

## Risk and Culture

*Risk*, most dictionaries agree, involves exposure to the possibility of loss or injury.<sup>1</sup> Perceptions of this possibility are embedded in culture and vary enormously over space and time. One frequently encounters the contention that it is important to distinguish between “real”, “actual”, “objective” risks and those that are merely “perceived”. But all risk is perceived. Risk is a word that refers to the future, and the future exists only in the imagination. And the imagination is a product of culture.

In their 1982 book *Risk and Culture* Mary Douglas and Aaron Wildavsky introduced a new way of thinking about risk. The titles of their first four chapters propose a break with a past in which *risk* was almost exclusively a subject of quantified scientific inquiry:

1. Risks are hidden
2. Risks are selected
3. Scientists disagree
4. Assessment is biased.

**Risks are hidden**, sometimes deliberately but more commonly by ignorance – or sometimes both. The veil of ignorance obscuring the risks attaching to asbestos and smoking, for example, was ultimately torn away by medical statisticians – but only after overcoming the resistance of the industries that profited from them. When public knowledge of risks threatens profits obfuscation continues to be a problem.<sup>2</sup>

**Risks are selected.** Different cultures choose to worry about different things. Two currently debated examples are nuclear power and GM crops. Some see them as solutions to the world’s energy and food-supply problems. Others see them as dangers imposed by profit-seeking big business.

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<sup>1</sup> This, for some, is a provocative start. “Risk”, they argue, can also encompass positive outcomes: risk is “the effect of uncertainty on objectives – **positive** and/or negative” proclaims the aggressively marketed *Risk Management – Principals and Guidelines*, International Standard ISO 31000 - <http://www.john-adams.co.uk/2012/02/22/iso-31000/>. I propose to stick with the dictionaries for reasons set out [here](http://www.john-adams.co.uk/2012/02/22/iso-31000/). <http://www.john-adams.co.uk/2012/02/22/iso-31000/>

<sup>2</sup> See, for example *Bad Pharma*, by Ben Goldacre. Fourth Estate, 2013.

**Scientists disagree.** Hormesis provides an example. The theory that (some) substances that are toxic at high doses are therapeutic at low doses is the focus of many long running debates. Deep green environmentalists view the theory as part of chemical and nuclear industry conspiracies to put profit before the welfare of the planet and its inhabitants.<sup>3</sup>

**Assessment is biased.** This is the chapter in which they introduce their radical idea – the role played by bias in the contemplation of uncertainty. The subtitle of their book is “An Essay on the Selection of Technological and Environmental Dangers”, and people’s selection of the risks they worry about, Douglas and Wildavsky argued, is subjective. In contemplating responses to risk they observed “The political argument over technology is conducted between the heavily risk averse and the risk takers.” As we shall see, Douglas and Wildavsky, and those following in their footsteps, subsequently enlarged on this dichotomy, introducing further participants in debates about risk. But until *Risk and Culture* risk had primarily been the domain of scientists, actuaries, statisticians and economists who strove to reduce future uncertainties to hard numbers, and they concentrated on two hard numbers in particular – lives and money - and often reduced risk to an equation:

*Risk = magnitude of loss X frequency of loss.*

And if magnitude was first measured in terms of lives at risk it was commonly later converted to a number preceded by a \$ or £ sign<sup>4</sup>.

The traditional “objectivists”, let’s call them, made and still make a distinction between *risk* and *uncertainty* – a distinction first drawn by Frank Knight in 1921 in his influential book *Risk, Uncertainty and Profit*. Knight insisted:

- If you don’t know for sure what will happen, but you know the odds, that’s *risk*, and
- If you don’t even know the odds, that’s *uncertainty*.

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<sup>3</sup> See, for example, The Debate Over Low Doses: Hormesis & Human Health, [http://www.healthandenvironment.org/partnership\\_calls/28](http://www.healthandenvironment.org/partnership_calls/28)

<sup>4</sup> See Adams, J (1974) “...and how much for your grandmother” *Environment and Planning A* 6(6) 619 – 626. <http://www.envplan.com/abstract.cgi?id=a060619>

But excluded uncertainty had a habit of creeping back into discussions of risk. The frequencies that the objectivists used in their risk equations were historical. Use of the equation set out above requires the assumption that trends in these magnitudes and frequencies will continue unaltered into the future. Insurance company actuaries were forced to concede that, aside from a few risk categories such as motor insurance that generated large and fairly stable actuarial databases, they were dealing with uncertainty – but still they needed numbers.

And far from considering uncertainty a problem, the insurance industry treats it as a profit-making opportunity. A personal example: I live in central London; 45% of my annual building insurance premium is earmarked for terrorism cover. Despite inquiries to my insurance industry friends, no one can/will tell me where this number comes from. It is, I'm guessing, a number plucked from thin air to cover someone's worst cast scenario. And until the worst happens it makes them a lot of money<sup>5</sup>.

### **Types of Risk**

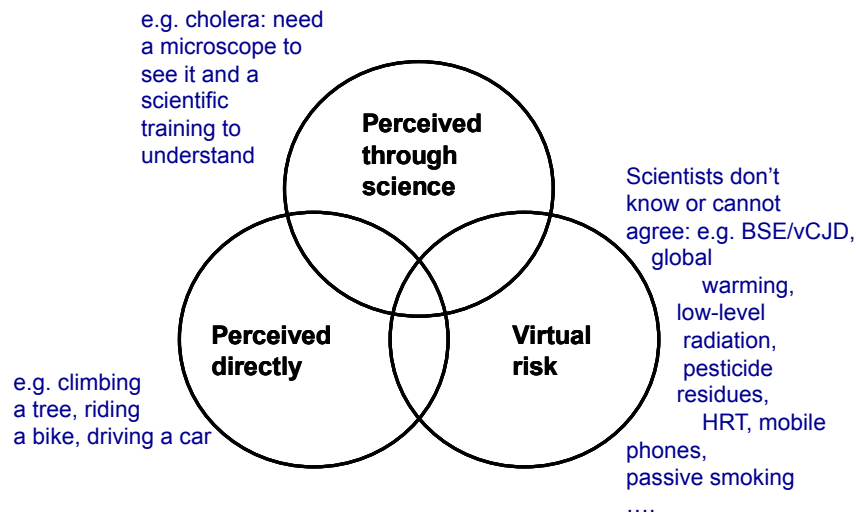
Where do worst-case scenarios come from? Or, for that matter, other less alarming scenarios? Much depends on the type of risk confronting one. There are many different types of risk. In the business pages one encounters financial risk, in the arts pages – artistic risk, in hospitals— medical risk, in places of employment – health and safety risk, in brand-marketing exercises – reputation risk, in airports – terrorism risk ... .. and so on. The list could go on almost without end. Any threat of nature or any human activity, physical or intellectual, leading to an uncertain outcome can serve as a descriptor of a type of risk.

A further, less open-ended, set of categories can be helpful in an attempt to illuminate the challenges facing those dealing with risk. Figure 1 presents a risk typology that is germane to most discussions of a wide variety of risks and their management.

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<sup>5</sup> And after the worst happens they are covered by a reinsurance operation called Pool Re and, should *its* reserves be exhausted, ultimately the government. The decision to buy terrorism insurance is made by my landlord who passes the cost on to me - so there is no incentive for the purchaser to query the price and, for that matter, no incentive for Pool Re to turn away business that in the final reckoning would be covered by the government: a good example of risk transfer.

**Figure 1** Different kinds of risk



**Perceived directly.** *Directly perceptible* risks are managed without the benefit of hard numbers. We do not undertake a formal probabilistic risk assessment before crossing the road. *Judgement*, some combination of instinct, intuition and experience, usually sees us safely to the other side.

**Perceived through science.** These risks dominate the risk management literature. In this circle risks are quantified. But quantification frequently fails to resolve disputes. People living alongside roads with high volumes of fast traffic often complain, relying on their direct perceptions, that their road is dangerous, and campaign for measures that will reduce the volume and speed of the traffic. Their campaigns sometimes bring them into contact with highway engineers with responsibility for their road. The engineers are likely to confront them with their road accident maps, showing them that they don't have a problem. The roads complained of, according to their maps, are safe, with no, or very few, accidents. The good accident rate however is frequently purchased at the cost of community severance. Residents respond to their perceptions of danger. Children are forbidden to cross the road. Old people are afraid to cross it. And fit adult cross it quickly and carefully. People on one side of the road tend not to know their neighbours on the opposite side.

This circle is the realm of problems where the odds are considered calculable. This is the realm of Knightian risk: quantified risk assessment. In this realm uncertainty comes with numbers attached in the form of probabilities.

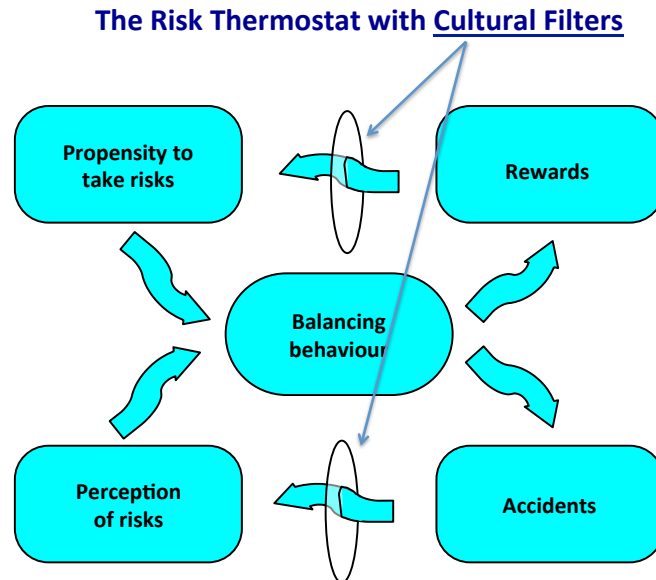
**Virtual risk.** This is the domain of Knight's uncertainty. Virtual risks may or not be real, but beliefs about them guide both individual behaviour and the policies of governments. Some find them liberating; if science can't settle an argument people and policy makers feel free to act upon their beliefs, prejudices or superstitions. It is in this circle that we find the longest-running and most acrimonious arguments. Global warming has been placed in this circle because the (potentially catastrophic?) warming of which some warn, and which others dispute, is the product of models that grossly simplify extremely complex physical systems. Beliefs about it lead some to propose policies that would, if pursued, dramatically alter the life-styles of billions. In this circle the inability of science to frame uncertainties in the form of agreed probabilities compels participants in the debate to rely, as in the first circle, on *judgement* – some imprecise combination of instinct, intuition and experience. And all such judgements, as Douglas and Wildavsky argued, will be biased.

### **Managing Risk**

Before examining these biases let us look at the act of making a risk decision itself. Figure 2 is proffered as the essence of the act. I call it the risk thermostat. The effect of the "cultural filters" will be discussed shortly but first consider the act of taking a risk.

The thermostat is set in the upper left hand corner. The setting can vary widely from high (wild and reckless) to low (timid and cautious) but zero is not possible – both getting out of bed and staying in it involve risks. Further, it follows that everyone must have some non-zero propensity to take risks. This propensity leads to risk-taking behaviour that leads, by definition, to accidents: to take a risk is to do something that carries with it a probability (usually unknown) of an adverse outcome. It is through surviving accidents and learning from them, or seeing them on television, or being warned by mother, that we acquire our perception of what is safe or dangerous. The model proposes that when propensity and perception get out of balance there will be a behavioural response that seeks to restore the balance. Why do we take risks? There are rewards. And the magnitude of the reward influences propensity.

**Figure 2** The risk thermostat



The behavioural adjustment described by Figure 2 is known as *risk compensation*. It is well-known to the insurance industry that calls it “moral hazard” – a rather judgmental term to apply to the actuary’s observation that people with house contents insurance are less careful about locking-up, or that drivers drive less carefully when wearing a seat belt <sup>6</sup>.

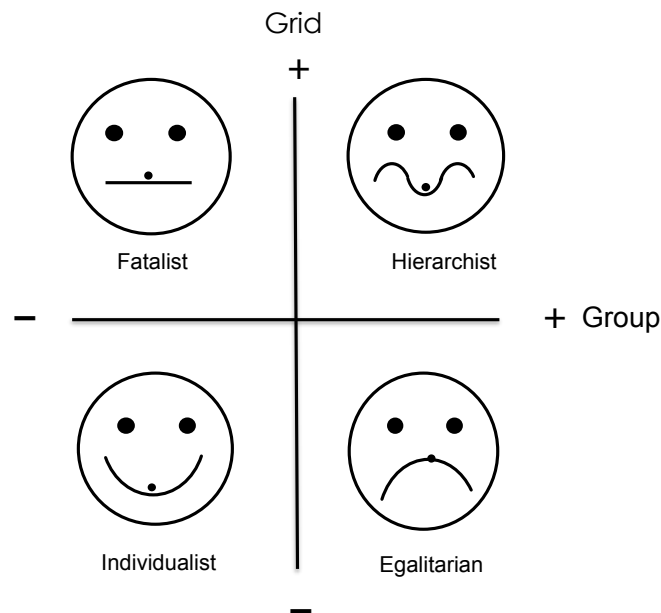
### A typology of bias

Figure 3 presents a set of cultural filters through which the potential rewards and losses of any particular risk might be viewed and debated. It is a composite, cartoon version, of a typology originally proposed by Mary Douglas and presented in Figures 1 and 2 of *Cultural Theory*<sup>7</sup>. The axes define two key dimensions by which risk-taking behavior might be described. The grid axis denotes the degree to which behavior is constrained by imposed rules. The group axis represents a ranking of cultures according to the importance attached to group solidarity. In *Cultural Theory* the four types are represented by a “high-caste hindu villager” (top right), a “self-made manufacturer” (lower left), a “non-unionized weaver” (top left) and a “communard” (lower right).

<sup>6</sup> A contention discussed below.

<sup>7</sup> *Cultural Theory*, M. Thompson, R. Ellis and A. Wildavsky, Westview Press, 1990.

Figure 3<sup>8</sup>



Additional contemporary representatives can be found for each quadrant. In the **Hierarchist** quadrant we can put the legislators, regulators and rule makers who prescribe behaviour confident in the knowledge that they know what is good for us. Also we can place the regulation enforcers here: the police who enforce speed limits, drink-drive laws, seat-belt laws, and the armies of risk assessors, compliance officers and safety officers

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<sup>8</sup> The expressions on the cartoon faces have been borrowed from Thompson, Ellis and Wildavsky (1990, p 27). They represent the “myths of nature” to which the different cultures adhere. The unhappy expression of the face of the Egalitarian represents a ball balanced precariously on an overturned cup; if you cannot prove something is safe, assume it’s dangerous. The smile on the face of the Individualist represents the myth of Nature benign and bountiful: the ball rests securely in the bottom of the cup. Life for the Fatalist is unpredictable; *que sera sera*. And for the Hierarchist Nature is manageable, within limits.

who enforce the requirements to assess all conceivable risks and ensure that the measures required to reduce them are acted upon.

In seminars and workshops I have done for the Royal Navy and the Ministry of Defence participants agreed that the armed forces were hierarchical organizations, and chose Eisenhower and his General Staff, running the war efficiently, to represent this quadrant.

They consigned to the *Individualist* quadrant the risk-taking mavericks of military history, including Patton, Montgomery, Nelson and Napoleon. In the *Egalitarian* quadrant they placed ideologues pursuing just causes – everyone from the ban-the-bombers to suicide bombers. And the *Fatalist* quadrant they reserved for the poor bloody infantry.

Another application of the typology can be found in *Taking Account of Societal Concerns about Risk*, a report for the UK Health and Safety Executive by Adams and Thompson (2002)<sup>9</sup>. In our report we identified the HSE as a Hierarchist: it makes the rules and enforces the rules governing risky behaviour in the workplace.

Our report anticipated that for the foreseeable future the HSE would face pressure from two directions: from the *Egalitarian* quadrant, by people complaining that the HSE was not doing enough to protect society, and from the *Individualist* quadrant by people complaining that the HSE was over-regulating, restricting freedoms and suppressing enterprise. The fatalists, following in the steps of their non-unionized-weaver forebearers, we thought would have negligible influence on the arguments; over a decade later these anticipations are proving robust.

An understanding of the debate about seat belt legislation, and the consequences of the law in Britain, can be assisted by Figures 2 and 3. The law that came into effect in January 1983 produced a large and almost instantaneous increase in seat-belt wearing rates – from about 36% to 95%. The evidence for their protective effect in crashes is compelling. So there should have been a large drop in road accident fatalities.

It didn't happen and Figure 2 can help to explain why. Belted drivers perceived themselves to be safer. This perception was reinforced by advertising campaigns extolling the safety benefits of seat belts. In such circumstances, and in the absence of a coincidental lowering of the

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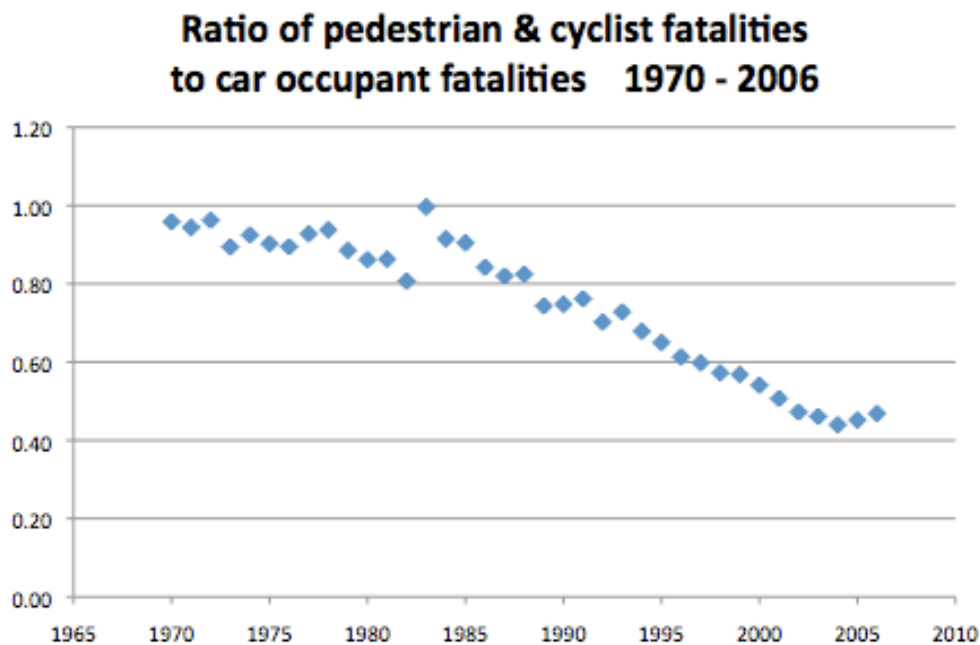
<sup>9</sup> <http://www.hse.gov.uk/research/rrpdf/rr035.pdf>



temperature setting of the national risk thermostat, Figure 2 predicts a change in driver behaviour. It predicts that drivers will drive in a way that restores the level of risk with which they had previously been content.

Not only was there no decrease in road accident fatalities following the seat-belt law, there was a large (25%) jump in the ratio of vulnerable road users (pedestrians and cyclists) killed to those best protected in cars wearing seat belts (Figure).

Figure 4<sup>10</sup>



<http://john-adams.co.uk/2009/11/05/seat-belts-another-look-at-the-data/>

The parliamentary debate that resulted in the seat-belt law involved participants from Cultural Theory central casting. The debate was initiated by occupants of the Hierarchist quadrant – believers in the efficacy of imposed rules – and opposed by Individualists who argued that people should be free to take whatever risks they wanted so long as no one else

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<sup>10</sup> This ratio had been declining steadily, from over 6:1 in the 1930s, as numbers of cars increased and walking and cycling decreased. See “Seat belts: another look at the data” in <http://www.john-adams.co.uk/?s=seat+belts>.

was endangered. The Egalitarians showed little interest in the debate until it was pointed out that others – vulnerable road users - *were* affected. The principal participants labelled each other: the top right quadrant was occupied by the Nanny State and the bottom left by Loony Libertarians.

The seat-belt law was celebrated as a triumph for the Hierarchists: the large increase in numbers wearing seatbelts apparently settled the matter. However, on the 25<sup>th</sup> anniversary of the law the Department of Transport, the Parliamentary Advisory Committee on Transport Safety and the Royal Society for the Prevention of Accidents provided an opportunity to re-open the debate. They all published press releases making the preposterous claim that over the previous 25 years the law had saved 60,000 lives.<sup>11</sup> That such a nonsense claim could be so widely believed and celebrated is a powerful illustration of way in which the biases embodied in the typology of Figure 3 can overpower rational analysis.

**“Change has to take root in people’s minds before it can be legislated.”<sup>12</sup>**

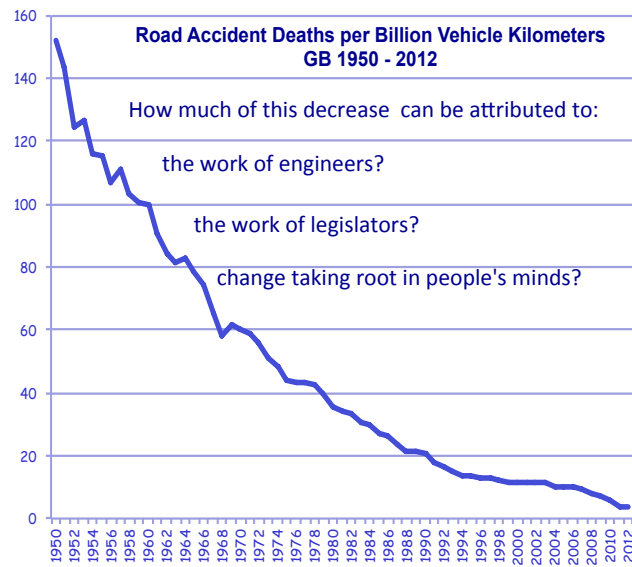
We began this essay by noting that perceptions of risk vary widely over space and time. Consider Figure 5, a graph depicting change over time. It shows an enormous decline in road accident death rates per vehicle kilometre in Britain over time: a 96 per cent decrease between 1950 and 2012 – an average annual decrease of 5.3 per cent. The reader is invited to guess the year in which the seat belt law, with its claimed enormous, and instantaneous, downward step in fatalities, took effect. See references in footnote 11 for the answer.

## Figure 5

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<sup>11</sup> 60,000 lives over 25 years amounts to 2400 per year – more than the total number of car occupants killed in the years before the law came into effect. The claim is examined by J. Adams in Chapter 10 of *Handbook of Risk Theory*, Springer, 2012, S. Roeser, R. Hillerbrand P. Sandin and M. Peterson (eds). And here <http://www.john-adams.co.uk/?s=seat+belts>

<sup>12</sup> Michael Sandel, author of *What Money Can't Buy: The Moral Limits of Markets*, Penguin, 2013 - Quotation from: <http://www.theguardian.com/lifeandstyle/2013/apr/27/michael-sandel-this-much-i-know>



How might we account for the dramatic fall in numbers of those killed on the road as traffic increased since the Second World War in economically developed countries such as Britain? In most of the road safety literature it is depicted as a triumph for the hierarchy: better roads and more crash-worthy cars (the result of more demanding design standards) and stricter laws governing speed and alcohol limits and the requirement to wear seat belts and motorcycle helmets.

Figure 6 casts doubt on this attribution of credit. It describes the variation over space, at one point in time, of the accident variable captured by Figure 5<sup>13</sup>. The safest country, by this metric, is Norway and the most dangerous, with a death rate more than 3000 times higher, is the Central African Republic. And yet it has, along with most of the other countries at the top end, a full set of road safety laws: national speed limits, drink-drive limits, helmet laws, seat belt laws, child restraint laws and laws forbidding the use of mobile phones while driving. And they are all achieving their extraordinary kill rates per vehicle with modern imported vehicles with a hundred years of safety technology built into them.

<sup>13</sup> The vertical axis has changed from fatalities per vehicle kilometre to fatalities per vehicle because countries at the high end of the graph do not have reliable traffic surveys with which to calculate the former.

Norway's superior roads also appear unlikely to explain the difference; it is often remarked that potholes are nature's speed humps.

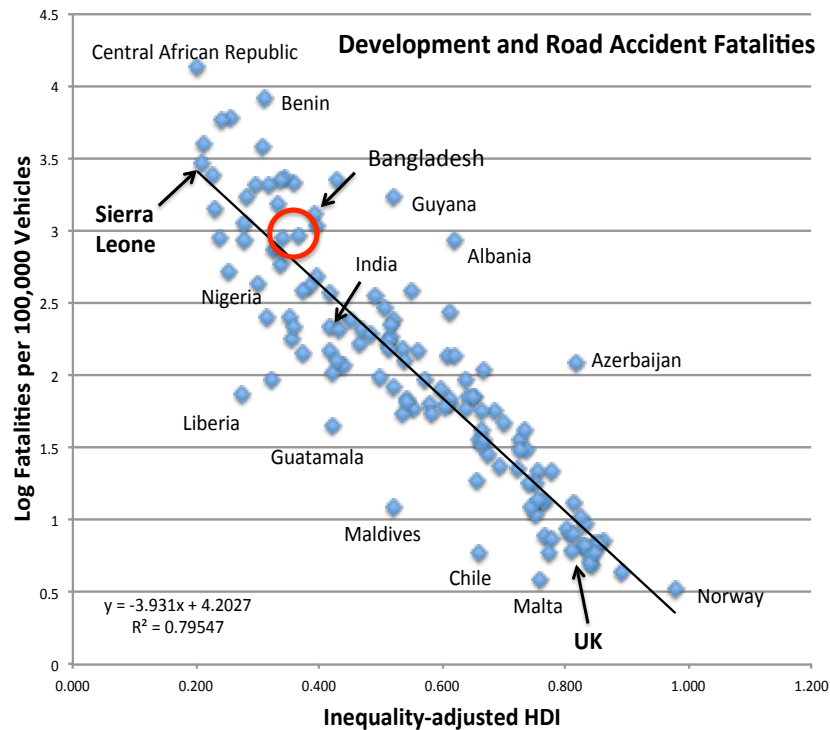
Bangladesh (marked with circle) has a lower, but still impressively high, road death rate – about 250 times that of Norway. It also has appalling standards of workplace health and safety, publicised worldwide at the time of the Rana Plaza garment industry disaster in 2013. The picture of Bangladesh that emerged in the analyses and reactions following that event might be characterised in terms of the typology of Figure 3 as follows. It is a country in which risk taking entrepreneurs (Individualists) enjoy a corrupt relationship with the government authorities (Hierarchists) responsible for formulating and enforcing regulations pertaining to health and safety, both in the workplace and on the road. The impoverished majority, at work and on the road, are compelled by their circumstances to suffer life's slings and arrows Fatalistically.

The country appears to have few Egalitarians campaigning effectively on behalf of the poor Fatalists. But the scale of the Rana Plaza disaster in the age of the global Internet energized Egalitarians in distant lands and led to campaigns pressing importers of goods from Bangladesh to insist that their suppliers implement safety standards prevailing in more risk-averse societies. To what effect remains to be seen.

## **Figure 6. Development and Road Accident Fatalities<sup>14</sup>**

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<sup>14</sup> The index was created by Mahbub-ul-Haq and Nobel Laureate Amartya Sen, the Inequality-Adjusted Human Development index is a composite of average longevity, education and income, adjusted for inequality - [http://en.wikipedia.org/wiki/Human\\_Development\\_Index](http://en.wikipedia.org/wiki/Human_Development_Index)



People living in countries toward the bottom of the line in Figure 6 often return home after visits to countries toward the top end horrified by the dangerous driving that they have witnessed. But for people living through the period represented by Figure 5 it would have been difficult to perceive their roads getting 5.3% safer year on year. However, that 62-year period witnessed extraordinary societal change. As a child I can remember my otherwise respectable parents urging “one for the road” on departing guests. Now drunken driving has become a stigmatizing offence.

And over this period the freedom of children has been severely constrained. I (now age 77) grew up as a free-range child at liberty to roam the neighbourhood until the streetlights came on and expected to get to school on my own. A study of English schools in 1971 revealed that 80% of 7 and 8 year old children got to school on their own, unaccompanied by an adult. A follow-up study of the same schools in 1990 revealed that that number had fallen to 9% - and the main reasons parents gave for denying their children the freedom that they had

enjoyed as children was fear of strangers and fear of traffic.<sup>15</sup> And now it has become a legal child-protection issue. In England two controversies recently appeared in the press in which parents were threatened with child-protection orders for allowing their children what used to be the widely accepted freedom to get to school unaccompanied.<sup>16</sup>

In the UK the various parts of The Hierarchy are beginning to show signs of worrying that risk aversion is now going too far. The Health and Safety Executive, the body responsible for overseeing safety at work and other areas, has responded to frequent media ridicule blaming it for “health-n-safety” excesses by launching a “Myth Busters Challenge Panel” to provide “a mechanism to independently challenge advice or decisions, made in the name of health and safety, that are believed to be disproportionate or inaccurate.”<sup>17</sup>

And the UK Government’s Chief Scientific Adviser also sees a need to curb excessive risk aversion. His annual report for 2014 is entitled “Innovation: managing risk, not avoiding it”<sup>18</sup>. It encapsulates the essence of the balancing act described by Figure 2: “It is [the] balance of risks and incentives that determine what choices innovators, entrepreneurs, investors, inventors, bureaucrats and citizens will make.” The Report worries that the country may not be getting the balance right. We have perhaps become too risk averse: “discussion of innovation has become almost inseparable from discussion of risk. Paradoxically, this discussion has become more prominent precisely because the innovations of previous generations have made our lives much safer and free of risk. People living in advanced economies have become more risk averse compared to previous generations.”

The daily news routinely proffers a steady stream of stories concerning established risks, such as global warming, intermixed with accounts of recent accidents and disasters, such as terrorist outrages

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<sup>15</sup> See *One False Move ...* [http://www.john-adams.co.uk/wp-content/uploads/2013/06/OneFalseMove\\_Hillman\\_Adams.pdf](http://www.john-adams.co.uk/wp-content/uploads/2013/06/OneFalseMove_Hillman_Adams.pdf)

<sup>16</sup> <http://www.telegraph.co.uk/family/7872970/Should-the-Schonrock-children-be-allowed-to-cycle-to-school-alone.html> and <http://www.bbc.co.uk/news/uk-england-lincolnshire-11288967>

<sup>17</sup> <http://www.hse.gov.uk/myth/index.htm>

<sup>18</sup> <https://www.gov.uk/government/publications/innovation-managing-risk-not-avoiding-it>

and, at the time of writing, the Germanwings plane crash in France. What factual information we have about such stories increasingly comes to us over the Internet. What is *undertood* about such stories is highly dependent on cultural filters – both of those transmitting the information and those receiving it.

### **Conclusion**

We began by observing that risk is a word that refers to an imagined future that is shaped by culture. At the time of writing there are over 7 billion risk thermostats in the world, each with its own set of cultural filters. Figures 5 and 6 (road accident death rates) have been proffered as indicators of the variation in frequency over space and time with which these thermostats collide physically. They also collide metaphorically in a wide range of debates about the appropriate thing to do in the face of uncertainty.

The figures provide a basis for speculating about the causes of these differences: why, in the UK, has there been such a dramatic decline in the last six and a half decades in the rate at which road users have been colliding? Why does the Central African Republic have a death rate per 100,000 vehicles over 3000 times higher than that of Norway? What help might Cultural Theory provide?

The Hierarchists in the countries represented in Figure 6 make and enforce the rules governing safety on the road; in other spheres, such as finance, other regulators perform a similar function. In terms of the Risk Thermostat of Figure 2, they are in charge of the societal balancing act. Their job is not only to reduce accidents and curb financial practices that exploit the vulnerable – but also to encourage the entrepreneurial risk takers pursuing the rewards that lead to *development*. In performing this duty they are urged on by both risk-reducing Egalitarians who complain that they are not doing enough to protect us, and risk-taking Individualists who often complain that they are over-regulating and suffocating enterprise. Fatalists, historically the vast majority, and still in Bangladesh and the Central African Republic, just get on with life and duck if they see something about to hit them.

What might have changed in the way that these cultures relate to each other between 1950 and 2012 in the UK? How might relations between the cultural biases represented by Figure 3 differ within Norway and Bangladesh? Can participants in scientifically contentious debates about

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issues such as climate change or global trade treaties ever agree? Such questions merit further examination under the light of Cultural Theory.

### **References**

Studies of *risk* and its *management* have exploded. Most multi-national corporations now have impressively well-paid senior executives bearing the title CRO (Chief Risk Officer). There are now Professors of Risk, numerous journals and university programmes devoted to the subject and numerous international institutions offering certificates of competence in various aspects of its management. And there are armies of lawyers trying, and often succeeding, to make money from its *mismanagement*.

Review essays such as this are usually followed by extensive bibliographies. Here I confess defeat. Typing “Risk and Culture” into Google yields over 15 million hits – and without the quotation marks, over 260 million.

You’re on your own. Good luck! JA