

Objective 11/15/17



Provided notes & an activity SWBAT evaluate the cyclical nature & possible functions of sleep & identify the major sleep disorders

Agenda:

1. Do Now
2. Notes
3. Activity

Do Now



The Sleep Myths Quiz-How much do you know?

States of Consciousness



AP PSYCHOLOGY: UNIT 4



**Topic: Patterns, Theories,
Disorders, and Dreams**

Consciousness: *Biological Rhythms & Sleep*



PART ONE



Consciousness: *Biological Rhythms*



- **Biological Rhythms**

- Periodic fluctuations in physiological functioning that the body **MUST** go through

- ✦ **Impact body temperature, blood pressure, production of certain hormones, effectiveness of medications, etc.**

- Annual cycles

- 28 day cycles

- 24 hour cycles

- 90 minute cycles



Consciousness: Biological Rhythms



- **Annual Cycles**

- On an annual cycle, geese migrate, grizzly bears hibernate & humans experience seasonal variations in appetite, sleep and mood...

- Example

- ✦ **Seasonal Affective Disorder (SAD)**

- Mood disorder; dark winter months

- **28-day Cycles**

- Menstrual cycle

- Also known as an *Infradian Rhythms*

Consciousness: Biological Rhythms



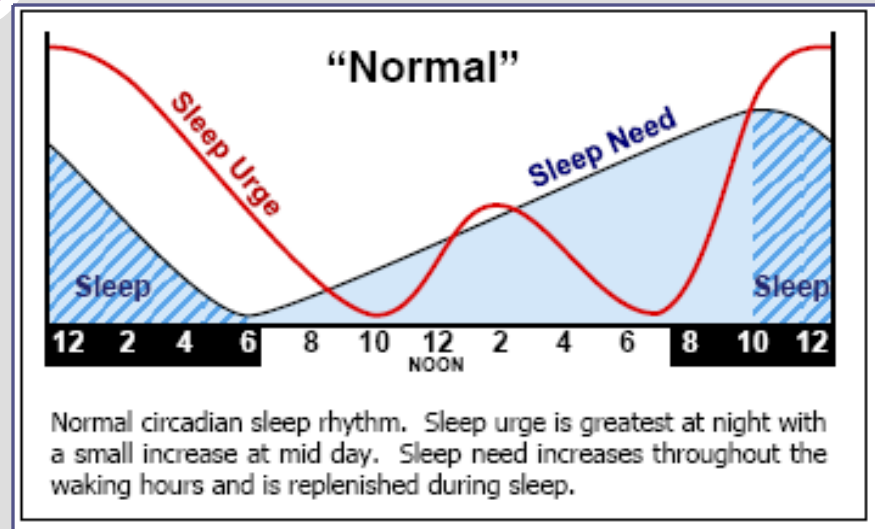
- **24-hour cycles**

- 24-hour cycles of varying alertness (*sleep-wake cycle*), body temperature and growth hormone secretion

- Also known as *Circadian Rhythms*; controlled by the brain

- **90-minute cycles**

- Humans experience various stages of sleep in a 90-minute cycle



<u>Function</u>	<u>Typical Circadian Rhythm</u>
Peak mental alertness and memory functions	Two peaks; 9:00am & 9:00pm
Lowest/highest body temperature	97°F at 4:00am/99°F at 4:00pm
Peak physical strength	Two peaks; 11:00am & 7:00pm
Peak hearing, visual, taste and smell sensitivity	Two peaks; 3:00am & 6:00pm
Lowest/highest sensitivity to pain	4:00pm/4:00am
Peak degree of sleepiness	Two peaks; 3:00am & 3:00pm
Peak allergic sensitivity to pollen and dust	Between 1:00pm and 1:00am

*****All approximations; some variation does exist!!**

Consciousness: Biological Rhythms



- **The Hypothalamus' Role**

- **The Suprachiasmatic Nucleus (SCN)**

- ✦ **A structure located deep within the hypothalamus; sensitive to changes in light; internal clock**

- **As daylight fades the SCN tells the pineal gland to secrete melatonin; SLEEPINESS!**

- **Melatonin**

- ✦ **A hormone that helps regulate daily biological rhythms**

- **Others?**

- ✦ **Serotonin? Body temperature? (*both correlational...*)**

Consciousness: *Biological Rhythms*



- **Sleep, the “*Gentle Tyrant*”**

- Two Kinds of Sleep

- ✦ REM Sleep (*Rapid Eye Movement*)

- ✦ NREM Sleep (*Non-REM*)

- Stage 1

- Stage 2

- Stage 3

- Stage 4

Consciousness: *Biological Rhythms*



- **Why do we spend a third of our lives sleeping?**

- Preservation & Protection Theory

- ✦ Elimination of waste products
- ✦ Repair of cells and brain tissue
- ✦ Strengthens immune system
- ✦ Preserves energy

- Restoration Theory

- ✦ General wear & tear; recuperation; muscles & brain relax

- Memory

- ✦ Strengthens/rebuilds fading memories

Consciousness: *The Sleep Stages*



PART TWO



Consciousness: Sleep Stages



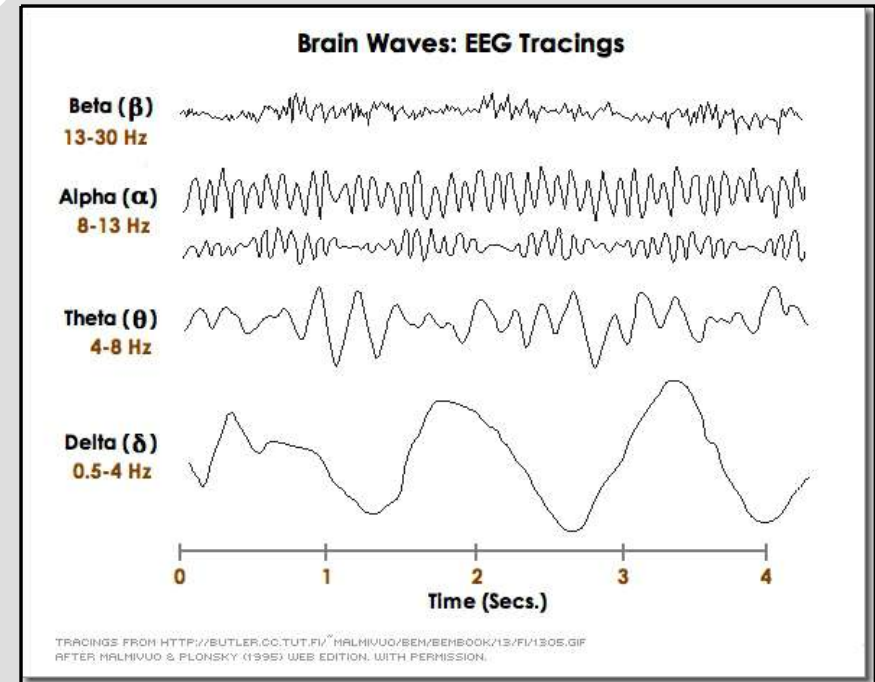
- **Stage 1: Light Sleep**

- **Brain Activity**

- ✦ Alpha waves decrease; theta waves increase

- **Characteristics**

- ✦ Breathing slows; brain waves become irregular
 - ✦ Occasional twitching
 - ✦ Hypnagogic images
 - ✦ Hypnic jerks
 - ✦ Non-REM



Easy to wake an individual in Stage 1 sleep; will insist that he or she WAS NOT sleeping!

Consciousness: Sleep Stages



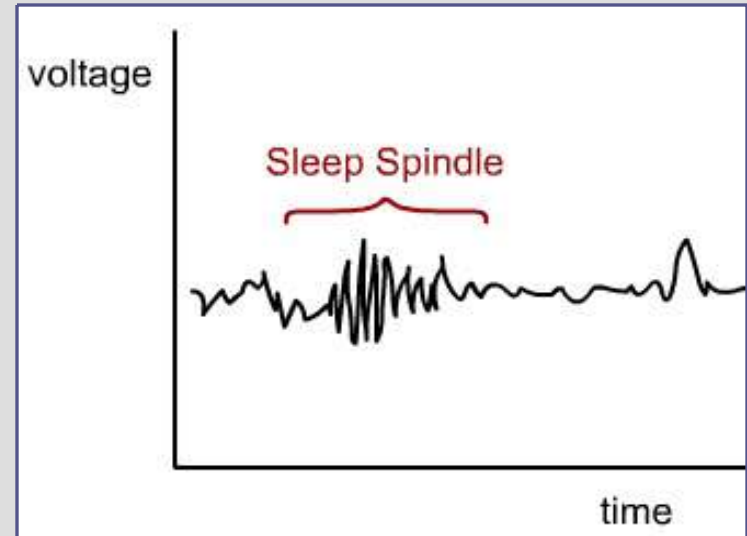
- **Stage 2: Sleep Spindles**

- **Brain Activity**

- ✦ Brain wave (*theta*) cycle slows
 - ✦ EEG sleep spindles develop; last 1-2 seconds

- **Characteristics**

- ✦ Sleep-talking
 - ✦ The first time through Stage 2 lasts approximately 20 minutes
 - ✦ Non-REM



Still relatively easy to wake an individual in Stage 2 sleep

Consciousness: Sleep Stages



- **Stages 3 & 4: Deep Sleep**

- **Brain Activity**

- ✦ **Delta waves increase
(larger & slower waves)**

- **Stage 3: 20-50% of total brain activity**

- **Stage 4: 50%+ of total brain activity; deepest stage**

- **Characteristics**

- ✦ **Growth hormones are released & peak during Stage 4**

- ✦ **The body is at its lowest level of functioning**

- ✦ **Non-REM**

Very difficult to wake an individual in Stage 4 sleep; will be confused and disoriented...

Consciousness: Sleep Stages



- **REM Sleep** (*Rapid Eye Movement*)

- **Brain Activity**

- ✦ Brain waves resemble beta (*waking*) waves

- **Characteristics**

- ✦ Body temperature rises to near-waking levels

- ✦ Eyes move rapidly & heart rate increases

- ✦ REM Paralysis

- Voluntary muscles are paralyzed during this stage

- ✦ 90% of dreams take place during REM Sleep

- ***Sometimes referred to as *paradoxical sleep*

Consciousness: *Sleep Stages*

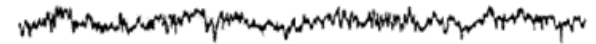


- Within any given night, humans generally pass through several 90-minute sleep cycles

- Stage 1
- Stage 2
- Stage 3
- Stage 4
- Stage 3
- Stage 2
- REM

EEG in the States of Vigilance

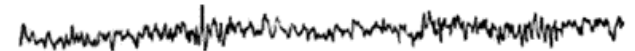
Alertness: beta waves



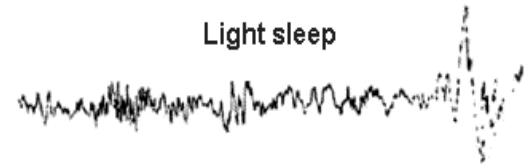
Relaxing: alpha waves



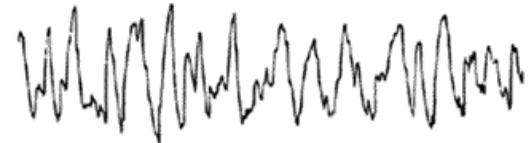
Sleeping: theta waves



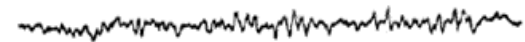
Light sleep



Deep sleep: delta waves

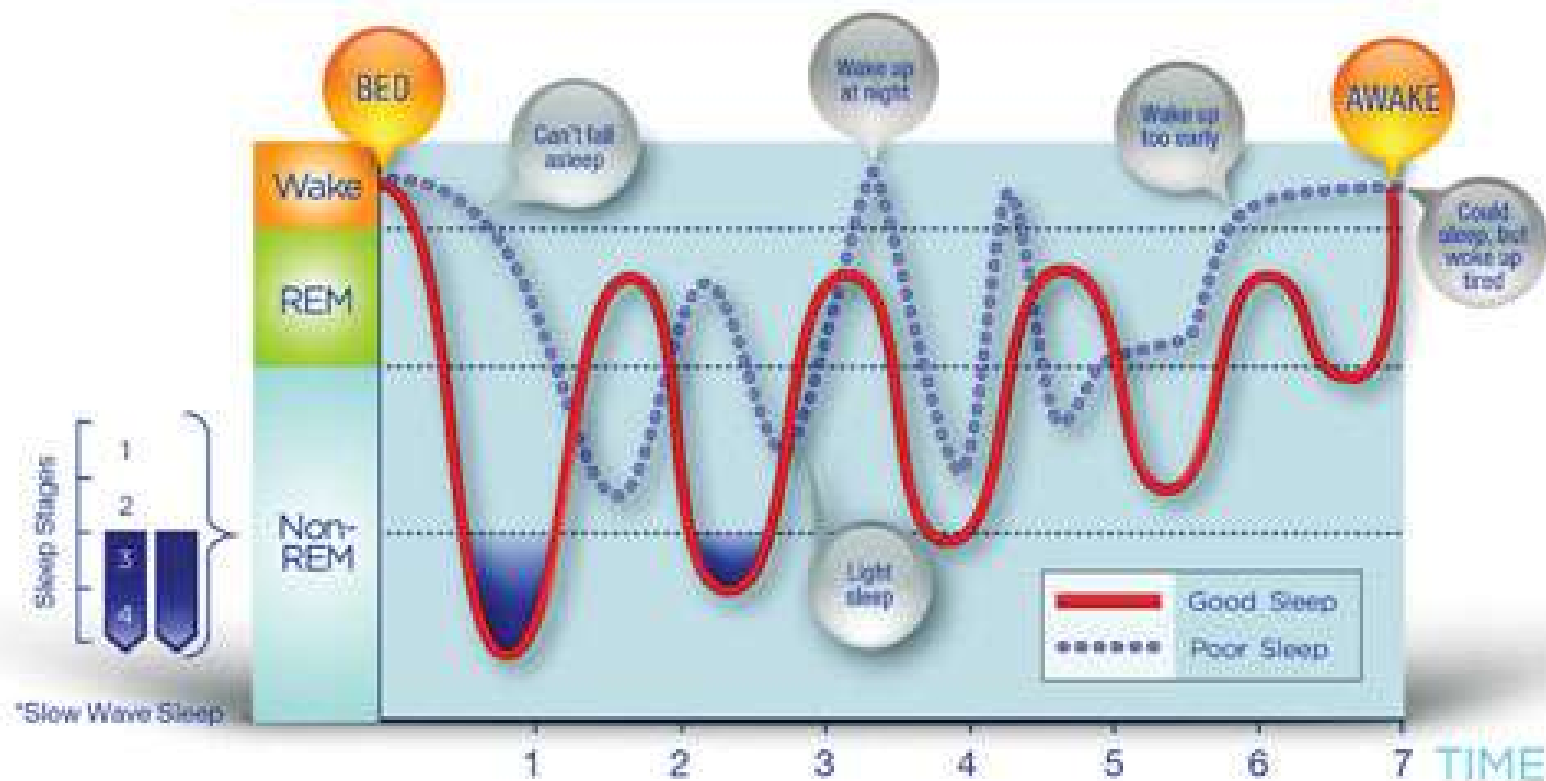


Paradoxical sleep: dreaming (REM)



SLEEP STAGE TRANSITION

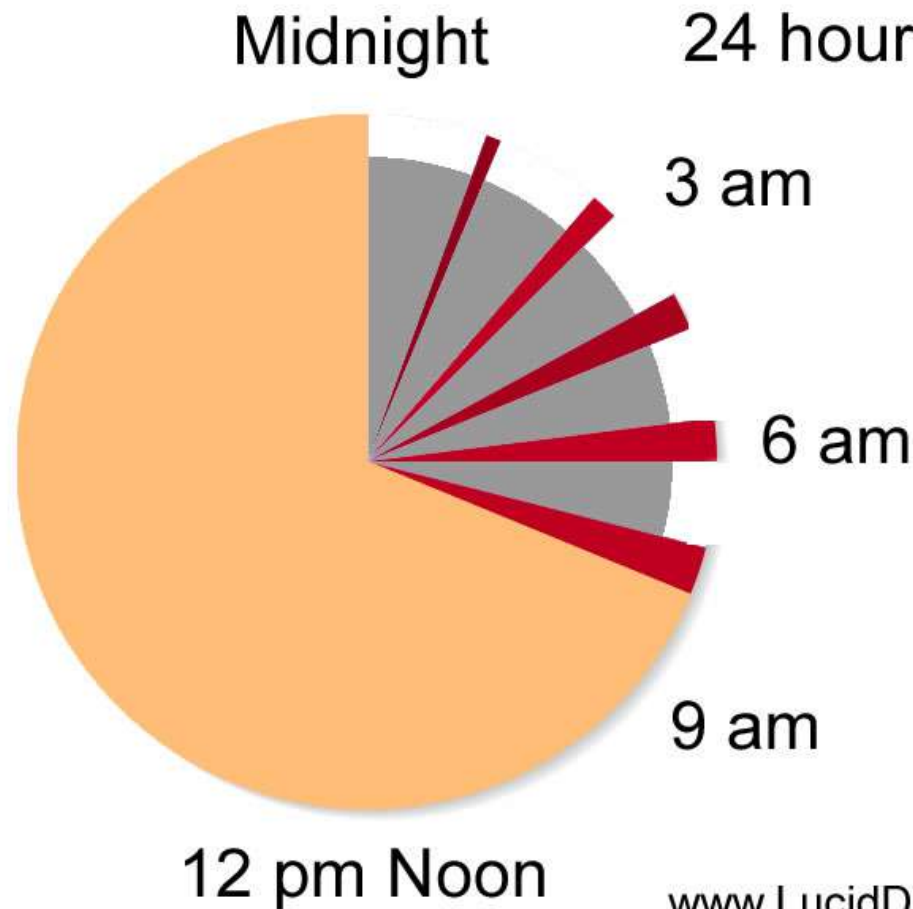
The diagram below illustrates the difference between good sleep (red line) and poor sleep (dotted line) architecture.



The red line illustrates a deep and restful sleep pattern.
The dotted line shows a more shallow and erratic sleep pattern.

Circadian Rhythm:

24 hour - sleep / dream cycle



- REM Dreaming Sleep
- Deep Sleep
- Awake

Note: This chart is based on a normal 8 hour night of sleep with a 90 minute Ultradian Rhythm.

www.LucidDreamExplorers.com/dreamscience



Consciousness: *Sleep Stages*



- **NREM versus REM?**
 - NREM – physical needs
 - REM – emotional needs
 - ✦ Potential function of REM dreams?
 - ✦ Age and time spent in REM sleep?
 - ✦ Age and differences in REM sleep?
 - REM Rebound?

Consciousness: *Sleep Issues*



PART THREE



The Hallucinations



The Second Wind



The Acceptance



Quiz: *Are you Sleep Deprived?*



- I need an alarm clock to ensure that I wake up at the appropriate time
- I struggle to get out of bed in the morning
- I hit the snooze button several times before I get up
- I feel tired, irritable and stressed out during the week
- I have trouble concentrating and remembering
- I frequently feel slow with regards to critical thinking, problem solving and being creative
- I often fall asleep while watching TV
- I often fall asleep during meetings or in warm rooms

Quiz: *Are you Sleep Deprived?*



- I often fall asleep after heavy meals
- I often fall asleep while relaxing after dinner
- I often fall asleep within five minutes of getting into bed
- I often feel drowsy while driving
- I often sleep extra hours on weekend mornings
- I often need a nap to get through the day
- I have dark circles under or around my eyes

Consciousness: *Sleep Issues*



- **Sleep Deprivation...**

- Decreases the efficiency of the immune system
- Decreases productivity & the efficiency of memory
- Increases safety and accident issues
- Contributes to hypertension, impaired concentration, irritability, etc.
- Potential impact on weight?

Consciousness: *Sleep Issues*



- **Insomnia**

- Chronic problems in getting adequate sleep

- Three basic patterns

- ✦ Difficulty in falling asleep

- ✦ Difficulty in remaining asleep

- ✦ Persistent early morning awakening

- Causes?

- ✦ Anxiety, depression, health issues, drugs, etc.

- 1 in 10 adults complain of insomnia

- ✦ Common (*though unhelpful*) “treatments”

- Effect of alcohol and sleeping pills?

Who's Most Prone to Insomnia?

It's not uncommon for most of us to have trouble sleeping at some point. But certain groups of people are at a higher risk for insomnia than others. Find out what puts you at risk, what the consequences of excessive fatigue are and how to get treated.



More than **70 million** Americans have sleep disorders



CONSEQUENCES

health
Daytime drowsiness, fatigue, compromised reaction times, anxiety, irritability and depression are all consequences of poor sleep



vehicular
#1
The number one reason couples avoid/delay sex is exhaustion

60% of people have driven while tired in the last year
37% (more than 1/3) have fallen asleep at the wheel



Treatment

Some lifestyle changes may be useful



Sources:
<http://www.better-sleep-better-life.com/insomnia-statistics.html>
<http://www.better-sleep-better-life.com/insomnia-in-children.html>
<http://www.sleepmed.md/page/1896>
<http://www.ncbi.nlm.nih.gov/health/health-topics/topics/insom/>
<http://www.insomnia911.com/insomnia-facts/statistics.htm>
<http://sleep-sense.com/1a/insomnia-statistics/>
<http://www.cna.com/2011/09/01/health/insomnia-cost-productivity/index.html>
http://pediatrics.about.com/od/sleep/a/0107_insomnia.htm
[www.sleepandyou.com/about-sleep-stats.htm](http://sleepandyou.com/about-sleep-stats.htm)

CanadaDrugCenter.com

America's Choice for Affordable Medications
1-877-270-3794

Consciousness: *Sleep Issues*



- **Nightmares**

- Anxiety-arousing dreams that lead to awakening, usually from REM sleep
 - ✦ Difficulty in going back to sleep
 - ✦ Usually occur in the early morning hours
 - ✦ Generally associated with stress

Consciousness: *Sleep Issues*



- **Night Terrors**

- Abrupt arousal from NREM sleep (generally Stage 4) accompanied by intense autonomic arousal (e.g. rapid heart rate, perspiration, etc.) and feelings of panic
 - ✦ Victims may scream or bolt upright & then stare into space; do not recall a coherent dream
 - ✦ Panic fades quickly
 - ✦ Most common in children ages 3 to 8
 - ✦ Night terrors are NOT nightmares!

Consciousness: *Sleep Issues*



- **Somnambulism (Sleep-Walking)**

- Occurs when a person arises and wanders about while sleeping; 15 seconds to 30 minutes

- ✦ Generally occurs during the first three hours of sleep
- ✦ 15% of children and 3% of adults exhibit persistent sleepwalking
- ✦ Generally goes away as one ages...



Consciousness: *Sleep Issues*



- **Narcolepsy**

- Periodic and overwhelming sleepiness that leaves individuals falling asleep while talking or standing up
 - ✦ May collapse directly into REM sleep; can last up to 5 minutes

- **Sleep Apnea**

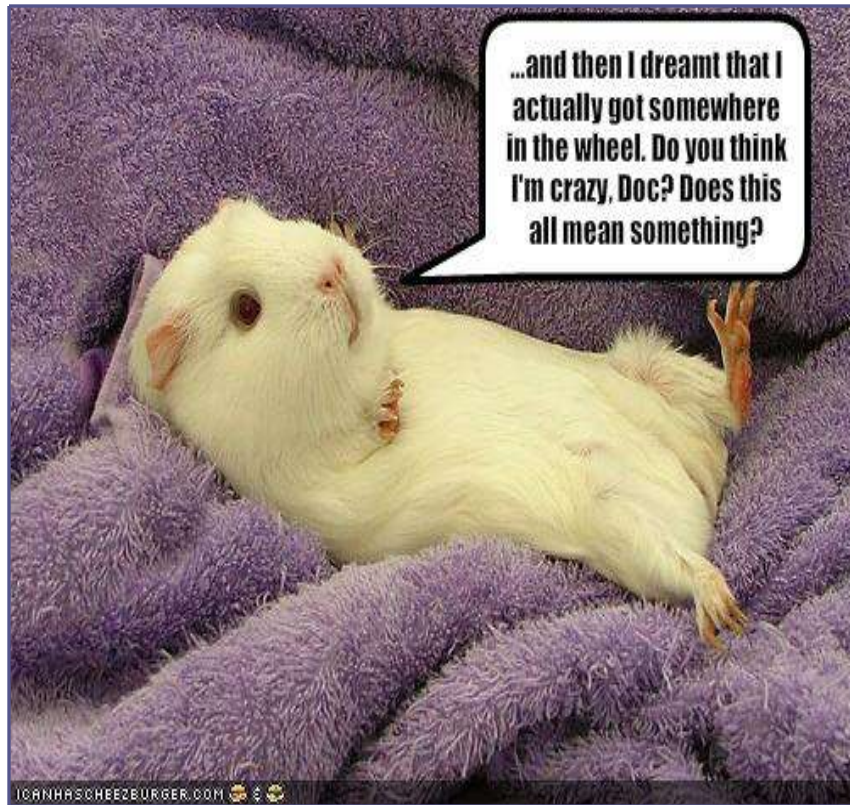
- Failure to breathe when asleep; many repeated awakenings
 - ✦ Most prominent in overweight males
 - ✦ Loud snoring

Consciousness: *Sleep Issues*



- **Bruxism**
 - Teeth grinding
- **Enuresis**
 - Bed wetting

Consciousness: *Dreams*



PART FOUR

Consciousness: *Dreams*



- **Dreams**

- Sequence of images, emotions & thoughts that pass through a sleeping person's mind

- **Lucid Dreams**

- ✦ **Awareness of one's dreams**

- Typically happens when the dreamer experiences something strange

- Stop to question their reality

- Realize they are in a dream



Consciousness: *Dreams*



- **Average number of dreams?**
 - 4 to 5 times per night
 - 90 minutes apart during REM (sleep cycle)
- **Range**
 - First dream: 10 minutes
 - Last dream: 30 minutes



Consciousness: *Dreams*



- **Most researchers agree that dreams reflect our waking thoughts, fantasies and emotions**
 - Calvin Hall (dream researcher; 1966)
 - ✦ Dreams reflect everyday & mundane events
 - ✦ Dominated by emotionally significant people
 - ✦ Almost ALWAYS from a first-person perspective
 - ✦ Self-centered; we dream about ourselves
 - Link between dreams and waking life?
 - ✦ Day Residue (Sigmund Freud)
 - ✦ External stimuli (William Dement & H₂O)
 - Culture and dreams?

Consciousness: *Dreams*



- Chased/pursued (81.5)
- Rapid falling (76.5)
- Sexual experiences (73.8)
- Teachers/studying (67.1)
- Being late (59.5)
- Verge of falling (57.7)
- Death (54.1)
- Trying again & again to do something (53.5)
- Flying/soaring (48.3)

- Failing exam (45.0)
- Being attacked (42.4)
- Frozen with fright (40.7)
- Back from the dead (38.4)
- Being a child again (36.7)
- Being killed (34.5)
- Swimming (34.3)
- Insects/spiders (33.8)
- Being nude (32.6)
- Being inappropriately dressed (32.5)

Consciousness: *Dream Theories*



PART FIVE



Theory: Wish-Fulfillment



- **Sigmund Freud**

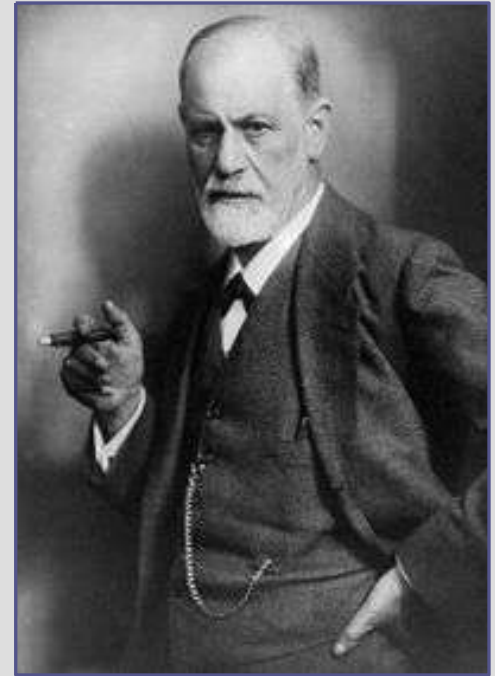
- **The Interpretation of Dreams (1900)**

- ✦ **An expression of unconscious desires & internal conflicts; provide a safety valve by which to dispose of unacceptable feelings**

- ✦ **Unconscious may try to censor & disguise true meaning of dreams**

- ✦ **Manifest Content v. Latent Content**

- **What is required to decipher the latent content of one's dreams?**



Theory: *Cognitive Problem-Solving*



- **Rosalind Cartwright**

- Dreams provide an opportunity to work through everyday problems & emotional issues; continuity between waking & sleeping thought

- ✦ Allows for creative thinking with regards to pressing personal issues because dreams are not restrained by logic or realism



Theory: Activation-Synthesis



- **J. Allan Hobson (and McCarley)**
 - Dreams are the side effects of the neural activation that produces beta brain waves during REM sleep
 - ✦ Neurons that fire periodically in the pons inhibit voluntary movement & send random signals to the cortex
 - ✦ The cortex synthesizes/constructs a dream from memories and other stored information in order to make sense of these signals
 - The frontal lobes are more-or-less shut down during dreaming; significance?
 - Criticisms?
 - ✦ Activation-Information-Mode Model (AIM)

Other Dream Theories



- **Information Processing**

- Dreams may help sift, sort and fix a day's experiences in our memories

- **Physiological Function**

- Dreams provide the sleeping brain with periodic stimulation to develop and preserve neural pathways