

Post-Normal Science and Science in Crisis (when science is not enough)

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Conventional Science




- Hypothesis-driven investigations – securely funded, via individuals or small teams
- Example: Nobel-prizewinning work of Sir John Eccles



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‘New’ science

- Large teams chasing small amounts of money: multi-institutional collaborations
- Driven by need to show ‘impact’

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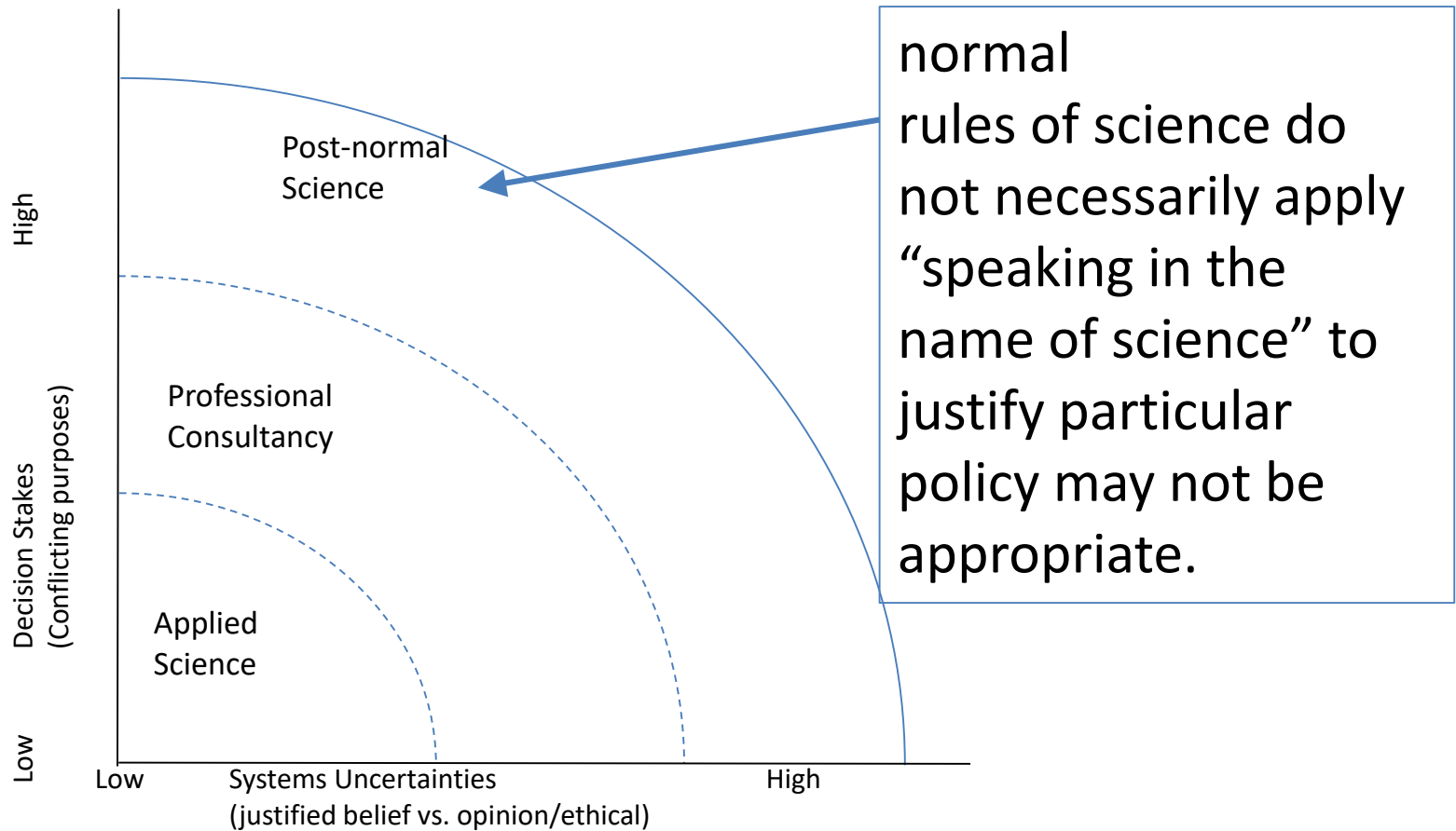
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Post-normal Science compared to conventional (Funtowicz and Ravetz [1993]).



Science in crisis (Saltelli & Funtowicz, 2017)

- 3 specific areas: **reproducibility; governance; use for policy.**
- Problems:
 - exponential growth in papers;
 - community with high ideals becoming a slave to objective measures;
 - where metrics predominate, practitioners tend to ‘game’ the system;
 - consensus fails where political pressures exist;
 - the myth of value-neutral nature of science.
- Reproducibility issue big talking point (Nature 533:452, 2016)
 - 77% of biologists reported being unable to reproduce someone else’s experiment and 60% were unable to reproduce their own.

Symptoms of science crisis

- Scientists resort to 'questionable research practices' including falsification of data (Fanelli, PlosOne, 2009)
- Lack of funding and stable positions for younger scientists lead to desperate measures (Nature, 2015)
- Time pressures lead to poor supervision/results checking by senior scientists (ibid)
- Cherry-picking ('p-hacking') of statistically significant results (Nature, 2016)