Consciousness

“I think, therefore I am.”

Rene Descartes

“I think, therefore I am... I think.”

George Carlin

Consciousness
What is consciousness?

Altered States of Consciousness

• Sleep & Dreams
• Hypnosis
• Meditation
• Drugs
What is consciousness?

*Consciousness* = awareness of ourselves and our environment

- Consists of all sensations, perceptions, memories, and feelings you are aware of at any instant
- We spend most of our time in *waking consciousness* – the state of clear, organized alertness
How do we know that consciousness exists?

- Early psychologists said consciousness did not exist
  - William James -- Can’t be observed so can’t be measured
  - John Watson – behaviorist – only study observable behaviors
    - Since consciousness not observable, can’t be studied
Later psychologists have proven it does exist

• Just because you can’t touch it, see it, measure it directly, doesn’t mean it doesn’t exist. That means it is a…

• …psychological construct

• Know they exist because of how it affects behavior -- it makes you behave in certain ways

• The behaviors can be measured – are quantifiable

• Give examples of behavior that demonstrate that consciousness is a real thing

• Other examples of psychological constructs?

• Intelligence, emotion, personality
Sigmund Freud -- early proponent of the existence of consciousness

For him consciousness analogous to an iceberg

- Said only actively aware of thoughts and perceptions – only mental processes at the **conscious level** (about 10%)

- Just below that – at **preconscious level** – are memories and stored knowledge (about 10-15%)
  - Can move them easily to conscious level if needed

- Below that is the **unconscious level** – where our deepest feelings and fears are hidden – can’t be made available voluntarily
What is consciousness? (cont.)

More contemporary psychologists continue to define consciousness and where it “resides” in the brain

“The Quest to Understand Consciousness” – Antonio Damasio

- [http://www.ted.com/talks/antonio_damasio_the_quest_to_understand_consciousness?language=en](http://www.ted.com/talks/antonio_damasio_the_quest_to_understand_consciousness?language=en)
- This TED Talk from 2011 is pretty deep – feel free to ask any questions or share any comments as we watch
- After we finish this and you have completed your reflection, be prepared to answer the following questions
  - How does he define consciousness? What does he say are its components?
  - What evidence does he give to back up his assertions?
  - Do you agree or disagree with him? Why or why not?
  - One of the comments on the webpage for this talk asks if he has identified the location of the “soul.” What do you think about that?
So, what is consciousness?
What is it made of?
How do we know it exists?
Describe Freud’s theories about consciousness.
Consciousness Unit Outline

What is consciousness?

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Describe someone who is “unconscious.”

- Did you say “asleep?” That is not unconscious
- Those who are “unconscious” are dead
- People asleep are experiencing an *altered state of consciousness*
  - Distinct shifts, but not complete elimination, in perceptions, emotions, memories, time sense, thoughts, feelings of self-control, and suggestibility

The rest of this unit will focus on different *altered states of consciousness.*
What is consciousness?

Altered States of Consciousness

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What is sleep?

- Sleep consists of different stages of altered consciousness
  - Stage 1, Stage 2, Stage 3, Stage 4, REM
    - Brain activity differs in each stage
    - We cycle through these stages 5-6 times a night

Periods of sleep and wakefulness are predictable – it's one of the many biological rhythms

- In that way they follow a predictable sleep patterns
- Typically 7 to 8 hours of sleep followed by wakefulness for about 16 hours
  - However, without the sun's time markers, most operate on a 25 hour cycle!
Sleep & Dreams (Cont.)

The Stages of Sleep

- Stages 1-4 also known as NREM sleep

- Small, irregular waves, some “alpha”

- Appearance of “sleep spindles”

- Long, slow “delta” waves begin to appear

- Almost all “delta” waves

- REM – waves similar to Stage 1. Most dreaming occurs here – experience paralysis

- 4-5% Light sleep. Muscle activity slows down. Occasional muscle twitching.

- 45-55% Breathing pattern and heart rate slows. Slight decrease in body temperature.

- 4-6% Deep sleep begins. Brain begins to generate slow delta waves.


- 20-25% Rapid eye movement. Brainwaves speed up and dreaming occurs. Muscles relax and heart rate increases. Breathing is rapid and shallow.

Sleep Stages

- Wake
- REM
- Stage 1
- Stage 2
- Stage 3
- Stage 4
- Stage 5

REM Sleep Cycle

- Deep Sleep (SWS)
- Dreaming (REM)
Why do we need sleep?

• Yes, the entire body needs rest to recover and rejuvenate

• *Dual process hypothesis* of sleep says both REM and NREM sleep help the brain refresh itself and store memories
  
  • NREM – calm the brain after day’s exertion; helps us forget “unimportant” events from the previous day so they don’t interfere with remembering the important stuff
  
  • REM – sharpens our important memories from the previous day

• Russell Foster “Why Do We Sleep” TED Talk
  
  • [http://www.ted.com/talks/russell_foster_why_do_we_sleep.html](http://www.ted.com/talks/russell_foster_why_do_we_sleep.html)

• Good follow up and suggestion for Independent Investigation
  
  • “Awakening to Sleep” (from Jan 2013 APA Monitor)
    
So, what is sleep?

How is sleep structured?

What is the difference between the different stages of sleep?

Why do we need sleep?

What does NREM sleep for us? REM sleep?
Sleep Disturbances

• Lots of them

  • Hypersomnia, Insomnia, Narcolepsy, Nightmare Disorder, Periodic limb movement syndrome, REM behavior syndrome, Restless leg syndrome, Sleep apnea, Sleep drunkenness, Sleep terror disorder, Sleep-wake schedule disorder, Sleepwalking disorder

• The AP folks ask us to concentrate on a select number of these in this unit
**Insomnia**

- Difficulty in getting to sleep or staying asleep
- Temporary insomnia
  - Lasts less than 3 weeks
- Chronic insomnia
  - Happens regularly; lasts more than 3 weeks
- Both temporary and chronic insomnia are caused by vicious cycles of worry
  - First, excess mental activity/heightened arousal block sleep
  - Then, you freak out about not falling asleep, which causes more worry and arousal
  - Which freaks you out even more

So, how can you break this cycle?
How to defeat temporary and chronic insomnia

- All the following are helpful – try them all
  - *Stimulus control*: Regular sleep schedule every day; don’t do anything else in bed but sleep (no TV, reading, etc.)
  - *Sleep restriction*: Don’t nap during if suffering from insomnia; stay up until normal bedtime
  - *Paradoxical intention*: Accept you are not going to sleep; reduces anxiety about not sleeping
  - Relaxation: Progressive muscle relaxation, mediation, think about calming images
  - Exercise: During the day well before bedtime
  - Avoid Stimulants/Alcohol: Especially before bedtime
  - Food intake: Carbs!
Drug-Dependency Insomnia

- Sleep loss caused by withdrawal from sleep aids
  - Non-prescription OTC sleep aids really don’t work well in the first place
    - May become physiologically dependent though
  - Barbiturates decrease Stage 4 and REM sleep, so you end up building up sleep debt for these stages
  - Ambien and Lunesta are better, but many users still suffer side effects
    - Only temporary fixes for insomnia
Sleepwalking/Sleeptalking

• aka *Somnambulism*

• Remember, sleeping is an altered state of consciousness, so we can still do some things

• Occurs during Stages 3 and 4 when we are not paralyzed (i.e. doesn’t happen during REM sleep)

  • So, are sleepwalkers dreaming?
**Nightmares and Night Terrors**

• Nightmares happen during REM sleep
  • Are just bad dreams
  • Paralyzed during them; usually remember if wake up after it

• Night terrors happen during stage 4
  • Terrifying hallucinations that last 15-20 minutes
  • Can sit up/scream; don’t remember much of it afterward
Sleep & Dreams (Cont.)

Sleep Apnea

- Repeated interruption of breathing during sleep
  - 20 seconds to 2 minutes
- Caused by brain not sending signals to the diaphragm or blockage of the upper air passages
- Common treatment: Continuous Positive Airway Pressure (CPAP) machine
- Suspected cause of SIDS
Narcolepsy

- Sudden, irresistible sleep attacks
- “Narcolepsy News Segment” from CNN 7/17/08 (7:34)
  - https://www.youtube.com/watch?v=OuEDV1hBYw
Describe the symptoms and causes of the following sleep disturbances

- Insomnia
- Sleepwalking/Sleeptalking
- Nightmares
- Night terrors
- Sleep apnea
- Narcolepsy
Dreams

Most vivid dreams are in REM sleep

Dream almost every time we are in REM sleep

- Therefore, we dream 4 – 5 times a night
- Those we remember happen just prior to waking up
- Occur in real time
- Three theories: Psychodynamic, Activation-Synthesis, Neurocognitive
Psychodynamic Dream Theory

- Sigmund Freud theorized dreams reflect person’s unconscious wishes/urges
  - Called them “the royal road to the understanding of unconscious mental processes.”
- Furthermore, thought that unacceptable unconscious wishes would be most likely to appear in dreams
  - Believed that people dream in symbols
  - Thought symbolic dreams give people way to deal with painful material that they cannot deal with consciously
- *Interpretation of Dreams* (1900)
Activation-Synthesis Hypothesis

• Some scientists believe dreams begin with biological, not psychological activity

• Believe neurons fire at random in a part of the brain that controls movement and vision

• For them dreams are meaningless

Neurocognitive Dream Theory

• Brain tries to make sense of these random firings based on recent and/or important events
  • In trying to make sense of these random firings, we create a story – a dream

• Might be an explanation why we often dream about things that happened earlier that day and/or things that matter to us
When do we dream, usually?

What are the theories on why we dream?

Before we talked about REM sleep and its role in “pruning” memories. If you subscribe to the neurocognitive dream theory, how do dreams help with that process?
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**Hypnosis** is an altered state of consciousness characterized by narrowed attention and increased suggestibility.

- Put “narrowed attention” and “increased suggestibility” into your own words.

So pop culture representations of people hypnotized are not entirely accurate.

Subject feel very relaxed and easily follow suggestions without thinking about it.

- **Basic suggestion effect** – carrying out suggested actions involuntarily.
Three theories regarding hypnosis

1) *Role theory*

- States some people are more easily hypnotized than others – they have different levels of *hypnotic susceptibility*
  - The predisposition to execute suggested actions
  - These people also tend to have richer fantasy lives, follow directions well, and/or can focus on a task for a long period of time
  - This suggests hypnosis is a social phenomenon, not an altered state of consciousness
    - Just more willing to fulfill a societal role
Hypnotic susceptibility can be measured by the *Stanford Hypnotic Susceptibility Scale*

- Published in the early 1960s -- 12 items of progressive difficulty, 50’ to complete
  - Script is online if you are interested in reviewing it
- Determines how susceptible subjects are to different suggestions
  - Higher the score the more susceptible one is to being hypnotized
2) **State theory**

- States under hypnosis we become either more or less aware of our environment
  - Therefore proponents of this view definitely believe it is an altered state of consciousness
- Point to some people realizing dramatic health benefits, like pain control and reduction in specific physical ailments
3) *Dissociation theory*

In the 1950s and 60s, Ernest Hilgard explained that hypnosis causes us to divide our consciousness voluntarily:

- One part of our consciousness responds to the suggestions of the hypnotist, while another retains awareness of reality.
- Says there is a *hidden observer* that monitors what is happening while another obeys the hypnotist's suggestions.
What can hypnosis do?

- Change perception
- Pain relief
- Smell
- Sight
- Hearing
- Many more
- Help subjects relax
- Help patients have more successful experiences in therapy

So, what can’t hypnosis do?

- Make us stronger
- Help to recall memories
- Long-term amnesia
- Act against their will
- Modify behaviors

“Hypnosis for Pain Relief” -- You Tube 4:03
http://www.youtube.com/watch?v=ZqYpc8FAb64
The book says stage hypnosis is generally a bunch of bullpoop. Do you agree or disagree? Why?
Hypnosis (cont.)

Compare the three theories of hypnosis.
Based on what you know right now, do you think hypnosis is an altered form of consciousness? Why or why not?
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Meditation: a process where you try and narrow your consciousness so that the stresses of the outside world fade away – you are trying to lose your self-awareness

- Two types
  - **Concentrative meditation**
    - Attend to a single focal point, such as an object, thought, or behavior (like breathing)
  - **Mindfulness meditation**
    - Widen your attention to become aware of everything in your environment at the same time
    - Tougher to do than concentrative meditation
Examples of concentrative meditation throughout history include:

• Egyptians gazing upon an oil burning lamp
• Yogis of India staring at an intricate pattern on a vase or carpet
• Repeating sounds such as “OM” – called a mantra

Demonstration – close your eyes, repeat a single word over and over in your head for about a minute

• What did you think about?
• What did you feel once you were able to only concentrate on that one word?
Key to successful concentrative meditation is to focus mentally only on one peaceful, repetitive stimulus from the environment so that one stimulus becomes only thing you are conscious of

- Sensory deprivation can facilitate the process. Why?
- Stop focusing on other stresses, worries, etc., allowing your body to relax

Benefits of meditation: lowered heart rate, blood pressure, muscle tension, other stress symptoms

- Not just reduces symptoms, but actually reduces stress
Yoga

A group of ancient spiritual practices originating in India – connected to religious belief and practices

Thought to lead to a spiritual experience and profound understanding or insight into the nature of existence

Numerous opinions on what the goal of yoga may be

- Range from improving health and fitness, to liberating yourself from the Hindu belief that life is a cycle of death and rebirth

At the very least it is an effective form of mediation that will help you relax

Discuss “What are the health benefits of Yoga?” handout
Compare concentration mediation vs. mindfulness mediation.

How does sensory deprivation fit into this?
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Drugs

*Psychoactive drugs* change the chemistry of the brain; induce an altered state of consciousness

- Although sometimes we act “under the influence” if we think we ingested a drug (placebo effect)

Changes brain chemistry one of two ways

- Drug molecules are able to pass through the *blood-brain barrier*
  - Those that mimic neurotransmitters are called *agonists*
    - Molecules fit into receptor sites neuron – causes neuron to fire
  - Those that prevent neurotransmitters from working are called *antagonists*
    - Molecules fit into receptor sites neuron clogging them – prevent natural neurotransmitters from fitting
Either way, since body isn’t using as many natural neurotransmitters any more, it stops making as much – this leads to an increase in *tolerance*.
Increase tolerance is related to **physical withdrawal** if one stops taking the drug.

- Uncomfortable symptoms caused by a lack of chemicals filling receptor sites (either the drug or what usually would be naturally made by the body).

**Psychological withdrawal** is related to an intense desire for the drug because they are convinced they need it in order to perform or a certain way.

Both types of withdrawal are powerful motivators for use and abuse.
Four classes of drugs

1) **Stimulants**

- Speed up body processes, including ANS functions like heart and respiration rate – accompanied by a sense of euphoria
- Examples?
  - Cocaine
  - Amphetamines
  - Caffeine
  - Nicotine
- All produce tolerance, withdrawal, and other side effects – severity depends on the power of the drug
2) Depressants

- Slow down the same ANS functions
- Also slows down reaction and judgment because it slows down brain function
- Excess can affect cerebellum (motor coordination)
- Euphoria also accompanies the depressing effects
- Also produce tolerance and withdrawal
- Examples?
  - Alcohol
  - Barbiturates
  - Anxiolytics (aka tranquilizers like Valium)

"Teen Drinking May Cause Irreversible Brain Damage" – NPR (4:48)
3) \textit{Hallucinogens}

- Alters perception, a loss of identity, and/or vivid fantasies
- Chemicals can stay in body tissue for extended period of time – can cause recurrence of symptoms
- Furthermore, ingestion of even a little amount a little later can combine with what is there – very strong effect possible – called \textit{reverse tolerance}

- Examples?
  - LSD
  - Peyote
  - Psilocybin mushrooms
  - Marijuana
4) **Opiates**

- Act as agonists for endorphins
  - Powerful painkillers and mood elevators
  - Cause drowsiness and euphoria
  - VERY addictive – rapidly change brain chemistry and create tolerance/withdrawal symptoms
- Examples?
  - Opium
  - Morphine
  - Heroin
  - Methadone
  - Codeine
- [http://abcnews.go.com/ThisWeek/video/week-heroin-crisis-22433623 (8:23)]
What is the difference between agonists and antagonists?

What is the difference between physical withdrawal and antagonists?

Compare the four classes stimulants, depressants, hallucinogens, and opiates.