Slight changes to the essay assignments

• Starting Assignment 2, you only need to pick 2 readings and critique on them. (Yoohoo!)

• If you have already written more than 2 responses for Assignment 2, then you can save the rest for Assignment 3 (i.e., if you’ve already written 4 responses for #2, then you are already done with both Assignment 2 and 3!! If you wrote 3 responses, then you just need to write one more for Assignment 3.)
Slight changes to the essay assignments

• To help you narrow down the scope for the essays, starting Assignment 3, your essay will be just answers to the following two questions:

1. Summarize the main points from the reading (as either bullet points or a short paragraph);

2. A question that we assign for each reading, which we will post on Blackboard forum. The question is pretty much like a discussion question.

(If you’re already done with Assignment 3, then no need to re-write. If you are partially done with it, i.e., need one more piece, then follow the new directions for that piece.)
Embodied Cognition & Language Metacognition

BCS153 Week 6.2
2/21/2019
Roadmap

• Embodied cognition and language
• Conclusion on embodied cognition
• Self-monitoring mechanisms in cognition
• Executive control and metacognition
• Attention shift and metacognition
• Traditional vs. Embodied view of cognition
  ➢ Sensorimotor experience in metacognition
Something looks static but actually dynamic - language

• How do we learn the meaning of a word (e.g., a verb)?
  ➔ Implication of mental representation (e.g., semantic network)

OR

• How do we learn to use the word (e.g., a verb)?
  ➔ Implication of functions and dynamics
  ➔ Mind, body, environment
Something looks static but actually dynamic - language

Language in action

“The flower is in the vase” ➔ Faster responses when the object orientation matches the description

Correct orientation?
Concluding remarks on embodied cognition

• Behavior can be explained by perception-action coupling and the task dynamics

→ Focus on performance and functions: dynamical system

• In radical embodiment, representation of action needed, but not representation of an object
How do we know if we are doing things right?

• Feedback
• Self-monitoring
  ➢ Memory retrieval
  ➢ Attention
  ➢ Working memory

Metacognition
Two levels of analysis in metacognition

Bergstra (2015)
Source monitoring in metacognition

• Where did event X happen?
  → Not only recall the event but also the context

• How did event X happen?
  → How did I get to know person X?
One essential component of metacognition - Executive control

• Selecting

• Maintaining

• Updating

• Rerouting
One essential component of metacognition - Executive control

• Selecting Stroop Task
One essential component of metacognition - Executive control

- Maintaining
  - Working memory tasks (e.g., digit span)
  - Immediate recall

Why important for metacognition?
→ Need to know what information is accessible (or inaccessible) so that we can make adjustments
One essential component of metacognition - Executive control

• Updating
  ➢ N-back task
e.g., 3-back task
In a series of numbers (presented either visually or auditorily)
3 6 2 9 0 8 9
3 6 2 9 0 8 9
One essential component of metacognition -Executive control

• Updating
  ➢ Verbal fluency task

You have one minute to come up with words starting with B, but no repetitions!
One essential component of metacognition - Executive control

• What does updating have anything to do with the verbal fluency task?

1. Monitoring the words you produced
2. Update current responses
3. Prevent repetition
One essential component of metacognition - Executive control

• Rerouting
  ➢ Correlated with selecting
  ➢ Attention shift and control

OK...what does rerouting have anything to do with metacognition?

➢ Dual-tasking
➢ Divided attention
Attention shift task

Is it a word?

TOGAK
Attention shift task

Is it blue?

POGAF
Attention shift task

• Switch trials (switch question) – perseveration
  ➔ Carry over the feature of the previous trial to the current trial
  ➔ Poor inhibitory control
  ➔ “Reroute” information processing route from one dimension (e.g., word/nonword) to another (color)
Traditional vs. Embodied view

• Do the concepts about metacognition discussed so far fall under the traditional or embodied view of cognition? Why?

• How would embodied view explain metacognition? E.g., how do we explain self-monitoring process in memory recall from an embodied view?
Embodied view of metacognition

• Sensorimotor experience in metacognition
  Alban & Kelley (2013)
• Weight as a cue in metacognition (!)
• Task: word learning and recognition
  ➢ Study a list of words and then later recall if a word is on the study list
  ➢ Rate “Judgment of Learning” (JOL) while studying the words on a scale of 0-100 (the likelihood of recalling this word afterwards)
Embodied view of metacognition

• Sensorimotor experience in metacognition
  Alban & Kelley (2013)

• Major manipulations of the experiment:
  - Exp. 1: 50% of the JOL done on a “light” clipboard; the other 50% done on a “heavy” clipboard
  - Exp. 2: word attached to a box with varied weight (as shown on the right)
  - Exp. 3: larger difference in weight between light and heavy boxes
Embodied view of metacognition

- Sensorimotor experience in metacognition

Alban & Kelley (2013)

- Results
- Weight matters in metacognition!
Concluding remarks on metacognition

• An essential component in our cognition to monitor our mental states and cognitive processes

• Highly dependent upon executive control

• Sensory input also plays a role in metacognition
Review

• What are the major approaches to the study of mind?
  ➢ Structuralism
  ➢ Behaviorism
  ➢ Information processing
  ➢ Computation
  ➢ Neuroscience

• Some core debates in cognitive science
  ➢ Representation and computability of mind
  ➢ Innateness
  ➢ Mind-brain identity
Review

• What are the major theories of intelligence? How do we test intelligence? What do we mean by “intelligent”?
• Similarities and differences between an animate and inanimate system
• Norman’s model of pure cognitive system
• Belief system and cognitive system
• Emotion and regulatory system in cognitive system
• What’s special about human cognition?
• Symbolism and human cognition
• How embodied view explains our cognition