Coping and Managing Under Uncertainty

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Blind-spots about uncertainty:

1. Confirmation bias: We seek out and pay attention to information that confirms what we already believe.

2. Catch-all underestimation: We under-estimate the likelihood of novel events.

3. Uncertainty is not always a negative aspect of human affairs. In fact, it is essential in learning, creativity, social relations, and culture.

4. People are not always motivated to reduce or banish uncertainty. Often they are motivated to create and maintain uncertainty.

5. Uncertainty (or even ignorance) is not invariably a disadvantage for the ignoramus.
Are there countermeasures against the confirmation and catch-all underestimation biases?

Yes, provided that we are willing to move beyond the tradition of betting everything on the “best prediction”.

Example: Lempert’s (2002, 2005) group at RAND have developed a “robust adaptive planning” framework with these key elements:

1. Using large-scale simulations of many possible futures to search for robust (rather than optimal) strategies/policies; and then

2. Engaging additional stakeholders and experts to search for new contingencies or challenges that could defeat the most robust alternatives produced by the simulations.

The simulations are impartial with respect to (dis)confirming results, and the additional humans are motivated to challenge the assumptions underpinning the simulation models.
“Positive” motives for uncertainty (or even ignorance):

- Freedom = positively labelled uncertainty. Creativity, discovery, and entrepreneurship all require unknowns. No uncertainty → Nothing to learn or discover, no freedom.
- Anticipatory positive emotions such as joyful anticipation, excitement, hope, and aspiration require uncertainty.
- There are many situations in which people have good reasons for desiring not to know something.

Uncertainty and ignorance underpin social capital:

- Privacy requires uncertainty or even ignorance.
- Trust requires uncertainty or even ignorance.
- Specialised knowledge is an example of organised ignorance and uncertainty that spreads risk and exploits distributed knowledge.
“Darker” motives for uncertainty (or even ignorance):
• Secrecy has its uses… (but all bad? Would it be a good thing if everyone knew the location of the Wollemi Pines?)
• Undermining claims by opponents by “manufacturing” uncertainty
• Enhancing power bases via uncertainty and ignorance

Organizational strategic uses of uncertainty:
• Evading culpability, enabling deniability
• Consensus-building and conflict avoidance
• Enhancing flexibility and potential for organizational change

Uncertainty and ignorance are employed to justify:
• Inaction, decision deferral and/or maintaining the status quo
• Non-responsibility
• Improvisation and tactics (rather than planning and strategy)
• Risk management policies and practices
Uncertainty often is traded for other things (and vice-versa):

- **Decisiveness versus error**: Anyone can avoid being wrong by being vague. However, vagueness is uninformative and results in indecision.

- **Collingridge’s tradeoff**: The less well-entrenched a system is and the shorter the time it has been operating, the more easily and inexpensively it can be changed; but the greater is our ignorance of its likely effects or problems. By the time we know enough about the system, it is too expensive and difficult to change it.

- **“Better” estimation or definition**: Redefining generates uncertainties. “A direct comparison between data reported for 1985 and 1996 cannot be made for the Murray Riverina Basin due to a change in the boundary definition of the Basin.” (Australian Natural Resources Altas)

- **Education versus info-glut dilemma**: Any party with an educational or persuasive interest will wish to broadcast its message in a public forum. Too many messages in an unregulated forum, however, may result in the public tuning out messages altogether.
Some kinds of uncertainty are preferable to other kinds:
- Most people prefer betting on an event with probability 1/2 to betting on the same event if its probability could be anywhere from 0 to 1. Most people prefer ambiguous but agreeing information to precise but conflicting information. So, probability is better than ambiguity is better than conflict.

People adopt moral stances towards uncertainty:
- Omitting information is worse than conveying it in a vague or ambiguous form.
- Giving false information is worse than omitting information.
- Secrecy is worse than privacy.
- Increasing risk of harm to the environment or other people is bad.
- Increasing risk of harm to yourself is bad if others depend on you.
“Uncertainty” is not unitary. There are different kinds and people respond to them differently as well.

A taxonomy of ignorance and uncertainty

- Ignorance
  - Error
  - Irrelevance
    - Untopicality
    - Taboo
    - Undecidability
  - Distortion
  - Incompleteness
    - Uncertainty
    - Absence
      - Vagueness
      - Probability
      - Ambiguity
        - Fuzziness
        - Nonspecificity
Uncertainty presents us with the following adaptive challenges:

1. Dealing with unforeseen threats and solving problems.
2. Benefiting from opportunities for exploration and discovery.
3. Crafting good outcomes in a partially learnable world.
4. Dealing intelligently and sociably with other humans.

No single way of dealing with uncertainty suffices to meet all four of these challenges.
Five kinds of response to uncertainty:

1. **Denial**: Treating uncertainty as non-existent. Example: BMJ editors banning the use of the term “accident” in their journal.

2. **Banishment**: Setting uncertainty aside as “out of bounds” and therefore not dealt with. Example: “…in the discipline of law there is no coherent discourse or even conscious or structured consideration of uncertainty – despite the fact that uncertainty is pervasive” (Jones, 2006).

3. **Reduction**: Gaining more knowledge and/or increasing constraints. Examples: Most scientific research.

4. **Acceptance** or toleration: Constructing flexible, corrigible decisions and actions. Example: Constructing policy in a climate of change.

5. **Relinquishment**: Adopting a fatalistic or nihilistic stance. Examples: Belief systems in which it is spiritually dangerous (blasphemous) to alter uncertainties; political orientations emphasizing rights.

**Key point**: ANY of these responses can be adaptive or maladaptive, depending on circumstances.
“The scientific and policy domains of environment and sustainability are characterized by pervasive uncertainty, stemming as much from extended time scales, complexity, contested values and the claims of multiple relevant knowledge systems as from the more usually recognised and straightforward lack of information.” Dovers et al. 2006

Can we handle uncertainty better? Shifts in control orientations

- Emphasis on anticipatory stance → Increased attention to resilience
- Concerns about strategy & planning → Concerns about finding effective responses to surprise
- Optimism re technological innovations → Realization that tech. innovations may increase uncertainty
- Reliance on expert/specialist input → Inclusion of broader constituencies and stakeholders
- Emphasis on “imposed” uncertainty → Realisation that uncertainty is also a social product