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