of "we-ness" or relationship with those in need of help⁵. Paradoxically, people are less likely to help if others are present - *the diffusion of responsibility*. What is more, people will not offer help if they are not sure what to do or if they feel that they don't have the resources to cope with the emergency⁶. In these circumstances, they may deny any responsibility at all⁷. The parallels in some of our reactions to the threat posed by climate change are obvious.

Noticing the event

In order for anyone to help in an emergency, they first have to notice what is happening. There are various strands of research in psychology and behavioural economics which demonstrate that this is by no means a straightforward process. For example, it may be assumed that people will accurately perceive what is happening around them.

In reality, for a range of reasons, people often fail to perceive and process such stimuli, a phenomenon labelled "bounded awareness"⁸ or "selective attention". In such cases people are "blind" to some information while "seeing" other apparently equally accessible information. One researcher⁹, for example, set up a situation in which students had to squeeze and struggle to get around awkwardly placed desks to enter and exit a lecture hall; when interviewed later, they could not describe the situation nor were they aware of what they had done. Such "environmental numbness" may be relevant to understanding our responses to climate change. Most people, most of the time, are thinking about something else – work, family, friends, the football.

⁵ Hornstein, 1982

⁶ Mulilis & Duval, 2003

⁷ Lalwani & Duval, 2000

⁸Bazerman, M. H. & Chugh, D. (2005). Bounded awareness: Focusing failures in negotiation. In L.Thompson (Ed.), *Frontiers of Social Psychology: Negotiation*. Psychological Press.

⁹ Gifford, R. (1976). Environmental numbness in the classroom. *Journal of Experimental Education*, 44, 4-7.

Climate change is not very visible in the first place. Increases in greenhouse gases in the atmosphere are not directly detectable by our senses. Even when we try to assess the tangible effects of increasing greenhouse gas levels, such as changes in temperature and rainfall or increases in the frequency of extreme weather events, such judgments are inevitably complicated by the yearly – and even daily-variability in these indicators which are a “normal” part of our experience. It is difficult to notice changes in the order of one or two degrees or changes which occur over decades and in very small increments. People are less likely to perceive change if it occurs slowly over time than when it is sudden.¹⁰ Where climate change is most noticeable, for instance in arctic regions such as Alaska and where glaciers are a familiar part of the landscape (Norway), more people are aware that change is occurring and express greater concern.

It is a consequence of the way we live in modern, industrialised and urban societies that we are less likely to perceive changes in our natural environment, including those due to climate change. In Australia, although we pride ourselves on our “outdoor” culture, the ABS Time of Use surveys indicate that people spend only 4% of their day (1.0 hour) outdoors (ABS 1994, 1996a, 1998). Similar results have been obtained in the U.S and Canada¹¹. In addition, since most people no longer do work that involves an intimate knowledge of and connection with the natural world, there are fewer sources of information about the state of our environment. Indeed most people have such limited exposure to the natural environment that they do not appreciate the extent to which they are reliant on its continued health. Furthermore, since many people have jobs that mean they are constantly on the move, and because they often move within regions, for example to upgrade housing, they are simply not in a position to see change such as reduced rainfall or reduced stream flows because they have no history in the location and no point of comparison. As a result of these changes in the way we live, people are less likely to feel connected to any particular environment and less likely to notice or to care when change occurs.

Because of this lack of first-hand experience, most of us have to rely on the accounts of those who still have a continuing link with the environment and those who are scientifically trained to detect and interpret these changes for our understanding of what is happening. This means we have to trust these sources of information and care enough about the issues being raised to attend to and understand what they are telling us.

¹⁰ Gino F, Bazerman, M. (2005) Slippery slopes and misconduct: the effect of gradual degradation on the failure to notice unethical behavior. Harvard Business School working paper 06-019

¹¹ Evans & McCoy, 1998; Leech et al, 1997

Because of its complexity, we know that climate change is difficult for people to conceptualise. Investigations have shown that most people still have a fairly limited understanding of the causes of climate change and they typically do not have an accurate picture of what and how human behaviour is responsible. Their understanding of key concepts is far from complete and the terminology used may confuse them. For example, in one U.K investigation¹² almost everybody reported that they had heard of “global warming”, but a more than 6% said they had not heard of “climate change” and there was some evidence that they understood climate change and global warming as different phenomena, apparently judging global warming as more serious than climate change. Nearly 17% claimed to know little or nothing about it.

It is fair to say, that for the non-scientist, climate change can seem confusing, particularly when information is communicated in technical language and using concepts which people routinely misunderstand. For example, the IPCC report states that global temperature increases which have occurred over the last 50 year are “very likely due to the observed increase in anthropogenic GHG concentration.” The definition of “very likely” used by the IPCC is 90% certain or more, but when people are asked what they think “very likely” means they come up with a much lower number.¹³

Similarly, the word “theory” which has a precise meaning in science is often understood as a hunch or conjecture in common parlance. As Sterman (2008) has pointed out, people also have a very poor understanding of stocks and flows and the concept of accumulation which is central to understanding climate change policies to reduce GHG emissions. In his study of graduate (mainly science) students at MIT, nearly two thirds of participants claimed that atmospheric CO₂ could stabilize even in conditions where emissions continuously exceed removal – analogous, as he points out to arguing that a bathtub filled faster than it drains will never overflow.

Policies which do not account of these limitations are likely to fail. Policy makers need to reinforce accurate beliefs and correct inaccurate ones while linking effective solutions to the explicitly stated causes. At the same time, they need to recognise that information alone will not provoke action.....

¹² Whitmarsh, L. (2009) What’s in a name? Commonalities and differences in public understanding of “climate change” and “global warming” *Public Understanding of Science OnlineFirst*, published on September 16, 2008 as doi: 10.1177/0963662506073088.,

¹³ Budescu, D., Broomell, S. & Han-Hui, P. (2009) Improving communication of uncertainty in the reports of the Intergovernmental Panel on Climate Change. *Psychological Science*, 20 (3), 299-308

Interpreting the Event as an Emergency

As well as “noticing” the changes, people must also realise that what they have observed (or learned about from other sources) constitutes an emergency. Since we are not the simple information processing machines envisaged in most economic models, our attitudes, fears, desires and goals will strongly influence how we evaluate and weigh the evidence and judge whether we are facing an emergency.

Many different surveys have confirmed that, in general, more than two thirds of people questioned are concerned about climate change, but typically rate it a lesser priority than other, more personally relevant issues such as education and health. The substantial literature on risk perception helps understand how people reach these conclusions.

Perceptions of risk are influenced by emotion as well as by more analytic processes. We are certainly not the unfailingly rational, fully informed, beings envisioned in neo-classical economics – which is why reliance on price signals alone is not likely to succeed in shifting behaviour very far. Judgements of risk are characterised by errors of reasoning which result from systematic biases and the employment of various rules of thumb (heuristics). In seeking to explain why people exaggerate or underestimate risks, researchers have examined how we employ these “rules of thumb”. For example, if we can easily remember or have vivid images of certain events (availability), we will judge them as more of a risk than others for which we lack such images.¹⁴

Events that affect us, which we can readily imagine and which occur in the near future are judged more risky. By implication, the lack of readily available images is an obstacle to inducing concern about climate change – and, conversely, communication which ties climate change risks to our own experiences and which emphasises the risk of damage to our health and to our community has been shown to be more likely to elevate judgments of risk.¹⁵

Similarly, when strong emotions are involved, people are inclined to ignore the fact that an event is highly unlikely. In one study, people were asked how much they would pay to eliminate cancer risks ranging from one in a million to one in 100,000.

¹⁴ Sherman, Stevens J et al (2002) Imagining can heighten or lower the perceived likeliness of contracting a disease: The mediating effect of ease of imagery. *Heuristics and Biases: The Psychology of Intuitive Judgment*. Eds Thomas Gilovich, Dale Griffin, and Daniel Kahneman. New York: Cambridge University Press.

¹⁵ Kahlor, 2007

Some of the participants were given descriptions of the cancer as gruesome and intensely painful. The statistical risk mattered less than the vividness of the description in influencing the payment they were willing to make.¹⁶ Global warming seems to be a case where the absence of direct experience or vivid images may result in a lower risk assessment than is warranted by the scientific evidence.

Appropriate framing of an issue can “nudge” people in the direction of greater concern and action. When people are asked to consider an uncertain situation, the ways in which the message is presented – or framed - quite apart from the content will result in very different responses. In numerous studies of people’s reactions to the risks of various medical procedures, for example, people react very differently to the information that “ninety to one hundred are alive” than to the statement that “ten in one hundred are dead” and people are more likely to express concern about climate change when it is framed as a risk to human health than when it is depicted as generally threatening to biodiversity.¹⁷

Research in a variety of settings also confirms the human tendency to discount the future: we generally prefer to take actions which confer lesser benefits now than those which give us greater benefits in the future. This attribute is obviously pertinent when trying to persuade people to take preventive action whose benefits will not be immediate. Indeed, we appear to have great difficulty even thinking about the future: as one researcher found, the “future goes dark around 15-20 years into the future”¹⁸.

In addition, the commonly observed phenomenon of unrealistic optimism even when the stakes are high and people’s tendency to overestimate their own capacities add to the tendency to minimise some risks. Most people see themselves and their world in a more positive light than objective data would dictate. Asked to envision their future, people typically say they are far less likely than average to have a heart attack, be fired from their jobs, get divorced, have a car accident or suffer major diseases. A recent international study¹⁹ found this optimistic tendency in most

¹⁶ Sunstein, Cass R. (2002) Probability neglect: Emotions, worst cases and law. *Yale Law Journal*, 112:1.

¹⁷ Sunblad, E, Biel, A & Garling, T (2007) Cognitive and affective risk judgments related to climate change, *Journal of Environmental Psychology*, 27, 97-106.

¹⁸ Tonn, B., Hemrick, A. & Conrad. F. (2006) Cognitive representations of the future: Survey results. *Futures*, 38 (7), 810-829

¹⁹ Gifford, R et al

people's assessments about the state of their local environments compared to those of other parts of their country or other nations – “things are better here than there”.

Part of this optimism is reflected in people's beliefs that they can control uncontrollable events, a disposition evident in the often expressed expectation that—as yet unproven—technological solutions will save us. Such optimism may contribute to people's unwillingness to view climate change as an emergency; the threat is seen as unfolding over a long time scale which gives a lot of scope for the optimistic projection that it may never happen.

While most people judge that the risks associated with climate change outweigh the benefits, they believe the effects on them personally will not be as great as for the wider society. It appears that phenomena like climate change have a relatively “low cognitive presence” partly because they are not directly experienced. However, even when people live in areas likely to be adversely affected e.g. by flooding, coastal erosion, they tend to underestimate the risks.

People's value systems, sometimes described as worldviews, influence their perception of the risk posed by climate change and how they respond to information about it. Based on people's preferences about how society should be organised Kahan et al (2007) developed a distinction between hierarchist-individualists (HIs), who support free-market principles and believe that goods should be distributed differentially among people and egalitarian-communitarians (ECs), who believe that society's interests should sometimes take precedence over those of individuals.

Egalitarians were far more likely (by a 3-to-1 margin) to recognize the risks posed by climate change, but when information about climate change was accompanied by the suggestion that nuclear power was a possible solution, the individualists were more inclined to attend to the scientific facts than other individualists who received the same message but with a call for pollution control. Worldviews too are important in understanding our potential for denial in response to fear inducing messages. Research shows that if fear is the primary message in communications designed to change attitudes, they often backfire²⁰.

People may respond to such messages by feeling anxious, which may motivate them to avoid thinking about the distressing information at all. It is relevant that many of the exhortations to modify our behaviour to reduce greenhouse gas emissions take the form of appeals to fear, invoking catastrophe and Armageddon.

²⁰Janis & Feshback, 195

One explanation of reaction to fear communication has been explored as part of Terror Management Theory. It proposes that since humans are aware of the inevitability of their death they deal with this knowledge by constructing beliefs about reality which they share with others (worldviews) and which provide a sense of meaning²¹. When constantly reminded of their own mortality, people hold more tenaciously to these views. Such worldviews usually incorporate standards for desirable behaviour; in the case of materialism, striving to increase one's wealth and possessions. Using forest management simulations, Kasser and Sheldon found that people reminded of their own mortality became greedier and more resistant to messages of restraint²². On the other hand, there is some evidence that worry may directly result in an increased disposition to act as well as elevating judgments about risk²³. People are more likely to seek further information on climate change if they are already worried about it²⁴.

Social norms are also important in these judgments, particularly because it appears that they are especially powerful in conditions of uncertainty, like climate change, when people are more likely to attend and respond to information about what others are doing – or not doing. Social norms are potent because we are social creatures who often conform in order to be accepted by our group. Social norms may be based on what someone believes about what others do in a particular situation (*descriptive* normative beliefs) or what an individual thinks others approve or disapprove of (*injunctive* normative beliefs). Over such norms may be adopted as personal norms, standards of behaviour to which people believe they should adhere as a matter of moral obligation²⁵.

Research has shown that people who believe that others are acting to protect the environment are also likely to think that they should too²⁶. In relation to climate change, people are more likely to consider that they need more information to judge the risk if they believe that others expect them to seek such information.²⁷

²¹ Pyszczynski, T. (2004) What Are We So Afraid Of? A Terror Management Theory Perspective on the Politics of Fear. *Social Research: An International Quarterly*, 71 (4), 827-848.

²² Kasser, T. & Sheldon, K.M (2000). Of wealth and death: Materialism, mortality salience, and consumption behavior. *Psychological Science*, 11, 348- 351

²³ Sunblad et al (2007) Op cit

²⁴ Kahlor

²⁵ Schwartz, 1977; Stern et al, 1999

²⁶ Thøgersen (2007)

²⁷ Kahlor

Feel personally responsible to act

Even if the emergency is recognized, potential helpers must feel personally responsible to do something. Most societies have norms about responsibility, about who and what we are responsible for. In Australia, my sense is that we have a tendency to think that the government will fix everything (“they oughta”) and we feel little responsibility for the state of the environment.

Climate change is particularly problematic because it involves so many parties: it provides the ideal situation in which people can assume that it is someone else’s responsibility – *the diffusion of responsibility*, mentioned earlier. It is also a classic social dilemma, in the case of resource competition usually called a “tragedy of the commons”, a concept with which you will all be familiar. The problem is that an action which may seem beneficial for an individual will, if chosen by everyone, produce harmful effects for everyone – the commons will be overgrazed and all the cattle will suffer. A small ray of hope is offered by the results of laboratory experiments set up to explore the dynamics of such dilemmas which show that inducing trust, simply by getting people to talk together in advance improves co-operation.

Many studies and observations have indicated that awareness and concern about climate change do not necessarily translate into a sense of personal responsibility to do something about it. Even when people do believe that they have social and moral responsibility to act, they often find justifications for not doing so. In one U.K. study²⁸ people gave a long list of reasons for not taking action to reduce their GHG emissions. Knowing that their actions contribute to climate change, people may use strategies of denial to assuage their guilt and to justify their inaction, especially considering the “uncomfortable implications of climate change mitigation for high consuming lifestyles” (p 453). (Slide)

Denial, a so-called “emotion focused coping mechanism”²⁹ helps manage the anxiety brought about by thinking about the threats posed by climate change. Examples of these mechanisms include: denying personal contribution to climate change and personal responsibility; blaming others (‘the USA isn’t doing anything so why should I?’); pointing to government inaction; claiming ignorance; arguing that climate change will happen anyway; having faith in technological solutions and so on.

²⁸ Lorenzoni et al 2007

²⁹ Lazarus & Folkman, 1984

The reality is that climate change *is* a massive problem and people understand that no one person has the personal resources to have anything but a tiny impact. While messages which stress the enormity of the emergency may make people sit up and take notice, they may simultaneously induce feelings of powerlessness. Those which break the task into manageable steps may produce better results – people judge a 2% per annum reduction for the next 40 years as possible, while 80% by 2050 causes them to run a million miles. It seems that people are more likely to employ emotion-focused coping when they believe that they have little control. People’s sense of perceived control or efficacy is enhanced if they feel they are not acting alone and they will be more likely adopt a problem solving approach rather than defensively denying responsibility.

Finally, a sense of connectedness to the natural world and to other people appears to increase willingness to help³⁰. Generally speaking, the research shows that the more strongly people hold values beyond their own immediate self-interest, such as altruistic or “biospheric” values, the more likely they are to express willingness to behave in ways which are environmentally sensitive³¹.

Knowing what to do

There is a raft of easily available information about what we can do to minimize our GHG emissions; from one off actions, such as purchasing more energy efficient appliances, to ongoing actions such as changing thermostats or driving less. Much of the information and technology is out there; the tough part is getting people to seek it out and use it. Reviewing the current state of knowledge about climate change mitigation in *Science* in 2004, Pacala and Socolow³² concluded that “humanity already possesses the fundamental scientific, technical and industrial know-how to solve the carbon and climate problem for the next half century.”

Doing it

As will be evident from several of the observations I have made, even if people view climate change as a serious problem and conclude that they have a responsibility to act, they will not necessarily do anything to change their behaviour. The assumption that educating and informing people will change their attitudes and beliefs - and hence their behaviour - is simply wrong, although it is a surprisingly common

³⁰ Mayer, Frantz, Bruehlman-Senecal & Dolliver, 2008

³¹ De Groot & Steg, 2007; De Young, 2000; Stern, 2000; Dietz et al., 2005

³² Pacala, S. & Socolow, R. (2004) Stabilization wedges: Solving the climate problem for the next 50 years with current technologies. *Science*, 305, 13 August, 968-972.

prescription for solving social problems. Research ³³ has shown that what people know about environmental problems is only a weak predictor of the likelihood that they will show environmentally sensitive behaviours...

But information based programs should not be abandoned entirely, because information can be made more powerful in influencing behaviour when it comes from credible sources, is combined with a commitment to act, is linked to valued social networks and includes suggestions about simple, low-cost actions which can be taken³⁴. Part of the problem for policy makers is that while people are willing to accept programs and policies which have marginal and relatively cost-free effect on their lives, they're very reluctant to contemplate high cost solutions e.g. fuel taxes, higher electricity costs or driving less. Policies also need to take account of several common "heuristics" in addition to those I outlined earlier. For example, policy designers need to take account of "loss aversion which produces inertia, leading people to avoid change, even when it is clearly in their own interests. This is an obvious hurdle.

However, it is worth noting that the tendency can also be harnessed; energy conservation campaigns which frame results in terms of potential losses from failure to save energy are far more effective than those which emphasise the savings, even when the amount is the same.

Conclusion

As Gowdy has argued:

"Understanding how humans make decisions and respond to incentives is much more than an interesting academic question. It may prove to be the key to the quality of human existence in the decades and centuries to come. It is likely that responding to rapid climate change will be the major challenge our civilization faces in the coming decades."

As you can see, there are many research findings on human thinking and behaviour which provide insight into these questions; climate change is not easily detectable, may not be seen as an emergency by enough people and may easily be rationalised as someone else's responsibility. Perhaps most problematic is that underpinning

³³ Leiserowitz, A. (2006). Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Climatic Change* 77(1-2), 45-72.

³⁴ Kazdin, A.(2009) Psychological Science's contributions to a sustainable environment, *American Psychologist*, Vol. 64, No 5, 339-356.

rising emissions is a personal and economic philosophy that equates increased consumption with improved well-being.

Policy that really is evidence-based would assist. Training young people so that they understand scientific concepts and arguments is crucial; increasing their exposure to the natural world and the circumstances of other people are beneficial for a whole range of reasons. Policy makers designing economic and technological solutions to conservation also need to be cognizant of the characteristic human patterns of thinking about risk assessment and to be aware of our sensitivity to the behaviour of others and social influence more generally if they are to succeed. Finally, messages about the need for change should not end with “a crescendo of fear”, but with an emphasis on the effectiveness of concerted action. Otherwise, all the information in the world will simply foster what Wiebe terms, “the syndrome of well-informed futility”.