

Unit 5: States of Consciousness

I. Introduction

- A. The idea of “consciousness” dates to the roots of psychology. But by the 1960s, consciousness had been almost entirely removed and replaced by behaviorism (that which can be observed).
- B. Around 1960, neuroscience made the study of consciousness possible again.
 - 1. Monitoring the brain (and thus consciousness) made this possible.
 - 2. Altered states of consciousness (like hypnosis and the effect of drugs) also became popular.
 - 3. The importance of cognition (mental processes) was also recognized.
- C. **Consciousness** is our awareness of ourselves and our environment.

II. Biological rhythms and sleep

- A. While asleep we’re not totally “out of it” or totally unconscious. For instance, we respond to sounds.
- B. People are built on an inborn 24-hour biological clock called the **circadian rhythm**. It regulates things like when we wake up, when we feel sleepy.
 - 1. Light in the morning hits our retinas which activates our **suprachiasmatic nucleus (SCN)** in our brain which cuts down the pineal gland’s production of melatonin, the sleep hormone.
 - 2. Being in bright light at night cuts down on sleep. As a result of lights in the modern world, many people get less sleep. Their bodies have taken on a 25-hour day (which throws off their night-day sleeping habits).
- C. Sleep is not an on-off thing. There are 5 cycles built into sleep.
 - 1. **Stage 1** – As you fall to sleep, an EEG registers slow **alpha waves**. You’re awake, but very relaxed, then slip into sleep. Breathing is slow and brain waves are irregular.
 - a. Stage 1 sleep is brief.
 - b. Alpha waves are very short in amplitude and tight in frequency. Theta waves begin with hi amplitude and low frequency.
 - c. It may contain hallucinations, a sense of falling (ever jumped back awake?), or floating weightlessly.
 - 2. **Stage 2** – This lasts about 20 minutes. An EEG shows **sleep spindles** which appear as very rapid, close flickers on the graph. Theta waves on an EEG may also show a **K-complex** which appears as a distinctly large and lazy flicker on the graph.
 - a. Sleepwalking may occur herebut it also may occur at *any other* sleep stage.
 - 3. **Stage 3** – This is a transitional stage between 2 and 4.
 - a. An EEG shows some large, slow **delta waves** that look lazy on a graph.
 - 4. **Stage 4** – This last about 30 minutes and is deep sleep.
 - a. An EEG shows even more delta waves.
 - b. This is where you’re “out of it” and may not hear loud noises like thunder.
 - c. Children may wet the bed or sleepwalk.
 - 5. **REM sleep** – This is the 5th phase and the most important. This is where you brain is the most active. Oddly, whereas your body rests by doing little or nothing, your brain rests by working.
 - a. After about an hour of going from stages 1, 2, 3, and 4, you leave what’s called **NREM sleep**. Then you start going back through the stages – 4, 3, 2 and into REM sleep.
 - b. REM (rapid eye movement) first lasts about 10 minutes.
 - c. An EEG shows that your brain waves are very similar to when you’re awake.

- d. Your pulse increases, your breathing becomes rapid and irregular. Your eyes shoot back and forth quickly.
 - e. Your brain blocks messages to the motor cortex – you’re paralyzed.
 - f. You can’t be easily awakened.
 - g. REM sleep brings on dreams that are very realistic – emotional, storylike, and vivid.
6. This 5-part sleep cycle goes through itself about every 90 minutes. Thus in a normal-length night, we go through about 4 sleep cycles.
- D. Why do we sleep?
- 1. People of different ages sleep different amounts of time. Children sleep longer, adults shorter.
 - 2. In the U.S., adults sleep just over 8 hours per day. Without lights or distractions, adults will sleep about 9 hours.
 - 3. Thus, we tend to have a sleep deficiency. There are good effects of enough sleep and bad effects of a deficiency...
 - a. Getting enough sleep means we concentrate better, are in better moods, are less hungry/obese, have stronger immune systems, and have lower chances of accidents.
 - b. Not getting enough sleep means the opposite of those things listed above. Other results of sleep deficiency are poor studying, less productivity, mistakes, crankiness, and feeling tired (imagine that!).
- E. Sleep theories
- 1. There are several theories to answer the question, “Why do we sleep?” They are...
 - a. Sleep protects – This theory has the idea that we’re safer at night while asleep. We won’t bang into dangerous things in the dark.
 - b. Sleep helps us recuperate – Brain activity creates toxins as a byproduct called “free radicals”. The idea is that sleep helps cleanse these from our brains by giving neurons a time to rest.
 - c. Sleep makes for memories – After all of our daily activities, sleep enables our brain to sort things into their proper spots, so to speak. This helps with our memories later.
 - d. Sleep can fuel creativity – Many great ideas come while asleep or dreaming. Or, many great ideas come just after a good night’s sleep.
 - e. Sleep helps with growth – The pituitary gland, the growth gland, secretes a growth hormone while in deep sleep.
- F. Sleep disorders
- 1. **Insomnia** is the persistent inability to sleep or to fall asleep. It’s not the occasional inability to sleep.
 - a. Insomnia can’t be “fixed” with alcohol or sleeping pills. These only reduce REM sleep and make the person feel even more sluggish the next day.
 - 2. **Narcolepsy** is a disorder where the person (or animal) simply falls asleep suddenly, out of the blue. It can be a problem because the person may fall asleep at a very bad or unsafe moment.
 - 3. **Sleep apnea** is a disorder where the person stops breathing at night, awakens, then breathes again.
 - a. Most people don’t even know they’re waking, even though it can happen hundreds of times per night.
 - b. Overweight men are especially prone to apnea.
 - c. It can be treated by wearing a special mask.
 - 4. **Night terrors** attack children mostly. A child may sit up, walk, mumble, their pulse and breathing may double, and they may seem terrified.

- a. Night terrors are not nightmares. Terrors occur in stage 4 sleep. Nightmares occur during REM sleep and usually have a story or plotline to them.
- b. Children may also experience sleepwalking and sleepwalking.

III. Dreams

- A. REM dreams are the most important. They are realistic, emotional, and often don't make sense.
- B. Dream stats and facts...
 - 1. 8 out of 10 dreams have something negative in them, like we're being attacked or we receive some sort of rejection.
 - 2. Dreams with sexual overtones are much less common. Men have dreams with sexual overtones 1 out of 10 times. Women, only 1 out of 30 times.
 - 3. Sensory stimuli can be woven into our dreams. That is to say, if we actually smell or hear something in real life, that smell or sound might get mixed right into our dream.
- C. There are several theories that try to answer the question, "Why do we dream?" They are...
 - 1. To satisfy our wishes.
 - a. This theory was started by Sigmund Freud. In Freud's mind, everything revolves around sex and aggression.
 - b. What we experience in our dreams is what he called the "**manifest content**". The manifest content symbolized the latent content (which is hidden).
 - c. The **latent content** is our subconscious drives (sex and aggression) that would be problematic if acted out in real life. For instance, if a guy wanted to have sex with a supermodel, and he really did it, he'd probably get arrested for rape.
 - d. In Freud's mind, dreams act as a safety-valve to let out our subconscious drives in a way that's not destructive.
 - 2. To file memories.
 - a. This theory thinks of the brain like a computer – it needs to file away memories and experiences into their proper spots for future reference.
 - b. While these memories are being "filed", they may flash into our minds and thus create dreams.
 - 3. To develop and preserve neural pathways.
 - a. This theory holds that dreams give the brain stimulation while sleeping in order to develop neural networks.
 - b. The evidence to support this theory is that infants and children have brains in the developmental stages. And, they also experience more REM sleep than adults. Thus, the correlation suggests that dreams may aid in brain development.
 - 4. To make sense of neural static.
 - a. This theory holds that we have neural activity originating in the brain stem while sleeping. Thoughts come into our brains in a rather random fashion. Our brain doesn't like things that don't make sense, so, our brains assemble the thoughts into a dream.
 - 5. To reflect cognitive development.
 - a. This theory believes that dreams are simply the result of a maturing brain.
 - b. Evidence to support this theory is that...
 - i. Children tend to dream in "slide-show" fashion.
 - ii. Adults tend to dream in a more complex, narrative story fashion.

IV. Hypnosis facts and falsehoods

- A. Hypnosis brings up a lot of notions, many of which are wrong. The bizarre work of Franz Mesmer (source of the term "mesmerize") has a lot to do with the questionable ideas surrounding hypnosis.
 - B. There's agreement that the hypnotist is less important than the subject's openness to suggestion.
 - C. Still, there are many questions surrounding hypnosis...
 - 1. Can anyone experience hypnosis?
 - a. Most people can to some degree. The degree depends on their openness to suggestion.
 - b. About 20% are highly suggestible. They can be led to smell things, or ignore a smell, like a bottle of ammonia.
 - 2. Can hypnosis enhance recall of memories?
 - a. Hypnosis doesn't enhance your memory. The idea that "it's in there, I just can't get to it, but hypnosis helps," is wrong.
 - b. Hypnosis usually mixes fact with fiction, just like our regular memories.
 - c. A good example is people who think they've been abducted by UFOs. In reality, they mix their "memory" with what they've come to understand is a "typical" UFO abduction.
 - 3. Can hypnosis force you to do something you don't want to do?
 - a. The answer to this question seems to be, "No."
 - b. The evidence suggests that when people follow a hypnotist, they're largely doing it to be "good subjects", not mindless robots.
 - 4. Can hypnosis be therapeutic?
 - a. The answer here is, "Yes."
 - b. Hypnosis can heal, such as headaches, asthma, stress-related skin disorders, and obesity.
 - c. Trying to get a person to respond after hypnosis, such as saying, "You will NOT want to order dessert," is called **posthypnotic suggestion**.
 - 5. Can hypnosis reduce pain?
 - a. The answer here is, "Yes."
 - b. For example, a hypnotized person can often dunk their arm in ice-water and feel less pain than a non-hypnotized person.
- V. Explaining the hypnotized state
- A. There are two main theories that try to explain what's going on when a person is hypnotized. They are...
 - 1. Social influence theory
 - a. This theory says that a person being hypnotized is doing little more than playing the role of a hypnotized person. The person is acting like a "good subject".
 - b. The subject's thinking is, "I'm expected to be hypnotized and do what the hypnotist tells me, so, that's what I'll do."
 - 2. Divided consciousness theory
 - a. This idea centers on the concept of dissociation. **Dissociation** says we have split layers of consciousness (we're aware of more than one thing at any given time).
 - b. The evidence to support this theory is that...
 - i. Most psychologists think the social influence theory has at least some impact. But, many go further with the "divided consciousness" theory.
 - ii. When hypnotized people were asked to imagine a color, areas of their brain "lit up" as if they actually saw it.
 - iii. Hypnotized people did better at saying what color they saw when a color-word (like red) was printed in green ink.

VI. Dependence and addiction

- A. Increased use of a drug leads to **tolerance** where a larger dose is required to get the same effect from a drug.
- B. Upon stopping a drug's use, a frequent user will likely experience withdrawal. A person experiencing **withdrawal** may feel physical pain and strong cravings.
 - 1. Pain and cravings are signs of physical dependence – a strong indication of addiction.
 - 2. Stress-relieving drugs may create psychological dependence. Here, the mind thinks it needs the drug (though the body doesn't react to being cut off).
- C. Drug **addiction** is a compulsive craving despite consequences to use. Physical symptoms often accompany an addiction. There are some myths to addiction...
 - 1. Addictive drugs will get you hooked very fast. For highly addictive drugs, about 10-15% of users will get hooked after initial use.
 - 2. A person can't get over addiction on his or her own. Although it's good to get help, people can do it on their own. For example, most people who kick the smoking habit did it by themselves.
 - 3. Addiction can be applied to any pleasurable activity. The word "addiction" is now used with gambling, sex, the Internet, and other behaviors. It may be an overstatement to actually say a person is addicted to something like social networking.

VII. Psychoactive drugs

- A. **Depressants** are sometimes called "downers" because they slow down the body.
 - 1. **Alcohol** has many effects...
 - a. It lowers inhibitions (it's a "disinhibitor"). An "inhibition" is our common sense that tells us, "Maybe I shouldn't do that." Alcohol turns this common sense off. This means that when drinking, we'll do things that we normally would NOT do.
 - b. It slows processing speed. We react slower, think slower, and speech is slurred.
 - c. It disrupts memory and impairs judgment.
 - d. It cuts self-awareness and self-control. This is why people who are "down in the dumps" (like they just got fired) often turn to alcohol – it takes their minds off of themselves.
 - e. It's impacted by the person's expectations. This means that people have ideas about how people act while drinking (even if they only think they've been drinking). This expectation shapes their behavior.
 - f. It correlates with risky sex. This means that drinking alcohol and risky sex go together – they co-relate.
 - 2. **Barbiturates** produce about the same effects as alcohol.
 - a. Large doses can cause impaired memory, judgment, or death.
 - 3. **Opiates** are drugs derived from opium, such as morphine, codeine, or heroin.
 - a. Opiates cause one's pupils to dilate, slows breathing, and creates sluggishness.
 - b. They leave the person craving more, but tolerance means a person would need higher doses for the same effect. Withdrawal results if a person stops using them.
- B. **Stimulants** are sometimes called "uppers" because they speed up the body.
 - 1. Stimulants cause the pupils to dilate, one's pulse and breathing rates to increase, energy and confidence to increase, and appetite to drop.
 - a. Cutting out a stimulant results in fatigue, headaches, crankiness, or depression.
 - 2. **Methamphetamine** (AKA "meth")
 - a. Meth stimulates the release of the neurotransmitter dopamine, which naturally improves your mood.

- b. But, meth can permanently drop your natural dopamine levels. This leaves you depressed.
 - c. Meth is highly addictive and very dangerous.
- 3. **Caffeine** is the world's most common psychoactive drug.
 - a. It usually lasts about 3-4 hours.
 - b. Regular use results in tolerance. Stopping it can result in withdrawal symptoms of fatigue and headaches.
- 4. **Nicotine** is also very common.
 - a. It's estimated that 10,000 people worldwide die from smoking per *day*. If a teen started smoking, then smoked until he died, he'd have a 50% chance that the smoking killed him.
 - b. Tolerance results, so smokers must smoke more for the same effect.
 - c. Withdrawal results when a person tries to quit, including cravings, insomnia, anxiety, and crankiness.
 - d. Nicotine starts to take effect after only 7 seconds of being smoked. It is as addictive as heroin or cocaine.
 - e. It triggers the neurotransmitters epinephrine and norepinephrine.
- 5. **Cocaine** produces a fast (but short) high and is followed by depression.
 - a. The good feeling result from a rush of dopamine, serotonin, and epinephrine. Reuptake is blocked by the cocaine. Thus the neurons are left depleted which results in a "crash" (depression).
- 6. **MDMA (Ecstasy)** is both a stimulant and a mild hallucinogen.
 - a. It starts the release of dopamine, but also releases serotonin and blocks its reuptake.
 - b. MDMA takes about an hour to "kick in" then lasts about 3 to 4 hours.
 - c. A major negative effect is dehydration. This can lead to overheating and death.
 - d. Another major negative is that natural serotonin production can be permanently damaged which can lead to permanent depression.
- 7. **Hallucinogens** create perception without sensory input (the definition of "hallucination").
 - a. **LSD** is a powerful and dangerous psychedelic drug.
 - i. LSD users sense extraordinary shapes, colors, etc.
 - ii. It acts in the same way a subtype of serotonin acts.
 - iii. Typical experiences are: geometric images, a tunnel or funnel image, past emotional experiences, and a feeling of mind-body separation.
 - 1. These same "symptoms" are typical of people who experienced "near-death". Oxygen deprivation yields these same results.
 - b. **Marijuana** contains the active ingredient **THC**.
 - i. It acts like alcohol in that it relaxes, it's a disinhibitor (you do things you normally wouldn't), and can give a "high" feeling.
 - ii. Unlike alcohol (which the body rids after hours), THC lingers for a month or more. Frequent users can thus get the same effect on less than infrequent users.
 - iii. Marijuana increases sensations (sight, sound, etc.)
 - iv. It impairs your judgment and your memory.

VIII. Influences on drug use

A. Abuse stats...

- 1. Drug use among high school seniors peaked in the late 1970s.
- 2. Anti-drug education campaigns in the 1980s cut abuse significantly.

3. Beginning in the early 1990s, drug abuse began to rise again. This was due to (a) easing anti-drug programs and (b) some glamorization of drugs in the media. Still, abuse didn't reach late 70s levels.
- B. In attempt to answer the question, "Why do people abuse drugs?" there are three main theories...
1. Biological influences
 - a. This theory believes that some people are biologically and/or genetically inclined to use drugs.
 - b. Twin and adoption studies seem to support a link between drug use and heredity.
 - c. Excitable boys (a hereditary trait) are more likely to abuse drugs.
 - d. Genes have been identified that link to alcohol and tobacco abuse.
 2. Psychological influences
 - a. If a person feels their life is useless or are depressed, they're more likely to abuse drugs.
 3. Socio-cultural influences
 - a. Teens usually drink because their peers are doing it.
 - b. Different countries have different views on drug use. Some may say it's terrible, others may say it's not-so-bad. This affects a person's willingness to try the drug.
 - c. A person's religion also plays a large role, usually in NOT doing drugs.
 - d. Other factors include...
 - i. Where you live – people in cities do more drugs than the country.
 - ii. If friends do drugs, you're likely to as well.
 - iii. Happy families have kids less likely to do drugs.
 - iv. A young person is likely to do drugs if peers do drugs, or even if that person thinks peers do drugs.