# Human Information Processing and Cultural Diversity

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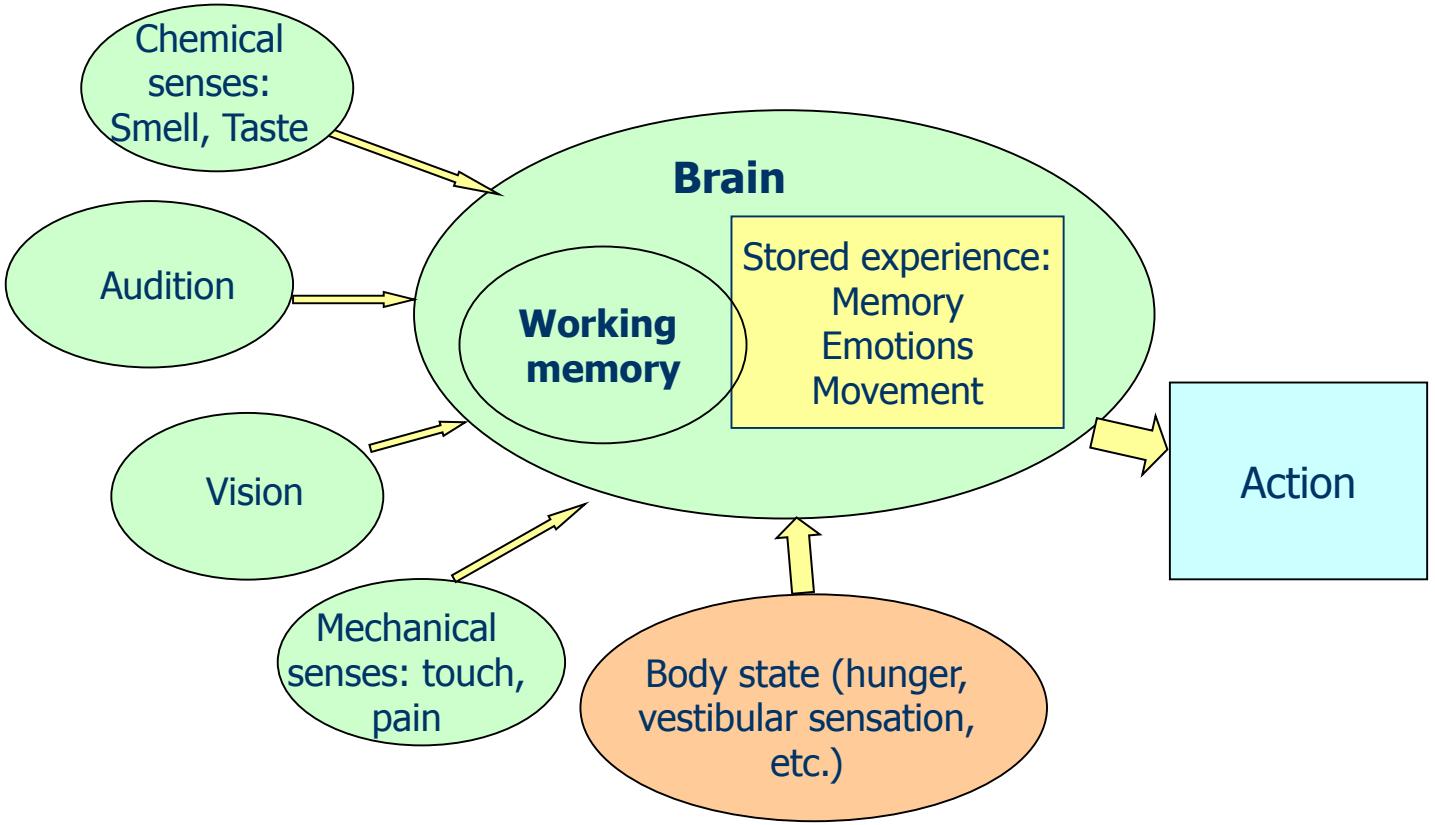
# Outline

- Introduction
- Understanding the human mind
- Cognitive capacity
- Cultural schemas

# The human mind
# Modalities: perception



# Damasio: maintaining balance

All living organisms try to maintain homeostasis:

- ”We should seek joy, by reasoned decree, regardless of how foolish and unrealistic the quest may look.”
- ”Feelings of pain or pleasure or some quality in between are the bedrock of our minds. We often fail to notice this simple reality because the mental images of objects and events that surround us, along with the images of the words and sentences that describe them, use up so much of our overburdened attention.”

# Human cognitive capacity

- Based on patterns and schemas
- Attention: selective perception
- Object and background:
  discrimination,
  exceptional features
- Attention is directed to one object
- Memory registers also unconscious perception
- Automatic actions (bicycle riding) do not need attention;
  but then action becomes fixed, difficult to modify (changes in interface)

# Use of cognitive tools

- Language and writing
  - Handwriting improves students' thinking ability
  - Handwriting helps in learning
  - Blind people allocate visual brain areas to touching and hearing
  - Deaf people allocate language areas to sign language (but not to other hand movement)

# Use of cognitive tools alters neuro-cognitive architecture

- Language and writing
  - Chinese employ visuo-motor brain areas for reading and writing to a much larger extent than alphabet users;
  - writing Chinese characters requires lots of hand movement control and visual memory
    安
  - http://en.wikipedia.org/wiki/Stroke_order#General_guidelines

# Improving memorizing

- Timing of activities is decisive when storing information to the memory.
- Distributed practice works better than massed practice.
- Spreading out your study is better than cramming.
- There is a specific time interval, about six to eight hours after training, when the neural activity is particularly strong, and lasting memories are formed.

# Improving memorizing

- Memory consolidation takes place while we **sleep**, and it takes up to a few weeks of **repeated rehearsal** for the molecular reactions controlling gene and protein synthesis to record long-term memories.
- If the interval between rehearsal sessions is too long, the short-term memory will have weakened too much to benefit from repetition.
- Also, having a break and **relaxing** after intensive working often  releases creativity and yields a solution to the problem under consideration.

# Benefits of sleep

- stores memories
- helps to attain high level of concentration
- reduces stress
- combats obesity

# Multitasking

- The people who engage in media "multitasking" are those least able to do so well.
- People who routinely consume multiple media such as internet, television, and mobile phones, perform less well in tests for attention and memory.
- Distraction confuses working memory.

# Spatial intelligence

- about half of brain cells  (neurons) are specialized in motor control, movement
- about ¼ of neurons are involved in perception
- therefore, walking in nature (varied and demanding terrain) develops brain more than almost any other activity
- exercise: produces endorphins that make you feel good & helps in production of new neurons

# Cognition and emotion

- Happiness and **positive mood** increases flexibility in problem solving.
- **Stress** weakens attention and working memory.
- **Laughing** has numerous benefits for health as well as learning: reduces stress; reduces pain
- Laughing improves memory: Students who watched an episode of "Friends" after studying for an exam, got 20% better grades than the control group that did not have fun.

# Music in brain

- Brain imaging studies: when people listen to music, the neural activation proceeds from the auditory system to regions related to planning, expectation and language as well as arousal, pleasure, mood and rhythmic movement.
- Music engages nearly every area of the brain.
- Music promotes cognitive development.
- Music reaches deep into the brain's most primitive structures, including the "reptilian brain" tied to motivation, reward and emotion.

# Human perception – cultural variation

- People can discriminate color and lighting
  - Different color categories in languages
- Object and background
  - Western preference for objects (?)
  - Collective vs. individualistic
- Borders and continuity
- Shapes and interpretations

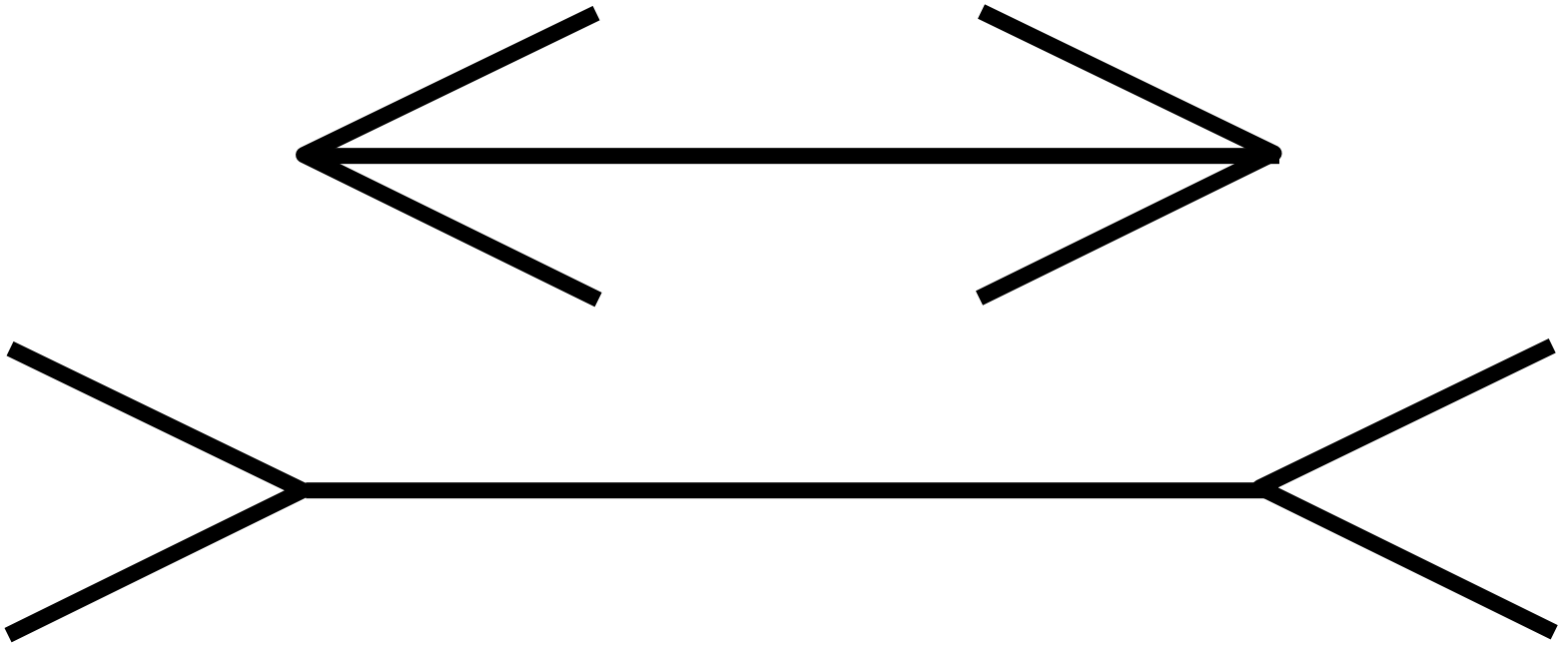
# Culture: Embodied feeling and culture

"Culture is the pattern of beliefs, behaviors, and values maintained by groups of interacting people"

- It refers to observational constructs of cultural experience rather than to the experience itself
- Reification of culture, culture as cognitive construct is only a partial view
- Embodied feeling of the culture, feeling of appropriateness:
  do you feel comfortable in this environment, with these people? (Bennett)

# Interpretation

- Müller-Lyer -illusion



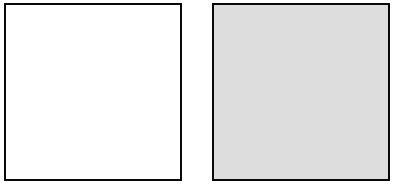
Culture specific?

# Colors

- Help in recognition
- Have emotional values and symbolic meanings - warning
- Warmth

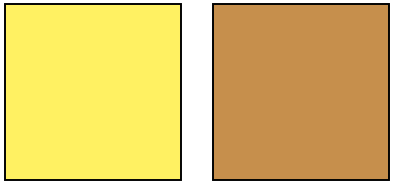
# Cultural feeling of colors

cold, pure, innocence, empty, death, age, West, misfortune



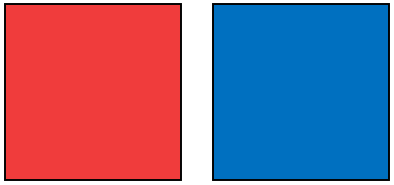
neutral, independent

happiness, creativity, sun; earth, center; envy



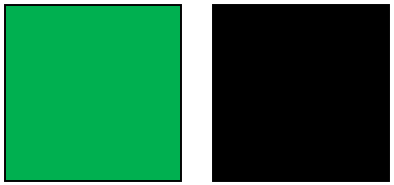
safety, warmth, dirt

action, danger, excitement; blood, life, fire, love; good fortune



hygienic, cold, calm; intellect, low emotion; bad fortune

calm, natural; growth, vitality



modern, death, darkness

- Orientation
- Left – right
- Cognitive overload:
  - Speed
  - Amount of signals and signs

# Cognitive tools are ubiquitous

- Maps
  - Survey vs. route map
  - Micronesian navigation maps (stars, islands, time)
- Memory aids
  - Non-literary cultures have epic stories, recital, ”dreaming” stories and pictures

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