Forming New Beliefs

- Immediate observations.
- Inferred beliefs
- “Hypotheses”
- Conjectures that go beyond observations.
- What makes for a good conjecture?
- Six “Virtues” of hypotheses.

Choosing a College

- “Virtues” of colleges.
- What you are looking for in a college.

- Inexpensive, good academic reputation, right major/variety of majors, good sports teams, beautiful campus, good location, friendly environment, right size, interesting social scene, etc.
- Can you “have it all”?
- Probably not!

Choosing a College

- Why did you end up at Virginia Tech?
Forming New Beliefs

- “Choosing” a spouse.
- “Virtues” of spouses:
  - Physically attractive, intelligent, trustworthy, fun-loving, nice, focused, spontaneous, etc.
- Can you “have it all”?
- Trade-offs

Forming New Beliefs

- “Choosing” a hypothesis:
  - What are we looking for in a hypothesis?
  - Fits well with what we know.
  - Helps make sense of what we know.

Quine’s 6 Virtues of Hypotheses

Conservatism

Conservatism: Don’t deviate from your established evidence or beliefs unnecessarily.

Conservatism

Blue is a good hypothesis. Green is a questionable hypothesis.

Conservatism

Modesty
Quine’s 6 Virtues of Hypotheses

Conservatism

Modesty: Don’t get carried away too much beyond the evidence you have to work with. Extrapolate carefully.

Simplicity

Simplicity: Don’t add things beyond what’s necessary to account for the evidence you are working with. Interpolate carefully.

Pierre LaPlace (1749-1827)
French mathematician

“I have no need of that hypothesis!”
Quine’s 6 Virtues of Hypotheses

Conservatism
Modesty
Simplicity
Generality

Generality

Quine’s 6 Virtues of Hypotheses
Conservatism
Modesty
Simplicity
Generality

Testability = Refutability

Generality

Testability

Testability

- Testability is more a matter of how the hypothesis is treated by the person who holds the hypothesis.
- Is the person willing to consider contrary evidence, or is potentially contrary evidence always explained away?
- Article of Faith, rather than hypothesis.
Testability

- Religion: Problem of Evil
- Santa Claus brings us presents.
- Horoscopes: “You can make progress if you deal with the right individuals.”
  “Hidden assets can be doubled if you play your cards right.”
- Psychics: If it didn’t happen, it’s because other factors intervened.

Quine’s 6 Virtues of Hypotheses

Conservatism
Modesty
Simplicity
Generality
Testability: Don’t be dogmatic.
Take contrary evidence seriously.

Precision

- Horoscopes:
  - “Love can be yours if you get out today.”
  - “Observe and you will learn.”
  - “Pleasure trips will promote romance.”
Quine’s 6 Virtues of Hypotheses

Conservatism
Modesty
Simplicity
Generality
Testability
Precision: Don’t be excessively vague.

Quine’s 6 Virtues of Hypotheses

A good hypothesis is one that does well in light of the six virtues of hypotheses.

God exists?
All my experiences are part of a dream?
Computer-robots could think?