Science vs. Pseudoscience
Popular psychology topics: myth or real

- Most people use only 10% of their brain
- Expressing anger is better than holding it in
- Opposites attract in relationships
- High self-esteem is needed for good psychological health
- Listening to Mozart can make infants smarter
- A full moon can trigger wacky behavior
- Your first guess is the right one on a test
- Most people will have a mid-life crisis
- Handwriting can reveal personality traits
Pseudoscience

“Claims that appear to be scientific but that actually violate the criteria of science.”
- “Claims exhibit superficial trappings of science but little of its substance” (Lilienfeld, 2004)

Examples?
- Crop circles, alien abductions, Big Foot, ...
- What about... hypnosis for memory recovery, multiple personality disorder, Rorschach inkblot test, handwriting analysis, polygraphs...?

Scientific revolution (new paradigm/theory) or pseudoscience?
- Thomas Kuhn (1970)
  - http://www.youtube.com/watch?v=GT3NoGiLyTQ&feature=related

Skeptic vs. critic vs. scientist
Pseudoscience and Science

- Each has a different approach to evidence
  - Science seeks out contradictory evidence; and adds it into theory
- Good or bad science, NOT good or bad scientist
  - No scientist is free of biases
  - But, can be aware of biases and try to control them
- Pseudoscience beliefs are not foolish or stupid
  - Don’t be a critic just to be contrary
  - There are remarkable theories that appear to be true
  - Seek out the truth – require good research methods!
- Do not confuse pseudoscience beliefs with religious beliefs
  - “Religious claims cannot be tested empirically so are outside the boundaries of science” (Lilienfeld, 2004)
Scientific approach (ch1)

- What are the “criteria of science”? 
- Systematic empiricism 
  - Design controlled study to observe behavior and draw conclusions 
- Publicly verifiable knowledge 
  - Present research so it can be observed, replicated, criticized and tested in other ways 
- Empirically solvable problems 
  - Questions are potentially answerable (can’t as “is there life after death”) 
  - Principle of falsifiability – possible to disconfirm hypothesis
Pseudoscience

Scientific American Frontiers video
- Palm reading
- Dowsing
- Alien body discovered
- Zero-point energy
- Graphology: Handwriting analysis
- Healing touch

- What are the claims?
- What is the evidence of pseudoscience?
Characteristics of Pseudoscience (Lilienfeld, 2004)

- A tendency to invoke loopholes or ad hoc hypotheses to immunize claims from falsification
- An absence of self-correction; intellectual stagnation
- An emphasis on confirmation
- A tendency to place burden of proof on skeptics
- Excessive reliance on anecdotal and testimonial evidence to substantiate claims
- Evasion of scrutiny afforded by peer review
- Absence to build on existing scientific knowledge
- Use of impressive-sounding jargon
- Absence of boundary conditions or where claims do not hold