Psychology 020
Lecture 7
Oct. 30, 2007

●Defining Consciousness

What is Consciousness?
-Awareness of Internal & External Stimuli
-Levels of awareness
→James: dynamic stream of consciousness
→awareness is not disjointed (as a motion picture); perceived as a whole
→Freud: three states of consciousness, large role of the unconscious
→Jung: collective unconscious
→Sleep/dreaming

Consciousness is…
-Subjective and Private (i.e., we are not aware of others' thoughts or feelings)
-Dynamic (ever-changing)
-Self-Reflective (thinking about the self: metacognition)
→Central to our sense of self
-Selective attention
→unlimited possibilities for conscious experience

Levels of Consciousness…

Psychodynamic perspective
●Conscious Mind
-thoughts, perception; mental events in our awareness
●Preconscious Mind
-outside of current awareness, but easily recalled
●Unconscious Mind
-normally can't be brought into awareness
→Figure: Iceberg (Id, Ego, and superego) → Freud's view of the human mind, with majority as subconscious

Components of Personality
●Id→ instinctual sexual and aggressive drives
→ *Unconscious*
●Ego→ mediating between Id and Superego
→ *Conscious (and pre-conscious)*
●Superego→ internalized morals
→ *Conscious (and pre-conscious)*

●Jung's Conception of Personality

-Ego: Conscious component; carries out normal daily activities
-Personal Unconscious: Contains all accessible memories; thoughts, and feelings, and all repressed memories, wishes and impulses

-Collective Unconscious: The most inaccessible layer; shared by all people; contains universal experiences

- For example, universal schemas of “mother”, “warrior”, “innocence” → Archetypes

→The ego and the personal unconscious is unique to each individual
→The collective unconscious is shared by all individuals

●Cognitive Perspective
-View conscious and unconscious as complimentary forms of information processing.
● ***“CONSCIOUS”*** → controlled effortful processing
● ***“UNCONSCIOUS”*** → automatic processing
→biological processes
→well-learned tasks

●Measuring Consciousness
●Self-Report
-Describe inner feelings.
-*Not always verifiable, individuals not always reliably aware of their states
→Like earlier introspective techniques
●Physiological Measures
-Establish correspondence between bodily states and mental processes. (e.g., brainwaves)
→much more objective
●Behavioural
-Performance on special tasks
→ Example: “Rouge test” (red dot on nose and child/monkey is given mirror)
→have a sense of self if they point to the dot on their nose
●Physiological Measures
-EEG → (electroencephalogram – a physiological index of consciousness)
-monitoring of brain electrical activity, brain waves
→Amplitude (height)
→Frequency (cycles per second)
-vary during different phases of sleep

→Figure: EEG patterns and states of consciousness
-Beta waves: normal waking thought, alert problem solving (low amplitude, high frequency)
-Alpha waves: deep relaxation, blank mind, meditation (high amp, high freq)
-Theta waves: light sleep (low amp, low freq)
-Delta waves: deep sleep (high amp, low freq, very erratic)

●Circadian Rhythms (“rhythm around the day”)
-24 hour biological cycles
→Regulation of sleep/body functions

→Physiological pathway of the biological clock:
-(1). Light levels
-(2). Retina
-(3). Greater activity in the neurons of the suprachiasmatic nucleus (hypothalamus)
-(4). Causes less secretion of melatonin (pineal gland)
-(5). Changes in alertness/drowsiness.
→SAD (seasonal affective disorder) and increased rates of depression; due to the amount of light. (reason why light therapy is helpful)

→average length of sleep hours: 7.5hrs (but varies person-to-person from ~5-10 hours a night)

●Changes in sleep periods of a subject isolated from the day-night cycle.
*Shifts to 25 hour cycle.
→Retire for sleep later and later with each cycle
●What happens when we suddenly alter our time schedule? (Because of natural 25-hour clock)
→Flying *east*: more difficult time adjusting →Flying *west*: less difficult time adjusting

●Sleep Research

●Sleep Stages: Cycling Through Sleep
●Stage 1:
→brief, transitional (1-7 minutes)
→alpha→ theta →hypnic/myoclonic jerks (natural body twitches while falling asleep)
●Stage 2:
→sleep spindles (10-25 minutes): erratic brainwaves.
●Stage 3 and 4:
→slow-wave deep sleep (30 minutes) *Delta waves
●REM:
→EEG similar to awake, vivid dreaming (initially a few minutes, progressively longer as cycle through the stages); body movements are shut down (normally prevents acting out dreams)
→called paradoxical sleep

→Figure: An overview of the cycle of sleep: 1 cycle = ~90 minutes
→Figure: EEG cycles
→Figure: Changes in sleep patterns over the life span
→average amount of sleep decreases with age (because of growth)

●<u>Variations in Consciousness</u>

●Brain Structures:
-Ascending reticular activating system (ARAS): arousal & alertness system
-Pons, medulla (hypnogenic system), thalamus, hypothalamus, limbic system
-Neurotransmitters:

→Acetylcholine and serotonin
→Also norepinephrine, dopamine, and GABA (inhibitory transmitter)
→Example: animals with no hypnogenic centre will have chronic insomnia

●**Sleep Deprivation**
→Figure: Effect of sleep deprivation on cognitive performance (Pilcher and Walters; 1997 study): Sleep deprivation causes a decrease in performance, but those deprived also underestimate the effect of the lack of sleep on their performance

●**Sleep Problems:**
●**Insomnia** → difficulty falling or staying asleep
→More: tense, worried about lack of sleep (which in turn makes the situation worse)
●**Narcolepsy** → falling asleep uncontrollably
●**Sleep Apnea** → reflexive gasping for air that awakens individual
Can cause brain or heart damage if left untreated
●**REM–Sleep Behaviour Disorder**
→ loss of muscle tone that usually accompanies REM sleep is absent, patient acts out their dreams
●**Somnambulism**
→sleepwalking →(stage 3 or 4 sleep)
●**Nightmares**
→anxiety arousing dreams – REM
●**Night Terrors**
→intense arousal and panic – NREM (non-REM) (stages 3 and 4)

●**Why Do We Sleep?**

●**Hypothesis 1: "Restoration Model"**
-Sleep helps animals to restore energy/other bodily resources
-***Most support, but still debated***
●**Hypothesis 2: "Evolutionary-Circadian Sleep Model"**
-Immobilization during sleep is adaptive because it reduces danger
●**Hypothesis 3: "Memory Consolidation Theory"**
-Sleep is essential for mental functioning (especially memory and problem solving)

●**Dreams:**
-mental experiences during sleep (occurs outside of REM, but REM dreams in colour and more vivid)
→content usually familiar (e.g., usually in our own language)
→common themes (e.g., falling, being chased, sex)
→waking life spill over; day residue (Freud: acting out impulses)

●**5 Theories of Dreaming**

-(1). Freud: wish fulfillment (The day residue shapes dreams that satisfy unconscious needs).
-(2). Hobson and McCarly: Activation-synthesis model: Neural activity (a story is created to make sense of random neuron firings)
-(3). Cartwright: problem-solving view (Thinking about day's problems during sleep)
-**(4). Cognitive-Process Theory:** Waking and dreaming are similar.
-(5). Antrobus: Integrated Model. During REM, the RAS stimulates modules in the cortex. Perceptual modules create experience, Cognitive modules interpret the experience, Emotional modules add affective content. The brain picks the best fit for this information, and the output is a dream.

●**Hypnosis…**
●**Hypnosis =** a systematic procedure that causes increased relaxation and suggestibility
●**Hypnotic susceptibility:**
→individual differences (10% easy to hypnotize, 10% impossible, remainder in-between)
●**Effects produced through hypnosis:**
→Disinhibition
→Sensory distortions/hallucinations
→Posthypnotic suggestions and amnesia
→Anelgesia (dental & childbirth studies)
→fMRI studies show < activity in pain centers

●**Theories of Hypnosis:**
→ **Altered State of Consciousness or Role Playing?**
●**Social Cognitive Theory:** expectations and role-playing produced "real" hypnotic experiences
●**Dissociation Hypothesis:** holds that hypnosis splits consciousness into two streams…divided consciousness.
●**How does hypnosis have its effects?** (Parasympathetic dominance?)
-Currently no definitive answer

Drugs, the brain and behaviour

●**Drugs:** enter the bloodstream and into the brain through a network of small blood vessels (called capillaries).
●**Blood-Brain Barrier:** screen out many foreign substances
Many drugs pass through and either facilitate or inhibit synaptic transmission.

●**Agonist:** is a drug that *increases* the activity of a neurotransmitter.
●Enhance neuron's ability to synthesize, store, or release the neurotransmitter.
●Bind with and stimulate post-synaptic receptor sites
●Inhibit reuptake
Example: amphetamines, or stimulants

→Amphetamine and neurotransmitters: Increases release of neurotransmitter & interferes with reuptake

Antagonist- is a drug that decreases or inhibits the action of a neurotransmitter.
●Reduce neuron's ability to synthesize, store, or release the neurotransmitter.
●Prevent the neurotransmitter from binding with and stimulating post-synaptic receptor sites

Tolerance- Decreasing responsiveness to a drug over time with repeated use.

Withdrawal- Compensatory responses continue after drug use stops.

●Depressants

-Decrease NS functioning

●Alcohol

→Increases activity of GABA (inhibitory neurotransmitter)

Low to Moderate Doses
→Reduces tension and anxiety.
→Less inhibition.
→Euphoria
→Impaired physical/psychological functioning.
→ (thinking/judgement).

High Doses
→Disorientation
→Depression
→Unconsciousness
→Slow down vital life processes (even to point of death).

Chronic/Long term use
→Tolerance develops gradually.
→Physiological dependence.
→Liver damage.
→Relationship difficulties.
→Sexual difficulties.

●Depressants

Barbiturates – Tranquilizers, sleeping pills, valium
→one of the most over prescribed drugs
-Suppress the Nervous system by:
→increasing the activity of GABA
→Highly addictive.

High Doses

→Initial excitation, followed by depression,
→Slurred speech, impaired co-ordination, and severe memory loss

Sudden Withdrawal
→after heavy use can cause death.
→So, several months of gradual decreases in dose.

Stimulants
●**Amphetamines / Ecstasy**

→Arouse the NS by increasing neural firing.
→ > Dopamine and Norepinephrine activity.
→ > alertness, heart rate, blood pressure, respiration.
→Boosts mood, produces euphoria, > irritability.

High Doses
→Heart failure / stroke / brain damage
→Short life expectancy
→ "Amphetamine psychosis" (high Dopamine)

Sudden Withdrawal
→ "Crash" exhaustion, depression, irritability.

Speed, uppers, and bennies, as well as caffeine and nicotine

●**Cocaine**
→ > Dopamine and Norepinephrine activity. (by blocking reuptake)
→Excitation, greater muscular strength
→Euphoria

High Doses
→Fever, vomiting, convulsions,
→Hallucinations, paranoid delusions

Sudden Withdrawal
→Withdrawal side effects are low
→Physiological dependence low, BUT "crave" high (psychological dependence).

●**Hallucinagens**
●**Mescaline, LSD**
→powerful mind-altering drugs producing hallucinations.
→Flooding of excitation in the NS
→Decreases serotonin activity
→Distort / intensify sensory experiences
→Paranoia, panic,
→Flashbacks of the "trip"

Used by about 10% of North Americans

●Marijuana
Cannabis (Hemp plant)
Hallucinogen? Sedative? Other?

→THC binds with receptors throughout the brain
→increases Dopamine activity (pleasurable)
→increases GABA activity (Relaxing effects)
→Euphoria, relaxation, enhanced sensory experience
→impaired memory / reaction time

- **INHALANTS**

Usually immediate effect on the brain

- destroys myelin sheath (& interferes with neutral transmission)

IMMEDIATE EFFECTS
- Typically depressant
  - Relaxed/euphoric
  - Disoriented
  - Slurred speech
  - nausea
  - inattentive
  - irritability/ depression

LONG TERM EFFECTS
- memory loss
- concentration problems
- visual disturbances; blindness
- motor problems
- peripheral nerve damage

Inhalants - highest use in 8th Grade
~ 20% have used an inhalant previous year

By Grade 12, reported
Use in past year:

Marijuana	48%
Inhalant	11%
Cocaine	09%
LSD	05%

SUBSTANCE INDUCED PSYCHOSIS

- hallucinogens (e.g. LSD & Mescaline)
- amphetamines (e.g. Speed & Cocaine)
- cannabis

after chronic use (& sometimes even after one use).

Psychoactive substances can lead to:

- delusions & loss of contact with external reality
- paranoid feelings
- delirium
- depression & mood swings
- flashbacks & PTSD symptoms