

认知心理学基础

第六讲 意识

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History of consciousness

意识是心理学中最高深莫测的话题，也是AI至今尚未攻克的堡垒。

解释意识，就像解释玫瑰花的芬芳，推理她的分子结构，然而玫瑰依然芬芳 —— Damasio, 1999

- Early philosophers: Who am I? Know yourself.
- 19th century: Psychology is the science of mental life (William James, 1890).
- Early 20th century: banished from psychology, because of behaviorism
- Last half of 20th century: cognitive psychology return to consciousness study

Definition of consciousness

- **Consciousness:** The process by which the brain creates a model of internal and external experience
- **Nonconscious processes (无意识加工) :** Any brain process that does not involve conscious processing
 - Preconscious memories (前意识)
Not in consciousness currently, but can be recalled
 - Unconscious (潜意识)
Classic Freudian theory

Definition of consciousness

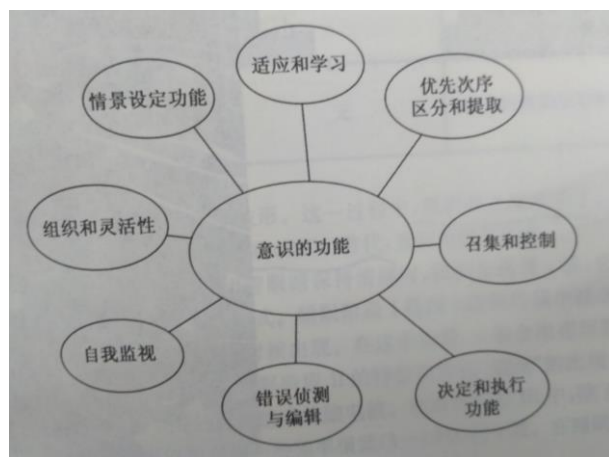
- **Two sides:**
 - A realization (觉察) of environmental stimuli
 - One' s cognizance of mental events- those thoughts that result from memories and your own internal sense of awareness and self

Unconsciousness

- In classic Freudian theory, a part of the mind that houses **memories, desires, and feelings** that would be threatening if brought to consciousness
- Many modern cognitive psychologists view the unconscious in less sinister terms, merely as a collection of mental processes that operate **outside of awareness (觉知)** —but not typically suppressing information or working at odds with consciousness

意识的功能

- 意识存在的唯一理由是让个体凭借意志采取的行动成为可能，而非纯粹依赖本能行动



Baars et.al, 1996

意识的框架：AWAREness理论 (Solso, 2003)

该框架吸收了传统意识研究的要素，并提出了一些新的观点，集大成者

- 注意 (Attention)
- 觉醒 (Wakefulness)：通过从睡眠到清醒的脑电，研究睡眠相关现象
- 构筑 (Architecture)：研究决定意识加工的生理结构及其物理定位
- 知识回忆 (Recall of knowledge)：包括自我知识、世界知识、共情
- 情感 (Emotion)
- 新异性 (novelty)、浮现 (emergence)、选择性 (selectivity)、主观性 (subjectivity)

知识回忆

自我知识

- 自我觉察：知道自己就是自己（“我识”——《养蜂人》，王晋康）
 - 镜子测试 (Gallup, 1970)：
 - 通过者——人类2岁、黑猩猩、倭黑猩猩、海豚、大象
 - 不通过者——鱼类、鸟类
- 个人信息：可以即刻回忆起来而无需重新体验实际事件

忠

世界知识

- 长时记忆中保存的所有关于外部世界的事实

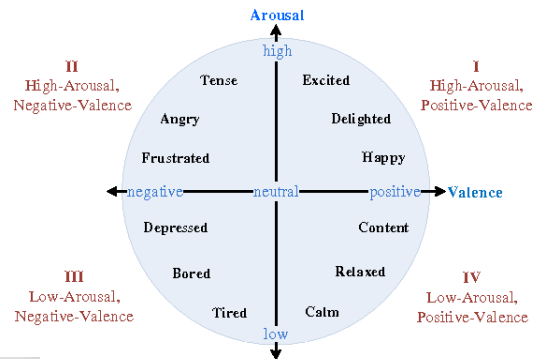
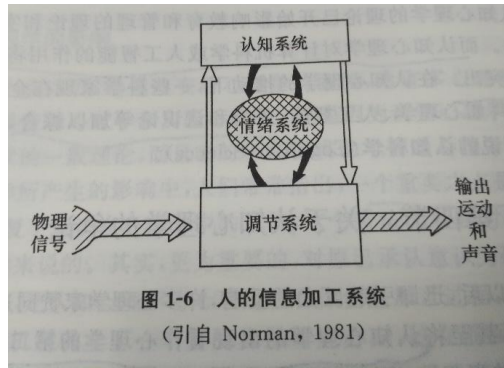
共情 (Empathize)：知道另一个的想法

恕

共情敏感性有利于生存——进化论

情感

- 研究情绪感受，而非思想或知觉；很难实验测量



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AWAREness理论

- **新异性 (novelty)**：人和动物都有追求新异而有新信息刺激的倾向，即偏好“新”事物
- **浮现 (emergence)**：意识处理的是私有、内部的思想，是关于内部信息和自我反映的神经过程
- **选择性 (selectivity)**：人随时不断选择一小部分想法进行考虑，并频繁受到新想法的干扰，“探照灯”隐喻是其具象表现
- **主观性 (subjectivity)**：每个人的意识体验是独一无二的

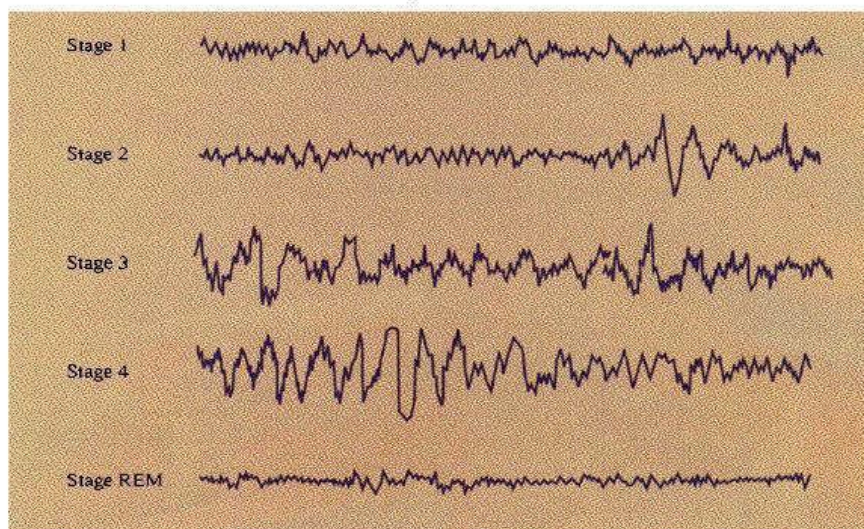
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觉醒——关于睡眠的研究

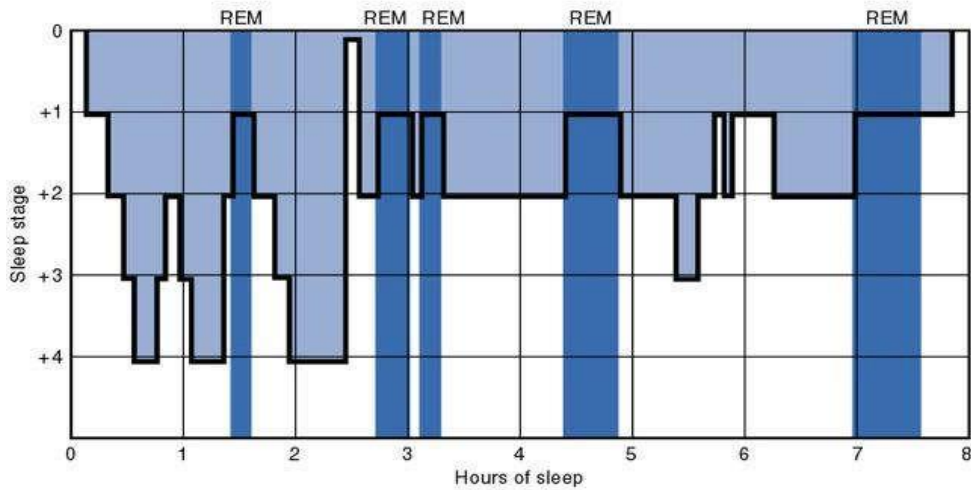
- Stage 1——Relatively rapid, low-amplitude
- Stage 2——Slower, more regular wave pattern, **sleep spindles**
- Stage 3——Slower, higher peaks and lower valleys
- Stage 4——Even slower, more regular, **least responsive to outside stimulation**
- REM sleep (Rapid Eye Movement) (快速眼动)

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Stages of Sleep



Hours of Sleep



Feature of Sleep

- The 90-minute cycles, 4~6 times per night' s sleep
- The occurrence of deepest sleep near the beginning of the night
- Increase in REM duration as sleep progress
 - only 10 minutes at the first cycle, nearly an hours at the last cycle

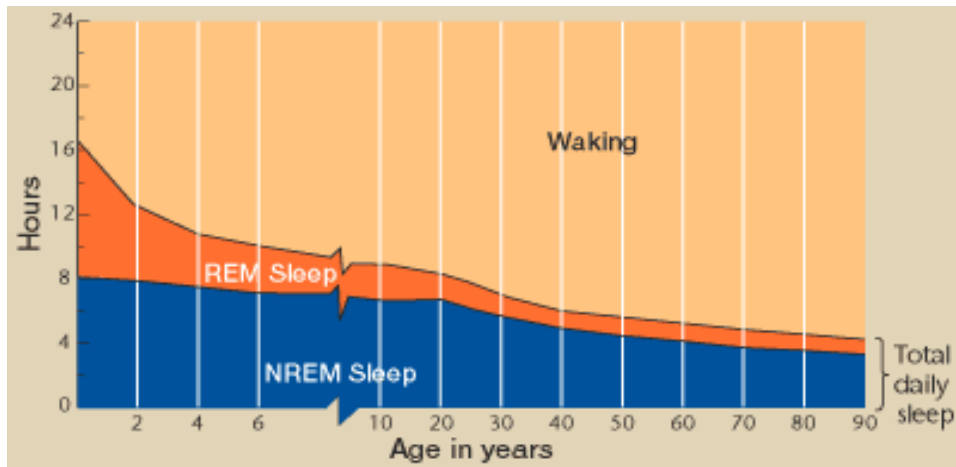
REM sleep

- Occurs approximately every 90 minutes, 20 percent of adults' total sleeping time
- Bursts of rapid eye movements occurring under closed eyelids.
- Sleep paralysis (睡眠性麻痹)
 - Unable to move any of the voluntary muscles, except those controlling the eyes.
- Associate with dreaming.

The need of sleep

- Why do we need?
 - Body require tranquil “rest and relaxation” period.
- Evolutionary perspective: conserve energy at night.
- How much do we need?
 - 7~8 hours each night on average
 - Wide variability among individuals (爱迪生 vs 爱因斯坦)
 - Development perspective: the sleep cycle change over one's lifetime.

Hours of sleep among ages



Dreaming

■ Circadian Cycles: The Biological Clock

Circadian = “about a day”

■ Why Do We Dream?

- Dreams as unconscious wishes——Freud’s psychoanalytic theory (日有所思、夜有所梦)
- Dreams-for-survival activity
- Activation-synthesis theory

■ Do We Need to Dream?

- Reprocessing of information
- Can you learn while asleep?

Dreaming

■ Dreams-for-survival activity

- ❑ Dreams arise out of the mind's reprocessing of information absorbed during the day—information that is important to the survival of the organism.
- ❑ Dreaming strengthens our memories of important information

■ Activation-synthesis theory

- ❑ Dream are the result of random activation of various memories, which are toed together in a logical story line.

Daydreams

- A common variation of consciousness in which attention shifts to memories, expectations, desires, or fantasies and away from the immediate situation



Hypnosis (催眠)

- An induced state of awareness usually characterized by heightened suggestibility, deep relaxation, and highly focused attention.
- Clinical application of hypnosis
 - Controlling pain.
 - Reducing smoking.
 - Treating psychological disorders.
 - Assisting in law enforcement.
 - Improving athletic performance.

Meditation (冥想)

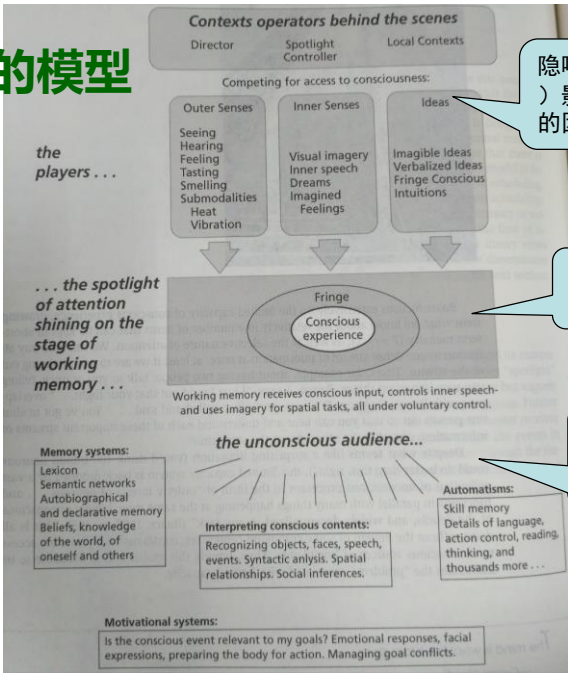
- A state of consciousness often induced by focusing on a repetitive behavior, assuming certain body positions, and minimizing external stimulation.
- Meditation may be interned to enhance self-knowledge, well-being, and spirituality.
- lowers the rate of metabolism, reduces heart and respiratory rates.
- Brain activity resembles that experienced during relaxed wakefulness, and the accompanying decrease in blood lactate reduces stress.

意识的模型



■ Baars (1983) 提出的综合工作平台理论（剧院模型）把意识看做是一套在整个大脑里传播信息的全局广播系统

IAIR Est. 1986



隐喻（metaphor）影响注意形成的因素

隐喻记忆及正在激活的注意

隐喻受注意影响的其他无意识加工