COGNITIVE OBSTACLES TO LEARNING:

Belief Perseverance

Leah Savion & Thomas Leitke
• The single most crucial component in learning is prior knowledge

• Prior knowledge enhances learning when it agrees with the new information

• Disagreement between the new and the old creates a barrier to understanding, encoding, and retention

• Belief perseverance is the persistence of explicitly discredited prior knowledge
Belief perseverance is a byproduct of otherwise normally functioning cognitive systems that operate according to major principles, with quick and dirty heuristical tools, and under cognitive, social and physical constraints.
The Learner’s Mind

**Dispositions**
- Generate coherence and meaning
- Concoct causal relations between events
- Erect and maintain an inflated ego
- Create the illusion of control

**Constraints**
- Memory constraints
  - Restricted STM
  - Fading EM
  - Fuzzy LTM retrieval
- Selection mechanism
  - Attention
  - Bottleneck
- Computational complexity
Cognitive Principles & Tools

- **Economy**
  - Belief confirmation
  - Availability
  - Anchoring

- **Equilibrium**
  - Return to default
  - Rationalization
  - Attribution

- **Purpose**
  - Language
  - Theory of mind
  - Mate selection
Educational Goals

**Teacher:**
- Long term retention
- Invest resources to master material
- Student matches learning to teaching style
- Innate note taking skills
- Intrinsic value of knowledge
- Popularity without sacrificing quality

**Student:**
- Confine learning to rewards
- Learn the most with the least effort
- Teacher matches teaching to learning style
- Spoon-fed, relevant notes
- Extrinsic value of education
- Entertainment
The Big Picture

Dispositions & Constraints
Cognitive Principles
Quick and dirty Tools

Pet Theories:
Intuitive explanatory constructs

Naive Misconceptions:
Inevitable errors in the pet theories

Belief Perseverance:
Misconceptions resistant to learning

PT
NM
BP
Unsatisfactory Explanations

- delusional overconfidence
- embarrassment at admitting mistakes
- cognitive laziness
- plain irrationality
Some Types of Belief Perseverance

Resistance to:
1. Additional Information
2. Logical Reasoning
3. Total Evidentiary Collapse

Examples:
- Pseudo-science
- WMD
- Stereotype
- Racial bias
- Superstition
- Spontaneous generation
Group Work

1: Identify a belief-perseverance related to your field

2: Trace its origin

3: Suggest practical remedies