What Makes Weird Beliefs Thrive?

The Epidemiology of Pseudoscience

Goal

- Cultural dynamics of pseudoscience (vs. science)
  - symptoms?
- Setting the stage
  - demarcation problem
  - intuitive appeal of pseudoscience
  - immunizing strategies & defense mechanisms

Demarcation problem

- old chestnut in philosophy
- traditional approach
  - silver bullet
  - formal distinction
- logical relation between
  - propositions
  - observation statements
- reluctant to bring science down to earth
  - psychology, sociology, cognitive science…

Naturalizing Science

- not abstract & disembodied
- natural phenomenon
  - cognitive underpinnings
  - social organization
  - institutional structure
- evolves over time…
  - theory choice / theory development

Cultural evolution

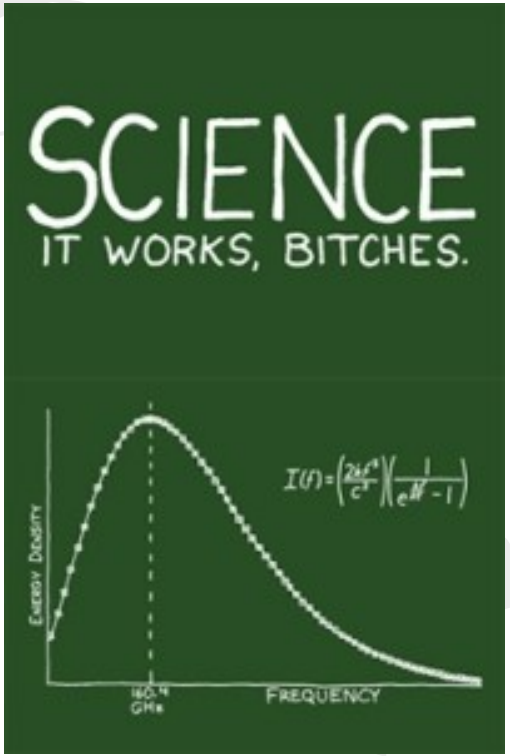
- what is distinctive about science?
- contrast it with its contenders
  - fake & phoney science
  - mimicry of the real thing
- Evolutionary dynamics

Epidemiology of science

- Scientific representations
  - highly counterintuitive (McCauley 2011, Wolpert 1992)
  - Epistemic selection (in the long run)
    - institutional structures (peer review, open access…)
    - methodological principles (double-blind trials, statistical testing…)
    - cultural disadvantage

Stability over time

- Cultural stability
  - in scientific community
  - in population at large
- stability
  - institutional support
  - prestige
  - technological success
- without those crutches…
  - collapse of science



Pseudoscience

- Mimics the trappings of science
- epistemic selection?
  - absent or inconsequential
    - (not cheating!)
- gravitation towards intuitive representations
  - at the expense of epistemic integrity
  - examples: essentialism, teleology, sympathetic magic, intentional stance, intuitive physics…
    - see paper…

Cultural success imperiled

Pseudoscience

- clashes with reality
- lack of psychological validation

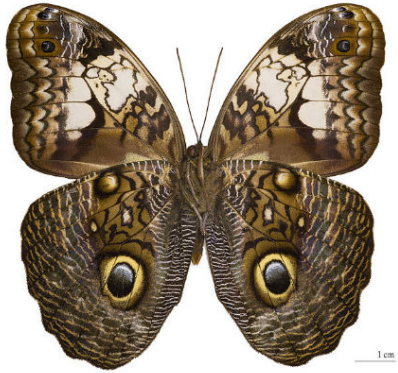
The Pull of Reason

- humans are not impervious to reason
  - we care about truth (Kunda 1990; Mercier and Sperber 2011)
- objections and empirical failures pose a threat to the belief system
  - nobody will embrace beliefs that are *obviously* false
  - scientific *pretensions*
    - keep up appearances

Mimicry

How to mimic good science?

- Epistemic warrant is hard to fake
- Immunizing strategies & defense mechanisms
  - Explored elsewhere (Boudry & Braeckman 2011,2012)



Examples

- multiple endpoints in prediction
- conspiracy theorizing
- built-in ad hoc clauses
- theory-internal explanations for dissent and resistance
- methodological licenses

→ *facilitating (spurious) confirmation, avoiding refutation*

Back to the demarcation problem

- No silver bullet
  - specific features of the theory
  - behavior of its adherents
  - social organization
- Requires detailed examination
  - instead: look at large-scale effects
  - how does this play out on a cultural level?

Paradox

- Pseudoscience
  - Protection from external threats
  - Tapping into sources of psychological validation

→ Liable to internal disruptions

→ Culturally unstable

Cultural evolution

- Success of pseudoscience
  - structural features
  - room for variation in the content
- Cultural change
  - conceptual innovation
  - may not affect its ‘fitness’
- Cultural drift
  - in the absence of epistemic selection

Empty shell

- changing the content of the belief
  - leaves the cultural ‘fitness’ intact
  - no rational method to settle disputes

Cultural changes

1. Different themes (variation)
2. Reduction (simpler theory)
3. Elaboration (more complex theory)
4. Recursion (new layer)

1. Different themes

- play a different tune
  - spin off rival factions, conflicting theories
    - “centrifugal dynamic” of psychoanalysis (Crews 1986)
    - “balkanization” of Velikovsky’s theories (Gordin 2012)
- Victim of its own success
  - too easy to play a different tune

Theoretical disputes

- Irresolvable disputes
  - little epistemic constraints
- Achieving stability?
  - authoritarian force
  - protection of dogma
  - ostracizing of dissidents
  - focus on founding texts

2. Reductions

- Reduction of elements in belief system
  - alternative medicine “that which is thought by the healer to be the cure is eventually eliminated—with no reduction in effectiveness” (Park 2002, p. 62)
  - disappear in the absence of selection pressure
    - animal magnetism (special gadgets)
    - homeopathic dilutions (potentializing)

3. Elaboration

- introduction of new elements
  - equally successful
- For example:
  - extra “meridians” in acupuncture
  - new constellations in astrology
  - new applications (inflated ambitions)

4. Recursion

- conspirational reasoning
  - conspiracy theories, psychoanalysis, Scientology, reincarnation therapy
  - additional *layers*
- Spirals of suspicion
  - theory turning in on itself
- Rhetoric of conspiratorial thinking
  - the truth is out there
  - reaching the bottom

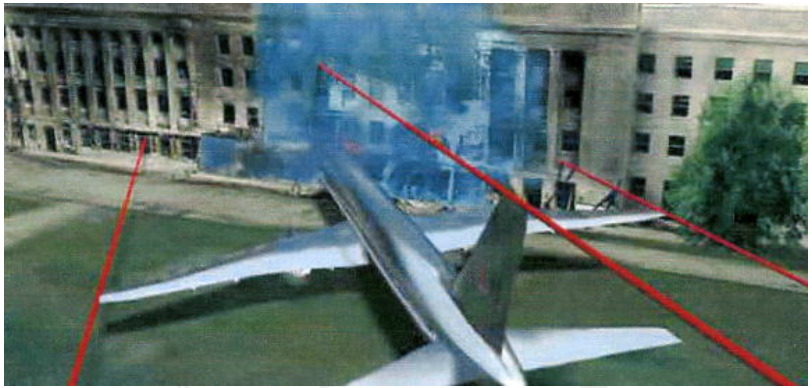
Conspiracy theories

- What if there is another level of cover-up?

→ upping up the ante

9/11 conspiracy theories

- 9/11 was an inside job
  - “no plane hypothesis”
  - *reductio ad absurdum?*
- mutual accusations
  - shrinking away from the full truth?
  - complicit in the cover-up
  - damaging the cause
  - disseminated by government?



Belief systems

- The very features that allow them to survive critical scrutiny…
  - immunizing tactics
  - psychological appeal
  - recipes for spurious validation

…make them victims of their own success

Conclusions (1)

- Demarcation problem is not dead
  - no silver bullet
  - mimicry & imitation
- Science vs. Pseudoscience
  - Symptoms
  - Cultural dynamics
  - How do they develop?

Conclusions (2)

- Resilience of pseudoscience
- Internal instability
  - changing the theme
  - elaboration
  - reduction
  - recursion

Boudry, M., Blancke S. & Pigliucci M. (2014) “What Makes Weird Beliefs Thrive? The Epidemiology of Pseudoscience”, *Philosophical Psychology*