

Does Robust Decision Making mirror *thinking* under uncertainty:



Can social science help us to understand the validity of DMDU approaches?



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Talk Structure

- Reasoning and models of thinking
 - Macrocognition
- Generic Robust Decision Making (RDM) process
- Comparison of Macrocognition (Data Frame Model) and RDM
 - Similarities and complementarities
- What this might mean for RDM and DMDU

Key points

1. There are social science theories and approaches that explain how individuals and groups seek to understand, make decisions and act under uncertainty. Let's use them!
2. Robust Decision Making seems to reflect Social Science theories quite well.
3. DMDU *could* explicitly use the DFM to develop its approaches; and use Social Science theories to stimulate discussion about underpinning DMDU theory

Psychology - Drivers for change



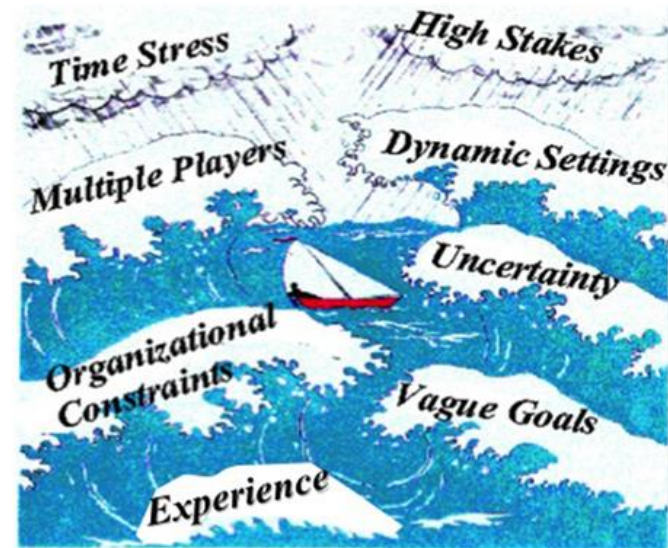
Photo Credit: Ms. Suzanne Ovel (Army Medicine)



Photo Credit: (U.S. Air Force; Airman 1st Class Derek Seifert)



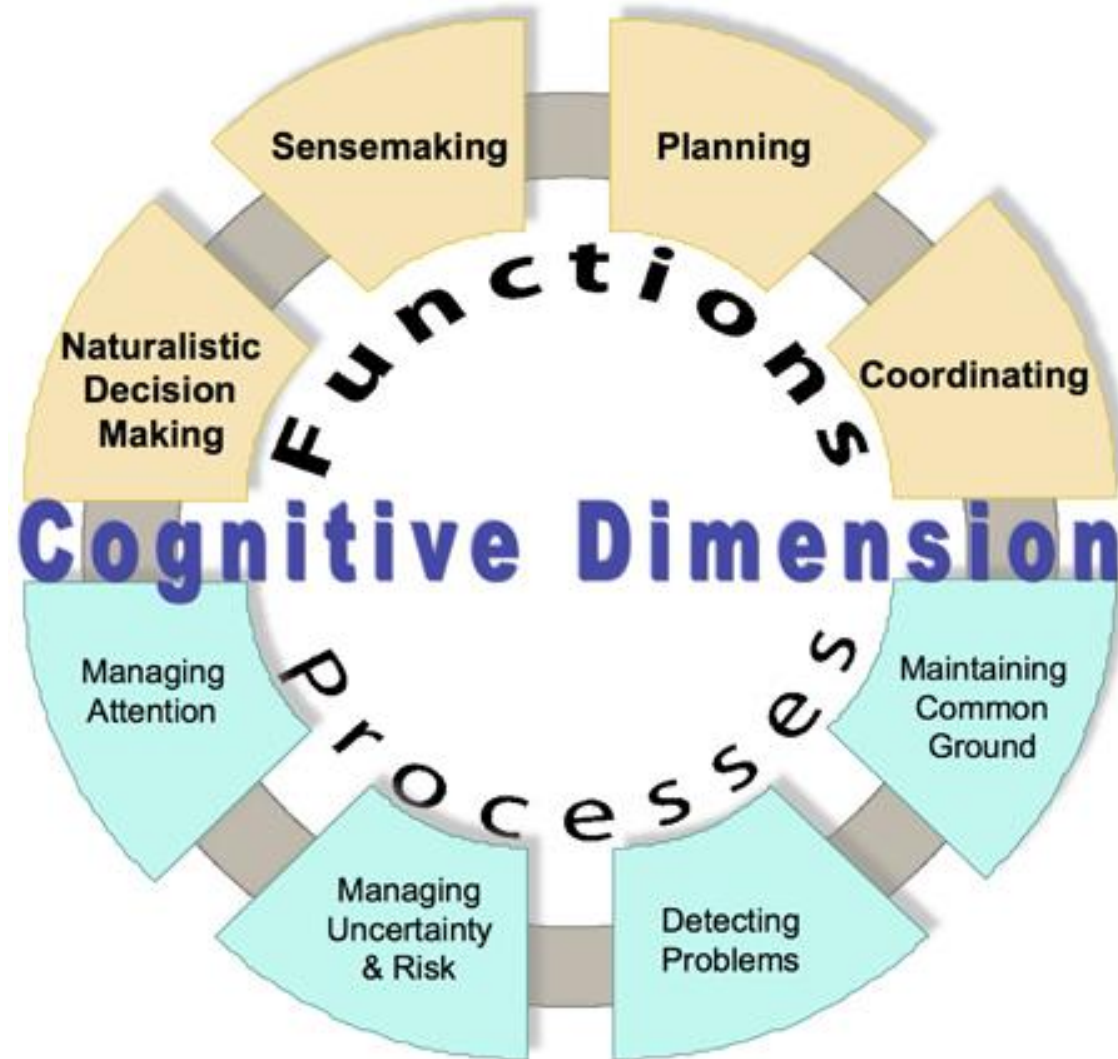
By Service Depicted: Navy Camera Operator: PH3 RONALD W. ERDRICH, USN (ID:DN-ST-89-02262) [Public domain], via Wikimedia Commons from Wikimedia copyright 2013



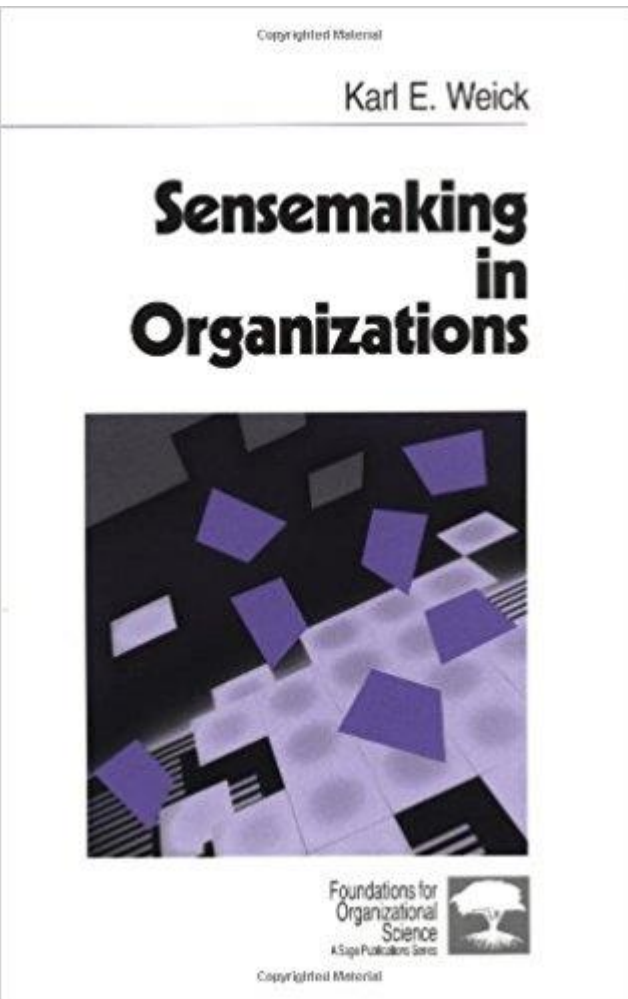
NDM variables (Klein et al., 1993). Illustrated by David Sweeney

Macrocognitive functions and processes

Klein, Ross, Moon, Klein, Hoffman & Hollnagel (2003).



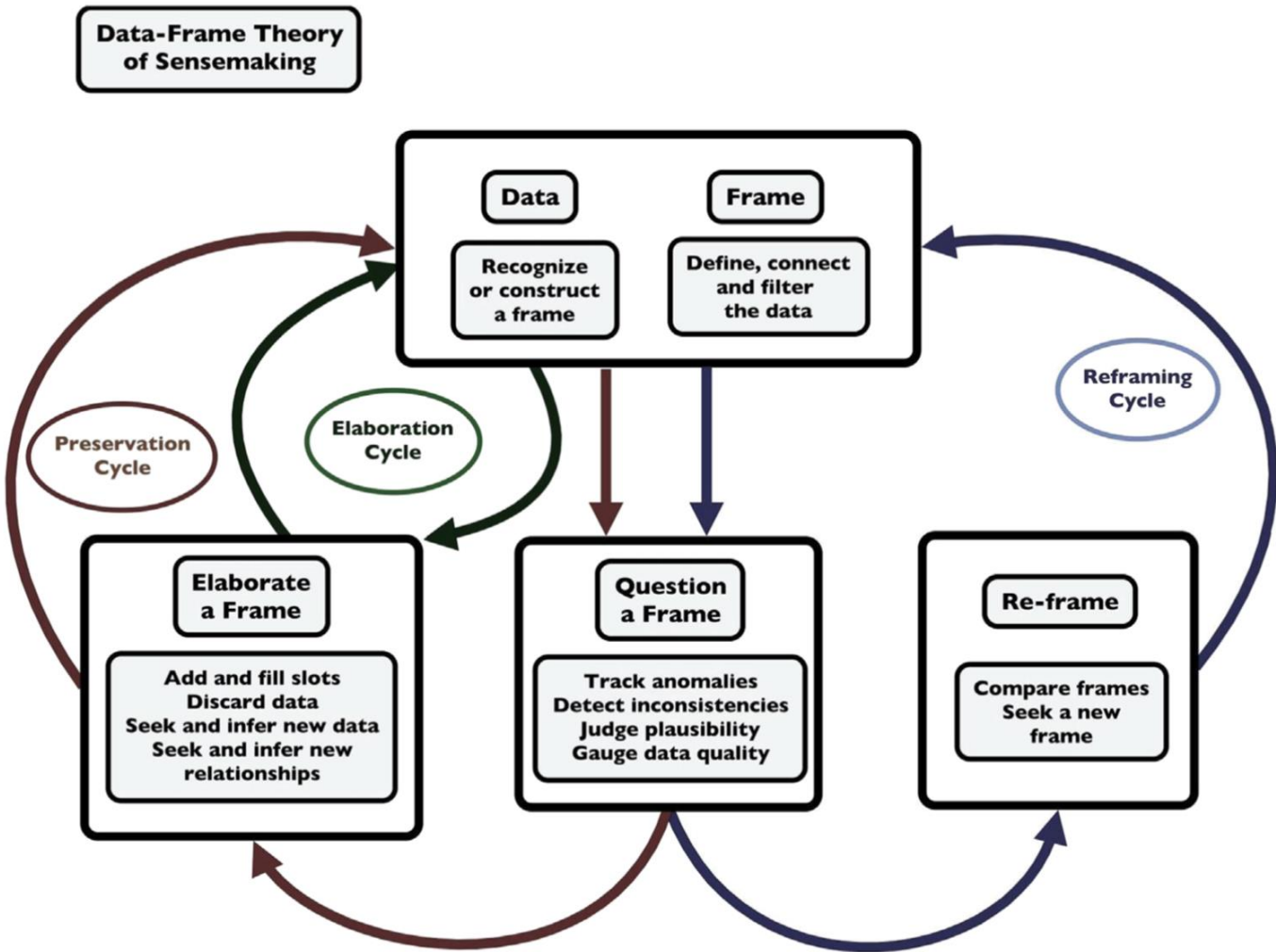
Organisational Sensemaking



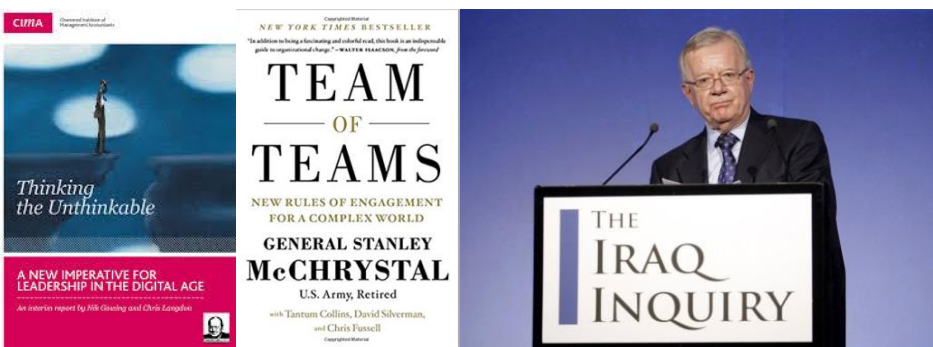
- Triggers
- Influences
- Important features
- Coherence with research from other areas

Data-Frame Model of sensemaking

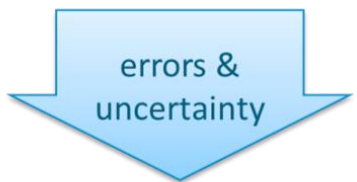
Klein, Moon, & Hoffman (2006)



Institutional inhibition of abductive reasoning and Macro-cognition



Performance improvement =



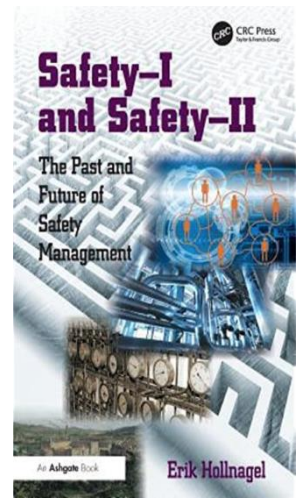
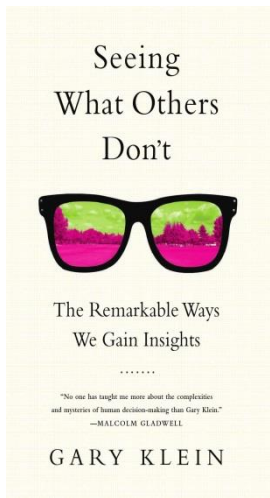
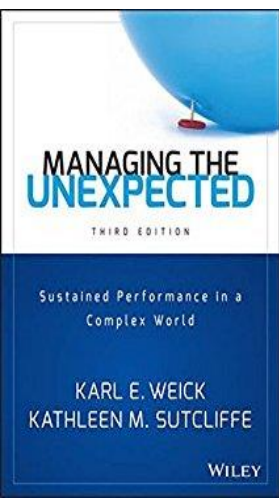
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- Contradictions
- Connections
- Coincidences
- Curiosity
- Creative desperation

- Standards
- Controls
- Documentation
- Reviews
- Rigor
- Checklists
- Procedures

Source: after "Seeing what others don't" Garry Klein (2015)



Robust Decision Making (1)

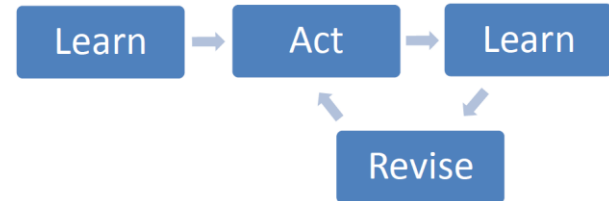
- Robust Decision Making (RDM)
 - Generic method (Lempert et al 2006) e.g. including Multi-objective Robust Decision Making (MORDM), Dynamic Pathways.
- Informal hypotheses about RDM:
 - Improvements in not just the analysis, but decision making under deep uncertainty – “*deliberation by analysis*”
 - Evidence of improvements anecdotal
 - Limited connections to the social science study of how individuals, teams and organisations make sense of uncertainty, and take decisions under those conditions

Robust Decision Making (2)

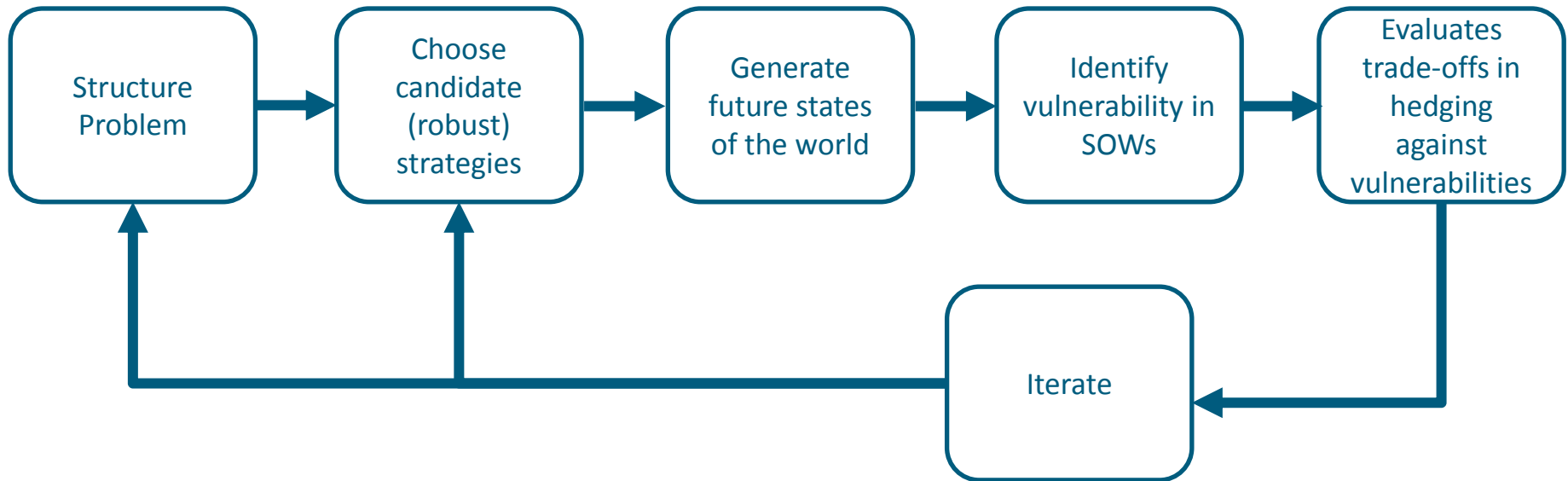
Normal planning



RDM planning



RDM Process Steps (Lempert et al 2006)



DFM/ RDM comparison:

Similarities

- Iterative and adaptive
- Has basis in bounded rationality, especially concerning satisficing
- Consideration of different configurations of a problem (cf. frames)
- Signposts and associated actions / violation of expectancies
- The importance of framing is not new in psychology or business strategy or creative / abductive thinking
- Both to an extent recognise that experts can correct confirmation bias and question their hypotheses
- Scale of its use, compared to its potential use, is low!

DFM/ RDM comparison:

Complementarities

- Distinguishing features - **Step-by-step** method / a **non-linear**, continual and messy process
- Sophisticated mental models to consider the future; one uses **statistical information**, the other **qualitative information**
- Focus on **generating meaning** to support decisions, rather than on **anticipated regret**
- **Narratives** play a key role in sensemaking, rather than **strategies**
- Acknowledgement that **actions taken** in order to make sense of the future **can alter the trajectory** of events

What this might mean for RDM and DMDU?

Assuming the alignment with DFM is beneficial

- Similarity infers additional evidence and theory, increasing validity of the approach
- Complementarities infer ways of potentially improving the RDM/ DMDU approaches
- Macrocognition is a difficult skill to develop proficiency in:
 - Modern institutions inhibit DMDU, thus this provides reasoning for why DMDU adoption is slow
 - RDM approaches may provide a helpful aid (handrail) to assist decision makers in developing proficiency in thinking under uncertainty

Key points

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A Challenge

How can we bring these two approaches together?

Any Questions?

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