

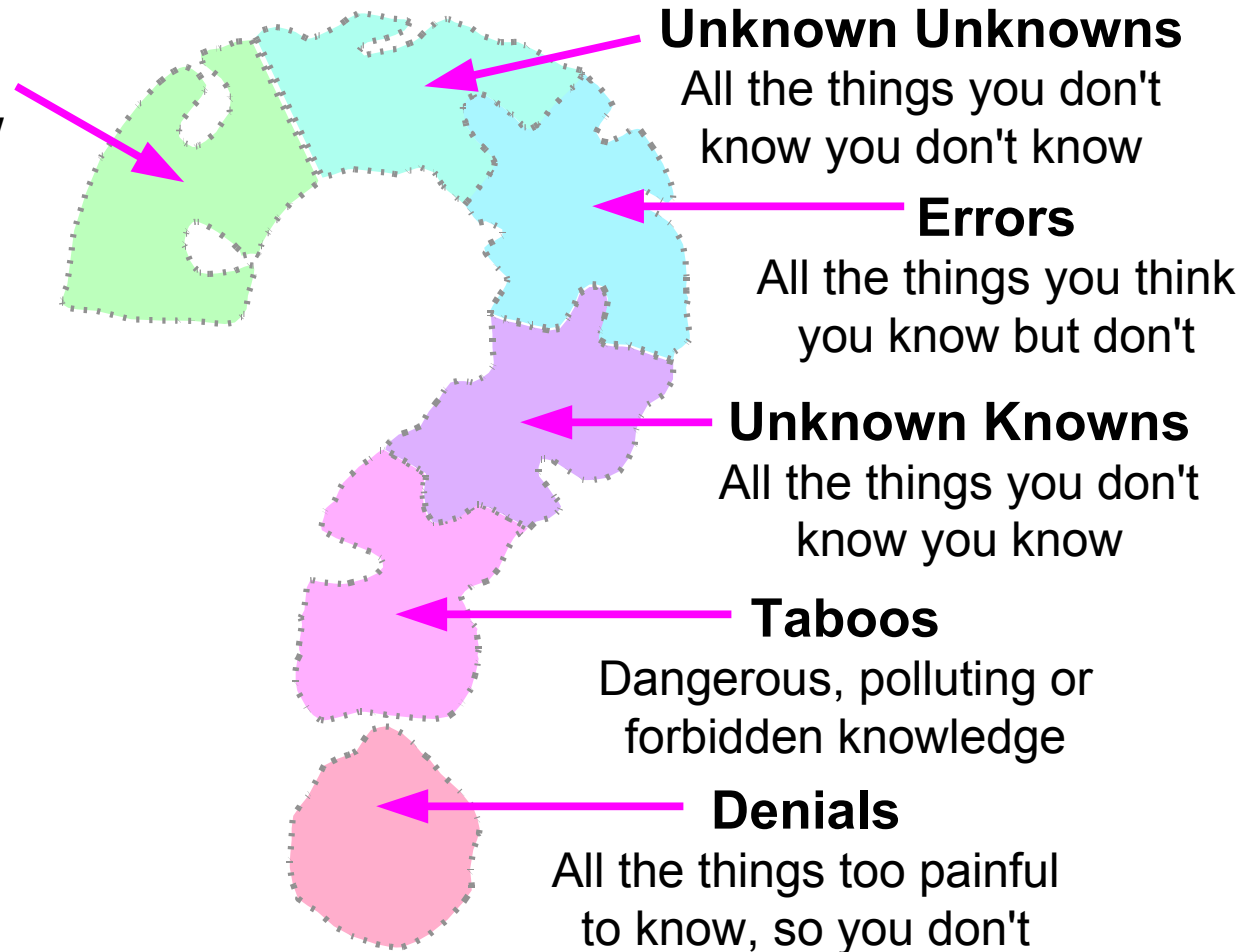
What do you know about what you don't know?

Known Unknowns
All the things you know you don't know

Ignorance Maps

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"Curriculum on Medical and Other Ignorance: Shifting Paradigms on Learning and Discovery", *Memory Distortions and their Prevention*, Margaret-Jean Intons-Peterson and Deborah L. Best, editors, Lawrence Erlbaum Associates, 1998



Mainstream science or post-normal science?

Mainstream science

... Kuhn described 'normal science' as the sort of research that is devoted to 'puzzle-solving' within a 'paradigm' that must be accepted uncritically .

He argued that in spite of its anti-humanistic tendencies, this style of research has been successful in creating the great edifice of scientific knowledge.

We argue that such a conception of science has now become part of the problem;

... if science ... around precaution, sustainability, safety, community or some related goal,... would constitute ... 'paradigm-shift' .. 'scientific revolution'

Mainstream science

... inherited attitudes and assumptions of inevitable and irrestable progress

... reductionist tradition of Western science, in which complex systems are assumed to be capable of being taken apart, studied in their elements and then reassembled.

In this old paradigm, systemic properties are deemed incapable of scientific study and are therefore to be ignored.

... 'public knowledge' exists only on the margins, displaced in the important areas by 'corporate know-how'.

Independent research has become hazardous, owing to the threats of litigation over claimed patent infringements.

Post-normal science

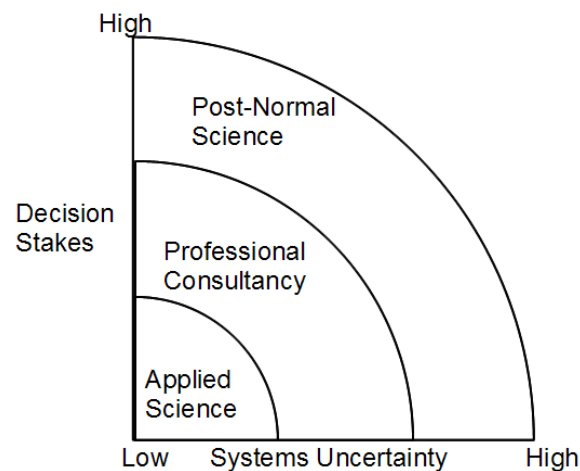
In the post-normal approach, the essential feature ... is its methodology.

... no way to refute the claims of established expertise ...

... under ... post-normal science, both 'systems uncertainties' and 'decision stakes' can be high, to the point of dominating the strategies for problem-solving.

... a narrowly trained expertise can be irrelevant or even counterproductive.

Then an 'extended peer community' [with] have 'extended facts', ... and these may include 'housewives' epidemiology', local knowledges, and investigative journalism.



Ravetz, Jerome R. 2004. "The post-normal science of precaution." *Futures* 36 (3): 347–357.
[http://dx.doi.org/10.1016/S0016-3287\(03\)00160-5](http://dx.doi.org/10.1016/S0016-3287(03)00160-5).

Post-normal science

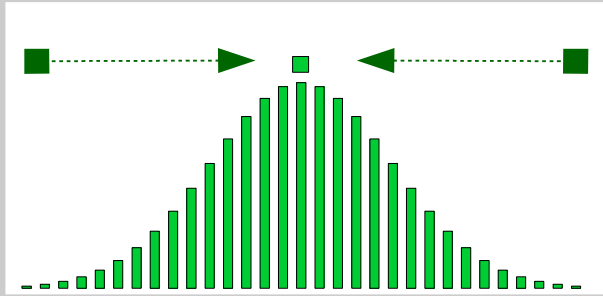
The contrasting approach to science ... called 'precautionary' ... usually concerned with reacting to the unintended harmful effects of progress.

... 'post-normal'; it lies at the contested interfaces of science and policy.

It addresses issues where, typically, facts are uncertain, values in dispute, stakes high and decisions urgent.

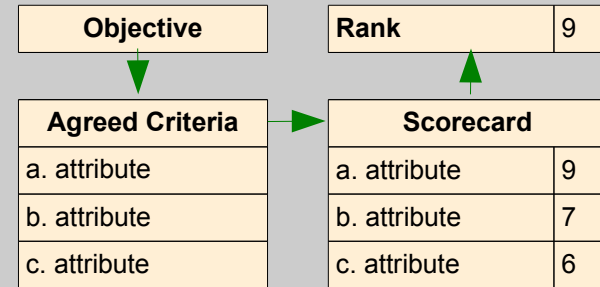
... has matured first in some areas of medicine and public health, where there are large, well defined constituencies with a high personal stake, and also where methodological issues are explicitly political

The first way of knowing (based on *objective* views)
Inductive-Consensual IS



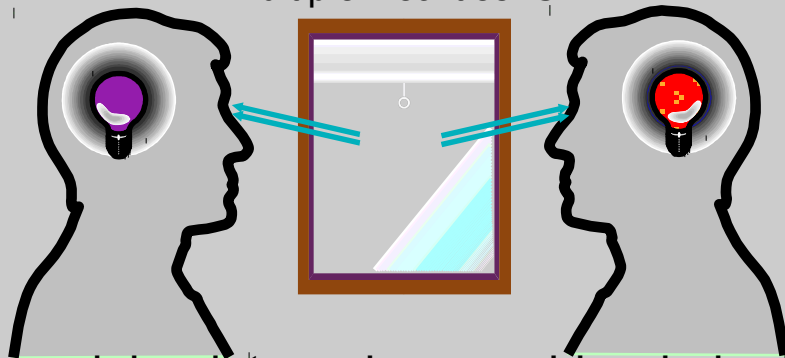
guarantor = **agreement** (consensus)
 e.g. Delphi approach

The second way of knowing (based on *objective* views)
Analytic-Deductive IS



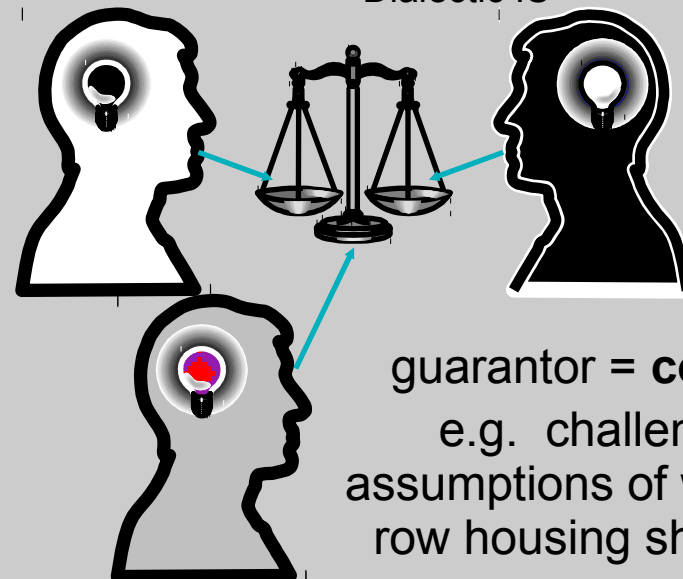
guarantor = **logical consistency**
 (fact nets)
 e.g. finding the “best man” for the job

The third way of knowing (based on *subjective* views)
Multiple Realities IS



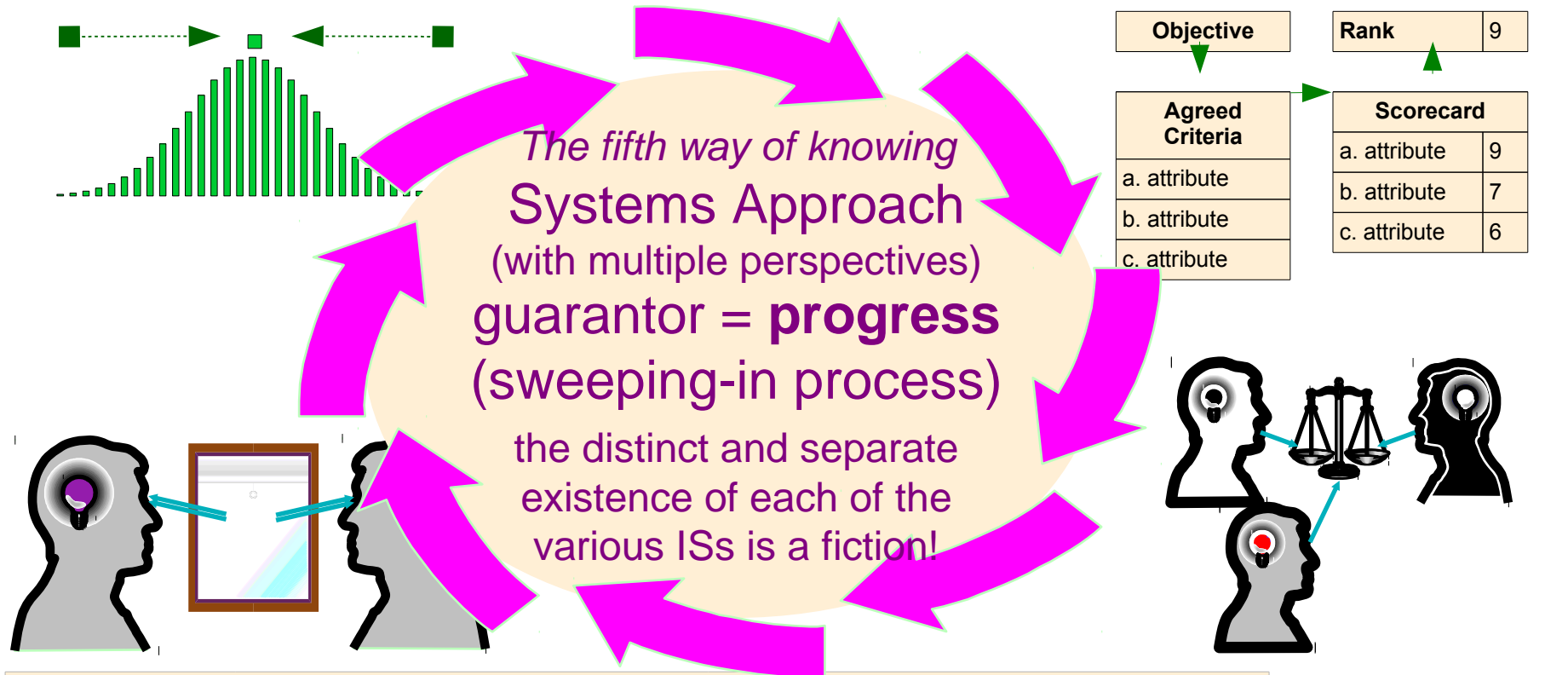
model + data as inseparable whole
 guarantor = **ability to see**
range of views (representations)
 e.g. disciplinary views of drug problem

The fourth way of knowing (based on *subjective* views)
Dialectic IS



guarantor = **conflict**
 e.g. challenging
 assumptions of what skid
 row housing should be

Inquiring systems: five ways of knowing



Way of knowing	Inquiring System	Philosopher(s)
First	Inductive-Consensual (agreement)	John Locke (1632-1704)
Second	Analytic Deductive (fact nets)	Gottfried Wilhelm Leibniz (1646-1712)
Third	Multiple Realities (representations)	Immanuel Kant (1725-1804)
Fourth	Dialectic (conflict)	Georg Wilhelm Friedrich Hegel (1770-1831)
Fifth	Systems Approach (progress, sweeping in)	Edgar Arthur Singer (1873-1954) C. West Churchman (1913-2004)

Mitroff, Ian I., and Harold A. Linstone. 1993. *The unbounded mind: Breaking the chains of traditional business thinking*. New York: Oxford University Press.