

# Precaution and the Affirmation of Risk

## The EMF Case

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# EMF Issue



The public debate about possible adverse health effects from exposure to EMF from cellular phones and base stations is one of the risk issues that keeps busy many political decision makers across Europe.

# EMF Science

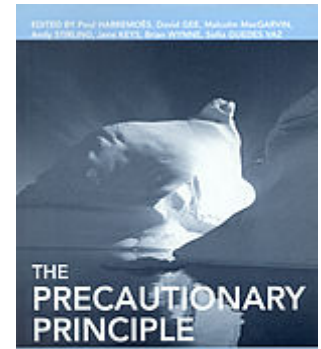


Scientists can not exclude the possibility that EMF may cause health problems.

The independent expert group indicated that the balance of evidence showed no adverse health effects from exposure to radio-frequency (RF) radiation from mobile phone technologies.

However, the group still recommended that “a precautionary approach to the use of mobile phone technologies be adopted until much more detailed and scientifically robust information on any health effects becomes available”.

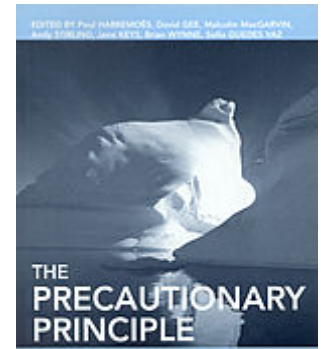
# Precautionary Principle



The precautionary principle suggests acting to prevent serious potential harm, regardless of scientific uncertainty as to the likelihood, magnitude, or causation of that harm.

“Whether or not to invoke the Precautionary Principle is a decision exercised where scientific information is insufficient, inconclusive, or uncertain and where there are indications that the possible effects on the environment, or human, animal or plant health may be potentially dangerous and inconsistent with the chosen level of protection.” EU (2000, p. 8).

# Precaution

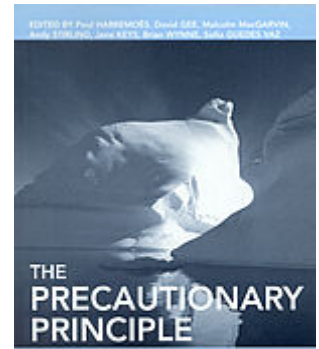


By considering precautionary measures the policy makers hope to cope with the potential risks and with the public fears about EMF.

Various strategies are offered including

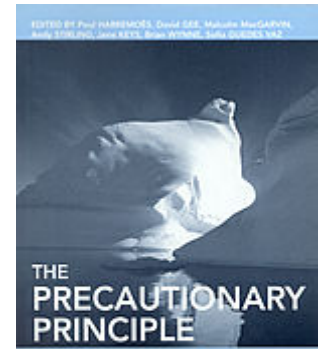
- more research
- better risk communication
- exposure minimization strategies
- stricter exposure limits

# Examples of EMF Related Precautionary Measures



- Switzerland: More restrictive exposure limits
- Netherlands: Decisions on the location of base stations by citizen's participation
- Germany: Better risk communication (public access to data revealing sites' locations and technical features of the base stations, participative decision making)  
Labeling of cellular phones

# Precautionary Principle



The Precautionary Framework has two objectives:

- To anticipate possible threats to health and respond appropriately in order to reduce exposures before introduction of an agent
- To address public concerns that a potential or perceived but unproven health problem is taken into account after introduction of an agent

WHO 2004

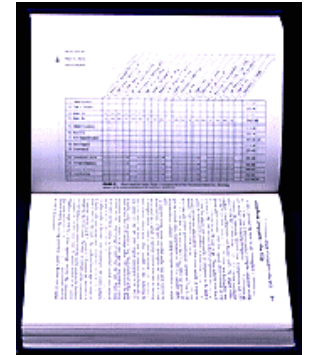
# The Precautionary Principle



The theoretical status and the rationality of the precautionary principle has been discussed in many papers and conferences.

However, there is no empirical study that analyses the impact of precautionary measures.

# Research Questions



How do people respond to the implementation of the precautionary principle?

Do precautionary measures influence risk perception, and if so, in which direction?

Do precautionary measures influence trust?

Does the disclosure of existing uncertainty in scientific knowledge affect risk perception, trust, and the perceived quality of the scientific knowledge?

# Which Research Method Is Appropriate?

- Interviews
- Focus Groups
- Surveys
- Experiments

# Why to Conduct an Experiment?



- An experiment allows
  - to proof a hypothesis about a causal relationship
  - to collect high quality evidence
  - to make sound scientific judgments

# 5 x 2 Design

Risk Management Measures	Non PP-measures		Exposure minimization		Precautionary limit values		Protection of sensitive areas		Citizen participation	
	C	UC	C	UC	C	UC	C	UC	C	UC
Disclosure of Uncertainty	C	UC	C	UC	C	UC	C	UC	C	UC

## Sample

- N=640 subjects of Switzerland (French: N=244; German: N=396)
- Average age = 22 yrs.
- 270 women / 369 men

# Basic Text

## Non-Precautionary Measures

A widespread debate about the potential risks related to electrosmog is ongoing.

The International commission for (Non-Ionising) Radiation Protection states that the current exposure limits protect the public adequately.

# Precautionary Measures

## Exposure Minimization

Nevertheless the Commission recommends precautionary measures: Exposure from mobile phone emission is to be kept as low as possible.

## Pre-cautionary limit values

Following a precautionary approach, the Salzburger Petition claims the exposure limits by a factor of ten in areas where people are exposed for long periods of time.

## Protection of sensitive areas

Nevertheless, following the precautionary approach, many local communities demand that stations should not be sited near to sensitive locations such as day care facilities, schools or hospitals.

## Citizen participation

Nevertheless, following the precautionary approach, many local communities claim that the residents should be involved in decisions about the siting process for base stations.

# Uncertainty Condition

Some scientists argue that substantial uncertainties exist as to whether current protection from electromog is sufficient.

## Rating Scale

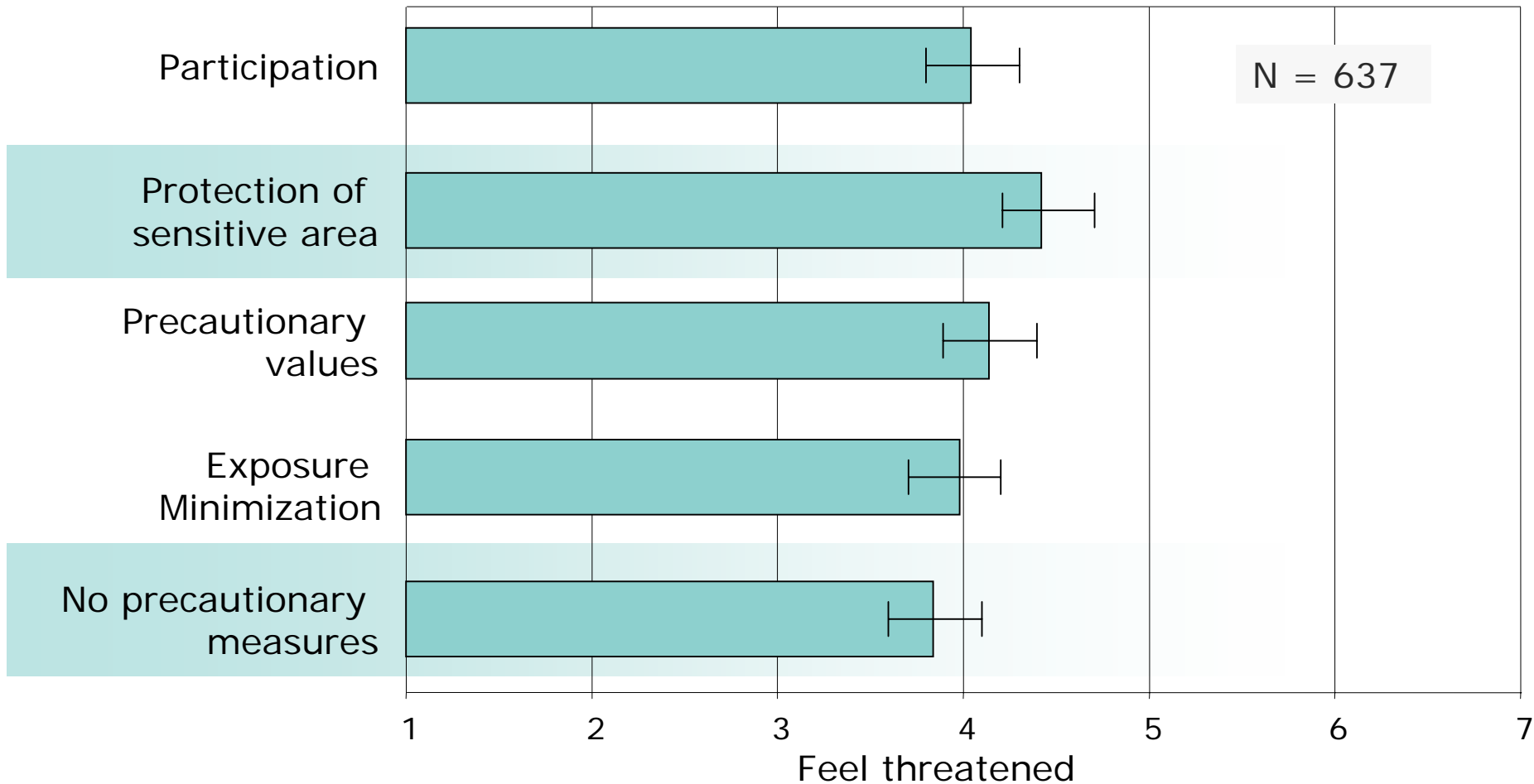
- Risk perception (feel threatened)
- Trust in health protection
- Perceived quality of scientific knowledge

# Example

A widespread debate about the potential risks related to electromog is ongoing. The International commission for (Non-Ionising) Radiation Protection states that the current exposure limits protect the public adequately.

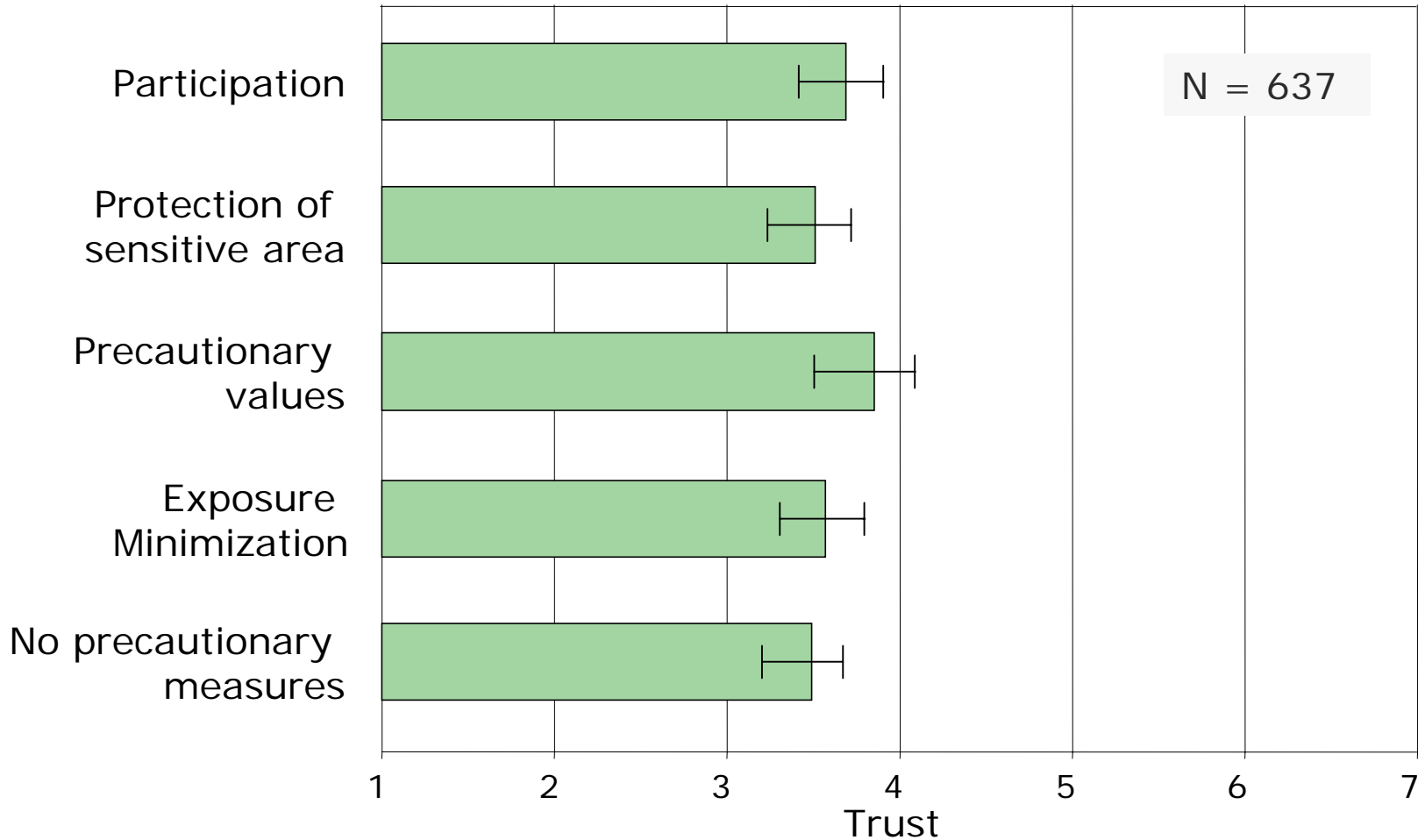
Nevertheless, following the precautionary approach, many local communities claim that the residents should be involved in decisions about the siting process for base stations.

# Impact of Precautionary Measures on Risk Perception



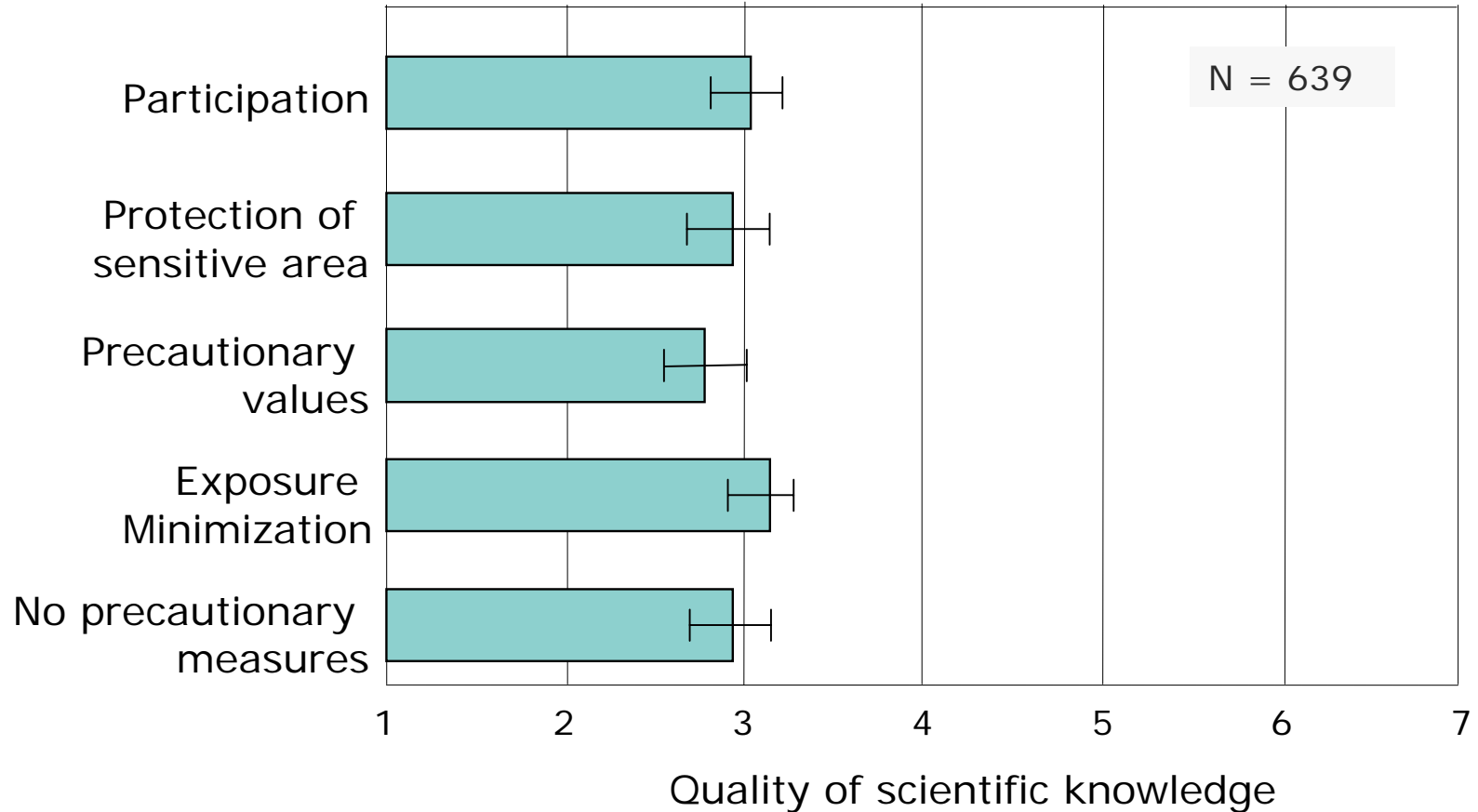
Statistical significant main effect for the precautionary measures factor. Under the condition of „protection of sensitive area“ the risk perception is statistical significant higher.

# Impact of Precautionary Measures on Trust in Health Protection



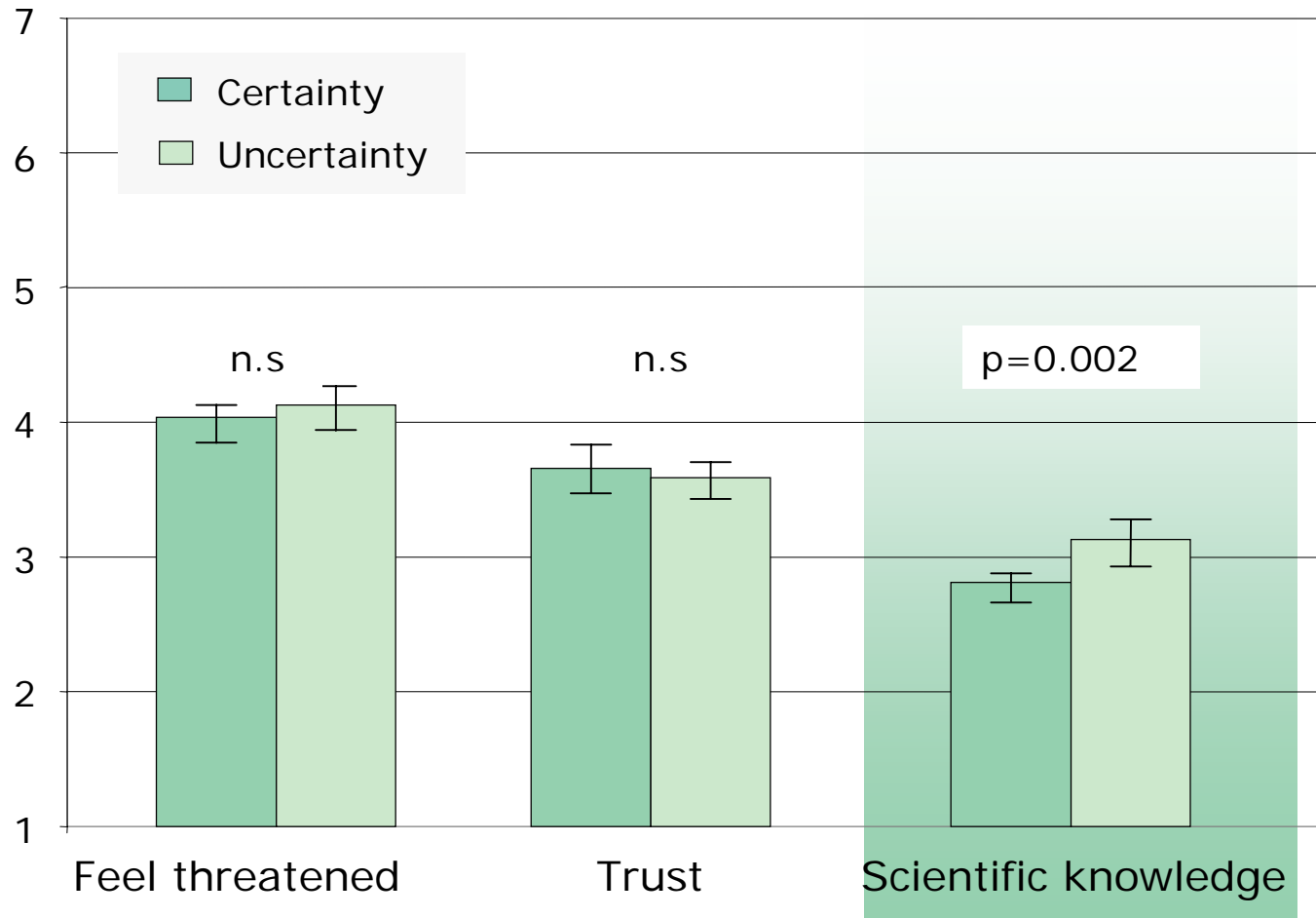
No statistical significant differences in trust between different precautionary measures.

# Impact of Precautionary Measures on the Perception of Scientific Knowledge



No statistical significant differences in the perceived quality of the scientific knowledge between different precautionary measures.

# Impact of Disclosure of Uncertainty



Statistical significant difference in the perceived quality of scientific knowledge between certainty- and uncertainty condition.

# Summary

The implementation of precautionary measures do have an impact on risk perception (in terms of amplifying risk perception).

Precautionary measures such as protection of sensitive areas (e.g. schools, hospital or day care facilities) may be considered as a cue that a risk might be real and increase the perception of risk.

The implementation of precautionary measures does not affect trust in public health protection.

# Discussion

- Limitations of the study
  - Small effects
  - Practical relevance?
    - However, no matter how small the effects are, they are contrary to the expectations of policy makers
- Strength
  - Results confirm our previous study
  - Cultural variance included
  - Based on experimental evidence

# Conclusion

- In contrast to the policy makers' intentions precautionary measures trigger concerns and amplify EMF risk perception.
- They might impair well being because they create fears.
- Policy makers should take into account such countervailing risks.
- PM require more and better risk communication to improve the understanding of such measures.
- They require science literacy.



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