Main point: you tend to see what you know
  o observation (in individuals) involves a lot of construction
    § based on knowledge to interpret sensory input
    § tend to perceive what we expect to perceive (based on mindset)
  o observation (in science) is similar –
    § based on theories to interpret data, to say what is, isn’t important
    § expected result: null hypothesis (based on theory)

Reasons for failures of insight
  1. Gripped by flawed beliefs —> need to be open-minded; consider other possibilities
  2. Lack of experience —> need to learn patterns (by years of study)
  3. Passive stance —> need to question existing knowledge; do this strategically
  4. Concrete reasoning style —> need to be comfortable with speculation, playing

Mindset – a set of expectations about the world – a way of looking at it (not just set of beliefs)
- can be useful to “fill in” gaps, but can also create problems:

1: confirmation bias - evidence that supports current mindset is not questioned
  o evidence that does not fit simply “bounces off”

2: distortion of evidence (theory-ladenness of facts; of perception)
  – no completely objective reality – a product of reality plus the observer
  o observation (in individuals) involves a lot of construction
  o tend to perceive what we expect to perceive
    § big problem when especially when input is ambiguous
    § tend to emphasize particular things, others recede to background
  o always know what to look for, but also watch for other things
    § keep an open mind – change your mindset when needed
    § never let exceptions pass unnoticed (cf. Darwin)

3: mindsets tend to resist change
- Mindset is essential; however, make sure to be flexible:
  o find out what mindset you’re using (e.g. try to be explicit)
  o use different ones whenever possible (e.g. look at from opponent’s side)
- realize that impressions (hypotheses) often formed on very little evidence
- often result of forcing – e.g. severe time deadlines
  o not all info can be adequately processed
- once set, ego often keeps it there
  o relative inability of older researchers to accept new discoveries
To improve decision-making / analysis, improve along two dimensions:
  o first dimension: reduce the number of errors - critical thinking
    • psychological dimension: critical vs gullible
      • willingness to *embrace* a belief
  o second dimension: increase the amount of insight
    • psychological dimension: *open*-minded vs *closed*-minded
      • willingness to *let go of* a belief (consider other beliefs)
      • not: *open*-minded vs critical

Deadlines for submitting critique sections  *(also see COGS303-critiques.pdf)*

- Issue 1: Feb 15
- Issue 2: Mar 01
- Issue 3: Mar 08
- Issue 4: Mar 22
- Issue 5: Mar 29
- Submission: Apr 05

Real-World Segment: Life in Grad School

1. it’s a lot of work. Only do it if you’re really motivated
   - not for someone who wants to make a lot of money
   - if you’re not sure, may want to take some time off, get experience
2. third year (or fourth if you’re taking time off) is the critical year
   - marks, lab experience, etc.
   - also gives you time to check out different schools, different advisors)
3. what to expect (roles, lifestyle); for
   - opportunity to define yourself as a researcher
   - start to become the best in the world at something
4. how to find a graduate school that works (see “how to be a good grad student”)
   - look at match of interests with advisor; funding opportunities
   - but: thesis advisor the single most important choice; more than thesis topic
     - want to match their *style* as well as their research interests