Eliciting mental models to understand how different individuals affected by disaster risk understand science, and scientific uncertainty

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What is the most effective way to communicate uncertainty?

Communicating uncertainty is important (e.g., WMO, IPCC)

If we do:

- Improves decision making;
- Manages user expectations;
- Reflects state of science;
- Honest, open, transparent.

If we don't:

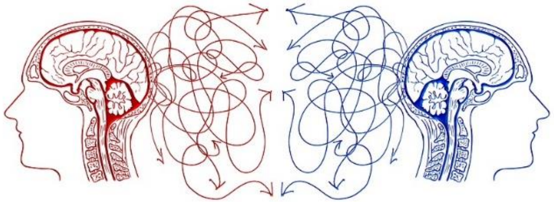
- Interdependencies can eclipse outcome uncertainty;
- Prevents plan B development;
- Impacts trust.

Interpretation influenced by:

- how information framed,
- cognitive & social factors,
- expectations of message context.

Can devalue message if *present*, or if *not present*.

<u>But</u>: we have little understanding of how people using hazards science understand uncertainty.



We want to understand the development, use, change, and **diversity in people's 'mental models'** of scientific uncertainty.

- *How they think the world works.*

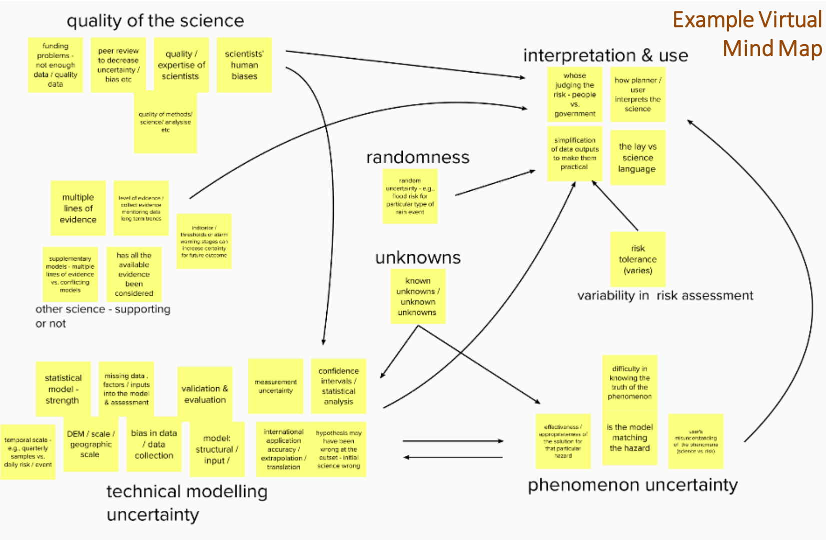
RQ1:

What are the existing **methods for eliciting mental models** of the way people think about science?

INITIAL FINDINGS:

2020 methodological scoping review, n=44 articles (from 561 abstracts):

- Huge range of direct and indirect approaches.
- Bias and research influences in prompts used
- Move beyond language for effective elicitation
- Need more evaluation of analysis approaches.



Example Virtual Mind Map

RQ2:

What are the **diverse 'mental models' and world views** of scientific uncertainty?

- different individuals, stakeholders, and decision-makers (and interaction between them)
- within the disaster risk reduction and emergency management sector

RESEARCH UNDERWAY:

Exploratory interviews, n=5 (pilot) + 20 (full), in person & virtual, Q & mapping:

- Maps advanced conversation = a 'co-development' approach
- Natural hazards science viewed as purely observational
- Holistic aspects of uncertainty: societal or organizational

- *"Underlying or overarching factors: human nature"; "the human element"*
- *"variables in perception"*
- *"emotional response to the science, the topic, the issue"*
- Other ways of knowing: *"taking the blinkers off"*

RQ3:

How can that knowledge be used to inform **more effective science and risk communication**?

- before, during, and after disasters?

NEXT:

- identify shared concepts underlying mental models to inform **future experimental research**
- explore how people's attitudes to concepts can be used to enhance efficacy of communication.