Consciousness and the Two-Track Mind
Modules 7-10

**Module 7: The Brain & Consciousness**

**Consciousness:** The process underlying the mental model we create of the world of which we are aware.
-It is also a part of the mind from which we can potentially retrieve a fact, an idea, an emotion, or a memory and combine it with critical thinking.

Can you make an argument that you are who/what your consciousness allows?

The Big Challenge
In psychology, the big challenge presented by consciousness is that it is so subjective and illusive.

How do we prove that we have consciousness?

Competing Views (review of CH 1)
-*Structuralists* used introspection (self-reporting) to find the boundaries of conscious thought.
-*Behaviorists*, like John Watson, sought to take the mind out of psychology. After all, he argued, there is no real way to see inside of it.
-As a result, psychology became a science of behavior without a consciousness or a mind.

The Mind Returns
-In the 1960s, psychologists began to question the behaviorist model for two reasons.
-First, there were psychological issues which needed better explanation than behaviorism could offer.
 Quirks of memory, perceptual illusions, drug induced states (very popular in the 1960s)
-Second, technological innovations let psychologists look at the brain in ways that Watson had never dreamed about.

**Cognitive neuroscience** involved cognitive psychology, neurology, biology, computer science and linguistics.

**The Conscious Mind**
-The conscious mind can take on a variety of roles, but it must focus sequentially on one thing and then another.
-Multitasking is not all it is cracked up to be.

**The Nonconscious Process**
-The nonconscious mind is great at multitasking. Where the conscious mind has the ability to focus on just one task, the nonconscious mind has no such restrictions.
-The conscious mind has to process things serially, while the nonconscious mind can handle many streams of information at the same time, called **parallel processing**.

Walking, chewing gum and breathing

What Consciousness Does
**Our consciousness has 3 main functions:**
1. Consciousness restricts our attention.
 It keeps our brain from being overwhelmed by stimulation by processing things serially and limiting what we notice and think about-this is called ***selective attention***
2. Consciousness provides us with a mental “meeting place.”
 Where sensation combines with memory, emotions and motives-this is the binding problem
3. Consciousness allows us to create a mental model of the world that we can manipulate.
 Unlike other, simpler organisms, we are not prisoners of the moment: We don’t just act reflexively to stimulation.
 Humans are the only animal with the ability to set goals.

**Mental Imaging**We can use our conscious mind to “zoom in” on an image, or to manipulate it.Lets try it….Close your eyes.Picture a cat.

The Results
Is the cat black? Does it have a long tail? Does it have a collar on? Does it have short hair? Does it have white paws?
-Psychologists have found that the smaller the detail, the longer people take to respond.

**Levels of the Nonconscious Mind**There are two levels of the nonconscious (subconscious) mind: *preconscious* and *unconscious.*

***Preconscious memories:*** Information that is not currently in consciousness, but can be recalled voluntarily.
***Unconscious*:** Cognition (thought) without awareness.
 Involves levels of brain systems that range from autopilot to those which can have subtle influences on consciousness and behavior.

**What is Unconsciousness**A dictionary might define the term as being a loss of all consciousness, like when a person faints.But in psychology, we define it a little differently. To show this, let's look at an example.

Fill in the blanks to complete the word below:
D E F \_ \_ \_
Answer
Using a technique called **priming**, psychologists can have some influence on the answer people give.

This idea of priming is similar to asking “leading questions” in court, or ***framing***questions by asking them in a way which increases the likelihood of certain answers.

There were a number of possible answers to the example: defend, defeat, defect, defile, deform, defray, defuse and **define.**
There is an increased likelihood you chose define. Why?

**Freud’s View of Consciousness**According to Freud, there are three levels of consciousness: **1. Conscious:** this is the part of the mind that holds what you’re aware of. You can verbalize about your conscious experience and you can think about it in a logical fashion. **2. Preconscious:** ordinary memory. Although things stored here aren’t in the conscious, they can be readily brought into conscious. **3. Unconscious:** Freud felt that this part of the mind was not directly accessible to awareness. A dump box for urges, feelings and ideas that are tied to anxiety, conflict and pain. These feelings and thoughts have not disappeared and are exerting influence on our actions and our conscious awareness

**Freud’s View of Consciousness**-The ***ego*** is based on the reality principleUnderstands that other people have needs and desires and that sometimes being impulsive or selfish is bad-meet the needs of the id, with in reason. **-**The ***id*** is based on our pleasure principle. The id wants whatever feels good at the time, with no consideration for the reality of the situation.The ***superego*** is the moral part of us and develops due to the morals and ethics of our parents. Many equate the superego with the conscience as it dictates our belief of right and wrong.

**The ego is the strongest so that it can satisfy the needs of the id, not upset the superego, and still take into consideration the reality of every situation**

**Freud’s View of the Unconscious
-**Freud’s ideas have largely lost support in the psychology community, but in society as a whole, they still have lots of support. **-**One of Freud’s main ideas was that the unconscious mind served as a mental dungeon where terrible urges and threatening memories were kept “locked up” and outside of awareness. **-**Freud said that the unconscious mind had an especially important role in our relationships. **-**He said we chose mates who are, on an unconscious level, just substitutes for our fathers and mothers.Oedipus Complex, Electra Complex and Penis Envy

**Nonconscious Mind Reality
-**For the most part, the nonconscious mind seems to devote its resources to simple background tasks such as screening the incoming stream of sights, sounds, smells and textures. **-**It alerts us to important things, like someone saying our name in a crowded room.

**Daydreaming**

**Daydreaming:** A common (and quite normal) variation of consciousness in which attention shifts to memories, expectations, desires or fantasies and away from the immediate situation.
-Most people daydream everyday, however, it is much more common amongst younger adults.
-Daydreams serve valuable functions such as planning and problem solving.

**Waking Consciousness**

**Daydreams and Fantasies**
-Everyone fantasizes.
-Fantasizing or daydreaming may help reduce stress, or help us to "practice" for future events (adaptive).
4% of the population fantasizes so vividly that they have a **Fantasy-prone personality.**
 As adults, they spend more than half their time fantasizing, which eventually leads to difficulties sorting fantasy from reality

**Module 8: Sleep and Dreams**

**Biological Rhythms:**
-Periodic physiological fluctuations which affect body processes like temperature, blood pressure, and the effectiveness of medicines.
-We are aware of some of these rhythms, but most run on autopilot and aren’t given a second thought.

**3 Main Biological Rhythms
1. Circadian Rhythms:** Occur once during a 24 hour period;
 Ex. Sleep-wake cycle **2. Ultradian Rhythms:** Occur more than once a day.Ex. Various stages of sleep each night **3.Infradian Rhythms:** Occur once a month or a season.Ex. Bears hibernating

**Why we sleep
-**Originally psychologists thought we slept because our neurons disconnected from each other causing us to simply “drift off.” **-**In reality, we do not have complete answers as to what causes us to sleep.

**What We Do Know
-**We do know that the hypothalamus is the control center for our 24 hour rhythm of sleep.  **-**The hypothalamus senses changes in light and dark and sends neurological messages to your brain and body that put you to sleep. **-**One of these neurological transmitters is melatonin, a hormone connected to the wake-sleep cycles that builds up while we sleep.

**Theories of Sleep**While we do not know for sure why, sleep may have evolved for a few reasons. **1.** Sleep protects us-evolutionary theory **2.** Sleep helps us recuperate-repairs brain tissue **3.** Sleeping to remember-helps rebuild our fading memories **4.** Sleep to grow-during deep sleep the pituitary gland releases a growth hormone

**Stages of Sleep
-**The sleep-wake cycle itself is circadian but we have ultradian cycles during our night’s sleep. **-**As you relax and try to go to sleep, your brain waves cycle more and more slowly. **-**Once you fall asleep, you will go through 4 stages of relatively quiet sleep before you go to the more active dreaming stage.

**Brain Waves and Sleep Stages**Alpha Waves **-** slow waves of a relaxed, awake brainDelta Waves **-** large, slow waves of deep sleep Hallucinations **-** false sensory experiences

**Stage 1
-**You will not know the exact moment when you enter Stage 1 of sleep. **-**It lasts only 5-10 minutes. **-**You are easily awaken from this stage and will probably insist that you were never asleep. **-**You may report dreamlike sensations of falling upon being waken up. **-**You experience **hallucinations** (experiences without real stimuli) such as *hyponogogic sensations (floating weightlessly, knee jerks, etc.)*

**Stage 2
-**Your brain waves slow down even more. **-***"sleep talking" could start now or any stage after this.*  **-**Little brain wave-bursts called spindles are common during this stage. **-**The first time you enter this stage it will last about 20 minutes. **-**Over the course of the night, you will spend ½ of your sleep in this stage.

**Stages 3 and 4
-**After about 30 minutes of sleep, your brainwaves slow down a lot. **-**Your brainwave cycles are less than 1 cycle per second, compared to 15 cycles per second when you first fall asleep. **-**This stage is called slow-wave sleep or **delta sleep**. **-**At Stage 3 - you are hard to wake.  **-**The first time you are in these rejuvenation stages, it will last about 30 minutes. **-**At Stage 4 - Bed-wetting, sleepwalking or night terrors may occur.

**Rem Sleep
-**The previous 4 stages have been part of N-rem, or non-rapid-eye-movement sleep. **-**After you reach Stage 4, your brain waves will begin to pick up a little more speed and strength. You will move back up through Stages 3, 2, and 1 and then enter your first period of Rem Sleep. **Rem sleep:** A reoccurring sleep stage during which vivid dreams commonly occur. **-**It is also called **paradoxical sleep** because the muscles of the body are relaxed, but the other body systems are active.

-The first period of Rem will not last long. When it is finished, you will return to Stage 1 of sleep and start the cycle over again.
-The 90 minute ultradian rhythm continues all night, but stages 3 and 4 are eventually skipped.
-The last 4 hours of sleep are spent between Stage 2 and Rem.

**Sleep Debt
-**Most adults need to sleep about 8 hours, or a little bit more, to feel good and function efficiently. However, most Americans get significantly less than 8 hours of sleep. **-**Often times, we attribute afternoon drowsiness to a big lunch-really the result of sleep-debt.  **-**Similarly, people say they fall asleep when they are bored. In reality, restlessness is the normal response to boredom, not sleepiness.

**Sleep Deprivation**

* Effects of Sleep Loss
-fatigue
-impaired concentration
-depressed immune system
-greater vulnerability to accidents

**Dreaming**
-Freud had many prominent thoughts on dreaming, as well as the nonconscious mind.
-Freud said dreaming had two main functions: to guard sleep and serve as a source for wish fulfillment.
**Manifest and Latent Content**
Freud distinguished between the:
 **manifest content**-the dream’s story line,
 **latent content**-the (supposed) symbolic meaning.
For example, symbols of containers and long rigid objects could symbolize the male and female genitalia and give clues to sexual conflicts.
[Freudian Dream Analyzer](http://freakydreams.com/)

**What We Dream
Negative Emotional Content:** 8 out of 10 dreams have negative emotional content. **Failure Dreams:** People commonly dream about failure, being attacked, pursued, rejected, or struck with misfortune.

**Sexual Dreams:** Contrary to our thinking, sexual dreams are sparse. Sexual dreams in men are 1 in 10; and in women 1 in 30.

**Truth About Dreams**-Despite his theories there is no solid evidence to support Freud’s interpretations of latent dream content. **-**Dreams, do however, vary by age, gender and culture. **-**Children are more likely to dream about animals that are large and threatening, while adults dream more about pets.  **-**Women are more likely to dream about men and women; men are more likely to dream about men.

**Culture and Dreams**Many studies have supported the theory that culture plays a large role in dream content.Ghana: Attacking cowsAmericans: Public nakednessMexican-Americans: DeathThere is strong support for the idea that dreams reflect life events that are important to the dreamer.

**Why do you have dreams that seem random?
-**Typically the first dream connects with events from the previous day. Later dreams tend to build on a theme in the previous dream. **-**Often times, the final dream is remembered most vividly, but has very little to do with the previous days events, or events that lay ahead.

**Other Theories
-**Not everyone believes that dreams have meaning and relate to the day’s events.Activation-synthesis theory says that dreams result when the sleeping brain tries to make sense of its own spontaneous bursts of activity.A dream, then, is the brain’s way of making sense out of nonsense.

**Modern Theories:
Information Processing:** An important memory-related function of sorting and shifting through the day’s experiences. **Physiological function:** Neural activity during Rem sleep which provides necessary brain stimulation and growth. **Activation-synthesis:** Our brain’s attempt to make sense of random neural firings in various parts of our brain. **Cognitive Theory:** Dream are the embodiment of thoughts.a dream is a pictorial representation of the dreamer's conceptions.

**Sleep Disorders:
Insomnia:** Recurring problems fall or staying asleep.There are lots of “remedies” which may actually worsen the problem.
 **Sleeping pills:** addicting, prevent Rem sleep **Alcohol:** Prevents Rem Sleep **Sleep apnea:** A sleep disorder characterized by a temporary stoppage in breathing forcing the person to wake up. **Narcolepsy:** A sleep disorder characterized by uncontrollable sleep attacks.
**Somnambulism:** Sleepwalking. The sleepwalker can walk, talk and see, but will have little or no memory of the event when they wake up.
**Night Terrors:** A sleep related problem characterized by high alertness and an appearance of being terrified.
**Bruxism:** Teeth grinding.
**Myoclonus:** Sudden movement or flinch of a body part occurring in Stage 1 or 2.

**Night Terrors –not nightmares. When one experiences night terrors, they appear terrified but do not remember the ordeal the next morning.**
 -occur after 2 or 3 hours of sleep and while the person is in **stage 4 sleep.**
 -The next morning the person hardly remembers what happened.

*In contrast,* ***nightmares happen in REM Sleep usually early in the morning.***

**Module 9: Hypnosis**

One of the more intriguing aspects of consciousness is hypnosis. The reality of hypnosis is far less intriguing than the anecdotal perception of what many of us have seen or heard.

**Hypnosis** is a social interaction in which one person (the hypnotist) suggests to another person (the subject) that certain perceptions, cognitions or behaviors will spontaneously occur.
**Does it work?**
-To a degree everyone is suggestible
-20% are highly suggestible
-The real power of hypnosis is not in the hypnotist, but in the subject’s own openness to suggestion.

**Can Hypnosis Enhance Memory?
-**Although most people believe lost memories can be retrieved through hypnosis, something called *age regression*, 60 years of science dispute such claims. **-**In reality, “hypnotically refreshed” memories often combine facts with fiction as the hypnotist asks leading questions like “Did you hear loud noises?” **-**Banned as evidence in America, Australian and England “Hypnosis is not a psychological truth serum and to regard it as such has been a source of considerable mischief.” –Researcher Kenneth Bowers **-**Thousands of examples of memories created under hypnosis come from people who reported seeing UFOs.Studies reveal that most reposts of UFOs have come from people predisposed to believe in aliens, are highly hypnotizable, and have undergone hypnosis

**Can Hypnosis Make People Act Against Their Will?
-**The short answer is no, not anymore than an authoritative figure can make someone who is not hypnotized act against their will.“The overt behaviors of hypnotic subjects are well within normal limits,” (Spanos 1982). **-**Hypnotized people don’t do anything that unhypnotized people can’t also be convinced to do. **-**Studies show that an authoritative person in a legitimate context can induce people-hypnotized or not-to perform some unlikely acts.

**Can Hypnosis be Therapeutic?
-**The short answer is yes….sometimes, kind of. **-**Posthypnotic suggestions, suggestions made during hypnosis, have helped alleviate headaches, asthma and stress-related skin disorders. **-**In other cases, clients whose therapy was supplemented with hypnosis showed greater improvement 70% of other patients. **-**Especially helpful with obesity **-**No help for smoking, drinking, drugs **-**No difference when patients were given the same positive reinforcement without hypnosis

**Can Hypnosis Alleviate Pain?
-**Hypnosis can actually alleviate pain! **-**This happens because of **disassociation** A split between levels of consciousness, hypnosis disassociates the physical stimulus of pain from the emotional suffering that defines our experience of pain **-**Called hypnotic analgesia **-Selective attention** we get caught up in the moment and do not feel the pain until later **-**Essentially distracting people from feeling pain **-**PET scans show that hypnosis reduces brain activity in a region that processes painful stimuli, but not in the sensory cortex that receives raw sensory input (Rainville 1997) **-**Hypnosis does not block sensory input, but it MAY block our attention to those stimuli.

**An Altered State of Consciousness?
-**We know hypnosis involves a heightened state of suggestibility, but some suggest it is more of a social phenomenon. **-**Some believe the hypnotic phenomenon is simply the workings of normal consciousness and the power of social influence-social influence theory **-**Not suggesting anyone is faking, but rather they get caught up in the role/moment. The more they trust the hypnotist, and feel motivated to demonstrate those behaviors, the more they allow that person to direct their attention

**A Diverted Consciousness?
-**While most agree that hypnosis involves normal social and cognitive processes, some think it is more than “acting.” **-**The divided-consciousness theory is controversial, but suggests we can run on autopilot for well rehearsed tasks, while consciously working on another task. **-**One thing we know for sure, we process a lot of information outside of our conscious awareness…much of our behavior occurs on autopilot.

**Module 10:
Drugs and Consciousness**Psychoactive Drug **-**A chemical substance that alters perceptions and moodPhysical Dependence  **-**Physiological need for a drug **-**Marked by unpleasant withdrawal symptomsPsychological Dependence **-**A psychological need to use a drug **-**For example, to relieve negative emotions

**Dependence and Addiction**Tolerance **-**Diminishing effect with regular use **-**The body begins to stop producing these chemicals naturally
Withdrawal **-**Discomfort and distress that follow discontinued use
**Psychoactive Drugs** Depressants
 -Drugs that reduce neural activity
 -Slow body functions
 -alcohol, barbiturates, opiates
 -**Alcohol -**Decreases neural dopamine levels
Stimulants
 Drugs that excite neural activity
 Speed up body functions
 -caffeine, nicotine, amphetamines, cocaine
Hallucinogens
 -Psychedelic (mind-manifesting) drugs that distort perceptions and evoke sensory images in the -absence of sensory input
 -LSD

**Effects of Drugs
-**Research tells us that the effects of drugs depends not just on its biological effects, but also on the psychology of the user’s expectations (Ward, 1994). **-**If one culture assumes that a particular drug produces euphoria and another does not, each culture may find its expectations fulfilled.

**Psychoactive Drugs-Depressants**Barbiturates **-**Drugs that depress the activity of the central nervous system, reducing anxiety but impairing memory and judgment **-**Opiates **-**Opium and its derivatives (morphine and heroin) **-**Opiates depress neural activity, temporarily lessening pain and anxietyBarbiturates are tranquilizers--drugs that depress central nervous system activity.  **Examples**: Nembutal, Seconal, Amytal  **Effects:** reducing anxiety and inducing sleep  **Problems:** reducing memory, judgment, and concentration; can lead to death if combined with alcohol

**Psychoactive Drugs-Depressants
-**Narcotics - derived from opium plant **-**Alcohol  **-**Opiates - opium and its derivatives (morphine and heroin) - opiates depress neural activity, temporarily lessening pain and anxiety Ex. Oxycodone (oxycontin) Opiates: *Highly Addictive Depressants
 -*Opiates depress nervous system activity; this reduces anxiety, and especially reduces pain.  **-**High doses of opiates produce euphoria.  **-**Opiates work at receptor sites for the body’s natural pain reducers (endorphins).
 -Opiates are chemicals such as morphine and heroin that are made from the opium poppy.

**Effects of Alcohol Use
 Impact on functioning
 -Slow neural processing**, reduced sympathetic nervous system activity, and slower thought and physical reaction  **-Reduced memory formation** caused by disrupted REM sleep and reduced synapse formation

 Impaired self-control, impaired judgment, self-monitoring, and inhibition; increased accidents and aggression

**Psychoactive Drugs-Stimulants**Amphetamines (Stimulants)  **-**Drugs that stimulate neural activity, causing speeded-up body functions (body temperature and heart rate) and associated energy and mood changes **-**Results in short term energy and euphoria **-**Originally diet drugs Stimulate both -Dopamine(pleasure system of the brain), -Norepinephrine("flight or fight“) Eventually reduces baseline dopamine level, leaving user permanently depressedEx: Cocaine

**Caffeine**-adds energy  **-**disrupts sleep for 3-4 hours  **-**Accelerates heart rate - Constricts blood vessels - Reduces adenosine  **-**can lead to withdrawal symptoms: if used daily:  **-**headaches  **-**irritability  **-**fatigue  **-**difficulty concentrating  **-**depression

**Why do people smoke?
-Starting** to smoke: invited by peers, influenced by culture and media
-**Continuing:** positively reinforced by physically stimulating effects  **-Not stopping**: after regular use, smokers have difficulty stopping because of withdrawal symptoms such as insomnia, anxiety, and distractibility

**Cocaine Euphoria and Crash**

**Methamphetamine** triggers the sustained release of dopamine, sometimes leading to eight hours of euphoria and energy.
 -**What happens next**: irritability, insomnia, seizures, hypertension, violence, depression
 -“Meth” addiction can become all-consuming.

**Psychoactive Drugs-Hallucinogens**Ecstasy (MDMA) **-**Synthetic stimulant and mild hallucinogen **-**Both short-term and long-term health risks
LSD  **-**Lysergic acid diethylamide **-**A powerful hallucinogenic drug **-**Also known as acidTHC **-**The major active ingredient in marijuana **-**Triggers a variety of effects, including mild hallucinations

**Ecstasy/MDMA (MethyleneDioxyMethAmphetamine)**Ecstasy is a synthetic stimulant that increases dopamine and greatly increases serotonin.  **Effects on consciousness:** euphoria, CNS stimulation, hallucinations, and artificial feeling of social connectedness and intimacy  **What Happens Next?**In the short run, regretted behavior, dehydration, overheating, and high blood pressure. Make it past that, and you might have:  **-**damaged serotonin-producing neurons, causing permanently depressed mood  **-**disrupted sleep and circadian rhythm  **-**impaired memory and slowed thinking  **-**suppressed immune system

**Hallucinogens - LSD
LSD (lysergic acid diethylamide)
 -**LSD and similar drugs interfere with serotonin transmission.  **-**This causes hallucinations--images and other “sensations” that didn’t come in through the senses.  **Hallucinogens- Marijuana/THC** Marijuana/THC (delta-9-TetraHydroCannabinol)  **-**Marijuana binds with brain cannabinoid receptors.  **Effect on consciousness:** - amplifies sensations - disinhibits impulses - euphoric mood
 - lack of ability to sense satiety  **What Happens Next?
 -**Impaired motor coordination, perceptual ability, and reaction time  **-**THC accumulates in the body, increasing the effects of next use  **-**Over time, the brain shrinks in areas processing memory and emotion  **-**Smoke inhalation damage

**Dependence *on a substance (or activity?)*
 -Tolerance:** the need to use more to receive the desired effect **-Withdrawal:** the distress experienced when the “high” subsides **-**Using **more than intended
 -**Persistent, **failed attempts to regulate use
 -**Much **time spent preoccupied with the substance, obtaining it, and recovering
 -**Important **activities reduced because of use
 -**Continued **use despite aversive consequences**

**What can turn drug use into dependence?
Biological factors:** dependence in relatives, thrill-seeking in childhood, genes related to alcohol sensitivity and dependence, and easily disrupted dopamine reward system  **Psychological factors:** seeking gratification, depression, problems forming identity, problems assessing risks and costs  **Social influences:** media glorification, observing peers

Trends in Drug Use

Perceived Marijuana Risk