


Learning and brain 2

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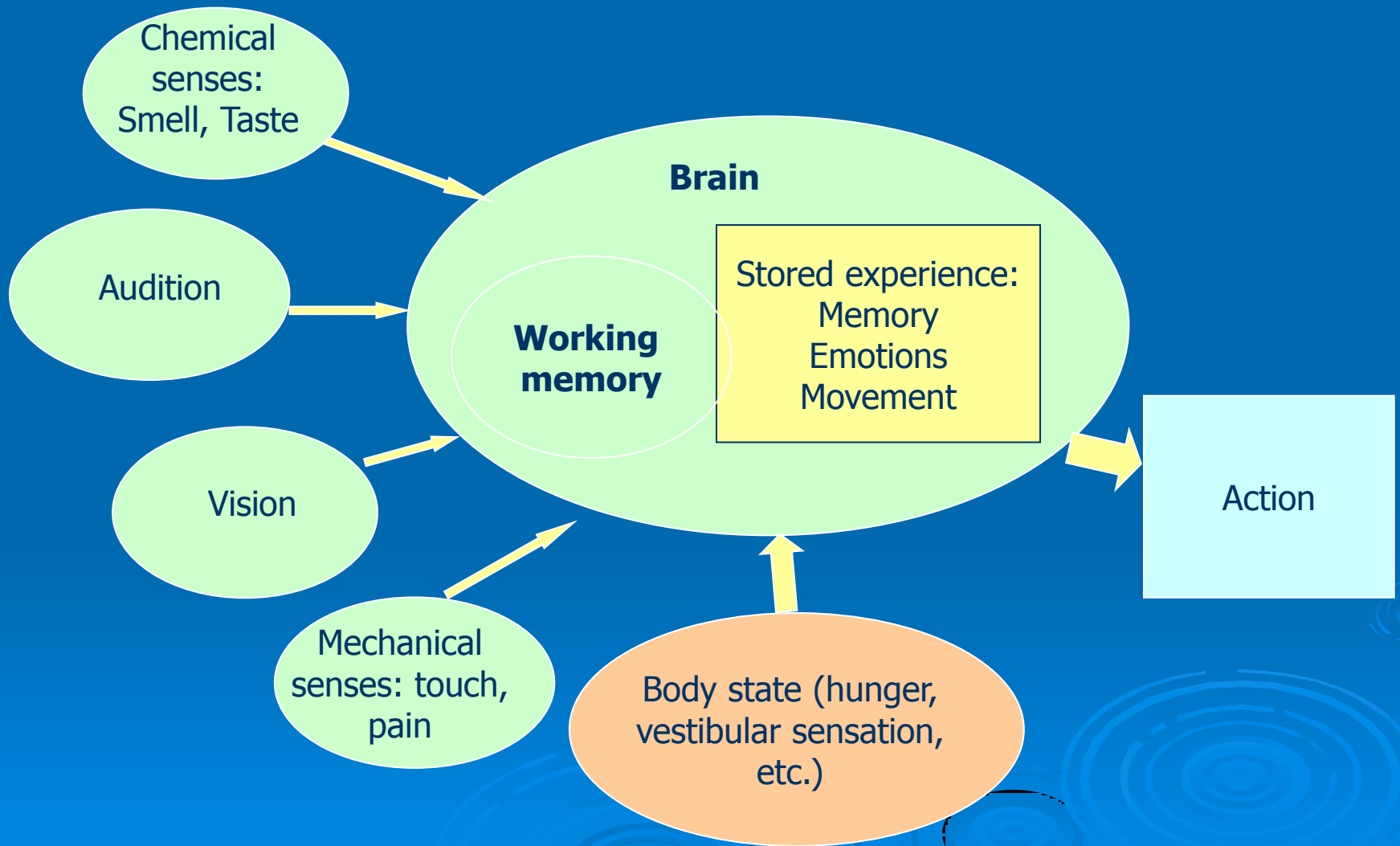
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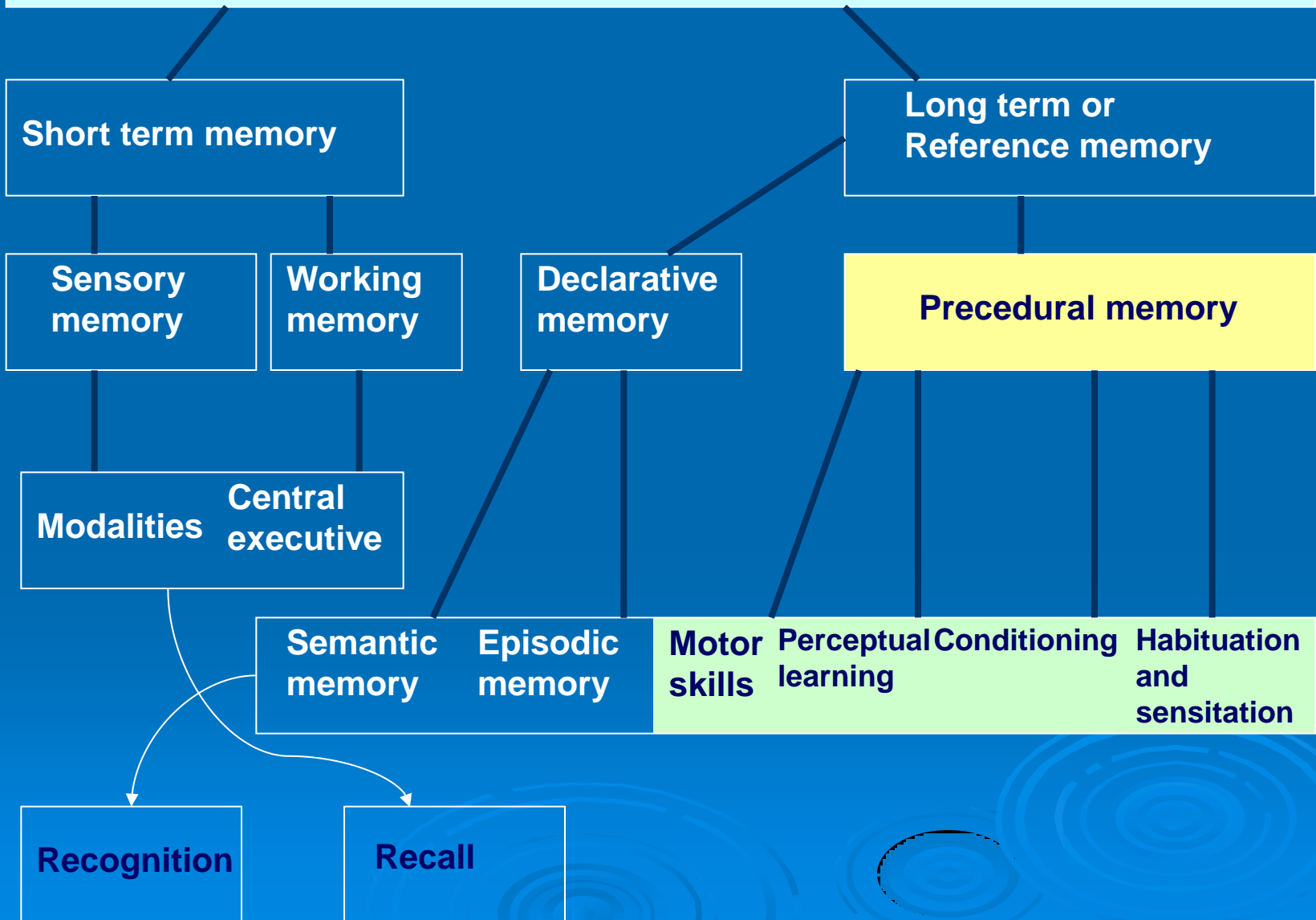
Learning, perception and memory



Modalities: perception



MEMORY



Development of brain

- The process of neurogenesis populates the brain until the maximum number of neurons has been reached at age 2,
- then programmed cell death cuts the growing brain down to size.
- During adolescence the brain goes through a process of synaptic pruning.
- Frontal cortex develops last, until over 20.
- Brain plasticity decreases in time, the localization of functions stays fixed in adults.

Improving memorizing

- Timing of activities is decisive when storing information to the memory.
- In an experiment, where fruit flies were trained to avoid a particular odor, it was found that massed training, giving the flies the same number of training experiences in rapid succession, did not produce an enduring memory;
- spaced training, with session intervals of 15 minutes, did produce.
- 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 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



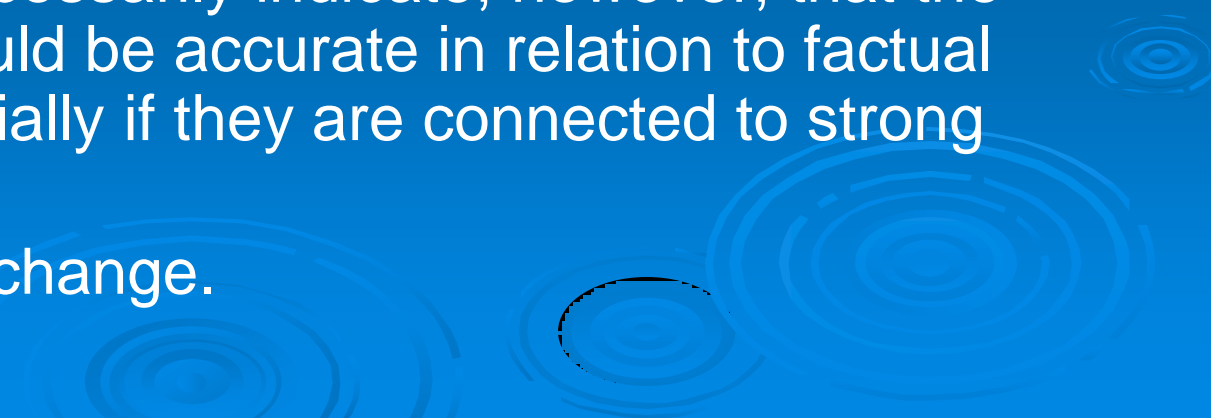
Multitasking

- 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 $\frac{1}{4}$ 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.
 - Affect, cognition, and motivation influence one another.
 - Meaningful and emotional information is retained better in memory than purely factual information.
 - It does not necessarily indicate, however, that the memories would be accurate in relation to factual events, especially if they are connected to strong feelings.
 - Memories do change.
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Cognition and emotion

- Stress weakens attention and working memory.
 - It rises levels of noradrenalin, dopamine, and cortisol in the brain, and induce neuron destruction in hippocampus. The production of new neurons in hippocampus is also reduced under stress.
- Laughing has numerous benefits for health as well as learning.
 - Laughing reduces stress because the level of cortisol is reduced and levels of epinephrine decrease.
 - 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.

Valuation

- Positive or negative impressions are formed in a mere "blink".
- People evaluate everything as good or bad.
- We feel before we analyze.
- Decisions made too quickly are not the best:
 - facing with complex decisions involving many factors, the best advice is to take your time - to await the intuitive result of unconscious processing

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.
- Music elevates dopamine levels.

Expatriate creativity

- a study in 2009 in France/ US
- people who had lived abroad more consistently showed innovation and creativity
 - in negotiations,
 - in the use of ordinary items,
 - in drawings.
 - http://50.insead.edu/press_releases/insead-research-shows-going-abroad-linked-creativity