

Public perception and communicating disaster risks

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**13th in Guardian
University Guide 2019**
of 121 UK institutions ranked

**2nd in UK for Teaching
Excellence (TEF)**
Times Higher Education metrics
ranking 2017 - Gold winner

**6th for Student
Experience**
The Times and Sunday Times
Good University Guide 2018

**Queen's Award
for Enterprise**
International Trade 2015

The question

- Why do people have different risk perception??
- ✓ Risk perception impacts on individual decision making
- ✓ Both emergent uncertainties and complexities have also tangled the interconnections among risks.
- ✓ What does this imply about the importance of risk analysis for future action and policy?



Baguio, Philippines

Risk perception

- “how people’s beliefs, attitudes, judgements and feelings, as well as the wider social or cultural values and dispositions that people adopt, [influence their attitude] towards hazards and their benefits.”

(Pidgeon et al. 1992: 89; EU
2014: 5)



Istanbul 2019

Your chosen risks:

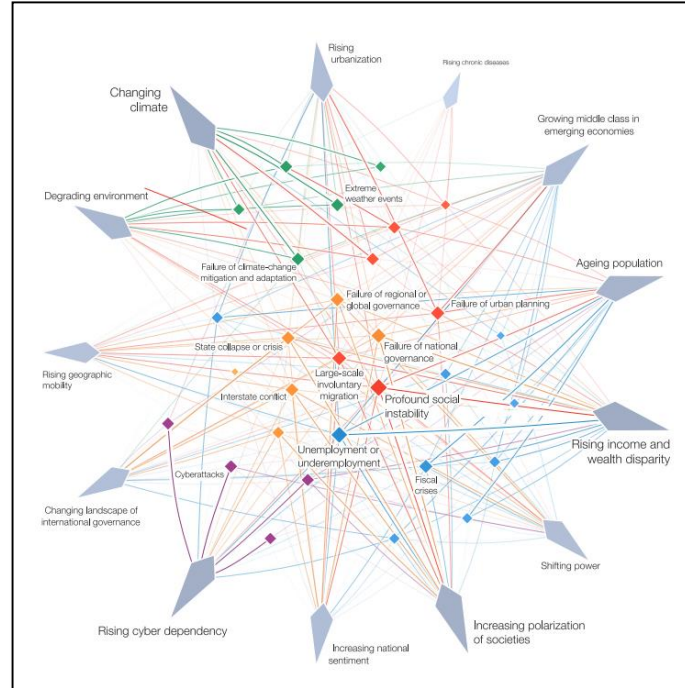
<https://www.menti.com/alpxjs9enj6x>

- Power blackout
- Extreme weather (heavy rainfall)
- Extreme weather (heat wave)
- River flooding
- Radiation accident
- Terrorist attack
- Question:
- Why did you choose these risks?



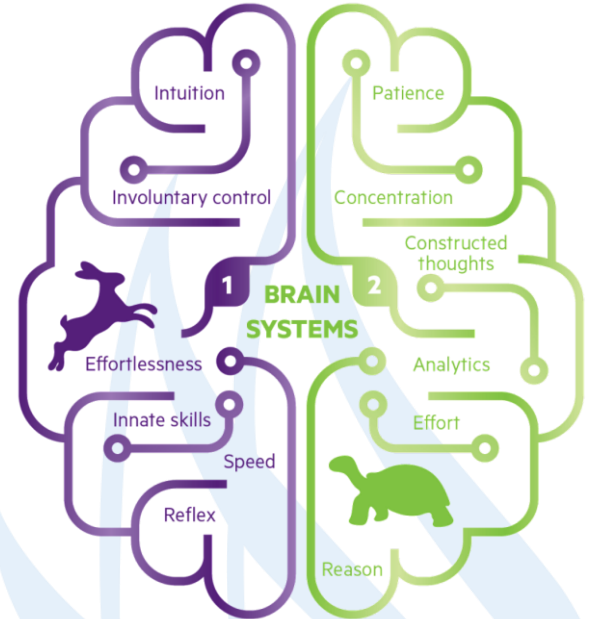
Can you find the connections between these risks?

NOTECH/cascading risks?



The rule of typical things

- Kahneman, Slovic and Tversky (1982) use psychological approach to examine risks
- system 1: **feeling** – works without conscious awareness; fast, source of snap judgments that people experience, intuition, emotion. There is no reason, it just DO.
- system 2: **reason** – works slowly, examines evidence, calculates and considers, easy to put into words and explain



A small test

- Linda is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations.

(Tversky and Kahneman 1983)

Please rank the descriptions:

- How likely is it that Linda [1(very likely)-10 (very unlikely)]
 - Is a teacher in elementary school?
 - Works in a bookstore and takes yoga classes?
 - Is active in the feminist movement?
 - Is a psychiatric social worker?
 - Is a member of the League of Women Voters?
 - Is an insurance salesperson?
 - Is a bank teller and is active in the feminist movement?

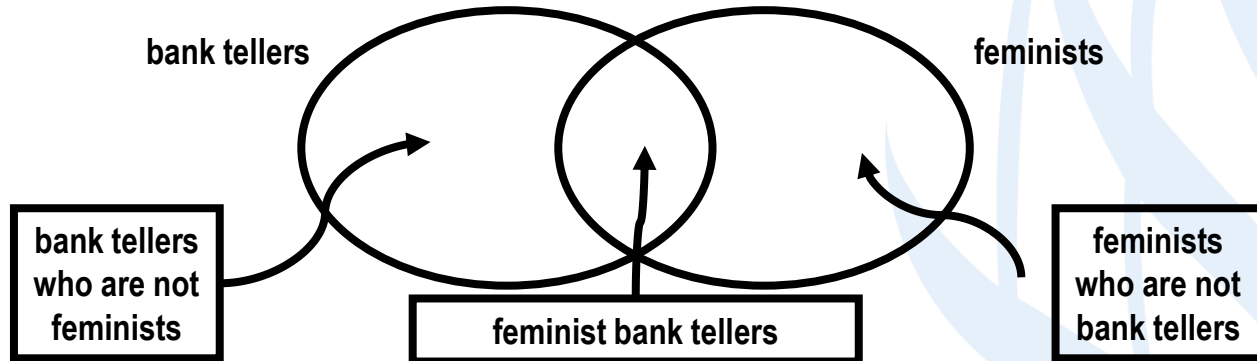
Their answer:

- So if we do it again, we only use these three options, how likely is it that Linda

Description	Average
Is active in the feminist movement	
Is a bank teller and is active in the feminist movement	
Is a bank teller	

Conjunction fallacy

- Nearly 90% choose the second alternative (bank teller and active in the feminist movement), even though it is logically incorrect (**conjunction fallacy**)
- The probability of two event happening at the same time, is not greater than single event taking place.



Heuristics

- Representativeness: decision made based on previous experience to / how much one thing resembles another
- Adjustment (visceral): personal initial values, or familiar positions, with an adjustment relative to this start point.
- Availability: memory/imagination of the event– this is the key to understand risk perception.



(Kahnemann and Tversky 1979: decision making under uncertainties)

General attributes of hazards that influence risk perception – fright factors

- Negative attributes of hazards that appear to influence risk perception and acceptability (Fishhoff et al 1981; Slovic 1978; Drennan and McConnell 2007: 70)
- **Involuntary** exposure to a risk
- Lack of personal **control** over outcomes
- **Uncertainty** about probabilities or consequences of exposure
- Lack of personal experience with the risk (fear of unknown)



Factors increasing risk perception	Factors decreasing risk perception
Involuntary hazard (radioactive fallout)	Voluntary hazard (mountaineering)
Immediate impact (wildfire)	Delayed impact (drought)
Direct impact (earthquake)	Indirect impact (drought)
Dreaded hazard (cancer)	Common hazard (road accident)
Many fatalities per event (air crash)	Few fatalities per event (car crash)
Deaths grouped in space/ time (avalanche)	Deaths random in space/time (drought)
Identifiable victims (chemical plant workers)	Statistical victims (cigarette smokers)
Processes not well understood (nuclear accident)	Processes well understood (snowstorm)
Uncontrollable hazard (tropical cyclone)	Controllable hazard (ice on highways)
Unfamiliar hazard (tsunami)	Familiar hazard (river flood)
Lack of belief in credibility of, and messages from, authority (private industrialist)	Belief in credibility of, and messages from, authority (university scientist)
Much media attention (nuclear power plant)	Little media attention (chemical plant)

Optimistic bias

✓ Individuals may acknowledge the existence of a risk, but will often **assume** that they personally are **not vulnerable to it** and are more knowledgeable about hazards relative to others (negative health effects of cigarette smoking are an example of this).

✓ It is the classic **“it couldn’t happen to me”** syndrome. The more an individual feels he or she knows about the hazard, the more control that person feels.

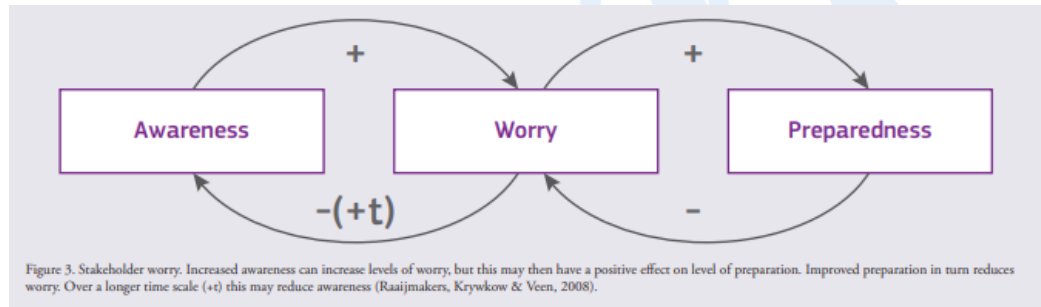


Figure 3. Stakeholder worry. Increased awareness can increase levels of worry, but this may then have a positive effect on level of preparation. Improved preparation in turn reduces worry. Over a longer time scale (+t) this may reduce awareness (Raaijmakers, Krykowiak & Veen, 2008).

Psychometric Model

- People overvalue low-probability risks, but react less to those more frequent but small-loss hazards.
- The majority of the citizens rely on intuitive risk judgments (risk perceptions) to assessing hazards while technologists implement risk assessment.
- Dreaded and involuntary factors – enhance risk perception.
- (Slovic, Fischhoff and Lichtenstein 1980; Fox-Glassman and Weber 2016)



Judgemental biases

- Experts' judgement appear to be prone to many of the same biases as those of general public, particular when experts are forced to go beyond the limits of available data and rely on intuition." (Slavic 1987)

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L'Aquila quake: Italy scientists guilty of manslaughter

 COMMENTS (594)



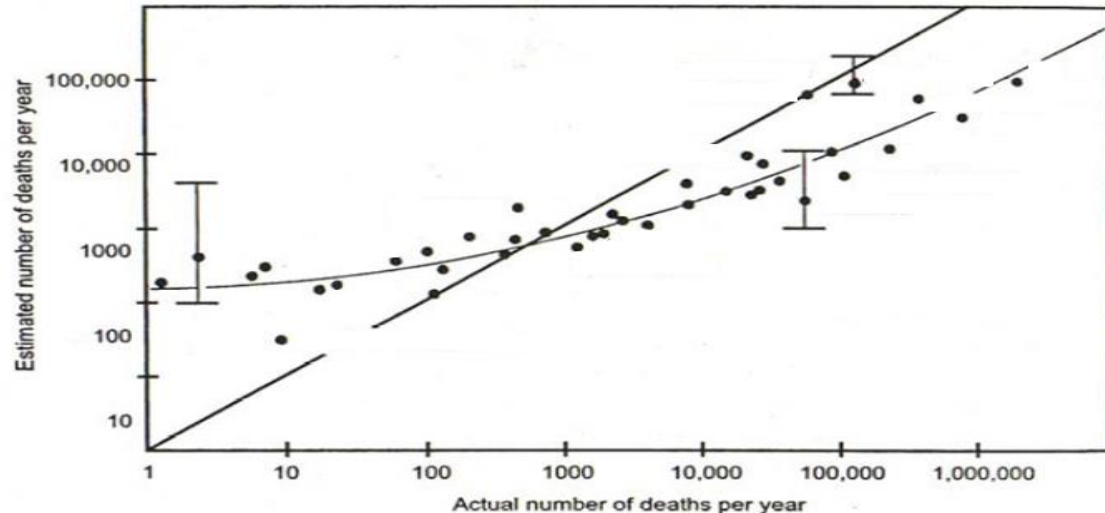
 **Play this again?**
L'Aquila quake scientists jailed

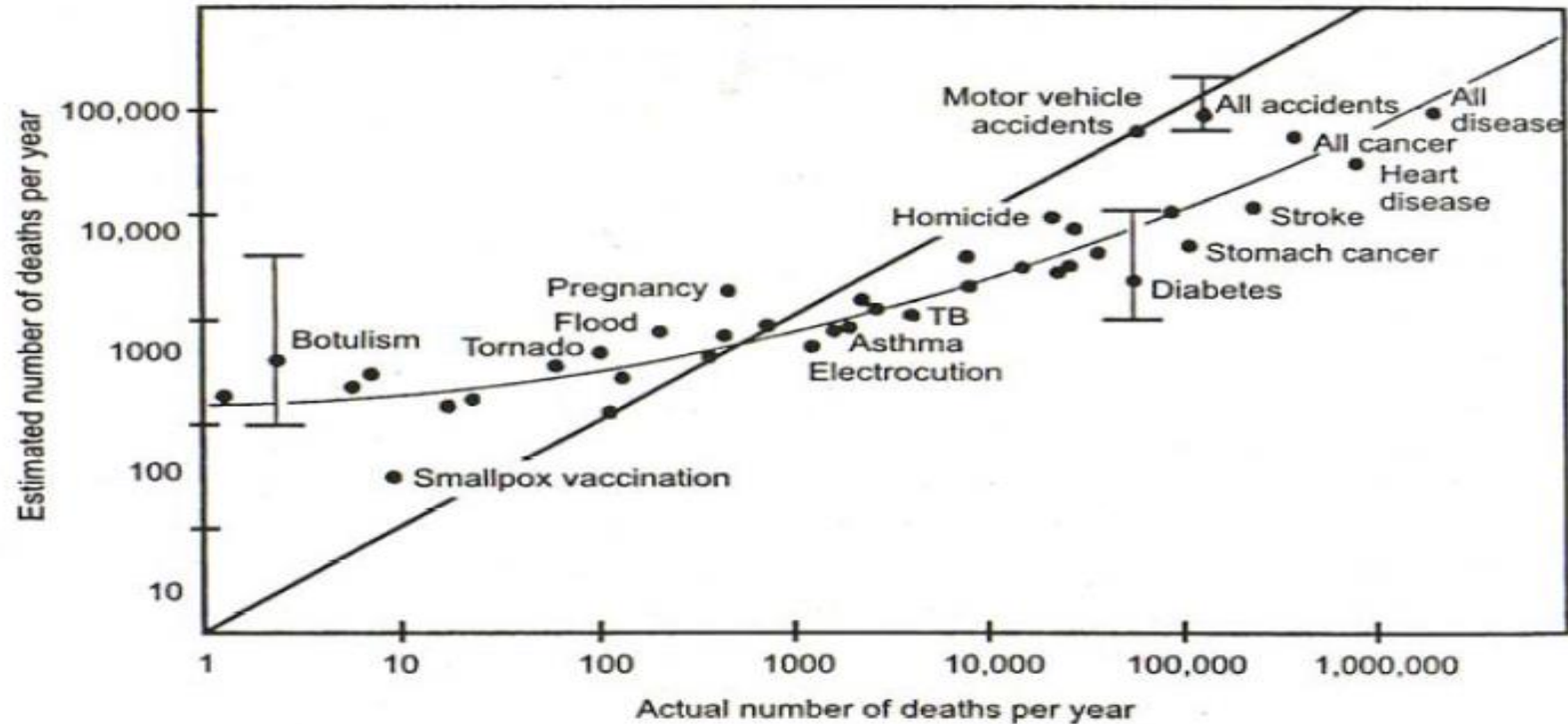
The BBC's Alan Johnston in Rome says the prosecution argued that the scientists were "just too reassuring"

[L'Aquila earthquake scientists win appeal](#)

Judged fatality estimates

- Relationship between judged frequency and statistical estimates of the number of deaths per year (US) for 40 causes of death (Slovic, Fischhoff and Lichtenstein 1980) Homicide, diabetics, heart disease, flood, and pregnancy.





Source: Fischhoff, Lichtenstein, Slovic, Derby and Keeney 1981

Deaths by risk factor, World, 2019

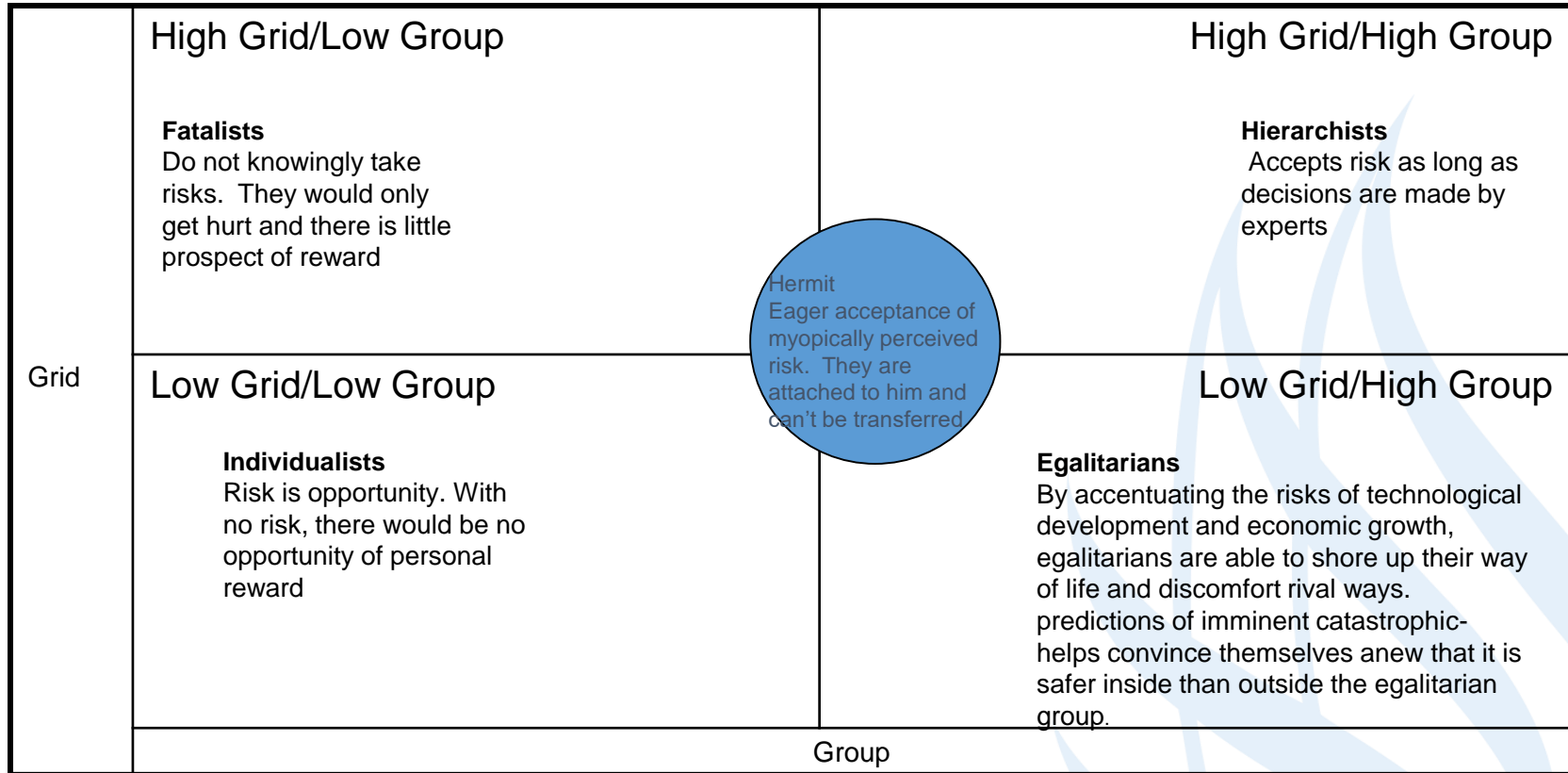
<https://ourworldindata.org/grapher/number-of-deaths-by-risk-factor>

Grid-group cultural theory

- People from different groups or cultural settings focus on different risks.
- Group: level of control - “high group” way of life exhibits a high degree of collective control, whereas a “low group” one exhibits a much lower one and a resulting emphasis on individual self-sufficiency.
- Grid: level of authority - A “high grid” way of life is characterized by conspicuous and durable forms of stratification in roles and authority, whereas a “low grid” one reflects a more egalitarian ordering.

(Douglas and Wildavsky 1982: 42)

The Social Construction of Risk



Cultural types: The Lewis Model

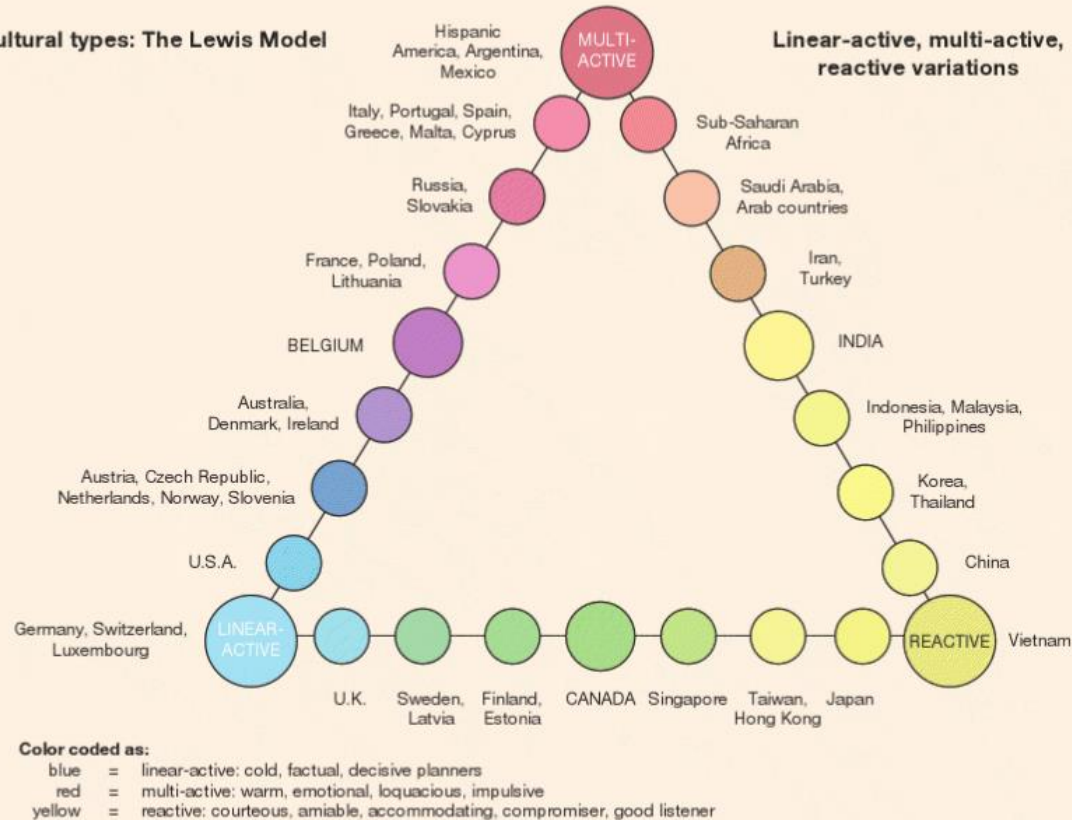


Figure 15.4 Cultural categorisation

Source: from *The Cultural Imperative: Global Trends in the 21st Century*, Nicholas Brealey (Lewis, R.D. 2007) © 2003 Richard Lewis. Reproduced by permission of Nicholas Brealey Publishing

Social framing of risk decision making

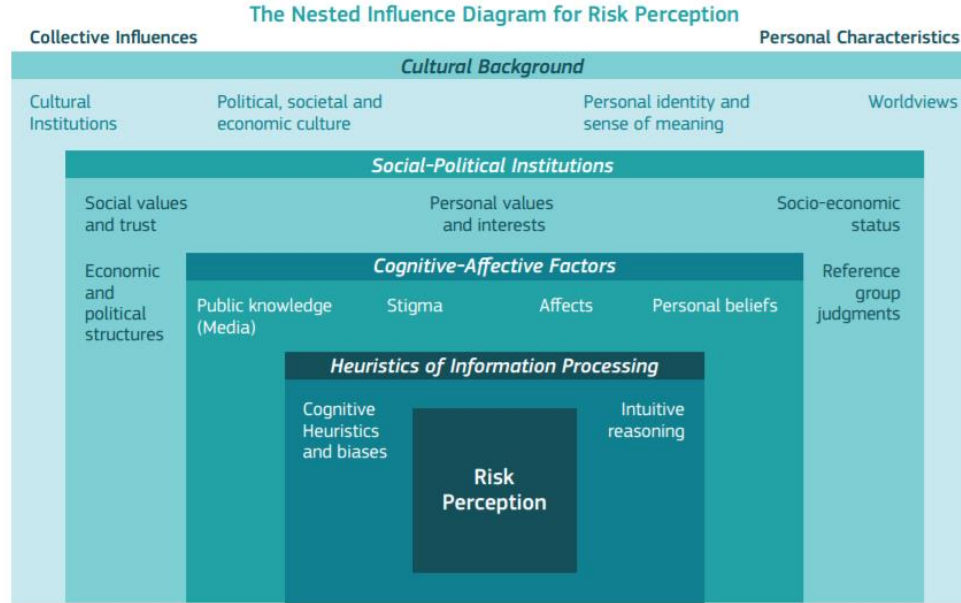


Figure 2. The multiple influences that interact to form risk perception (modified from Renn & Rohrman, 2000b).

Risk intervention

- When we worry about a risk, we pay more attention to it and take action where warranted (Gardner 2009: 6).
- How safe is safe enough?
- How risk decisions/policies are made?



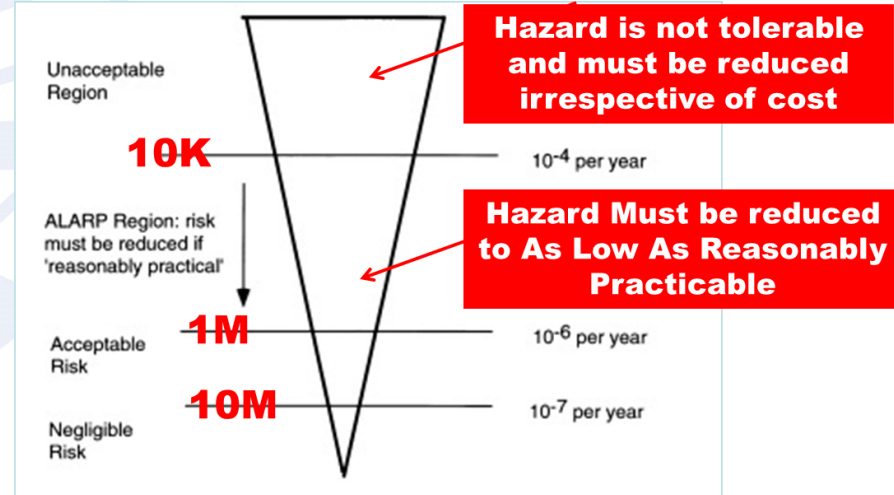
Acceptable risk-benefit trade-offs

- People seem willing to accept risks from voluntary activities roughly 1,000 times greater than they would tolerate from involuntary activities that produce the same level of benefits.

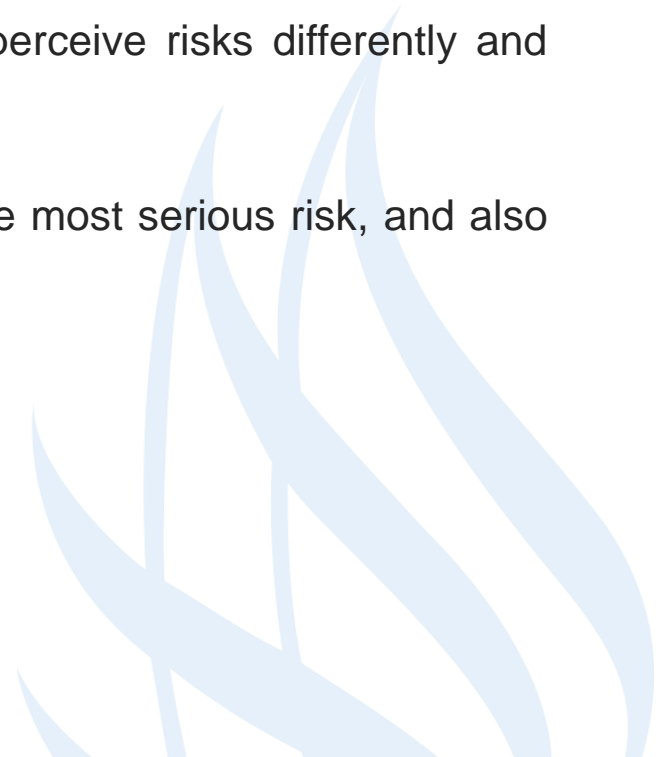
(Starr 1969; Slovic, Fischhoff and Lichtenstein 1985; Fischhoff *et al.* 2000)

ALARP

- For a risk to be ALARP it must be possible to demonstrate that the cost involved in reducing the risk further would be grossly disproportionate to the benefit gained.
- The ALARP principle arises from the fact that it would be possible to spend infinite time, effort and money attempting to reduce a risk to zero.
- It should not be understood as simply a quantitative measure of benefit against detriment.
- It is more a best common practice of judgment of the balance of risk and societal benefit.



- We are living in a complex society. Individuals, organisations, communities involved in a disaster come from different background, they perceive risks differently and hence deal with risks in a very different way.
- The question is that, how can we agree on what is the most serious risk, and also what is the 'best' way to mitigate it/them?



Cognitive map of risk attitudes and policy making

- The larger the point, the greater the desire for strict regulation to reduce risks.

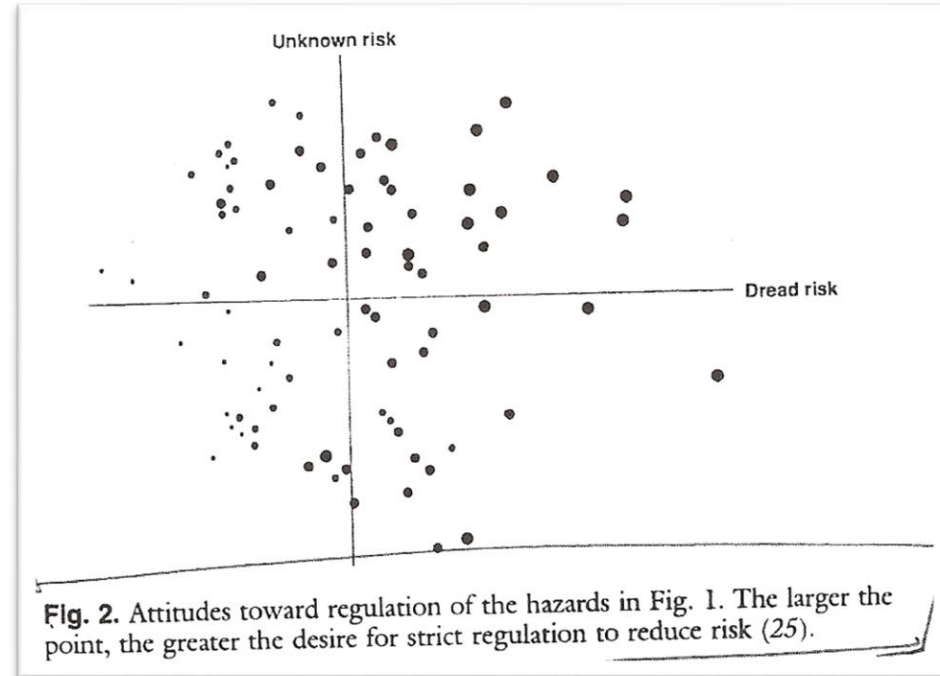
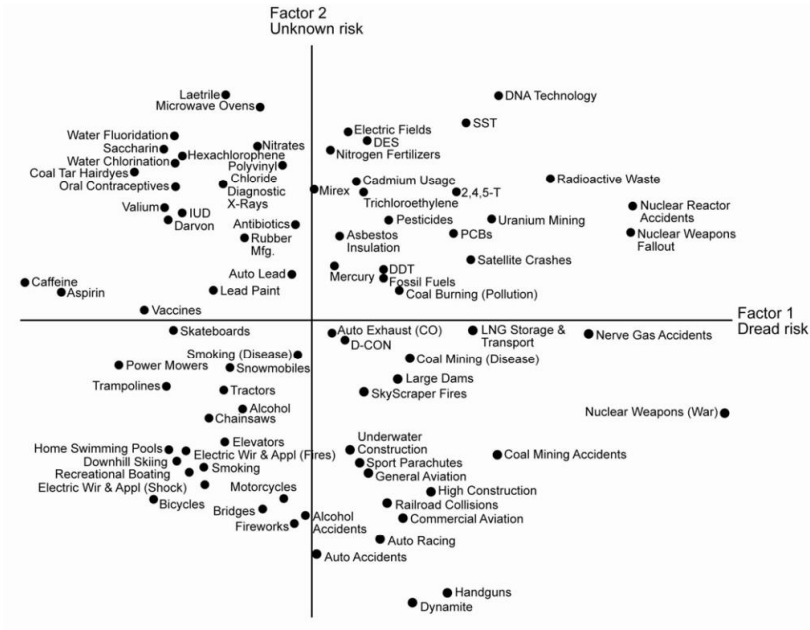


Fig. 2. Attitudes toward regulation of the hazards in Fig. 1. The larger the point, the greater the desire for strict regulation to reduce risk (25).

Risk compensation – the failure of seat belt legislation

In a British parliamentary debate about seat belts in 1979 William Rodgers, then Secretary of State for Transport, claimed “On the best available evidence of accidents in this country - evidence which has not been seriously contested - compulsion could save up to 1000 lives and 10,000 injuries a year” (*Hansard* 22 March).

- less careful driving by belted motorists might displace risks to other road users, mainly cyclists and pedestrians.

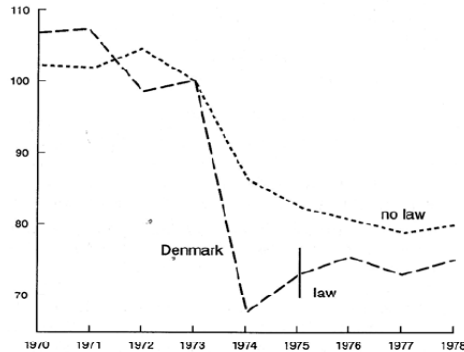


Figure 3 The effect of the seat belt law in Denmark. Source: (Adams 1982, 2824-38).

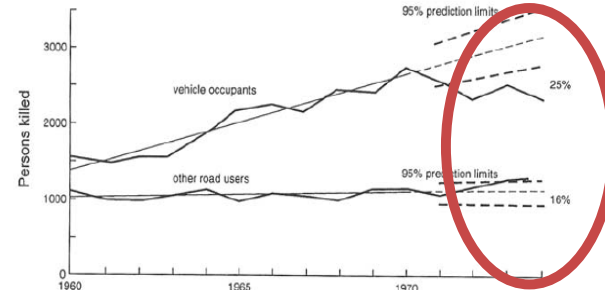
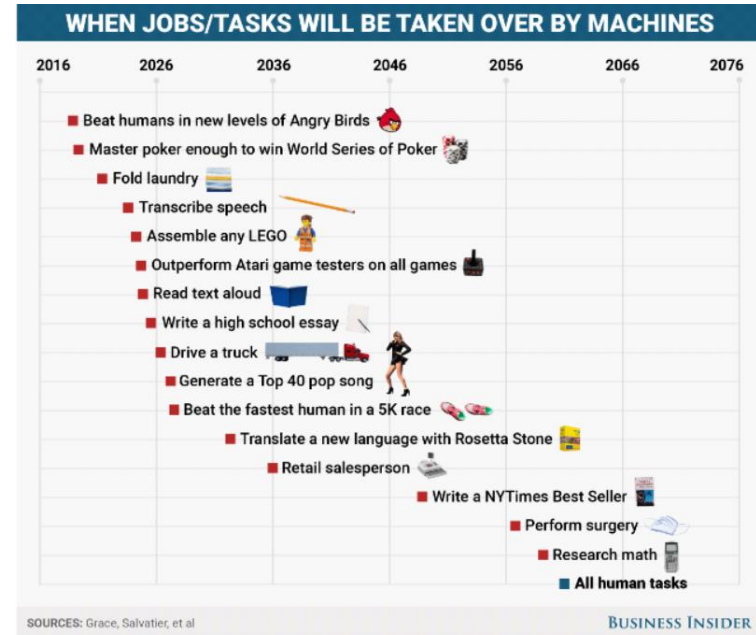


Figure 4 Road accident deaths in Australia; the beginning of the myth of seat belt effectiveness. Source: (Adams 1982, 2824-38).

- The way in which decisions are made and policies are implemented; however, can trigger or aggravate the various risks that are present in megacities.
- (Helmholtz Research Programme 2005: 18)



Who is responsible for the policies made?

- We are more afraid than ever because we are more at risk than ever.
- “Rarely is anyone being responsible for the damaging effects of technology”.
 - Chapman 2007: 5
- To be or not to be, now is the question!





Q&A

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Thank you.

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