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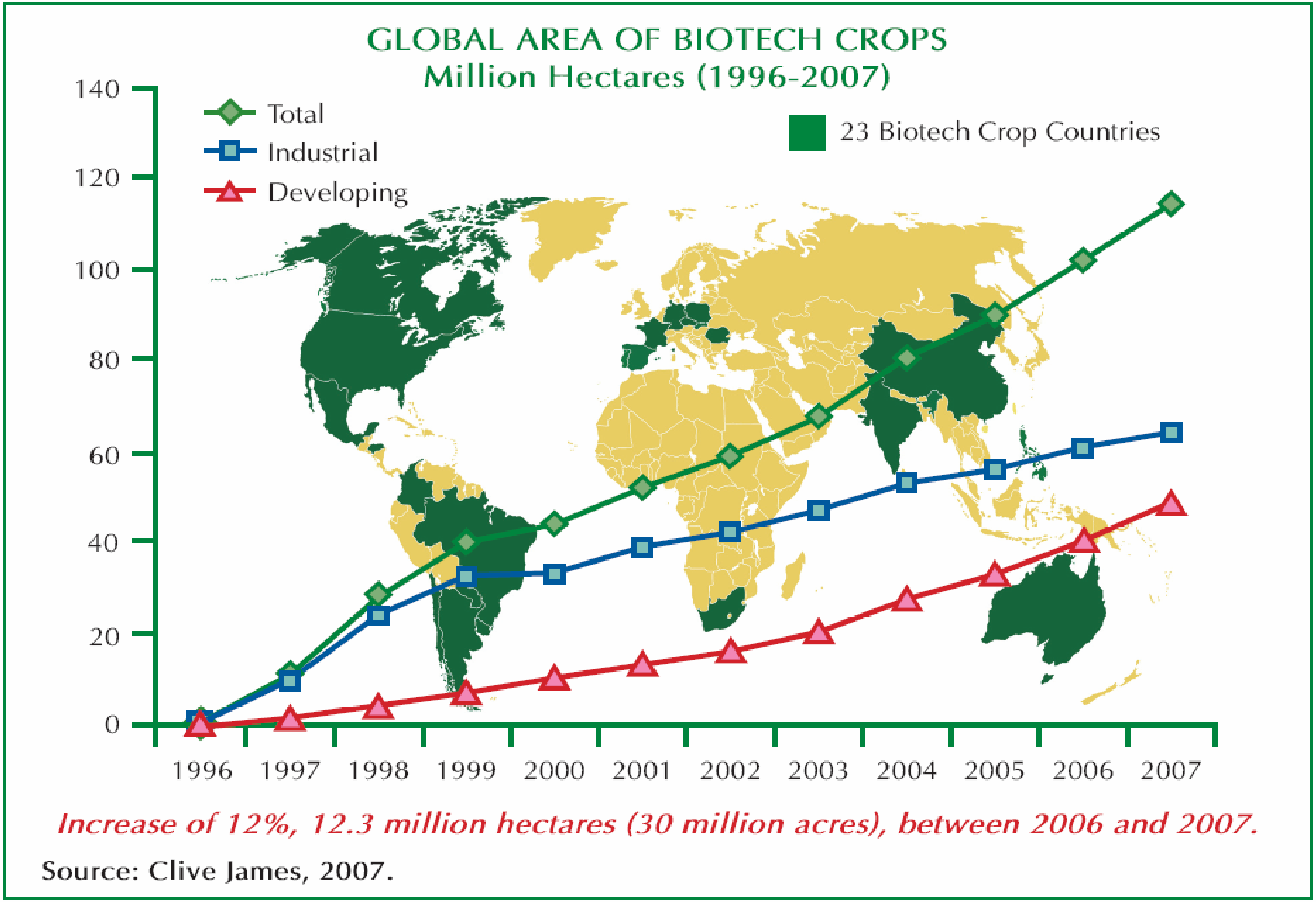
# GM crops - do they work in Europe ?
# Mechanisms of public acceptance


ResistVir

***Gabi Krczal***

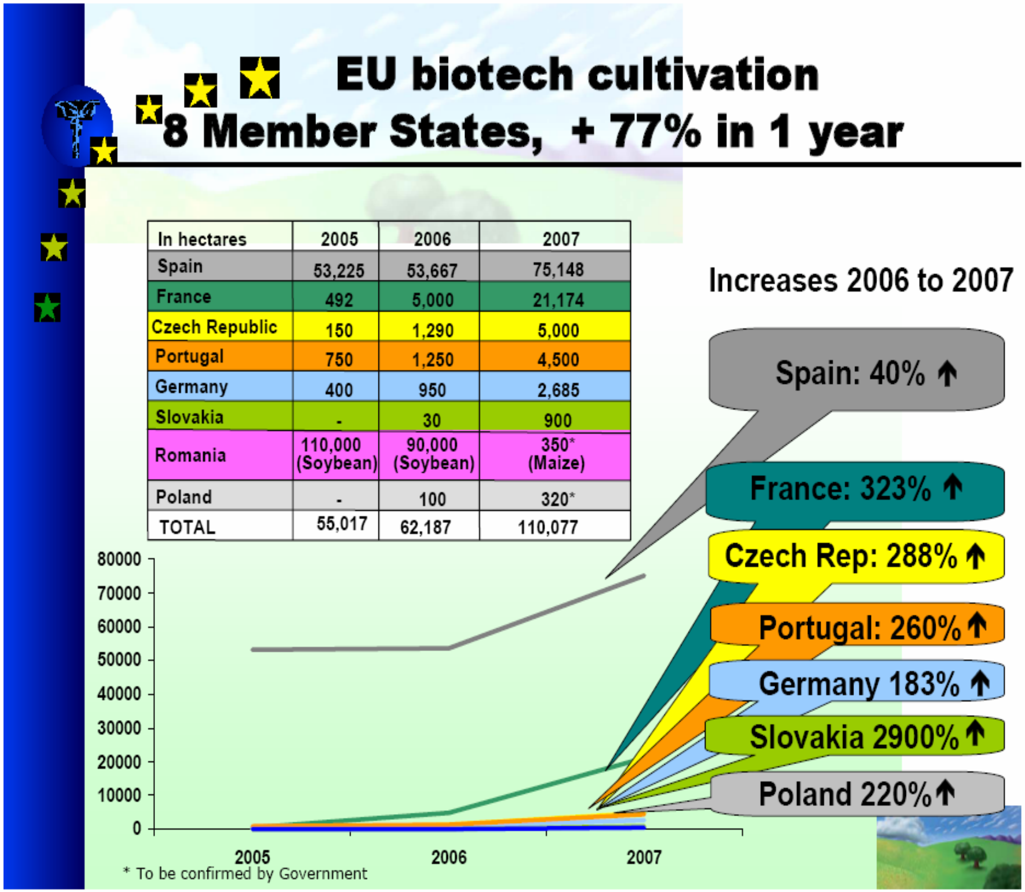
*„In modern technological societies statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write.“*
H.G. Wells
science fiction writer

# GM Crops Worldwide




***67-fold increase** between 1996 and 2007, making GM technology the fasted adopted crop technology in recent history*

# Bt-Maize in Europe




| In hectares | 2005 | 2006 | 2007 |
|---|---|---|---|
| Spain | 53,225 | 53,667 | 75,148 |
| France | 492 | 5,000 | 21,174 |
| Czech Republic | 150 | 1,290 | 5,000 |
| Portugal | 750 | 1,250 | 4,500 |
| Germany | 400 | 950 | 2,685 |
| Slovakia | - | 30 | 900 |
| Romania | 110,000 (Soybean) | 90,000 (Soybean) | 350* (Maize) |
| Poland | - | 100 | 320* |
| TOTAL | 55,017 | 62,187 | 110,077 |



In 2008 France has deferred cultivation approval for the genetically modified Bt maize MON810. The French government has invoked a safeguard clause enshrined in EU law.

Deadlines for lifting unsubstantiated national bans by Austria and Poland expired in January 2008 without any reaction.

This led to a pending conflict between the World Trade Organization (WTO) and the European Commission

# "News is bad News"

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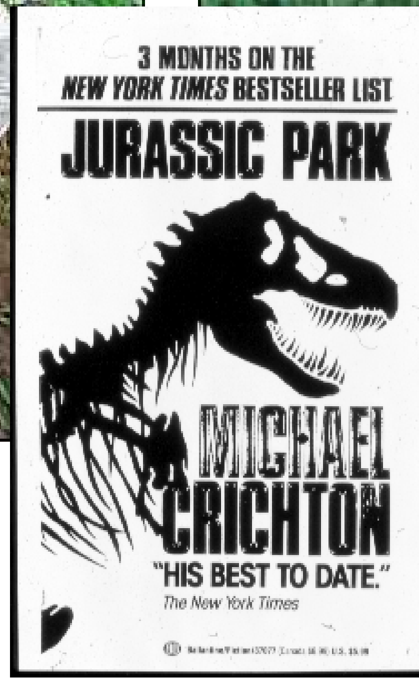
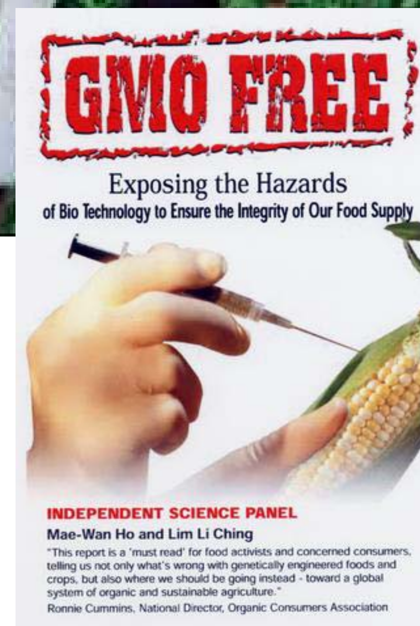
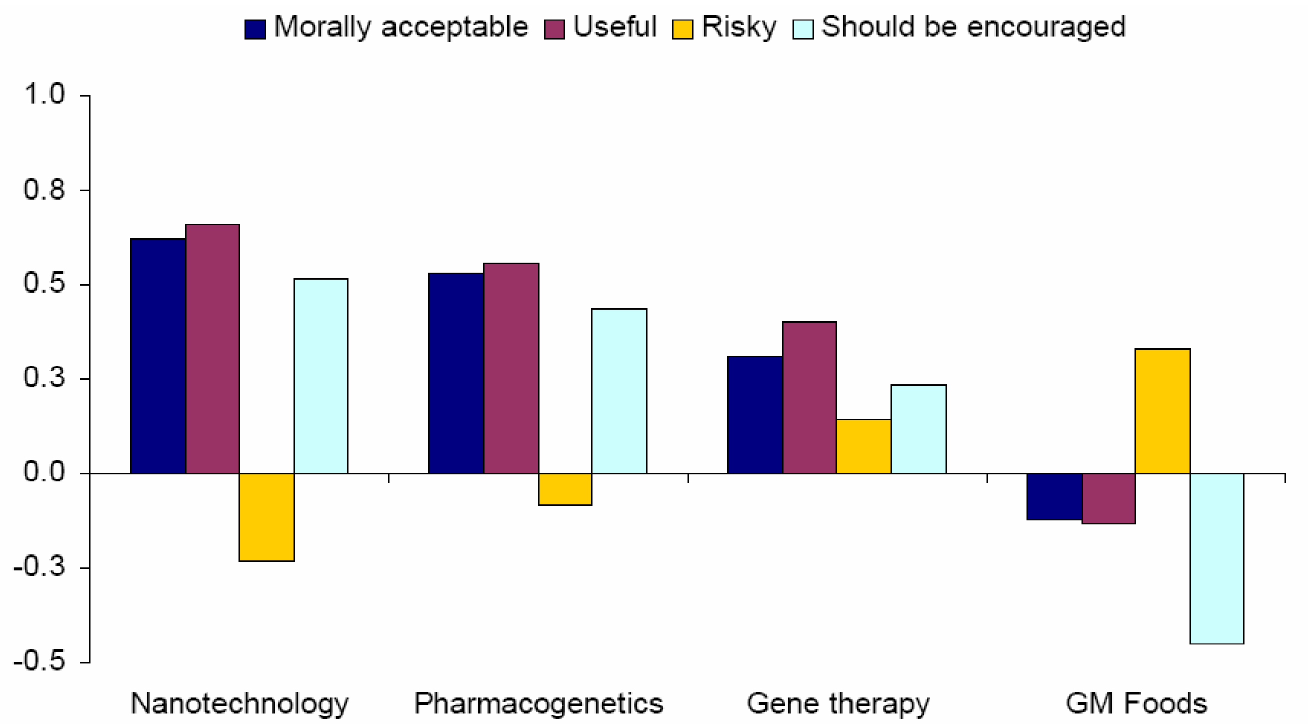



OHNE GENTECHNIK

GREENPEACE.ORG

# Eurobarometer 64.3: Evaluations of Technologies




Nanotechnology and pharmacogenetics are perceived as not risky and should be encouraged.

For GMO food the opposition is accompanied by perceptions of relatively high risk. Only in Spain, Portugal, Ireland, Italy, Malta, Czech Republic and Lithuania supporters outnumber opponents. **On an European average 27% support GM food technology**.

Gene therapy is supported despite being perceived as risky („risky but worth the risk").

# Eurobarometer 64.3: Three Common Logics

| Logic | Useful | Risky | Morally acceptable | Encouraged |
|---|---|---|---|---|
| **Outright supporters** | yes | no | yes | yes |
| **Risk tolerant supporters** | yes | yes | yes | yes |
| **Opponents** | no | yes | no | no |

Percentage of outright supporters, risk tolerant supporters and opponents among the 'decided public'

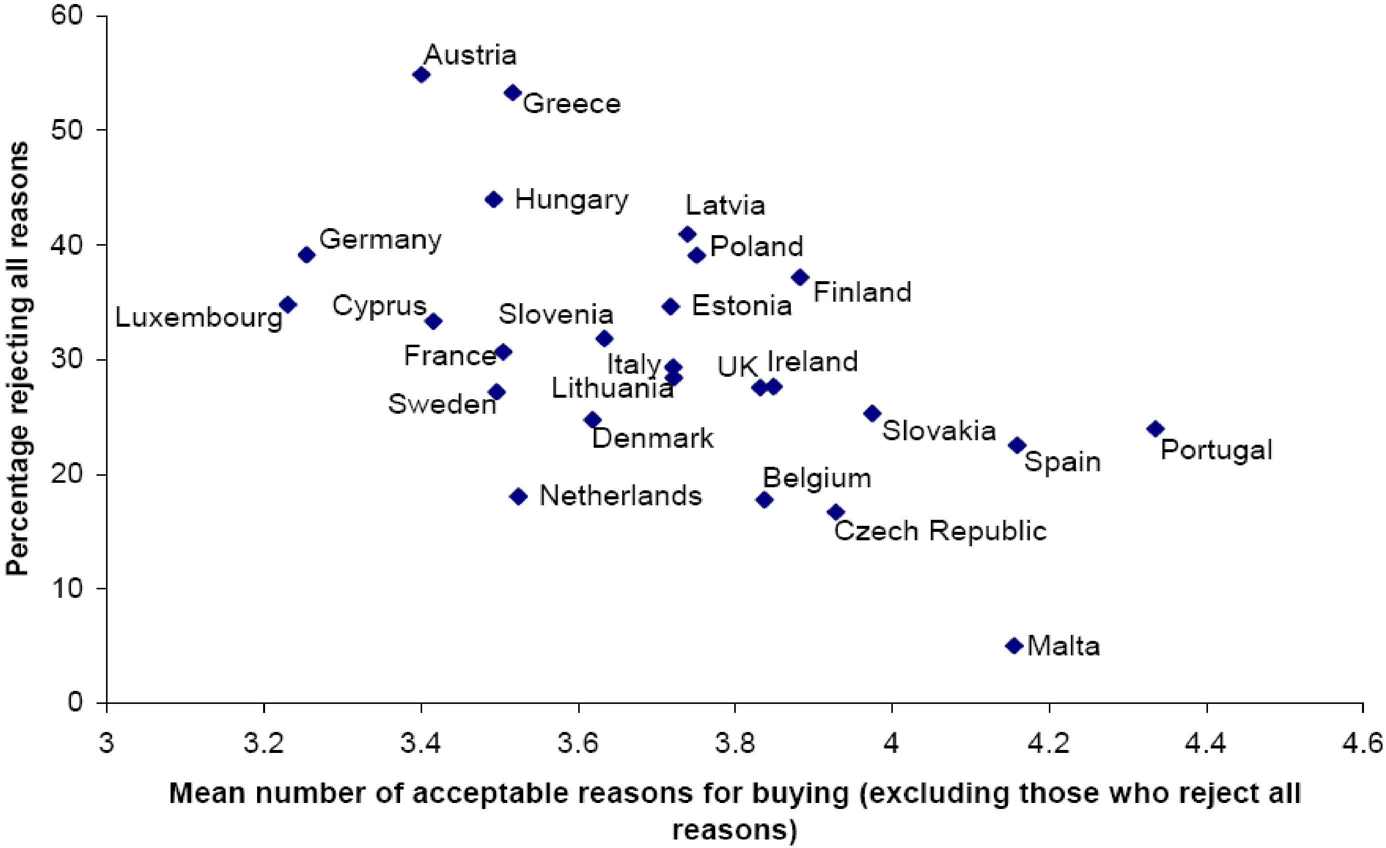
| | **Gene therapy** (Base = 51%) | **Pharmacogenetics** (Base = 50%) | **GM foods** (Base = 49%) | **Nanotechnology** (Base = 53%) |
|---|---|---|---|---|
| **Outright supporters** | 44 | 57 | 25 | 66 |
| **Risk tolerant supporters** | 36 | 33 | 17 | 25 |
| **Opponents** | 20 | 10 | 58 | 9 |

*Proportions are based only on those 50% of respondents who gave one of the common three logics as a response*

Outright support and risk tolerant support for GM food across EU:

| | 1996 | 1999 | 2002 | 2005 |
|---|---|---|---|---|
| Spain | 80 | 70 | 74 | 74 |
| Portugal | 72 | 55 | 68 | 65 |
| Ireland | 73 | 56 | 70 | 55 |
| Italy | 61 | 49 | 40 | 54 |
| Netherlands | 78 | 75 | 65 | 48 |
| United Kingdom | 67 | 47 | 63 | 48 |
| Finland | 77 | 69 | 70 | 46 |
| Belgium | 72 | 47 | 56 | 45 |
| Denmark | 43 | 35 | 45 | 42 |
| Sweden | 42 | 41 | 58 | 32 |
| Germany | 56 | 49 | 48 | 30 |
| France | 54 | 35 | 30 | 29 |
| Austria | 31 | 30 | 47 | 25 |
| Luxembourg | 56 | 30 | 35 | 20 |
| Greece | 49 | 19 | 24 | 12 |

# Eurobarometer 64.3: Acceptable Reasons for buying GM food




I would buy GM …..food if it were healthier

……………………..if it would contain less pesticide residues than other food

……………………..if it were grown in a more environmentally friendly way than other foods

……………………..it it were approved by the relevant authorities

……………………..if it were cheaper than other foods

# Eurobarometer 64.3: Governance and Trust

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| | Based mainly on the advice of experts | Based mainly on the general public's view |
|---|---|---|
| Based primarily on scientific evidence about the risks and benefits involved | Scientific delegation 59% | Scientific deliberation 9% |
| Based primarily on the moral and ethical issues involved | Moral delegation 17% | Moral deliberation 15% |

| | Mean score on technological optimism (additive scale 1-8, where 8 equals high optimism) | % who encourage GM food | % who encourage nanotechnology |
|---|---|---|---|
| **Scientific delegation** | 5.1 | 35% | 84% |
| **Scientific deliberation** | 4.7 | 30% | 77% |
| **Moral delegation** | 4.7 | 25% | 74% |
| **Moral deliberation** | 4.3 | 24% | 60% |

*To build further confidence in science policy it would seem prudent to ensure that moral and ethical considerations and the public voices are seen to inform discussions and decisions*

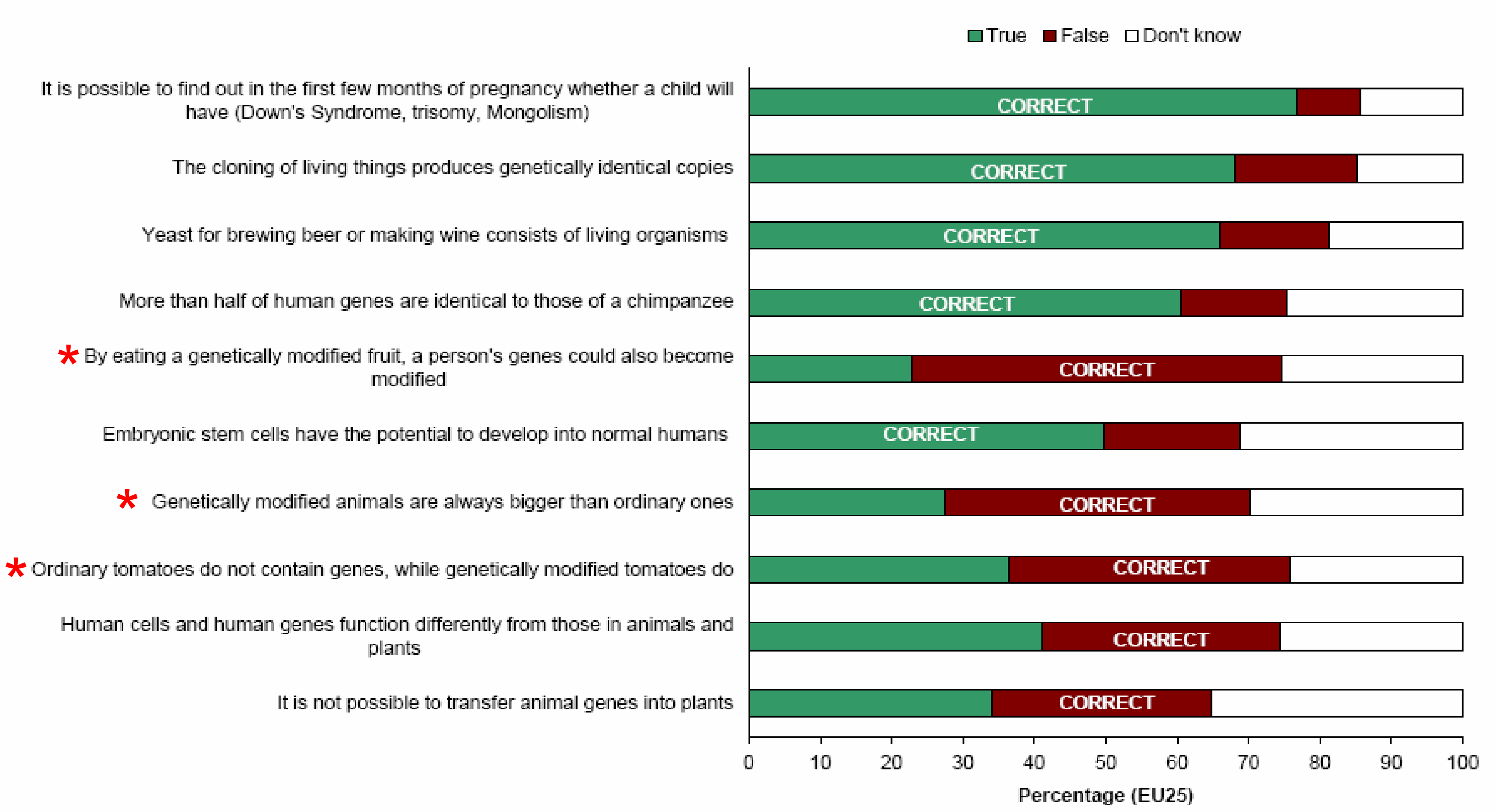
# Eurobarometer 64.3: Trust in Key Actors

| | % in 2005 (Base: including 'don't know's) | | Trust surplus/deficit (Base: excluding 'don't know's) | | |
|---|---|---|---|---|---|
| | Doing a good job | Not doing a good job | 1999 | 2002 | 2005 |
| Medical doctors keeping an eye on the health implications of biotechnology | 75 | 8 | 72 | 80 | 79 |
| * University scientists doing research in biotechnology | 73 | 8 | - | 73 | 78 |
| Consumer organisations checking products of biotechnology | 70 | 10 | 72 | 73 | 76 |
| Scientists in industry doing research in biotechnology | 64 | 15 | - | 55 | 60 |
| Newspapers and magazines reporting on biotechnology | 61 | 18 | 53 | 57 | 49 |
| Farmers deciding which crops to grow | 58 | 20 | 46 | 44 | 44 |
| The European Union making laws on biotechnology for all European Union countries | 54 | 19 | - | 48 | 42 |
| * Industry developing new products with biotechnology | 53 | 21 | -12 | 20 | 41 |
| Television reporting on biotechnology | 59 | 22 | - | - | 39 |
| * Environmental groups campaigning against biotechnology | 50 | 24 | 54 | 56 | 35 |
| Our government in making regulations on biotechnology | 50 | 23 | 22 | 27 | 33 |
| Shops making sure our food is safe | 56 | 26 | 46 | 39 | 32 |

***The survey data do not support the hypothesis that there is a crisis of trust in actors involved in biotechnology in Europe. Trust in university and industrial scientists, and in industry itself show improvements since 1999.***

# Eurobarometer 64.3: Knowledge about Biology and Genetics






*„Perhaps a combination of unease about the technology, anxieties about food and magical thinking leads people to assume the worst“*

*Regression Approval of GM food on ist attributes*

| GM Food | Europe | USA | Canada |
|---|---|---|---|
| **Useful** | .31 | .42 | .30 |
| **Risky** | -.16 | -.24 | -.41 |
| **Morally acceptable** | .19 | .18 | .25 |
| **Confidence in regulation** | .31 | .28 | .21 |

Binary logistic regression was used, predicting unqualified and qualified approval from the four attributes. Regression coefficients are shown, which are all statistically significant

- **In Europe, perception of use and confidence in regulation play the most important roles**
- **In the US it is usefulness, in Canada the most prominent attributes are risk for GM food**

Compared to earlier surveys European citizens became:

• more optimistic about technology

• more informed

• more trusting of the biotechnology system

The majority is willing:

• to delegate responsibility on new technologies to experts

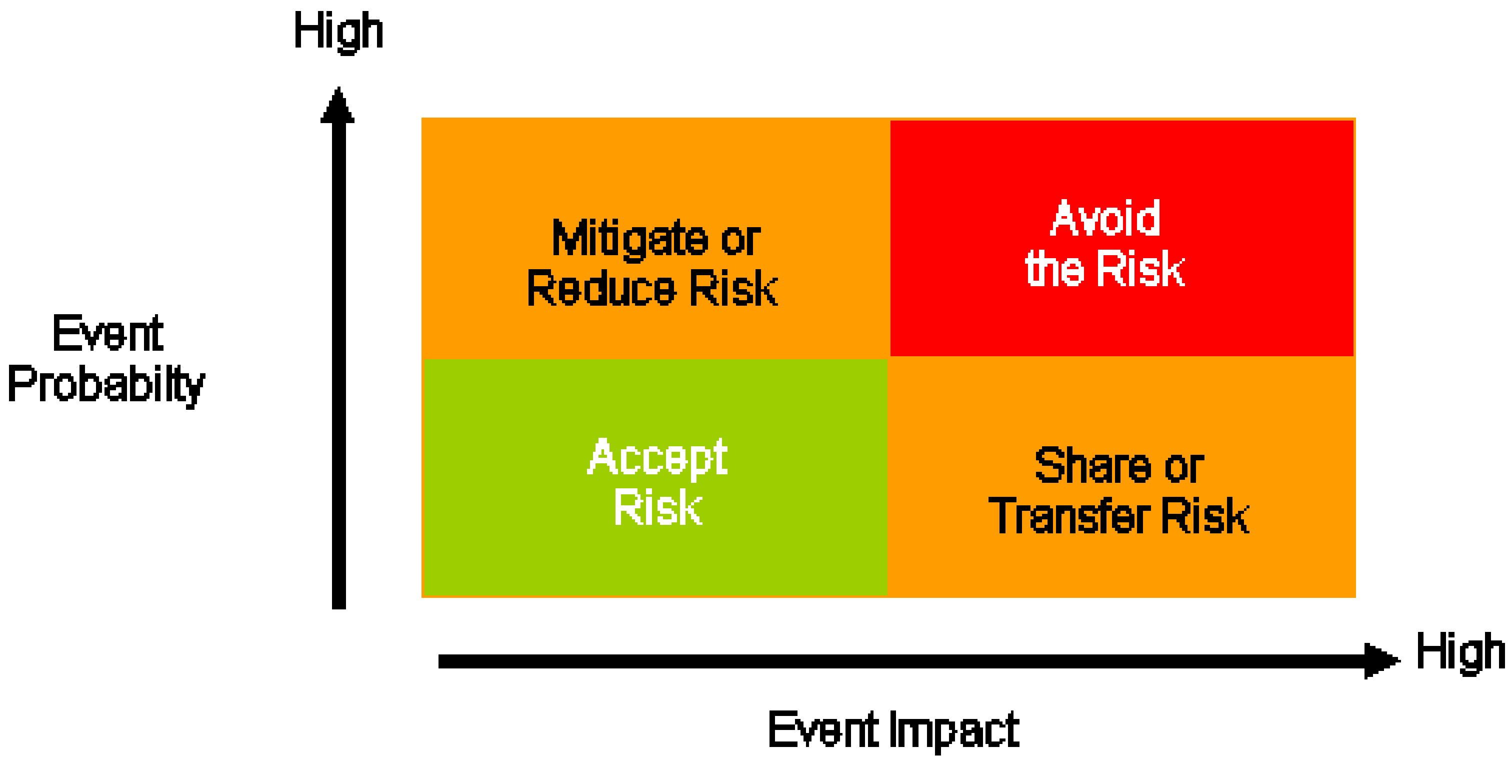
A substantial minority would like:

• to see greater weight given to moral and ethical considerations

Lesson for agri-food biotechnology:

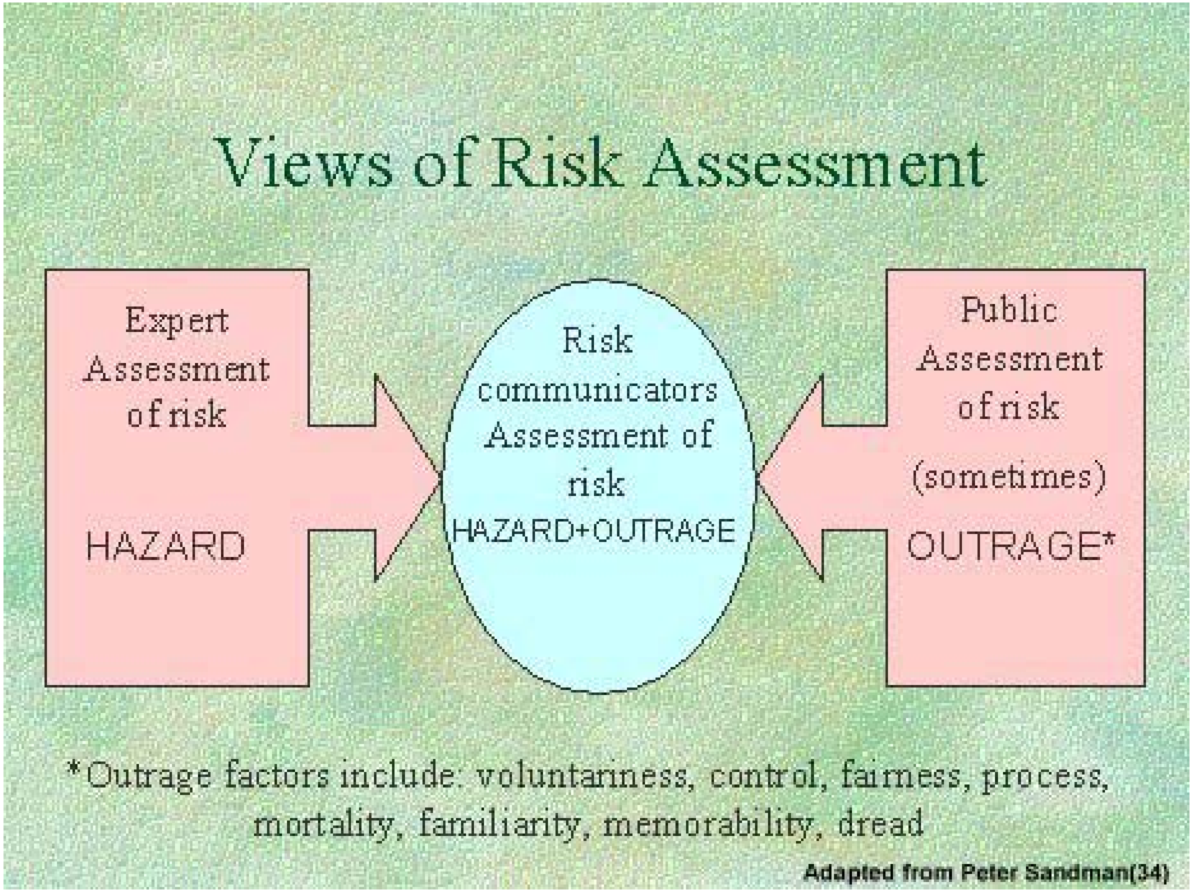
• Public will continue to be skeptical, unless new crops / products are seen to have consumer benefits

# Risk Assessment; Expert's View“




If by “rational” we mean conforming to the classical expected-utility model, or backward induction, then we have an “autistic” conception of human rationality (Gigerenzer and McElreath, 2003)

# The Multidimensionality of Risk




„Bounded rationality“: Quantitative probabilities, utilities, and optimization do not play a large role in the actual processes of the human mind, whereas fast and frugal heuristic processes, such as emotions, name recognition, aspiration levels, imitation learning, limited search, stopping rules, and one-reason decision-making, do (Gigerenzer, Todd, 1999).

# Risk Perception

Risk conflicts: There is a vicious cycle of public perception, congressional overreaction, and conservative regulations that leads to obsessive and costly preoccupation with reducing negligible risks as well as to inconsistent standards among safety programs (Breyer 1993).

The dissatisfaction can be traced, in part, to failure to appreciate the complex and socially determined nature of the concept „risk".

Dangers are real, but there is no „real risk" or „objective risk". Risk is a concept invented by people.

To arrive at any selection of risk measures requires a value judgment .
E.g. „numbers of deaths" as the summary indicator of risk implies that it is as important to prevent death of people who engage in an activity by choice and have been benefiting from it as it is to protect those who are exposed to a hazard involuntarily and get no benefit from it.

# Intuitive Risk Perception

**Voluntariness: People that create, manage, control and benefit from technologies and activities perceive associated risks as low(er) or accept risks more easily.**
**In consequence perceived risk is often inversely related to income and education.**

**Risk Perception and Worldviews: Worldviews work as „orienting dispositions“ because of their role in guiding people's responses to complex issues**

- ***Fatalism***
- ***Hierarchy***
- ***Individualism***
- ***Egalitarism („People should be treated equally“)***

**Egalitarians are the strongest opponents against technologies which they consider risky and useful for only part of the society**

# Risk Perception and Trust

A reason why the public often rejects scientist's risk assessments is lack of trust. Trust in risk management, like risk perception has been found to correlate with gender, race, worldviews, and affect.

Value conflicts and pervasive distrust in risk management cannot easily reduced by technical analysis

Because evidence for lack of risk often carries little weight, risk-assessment studies tend to increase perceived risk.

A social phenomenon influencing the public risk debate is the rise of powerful special interest groups („NGOs") well funded and using their own experts to communicate their distrust and concerns to the public (Slovic, 1999).

# Risk Perception, Emotion and Affect

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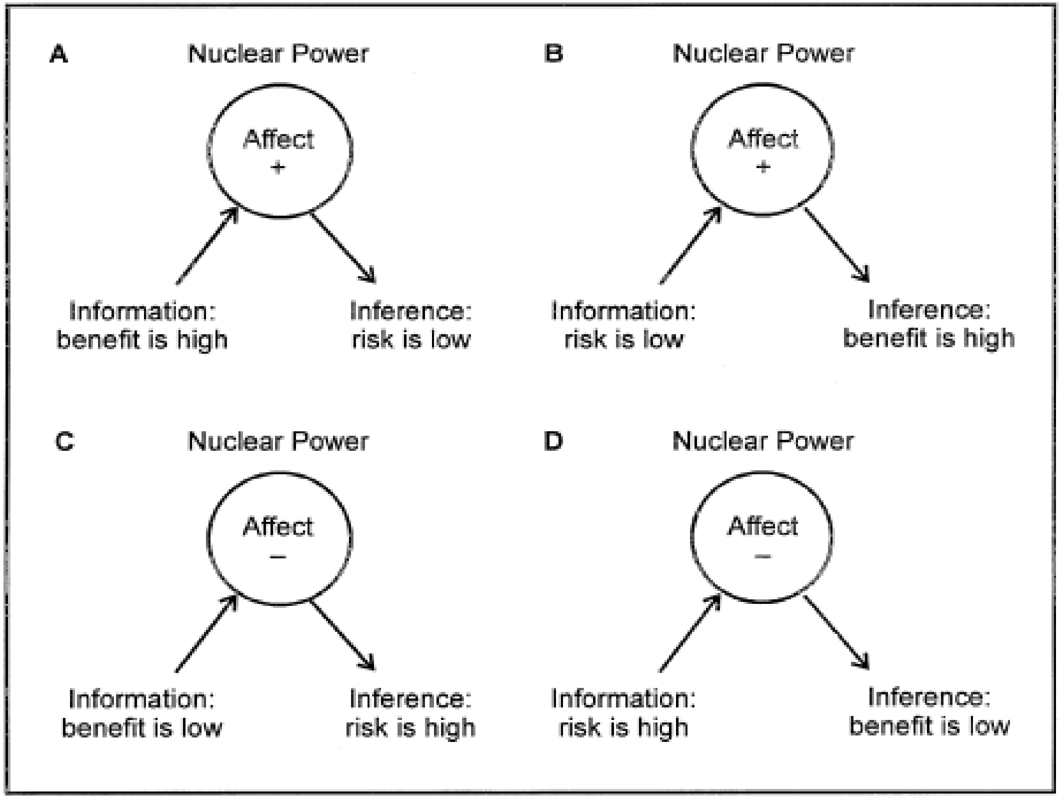



**Information about benefit can create a more positive affective evaluation of the technology in question and a modified perception of associated risk**

***Source: Slovic, Risk Analysis, 1999***

# The social Amplification of Risk

- Triggered by occurrence of an adverse event, being a major or minor accident
- Falls into either the risk-unknown or risk-previously-ignored category
- The direct impacts need not to be too large to trigger major indirect impacts
- The Impact is bigger if an accident occurs as part of an „unfamiliar system“

**Through the process of risk amplification, the adverse impact may extend far beyond the direct damages to victims**

**May result in massive indirect impacts such as litigation against a company, increased regulation of industry etc**

**The event can be thought as a stone dropped into a pond**

**Examples: Monarch butterfly story, Pusztai Story**

**Lesson: Effort and expenses beyond that indicated by a cost-benefit analysis might be warranted to reduce the possibility of „high-signal-events“**

***Source: Slovic and Weber, Risk Management Strategies in an uncertain world, New York, 2002***

# Cognitive Dissonance

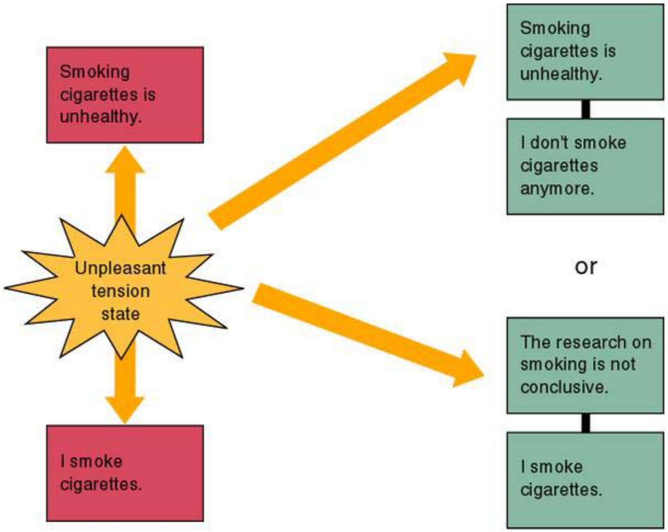
•Dissonance theory applies to all situations involving attitude formation and change. It is especially relevant to decision-making and problem solving.

•Cognitive Dissonance occurs when there is a need to accommodate new ideas

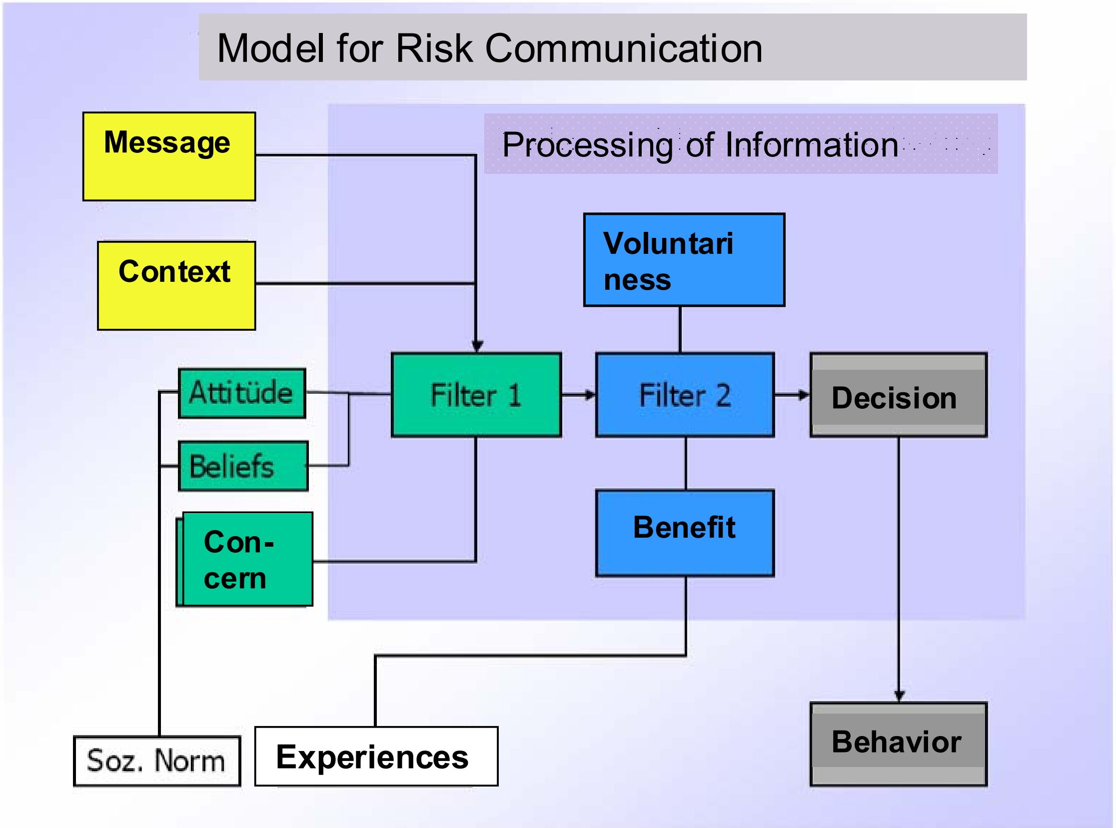
•If someone is called upon to learn something which contradicts what he already thinks he knows – especially if he is committed to that prior knowledge – he is likely to resist new learning.

•Some people will go to bizarre length to avoid inconsistency between their cherished beliefs and the facts

•With this kind of irrational thinking, it may seem pointless to produce evidence to try to persuade people of the error of their ways



# Risk Communication




**It is possible to overcome „Filter 1“ by suitable communication. But if there is no benefit and people feel forced to take a „Risk“ they will not change their judgment**

# Risk Management / Communication

- **build Trust**
- **demonstrate Benefits – if possible**

***Slovic, 1999*: Introduce more public participation into both risk assessment and risk decision making to make the decision process more democratic, improve the relevance and quality of technical analysis, and increase the legitimacy and public acceptance of the resulting decisions.**

**OR**

**Talk as little about it as possible as long as there are no products that benefit the public**


Akademischer Diskurs . . .


Thank you

for your Attention !