

## Cognitive Psychology Study Guide

### Embodied Learning

- o What is the Chinese room experiment?
  - If you are in a room surrounded by language books and symbols, are you going to learn the language? No.
  - Experiences are grounded in sensorimotor.
  - The meaning of language doesn't come from symbols.
  
- o What are **amodal theories** of representation?
  - Symbols used to represent knowledge/language/meaning
  - Says that with enough machine learning and rules, you can get a computer to understand language.
  - Embodied cognition disagrees with this (no body, no sensation, no perception, no affordances).
  
- o What is a **modal theory** of representation?
  - Representation of knowledge is more than symbols.
  - Meaning is derived from affordances, having a body, and the senses.
  - Embodied cognition
  
- o What are the main points of **embodied cognition**?
  - Modal theories fail argument – symbol relationships still don't give meaning.
  - Meaning comes from *affordances* – what an object does for you. The object's "value."
  - Knowledge is embodied or grounded in bodily states. We need a body to have affordances.
  - Cognitive representations and operations are grounded in their physical context.
  
- o What role do **affordances** play in embodied cognition?

- What objects can do for us.
  - Meaning is derived from the value objects have to us.
  - Things can only have value if we have desires/needs.
  - Watson, and computers in general, don't have these things.
- o What is the **action-compatibility effect**?
- Shows the role the body has on processing action.
  - The idea: Forming the body in a position primes the body for certain behavior and interpretations.
  - Ex. Pencil in mouth laughing experiment; bottle cap study; slumping & mood study.
- o What role does **metaphor** play in understanding **abstract concepts** such as "freedom"?
- Abstract concepts understood by using metaphors.
  - Understood in the context of concrete experiences.
  - The sensorimotor system forms the representation.
  - Ex: Freedom (container); "he's on fire" (temperature); "He flew through his work" (movement); "we've come a long way" (journey).
- o **Sensorimotor simulations:**
- We derive meaning by activating sensorimotor in our brain and simulating the experience.
  - Meaning comes from re-simulation of something.
  - Ex: sitting in a chair.
- o What is the **traditional view** of learning the sciences?
- Association and stimulus response using symbols and formulas.
  - Not so focused on how we represent understanding concepts.
- o What does **Embodied Learning** (EL) say about learning?

- We ground our conceptual knowledge & comprehension in bodily states.
  - Focusing on the principles of embodied cognition and applying them to learning sciences.
  - Using the body to mediate understanding of abstract concepts in science.
  - \*Appears to be better than traditional forms of instruction.
  - \*Tools that encourage people to use the body tend to be more successful.
- o What **activities** are useful from **an EL perspective**?
    - Tools that require use of body movements to learn.
    - Metaphor.
    - Object manipulation.
    - Mathematical imagery trainer.
    - Ex. A 'variable' is a 'container' of something.
  - o What is the process in which **abstract concepts** are learned?
    - \*Using metaphors.
    - Linking perceptions and movement.
    - Thinking is a lot like seeing and moving.
    - \*Manipulating symbolic notation is cognitively similar to physically moving objects in space.
  - o How does the **mathematical imagery trainer** work?
    - Example of embodied cognition.
    - Teaches the principles of proportion using embodied principles.

## Language

- o What is **language**? (Not on exam.)
  - System of communication that involves words.
- o How does language differ from **written language**?
  - Written language requires *explicit teaching*.