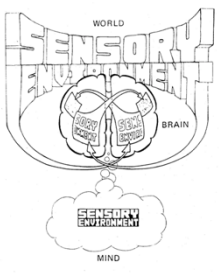
Consciousness

Mind-body Problem

- Fundamental issue addressed by psychologists
- Dualism
  - Mind is immaterial
  - Mind can exist separate from the body
- Monism
  - Mind and body are different aspects of the same thing

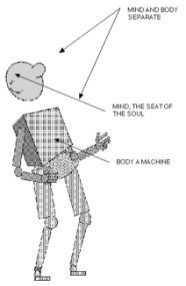
Cartesian Substance Dualism

- Mind is immaterial
- Brain is physical
- Mind and brain interact
  - Interaction determines behavior



Popular Dualism

- Person is a "ghost in a machine"
  - Machine = human body
  - Ghost = mind
- Mind
  - Spiritual substance
  - Inside body it controls
    - In head
    - In contact with brain



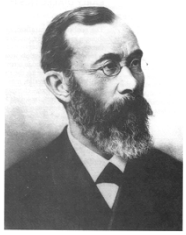
Characteristics of consciousness

- Awareness of external events
- Awareness of internal sensations
- Awareness of self as a unique being
- Awareness of thoughts about experiences

Consciousness = personal awareness

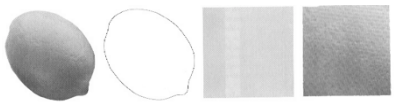
History

- Of interest through history
- One of the first topics addressed by psychologists
- Wundt
  - Set up very first lab for psychological research
    - University of Leipzig
    - 1879



Wundt's Research

- Interested in consciousness/thought
  - Examined basic elements of thought
  - Experience of those elements
- Meaningful psychological experiments



Stream of Consciousness

- William James
  - Addressed the issue in "Principles of Psychology"
    - 1890
- First to propose a stream of consciousness

Levels of Awareness

- Sigmund Freud (1900)
  - Proposed existence of the subconscious
  - Recognized that consciousness was not an all-or-none phenomena
- Usually maintain awareness
  - During sleep
  - Under anesthesia
- Some stimuli still penetrate awareness

Deeply Anesthetized Patients

- "Fat Lady Syndrome"
- No conscious recollection
- Upset after surgery
- Spontaneous recovery of memory

Positive Statement Study

- 39 hysterectomy patients
  - 19 in positive suggestion group
  - 20 in control (white noise) group
- Listened to tape during surgery
- Recovery significantly better in positive suggestion group
- Guessed condition at above-chance levels

Biological Rhythms

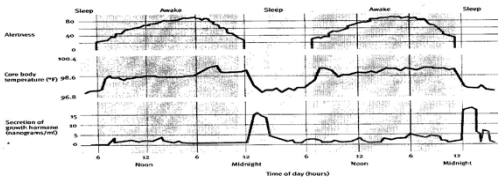
- Rhythms pervade the world around us
  - Day/night cycle
  - Seasons
  - Cycles of the moon
- Biological rhythms tied to planetary rhythms
- Contribute to changes in consciousness

Circadian Rhythms

- Biological rhythms align to day-night cycle
- Biological "clocks"
  - Time biological processes
  - Measure events
    - Occur once per day

Circadian Rhythms

- **Regulate**
  - Metabolism
  - Physiology
  - Behavior

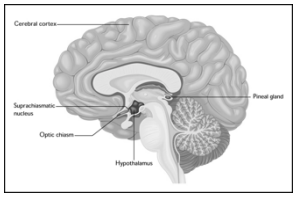


Circadian Rhythms

- Operate similarly across species
  - Common mechanism
    - Passed on through common evolutionary ancestor?
  - Outwardly similar
    - Arisen multiple times due to stimulus of nature

Setting our Biological Clocks

- Retina sends light information to SCN
  - Retinohypothalamic tract
- Suprachiasmic nucleus (SCN)
  - Located in the hypothalamus
  - Interprets information sent by retina
- Pineal gland
  - Receives information from SCN
  - Secretes melatonin

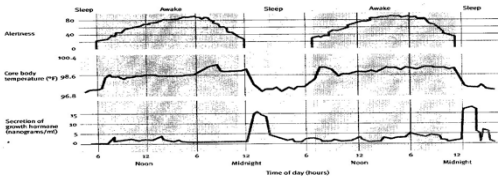


Melatonin

- Nighttime
  - Melatonin levels rise
- Daylight
  - Inhibits release of melatonin
- Absence of light cues
  - Cyclic release of melatonin
- Destroy SCN
  - Circadian rhythms disappear

Body Temperature

- Related to level of alertness and sleep/wake cycle
  - Increase in body temp = increase in alertness
  - Decrease in body temp = decrease in alertness & motivation

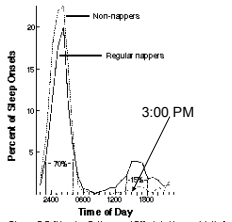


Alertness Cycles

- Usually two peak times of alertness each day
  - 9:00 AM
  - 9:00 PM
- Usually one low point in alertness each day
  - Between 1:00 PM and 4:00 PM
  - Lowest point at 3:00 PM

Napping

- Corresponds to dip in body temperature
- Common feature of sleep-wake behavior
- Easily suppressed
- Does not affect duration of main sleep or circadian cycle



From Dinges, D.F. "Napping Patterns and Effects in Human Adults." 1989

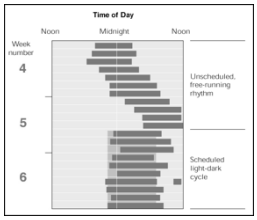
Infant Sleep

- Sleep-wake cycle initially random
- 6 weeks
  - Circadian rhythms begin
- 16 weeks
  - Circadian rhythms trained

Zeitgeber – Social cues

- Environmental time cue
  - Sunlight
  - Food
  - Noise
  - Social interaction
- Work with or against entrainment to natural light-dark cycle

Removing Environmental Cues



Elderly Insomnia

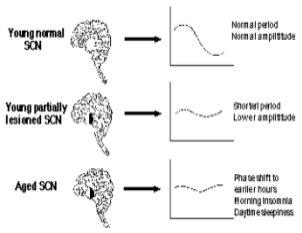
- Elderly more prone to sleep rhythm disorders
- Up to ½ of elderly Americans complain of chronic sleeping problems

Elderly Insomnia

- Less total daily sleep
- More frequent and longer awakenings
- Phase shift
- More and longer daytime naps

Elderly Insomnia

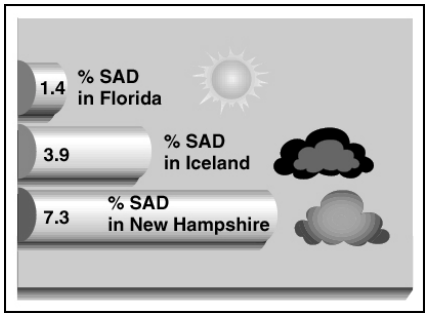
- Causes of sleeping problems are varied
- Some circadian rhythms disrupted by age
  - Amplitudes decrease with age
- Humans > 80 yrs old
  - Fewer SCN neurons
  - Smaller SCN



Sleeping Aids

- Timed bright light exposure
  - 2-4 hours
  - Administered in evening
- Resulted in improved sleep patterns
- Studies are still preliminary

Seasonal Affective Disorder



Symptoms of SAD

- Symptoms occur regularly during the fall or winter months
- Depression subsides in spring and summer months
- Symptoms have occurred in the past 2 years
  - No non-seasonal depression episodes
- Seasonal episodes outnumber non-seasonal depression episodes
- Individual craves sugary or starchy foods

Risk for SAD

- Young people and women at highest risk
- Can affect anyone
- Mild winter SAD
  - Estimated 25% of population
- Severe winter SAD
  - Estimated 5% of population

Melatonin and SAD

- Linked to SAD
- Increased production
  - Can cause symptoms of depression
- Secretion increases in darkness

Treatment of SAD

- Mild symptoms
  - Spending time outdoors during daylight
  - Arranging workplace/home to receive more light
- Regular exercise
  - Outdoors

Treatment of SAD

- Severe symptoms
  - Phototherapy
    - Suppresses brain's secretion of melatonin
    - Not an empirically proven antidepressant
  - Antidepressants
    - May have side effects

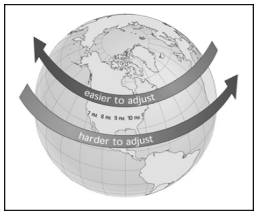
Jet Lag

- Symptoms
  - Fatigue
  - Gastorintestinal complaints
  - Shortened attention span
- Results from flying across time zones

Jet Lag

- Conflict between circadian clock and external rhythms of new time zone
- Social cues at odds with biological clock
- Environmental cues resynchronize clock
  - Light
  - Internally generated rhythms adapt at different rates

Time Zone Travel



- Direction of travel
  - West better than East
    - Easier to stay up later than go to sleep earlier
- # time zones crossed
  - 1 day of recovery for each time zone crossed
- Stress of travel increases jet lag
  - Dehydration
  - Unhealthy eating