Awareness-raising in theory and practice

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NET RISK WORK – PROJECT MEETING
Freiburg, 10th May 2017
Knowledge, Capability, Willingness

The missing piece of the puzzle?
Raising risk awareness

What are the barriers?

Knowledge

Visibility

Uncertainty

Time reference
Raising risk awareness

What are the barriers?
Access to knowledge

Barrier: Knowledge

Information / knowledge level

Existing knowledge

Available knowledge

Applicable knowledge

Knowledge is often not applicable

→ (Online) handbooks
→ Journals
→ Conference reports
→ New media ... 

→ Trainings
→ Expert exchange
→ Support
Use of knowledge

Barrier: Knowledge

Knowledge on risk management

Low interest during normal operation

High interest after a hazard

Focus on the crisis management, not on prevention!

17./18. Jan 2007
Cyclone Kyrill in Germany
Temporal and geographical distance

**Barrier: Knowledge**

Combination of temporal and geographical distance
Natural hazards are rare on a local level

**Storm events in Germany**

- 1990 (150 %) ca. 15 Mio. m³
- 1999/2000 (300 %) ca. 30 Mio. m³
Experience as a problem?

**Barrier: Knowledge**

**Uncertain risks:**

→ Available knowledge becomes outdated quickly

**Experience as adviser?**

Decisions based on the personal experience of infrequent hazards:

→ People tend to **underrate** the probability of a rare event

If occurred very recently:

→ People tend to **overrate** the probability of a rare event

Sources: Hertwig et al. 2004, Weber 2017
Raising risk awareness

What are the barriers?
Visibility of changing conditions

Barrier: Visibility

Hazards have a strong impact → stimulus to action

Climate change influences the probability of hazards → No direct perception possible

Average temperature in Baden-Württemberg (1901-2011)

- Average temperature
- Linear trend
- Polynomial trend

Source: LUBW (2011)

→ Invisibility of gradual change: Creeping normalcy

Damage six months after storm Kyrill
Visibility of protective measures

Barrier: Visibility

Visible protection – crisis management

- Preventive and adaptive measures have no direct rewarding effect
  - No clear cause-effect relation
  - Prevention can lower risk awareness

Invisible protection – risk management

- Preventive and adaptive measures cannot fully prevent hazards
  - Success is reflected in lowered costs, damage, loss
  - Perception still in negative effects

Polder landscape in den Netherlands, Quelle: Wikipedia by Onderwijsgek, 2012
Raising risk awareness

What are the barriers?
Future oriented action

Barrier: time reference

Closer goals are often much more present than consequences in terms of rare risks, hazards, climate change.

Immediate benefit is often preferred over later benefits
- Uncertainty of benefits
- Fear of sacrifices

Problems to cope with distant time horizons
- 15 years max.
- Feasibility of long-range goals?

Sources: Hoogstra and Schanz 2009, Weber 2017
Focus “on actions or regimes that are already in place and makes us ignore available, but less salient, alternatives that could increase individual or public welfare” (Weber 2017)

→ First considered option: keeping the status-quo

“better the devil you know than the devil you don't” (idiom)

Study (Lidskog und Sjödin, 2014): after storm
Uncertainty about alternative strategies
→ familiar management practices
→ Same vulnerable tree species (spruce) considered as the “safest option”

Sources: Lidskog und Sjödin 2014, Weber 2017
Time gap between cause and effect

Barrier: Time reference

Little short-term effects

Major long-term consequence

In forest management:
Actions aim to justify today’s value conflicts, goals and interests.

→ justifying or legitimizing in advance of what can be judged as successful or efficient only in retrospect

Source: New York magazine 1976

Sources: Detten 2013
Underestimation of naturally varying hazards

Barrier: Time reference

Natural hazards in Germany 1970 – 2011, number of events and trend

Source: NatCatSERVICE – July 2012
Raising risk awareness

What are the barriers?
Conflicting goals

Barrier: Uncertainty

Risk management goals can be in conflict to other management goals:

Nature protection
Recreation
Profit

Sources: Hoogstra and Schanz 2009, Weber 2017
Decision-making under uncertainty

Barrier: Uncertainty

Fast decision-making under known conditions

Slow decision-making under uncertain conditions

Sources: Hoogstra and Schanz 2009, Weber 2017
RISK PERCEPTION IN THEORY
What is a risk?

Definition and meanings

Risk:
The combination of the probability of an event and its negative consequences.
(UNISDR Terminology / ISO/IEC Guide 71)

Semantic images of risk refer to...

- Risk as a pending danger (fatal threat)
- Risk as a stroke of fate
- Risk as a personal thrill
- Risk as a gamble
- Risk as an indicator of insidious danger (slow agents)

Sources: Renn 2008
Risk perception

RISK ≠ RISK PERCEPTION

Statistical risk does not meet risk perceptions of society

Why?

• Control (personal / institutional)
  • Voluntariness
  • Individual concern
    • Blame
    • Familiarity

Social amplification of risk
Communicated risks interact with individual psychological, social and other cultural factors
→ Decrease
→ Increase

Statistical effects

Heuristics

Coping with risk and uncertainty guided by intuition

**Heuristic:** Any approach to problem solving, learning, or discovery that employs a practical method not guaranteed to be optimal or perfect, but sufficient for the immediate goals.

**Satisficing (from satisfy & suffice):** choosing the first possible opportunity to meet the purpose in uncertain situations

**Availability:** Relevance determined by mental presence of a risk and previous experience

**Anchoring effect:** internal references determine risk information (e.g. mood, experience)

**Intuitive inductive reasoning:** generalized personal experience and perception

**Emotional reasoning:** emotional and affective processes guide risk perception

Sources: Tversky and Kahnemann 1974, Renn 2014
Individual experience

Anchoring

Can lead to risk awareness:
Flood-affected households in Australia → stronger preference for risk management measures than those who lacked experience

Can lead to denial and habituation:
Storm-affected forest owners in Sweden → maintenance of management practices and tree species

Individual factors

Experience

Perception of natural hazards

Influence of heuristics and perception biases

Natural hazards are perceived as not influenceable
\[ \rightarrow \text{Effects are also perceived as given (no one to blame)} \]

Rare catastrophes seem more dangerous than common ‘small’ events
(\text{emotional reasoning, availability heuristic})

but

Recent “available risks” are seen as more worrisome for the future \( \rightarrow \text{crisis-driven regulation} \)
(\text{inductive reasoning, availability heuristic})

False attributions of causes
Perceived experience with hazards due to climate change than statistically possible
(\text{anchoring heuristic})

Sources: Grothmann 2005, Seidl et al. 2015, Wiener 2016
Extrapolation bias

**New circumstances are imagined similar to already existing ones**

Something completely new is hard to imagine (e.g. the first cars looked like carriages, aliens in science fiction)

**Retrospect**

If a “worst-case-scenario” does not occur, it is perceived as hysteria and error of experts

→ Preventive measures could have avoided the worst

**Consistent end of the world**

The public is tired of computer-modeled “doomsday scenarios”

Typical errors in dealing with scenarios:

- Thinking in linear relations
- Thinking in causal chains instead of causal networks
- Overemphasis of current objectives

The importance of trust

easy to loose - hard to earn

How trust affects risk perception

• Lack of trusts leads to a distorted picture of a risk
• Trust influences the selection of information sources

Trust in science is crucial for risk assessment
Without trust, science can only encourage further suspicion because it reveals “bad news”

Sources: Slovic 1996, Schütz 2008,
The importance of social situations

a social experiment

Plausibility over accuracy

- Social situations are meaningful in themselves
- Even contradictions and complex situations are creatively interpreted

Sources: Weick 1995, Renn 2014
The importance of social learning

We are social beings

Learning theory:

→ Direct learning from own experience
→ Social learning from others
→ Social learning with others

Influence on risk perception:

• Clear correlation between risk awareness of a person and its social environment
• Abstract risks are better understood when shared and discussed through own experiences

Controlled process of social learning
→ Communities of Practice

Sources: Banduras 1977, Marx et al. 2007, Taddicken and Neverla 2011, Reser and Swim 2011
Frames:

“Frames are interpretive storylines that set a specific train of thought in motion, communicating why an issue might be a problem, who or what might be responsible for it, and what should be done about it” (Nisbet, 2009)

Function:

They organize experience – what counts as relevant for attention and assessment? They bias for action – what style of decision or behavioural response is appropriate?
## Societal perspective on risk

### Framing effects: Typology of frames applicable to climate change

<table>
<thead>
<tr>
<th>Frame</th>
<th>Defines science-related issue as . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social progress</strong></td>
<td>A means of improving quality of life or solving problems; alternative interpretation as a way to be in harmony with nature instead of mastering it.</td>
</tr>
<tr>
<td><strong>Economic development and competitiveness</strong></td>
<td>An economic investment; market benefit or risk; or a point of local, national, or global competitiveness.</td>
</tr>
<tr>
<td><strong>Morality and ethics</strong></td>
<td>A matter of right or wrong; or of respect or disrespect for limits, thresholds, or boundaries.</td>
</tr>
<tr>
<td><strong>Scientific and technical uncertainty</strong></td>
<td>A matter of expert understanding or consensus; a debate over what is known versus unknown; or peer-reviewed, confirmed knowledge versus hype or alarmism.</td>
</tr>
<tr>
<td><strong>Pandora’s box / Frankenstein’s monster/runaway science</strong></td>
<td>A need for precaution or action in face of possible catastrophe and out-of-control consequences; or alternatively as fatalism, where there is no way to avoid the consequences or chosen path.</td>
</tr>
<tr>
<td><strong>Public accountability and governance</strong></td>
<td>Research or policy either in the public interest or serving special interests, emphasizing issues of control, transparency, participation, responsiveness, or ownership; or debate over proper use of science and expertise in decision-making (“politicization”).</td>
</tr>
<tr>
<td><strong>Middle way / alternative path</strong></td>
<td>A third way between conflicting or polarized views or options.</td>
</tr>
<tr>
<td><strong>Conflict and strategy</strong></td>
<td>A game among elites, such as who is winning or losing the debate; or a battle of personalities or groups (usually a journalist-driven interpretation).</td>
</tr>
</tbody>
</table>

Sources: Nisbet 2009, Reser et al. 2011, Neverla 2012
Societal perspective on risk

Framing effects: an example

Movie – The Day after Tomorrow

High expectations on the movies’ influence
→ wake-up call for the public

→ Press releases, public meetings and panel discussions about the film’s ‘serious message’

→ viewers experienced difficulty in distinguishing science fact from dramatized science fiction

→ film reduced viewers’ belief in the likelihood of extreme weather events occurring as a result of climate change

→ Negative and improper framing

Sources: Hulme 2011
Societal perspective on risk

Influence of the media

**Distortion of information**

- Mass media influence sovereignty of interpretation
  - Experts dilemma
- generalization of information
- sensationalization of the science
  - Dominance of negative messages

Sources: Schäfer 2012, Boykoff 2013, Renn 2014
Awareness and consciousness

Idea and quality

Awareness:

“Awareness is the ability to directly know and perceive, to feel, or to be cognizant of events. More broadly, it is the state or quality of being conscious of something” (Wikipedia)

→”awareness occurs at the interface between sensory processing and planning” (Koch, 2004)

Consciousness raising / awareness raising:

“people attempting to focus the attention of a wider group of people on some cause or condition” (Wikipedia)

Sources: Koch 2004
Knowledge = Awareness = Action?

Is knowing better enough?

Deficit model: Unaware people do not know enough

Information campaign of the 80s

Drastic presentation of environmental problems
Overuse in “catastrophe pedagogics”

→ “The catastrophe is faceless”

Knowledge and Action are not necessarily connected

Cognitive dissonance

Coping strategies:
• Denial
• Changing meaning
• Changing a little

Components of awareness

ABC-model

Cognition:
- Knowledge
  - Facts

Affect:
- Emotion
  - Feeling concerned

Behavior:
- Accepting responsibility
  - Readiness to act

Cognitive dissonance = internal conflict of these components of awareness

Inconsistent attitudes towards an issue are not stable

Sources: Stoknes 2014,
RISK PERCEPTION IN PRACTICE
Awareness-raising on all levels

**Cognition**
- Providing knowledge on the right level
- Being open about and helping to understand uncertainty and complexity
- Finding the right medium

**Affect**
- Including a personal reference
- Sharing information on a joint risk in groups
- Addressing the sense of responsibility

**Behavior**
- Providing easy models and “low regret strategies”
- Creating incentives and a positive culture of action
- Change as the default option

Creating perspectives

The power of images (in our minds)

Sources: Banduras 1977, Marx et al. 2007, Taddicken and Neverla 2011, Reser and Swim 2011
Creating perspectives

Wording

• Language is never neutral
  “illegal immigrant” ← → “humanitarian refugee”

• It creates associations (conscious and unconscious)

• It affects decisions
  32 % patients died after operation
  68% patients survived after operation

• It distorts communication

Sources: Slovic 1996, Hulme 2011, Somerville and Hassol 2011, Stoknes 2014,
Creating perspectives

Framing

Pre-existing frames need to be matched with the argumentation

Which frames has my addressee?
Which frames activates readiness for action?

Triggering a new way of thinking

Pandora’s box

reframing

New alternatives
Economic development

TABLE 7.1: Examples of ways of framing climate change, and the audiences most engaged.

<table>
<thead>
<tr>
<th>Climate change frame</th>
<th>Audience engaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific uncertainty frame</td>
<td>Those who don’t want to change</td>
</tr>
<tr>
<td>National security frame</td>
<td>As above, but now inspired to act</td>
</tr>
<tr>
<td>Polar bear frame</td>
<td>Wildlife lovers</td>
</tr>
<tr>
<td>Money frame</td>
<td>Politicians and the private sector</td>
</tr>
<tr>
<td>Catastrophe frame</td>
<td>Those who are worried about the future</td>
</tr>
<tr>
<td>Justice and equity frame</td>
<td>Those with strong ethical leanings</td>
</tr>
</tbody>
</table>

Source: Shanahan (2007).

Sources: Shanahan 2007, Nisbet 2009, Hulme 2011, Stoknes 2014
Creating perspectives

**Storytelling**

Explanation of linkages (importance of plausibility)
- Visualization of cause effect-relationships
  - Danger of misuse!

**Personal experience and development histories**
- How on earth did we get here?

**Development of new ways**
- Offering future perspective

Sources: Renn 2014,
Working with professionals

Considering responsibility

(Risk related) uncertainty can challenge one’s own expertise

- Importance of legitimacy over “right or wrong”
- Decision makers tend to make widely accepted and established decisions

Advice from experts to professionals

“textbook knowledge” vs. “practical realities”
“expert-based knowledge” vs. “experience-based knowledge”

Framing advice:

In uncertain situations **professionals are guides**
Creating the possibility for discussion and negotiation concerning the **optimal path**

Sources: Lidskog and Sjödin 2014, Detten and Hanewinkel 2017
Thank you

net risk work