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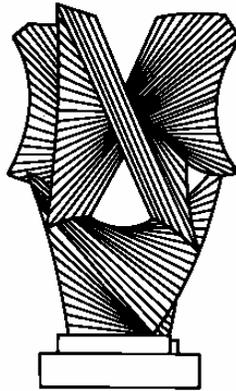
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The Availability Heuristic, Intuitive Cost-Benefit Analysis, and Climate Change

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The Availability Heuristic, Intuitive Cost-Benefit Analysis, and Climate Change

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Abstract. Because risks are on all sides of social situations, it is not possible to be “precautionary” in general. The availability heuristic ensures that some risks stand out as particularly salient, whatever their actual magnitude. Taken together with intuitive cost-benefit balancing, the availability heuristic helps to explain differences across groups, cultures, and even nations in the assessment of precautions to reduce the risks associated with climate change. There are complex links among availability, social processes for the spreading of information, and predispositions. If the United States is to take a stronger stand against climate change, it is likely to be a result of available incidents that seem to show that climate change produces serious and tangible harm.

1. Introduction

“Many Germans believe that drinking water after eating cherries is deadly; they also believe that putting ice in soft drinks is unhealthy. The English, however, rather enjoy a cold drink of water after some cherries; and Americans love icy refreshments” (Henrich et al., 2001).

“The most important factor contributing to the increased stringency of health, safety and environmental regulation in Europe has been a series of regulatory failures and crises that placed new regulatory issues on the political agenda and pressured policy makers to adopt more risk averse or precautionary policies. . . . The regulatory failure associated with BSE significantly affected the attitude of the European public toward GM foods. . . . Consumer and environmental regulations are likely to become more innovative, comprehensive and risk averse as a response to a widespread public perception of regulatory failures” (Vogel, 2003).

It has become standard to say that with respect to risks, Europe and the United States can be distinguished along a single axis: Europe accepts the Precautionary Principle, and the United States does not. On this view, Europeans attempt to build a “margin of safety” into public decisions, taking care to protect citizens against risks that cannot be established with certainty. By contrast, Americans are reluctant to take precautions, requiring clear evidence of harm in order to justify regulation. These claims seem plausible in light of the fact that the United States appears comparatively unconcerned about the risks associated with climate change and genetic modification of food; in those contexts, Europeans favor precautions, whereas Americans seem to require something akin of proof of danger. To be sure, the matter is quite different in the context of threats to national security. For the war in Iraq, the United States (and England) followed a kind of Precautionary Principle, whereas other nations (most notably France and Germany) wanted clearer proof of danger. But for most threats to safety and health, and for climate change in particular, many people believe that Europe is precautionary and the United States is not.

But this opposition between Europe and America is false, even illusory (Wiener and Rogers, 2002). It is simply wrong to say that Europeans are, in general, more precautionary than Americans. As an empirical matter, neither is “more precautionary.” Europeans are not more averse to risks than Americans. They are more averse to particular risks, perhaps most prominently the risks associated with climate change; but Americans have their own preoccupations as well. No nation can, even in principle, commit itself to precaution as such (Sunstein, 2005; Sunstein 2003a). The real problem with the Precautionary Principle, at least in its strongest forms, is that it is incoherent. It purports to give guidance, but it fails to do so, because it condemns the very steps that it requires. The reason is simple: Precautions always give rise to risks of their own.

As a starting point, it is reasonable to think that judgments about precautions will be based on a form of intuitive cost-benefit balancing. If the costs of precautions are high, they are less likely to be appealing; so too if the benefits are low. This point applies to climate change as to all other problems, and it helps to explain the massive differences between the United States and Europe with respect to that topic. In addition, the availability heuristic is often the source of people’s fears about certain risks (Rohrman

and Renn, 2000).¹ If a particular risk is cognitively “available”—both vivid and salient—then people will have a heightened fear of the risk in question. If people in one nation fear the risks associated with climate change, and people in another nation fear the risks associated with terrorism, the availability heuristic is likely to be the reason. But this point misses some complexities, about intuitive cost-benefit balancing, social influences and cultural predispositions; I shall turn to these in due course. The availability heuristic does not operate in a social or cultural vacuum.

In short, I suggest that cross-cultural differences in both risk perception and in precautions are produced, in large part, by availability, which operates in the context of social influences and intuitive attention to both costs and benefits. In the context of climate change, many Americans believe that far more would be lost than gained by extensive precautions; in Europe, the opposite is true. It is important, for example, that the risks associated with climate change are not salient to most Americans; it is important as well that efforts to control greenhouse gases would impose unusually high burdens on the United States. These points bear directly on cross-cultural differences with respect to climate change. If the United States will ultimately show more concern about the risks associated with climate change, it is likely to be a product of a shift in intuitive cost-benefit balancing—with available incidents, apparently linking climate change to serious harm, playing a large role.

2. The Mirage of Precaution

Despite its formal enthusiasm for the Precautionary Principle, European nations are not “more precautionary” than the United States. Simply as a logical matter, societies, like individuals, cannot be highly precautionary with respect to all risks. Each society and each person must select certain risks for special attention. In these respects, the selectivity of precautions is not merely an empirical fact; it is a conceptual inevitability. Comparing Europe to the United States, Wiener and Rogers (2002) demonstrate this point empirically. In the early twenty-first century, for example, the United States appears to

¹ Undoubtedly a great deal can be learned from use of the psychometric paradigm, stressed in Rohrman and Renn (2000, p. 17-18). I stress the availability heuristic here because of its comparative simplicity, but the heuristic interacts in complex ways with psychometrics and with culture; I try at least to scratch some of the surfaces.

take a highly precautionary approach to the risks associated with abandoned hazardous waste dumps and terrorism, but not to take a highly precautionary approach to the risks associated with climate change, indoor air pollution, poverty, poor diet, and obesity. It would be most valuable to attempt to see which nations are especially precautionary with respect to which risks, and also to explore changes over time.

A nation-by-nation study commissioned by the German Federal Environmental Agency goes so far as to conclude that there are two separate camps in the industrialized world: “precaution countries” (Germany, Sweden, the Netherlands, and the United States) and “protection countries” (Japan, France, and the United Kingdom) (Sand, 2000, p. 448). But this conclusion is ludicrously implausible. The universe of risks is far too large to permit categorizations of this kind. The most general point is that no nation is precautionary in general and costly precautions are inevitably taken against only those hazards that seem especially salient or insistent. The problem with the idea of precaution, and any general Precautionary Principle, is that it wrongly suggests that nations can and should adopt a general form of risk aversion (Sunstein, 2005).

3. The Availability Heuristic

I suggest that the Precautionary Principle becomes operational if and only if those who apply it wear blinders—only, that is, if they focus on some aspects of the regulatory situation but downplay or disregard others. But this suggestion simply raises an additional question: What accounts for the particular blinders that underlie applications of the Precautionary Principle? What people’s attention is selective, why is it selective in the way that it is? Part of the answer, I contend, lies in an understanding of behavioral economics and cognitive psychology, which provide important clues to cross-cultural differences in risk perception, in a way that much bears on social judgments about climate change. The availability heuristic is the place to start.

3.1. Availability in action. It is well-established that in thinking about risks, people rely on certain heuristics, or rules of thumb, which serve to simplify their inquiry (Kahneman et al., 1982). Heuristics typically work through a process of “attribute substitution,” in which people answer a hard question by substituting an easier one (Kahneman and Frederick, p. 53). Should we be fearful of climate change? When people

use the availability heuristic, they assess the magnitude of risks by asking whether examples of harm can readily be brought to mind (Tversky and Kahneman, 2002, pp. 11-14). If people can easily think of such examples, they are far more likely to be frightened than if they cannot. The availability heuristic illuminates the operation of the Precautionary Principle, by showing why some hazards will be on-screen and why others will be neglected. The availability heuristic also tells us a great deal about differences in risk perceptions across groups, cultures, and even nations.

For example, “a class whose instances are easily retrieved will appear more numerous than a class of equal frequency whose instances are less retrievable” (Tversky and Kahneman, 2002, p. 11). Consider a simple study showing people a list of well-known people of both sexes, and asking them whether the list contains more names of women or more names of men. In lists in which the men were especially famous, people thought that they were more names of men, whereas in lists in which the women were the more famous, people thought that there were more names of women (Tversky and Kahneman, 2002).

This is a point about how familiarity can affect the availability of instances. A risk that is familiar, like that associated with terrorism, will be seen as more serious than a risk that is less familiar, like that associated with sun-bathing. But salience is important as well. “For example, the impact of seeing a house burning on the subjective probability of such accidents is probably greater than the impact of reading about a fire in the local paper” (Tversky and Kahneman, 2002). The point helps explain differences across time and space in much risk-related behavior, including decisions to take precautions. Whether people will buy insurance for natural disasters is greatly affected by recent experiences (Slovic, 2000, p. 40). If floods have not occurred in the immediate past, people who live on flood plains are far less likely to purchase insurance. In the aftermath of an earthquake, insurance for earthquakes rises sharply—but it declines steadily from that point, as vivid memories recede. Note that the use of the availability heuristic, in these contexts, is hardly irrational.² Both insurance and precautionary measures can be

² Tversky and Kahneman (1986) emphasize that the heuristics they identify “are highly economical and usually effective,” but also that they “lead to systematic and predictable errors.” Gerd Gigerenzer, among others, has emphasized that some heuristics can work extremely well (Gigerenzer et al., 1999; Gigerenzer, 2000), and used this point as a rejoinder to those who stress the errors introduced by heuristics

expensive, and what has happened before seems, much of the time, to be the best available guide to what will happen again. The problem is that the availability heuristic can lead to serious errors, in terms of both excessive fear and neglect.

What, in particular, produces availability? An intriguing essay attempts to test the effects of ease of imagery on perceived judgments of risk (Sherman et al., 2002). The study asked subjects to read about an illness (Hyposcemia-B) that “was becoming increasingly prevalent” on the local campus. In one condition, the symptoms were concrete and easy to imagine—involving muscle aches, low energy, and frequent severe headaches. In another condition, the symptoms were vague and hard to imagine, involving an inflamed liver, a malfunctioning nervous system, and a general sense of disorientation. Subjects in both conditions were asked to imagine a three-week period in which they had the disease and to write a detailed description of what they imagined. After doing so, subjects were asked to assess, on a ten-point scale, their likelihood of contracting the disease. The basic finding was that likelihood judgments were very different in the two conditions, with easily-imagined symptoms making people far more inclined to believe that they were likely to get the disease.

3.2. Availability and cross-national risk perceptions in general. The availability heuristic helps to explain the operation of the Precautionary Principle and cross-national differences for a simple reason: Sometimes a certain risk, said to call for precautions, is cognitively available, whereas other risks, including those associated with regulation itself, are not. In many cases where the Precautionary Principle seems to offer guidance, the reason is that some of the relevant risks are available while others are barely visible. Differences across nations, in the perception of risks, have a great deal to do with the operation of the availability heuristic. I shall turn to climate change shortly; for the moment, let us explore the hypothesis more generally.

The study of cross-cultural risk perceptions remains in its infancy (Renn and Rohrman, 2000), and hence my claim must remain only a hypothesis, one that I cannot establish to be true. What is necessary, and what is lacking, is anything like comprehensive information about cross-cultural risk perceptions, allowing us to test the

and biases. I do not mean to take a stand on the resulting debates. Even if many heuristics mostly work well in daily life, a sensible government can do much better than to rely on them.

role of availability. And we shall shortly see some complexities that bear on the adequacy of the availability hypothesis. But for now, consider some supportive evidence:

- Within the United States, public concern about risks usually does track changes in the actual fluctuations in those risks. But public concern outruns actual fluctuations in the important case of “panics,” bred by vivid illustrations that do not reflect changes in levels of danger (Loewenstein and Mather, 1990). At certain points in the 1970s and 1980s, there were extreme leaps in concern about teenage suicides, herpes, illegitimacy, and AIDS—leaps that did not correspond to changes in the size of the problem. Availability, produced by “a particularly vivid case or new finding that receives considerable media attention,” played a major role in those leaps in public concern (Loewenstein and Mather, 1990, p. 172). Sometimes the concern led to unjustified precautions, as in the behavior of some parents who refused to allow their children to attend classes having students with signs of herpes.
- What accounts for people’s perception of their risk of being infected with HIV? Why are some people and some groups largely unconcerned about that risk, while other people and groups are highly focused on with it? A study of rural Kenya and Malawi suggests that availability plays a critical role (Behrman et al., 2003). The authors find that risk perception is a product of discussions that “are often provoked by observing or hearing about an illness or death” (Behrman et al., 2003, p. 10) People “know in the abstract how HIV is transmitted and how it can be prevented,” but they are unclear “about the advisability and effectiveness of the changes in sexual behavior that are recommended by experts” (Behrman et al., 2003, p. 18). Perceptions of the risk of HIV transition are very much a function of social networks, with pronounced changes in belief and behavior resulting from interactions with other people expressing a high level of concern. The effects of social networks are thus asymmetric, with substantial effects from having “at least one network partner who is perceived to have a great deal of concern about AIDS.” The authors do not refer explicitly to the availability heuristic, but their findings are compatible with the suggestion that with respect to AIDS, risk perceptions are produced by availability.

- What accounts for the recent rise of precautionary thinking in Europe? Why have certain environmental and health risks achieved so much salience in England, France, and the European Union generally? A comprehensive study suggests that a few readily available incidents played a large role (Vogel, 2003). In the 1990s, a “wave of crises” involving food safety, above all mad cow disease, led to the deaths of about one hundred people, with especially large effects on public attitudes (Vogel, 2003, p. 568-569). In a tribute to the operation of availability, the “regulatory failure associated with BSE significantly affected the attitude of the European public toward GM foods” (Vogel, 2003, p. 569). An additional “scandal was the apparent failure of French government officials and doctors to protect haemophiliacs from blood contaminated with AIDS” virus, in a way that had large repercussions for public opinion in France (Vogel, 2003, p. 570-571). The conclusion is that differences between European and American policies are not a product of deep-rooted cultural differences, but instead have a great deal to do with “widespread public perception of regulatory failures,” often based on particular, vivid, and widely salient events (Vogel, 2003, p. 580).

5.3. Availability, climate change, catastrophe, and long-term risks. These points have particular implications for risks from climate change that, by their very nature, are not likely to cause serious harms in the near future. The problem, a serious one, is that such harms will not be cognitively available to citizens, at least not ordinarily. People will not “see” those harms until it is too late. In this way, the availability heuristic tends to help explain high discount rates, by which people do not take preventive action against even serious harms that will not come about for many years. For potentially catastrophic risks whose prevention requires long-term investment, there are built-in obstacles to serious regulatory efforts. If salient events, such as hurricane activity, can be associated with climate change, the likelihood of a response is increased. But for most people most of the time, these associations seem speculative.

A real puzzle, in this light, is not that the United States is relatively unconcerned with climate change; it is that European nations are so willing to take action to combat it. How do we explain this puzzle? I suggest that the availability heuristic operates as an important “input” into a form of intuitive cost-benefit balancing, and that when the

balance favors regulation, people will seek regulatory solutions even if social harms are not clearly “available.” The availability heuristic does help people to assess the magnitude of a risk; people’s judgments about magnitude are greatly affected by use of the availability heuristic. But availability is not the only factor. If the costs of reducing the risk are also “on screen,” and if they seem high, then people will not be so enthusiastic about extensive precautions. In the United States, intuitive cost-benefit balancing, done with the assistance of the availability heuristic, does not clearly support significant precautions. For Europe, exactly the opposite is true.

Of course cost-benefit analysis is often done by technocrats in and out of government, usually without close reference to the availability heuristic. But for both intuitive and expert practitioners of cost-benefit analysis, the evaluation of global warming is very different in the United States from what it is in Europe.

The crucial point here is that the United States appears to stand to lose much more from aggressive regulation than European nation do. For the United States, the likely costs of the Kyoto Protocol, for example, seem to exceed its likely benefits, at least on the latest numbers (Nordhaus and Boyer, 2003, p. 161). The picture for the world as a whole is far more mixed, with Europe anticipated to be a net gainer, and with Russia likely to gain an especially large amount (Nordhaus and Boyer, 2003, p. 162). Hence those nations that favor aggressive controls on greenhouse gases are responding in large part to the fact that they are likely to gain more than they lose. In such circumstances, regulation will seem attractive if the risks of climate change are even mildly “available” to leaders and citizens. Compare in this regard the assessment of ozone depletion. In the end, the United States was highly supportive of extensive precautions, largely because a study from the Council of Economic Advisers suggested that the benefits of precautions, for Americans, greatly outweighed the costs. The reason for this conclusion is that reductions in skin cancer and cataracts, once monetized, suggested that the decreasing costs of precaution would be well-justified. Hence President Reagan himself, no enthusiast for extensive regulation, strongly supported American involvement in the Montreal Protocol.

If the costs of reducing greenhouse gases were perceived as very low, the likelihood of American involvement in precautionary efforts would dramatically

increase; so too if it were generally perceived that the United States had a great deal to gain from such reductions. But at the present time, many people believe that the United States will be able to handle the costs of climate change, and hence that expensive precautions are hard to justify simply from the standpoint of national self-interest. If this is so, then intuitive cost-benefit balancing, undertaken without readily available incidents of harm, is the source of the official position of the United States; it also helps to explain Europe's greater willingness to engage in precautionary measures.

Consider the recorded views of Americans about environmental protection and climate change in the late 1990s. About 63 percent of Americans agreed with the following statement: "Protecting the environment is so important that requirements and standards cannot be too high and continuing environmental improvements must be made regardless of cost."³ In the same general vein, 59 percent supported the Kyoto Treaty on global warming, with only 21 percent opposed. But in the same period, 52 percent of Americans said that they would refuse to support the Kyoto Treaty on global warming if "it would cost an extra \$50 per month for an average American household." In fact only 11 percent of Americans would support the Kyoto Treaty if the monthly expense were \$100 or more. How can we explain strong majority support for "environmental improvements . . . regardless of cost" and strong majority rejection of environmental improvements when the cost is high? The answer lies in the fact that people are not, in fact, willing to spend an infinite amount for environmental improvements. When the costs are squarely placed "on screen," people begin to weigh both costs and benefits. Surveys in Europe suggests that significant numbers of citizens there are willing to pay a considerable amount to reduce the risks of global warming; but even there, the amount is not extremely high (Viscusi and Hirsch, 2005). For citizens as well as leaders, intuitive assessment of costs and benefits plays a large role in determining the level of precautions actually sought.

But let us simply stipulate (without arguing) that the United States ought to be doing more to control greenhouse gases than it is currently willing to do. If so, what can be done by way of response? A clue comes from President Bush's efforts to activate

³ See The Program on International Policy Attitudes, Americans on the Global Warming Treaty, available at http://www.pipa.org/OnlineReports/GlobalWarming/glob_warm_treaty.html at Box 15.

public concern about the catastrophic risks associated with terrorism: *Conjure up vivid images of what might happen when the relevant risks come to fruition.* In this way, the availability heuristic might be enlisted on behalf of regulatory controls. In connection with the Iraq war, the Patriot Act, and many other terrorism-related initiatives, vivid images of the Sept. 11 attacks helped to ensure that Americans would be willing to “invest” in initiatives that would cost a great deal. Of course it is true that the most serious harms associated with climate change are not likely to occur in the near-term, a contrast with the risks of terrorism, where a catastrophe could be around the corner.

This fact makes it difficult to capture people’s attention with vivid images of harm—difficult, but not impossible, at least if those images are combined with moral appeals (involving obligations to future generations, whose members can be concrete, as in, “your children and your grandchildren”) and with efforts to quell fears about the high costs of regulatory controls. In other words, availability and salience are a promising way of promoting public attention to risks that will not materialize for a long time. If current hurricane activity can be associated with climate change, citizens and officials will be more likely to favor aggressive action. To see this point, it is necessary to shift from individual judgments to social ones.

4. Social Influences

Thus far my emphasis has been on individual cognition. But to say the least, the availability heuristic does not operate in a social vacuum. What is readily “available” to some individuals, groups, cultures, and nations will not be available to all. In the context of climate change, environmentalists, in and out of government, often attempt to focus public attention on potentially catastrophic harms. Well-organized private groups play a central role in activating public concern. The “social amplification of risk” is a well-known phenomenon (Pigeon et al., 2003). When social amplification occurs, it is often a result of the availability heuristic, operating alongside social processes.

The question suggests the need to attend to the social and cultural dimensions of fear and risk perception. In many cases of high-visibility, low-probability dangers, the sources of availability are not obscure. The mass media focus on those risks; people communicate their fear and concern to one another; the widespread fact of fear and

concern increases media attention; and the spiral continues until people move on. Hence the “risk of the month” syndrome, familiar in many societies, stems from the interaction between availability and social influences. Much of the time, however, what is available and salient to some is not available and salient to all.

In any case people and cultures have different predispositions. These predispositions play a large role in determining which, of the numerous possibilities, is salient. Those who are predisposed to believe that most media scares are false or trumped-up will find cases in which public fears have been proved baseless. This is an example of an individual predispositions, but undoubtedly cultural forces, some deep and some less so, help account for differences across nations. Availability helps to determine beliefs, to be sure; but beliefs help to determine availability as well. Both beliefs and availability are endogenous to one another. When social and cultural forces interact with salience, to produce concern about one set of problems but not another, predispositions are crucial. Fears about the risks of climate change, and dismissal of those fears, can both be explained in this way. It is in this sense that availability can be a product of forces that must be explained independently. But let us now turn to how availability spreads.

5. Cascades

Sometimes availability and salience are produced through social bandwagons or cascades, in which apparently representative anecdotes and gripping examples move rapidly from one person to another (Heath et al., 2001; Heath, 1996). Consider a stylized example. Andrew hears of a dangerous event, which he finds to be revealing or illustrative. (The event might involve a harmful effect produced by climate change.) Andrew tells Barry, who would be inclined to see the event as not terribly informative, but who, learning Andrew’s reaction, comes to believe that the event does indeed reveal a great deal, and that a serious threat exists. Carol would tend to discount the risk, but once she hears the shared opinion of Andrew and Barry, she is frightened as well. Deborah will have to have a great deal of private information to reject what has become the shared opinion of Andrew, Barry, and Carol (Hirschleifer, 1995, p. 193-194). Stylized though it is, the example shows that once several people start to take an example as probative,

many people may come to be influenced by their opinion, giving rise to cascade effects. Cultural and even national differences can be explained partly in this way.

A distinctive feature of social cascades is that the people who participate in them are simultaneously amplifying the very social signal by which they are being influenced. By their very participation, those who join the cascade increase its size, making it more likely that others will join too.

In the domain of risks and precautions, “availability cascades” are responsible for many social beliefs (Kuran and Sunstein, 1999). A salient event, affecting people because it is available, tends to be repeated, leading to cascade effects, as the event becomes available to increasingly large numbers of people. The point is amplified by the fact that fear-inducing accounts, with high emotional valence, are especially likely to spread (Heath et al., 2001). There is a general implication here. Because different social influences can be found in different communities, local variations are inevitable, with different examples becoming salient in each. Hence such variations—between say England and the United States, or between Germany and France—might involve coincidence or small or random factors, rather than large-scale cultural differences. Different judgments within different social groups, with different “available” examples, owe their origin to social processes of this sort. Return to my epigraph: “Many Germans believe that drinking water after eating cherries is deadly; they also believe that putting ice in soft drinks is unhealthy. The English, however, rather enjoy a cold drink of water after some cherries; and Americans love icy refreshments” (Henrich et al., 2001, p. 353-354).

6. Group Polarization

There is a closely related phenomenon. When like-minded people deliberate with one another, they typically end up accepting a more extreme version of the views with which they began (Sunstein, 2003b). This is the process known as group polarization. Consider a few examples:

- After discussion, citizens of France become more critical of the United States and its intentions with respect to economic aid (Brown, 1985, p. 224).

- A group of moderately profeminist women becomes more strongly profeminist after discussion (Myers, 1975).
- After discussion, whites predisposed to show racial prejudice offer more negative responses to the question whether white racism is responsible for conditions faced by African-Americans in American cities (Myers and Bishop, 1971).
- After discussion, whites predisposed not to show racial prejudice offer more positive responses to the same question, that is, they are more likely to find white prejudice to be the source of conditions faced by African-Americans in American cities (Myers and Bishop, 1971).
- Juries inclined to award punitive damages typically produce awards that are significantly higher than the awards chosen, before deliberation, by their median member (Sunstein et al., 2002).

Group polarization will inevitably occur in the context of perceptions of risk; and hence group polarization helps to account for cultural and even national differences. If several people fear climate change, and speak to one another, their fear is likely to increase as a result of internal discussions. If some groups seem hysterical about certain risks, and other groups treat those risks as nonexistent, group polarization is likely to be a reason. Hence group polarization provides another explanation for the different fears of groups, localities, and even nations.

Group polarization undoubtedly occurs in connection with climate change; indeed, it helps explain cross-cultural differences. An initial predisposition toward fear is likely to be aggravated as a result of collective deliberations. Within groups, a tendency toward fear or neglect breeds its own amplification. In the United States, group polarization has played a large role within groups concerned or less concerned about climate change. Those who believe that the risks are trivial, or not worth addressing, often speak largely with one another, intensifying their antecedent belief.

7. Media, Interest Groups, and Politicians

It should be clear that in the real world, some voices are more important than others, especially when availability and salience are involved. In particular, the behavior and preoccupations of the media play a large role. Knowing the importance of media

coverage, well-organized private groups work extremely hard to promote public attention to particular risks. Some of these groups are altruistic; others are entirely self-interested.

The common tactic is to publicize an incident that might trigger both availability and salience. Showing at least a working knowledge of the availability heuristic, private groups seize on selected incidents, even ones expected to occur in the future, and publicize them to make them generally salient to the public. In all of these examples, the use of particular instances might be necessary to move the public, and legislatures, in the right directions. Certainly the social processes that interact with salience and availability can promote reform where it is needed.

Politicians engage in the same basic project. By its very nature, the voice of an influential politician comes with amplifiers. When public officials bring an incident before the public, a seemingly illustrative example is likely to spread far and wide. A legal enactment can itself promote availability; if the law responds to the problems associated with climate change, people might well come to see those problems as readily available. The terrorist attacks of September 11, 2001 would inevitably loom large no matter what President George W. Bush chose to emphasize. But the President, and his White House generally, referred to the attacks on countless occasions, frequently as a way of emphasizing the reality of seemingly distant threats and the need to incur significant costs to counteract them (including the 2003 Iraq war, itself fueled by presidential speeches including vivid narratives of catastrophic harm). And there is no doubt that the salience of these attacks played a large role in affecting political behavior—and that this role cannot be understood without reference to social influences. The implications for cultural differences and for climate change should be clear. If leaders in different nations draw attention to different risks, there will be large-scale differences in risk perceptions.

8. Predispositions and Culture

But all this does not provide the full picture. Beliefs and orientations are a product of availability, and social influences ensure both availability and salience. But as I have suggested, what is available is also a product of antecedent beliefs and orientations, both

individual and social. In other words, availability is endogenous to, or a product of, predispositions, individual, cultural, and national.⁴

Why do some people recall and emphasize incidents in which a failure to take precautions led to serious environmental harm? A likely reason is that they are predisposed to favor environmental protection. And why do some people recall and emphasize incidents in which environmental protection led to huge costs for little gain? A likely reason is that they are predisposed to oppose environmental controls. Here is an interaction between the availability heuristic and confirmation bias—“the tendency to seek information to confirm our original hypotheses and beliefs” (Aronson, 1995, p. 150). Confirmation bias plays a large role in different risk perceptions across individuals and groups. If members of a culturally distinct group are predisposed to believe that climate change contains serious risks, apparently supportive illustrations will be memorable, and contrary ones will be discounted.

Of course predispositions are not a black box, and they do not come from the sky. They have sources. Among their sources are availability and salience. After incidents of mad cow disease in England, many Europeans lost trust in the relevant authorities and acquired a predisposition to fear, and to take and urge precautions against, associated and analogous threats. In Europe, the growth of precautionary thinking, across certain domains, had a great deal to do with particular salient incidents (Vogel, 2003). The desire to combat climate change was spurred in this way. Hence there is complex set of interactions, with heuristics helping to constitute predispositions, which are in turn responsible for the real-world operation of heuristics. All this happens socially, not merely individually; and predispositions are not static. When people are in a group that is predisposed in a particular direction, the salient examples will be quite different from those that are salient in a group with an opposite predisposition. Here group polarization is especially important. What is sometimes described as “culture,” or as “deep-rooted cultural differences,” may be no such thing. Cascade effects and polarization, interacting with availability, can be responsible for inclinations and variations that might well have taken another form.

⁴ On culture, an influential treatment is Douglas and Wildavsky (1984); a natural reading of their work and the work of those inspired by them is that availability is a product of cultural orientations, rather than vice versa. But see Vogel (2003) for a contrasting view.

9. Conclusion

Why are some groups and some nations concerned with the risks associated with climate change, and why are others much less so? A sensible default assumption is that they are motivated by a form of intuitive cost-benefit balancing. Nations usually follow their rational self-interest, and a nation that has relatively less to gain from precautions, and relatively more to lose, will naturally be interested in greater precautions. Contrast here the enthusiasm of the United States for precautionary steps to reduce ozone depletion with the reluctance of the United to endorse such steps to reduce global warming. The difference has a great deal to do with that nation's assessment of the costs and benefits of precautions.

I have also suggested that the operation of the Precautionary Principle, and differences in risk perception among nations, have a great deal to do with the availability heuristic, which helps to inform intuitive cost-benefit balancing. For the risks associated with climate change, which are not likely to come to fruition in the near future, it is difficult to promote availability; but vivid images are possible to provide here as well. European nations are more concerned about climate change than the United States in part because certain environmental risks have become more salient in the former than in the later, and in part because both intuitive and formal cost-benefit analysis suggest that with expensive preventive measures, the United States is more likely to be a net loser. If that analysis shifted, through declining costs of control or through more vivid incidents of tangible harm, American participation in international agreements would be far more probable.

Of course availability is a product of social influences. Cascade effects and group polarization play substantial roles in making one or another incident available to many or most. There are multiple equilibria here: Single incidents and small shocks can make an extraordinary difference. Moreover, what is available to some will not be available to all, in part because of social influences, and in part because of individual, cultural, and national predispositions. It follows that some cultures will find risks of climate change "available" not because of simple facts about what citizens have to gain and to lose, but also because the relevant citizens are predisposed to focus on some risks but not on others. But even across cultural differences, intuitive cost-benefit balancing can be

altered by available incidents; if vivid incidents become salient, aggressive regulation is far more likely to be forthcoming.

References

- Aronson, E. (ed.): 1995, *Readings about the Social Animal*, W.H. Freeman, New York, p. 150.
- Behrman, J.R., Kohler, H.P., and Watkins, S.C.: 2003, 'Social Networks, HIV/AIDS, and Risk Perceptions', PIER Working Paper No. 03-007. <http://ssrn.com/abstract=382844>.
- Bikhchandani, S., Hirshleifer, D., and Welch, I.: 1998, 'Learning from the Behavior of Others: Conformity, Fads, and Informational Cascades', *J. Econ. Perspect.* **12**, 151-170.
- Brown, R.: 1985, *Social Psychology*, Free Press, New York, p. 224.
- Burnum, J.F.: 1987, 'Medical Practice a la Mode: How Medical Fashions Determine Medical Care', *N. Engl. J. Med.* **317**, 1220-1222.
- Douglas, M. and Wildavsky, A.: 1982, *Risk and Culture: An Essay on the Selection of Technical and Environmental Dangers*, Univ. of California Press, Berkeley.
- Feigenson, N., Bailis, D., and Klein, W.: 2005, 'Perceptions of Terrorism and Disease Risks: A Cross-national Comparison', *Univ. Missouri L. Rev.*, forthcoming.
- Gigerenzer, G.: 2000, *Adaptive Thinking: Rationality in the Real World*, Oxford Univ. Press, New York.
- Gigerenzer, G., Todd, P.M., and ABC Research Group: 1999, *Simple Heuristics That Make Us Smart*, Oxford Univ. Press, New York.
- Heath, C.: 1996, 'Do People Prefer to Pass Along Good or Bad News? Valence and Relevance as Predictors of Transmission Propensity', *Org. Behav. & Hum. Decis. Process.* **68**, 79-94.
- Heath, C., Bell, C., and Sternberg, E.: 2001, 'Emotional Selection in Memes: The Case of Urban Legends', *J. Personality & Soc. Psych.* **81**, 1028-1041.
- Henrich, J., Albers, W., Boyd, R., Gigerenzer, G., McCabe, K.A., Ockenfels, A., and Young, H.P.: 2001, 'Group Report: What is the Role of Culture in Bounded Rationality?', in Gigerenzer, G. and Selten, R. (eds.), *Bounded Rationality: The Adaptive Toolbox*, MIT Press, Cambridge, pp. 343-360.
- Hirschleifer, D.: 1995, 'The Blind Leading the Blind: Social Influence, Fads, and Informational Cascades', in Tommasi, M. and Ierulli, K. (eds.), *The New Economics of Human Behavior*, Cambridge Univ. Press, Cambridge, pp. 188-216.
- Kahneman, D. and Frederick, S.: 2002, 'Representativeness Revisited: Attribute Substitution in Intuitive Judgment' in Gilovich, T., Griffin, D., and Kahneman, D. (eds.), *Heuristics and Biases: The Psychology of Intuitive Judgment*, Cambridge Univ. Press, Cambridge, pp. 49-82.
- Kahneman, D., Slovic, P., and Tversky, A. (eds.): 1982, *Judgment Under Uncertainty: Heuristics and Biases*, Cambridge Univ. Press, Cambridge and New York.
- Kull, S.: 2000, 'Americans on the Climate change Treaty', *PIPA*. http://www.pipa.org/OnlineReports/GlobalWarming/buenos_aires_02.00.html
- Kuran, T. and Sunstein, C.R.: 1999, 'Availability Cascades and Risk Regulation', *Stan. L. Rev.* **51**, 683-768.
- Loewenstein, G. and Mather, J.: 1990, 'Dynamic Processes in Risk Perception', *J. Risk & Uncert.* **3**, 155-175.
- Myers, D.G.: 1975, 'Discussion-Induced Attitude Polarization', *Hum. Relat.* **28**, 699-714
- Myers, D.G. and Bishop, G.D.: 1971, 'The Enhancement of Dominant Attitudes in Group Discussion', *J. Personality & Soc. Psych.* **20**, 386-391.

- Nordhaus, W.D. and Boyer, J.: 2003, *Warming the World: Economic Models of Climate change*, MIT Press, Cambridge, pp. 161-162.
- Pidgeon N., Kasperson, R.F., and Slovic, P.: 2003. *The Social Amplification of Risk*, Cambridge University Press, Cambridge.
- Posner, R.A.: 2004, *Catastrophe: Risk and Response*, Oxford Univ. Press, New York.
- Renn, O. and Rohrman, B. (eds.): 2000, *Cross-Cultural Risk Perception: A Survey of Empirical Studies*, Kluwer Academic Publ., Dordrecht and Boston.
- The Program on International Policy Attitudes, Americans on the Global Warming Treaty, available at http://www.pipa.org/OnlineReports/GlobalWarming/glob_warm_treaty.html at Box 15.
- Rohrman, B. and Renn, O.: 2000, 'Risk Perception Research: An Introduction', in Renn, O. and Rohrman, B. (eds.), *Cross-Cultural Risk Perception: A Survey of Empirical Studies*, Kluwer Academic Publ., Dordrecht and Boston, pp. 11-54.
- Sherman, S.J., Cialdini, R.B., Schwartzman, D.F., and Reynolds, K.D.: 2002, 'Imagining Can Heighten or Lower the Perceived Likelihood of Contracting a Disease: The Mediating Effect of Ease of Imagery', in Gilovich, T., Griffin, D., and Kahneman, D. (eds.), *Heuristics and Biases: The Psychology of Intuitive Judgment*, Cambridge Univ. Press, Cambridge and New York, pp. 98-102.
- Sjoberg, L., Kolarova, D., and Rucai, A.: 2000, 'Risk Perception in Bulgaria and Romania' in Renn, O. and Rohrman, B. (eds.), *Cross-Cultural Risk Perception: A Survey of Empirical Studies*, Kluwer Academic Publ., Dordrecht and Boston, pp. 145-184.
- Slovic, P.: 2000, *The Perception of Risk*, Earthscan Publ., London and Sterling, Va., p. 40.
- Sunstein, C.R.: 2005, *Laws of Fear: Beyond the Precautionary Principle*, Cambridge Univ. Press, forthcoming.
- Sunstein, C.R.: 2003a, "Beyond the Precautionary Principle", *Univ. Pa. L. Rev.* **151**, 1003-1058.
- Sunstein, C.R.: 2003b, *Why Societies Need Dissent*, Harvard Univ. Press, Cambridge.
- Sunstein, C.R., Hastie, R., Payne, J.W., Schkade, D.A., Viscusi, W.K.: 2002, *Punitive Damages: How Juries Decide*, Univ. of Chicago Press, Chicago.
- Tversky, A. and Kahneman, D.: 2002, 'Judgment Under Uncertainty: Heuristics and Biases' in Kahneman, D., Slovic, P., and Tversky, A. (eds.), *Judgment Under Uncertainty: Heuristics and Biases*, Cambridge Univ. Press, Cambridge and New York, pp. 3-22.
- Tversky, A. and Kahneman, D.: 1986, 'Judgment Under Uncertainty: Heuristics and Biases', in Arkes, H.R. and Hammond, K.R. (eds.), *Judgment and Decision Making: An Interdisciplinary Reader*, Cambridge Univ. Press, Cambridge and New York, pp. 38-55.
- Viscusi, W.K. and Hirsch, J.: 2005, "The Generational Divide in Support for Climate Change Policies: European Evidence," Discussion Paper No. 504, Harvard Law School.
- Vogel, D.: 2003, 'The Hare and the Tortoise Revisited: The New Politics of Consumer and Environmental regulation in Europe', *Brit. J. Pol. Sci.* **33**, 557-580.
- Wiener, J.B. and Rogers, M.D.: 2002, 'Comparing Precaution in the United States and Europe', *J. Risk Res.* **5**, 317-349.

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