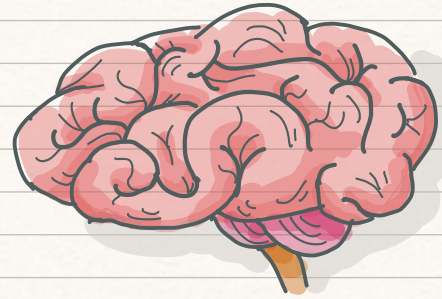


Psychology Notes



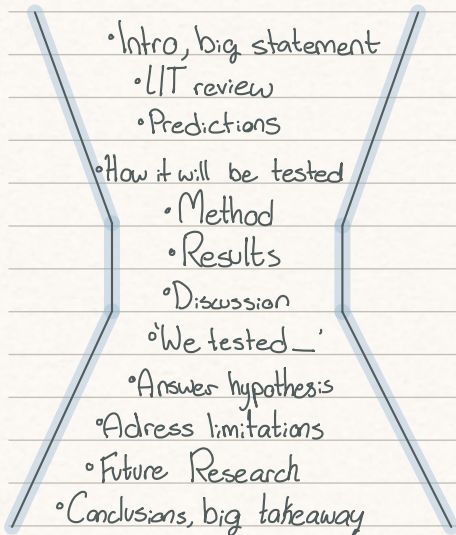
8/17 Tuesday

- **Experiential processing** - effortless, passive and automatic. Doesn't work well in focused learning; one needs to focus on specific material and share it for later use.
- **Reflective learning** means to actively think about it (AKA elaborative processing).
- Steps for reflective learning include setting specific goals and summarizing every 20 minutes.
- **SQ4R method** - Survey, Question, Read, Recite, Reflect, Review.
- **LISAN** - Lead, Ideas, Signal words, Actively listen, note taking
- **Study Space**
 - minimize distractions, study music, quiet area.
- **Spaced Practice**
 - a large number of short study sessions.

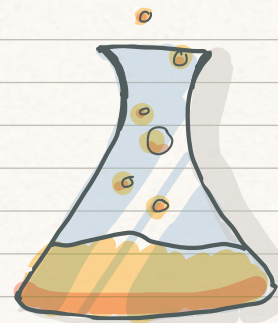


8/19 Thursday

- The abstract of an article helps as a summary for an article, however does not give the entire depth.
- Introduction is several pages long and is the main section of the article.
- Starts with a big, general statement, and gradually goes in depth.



- method
- participants
- apparatus and stimuli
- procedure
- results
- discussion
- address hypothesis
- future research
- conclusion/big takeaway statement
- references
- acknowledgements
- extra information
- appendix



8/23 Monday

Chapter 1



Psyche - Greek for 'mind'

Logos - knowledge or study

> **Psychology** - the scientific study of overt behavior and mental process (covert behavior)

- Applied to mental health, business, education, sports, law, medicine, and the design of machine.

How can a psychologist learn about your mind?

- You are the only person who can directly observe your own thoughts - introspection

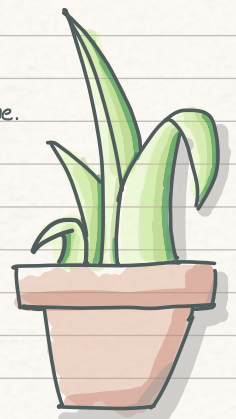
> **Psychology** must be defined by scientific observation.

- Objective scientific research, systematically answer questions

- Similar to chemistry, physics, medicine; different than history, law, art and business.

• **Overt behavior** - directly observable (talking, eating, sleeping).

• **Covert behavior** - subjective mental events (dreaming, thinking, remembering, decision making).



Common Sense

◦ common sense is often incorrect

◦ Cognitive Unconscious - the part of the mind which we are subjectively unaware that is not open to introspection.

What do psychologists aim to achieve?

◦ Description, understanding, prediction, and control.

Scientific observation

◦ An empirical investigation structured to answer questions about the world in a systematic and intersubjective fashion.

◦ Empirical evidence.

The Scientific Method

◦ Making observations

◦ Defining a problem

◦ Proposing a hypothesis

◦ Gathering evidence / test hypothesis

◦ Build a theory

◦ Publish results



8/24 Tuesday

- Few truths transcend the need for logical analysis and empirical testing

◦ Everything else should be evaluated through logic, evidence, and the scientific method.

- Authority or claimed expertise does not automatically make an idea true or false

- Judging the quality of evidence is crucial.

- Critical thinking requires an open mind.

- The power of falsification

◦ falsification: the deliberate attempt to uncover how a commonsense belief or scientific theory might be false.

◦ uncritical acceptance: the tendency to believe claims because they seem true or because it would be nice if they were true.

- Research Ethics and ethical guidelines

◦ Avoid harming participants

◦ IRB Internal Review Board

◦ APA (American Psychological Association) has ethical guidelines

Wed 8/25

- Phrenology: an attempt to assess personality by examining various areas of the skull.

- Wilhelm Wundt (pronounced Villhem Voont): father of psychological science (late 1800s).

◦ How do we experience sensation, images, and feelings

◦ Systematically observed various stimulus (lights, sound) on behaviors.

◦ Insisted on systematic observation and measurement.

◦ His student, Karl Marbe, discovered imageless thought (described which object in each hand is heavier - how do you know?)

◦ Stimulus - any physical energy that an organism senses.

- Structuralism: The school of thought concerned with analyzing sensations and personal experience into basic elements.

◦ No definite answer - very frustrating.

- Functionalism: the school of psychology concerned with how behavior and mental abilities help people adapt to their environments.

- Behaviorism: the school of psychology that emphasizes the study of overt, observable behaviors.

- Radical behaviorism: A behaviorist approach that rejects both introspection and any study of covert mental events, such as thinking, as inappropriate topics for scientific technology.

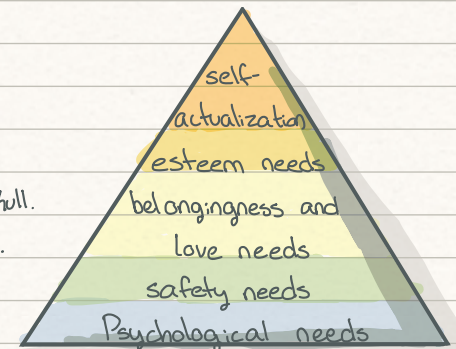
- Gestalt Psychology: a school of psychology emphasizing the study of thinking, learning, and perception in whole units, not by analysis into parts.

◦ Gestalt = "form, pattern or whole" in German.

- Psychoanalytic psychology

◦ Sigmund Freud: believed in Dynamic Unconscious (the parts of the mind that are beyond awareness, especially conflicts, impulses, and desires, not directly known to a person.

Maslow's Hierarchy of Needs

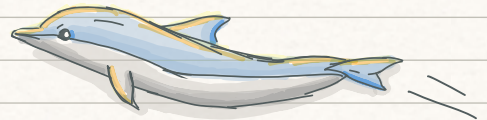


- Freud: believed all thoughts, emotions, and actions are determined **nothing is by accident**, opposite of behaviorism, psychoanalysis, first to experience the role of early experience
- Neo-Freudian: a psychologist who accepts the broad features of Freud's theory but has revised it to fit their own concepts (less sex and aggression).
- **Humanistic psychology**: an approach to psychology that focuses on human experiences, problems, potentials, and ideals.
 - Determinism
 - Free will
 - Abraham Maslow's hierarchy of needs
- **Cognitive behaviorism and cognitive psychology**
 - Behaviorism was too extreme, and changed into cognitive behaviorism.



Th 8/26

- **Most early psychologists** were old white men. Diversity expanded variety of views.
- **Gender bias**: A tendency for females and female related issues to be underrepresented in research, whether psychological or otherwise.
- **WEIRD**: Western, Educated, Industrialized, Rich and Democratic
 - Edward Tolman noted that much of the psychology research we read is based on rats and college sophomores.
- **Today**: 3 complimentary perspectives on behavior--they have blended into newer, broader perspectives.
 - **Biological perspective**: the attempt to explain behavior in terms of underlying biological principles. Includes brain processes, evolution, genetics, Neuroscience, and Evolutionary psychology
 - **Psychological perspective**: the traditional view that behavior is shaped by psychological processes occurring at the level of the individual.
 - **Sociocultural perspective**: the focus on the importance of social and cultural contexts in influence on the behavior of individuals.
- **Positive psychology**: The study of human strengths, virtues, and effective functioning (love, happiness, creativity, well-being, self-confidence, and achievement) Helps others make the most of their lives.
- **Cultural Relativity**: the idea that behavior must be judged relative to the values of the culture in which it occurs.
- Behavior is influenced by differences in age, ethnicity, gender, religion, disability, and sexual orientation.
- **Psychologist**: a person highly trained in the methods, factual knowledge, and theories of psychology (masters or doctorate).
 - Over 50 divisions
- **Animals and psychology**: interested in the behavior of any living creatures.
 - Cats, dogs, parrots, dolphins, and primates
- **Helping people**
 - **Clinical Psychologist**: specializes in the treatment of psychological and behavioral disturbances or does research on it.
 - **Counseling Psychologist**: specializes in the treatment of milder emotional and behavior disturbances.
 - *Need to be licensed*
- Not all psychologists are also psychiatrists.
 - **Psychiatrist**: a medical doctor with additional training in the diagnosis and treatment of mental and emotional disorders.
 - **Psychoanalyst**: a mental health professional (usually a medical doctor) trained to practice psychoanalysis.



F 8/27

- **Experiments**:

- **Experiment**: a formal trial undertaken to confirm or disconfirm a hypothesis about cause and effect.
- **Experimental subjects**- humans (participants) or animals whose behavior is investigated in an experiment.
- **Participants**: humans whose behavior is investigated in an experiment (experimental and control group).
- **Variables**: any condition that changes or can be made to change; a measure, event or state that may vary.

- Independent
- Dependent

◦ **Extraneous**: a condition or factor that may change and is excluded from influencing the outcome of an experiment (to be controlled).

◦ **Control group**: the group of subjects exposed to all experimental conditions or variables except the IV.



-Random assignment: use of chance to assign subjects to experimental and control groups.

◦ Statistically Significant: experimental results that would rarely occur by chance alone.

-Less than a 5% chance that those results just happened $\alpha = .05$ (alpha), $p < .05$ (results of statistical test).

◦ Meta-analysis: a statistical technique for combining the results of many studies on the same subject. (huge amounts of data).

-Research bias

◦ Changes in the behavior of study participants caused by the unintended influence of their own expectation

◦ Placebo effect: changes in behavior due to participants' expectations that a drug (or other treatments) will have some effect.

◦ Placebo: an inactive substance given in the place of a drug in psychological research or by physicians who want to treat a complain by suggestion.

◦ Single-blind experiment: an arrangement in which participants remain unaware of whether they are in the experimental group or the control group.

◦ Researcher bias: changes in participants' behavior caused by unintended influence of a researcher's actions.

-Self fulfilling prophecy: a prediction that prompts people to act in ways that make the predictions come true.

◦ The double-blind experiment: an arrangement in which both participants and researchers are unaware of whether participants in the experimental group or in the control group, including who might have been administered a drug or placebo.

T 8/31



-Non-experimental Research Methods

◦ Experimental method: investigating causes of behavior through controlled experimentation; not always possible.

◦ Naturalistic observation: observing behavior as it unfolds in natural setting.

◦ Correlational Method: making measurements to discover relationships between events (non-experimental)

◦ Case study method: an in-depth focus on all aspects of a single person (clinical).

◦ Survey method: using questionnaires and surveys to poll large groups of people.



-Naturalistic observation

◦ Observe people moving around a setting (shopping).

◦ Downsides: Observer effect changes in an organism's behavior brought about by an awareness of being observed.

◦ Observer bias: the tendency of an observer to distort observations or perception to match their expectations.

◦ Anthropomorphic error - attributing human thoughts and feelings to animals.

◦ Jane Goodall observing chimpanzees in the wild.

-Correlational Method

◦ Correlation: the existence of a consistent, systematic relationship between two events, measures, or variables.

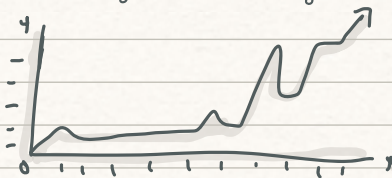
◦ Correlational Study: a nonexperimental study designed to measure the degree of relationship (if any) between two or more events, measures or variables.

◦ Coefficient of Correlation: a statistical index rating from -1.0 to +1.0 indicating the directionality.

◦ 0.0 = no relationship at all

◦ 1.0 = perfect positive relationship

◦ -1.0 = perfect negative relationship



-Case study method

◦ Can't (or is it unethical) to study rare events experimentally. (can't cause someone to have brain damage.)

Chapter 2

W 9/1

-Organization of the nervous system

-The central nervous system: Consists of the brain and spinal cord.

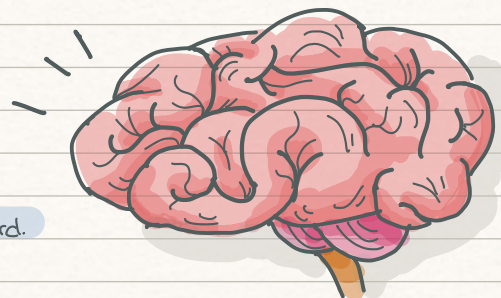
-The brain

-The spinal cord

-The peripheral nervous system: Consists of the somatic nervous system and the autonomic nervous system.

-The somatic nervous system (SNS): Carries messages from the sensory organs and skeletal muscles.

◦ Controls voluntary behavior (clapping your hands or dancing).



• Soma: body

• Part of the peripheral nervous system that transmits commands for voluntary movement from the CNS to the muscles and bring sensory input back to the CNS for further processing.

• 31 pairs of spinal nerves serving the torso and limbs

• 12 pairs of cranial nerves serving the head, neck, and some internal organs.

Soma

-The autonomic nervous system

• Controls internal organs and glands (heart rate, digestion, perspiration)

• Autonomic: "self-governing"

• Sympathetic Branch: Activates body (fight or flight response).

• Parasympathetic Branch: Quiets the body.

• Homeostasis and Autonomic Nervous System

-SNS + ANS

• SNS and ANS have to work together (haunted house).

-The sympathetic nervous system: Activates body

-The parasympathetic nervous system: Calms body

-The spinal cord

• 31 pairs of spinal nerves exit between the bones of the vertebrae

• Sensory info from body to the central nervous system

• Carry motor commands to muscles.

-Neurons and Neurotransmission

• Neurons process and transmit info

• Two types of branches extend from cell body: axons and dendrites.

-Axon: the branch of a neuron that is usually responsible for transmitting info to other neurons.

-Axon terminal: Contains synaptic vesicles, which contain chemical messengers called neurotransmitters that transmit signals between neurons.

• These neurotransmitters communicate with receptors on the dendrites of other neurons.

W 9/8

-Dendrites

• A branch from the neural cell body that usually receives input from other neurons.

• Neurotransmitters from the sending neuron communicate with receptors on the dendrites of other neurons.

• Nerve impulses usually travel from the dendrites and soma (cell body) to the branching ends of the axon.

-Electrical Signaling: action potential

-Chemical Signaling: neurotransmitters

-Steps in transmission between nerves

1) Takes place in the signaling neuron's axon. Neuron generates an electrical signal AKA action potential. Signal travels the length of the axon from its junction with the cell body to its terminal.

2) Takes place between the two neurons. Arrival of an action potential at the axon terminal of the first neuron signals the release of neurotransmitters. Neurotransmitters float across the extracellular fluid separating the two neurons. On the influence of neurotransmitters, the second neuron may respond with its own action potential and send the message along.

Action Potentials: Either an action potential occurs or the cell remains at rest -- there is **no middle ground**. Because of this consistency, we say that action potentials work in an **all or nothing** fashion.

• Myelinated axon: faster neuron transmission

• Unmyelinated axon: slower neuron transmission

• Propagation: the duplication of the electrical signal down the length of the axon to the axon terminal.

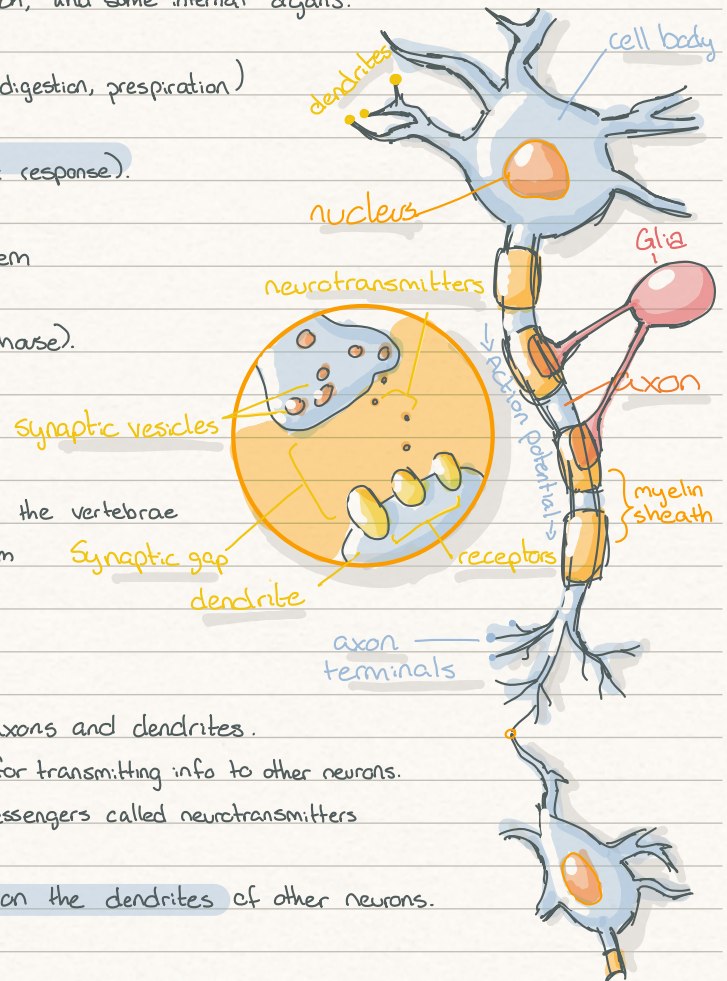
• Once the action potential reaches the axon terminal, the neural communication system switches from an electrical signal to a chemical signal.

• Synapse

-Receptors: special channels on the receiving dendrite that "catch" neurotransmitters

-Receptors work with the neurotransmitters like locks and keys

-Neurotransmitters do not stay bound to receptors very long.



- Once they pop out of the receptor binding site, neurotransmitter molecules drift away from the gap, broken down by enzymes, or return to the axon terminal from which they were released in a process called reuptake.

Neurotransmitters

- any chemical released by a neuron that alters activity in other neurons.

- Acetylcholine: (excitatory) movement, autonomic, functioning, learning and memory (deficiency = Alzheimer's)
- Dopamine: (excitatory) motivation, reward, planning of behavior (deficiency = Parkinsons + schizofrenia)
- GABA: (inhibitory) Inhibitory effect in the CNS; participates in moods (deficiency = anxiety)
- Glutamate: (excitatory) Excitatory effect in the CNS; learning and memory (excess = neuron death + autism, deficiency = tired)
- Norepinephrine: (excitatory) Arousal, vigilance, and mood (excess = anxiety)
- Serotonin: (inhibitory) Mood, appetite, and sleep (deficiency = depression / anxiety).
- Drugs can mimic, duplicate, or block neurotransmitters. (cocaine).



Th 9/9

Neural Regulators

- Enkephalins: reduces pain and stress, opiate-like
- Neuropeptides: they do not carry messages but they regulate the activity of other neurons.
- Endorphins: released by the pituitary gland, reduces pain

Neural Networks

- Interlinked collections of neurons, process info in our neural systems
 - reflex arc: occurs when a stimulus provokes an automatic response
 - sensory neuron: carries messages from the senses to the CNS
 - motor neuron: carries commands from the CNS to muscles
- Reflexes are initiated by the spinal cord without the assistance of the brain.

Glial cells and the Blood Brain Barrier

- Form the framework that holds neurons in place.
- Create tight connections with blood vessels serving the brain, the blood barrier
- Clean up debris where neurons have been damaged.
- The myelin sheath insulates axons and speeds electrical transmission along axons.



Myelin

- Neurons are the "grey matter" of the brain and myelin is the white matter.
- The myelin sheath insulates and protects the axon, and speeds up transmission of electrical signals along the axon and is generated by glial cells
- Myelin in the brain and spinal cord forms scar tissue when damaged, interfering with transmission; myelin in the rest of the nervous system does not.

Myelin & the Teenage Brain

- Takes a long time to complete
- Prefrontal cortex is still undergoing myelination into adulthood (age 30?)
- Prefrontal cortex

- cognitive control
- attention regulation
- response inhibition
- planning, goal setting, decision making

- Foods to improve myelination
 - Healthy fats

Neuroplasticity

- Nervous system changes in response to experience.
- New synapse connection can be made
- Synaptic connections can be strengthened
- Inactive connections may weaken and die
- younger age = more plasticity = easier to learn

NEUROPLASTICITY <



> BIOPSYCHOLOGY

• Neurogenesis: The production of new brain cells.

• Use it or lose it

- Biopsychology

• The study of how biological processes, especially from the nervous system relates to behavior

• Investigate the areas of the brain that control mental or behavioral functions

- CAT Scans

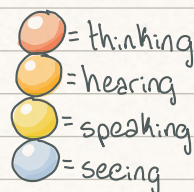
• Computed tomographic scans

• X-rays taken from number of different angles.

• Formed into an image

• May expose patients to unhealthy doses of radioactivity

• Reveals only brain structure.



→ PET ←

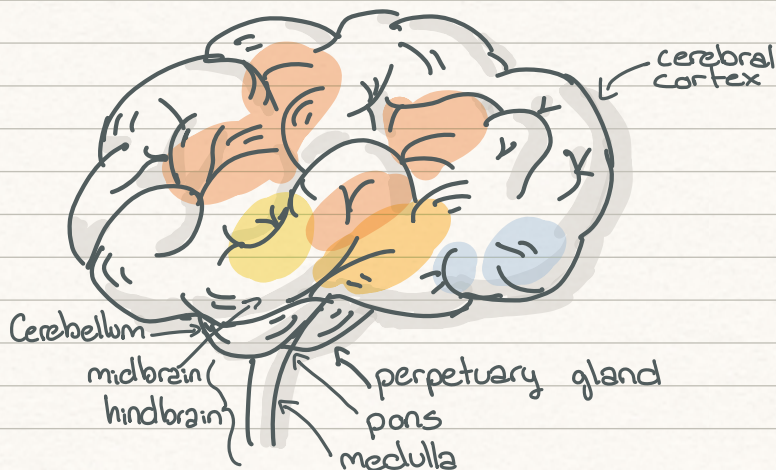
- MRI

• Magnetic Resonance Imaging

• Body placed inside a strong magnetic field.

• creates 3-D image

• "slices" can be displayed



- fMRI

• Functional MRI

• Uses MRI technology to make activity visible

• can maybe detect when someone is lying

F 9/10

- PET scan

• Positron Emission Tomography

• Detects positrons (subatomic particles) emitted by weakly radioactive glucose (sugar) as it is consumed by the brain.

• Creates a moving, color video of changes in brain activity

• Shows what areas of the brain are using more energy.

- Clinical Studies of the brain

• Electrical stimulation of the brain: using an electrode (thin, insulated wire), the surface of the brain can be "turned on."

• Ablation: surgical removal of parts of the brain

• Deep lesioning: tissue below the surface can be removed

- EEG

• Electroencephalography: measures the waves of electrical activity produced near the surface of the brain.

• Electrodes placed on person's scalp

- The Ventricles of the Brain

• The spinal chord and brain are cushioned by cerebrospinal fluid which is generated by the ventricles

M 9/13

- Hindbrain • composed of the medulla, pons, and cerebellum (also called the brain stem)

• Medulla merges with the spinal cord.

- contains large bundles of axons traveling to and from higher levels of the brain.

- manages essential functions (heart rate, blood pressure), damage results in quick death.

• Pons sits above the medulla

- involved with the management of sleep, arousal, and facial expressions.

- Cerebellum

• Maintains balance and motor coordination.

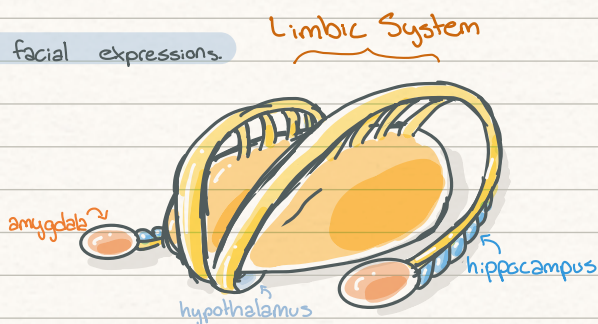
• Stores memories related to skills and habits.

• One of the first brain structures to be affected by alcohol.

- Midbrain & Reticular Formation

• Midbrain sits above the pons

• contains structures involved in sensory reflexes, movement, and pain.



- Reticular formation runs the length of the brainstem's core from the upper medulla into the midbrain
- Participates in the control of mood, arousal, and sleep
- Reflexes involve breathing, sneezing, coughing, and vomiting

Subcortical Structures and their Functions

• Limbic system: Thalamus, Basal Ganglia, Amygdala, etc. (located in the center of the brain)

↳ sometimes referred to as "emotional" brain

- Thalamus: "gateway to the cortex", as input from most of our sensory systems (vision, hearing, touch, and taste) 1st travels to.
 • involved with memory and states of consciousness.

- Basal Ganglia: Collection of large structures involved with voluntary movement

• "Causes" parkinsons disease

- Amygdala: May have a role in identifying, remembering, and responding to fear and aggression.

• Emotion processing

• Limbic system and teenage brain

- responsible for reward seeking
- stimulated by social and emotional variables
- develops earlier and faster than the cortex.

• Hypothalamus: collection of structures involved with motivation and homeostasis or the regulation of body functions

temperature, thirst, hunger, biological rhythms and mating (4 f's: feeding, fighting, fleeing and f*cking)

- directs the autonomic nervous system and the endocrine system and its hormones.

- Production of GnRH (gonadotrophin releasing hormone) stimulates pituitary gland to release FSH (follicle stimulating hormone) and LH (luteinizing hormone), travels to gonads to "turn on" sexual development.

• Hippocampus

- Essential to the formation of long-term memories

- involved in the storage and retrieval of memories located elsewhere in the brain.

• Cingulate Cortex

- forwards two thirds of this structure, known as the anterior cingulate cortex (ACC) participates along with the the hypothalamus in the control of the autonomic nervous system

- ACC also important in decision-making, emotion, anticipation of reward, empathy.

- PCC (posterior cingulate cortex) the rear third, participates in memory and visual processing.

- Coordinates sensory input with emotions and emotional response to pain.

• Corpus Callosum & Cerebral Cortex

- Located above the brainstem, two cerebral hemispheres

- The corpus callosum is a large bundles of axons that connects these hemispheres

- The cerebral cortex is the thin layer of cells covering the outer surface of the cerebral hemispheres

- The cerebrum, hypothalamus and thalamus are collectively referred to as the forebrain.

• Lateralization: the specialization of the abilities of the left and right hemispheres.

- Damage to one hemisphere can cause a problem called Spatial Neglect

- Split brain operation: the corpus callosum is cut to control severe epilepsy.

T 9/14

- Right brain / left brain

• Left

- 95% of people use the left hemisphere for language

- Speaking, writing and understanding

- Math, judging time, rhythm,

- Coordinating complex movements such as speech

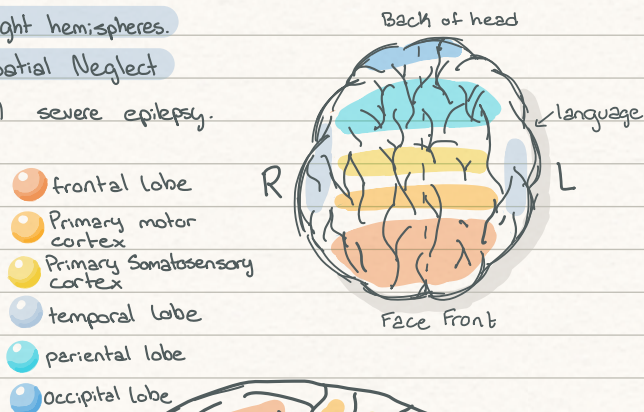
• Right

- Simple words and numbers,

- pattern recognition: faces, melodies, puzzles, drawing pictures

- expressing & detecting emotion

- jokes, irony, sarcasm, implications, metaphors



- frontal lobe
- Primary motor cortex
- Primary Somatosensory cortex
- temporal lobe
- parietal lobe
- occipital lobe



The Four Lobes of the Cerebral Cortex



Occipital Lobe

- Located at the back of the brain
- Home to the primary visual cortex
- Two important pathways link the lobe with rest of brain
 - Pathway connecting the occipital lobe with temporal lobe allows to recognize objects we see.
 - Second pathway connects occipital lobe with the parietal lobe and allows us to process the movement of objects.

Occipital lobe & face

- Visual agnosia: inability to identify seen objects
 - Can see a candle, describe it, and draw it, but cannot name it.
 - If candle is placed into the hand, it can be named.
- Facial agnosia: the inability to perceive familiar faces (Prosopagnosia)
 - Fusiform Gyrus (area of the brain)



Temporal lobe

- Has a number of areas that are specialized for particular functions
- Home to our primary auditory cortex which allows us to process incoming sounds
- Processes some higher visual system tasks including the recognition of objects and the faces of familiar people.
- Wernicke's Area: area of the brain responsible for receptive language.
 - Damage makes it difficult to understand speech (the meaning of words)



Parietal Lobe

- Home to our primary somatosensory cortex (helps localize touch, pain, skin temperature, body position)
- Processes input about taste and, like the temporal lobe, engages in some complex processing of vision.

Frontal lobe

- Home of the primary motor cortex
- Has a number of important, sophisticated cognitive functions
 - The most forward portion of each frontal lobe, known as the prefrontal cortex, is involved with the planning of behavior, attention and judgement
 - The orbitofrontal cortex, a part of the prefrontal cortex located just behind the bony orbits protecting the eyes, plays an important role in our emotional lives

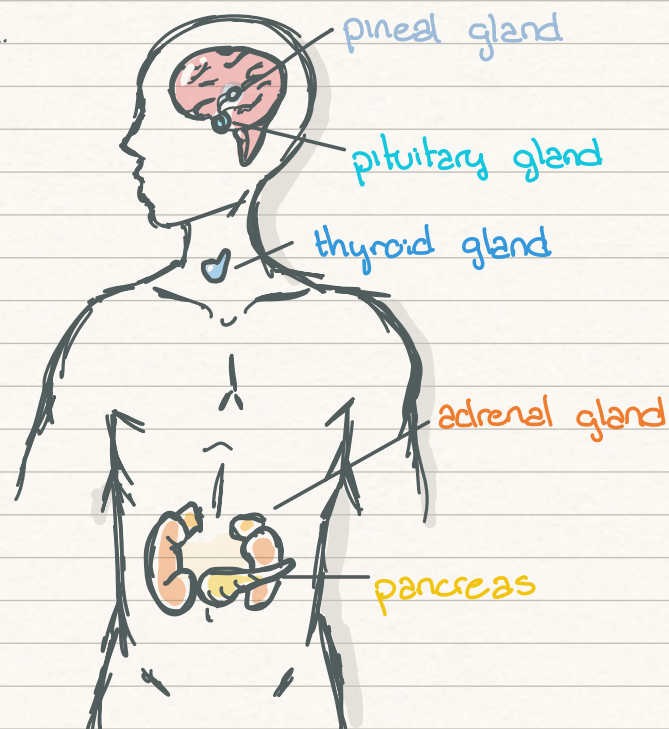
Language and this lobe

- Aphasia: a speech disorder resulting from brain damage ("Tan")
- Broca's Area: speech center that is part of the left frontal association area.
- Responsible for speech production (speaking or writing)
 - Damage causes motor (or expressive) aphasia.

W 9/15

The Endocrine Glands

- Pineal gland
 - regulates body rhythms and sleep cycles
- Pituitary gland
 - influences growth and lactation
 - also regulates the activity of other glands
- Thyroid gland
 - secretes hormones that arouse the body
 - help with adjustment to stress
 - regulate salt
- Adrenal glands:
 - secretes hormones that arouse the body
 - balance
 - affect sexual functioning
- Pancreas



- releases insulin to regulate blood sugar and hunger

- Endocrine System

◦ Comprised of a number of glands that release chemical messengers known as hormones into the bloodstream to communicate with other body parts

- important glands of the endocrine system include the **pineal gland**, the **pituitary gland** (aka "master gland", the **thyroid gland**, and the **adrenal glands**)

- Sex hormones

◦ In males, major reproductive glands are the **testes**.

◦ In females, major reproductive glands are the **ovaries**.

- Endorphins and other important hormones

◦ Endorphins

- Endogenous morphines that modify our natural response to pain; act as neuromodulators

◦ Melatonin

- Released by the pineal gland in response to daily cycles of light and dark

◦ Epinephrine

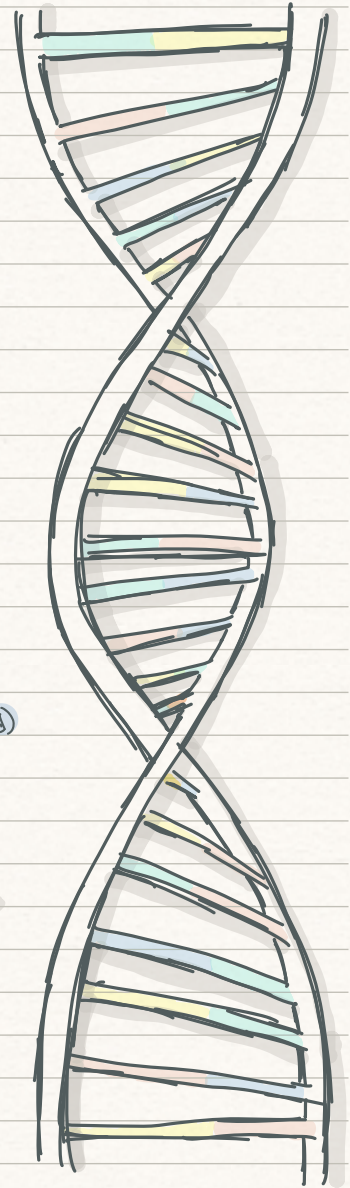
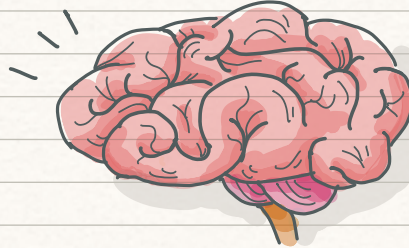
- Adrenal hormone that tends to arouse the body; associated with fear

◦ Norepinephrine

- Neurotransmitters and adrenal hormone that tends to arouse the body; associated with anger.

◦ Thyroid hormones

- help regulate metabolism rate



Chapter 3

- Developmental psychology

◦ The study of **progressive changes** in **behavior and abilities** from **conception to death**

◦ Many steps in the process.

- Development sequence

◦ Prenatal

- conception until birth (**zygote, embryo, fetus**)

◦ Neonatal

- Birth to a few weeks (**neonate newborn**)

◦ Infancy

- Few weeks until walking, around 1 year to 18 months (**infant, baby**)

◦ Early childhood

- 15-18 months until 2-2.5 years (**toddler**); 2-3 years until age 6 (**preschool child**)

◦ Middle childhood

- 6-12 years (**school-age child**)

◦ Pubescence

- 2 years before puberty

◦ Adolescence

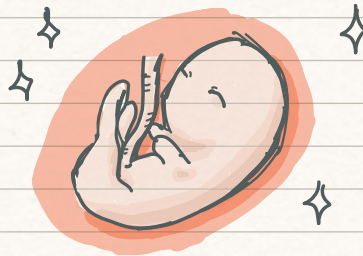
- beginning of pubescence until full social and sexual maturity (**adolescent, teenager**)

◦ Adulthood

- post-adolescence to death, young adult, adulthood, and maturity (**41+ years**)

◦ Senescence

- "old age" marked by **physiological and psychological** deterioration.



- Nature and Nurture (heredity & environment)

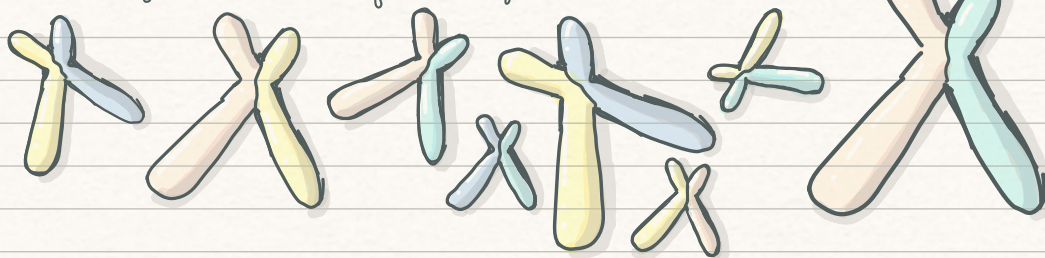
- Heredity and Maturation

◦ **Heredity**: "nature"; the transmission of physical and psychological characteristics from parents to offspring through genes.

-The genome comes from the combination of genes from both the mother and the father.

-Genetic disorders: problem caused by defects in the genes or by inherited characteristics

- Sickle-cell anemia
- Hemophilia
- Cystic fibrosis
- Albinism
- Huntington's disease



-Genomes (DNA)

-Genes: small segments of DNA that affect a particular process or personal characteristic, carry hereditary info.

- Code for proteins
- Genes can either be recessive or dominant
- Dominant genes: controls a feature and someone with that gene will always express that characteristic
- Recessive genes: must be paired with a second recessive gene (from the other parent) of the same type to be expressed.

-Punnett Squares (Bb)

W 9/22

-Epigenetics (means above genetics)

- The process by which genes are expressed, either strong or weak, and at what time.
- Maturation: the physical growth and development of the body and the nervous system.
- Epigenetics influence the body size, shape, height, intelligence, etc.
- Based on the environmental signals
- Football team; genes are the players and equipment, the epigenetics is the coaches, rules, etc.

- Genome does the work.
- Epigenome tells what to do.

Environment & Maturation

- Environment (nurture): the sum of all external conditions that affect development, including especially the effects of learning.

• Prenatal experience → death

- space rats
- sound experience in the woman
- stress hormone

- Teratogen: anything capable of altering fetal development in nonheritable ways that cause birth defects.

- Congenital problems: problems or defects that originate during prenatal development in the womb.

-Fetal alcohol syndrome (Teratogen)

Th 9/23

-From ovulation to implantation

-Stages of Prenatal Development

• Germinal

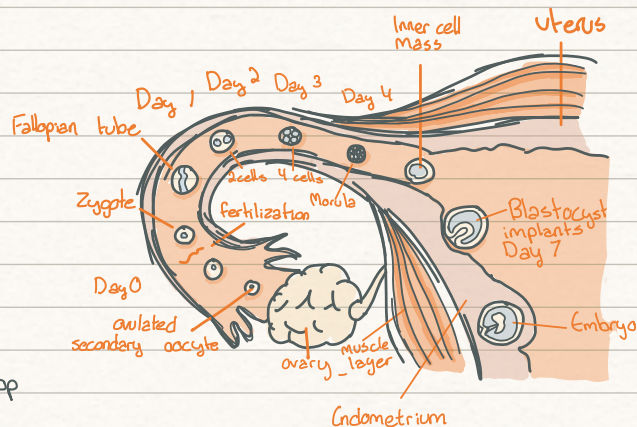
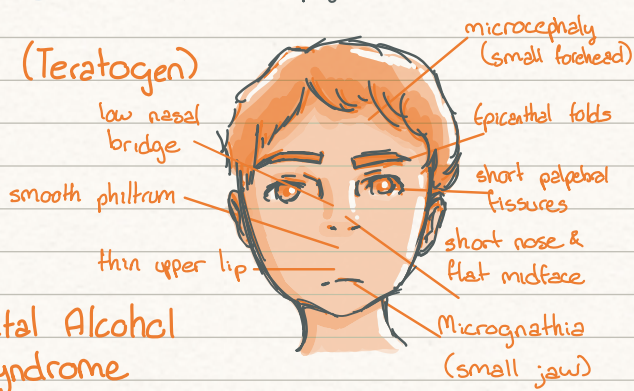
- Begins with formation of zygote, ends after 2 weeks
- When the outer portion of the zygote's developing cluster of cells has attached itself to the uterine wall.

• Embryonic

- From 2 weeks to 2 months
- Major structures and organs of the body begin to develop
- Embryo starts to resemble a human being

• Fetal

- From about 2 months to birth
- Developing organism is called a fetus
- Through very rapid growth
- Body structures and organs complete their growth



FOOD

Maturation in Infancy

- Humans are born in a "premature" state.
 - Compared to other primate species (evolution)
 - Cannot walk or climb or grasp onto mom.
 - But still have a surprising ability to learn through sensory information
 - Reflexes: grasping, rooting, sucking, Moro (startle)



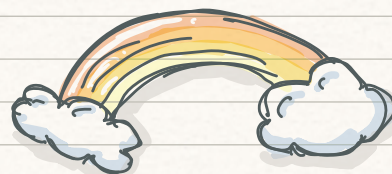
F 9/24

- Motor Development in Infancy

- Rate of motor maturation varies from child to child (order is usually the same)
 - lift head, sit up, crawl, pull self up, walk with support, walk, run
 - Some children skip crawling (but crawling is still important for muscle tone)
 - Must practice, emergent behavior

- Sensory Development in Infancy

- Neonates can see, hear, smell, taste, and respond to pain and touch.
 - less accurate, but develops quickly
 - At birth, neonates see things best about 1 foot from their face, but by 4 months have "drivable" vision.
 - follow moving objects with eyes
 - Visual attention is incredibly important
 - Prefer complex shapes, faces, familiar sounds and smells.
 - Quickly learn patterns, language sounds, categories of animals.



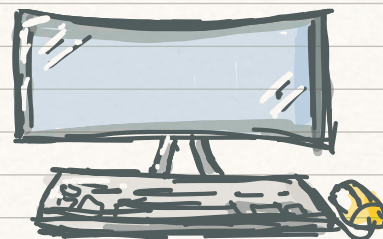
- Readiness

- Condition that exists when maturation has advanced enough to allow the rapid acquisition of a particular skill
 - Potty training: body has to be mature enough to control their bodies (helps if they are also verbal).
 - 18-24 months

• Reading

- Sensitive Periods

- During development, a period of increased sensitivity to environmental influences. A time during which certain events must take place for normal development to occur.
 - Bonding with caregivers
 - Language development
 - Hearing impairments



- Deprivation and Enrichment

- Feral children: children of war, poverty

- The whole human

- Reciprocal influences of the child on the environment
- Temperament: the physical core of personality including emotional and perceptual sensitivity, energy levels, and mood.
 - Easy, Challenging, Sensitive & Intense
 - Based on regularity, initial reaction, adaptability, sensitivity, intensity, mood, distractibility, attention span & persistence.
 - Some don't fit into one category

M 9/27

- Developmental Level

- An individual's current state of physical, emotional, and intellectual development
 - Three factors come together to determine the level (bidirectional, over time)
 - Heredity
 - Environment
 - Own behavior

- Emotional Development in Infancy

- Basic emotions: distress, contentment, interest, and disgust
- 7 months: surprise, anger, fear, sadness, joy
- Social smile: smile elicited by social stimulus



- Social Development

• Emotional attachments help development of self awareness and awareness of others.

- Attachment

• Contact comfort: pleasant feeling of clinging on to caretaker

• Separation Anxiety: affects infants 8-12 months

- Attachment quality

• Ainsworth: Strange Situation (Research where mom leaves room etc.)

• Secure attachment: a stable and positive emotional bond

• Insecure-avoidant attachment: anxious emotional bond marked by a tendency to avoid reunion with caregiver

• Insecure-ambivalent attachment: an anxious emotional bond marked by both desire to be with a parent or caregiver and some resistance to being reunited (mad at caregiver for abandonment).

• Securely attached infants show greater social skills, resiliency, curiosity, problem solving, etc.

Tu 9/28

- Disattention

• Avoidant

- Little emotional sharing in play.

- Few signs of emotion when caregiver comes or goes.

- low affect when offered attention

- lack of attachment

- low self esteem

• Disorganized

- Lack of attachment

- expressed by disorganized emotional behavior (back turned).

- Promoting Secure Attachment

• Acceptance and sensitivity to baby's signals

• Overstimulating or rejecting infant can cause insecure attachment.

- Daycare

• Improves social experience, language and skills

- preferably small child to teacher ratio.

- Parenting Styles: identifiable patterns of parental caretaking and interaction with children (4 major styles)

1) Authoritarian: enforce rigid rules and demand strict obedience to authority

- power assertion

- withdrawal of love

- results in low self esteem

2) Overly permissive: give little guidance, allow too much freedom, or do not require the child to take responsibility.

- results with hyper self esteem

3) Authoritative: parents who supply firm and consistent guidance combined with love and affection

- Management techniques

- results in resilience and thrives in difficult situations

4) Uninvolved: absent parents

- Maternal and Paternal Influences

• Maternal influences: the aggregate of all psychological effects that mothers have on their children

• Paternal influences: ... fathers have on their children.

W 9/29

- Language Development

• Closely tied to maturation

• 6-8 weeks: begins to coo and "creaking."

• 7 months: begins to make consonant sounds, then reduplicative babbling

• 1 year: responds to words (no, hi) and begins to address parents

• 18 months - 2 years: word explosion



	Affection	
	-	+
control	+ Authoritarian	Authoritative
	- Uninvolved	Overly Permissive



-Language and Terrible Two's

- Age 2: more independent
- Respond with no
- First grade: know about 8,000 words, use 4,000.

-Roots of Language

- Noam Chomsky: believes humans are biologically predisposed to learning language.
- presumes heredity has readied humans to learn certain skills, such as how to use language, or a readiness to behave in particular ways.

-Early communication

- Social exchanges, even if they are one-sided help keep the infant's attention and arousal
 - Peek-a-boo
- Use signals: in early language development, behaviors such as touching, vocalizing, gazing and smiling; allow for non-verbal interaction and turn-taking

-Perceptual Narrowing

- Phonemes: smallest part of speech, each language has their own set of phonemes.
- Infants are born with the capacity to learn the phonemes from any language system.
 - as experience to native sounds increase, sensitivity to non-native sounds decreases.

-Parentese: Infant directed speech

AKA motherese or babytalk, pattern of speech used when talking to infants

Th 9/30

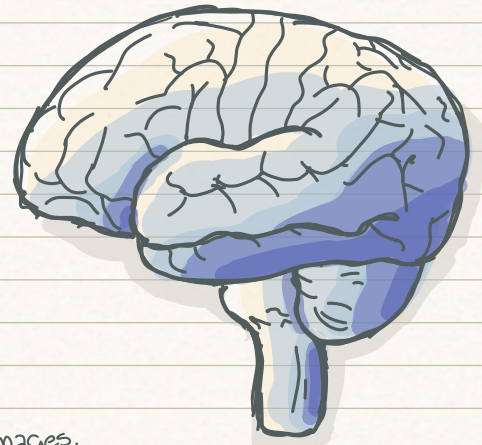
-Cognitive Development

Mimic facial expressions, prefer eye contact

•Jean Piaget

- Children are active "actors" in their environments.
- Thinking is based on things baby's can see and touch
- Mature through distinct stages
- His ideas came from watching his own child develop.
- Sensorimotor stage (0-2 years)

- Sensory input and motor responses become coordinated
- Early, cannot create internal representation such as mental images.
- Object permanence: the understanding that objects and people continue to exist when not seen.



•Preoperational stage (2-7 years)

- preoperational: begin to use language and think symbolically, yet remain intuitive and ego centric in their thought.
- cannot mentally rotate and transform images
- Intuitive thought: thinking that makes little or no use of reasoning and logic (concrete).
- Ego centric thought: thought that is self-centered and fails to consider the viewpoints of others.

•Concrete operational stage (7-11 years)

- Concrete operational: children become able to use the concepts of time, space, volume, and numbers, but in ways that remain simplified and concrete rather than abstract.
- "Do you have a brother?" "Yes." "Does he have a brother?" "No."
- Conservation: they get it; mass, weight, volume, numbers

•Formal operational stage (11+)

- Formal operational: thinking that includes abstract, theoretical and hypothetical ideas.
- Self reflective, less egocentric
- inductive and deductive reasoning
- Comprehend abstract math and philosophy
- Hothead: forcing a child to move to learn something they are not mentally or physically prepared for.

- One step ahead strategy: teaching efforts that are aimed just one step ahead of where child is.

• Newer studies show babies have more developed processing than Piaget thought

- Object permanence as early as 3 months

- Vygotsky's sociocultural theory

• Focus on impact of sociocultural environment on development

• Culture provides framework of how to learn.

• Zone of proximal development: a term referring to the range of tasks that a child cannot yet master alone, but that she or he can accomplish with the guidance of a more capable partner.

• Scaffolding: the process of adjusting instruction so that it is responsive to a beginner's behavior.

- Theory of Mind

• The understanding that people have mental states such as thoughts, beliefs, and intentions.

• Achieved around age 4

• Sally-Ann task

F 10/1

- Mirror self recognition

• Related to theory of mind

• Begins at ~18 months

- certain species can recognize themselves

• must have previous experience

- Moral Development

• Kohlberg's theory of moral development

- 5 basic emotional reactions to impending death

• Denial

• Anger

• Bargaining

• Depression

• Acceptance

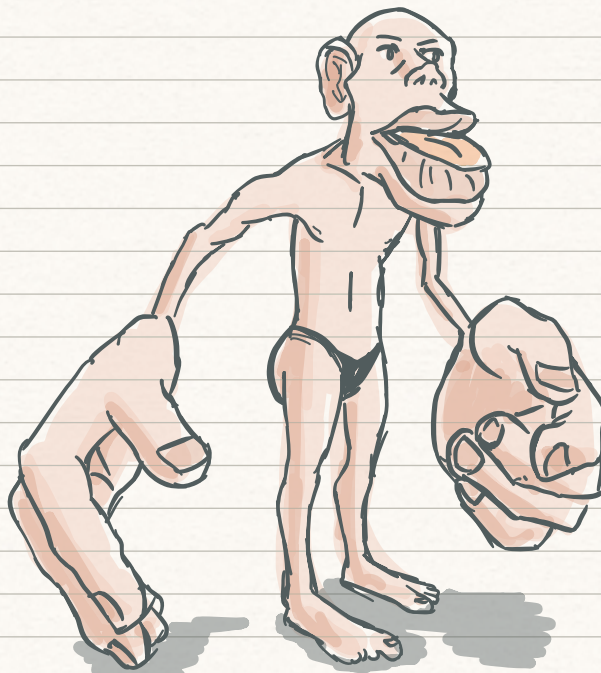


- Body after death

• Traditional burial (embalming or not), cremation

• Aquamation (water cremation) "green burial, human composting"

• Body donation



Chapter 4

M 10/4

- Sensation & Perception

• 5 senses + extra senses

- Proprioception: Spatial location

- Pain

- Heat

- Sensation (stage 1)

• Transducers: devices that convert one kind of energy into another

- The main function of sensory organs

- Each type takes a specific type of physical energy and translates it into activity in our neurons (action potential).

• Sensations: sensory impression; also the process of detecting physical energies with sensory organs.

• Perception: mental process of organizing sensations into meaningful patterns.

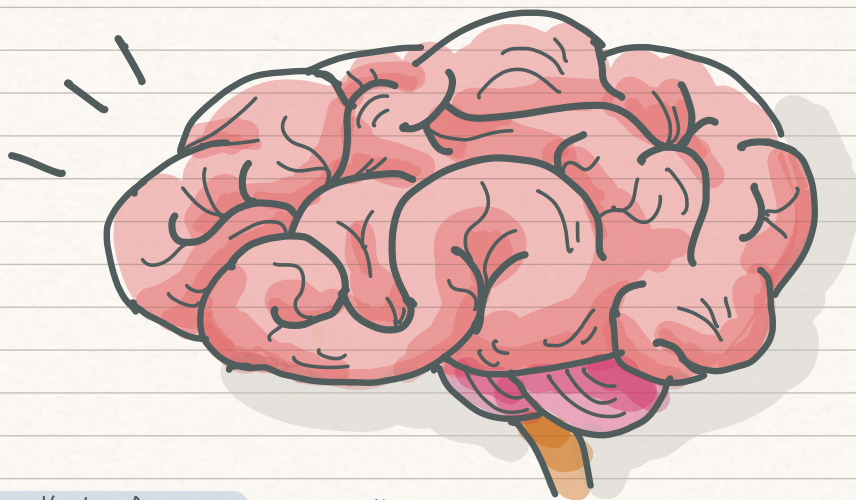
• Sensations: receive signals from environment

• Perception: Organizing and interpreting signals

- Psychophysics: study of how energy can be measured and how it's related to different aspects of sensory experience

• brightness, loudness, etc.

• Info comes in different forms of energy (light and sound waves, chemicals, temperature).



Steps

- 1) energy contains info about world
- 2) accessory structure modifies energy
- 3) receptor transduces energy into a neural response
- 4) thalamus processes and relays neural response
- 5) cerebral cortex receives input and produces the sensation and perception



Does the patient have a tumor?

Do you think the patient has a tumor?

	Yes	No
Yes	HIT	false alarm
No	Miss	correct rejection

- Absolute thresholds: the lowest level of stimulation that can be detected 50% of the time.

- Sensory adaptation: decrease in sensory response to an unchanging stimulus.

- Weber's Law: The proportion of change is more important than the absolute value of change

- Signal detection: many perceptions involve some uncertainty

- Sensory Prosthetics, bypassing transducers

- Sensory analysis: the separation of sensory info into important elements.

- Perceptual features: basic elements of a stimulus (lines, shapes, edges and colors).

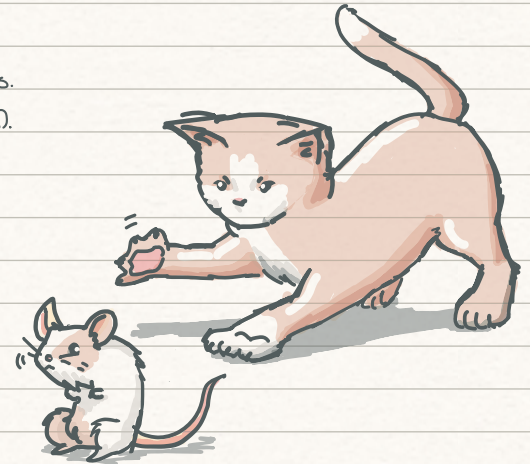
- Blakemore & Cooper (1970)

• "Horizontal" and "vertical" killifish

T 10/5

Attention

- The link between sensation, perception and our experiences
 - Directs sensory to certain stimuli
 - Selects specific info for further processing
 - Allocates mental energy needed for that processing
 - Regulates flow of resources needed to perform tasks
- Divided attention: multitasking
 - inattention blindness

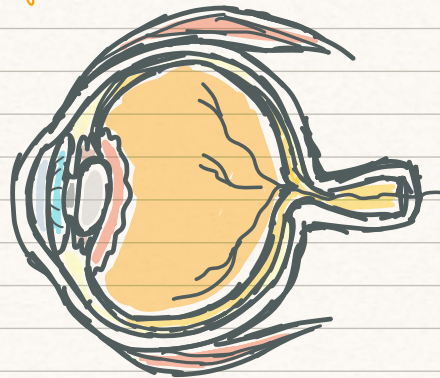
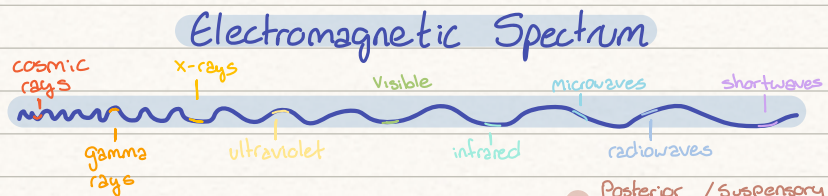


Vision

- Wavelength: perceived as color

Anatomy

- Sclera: white area, jello-like substance
- Cornea: outermost layer
 - protection & focus (use for glasses)
 - many nerve endings, hurts when is touched
- Vitreous body (filled with vitreous humor; fluid)
- Retina: thin layer of cells
 - light sensitive, contains cones & rods
 - Dark red, seen with flash
- Optic nerve: bundle of nerves
- Rods: for viewing dim light with no color
- Cones: for bright light with color



- Posterior chamber / suspensory ligaments
- ora serrata
- Vitreous body (filled w/ vitreous humor)
- retina
- Ciliary / muscle body
- Iris
- Anterior chamber (filled with aqueous humor)
- Lens
- Pupil

- Rods and cones are the visual receptors located within the retina. They each contain pigments that are broken down by light energy. As pigment breaks down, they start a series of chemical reactions that changes the activity levels of visual system neurons.

- More rods than cones

Visual pathway

- 1) optic nerve
- 2) optic chiasm
- 3) optic tracts
- 4) thalamus
- 5) occipital lobe

Trichromatic Theory of Color vision

- Perception of color is based on the response rates of three kinds of cones

• Red, blue, green

• Opponent process theory of color vision

- colored afterimages demonstrate opponent process

• Color blindness: inability to distinguish 2 or more shades

- monochromats: total color blindness; their worlds look black & white

- Dichromats: trouble distinguishing red from green, have only 2 kinds of functioning cones

- 3 main cones: red, green, blue

- x-chromosomes contain the genes for red and green cones, hence men more likely to be colorblind.

- benefits: sees camouflage, better underwater

• Dark adaptation: increased retinal sensitivity to light

- 30-35 minutes to reach maximum visual sensitivity

- Rods contain light-sensitive visual pigment called rhodopsin.

- When struck by light, visual pigments bleach, breaking down chemically

- Rods are extremely insensitive to very red light, which is why it is often used in low-light environments.



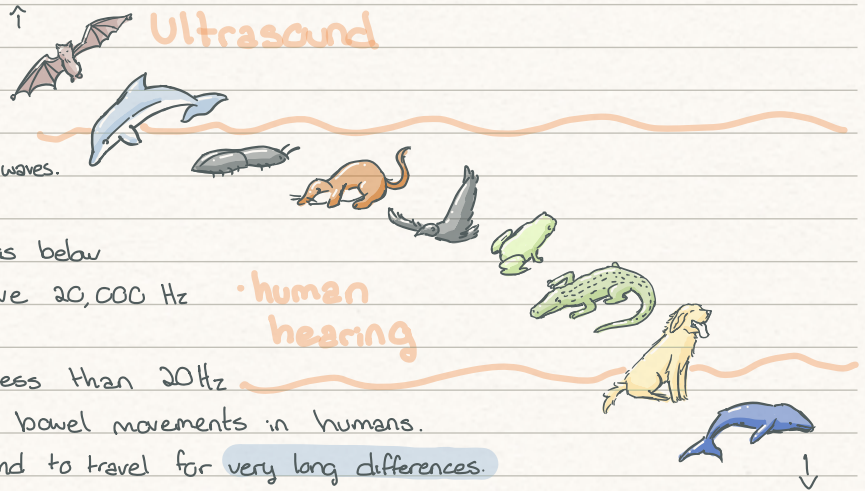
Hearing

• Sound waves: different amplitudes & frequencies

- amplitude: loudness or intensity

- frequency: pitch

- most sounds consist of complex combinations of waves.



• Ultrasounds

- above range of human hearing, infrasound is below

- ultrasound stimuli occur at frequencies above 20,000 Hz

- can be used to clean jewelry or teeth.

• Infrasound: frequencies below human hearing; less than 20 Hz

- produces dizziness, nausea, uncontrolled bowel movements in humans.

- particularly effective in water, allows sound to travel for very long distances.

- elephants & marine animals.

• Ear Anatomy

• Outer ear: consists of structures that are visible outside the body

- the pinna: outer visible structure, collects and focuses sound like a funnel

• helps localize sounds as being above or below the head

• sounds collected by the pinna are channel through auditory canal, which ends at the tympanic membrane (eardrum) at the boundary between the outer and inner ear

• The ossicles are 3 little bones that vibrate which amplifies sound energy from outer to middle ear

- sound waves weaken as they move from air to water.

• Inner ear: contains two sets of fluid-filled cavities embedded in the bone of the skull

- one set is part of vestibular system

- other set is cochlea, greek word for snail

- when rolled up, cochlea is size of a pea.

- cochlea contains specialized receptor cells that respond to vibrations transmitted to inner ear.

• Cochlea: ossicles push sound waves through oval window

- cochlea is filled with fluid called perilymph

- vibrations displace hair cells along basilar membrane

• hair cells transduce sound energy into neural signals

• Auditory Nerve → Medulla → Midbrain → Thalamus → Temporal Lobe

• Exposure to Sound

• Loudness of sound is measured in decibels

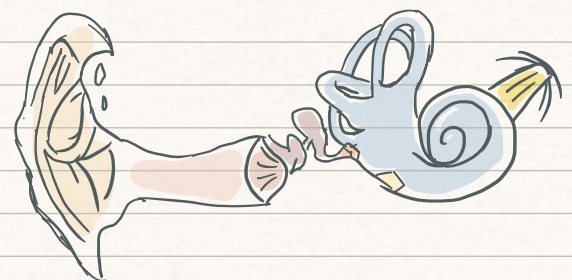
- whisper ~ 20 dB

- normal conversation ~ 60 dB

- phone with standard earbuds ~ 100 dB

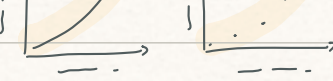
normal

implants



• The pinna

- threshold of pain ~130 dB



- Cochlear implants

- don't produce noise; produce electrical signals, similar to hairs
- stimulate auditory nerves directly
- don't hear all pitches

- Somatosensation

- Bodily sensations coming from skin, muscles and joints
 - processed by somatosensory cortex
 - receptors with skin provide info about touch, pressure and temperature
 - receptors within muscles and joints provide info about position and movement
 - both types of receptors can send pain signals to brain.

- Receptors for touch, temp. and pain

- Endorphins

- reduce pain by helping to close the gates that allow painful nerve impulses into the brain.
- can be released in wide variety of circumstances. (traumatic injury, runners high, pleasant experiences)

- Vestibular System

- fluid-filled sacs (otolith organs): sensitive to movement, acceleration, gravity.
 - Otolith organs contain tiny crystals in soft gelatin-like mass
- Stimulates hair-like receptor cells, allowing to sense gravity, acceleration and movement
- Semicircular canals: sensory organs for balance
 - movement cause fluid to swirl about

Smell

- Olfaction

- receptors are located in a thin layer of cells within nasal cavity
 - regularly die and are replaced, cycles last 4-6 weeks
 - cells at base of receptors are responsible for producing mucus surrounding receptors
 - one branch of each receptor interacts with molecules dissolved in the mucus
 - branch carries info back to central nervous system as part of the olfactory nerve.
- olfactory nerve fibers synapse in one of the two olfactory bulbs, located below frontal lobes.



Taste

- Taste receptors

- taste buds located on papillae (lumps) on tongue
 - purpose is to protect from eating poisonous or spoiled food
 - four major categories: sweet, sour, salty, bitter
 - fifth type of taste (umami) means savory
 - tongue contains receptors for capsaicin, active ingredient in hot peppers.
- Bumpy texture of tongue results in presence of papillae, containing 1-100 taste buds.



W 10/13



- Top-down processing

- In top-down processing, context & preexisting knowledge are used to rapidly organize features into a meaningful whole
- Interpretation depends on context

- Bottom-up processing

- Bottom-up processing we start constructing at the bottom with raw materials--
- that is, we begin with small sensory units (features) and build upward to perception.

- Gestalt principles

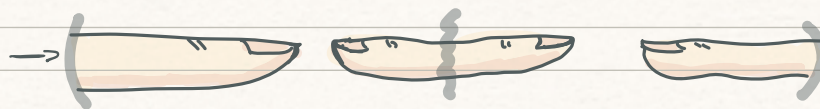
• We are born with a number of built-in tendencies to organize incoming sensory info in certain ways

- Monocular Cues: one eye

- Binocular Cues: two eyes

- Perceptual constancies

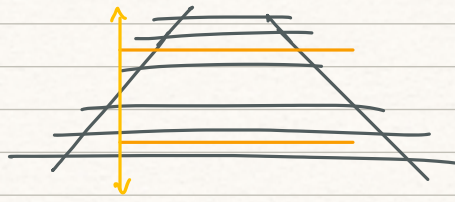
- tendency to perceive objects as the same even when their physical characteristics change



A B C

1 2 1 3 1 4

- Size
- Shape
- Brightness
- Color



- Constancies

- Size constancy: perceive objects as remaining the same size even when image on retina continuously grow or shrink.
- Shape constancy: perceive object as retaining same shape, even though different angles
- Brightness constancy: perceive brightness as same in changing illumination
- Color constancy: perceive color as remaining stable despite difference in lighting.

- Visual illusions

- Müller-Lyer and Ponzo

Th 10/14

- Illusions: perceptual experience in which you perceive an image as being so strangely distorted that it can't exist.

- created by manipulating perceptual cues so that brain can no longer correctly interpret space, size or depth

- Multisensory Perception

- Most sensory experience co-occurs with another sensory system

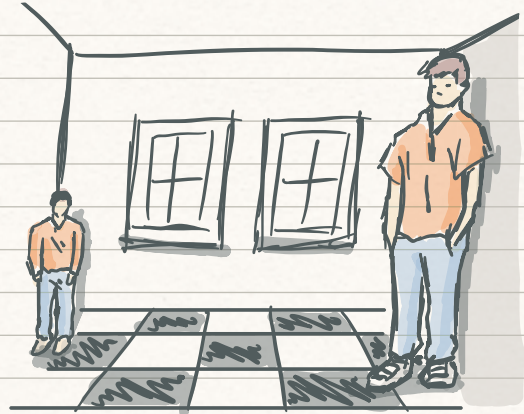
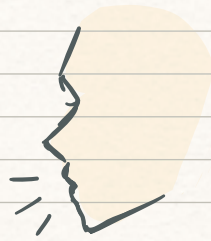
- See and hear
- Taste and smell

- Developmental experience

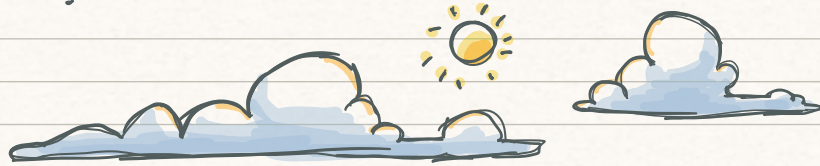
- Language

- Extrasensory Perception: FAKE

- Telepathy: transfer one's thought
- Precognition: foretell events
- Clairvoyance: perceive objects out of sight
- Psychokinesis: move object without touching



Chapter 5

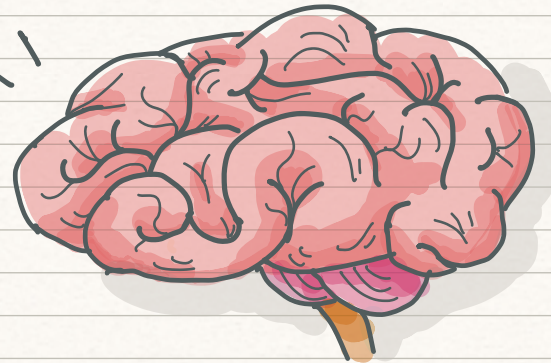


- Consciousness: mental awareness of sensations and perceptions of external events as well as self-awareness of internal events, including thoughts, memories and feelings about experiences and the self.

- feeling in the moment
- one's own perception of introspective experience is subjective.

- Disorders of consciousness

- Most of one's time spent in Waking Consciousness.
 - State of clear, organized alertness
 - Everything we see and feel seem real and responsive to stimuli.
- Coma: state of total unresponsiveness
- Brain dead or persistent vegetative state
 - long-term waking state w/out any signs of awareness
- Locked in: looks like coma, can't move anything
- Drs use various brain imaging scans to determine level & location of brain activity.



- Altered state of consciousness

- fatigue, delirium, hypnosis, drugs, euphoria, dreaming, daydreaming
- condition of awareness distinctly different in quality or pattern from waking consciousness
 - during perceptions, emotions, memories, time sense, feelings of self control, etc.
 - caused by monotonous stimulation.

- Consciousness and Culture

- Altered states of consciousness important role in cultures.
 - Native American sweat lodges.



-Buddhists during meditation

-Navaho elders drink peyote

• meant to cleanse body and mind, connect with spirit

-personal enlightenment



Th 10/21

-Hypnosis

-Meditation: mental exercise for producing relaxation or heightened awareness

• focus

• reduces stress and physical tension.

• frontal lobe activity changes

-Concentrative Meditation: attending to a single object, thought or breathing ("om").

-Mindfulness Meditation: widening attention to become aware of everything experienced at a given moment.

• Open, nonjudgemental awareness (quieted thoughts during a walk in nature).

-Concentrative Meditation Ma ta (monkey mind)

-The Relaxation Response: pattern of internal bodily changes that occur at times of relaxation.

• Relaxes fight or flight response

• Physical benefits (lowered heart rates, blood pressure, muscle tension).

• Mental benefits (concentration, clarity, calm)

-used in drug & alcohol rehab

-helps with insomnia and aggression

-Tranquility Tank

• Sensory deprivation tanks: float in a tank of saltwater in the dark with no sound

• Strong relaxation during short durations

• drop in blood pressure, muscle tension, chronic pain

• Stimulates creative thinking (music, performance)

-Mindfulness and Well-being

• Mindfulness: state of open nonjudgemental awareness of current experience (opposite of being spaced out).

-peaceful in moment, aware of everything

-benefits (increased self-knowledge, easier to quit smoking, reduced distress)

-Sleep

• Spend 25 years on average asleep

• Improves memory, less needed energy (would have to eat more)

F 10/22

-The Need for Sleep

• Biological Rhythm: any repeating cycle of biological activity, such as sleep and waking cycles or changes in body temperature

• 4 days or more becomes very dangerous

-World record is 11 days

• Sleep deprivation: being prevented from getting desired or needed amounts of sleep

• Sleep loss: slurred speech, reduced concentration, poor memory, can't recall names of common objects, trembling hands, irritability, increased pain sensitivity, discomfort

• Hyperinsomnia: excessive daytime sleepiness

• Microsleeps: brief shifts in brain activity to patterns similar to sleep

• Sleep-deprivation psychosis: a major disruption of mental and emotional functioning brought about by sleep loss.

-15% of fatal car crashes are caused by sleepiness

-Sleep Patterns

• Light & dark help time marketing and ties our sleep-wake cycle to day/night

• Typically need 7-9 hours of sleep

• Infants need 20 hours

• Older adults need 6



- Stages of Sleep

• Repair/restorative Theories of Sleep: propose that lowering body and brain activity and metabolism during sleep may help conserve energy and lengthen life

• EEG

• Beta waves: Small, fast brain waves associated with being awake and alert

• Alpha waves: large, slow brain waves associated with relaxation and falling asleep

• Sleep stage: levels of sleep identified by brain-wave patterns and behavioral changes (Theta & Delta waves)

- Brain Waves Mnemonic

• Beta: bright eyed, awake

• Alpha: Almost asleep

• Theta: a little bit asleep, light

• Delta: Deep Sleep

- 4 sleep stages

1) Light sleep: heart rate slows, breathing becomes more irregular, muscles relax, may trigger hypnic jerk

2) EEG shows sleep spindles (short bursts of distinctive brain wave activity, prevents arousal from stimuli)

3) Deeper, slow-wave sleep. Delta waves further loss of consciousness

4) Deep sleep: deepest level, takes abt one hour to get there. Deep state of oblivion, would be awoken to

M 10/25

- Sleep & Memory

• During lighter cycles of sleep cycle, Rapid Eye Movement begins (REM)

- Fast, irregular EEG patterns (looks like stage 1)

- Brain is as active as when awake

• Non-REM sleep: non-rapid eye movement sleep characteristics of stages 2, 3, & 4.

- helps memory formation and calming brain.

• Function of NREM sleep

- NREM sleep is dream free 90% of time

- Most prevalent after physical exertion, may help recover body fatigue

- Calms the brain in order to begin memory consolidation

- Helps refresh the brain after a day's activity

• Function of REM sleep

- sharpens or completes the memory consolidation

- daytime stress increases REM sleep



- REM sleep & dreaming

• Brain regions responsible for imagery and emotion activate

• Body becomes very still in REM-sleep paralysis

- Naps

• Recovery (compensation for sleep loss)

• Prophylactic (in preparation of sleep loss)

• Appetitive (joy of nap)

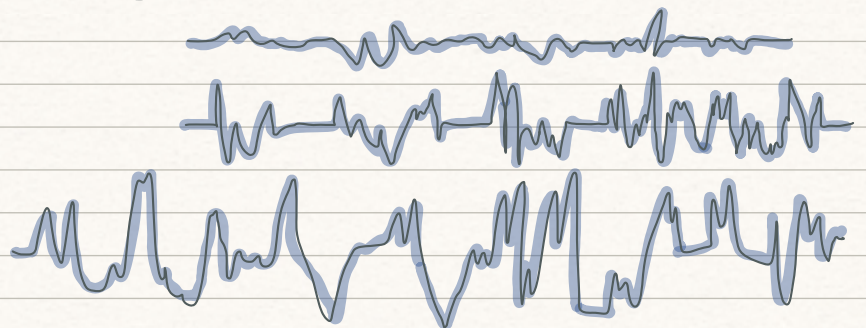
• fulfillment (necessary: children)

• Essential (when sick)

• Power nap: ideal length 10-30 min

- interfere with normal bedtime, sleep inertia (feeling groggy)

- better mental health



- Sleep disorders & disturbances

• Narcolepsy: chronic sleep disorder where the person is overwhelmed by daytime drowsiness and sudden attacks of sleep.

• Insomnia Disorder: difficulty getting to sleep or staying asleep

• Types: Temporary & chronic

- drug dependency insomnia: sleep loss caused by withdrawal from sleeping pills (amnesia, depression, etc.)

Behavioral remedies

- stimulus control: regular sleep schedule
- sleep restriction: don't nap
- paradoxical intention: remove pressure of falling asleep
- relaxation: progressive muscle relaxation
- exercise: early in day is better
- food intake: eat starch
- Stimulant avoidance: no coffee, cigarettes and alcohol
- Avoid screens: emit blue light



- Sleepwalking, Sleep talking, Sleepsex

- Somnambulists: sleepwalkers
 - Avoid obstacles
 - Occurs during stage 3 (not REM)

T 10/26

- Sleep apnea: repeated interruption of breathing during sleep

- breathing stops 20 sec - 2 min during sleep
- Can use CPAP machine or other techniques to reduce problem (weight loss)
- Always fatigued, stresses heart & body

- Sudden infant death syndrome (SIDS): sudden death of apparently healthy baby

- Could be due to weak arousal reflex
- health concerns (slight cough, prematurity, choking)
- Prevention: "Back to Sleep"
 - healthy infants should always be placed on their backs to sleep
 - 15% of SIDS cases are caused by accidental suffocation on clothes and bedding, strangulation, or overlaying
 - more like 90%

- Dreams

- Most people dream 4-5 times a night
- REM Rebound: occurrence of extra rapid eye movement sleep following REM sleep deprivation
 - Sleepers awaken during start of REM; found had REM more frequently
- Dream theories
 - Psychodynamic (Freudian): represent internal conflict & unconscious forces; hidden, symbolic meaning
 - Activation-Synthesis: dream content affected by motor commands in brain that are not carried out; dreams meaningless
 - Neurocognitive dream theory: dreams correlate w/ waking thoughts and emotions; no hidden meaning.

- Effects of commonly used psychoactive drugs

- Psychoactive drug: substance capable of altering attention, memory, judgement, time sense, self-control, mood or perception.
 - Stimulant (upper): increases activity in the body and nervous system.
 - Depressant (downer): substance that decreases activity in body and nervous system.
 - Instrumental use: anti-inflammatory for muscle pain or anti-depressant for depression.
 - Recreational use: focus on the experiencing the psychoactive effects (get high)

- Psychoactive drug misuse & abuse

- Drug abuse: misuse that carries harm
- Experimental use: short term
- Social-recreational: occasional use for pleasure or relaxation
- Intensive: daily use with elements of dependence
- Compulsive: intense use and extreme dependence

- Polydrug Abuse

- When drugs mixed, frequently have different and multiplied effects
 - causes accidental overdose
 - drug interaction: combined effects of two drugs that exceeds addition of one drug's effects to the other
 - legal & illegal drugs



- Drug dependence

• Physical dependence (addiction): compulsive use of a drug to maintain bodily comfort as indicated by the presence of drug tolerance and withdrawal symptoms

• Withdrawal symptoms

• drug tolerance

• psychological dependence: drug dependence based primarily on psychological needs.

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- Drugs of abuse: uppers

• Amphetamine: prescribed for ADD/ADHD

• Cocaine: increases dopamine and noradrenaline which produces the "rush", powerfully rewarding

• Anhedonia: brain adapts to this chemical balance, causing depression when removed and is no longer able to feel pleasure

• MDMA: ecstasy/Molly, rush of energy and sensory experiences, causes elevation of body temp. that can be fatal and liver damage, depression and brain damage.

- Uppers

• Caffeine: can cause insomnia, miscarriage risk, elevated temp., racing heart, chills, etc. most frequent used drug in America.

• Nicotine: can cause stomach pain, vomiting, dizziness. Long term effects due to carcinogens in tobacco. Second frequent used drug

- E-cigarettes & vaping

• E-cigarettes: devices that heat a liquid into an aerosol that the user inhales.

- liquid usually has nicotine & flavoring

• Potential harmful ingredients

- ultrafine particles inhaled deep in lung diseases.

- flavorants such as diacetyl, a chemical linked to serious lung disease.

- Volatile organic compounds

- heavy metals, nickel, tin, and lead

- Nicotine & E-cigarettes

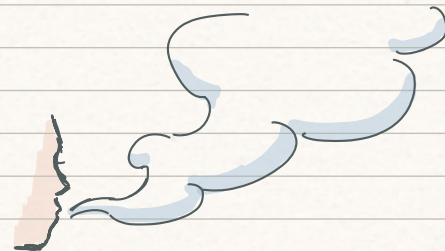
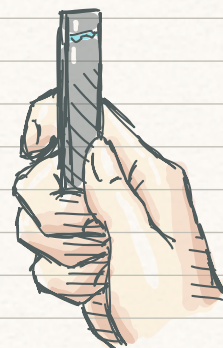
• Can stunt brain development up to age 25

- addiction, mood disorders, permanent lowering of impulse control

- harm brain regions responsible for attention control and learning

• E-cigs contain around 20 regular cigarettes

• More likely to become addicted to alcohol.



- Downers

• Narcotics: opium has been used for centuries for pain relief

- now commonly refined into morphine, codeine & heroin (methadone)

- Naloxone: reverses immediate effects of an overdose

- Harm-reduction strategy: treatment approach to drug addiction that seeks to reduce the negative consequences of addiction without necessarily requiring drug abstinence (methadone and needle clinics).

- Overdose deaths & Narcan

- Downers; tranquilizers

• Tranquilizers: alleviates nervousness and stress (valium, xanax, rophies), but causes amnesia and extreme relaxation/intoxication (date rape drug); withdrawal causes severe emotional depression

• These drugs slow normal brain function: slowed speech, breathing, sluggishness, dilated pupils, etc.

- Downers; Alcohol

• produces feelings of relaxation and euphoria, large amounts causes great impairment until consciousness is lost

• Alcohol myopia: shortsighted thinking and perception that occurs during alcohol intoxication

• Abuse, binge-drinking: drinking 5 or more drinks in a short time, can cause permanent memory loss, especially in young adults.

- At Risk

• Detoxification: treatment of drug abuse, including alcoholism, the withdrawal of the patient from the drug(s) in question

• Women are at greater risk because it's absorbed faster, but metabolize more slowly

• Moderate drinking

- Drink slowly

- Practice saying no

- Eat beforehand.

Thu 10/28

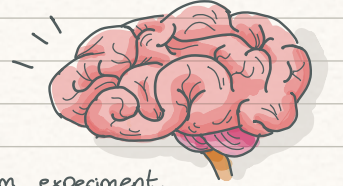
- Hallucinogens

- Mild stimulant, but main effect is to alter sensory impressions
- LSD, PCP (angel dust), peyote, and mushrooms
 - causes agitation, disorientation, violence; effects neurotransmitter systems
 - possible medical benefits: depression, anxiety, PTSD
- Marijuana: tetrahydrocannabinol (THC); sense of euphoria or relaxation; marijuana intoxication is mild compared to other drugs but can cause paranoia, hallucinations and delusions
 - lasting effects on attention, coordination & short-term memory impairment
 - may be used medical

- Medical marijuana

- Marijuana plant used to make THC & CBD
 - CBD doesn't make people high.
 - useful in reducing pain and inflammation, controlling epileptic seizures, & mental illnesses
 - Research extremely limited since it's illegal
 - THC increases appetite & reduce nausea; Also decreases pain, inflammation and muscle problems
 - FDA hasn't recognized nor approved marijuana plant as medicine.

Chapter 6



- Responding to our environment

- Learning: a relatively permanent change in behavior or the capacity for behavior that occurs from experiment.

- Types of learning

• Associative learning: formation of simple associations between various stimuli and responses

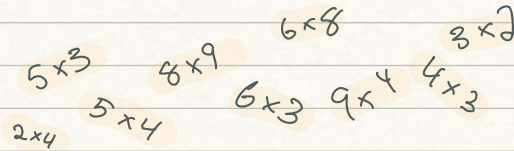
- classical & operant conditioning

• Cognitive learning: higher-level learning involving thinking, knowing, understanding and anticipation

- observational learning

• Antecedents: events that precede a response

• Consequences: effects that follow a response



- Rote vs. Discovery learning

• Rote learning: takes place mechanically through repetition and memorization or by learning rules (times tables)

• Discovery learning: based on insight & understanding (projects)

- Associative learning: occurs when forming connections among stimuli and behaviors

• classical conditioning: form of learning in which reflex responses are associated with new stimuli

• Operant conditioning: learning based on the consequences of responding (voluntary behaviors)

- Observational learning

• Occurs when organism learns by modeling the actions of another

- Classical Conditioning: Ivan Pavlov

• principles, phenomena, and applications of classical conditioning

- Process; before conditioning

• unconditioned response

• unconditioned stimulus

• The Office episode

- Terms

• Unconditioned Stimulus (US): stimulus that naturally and reliably evokes a response

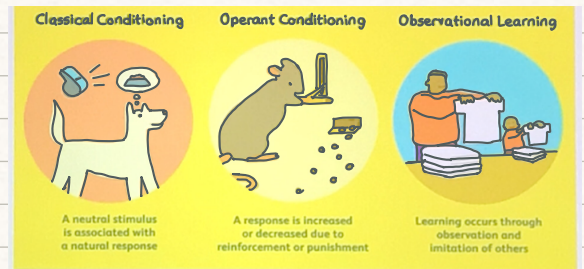
• Unconditioned Response (UR): Response naturally and reliably elicited by the unconditioned stimulus

• Neutral stimulus (NS): stimulus that does not initially elicit the unconditioned response

• Conditioned stimulus (CS): stimulus that was once neutral, but through association with the US, now elicits a response.

• Conditioned response (CR): after conditioning has occurred, response that is elicited by conditioned stimulus.

- Contingency & Continuity



- Continuity + Contingency = better learning
- Contingency + less continuity = slowed learning



- Expectancy & Extinction

- expectancy: anticipation concerning future events or relationships
- extinction: weakening of a conditioned response through removal of reinforcement
over time, US stops following CS, condition fades away
- Spontaneous recovery: the reappearance of a learned response after its apparent extinction

- Extinction & Spontaneous Recovery

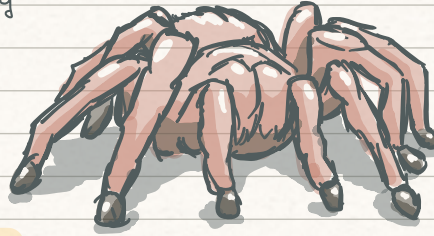
- Extinction: learned behaviors stop when they are no longer followed by a reinforcing consequence

- Taste Aversion

- types of stimuli: used as conditioned and unconditioned stimuli do matter

- Classical conditioning Application: Aversion therapy

- Conditioning taste aversion to alcohol



- Little Albert

- John Watson & Rosie Rayner (1920)
- Subject: 9 month old Albert B
- scared of white fluffy things

- Classical conditioning Application: overcoming fear

- Flooding: treating phobias by exposing people to fear-producing stimuli in a manner that is safe until they no longer respond
- Systematic desensitization: associations between a phobic stimulus and fear are replaced by associations between the phobic stimulus and relaxation. The introduction of the stimulus often starts small and increases in intensity.
- If relaxation falters at any point, the person retreats to an earlier stage of exposure to the fear stimulus until he or she can relax again.

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- Vicarious, or secondhand, conditioning: seeing other people dislike something

- Vicarious CC: CC brought about by observing another person react to a particular stimulus

- Operant Conditioning (instrumental learning & voluntary responses)

- Thorndike's Law of Effect

- Shaved animals had intelligent



- The Skinner Box & Behaviorism (1904-1990)

- Proposed that consequences of a behavior are critical for learning
- Skinner Box: Operant conditioning chamber, an apparatus designed to study operant conditioning in animals.

- Shaping: gradually molding responses to a final desired pattern

- successive approximations

- Reinforcement

- reinforcer: any event that reliably increases the probability of responses it follows

- Punishment

- punishment: any event that reliably decreases probability of response it follows

- Consequences of Conditioning

- Add some element to one's environment ("positive"), or remove an element ("negative")

adding to environment	removing from environment
positive reinforcement	negative reinforcement
positive punishment	negative punishment

M 11/1

- Punishment

- Timing
- consistency
- Intensity



- Observational Learning

- Bandura's Experiments
 - watching aggressive behavior, child imitates aggression
- Modeling: person who serves as an example in observational learning.

• Observational learning: watching/imitating actions of another person or noting consequences of those actions

1) Attention: observer will pay more attention to older person of same sex

2) Retention in memory: must retain cognitive memory of model's behavior

3) Reproduction of behavior: must reproduce behavior

4) Motivation: motivated to produce behavior

• Modeling & Media: violent shows & video games

• Case study: Neurology of imitation

- mirror neurons show patterns of activity / when you feel what another person is feeling

• Ex: seeing another person get hurt

